United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Wyoming State Office
P.O. Box 1828
Cheyenne, Wyoming 82003-1828

In Reply Refer To:
2800 (920George)
WYW-174598
IDI-35849
NVN-089270
Gateway West Transmission Line

JUL 5 2011

Dear Reader:

Enclosed for your review and comment is the Draft Environmental Impact Statement (Draft EIS) for the Proposed Gateway West Transmission Line Project and accompanying land use plan amendments for several Bureau of Land Management (BLM) areas and National Forest units. The BLM prepared this Draft EIS in consultation with cooperating agencies and in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended; the Council on Environmental Quality, Department of Agriculture, and Department of the Interior regulations implementing NEPA (40 CFR Parts 1500-1508 (for CEQ), 43 CFR Part 46 for the BLM, and 36 CFR Part 220 for the Forest Service) to analyze the effects of authorizing the Proponents (Rocky Mountain Power and Idaho Power) to construct and operate the Gateway West Transmission Line Project. The Proponents submitted applications for right-of-way (ROW) grants to utilize portions of the National System of Public Lands and Special Use Permits to utilize portions of National Forest System Lands in southern Wyoming, southern Idaho, and possibly northern Nevada. The Wyoming State Office of BLM is the lead BLM office for this project.

The Proponents are requesting the BLM ROW Grants and Forest Service Special Use Permits for the construction and operation approximately 1,103 miles of new 230-kilovolt (kV) and 500-kV electric transmission system consisting of 10 segments between the Windstar Substation at Glenrock, Wyoming, and the Hemingway Substation approximately 30 miles southwest of Boise, Idaho. The proposed transmission line would supplement existing transmission lines and relieve operating limitations, increase capacity, and improve reliability in the existing electric transmission grid. This would allow for the delivery of up to 3,000 megawatts (MW) of additional energy for the Proponents' larger service areas, principally in Utah and Idaho, and to other interconnected systems. The Project includes three proposed substations, an expansion at one planned substation to be constructed for other purposes, and expansions at eight existing substations. Other associated facilities include communication systems, optical fiber regeneration stations, and substation distribution supply lines.

The Draft EIS assesses the environmental impacts of the Proposed Action, Route Alternatives, Schedule and Structural Variations, and includes an analysis of the No Action Alternative. The BLM has not identified a preferred route alternative for the project. The BLM preferred route

alternative will be identified in the Final EIS. The BLM and the Forest Service have identified preferred plan amendments for each of the amendments that would be required if a particular Proposed or Alternative Route were selected.

Because the BLM has not identified a preferred route alternative at this time, we encourage comments on the full suite of route alternatives. Comments will be most valuable if they also address the proposed land management plan amendments for each of the route alternatives where applicable.

The Draft EIS is not a decision document. Rather, its purpose is to inform the public and interested parties of impacts associated with implementing the proponent's proposal as associated with granting right-of-way to construct, operate, maintain, and decommission transmission facilities across federal lands, and in some cases amending underlying land management plans. This Draft EIS also provides information to other regulatory agencies for use in their decision making process for other permits required for implementation of the project.

The BLM will host public meetings to discuss the Draft EIS. Dates, times, and locations of these meetings will be distributed in newsletters, announced in the local news media, and posted on the project website at http://www.wy.blm.gov/nepa/cfodocs/gateway_west.

The comment period for the Proposed Gateway West Transmission Line Project and accompanying land use plan amendments Draft EIS will close 90 days following the date the U.S. Environmental Protection Agency's (EPA) publication of the Notice of Availability in the Federal Register. The BLM can best use your comments and information if received within the review period. You may submit written comments on the Draft EIS by hand delivery, U.S. Postal mail, or electronic mail. You may also submit comments electronically at www.gatewaywesteis.com. Written comments will also be accepted at the public meetings.

Written comments may be hand delivered to any of the following BLM offices during normal business hours:

Idaho State Office
Boise District Office
Owyhee Field Office
Twin Falls District Office
Burley Field Office
Shoshone Field Office
Idaho Falls District Office
Pocatello Field Office

Wyoming State Office
Casper Field Office
Rawlins Field Office
Rock Springs Field Office
Kemmerer Field Office

Comments submitted by U.S. postal mail can be sent to:
Project Manager
Gateway West Transmission Line Project EIS
Bureau of Land Management
P.O. Box 20879
Cheyenne, WY 82003

Electronic comments must be submitted to Gateway_West_WYMail@blm.gov. Please include "Gateway West Transmission Line Project" in the subject line of the comments. E-mails submitted to email addresses other than the one listed or containing viruses will be rejected.

It is the BLM's practice to make comments, including names and addresses of respondents, available for public review. Before including your address, phone number, email address, or other personal identifying information with your comments, be advised that your entire comment, including your personal identifying information, may be made publicly available at any time. Although you may ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so. All submissions from organizations and businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, will be available for public inspection in their entirety.

To be most helpful, comments on the Draft EIS should be as specific as possible, mentioning particular pages, sections, or chapters. All comments will be reviewed; however, only substantive comments will be utilized during the preparation of the Final EIS. For a comment to be substantive, it should:

- Provide new information pertaining to the Proposed Action, an alternative, or the analysis;
- Identify a different way to meet the underlying need;
- Point out a specific flaw in the analysis;
- Suggest alternate methodologies that should be used, including reasons why;
- Make factual corrections, or
- Identify a different source of credible research, which, if used in the analysis, could result in different effects.

For additional information, contact Walt George, Project Manager, Wyoming State Office at (307) 775-6116, or visit the website at: http://www.wy.blm.gov/nepa/cfodocs/gateway_west

Thank you for your interest and participation in this analysis.

Sincerely,

Donald A. Simpson
State Director
for

READER'S GUIDE

The Bureau of Land Management (BLM) has prepared the Draft Environmental Impact Statement for the proposed Gateway West Transmission Line Project (Draft EIS). The purpose of the federal action on federally managed lands is to determine if the use of those lands for portions of the Gateway West Project is in the public interest. The need for the action is established by the federal agencies' responsibility under the Federal Land Policy and Management Act[1] to respond to an application for a right-of-way. In addition, the U.S. Army Corps of Engineers must respond under the Clean Water Act[2] to an application for a permit to discharge dredged or fill material into waters of the United States, including wetlands.

The public will have 90 days to review this Draft EIS. Given that the document consists of about 3,150 pages, 7 chapters and 10 appendices, we prepared this Reader's Guide to assist your review. It includes general guidance as well as a section-by-section summary and guide.

We hope this Guide will help you find information more easily, understand the various components of the proposal and how they are constructed, and have a complete understanding of measures incorporated into the proposal by the Proponents that are analyzed as part of the Proposed Action, and the mitigation measures required by the BLM and Forest Service in addition to the Proponents' Proposed Action.

GENERAL GUIDANCE

- Sections of the Draft EIS have been divided into separate volumes. The volumes are identified in the section-by-section guide below, along with the approximate number of pages. The volume contents are also listed in the front of each volume.
- Given the length of the Draft EIS, readers are encouraged to maximize their use of the electronic version of the document. All sections of the Draft EIS can be downloaded from the project Web site (http://www.wy.blm.gov/nepa/cfodocs/gateway_west). CD copies of the Draft EIS may also be requested at this site.
- The electronic copies of all sections are provided in PDF format, with bookmarks included to assist in navigating through the text.
- Acronyms are defined upon their first use. A master list of all acronyms used in the Draft EIS is provided in the front of each volume.
- A consolidated list of literature cited is located in Chapter 7.
- Appendix B contains detailed design information on the transmission line and its ancillary facilities. It also contains a narrative description of how the transmission line will be built. You are encouraged to review this material if you are not familiar with transmission line construction.
- Appendix C contains the Proponent's proposed Environmental Protection Measures (EPMs). These measures are incorporated as part of the Proposed Action. Because many of these measures have not typically been included in

[1] Federal Land Policy and Management Act of 1976, as amended, 43 United States Code (U.S.C.) § 22
[2] Clean Water Act of 1972, as amended, 33 U.S.C. § 1251

project proposals, you are encouraged to review this material to understand the impacts analysis in Chapter 3.

- Appendix D contains tables comparing quantitative impacts to various resources across route alternatives. Many readers find these tables a quick reference for impact and route comparisons.

REVIEWING THE DRAFT EIS

At a minimum, we recommend reviewing the following parts of the Draft EIS:

- Chapter 1, “Purpose and Need”
- Chapter 2, “Alternatives”
- Appendix B, “Transmission Line and Substation Components Common to All Action Alternatives”
- Appendix C, “Environmental Protection Plan and Measures”

Chapter 1 presents (1) the Proponent’s purpose and need for the Project and the purpose and need for the agency actions, (2) a list of issues identified during scoping that form the basis for the analysis and provides a comparison of the alternatives considered across all resources, (3) information on the geographic and temporal scope of the analysis, and (4) the laws, regulations, and policies bearing on the proposal.

Chapter 2 is the heart of the EIS and summarizes the results of the detailed analysis found in Chapters 3 and 4. Alternatives analyzed in detail and those considered but not analyzed (and rationale why they were not fully analyzed) are presented in this chapter. In Chapter 2 you will also find a summary of the EPMs proposed by the Proponents and considered part of the project description. In many cases, BLM and the Forest Service have required additional mitigation, and those mitigation measures are also summarized in Chapter 2. For a narrative summary comparison of the alternatives and cumulative effects, please see Sections 2.9 and 2.10.

If you have time to read **Chapter 3**, please first carefully read the introduction in Section 3.1. The Project is so large and, for some segments, there are so many alternatives, that understanding how each resource section is organized will save time and reduce confusion. Very importantly, please note that much of the analysis is reported in the “Effects Common to All Action Alternatives” subsection and is not repeated in the comparison of impacts among alternatives in each resource section of Chapter 3.

Chapter 3 combines both Affected Environment and Environmental Consequences (sometimes presented as separate chapters in other EIS documents). This allows an analysis by resource that starts with a description of the resource across the analysis area and then describes the consequences of permitting the Proposed or Alternative Routes across that analysis area for that resource.

We arranged the effects discussion in Chapter 3 by resource rather than segment because this avoids repeating basic resources information in each segment narrative. If you are interested in the Project effects to a particular resource (e.g., wildlife or water resources), across the entire project, you would read Sections 3.10 and 3.16, respectively. If you are interested in all the Project effects in a certain segment, you will need to use the bookmark for that segment’s text in each of the resource sections of Chapter 3. The CD format of the Draft EIS is bookmarked and will facilitate this type of review.

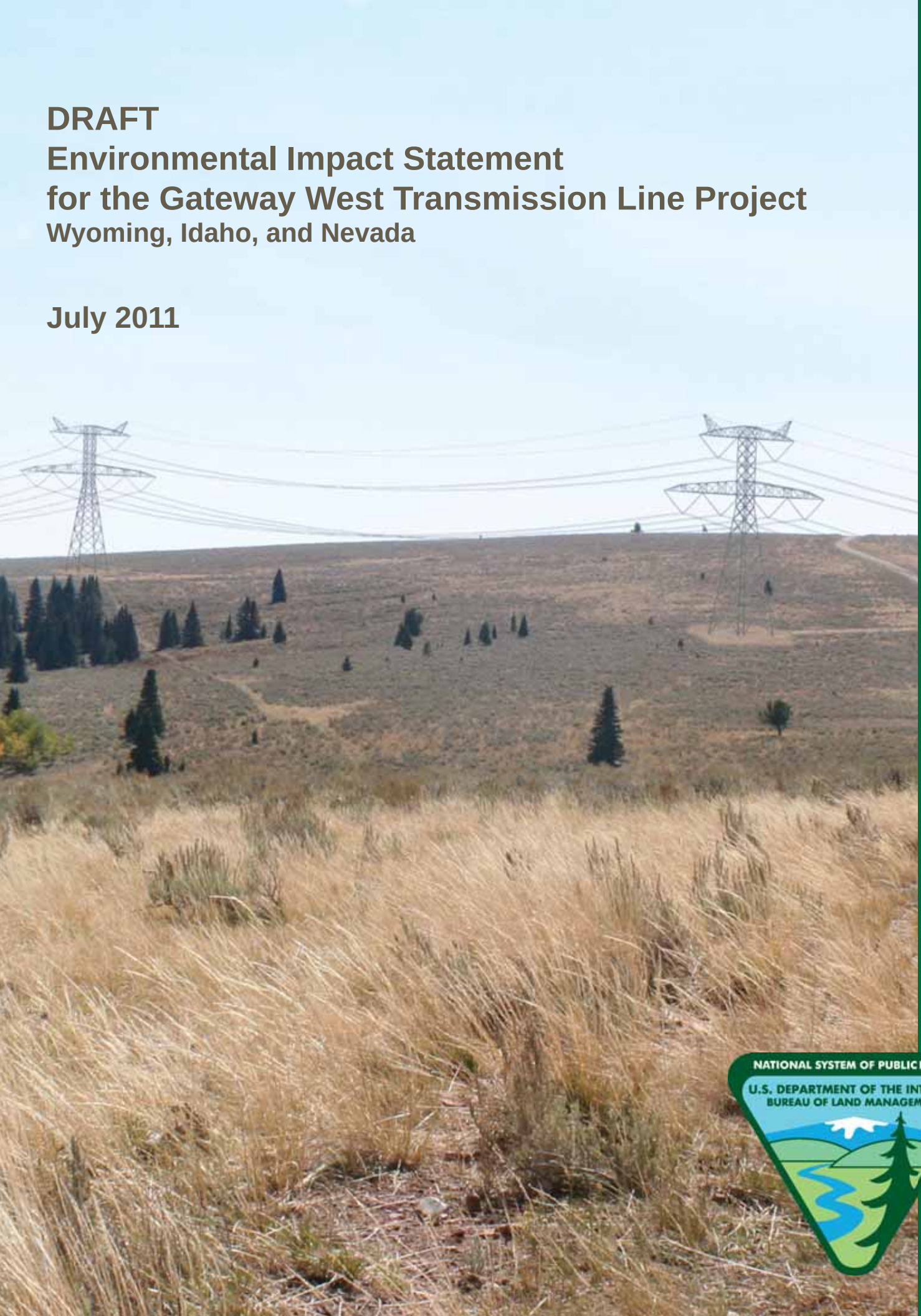
The following table presents a summary description of each chapter and appendix and explains how they support one another in displaying the environmental analysis conducted for the proposed Gateway West Transmission Line Project.

Section	Description
Executive Summary (Vol. 1a, ~28 pages)	This stand-alone summary provides an understanding of why the agencies have prepared the Draft EIS, summary-level descriptions of each agency's proposed actions and alternatives, and the potential impacts of these actions.
1: Purpose and Need (Vol. 1a, ~40 pages)	This chapter provides the purpose and need for the agencies' actions; the purpose and need for the Project itself, the scope of analysis; Cooperating Agencies; presents a description of applicable federal orders and mandates and provides a list of permits, consultations, and approvals required for the Project to be constructed and operated; summarizes the scoping conducted for the Project; and lists the issues that were raised during scoping that drive the analysis.
2: Alternatives Considered (Vol. 1a, ~212 pages)	This chapter is the heart of the EIS and provides a description and a summary comparison of the Proposed Action, Route Alternatives, the Design Schedule, and Structure Variations, and the No Action Alternative. It includes alternatives considered but eliminated from detailed analysis and the rationale for this decision. It provides a detailed description of the Proposed Action and the design and construction components common to all Action alternatives. Chapter 2 summarizes the comparison among Route Alternatives, presents a summary of mitigation measures, and also summarizes the needed plan amendments. It is supplemented by **Appendix A**, which shows maps of the Proposed and Alternative Routes; by **Appendix B**, which provides design and construction details common to all action alternatives; and by **Appendix F**, which details the proposed plan amendments for both National Forest System Lands and Public Lands managed by the BLM.
3: Affected Environment and Environmental Effects (Vol. 1a, ~758 pages and Vol. 1b, ~746 pages)	This chapter is organized by resource, and is introduced by a general guide to the chapter, explaining how each resource is organized and how disturbance is calculated (Section 3.1). It covers, by resource, the affected environment and the environmental consequences of the Action Alternatives and compares them to the No Action Alternative. It also analyzes the impacts of the plan amendments where they change underlying land classification and could have impacts beyond that of the project itself. It provides the detailed analysis that supports the comparison of alternatives found in Chapter 2, and is itself supported by detailed tables of comparisons found in **Appendix D** and by maps and simulations of visual impacts found in **Appendix E**. Sections 3.1 through 3.9 are found in Volume 1a, while Sections 3.10 through 3.23 are found in Volume 1b.
4: Cumulative Effects (Vol. 1b, ~96 pages)	Chapter 4 presents the cumulative effects of the Gateway West Project when considered together with the past, present, and reasonably foreseeable future actions in the analysis area. It includes the rationale for selecting other actions for inclusion, lists and describes those actions or projects, and presents an analysis of their cumulative effect. It includes consideration of land use plan amendments and is supported by maps presented at the end of **Appendix E**.
5: Consultation and Collaboration (Vol. 1b, ~24 pages)	This chapter highlights the consultation and collaboration process for the proposed Project, including the general public as well as Tribal governments, and federal, state, and local agencies and organizations.
6: Glossary and Index (Vol. 1b, ~26 pages)	The glossary provides definitions of specialized words and phrases found in the document and also briefly defines the important federal laws that provide the framework for the analysis. The index allows the reader to search the document by important word or phrase.

Section	Description
7: Literature Cited (Vol. 1b, ~50 pages)	This chapter presents literature cited, organized alphabetically by author for the entire document.
Appendix A (Vol. 3, ~18 pages)	Appendix A provides 11 x 17" maps of the Proposed Route and Alternative Routes, starting with a map that covers the whole project and followed by maps for each segment. For each segment, the maps depict the Proposed Route in red, the Alternative Routes considered in detail in green, and the Alternatives not considered in detail in purple. Detailed maps of each substation follow.
Appendix B (Vol. 2, ~80 pages)	Appendix B, Transmission Line and Substation Components Common to All Action Alternatives, is derived from the Proponents' Plan of Development and contains design details that supplement the description found in **Chapter 2**.
Appendix C (Vol. 2, ~226 pages)	Appendix C contains the Proponents' proposed Environmental Protection Measures that were considered as part of the Proposed Action. The EPMs were submitted to the BLM as plans, and have been presented here in five sections within the Appendix, including Environmental Protection Measures and Plans (C-1), Framework Reclamation Plan for Construction (C-2), Proposed Plant and Wildlife Conservation Plan –Construction Activities (C-3), Plan for Operations, Maintenance, and Emergency Response Activities (C-4), Greater Sage-grouse Avoidance, Minimization, and Mitigation Measures (C-5), and Framework Mitigation Plan for Unavoidable Impacts to Waters of the U.S. (C-6).
Appendix D (Vol. 3, ~202 pages)	Detailed large-format (11 x 17") tables comparing quantitative impacts across Route Alternatives are presented in Appendix D.
Appendix E (Vol. 3, ~123 pages)	Appendix E contains large-format (11 x 17") maps depicting the results of GIS analysis for various resources and also contains locational maps for Key Observation Points (KOPs) and the photographic simulations associated with those KOPs for both visual and cultural resources.
Appendix F (F-1 and F-2, Vol. 2., ~88 pages)	In several cases, for a Proposed or Alternative Route to be approved, the land management plan for the USFS or BLM unit crossed must be amended. Appendix F contains the language of each proposed plan amendment and a brief analysis of the need for the amendment and the effects of the amendment. Appendix F-1 details amendments to BLM Resource Management Plans or Management Framework Plans, while Appendix F-2 details amendments to Forest Service Land and Resource Management Plans.
Appendix G (G-1 and G-2, Vol. 2, ~356 pages)	Appendix G is the visual analysis supplement for Appendix F, and provides simulations of the Proposed or Alternative Route that would trigger a plan amendment, and the impacts to the underlying land allocations. Appendix G-1 supports the analysis of BLM plan amendments while Appendix G-2 supports the analysis of USFS plan amendments.
Appendix H (Vol. 2, ~52 pages)	This appendix provides the complete list of Interagency Operating Procedures (IOPs) from the Programmatic EIS for the West-wide Energy Corridors (DOE and BLM 2009). It shows how Gateway West has complied with those procedures and where such compliance can be found in the document.
Appendix I (Vol. 3, ~18 pages)	Appendix I presents a large-format (11x17") calendar of seasonal stipulations by wildlife species and by federal land managing unit
Appendix J (Vol. 2, ~4 pages)	This appendix provides details of the sage grouse analysis framework for interstate transmission lines.

DRAFT
Environmental Impact Statement for the Gateway West Transmission Line Project
Wyoming, Idaho, and Nevada

July 2011



BLM

Wyoming State Office

NATIONAL SYSTEM OF PUBLIC LANDS
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

The BLM's multiple-use mission is to sustain the health and productivity of the public lands for the use and enjoyment of present and future generations. The Bureau accomplishes this by managing such activities as outdoor recreation, livestock grazing, mineral development, and energy production, and by conserving natural, historical, cultural, and other resources on public lands.

BLM/WY/PL-11/038+1430

The photograph used for the cover of the Draft EIS was taken near Kemmerer, WY, from Dempsey Ridge Road north of Coke Mountain and east of the Tunp Range facing south, Key Observation Point 636 in the visual resources analysis. The transmission lines and towers depicted in this photograph are computer-generated simulations.

Gateway West Transmission Line Project
Environmental Impact Statement

[X] Draft [ ] Final [ ] Supplemental

Lead Agency	Bureau of Land Management, Department of the Interior	
Cooperating Agencies	Medicine Bow-Routt, Caribou-Targhee, and Sawtooth National Forests; National Park Service (National Trails Office, Minidoka National Historic Site, Hagerman Fossil Beds National Monument, Fossil Butte National Monument, Craters of the Moon National Monument and Preserve, and City of Rocks National Reserve); U.S. Fish and Wildlife Service (Ecological Services Division, Seedskadee and Cokeville Meadows National Wildlife Refuges); U.S. Army Corps of Engineers; Bureau of Indian Affairs; the States of Idaho and Wyoming; Idaho Army National Guard; Cassia, Power, and Twin Falls Counties, Idaho; Lincoln, Sweetwater, and Carbon Counties, Wyoming; the Medicine Bow and Saratoga Encampment-Rawlins Conservation Districts in Wyoming; and the City of Kuna, Idaho.	
Responsible Officials	Don Simpson BLM Wyoming State Director	Brent Porter Forest Supervisor Caribou-Targhee National Forest
For Information Contact	Walter George Project Manager PO Box 20879 Cheyenne WY 82003 (307) 775-6116	

Abstract

Idaho Power Company and PacifiCorp, Inc. jointly submitted an application for a right of way grant and special use permit for the construction and operation of a 230/500 kV transmission line from the Windstar Substation at Glenrock, Wyoming, to the Hemingway Substation approximately 30 miles southwest of Boise, Idaho. The transmission line would be approximately 1,103 miles long. This environmental impact statement evaluates the proposed action as stated in the application including environmental protection measures. It also examines the impacts of several possible alternative route locations in portions of Wyoming, Idaho, and Nevada, a structure variation, a design variation in Wyoming, and a schedule variation. Route alternatives were developed to avoid (or minimize impacts to) historical features, important wildlife or forested habitat, National Wildlife Refuges, National Monuments, state parks, recreational activities, restricted areas, irrigated agricultural lands, and planned infrastructure and housing developments. Alternatives were also considered that were specifically requested by the Wyoming Governor's Office, were "more direct" (shorter distance), and that adhered to utility corridors previously established by BLM and Forest Service land use plans, including corridors established by the Approved Resource Management Plan Amendments/Record of Decision (ROD) for Designation of Energy Corridors on Bureau of Land Management-Administered Lands in the 11 Western States and Record of Decision: USDA Forest Service Designation of Section 368 Energy Corridors on National Forest System Land in 10 Western States. Granting of the right of way and special use permit would require amendments of seven Bureau of Land Management Resource Management Plans (Casper, Cassia, Green River, Jarbidge, Kemmerer, Rawlins, and Morley Nelson Snake River Birds of Prey National Conservation Area), five Bureau of Land Management Framework Plans (Malad, Twin Falls, Bennett Hills/Timmerman Hills, Bruneau, and Kuna) and two Forest Service Plans (Revised Forest Plan for the Caribou National Forest and Medicine Bow Revised Land and Resource Management Plan). Depending on alternatives selected, amendments to the Sawtooth Forest Plan and Wells Resource Management Plan could also be required. Significant impacts were identified from construction and operation of the transmission line on historical resources (historic trails), visual quality, and cumulative impacts on several resources based on past and present levels of disturbance. The comment period on the Draft EIS will close 90 days from the date of publication of the EPA's Notice of Availability in the Federal Register.

EXECUTIVE SUMMARY

INTRODUCTION

Idaho Power Company and PacifiCorp (doing business as Rocky Mountain Power), collectively known as the Proponents, applied to the Bureau of Land Management (BLM) for a right-of-way (ROW) grant to use the National System of Public Lands for portions of the Gateway West Transmission Line Project (Gateway West or Project) on May 7, 2007. The original application was revised in October 2007, August 2008, May 2009, and January 2010 to reflect changes and refinements in their proposed Project. This application was assigned the case file numbers of IDI-35849 for Idaho, NVN-089270 for Nevada, and WYW-174598 for Wyoming.

The Proponents propose to construct and operate approximately 1,103 miles of new 230-kilovolt (kV) and 500-kV electric transmission system consisting of 10 segments between the Windstar Substation at Glenrock, Wyoming, and the Hemingway Substation approximately 30 miles southwest of Boise, Idaho. The proposed transmission line would supplement existing transmission lines and relieve operating limitations, increase capacity, and improve reliability in the existing electric transmission grid. This would allow for the delivery of up to 3,000 megawatts (MW) of additional energy for the Proponents' larger service areas, principally in Utah and Idaho, and to other interconnected systems. The Project includes three proposed substations, an expansion at one planned substation to be constructed for other purposes, and expansions at eight existing substations. Other associated facilities include communication systems, optical fiber regeneration stations, and substation distribution supply lines.

PURPOSE AND NEED

BLM is the lead federal agency under the National Environmental Policy Act and will coordinate the preparation of the environmental analysis. The cooperating agencies include the U.S. Department of Agriculture Forest Service (Forest Service) (the Caribou-Targhee, Medicine Bow-Routt, and Sawtooth National Forests); the National Park Service (including the National Trails Office, Minidoka National Historic Site, Hagerman Fossil Beds National Monument, Fossil Butte National Monument, Craters of the Moon National Monument and Preserve, and the City of Rocks National Reserve); the U.S. Fish and Wildlife Service (Ecological Services Division, Seedskadee and Cokeville Meadow National Wildlife Refuges [NWRs]) Wyoming; the U.S. Army Corps of Engineers (USACE); the Bureau of Indian Affairs; the States of Idaho and Wyoming; Idaho Army National Guard (IDANG); Cassia, Power, and Twin Falls Counties, Idaho; Elko County, Nevada; Lincoln, Sweetwater, and Carbon Counties, Wyoming; the Medicine Bow and Saratoga Encampment-Rawlins Conservation Districts in Wyoming; and the City of Kuna in Idaho.[1]

The purpose of the federal action on federally managed lands is to determine if providing for the use of those lands for portions of the Gateway West Project is in the

[1] BLM and the cooperating agencies may be referred to collectively hereafter as "the Agencies."

public interest. The need for the action is established by the federal agencies' responsibility under the Federal Land Planning and Management Act[2] to respond to an application for a ROW. In addition, the USACE must respond under the Clean Water Act[3] to an application for a permit to discharge dredged or fill material into waters of the United States, including wetlands.

ISSUES

Issues raised through scoping include effects on visual resources, cultural resources, socioeconomics, environmental justice, plants and wildlife, including special status species, water resources, land use, conformance with land use plans, agriculture, reclamation, control of invasive plant species, recreation, wilderness characteristics, transportation, air quality, noise. electrical environment, and public safety. Chapter 3 of the Draft EIS discusses how the Proposed Route and the Route Alternatives would affect key issues.

PROPOSED ACTION AND ALTERNATIVES

PROPOSED ACTION

The Project would begin in Wyoming at the Windstar Substation and take two paths to the Aeolus Substation—one to the east (Segment 1E) to access new wind energy, and one (Segment 1W) that would follow or parallel the West-wide Energy (WWE) corridor and an existing 230-kV line proposed for reconstruction (Figure ES-1). It would then proceed as a double-circuit 500-kV line from Aeolus to Populus. At Populus, the Gateway West Project would split into two single-circuit 500-kV roughly parallel paths—Segments 5, 6, and 8 would travel on a more northerly route toward the Hemingway Substation through the Borah and Midpoint Substations, while Segments 7 and 9 would travel a more southerly route through the Cedar Hill Substation to the Hemingway Substation (Figure ES-2). Segment 10 would provide an interconnection between the Cedar Hill and Midpoint Substations and also provide an interconnection between the more northerly and more southerly routes. The Proponents have proposed this split because of the need to serve loads along the way and also to increase reliability.

The Proponents' overall Project approach was to use the WWE corridor and other designated ROW corridors and existing utility corridors, if feasible and unless there was a compelling reason to avoid them. In many cases, the proposed routing closely follows the WWE corridor; however, the WWE corridor is only designated across federally managed lands, and about half the land along the route is privately owned. In some locations, the WWE corridor is too narrow to allow for the required separation (generally 1,500 feet) from existing transmission lines already in the corridor.

[2] Federal Land Policy and Management Act of 1976, as amended, 43 United States Code (U.S.C.) § 22
[3] Clean Water Act of 1972, as amended, 33 U.S.C. § 1251

NATIONAL SYSTEM OF PUBLIC LANDS

0 10 20 30
Miles

Route Features
- Proposed Route
- Feasible Alternative
- Energize Existing 345kV line to 500kV

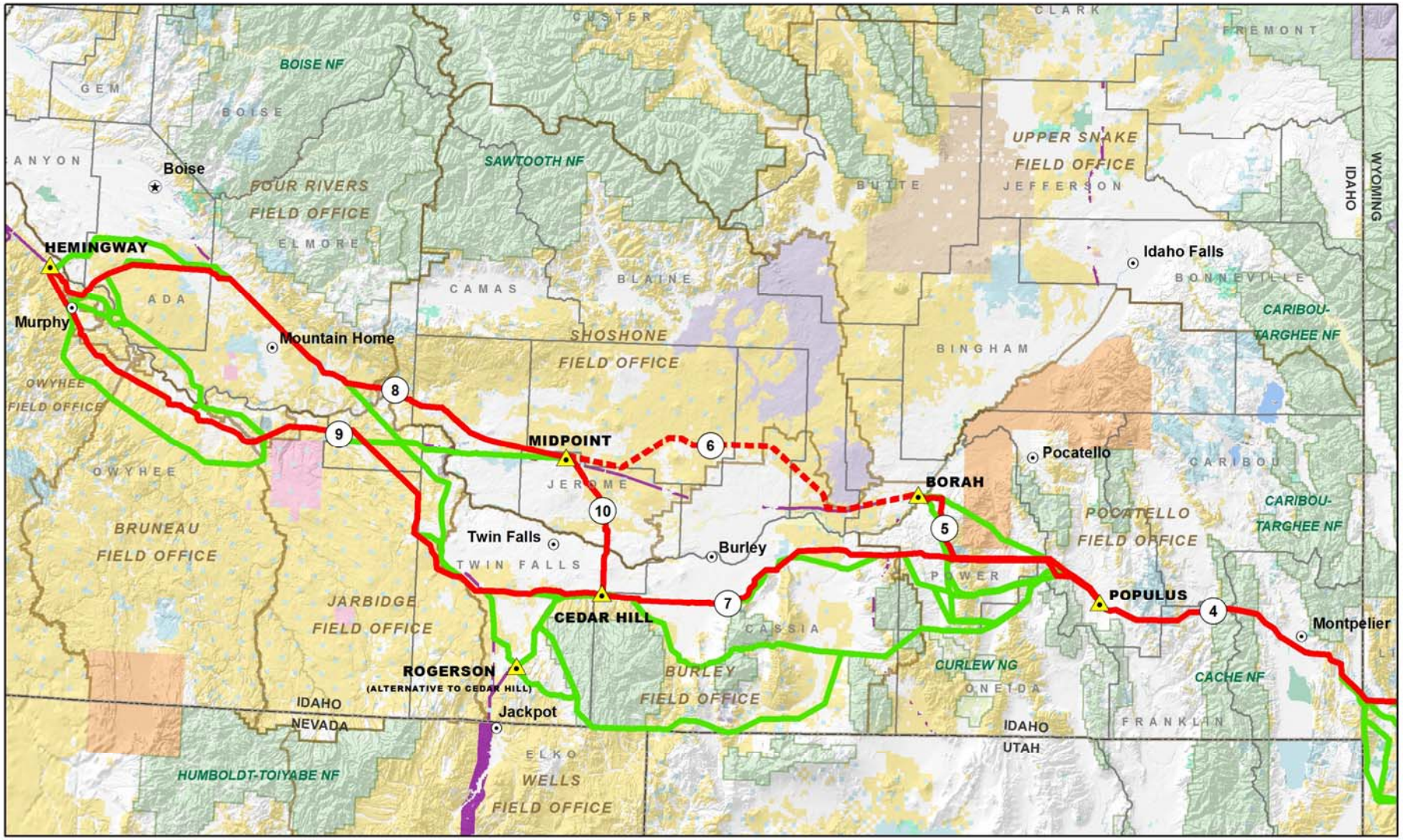
Project Features
- Substation Location
- West-Wide Energy Corridor
- Segment Number

Administrative
- City, Town
- State Capital
- County Boundary
- State Boundary

Transportation
- Interstate
- airports

Gateway West
Transmission Line Project
Idaho, Nevada, Wyoming

Wyoming Routes
FIGURE ES-1



NATIONAL SYSTEM OF PUBLIC LANDS

0 10 20 30
Miles

Route Features
- Proposed Route
- Feasible Alternative
- Energize Existing 345kV line to 500kV

Project Features
- Substation Location
- West-Wide Energy Corridor
- (7) Segment Number

Administrative
- City, Town
- State Capital
- County Boundary
- State Boundary

Transportation
- Interstate
- airports

Gateway West
Transmission Line Project
Idaho, Nevada, Wyoming

Idaho and Nevada Routes
FIGURE ES-2

The transmission line segments would cross federal, state, and private lands. Table ES-1 summarizes miles crossed by ownership for the Proposed Action. The ROW width requested for the transmission line ranges from 125 feet for single-circuit 230-kV and 250 feet for single-circuit 500-kV to 300 feet for double-circuit 230-kV and 500-kV segments.

Table ES-1. Proposed Action Summary of Miles and Percent Crossed by Ownership

Segment	Length (Miles)						Percent of Total				
	BLM	NF[1/]	State	Private	Other[2/]	Total	BLM	NF	State	Private	Other
Segment 1E – Windstar to Aeolus	11.6	2.8	22.0	64.0	0.1	100.6	11.5	2.8	21.9	63.7	0.1
Segment 1W(a) – Windstar to Aeolus	26.6	2.3	18.5	29.1	0.0	76.5	34.7	3.0	24.2	38.0	
Segment 1W(c) – Dave Johnston to Aeolus	24.2	2.3	15.4	28.7	0.1	70.6	34.2	3.3	21.8	40.6	0.1
Segment 2 – Aeolus to Creston	36.9		6.2	53.5	0.1	96.7	38.2		6.4	55.3	0.1
Segment 3 – Creston to Anticline[3/]	29.0		1.0	26.5		56.5	51.3		1.8	46.9	
Segment 4 – Anticline to Populus	82.2	9.2	10.7	97.7	3.2	203.0	40.5	4.5	5.3	48.1	1.6
Segment 5 – Populus to Borah	13.2		3.5	37.8	0.1	54.6	24.2		6.4	69.2	0.2
Segment 6 – Borah to Midpoint[4/]				0.5		0.5				100.0	
Segment 7 – Populus to Cedar Hill	28.1		4.3	85.7		118.1	23.8		3.6	72.6	
Segment 8 – Midpoint to Hemingway	86.5		9.3	33.4	1.8	131.0	66.0		6.9	25.5	1.6
Segment 9 – Cedar Hill to Hemingway	128.7		4.6	28.4		161.7	79.6		2.8	17.6	
Segment 10 – Midpoint to Cedar Hill	13.1			20.3	0.1	33.6	39.2			60.6	0.3
Total Project[5/]	480.5	16.7	95.2	506.7	5.7	1,103.4	43.5	1.5	8.6	45.9	0.5

1/ Totals reflect mileage crossed on National Forest System (NFS) land.
2/ Other includes Bureau of Reclamation, U.S. Fish and Wildlife Service, etc.
3/ Segment 3 includes 5.5 miles of 345-kV and 4.3 miles of 230-kV single circuit line.
4/ Segment 6 does not include ground-disturbing activity except in association with the expanded Borah and Midpoint Substations.
5/ Totals may not equal 100 percent due to rounding.

Details of construction and operations, common to all alternatives, are summarized in Section 2.7 of the EIS and detailed in Appendix B. Environmental protection measures (EPMs), proposed by the Proponents, are provided in Appendix C and are considered part of the Project description for the proposed and alternative routes and design variations.

Structure and Schedule Variations

After analysis and comparison with the alternative structure types considered, the double-circuit 500-kV horizontal lattice tower has been proposed for those line segments requiring a double-circuit configuration. However, two single-circuit 500-kV structures in a 350-foot-wide ROW (wider than the 300-foot width of the proposed single-tower, double-circuit structure) are an economically feasible structure alternative for the line segments requiring two 500-kV circuits and are analyzed as a structure option for Segments 2 through 4.

Due to the uncertain economic conditions, some of the potential customers for Gateway West have cancelled or deferred project development plans. To maintain flexibility in an uncertain market and still meet customer requests, the Proponents have proposed a Schedule Variation for detailed analysis applicable to Segments 1 through 4. Chapter 2, Table 2.1-7 in the Draft EIS shows the Schedule Variation construction schedule. Key elements of the Schedule Variation are described below.

- Constructing Segments 1E, 1W(a), 3A (345-kV line between the Anticline yard and the existing Jim Bridger Substation); one circuit of Segments 2, 3, and 4;

construction of the Heward and Anticline Substations; and modifications to the Windstar, Aeolus, and Populus Substations.

- Shifting construction of Segment 1W(c); one circuit of Segments 2, 3, and 4; and modifications to the Windstar, Aeolus, Creston, Anticline, and Populus Substations to the 2018 to 2020 time frame[4].
- The second circuit for Segments 2, 3, and 4 would be operated at 500 kV when constructed; the Creston Substation would be constructed as a 500-kV substation; and Segment 3B (230 kV to the existing Jim Bridger Substation) would not be needed.

ROUTE ACTION ALTERNATIVES

Alternatives were developed within each Project segment rather than from the beginning (Windstar Substation) and end points (Hemingway Substation) of the entire project. Project segments are defined by substations since these are the logical connection points of the Gateway West Project with other transmission and distribution lines.

Several alternatives were considered but eliminated from detailed study because it became clear that they provided no environmental benefit over the Proposed Action or one of the other alternatives considered in detail; they were not feasible for environmental, physical, or economic reasons; or they did not reasonably meet the Proponents' Purpose and Need.

Alternatives considered in detail are compared with the Proposed Action based on the same beginning and ending points so all the Action Alternatives can be compared equally. Not all of the Proposed Action segments had feasible alternatives, and some segments only had alternatives proposed for part of their length. Alternatives considered in detail, as well as alternatives considered and eliminated, are shown on Figure A-1 (in Appendix A), and are discussed in detail for each resource in Chapter 3 of the Draft EIS.

Alternative routes were analyzed for route segments 1E, 1W(a), 2, 4, 5, 7, 8, and 9. No alternatives were identified for Segment 6 because it is a rebuild of an existing line. No feasible alternatives were identified for Segments 3 and 10. Segment 3 generally follows Interstate 80 and existing transmission lines and Segment 10 follows a WWE corridor for all but 2.3 miles of its 33.6-mile length. Segments with feasible alternatives are discussed below.

Alternatives 1E-A, 1E-B, and 1E-C Compared to the Proposed Route

Segment 1E of the Proposed Route was developed to avoid multiple transmission lines on private lands in the Dave Johnston – Rock Springs transmission corridor near the North Platte River and to access planned wind energy resources in northwest Albany County, Wyoming. Among the key factors considered in routing this segment were

[4] The exact time frame for construction of the second single-circuit 500-kV transmission line and associated substation modification depends on market conditions and could occur from 1 to 5 years after completion of the first single-circuit 500-kV line. For the purpose of the environmental analysis, a midrange of 2018 to 2020 was selected.

visual resources, wildlife resources (sage-grouse, big game winter range, and nesting raptors), and geologic features (an ice cave).

Alternative 1E-A was developed as an alternative to the northern segment of the Proposed Route in response to visual and land use impact concerns expressed by local citizens along the Proposed Route. This alternative would minimize the effect of separate transmission lines on private lands located along the existing Dave Johnston – Rock Springs transmission line corridor. Alternative 1E-A is shorter than the comparison portion of the Proposed Route (16.1 miles vs. 17.6) but would have more impacts on visual resources as seen from residences in the Glenrock area. This alternative would parallel an existing transmission line corridor (Segment 1W[c]) for over 80 percent of its length versus approximately 2 percent for the comparison portion of the Proposed Route. However, if Segment 1W(a) of the Proposed Route is built as proposed, Segment 1E of the Proposed Route would be adjacent to the 1W(a) line for approximately half of its length. Alternative 1E-A would cross more big game winter range (30.8 miles vs. 28.0) but less sage-grouse core area (0.5 acre vs. 8.9) than the comparison portion of the Proposed Route. This alternative would be within the buffer of one raptor nest whereas the comparison portion of the Proposed Route would not.

Alternative 1E-B was primarily developed as an alternative to the southern portion of the Proposed Route to avoid sage-grouse core areas. Alternative 1E-B would not cross any sage-grouse core areas whereas the Proposed Route would cross 15.4 miles of this habitat. This alternative would be consistent with the State of Wyoming's Sage-Grouse Core Area strategy, whereas the comparison portion of the Proposed Route would not. This route would cross more Visual Resource Management (VRM) Class II lands (2.6 miles vs. 0) and would result in a new transmission line in the foothills of the Laramie Mountains, creating greater permanent disturbance.

Alternative 1E-C was developed to be approximately 1,500 feet from an existing 230-kV transmission line. Therefore, this alternative would be consistent with the State of Wyoming's Sage-Grouse Core Area strategy, whereas the comparison portion of the Proposed Route would not. This alternative would cross fewer miles of VRM Class I and II lands (0.5 mile vs. 4.8 miles for the comparison portion of the Proposed Route). Alternative 1E-C would be in close proximity to an ice cave, a geologic feature located on private land, which the Proposed Route would avoid. This alternative would cross less big game winter range (32.3 miles vs. 49.1) and would cross the buffers on 6 raptor nests compared to 14 for the comparison portion of the Proposed Route. Alternative 1E-C would not meet the Proponents need to provide 230-kV infrastructure farther east where wind energy resources are planned.

Alternative 1W-A Compared to the Proposed Route

Segment 1W of the Proposed Route was developed to follow an existing utility corridor for most of its length. Among the key factors considered in routing this segment were wildlife resources (sage-grouse, big game winter range, and raptors), cultural resources, historic trails, and wetlands.

Alternative 1W-A was developed as an alternative to the north end of the Proposed Route that uses existing BLM- and Forest Service-designated ROW corridors. This alternative would be parallel to an existing transmission line corridor for 10.7 miles vs.

6.4 miles for the comparison portion of the Proposed Route. Alternative 1W-A would be shorter than the comparison portion of the Proposed Route (16.2 miles vs. 20.3) and, therefore, would result in less overall disturbance. However, it would result in up to three transmission lines on some private parcels. Alternative 1W-A would cross one raptor nest buffer whereas the Proposed Route would not cross any. Both Alternative 1W-A and the comparison portion of the Proposed Route would be consistent with the state's Sage-Grouse Core Area strategy identified in the Wyoming Governor's Executive Order (EO) 2011-5. This alternative would impact 3.6 acres of wetlands whereas the comparison portion of the Proposed Route would not cross any. Alternative 1W-A would potentially affect slightly more cultural resource sites (36 vs. 34) than the comparison portion of the Proposed Route. Alternative 1W-A would cross one fewer historic trail than the comparison portion of the Proposed Route (two vs. three).

Alternatives 2A, 2B, and 2C Compared to the Proposed Route

Segment 2 of the Proposed Route was developed to follow the WWE corridor and existing BLM-designated ROW corridor where feasible. Among the key factors considered in routing this segment were visual resources visible from the Fort Fred Steele State Historic Site and nearby residences, sage-grouse and big game winter range, mining leases, and Special Recreation Management Areas (SRMAs). The current Proposed Route would have the least impact on Fort Fred Steele and residences among the Route Alternatives.

Alternative 2A was developed to maximize the use of the WWE corridor and existing BLM-designated ROW corridor. This alternative is similar in length to the comparison portion of the Proposed Route; however, visual impacts to visitors to Fort Fred Steele State Historic Site would be greater compared to the other alternatives and the comparison portion. Alternative 2A would disturb more sage-grouse core area than the comparison portion of the Proposed Route (16.8 acres vs. 14.9) and would impact more acres of mineral leases (92 acres vs. 83). Alternative 2A would cross less big game winter range than the comparison portion of the Proposed Route (39.4 miles vs. 62.8). Both Alternative 2A and the comparison portion of the Proposed Route would cross the Continental Divide SRMA and the North Platte River SRMA.

Alternative 2B was originally considered by the Proponents as the Proposed Route. Due to local landowner concerns and visual impacts to visitors to the Fort Fred Steele State Historic Site located on the North Platte River as well as several eagle nests in the area, the Proponents relocated the Proposed Route several miles to the south and BLM left the original Proposed Route as an alternative to be analyzed in detail. This alternative would not impact sage-grouse core area and would affect slightly less big game winter range than the comparison portion of the Proposed Route (10.4 miles vs. 16.8). Alternative 2B would affect fewer acres of mineral leases (34 acres vs. 54). Alternative 2B would cross the Continental Divide SRMA whereas the corresponding portion of the Proposed Route would cross the Continental Divide SRMA and the North Platte River SRMA. Alternative 2B would be less visible from the Fort Fred Steele State Historic Site than the comparison portion of the Proposed Route.

Alternative 2C was developed to maximize use of the Wyoming Governor's sage-grouse transmission line corridor to be consistent with EO 2011-5. This alternative

would cross less sage-grouse core area than the Proposed Route (24.1 acres vs. 27.7). This route would be shorter than the Proposed Route or the other alternatives, and thus would result in less disturbance; however, it would impact more acres of mineral leases (63 acres vs. 57). It would also lie on more public and less private land than the comparison portion of the Proposed Route. Neither Alternative 2C nor the corresponding portion of the Proposed Route would cross an SRMA or be near the Fort Fred Steele State Historic Site.

Alternatives 4A, 4B, 4C, 4D, 4E, and 4F Compared to Proposed Route

Initial routing for Segment 4 of the Proposed Route focused on an existing east-west 345-kV ROW with three existing lines originating at the Jim Bridger Power Plant and heading west/northwest into southeastern Idaho. Concerns regarding sage-grouse core area, big game winter range, cultural resources, historic trails, visual resources, and siting on private versus public lands resulted in the identification of six alternative routes.

Alternative 4A was developed to parallel the existing 345-kV corridor where feasible. This alternative would be consistent with EO 2011-5 and was recommended by the Office of the Governor of Wyoming whereas the comparison portion of the Proposed Route would not be consistent. This alternative would be 5 miles shorter and would result in less overall disturbance than the corresponding portion of the Proposed Route. Alternative 4A would cross less VRM Class II lands (13.5 miles vs. 19.1) than the comparison portion of the Proposed Route and less big game winter range (80.1 miles vs. 127.0). Alternative 4A would impact fewer cultural resources than the Proposed Route (189 compared to 250) but would cross historic trails more times (11 compared to 7).

Alternatives 4B through 4F would not be consistent with EO 2011-5. Alternative 4F would cross the least sage-grouse core area (27 miles) and 4C and 4E would cross the most (approximately 57 miles); the comparison portion of the Proposed Route would cross 31.9 miles and Alternative 4A would cross 28.4 miles. Alternatives 4B through 4F would cross, or be in proximity to, more land uses where visual impacts to recreationally and culturally sensitive areas are possible, such as the Cokeville NWR (Alternatives 4B through 4E), the Bear River Special Management Area (Alternatives 4B through 4D), the Raymond Mountain Special Management Area (Alternative 4F), and Fossil Butte National Monument (Alternatives 4B and 4C); however, these alternatives would cross less VRM Class II land than the comparison portion of the Proposed Route. Overall, visual impacts would be least under Alternative 4D. Alternatives 4B through 4E would cross between 102.3 to 117.8 miles of designated big game winter range, whereas the comparison portion of the Proposed Route would cross 127.0 miles and Alternatives 4A and 4F 70.1 and 80.1, respectively. Alternatives 4D, 4E, and 4F would have the fewest cultural resource impacts; Alternative 4B would affect the most cultural resources. Alternatives 4B through 4E would cross historic trails approximately the same number of times as the comparison portion of the Proposed Route (6 to 7), while Alternatives A and F would cross more times (11 and 10, respectively).

Alternatives 5A, 5B, 5C, 5D, and 5E Compared to Proposed Route

Segment 5 alternatives were identified through scoping and in discussions with various stakeholders. Among the key factors considered in routing this segment were visual resources near the Deep Creek Mountains, agricultural lands in the Arbon and Rockland Valleys, crossing the Fort Hall Indian Reservation, residential developments, the Arbon Elementary School, and the East Fork Rock Creek Recreation Area, as well as potential disturbance to nesting bald eagles along the Snake River.

Alternatives 5A and 5B were developed to reduce visual impacts and limit road construction on forested BLM-managed lands in the Deep Creek Mountains. Unlike the Proposed Route, both alternatives would avoid the recreation area. They would also avoid all raptor nest buffers, as would the comparison portion of the Proposed Route. Alternative 5A would come within 1,000 feet of three residences, compared to four for Alternative 5B and the comparison portion of the Proposed Route.

Alternative 5C would parallel an existing transmission line through the Fort Hall Indian Reservation, rather than create a new corridor. In doing so, the length and overall visual impacts would be less under Alternative 5C than the comparison portion of the Proposed Route. However, Alternative 5C would result in additional visual and cultural impacts to the Fort Hall Indian Reservation. Alternative 5C is the preferred route of Power County. Neither Alternative 5C nor the comparison portion of the Proposed Route would be within 1,000 feet of a residence or school.

Alternative 5D was the Proponents' original Proposed Route, but issues were raised by local landowners about impacts to agricultural land. The Proponents agreed to move their Proposed Route several miles to the east and keep the original Proposed Route as an alternative to be analyzed in detail (Alternative 5D). Alternative 5D would affect more agricultural land than would be impacted by the comparison portion of the Proposed Route. Additionally, Alternative 5D would be more visible from residences in the Rockland Valley compared to the Proposed Route, which takes better advantage of topography to minimize visual impacts from the valley. However, it would cross within 1,000 feet of an elementary school (the only alternative to do so) and 24 residences, compared to 10 for the comparison portion of the Proposed Route.

Alternative 5E was developed as an alternative approach to the crossing of the Snake River as requested by Power County. However, it would not meet the separation criteria (minimum of 1,500 feet) from existing high-voltage transmission lines the Proponents established as part of the Project purpose and need. Because it would be adjacent to an existing line, Alternative 5E would have fewer visual effects than the comparison portion of the Proposed Route, would also avoid potential disturbance to nesting raptors, and would affect less agricultural land. It would cross within 1,000 feet of 2 residences compared to 10 for the comparison portion of the Proposed Route.

Alternatives 7A, 7B, 7C, 7D, 7E, 7F, 7G, 7H, 7I, and 7J Compared to Proposed Route

Key factors considered in routing the first third of Segment 7 were similar to those discussed under Segment 5, because the segments parallel one another to the point west of the Deep Creek Mountains where they diverge. Additional factors considered in

routing this segment were impacts to agricultural operations, rural residences, a local hang gliding area, visual resources, National Historic Trails (NHTs), cultural resources, big game winter range, sage-grouse key habitat, designated roadless areas, and local planning goals.

Alternatives 7A and 7B would parallel Alternatives 5A and 5B to the point where they exit the Deep Creek Mountains; therefore, their purpose for development and issues were discussed above. Both alternatives would cross less big game winter range than the comparison portion of the Proposed Route (6.9 and 10.3 acres, respectively, vs. 16.9) but more sage-grouse key habitat (4.6 and 7.9 miles, respectively, vs. 0 miles). Alternative 7B would impact more agricultural land (244 acres vs. 150) than the comparison portion, Alternative 7A approximately the same; both alternatives would cross within 1,000 feet of three residences, compared to two for the comparison portion of the Proposed Route.

Alternative 7C was developed to avoid impacts to sage-grouse, whereas the comparison portion of the Proposed Route would cross 0.2 mile of key habitat. Alternative 7C would cross more big game winter range (7.3 miles vs. 4.8). It would affect less agricultural land than the comparison portion of the Proposed Route (71 acres vs. 119). This alternative would be farther from the Parting of the Ways location on the NHT system. This alternative would cross within 1,000 feet of two residences, compared to none for the comparison portion of the Proposed Route.

Alternative 7D was developed to avoid BLM-managed lands that have an easement restriction that does not allow both transmission line segments cross the Oregon and California NHTs. Alternative 7D would cross 2.5 miles of sage-grouse key habitat compared to 1.7 miles for the comparison portion of the Proposed Route and would cross the same amount of big game winter range (2 miles). Neither Alternative 7D nor the comparison portion of the Proposed Route would cross within 1,000 feet of a residence and both impact a similar amount of agricultural land (37 acres).

Alternative 7E was developed to avoid two sage-grouse leks, sage-grouse habitat in the Water Canyon area, and a local recreational area used as a hang glider launch site. Alternative 7E would cross slightly more sage-grouse key habitat than the comparison portion of the Proposed Route (3.2 miles vs. 3.0). Alternative 7E would cross within 1,000 feet of four residences, compared to seven for the comparison portion of the Proposed Route, and would impact a similar amount of agricultural land (12 and 14 acres, respectively).

Alternative 7F was developed to avoid visual impacts to residential development in the Delco area. This alternative would cross less private land than the comparison portion of the Proposed Route; however, it would cross a scenic byway to the town of Albion. Alternative 7F would cross more big game winter range (10.7 miles vs. 9.3) but less sage-grouse key habitat (3.3 miles vs. 5.1) than the comparison portion of the Proposed Route, although it would not avoid the Water Canyon area. This alternative would impact less agricultural land (29 acres vs. 66) than the comparison portion of the Proposed Route. It would not cross within 1,000 feet of a residence whereas the comparison portion of the Proposed Route would cross within 1,000 feet of seven.

Both Alternative 7F and the Proposed Route would affect a planned runway at the Dry Creek Sky Ranch.

Alternative 7G was developed to minimize the extent to which the transmission line would be within a BLM motorized vehicle winter closure area. This vehicle closure area is designated for wintering big game and sage-grouse. Alternative 7G would run along the northern border of the vehicle closure area, whereas the comparison portion of the Proposed Route would run farther within. Despite this difference, Alternative 7G would disturb a comparable amount of big game winter range (3.2 miles vs. 3.1) and sage-grouse key habitat (also 3.2 miles vs. 3.1) as the comparison portion of the Proposed Route. Alternative 7G would also disturb more agricultural land than the comparison portion of the Proposed Route (17 acres vs. 7). Both Alternative 7G and the comparison portion of the Proposed Route would cross within 1,000 feet of one residence.

Through a lengthy process of collaboration with the landowners; local, state, and federal agencies, and the Proponents, Alternative 7I was developed to avoid proximity to agricultural facilities (e.g., dairies and agricultural land). It should be noted that Alternative 7I was presented and supported by local landowners over the Proposed Route but was not supported by the Proponents. As a compromise to the Proposed Route and Alternative 7I, the Proponents developed and support Alternative 7H (which was originally considered but eliminated during their siting study). Cassia County has stated its objection to Alternative 7H. After additional consideration, local landowners proposed Alternative 7J, which requires that an alternative substation, the Rogerson Substation, be constructed instead of Cedar Hill and be located 24 miles southwest of the proposed location for the Cedar Hill Substation.

Alternatives 7H, 7I, and 7J would be longer than the comparison portions of the Proposed Route (9.4, 55.3, and 58.2 miles, respectively). Alternatives 7H, 7I, and 7J would impact less agricultural land (between approximately 490 and 580 acres less) than the comparison portions of the Proposed Route. The three alternative routes would impact less big game winter range, 37.3, 45.4, and 47.9 miles, respectively, than the comparison portions of the Proposed Route (50.1 miles for the 7H and 7I comparison portion and 60.0 miles for the 7J portion). Alternatives 7H, 7I, and 7J, being longer, would result in greater amounts of ground disturbance during construction, operations, and maintenance than the comparison portions of the Proposed Route; they would also have a greater visual impact to sensitive federal lands. Alternatives 7I and 7J would have the potential to impact visitors to the City of Rocks National Reserve as well as local sensitive viewing areas such as Sparks Basin, Granite Pass, the Sawtooth National Forest, and the California NHT. Alternatives 7I and 7J would pass along the southern edge of the proposed Tunnel Hill Archaeological District. In addition, Alternatives 7I and 7J would cross into Nevada for 7.2 miles, the only alternatives that would cross that state. Finally, these alternatives would cross more sage-grouse key habitat (41.1, 67.8, and 73.0 miles, respectively, vs. 11.9 and 16.8) and cross more nesting raptor buffers (54, 66, and 85, respectively, vs. 12 and 32) than the comparison portions of the Proposed Route.

Alternatives 8A, 8B, 8C, 8D, and 8E Compared to the Proposed Route

Key factors considered in routing this segment included using the WWE corridor where possible, conflicts with agricultural lands, residential development, visual resources, the Morley Nelson Snake River Birds of Prey National Conservation Area (SRBOP), the Guffey Butte-Black Butte Archaeological District, and the IDANG Orchard Training Area.

Alternative 8A was developed to maximize use of the WWE corridor. This alternative would cross 6.2 miles of VRM Class I (but no Class II) land whereas the comparison portion of the Proposed Route would cross 3.2 miles of Class I and 8.1 miles of Class II. The comparison portion of the Proposed Route would be close to the communities of Hagerman and Glenns Ferry, the Hagerman Fossil Beds, and the Billingsley Creek Wildlife MA. This alternative would impact more cultural resources than its comparison portion of the Proposed Route (84 vs. 33). It would cross within 1,000 feet of 46 residences compared to 14 for the comparison portion of the Proposed Route. It would affect slightly less agricultural land (182 vs. 188 acres).

Alternative 8B, originally considered for the Proposed Route to avoid the SRBOP and the IDANG Orchard Training Area, became an alternative due to opposition from the cities of Kuna and Melba, Idaho. Alternative 8B is in close proximity to several residential areas, crossing within 1,000 feet of 55 residences compared to 12 for the comparison portion of the Proposed Route, resulting in greater visual effects on these communities. This alternative would cross within the Kuna city boundary and may affect future development patterns. This alternative would avoid crossing the SRBOP. Alternative 8B would affect more agricultural land (213 acres vs. 29) than the comparison portion of the Proposed Route. Unlike the Proposed Route, it would not cross the archaeological district.

Alternative 8C was also originally considered as part of the Proposed Route. However, it would have an adverse visual impact on residential areas. Although it would only cross within 1,000 feet of one residence, this route would be close to planned expansion of the planned Mayfield Springs community. The comparison portion of the Proposed Route would not be within 1,000 feet of a residence and would not affect the planned subdivision. Alternative 8C would cross more agricultural land (12 acres vs. 0) than the comparison portion of the Proposed Route.

Alternative 8D was developed to avoid the Alpha Maneuver Sector of the IDANG Orchard Training Area (but not the Bravo Sector). The IDANG recently commented that it would prefer a route that completely avoids the training area. Other environmental impacts would be similar to the comparison portion of the Proposed Route.

Alternative 8E was developed to avoid the Halverson Bar non-motorized area in the Guffey Butte-Black Butte Archaeological District. This route would still cross the SRBOP. Neither this alternative nor the comparison portion of the Proposed Route would cross within 1,000 feet of a residence. However, it would follow a portion of Alternative 9D. If that route were selected, Alternative 8E could not be used. Conversely, if Alternative 8E were selected, the Alternative 9D route could not be used.

Alternatives 9A, 9B, 9C, 9D, 9E, 9F, 9G and 9H Compared to the Proposed Route

Key factors considered in routing this segment were agricultural and residential development in Owyhee County, visual resources, the Jarbidge Military Operations Area, Saylor Creek Air Force Range, Balanced Rock County Park, Bruneau Dunes County Park, the Cove Non-motorized Area, and Salmon Falls Creek Wild and Scenic River (WSR).

Alternative 9A was the Proponents' original Proposed Route. The Proponents worked with local citizens, landowners, and the BLM to move a 7.8-mile portion of the Proposed Route about a mile to the south to avoid impacts to irrigated agriculture and dairies, leaving the original Proposed Route as an alternative to be analyzed in detail. Alternative 9A and the comparison portion of the Proposed Route would both cross within 1,000 feet of one residence, and Alternative 9A would impact an additional 3 acres of agriculture land compared to the comparison portion of the Proposed Route.

Alternative 9B was developed to maximize use of the WWE corridor and to parallel existing utility corridors; however, Alternative 9B would have greater visual impacts due to its proximity to private lands, historic trails, and VRM Class I lands. Alternative 9B would be within 1,000 feet of seven residences, compared to none for the comparison portion of the Proposed Route. It would disturb more agricultural land than the comparison portion of the Proposed Route (206 acres vs. 45). Alternative 9B would avoid crossing both the WSR and the eligible WSR portions of Salmon Falls Creek; the comparison portion of the Proposed Route would cross the eligible portion only. Both Alternative 9B and the comparison portion of the Proposed Route would avoid crossing Balanced Rock County Park.

Alternative 9C would parallel existing transmission lines in corridors for a greater extent than the comparison portion of the Proposed Route (10.4 miles vs. 1.0) but would have a greater visual impact on Balanced Rock County Park due to its proximity. Alternative 9C would be within 1,000 feet of five residences, compared to none for the comparison portion of the Proposed Route. This alternative would impact more agricultural lands than the comparison portion of the Proposed Route (62 acres vs. 0). Alternative 9C would not cross the eligible WSR portion of Salmon Falls Creek whereas the comparison portion of the Proposed Route would.

Alternatives 9D and 9E were developed as a result of collaboration with citizens, landowners, the BLM, the Owyhee County Task Force, and the Proponents to avoid private lands and maximize the use of public lands in Owyhee County. Both alternatives would deviate from the WWE corridor, which would be followed by the comparison portion of the Proposed Route; however, both alternatives would cross less private land (3.3 and 1.3 miles, respectively, vs. 18.4 miles). Alternatives 9D and 9E would not cross within 1,000 feet of a residence, whereas the comparison portion of the Proposed Route would be within 1,000 feet of nine residences. Both alternatives would impact less agricultural lands (19 and 3 acres, respectively, vs. 199 acres). Alternative 9D would cross more BLM-managed VRM Class II lands (11.5 miles vs. 0.2) than the comparison portion of the Proposed Route. Alternative 9D would be within the SRBOP for well over half of its length.

Alternatives 9F and 9H were proposed by the BLM to avoid the non-motorized portion of Swan Falls, avoiding both the Cove Non-motorized Area and the non-motorized portion of the Guffey Butte-Black Butte Archaeological District. Alternative 9F would cross the river twice, once near the C.J. Strike SRMA and again near the Swan Falls Dam. However, the route it would follow to avoid the non-motorized area in the historic district would be the same alignment that Alternative 8E would follow. If 8E were selected, Alternative 9F could not also be selected. Therefore, Alternative 9G was proposed by the BLM. It would avoid the non-motorized portion of the historic district but not the Cove Non-motorized Area. Alternative 9G follows the same route as Alternative 9D through the Cove area, then, where Alternative 9D/9G merge with Alternative 9F/9H, it follows the same route as 9H. It would cross the river approximately 3 miles south of the Alternative 9F crossing point. Alternative 9F would be within 1,000 feet of eight residences, compared to nine residences for the comparison portion of the Proposed Route, whereas Alternative 9G would not be within 1,000 feet of any residences. Impacts to agricultural land from Alternative 9G would be similar to those for Alternative 9D.

Alternative 9H is another route developed by the BLM that would avoid the Cove Non-motorized Area and the non-motorized portion of the Guffey Butte-Black Butte Archaeological District. Like Alternative 9G, this route was proposed in the event that Alternative 8E was selected and Alternative 9F could not be used. As with Alternative 9F, Alternative 9H would be within 1,000 feet of eight residences, compared to nine for the comparison portion of the Proposed Route. Both Alternatives 9F and 9H would cross within 300 feet of two residences, less than the six residences along the comparison portion. Impacts to agricultural land would be similar to those for Alternative 9F.

NO ACTION ALTERNATIVE

Under the No Action Alternative, the Project would not be constructed or operated. No Project-related impacts to physical or biological resources would occur. Impacts to these resources would continue as a result of natural events (such as fire, drought, and severe weather) and existing and future developments in the area. No direct Project-related impacts to socioeconomics would occur. However, as discussed in Chapter 1 of this Draft EIS, the Gateway West Project is needed to supplement existing transmission lines and relieve current congestion, capacity, and reliability constraints in the existing electric transmission grid, and allow for the delivery of up to 3,000 MW of additional energy for the Proponents' larger service areas, primarily in Utah and Idaho. The purpose and need of the proposed Project would not be met under the No Action Alternative and existing constraints coupled with projected increases in demand in the Proponents' service areas could result in insufficient supply to meet energy demand and an increase in the potential for supply outages. These potential impacts could have detrimental socioeconomic impacts, with negative impacts to existing businesses and economic activities, as well as businesses and economic activities that might otherwise consider locating in the affected service areas.

EFFECTS

The following section summarizes the effects analysis documented in Chapter 3 of the Draft EIS.

VISUAL RESOURCES

BLM administered-lands crossed by the Project were analyzed based on the VRM system. National Forest System (NFS) lands crossed by the Project were analyzed based on the Scenery Management System (SMS) or the Visual Management System (VMS), depending on the National Forest crossed by the Project. Generally, the proposed transmission line would be in conformance with the visual classifications VRM III and VRM IV. On NFS lands, the transmission line would be generally consistent with a Low or Very Low (SMS)/Modification and Maximum Modification (VMS). However, the transmission lines were considered to not be in conformance with VRM Classes I and II on BLM-managed lands and with Very High, High, and Moderate (SMS) and Preservation, Retention, and Partial Retention (VMS) on NFS lands. Management plan amendments would be needed where a proposed or alternative route does not conform with the visual management objectives on federal land.

CULTURAL RESOURCES

Construction of the transmission line and its ancillary facilities could directly impact existing cultural resources, such as prehistoric or historic archaeological sites, districts, buildings, trails, roads, and landscapes. In limited cases, the setting of an historic property could be indirectly impacted by the Project. Construction or other ground-disturbing activities could directly or indirectly impact previously undetected cultural resources, especially buried resources. Such impacts are likely to be adverse. Identification of new or previously recorded cultural resources and increased use of existing and new access roads may encourage unauthorized site access, artifact collection, and vandalism. Construction access roads are temporary features, however, and vegetation along those roads would be allowed to grow back once construction is completed. Over time, these roads would be indistinguishable from other two-track roads in the Analysis Area. The visual impacts of these roads on historic trails/roads are considered to be minimal, because their appearance and purpose are not incompatible with the historic features. Short-term impacts on the setting and feeling for NHTs and Traditional Cultural Properties may be introduced through the addition of structural elements to the landscape.

Mitigation measures would avoid potential impacts to cultural resources if relocation of Project features is possible. However, if avoidance is not feasible, potential impacts would be mitigated through measures established through consultation under Section 106 of the National Historic Preservation Act.

SOCIOECONOMICS

Construction of the Proposed Action would generate economic activity in the form of Project-related expenditures on materials and supplies. The Project would also employ construction workers who would in turn be expected to spend much of their income

within the Analysis Areas and increase output in the sectors that provide consumer goods and services. The proportion of workers likely to come from outside the Analysis Area would vary by Engineering, Procurement, and Construction (EPC) contract and over the construction period because the mix of labor categories or skills will vary. For the purposes of analysis, the Proponents estimate that during peak construction periods 20 percent of the workforce would be local (i.e., normally reside within commuting distance of the job sites), and would likely commute to and from their homes to work each day. The remaining 80 percent of the workforce would either temporarily relocate to the affected regions or commute from their permanent residences.

Many non-local workers would provide their own housing in the form of recreational vehicles (RVs) or pop-up trailers, with the remaining non-local workers expected to require rental housing (apartments, houses, mobile homes) and motel or hotel rooms. Construction workers, particularly those working in less populated areas, would be expected to commute longer distances to the job site, with commutes of up to 90 minutes each way possible. Existing housing resources, rental housing, hotels and motels, and RV spaces tend to be concentrated in and around the larger communities in the Analysis Areas. Projected local and non-local employment totals are summarized for average weekly and peak employment by EPC Analysis Area in Table 3.4-20 of the Draft EIS. Very few, if any, of the workers employed during the construction phase of the Project would be expected to permanently relocate to the area.

ENVIRONMENTAL JUSTICE

Data compiled by the U.S. Census at the block group level indicate the presence of minority and low income communities in the vicinity of the Proposed Route and Route Alternatives. Construction of the proposed Project is not, however, expected to have high and adverse human health or environmental effects on nearby communities. Adverse construction-related impacts would likely include increases in local traffic and noise, as well as dust, and could result in temporary delays at some highway crossings. Construction workers temporarily relocating to the Project area would increase demand for local housing resources. These impacts would be temporary and localized, and are not expected to be high. Potential impacts on public safety are discussed in Section 3.22 – Public Safety.

Construction would also increase demand for education, health care, and municipal services, as well as potentially increase demand for police and fire protection services. However, these impacts are also expected to be temporary and would not measurably affect the quality of services currently received by local communities and residents. Local construction expenditures for materials and supplies and spending by workers directly employed by the Project are expected to benefit local economies. Construction would also generate state and local tax revenues. The Project would benefit service industry occupations that are typically relatively low paid, particularly those associated with accommodation and food service. These benefits would result from increased demand and spending by construction workers temporarily relocating to the Project region, and would be short-term.

VEGETATION COMMUNITIES

The effects of a transmission line crossing shrub-steppe and other low vegetation would generally be minor, and would consist of the localized impacts from clearing and grading of lands, as well as the use, maintenance, or restoration of the Project components. For impact analysis, all construction sites are assumed to have total loss of existing vegetation, although some construction sites may not need to be graded, which would reduce the loss of vegetation.

In forested areas, clearing for construction of the transmission line would include clearing all vegetation from the construction work area for each tower and cutting trees and tall shrubs out of the ROW to avoid damage or danger to the conductors. Ongoing ROW maintenance would include continuing to cut trees and tall shrubs along the ROW. The area within the ROW would no longer be available for growing and harvesting timber products.

INVASIVE PLANT SPECIES

Vegetation removal and soil disturbance during construction could create optimal conditions for the establishment of noxious weeds and invasive species. Noxious weeds and invasive species produce abundant seed, have few natural competitors, and once established spread quickly and overtake desirable plant communities. Vehicles and construction equipment traveling from weed-infested areas into weed-free areas could disperse noxious weed and invasive species seeds. If weed seeds are transported, this could result in the establishment of weeds in previously weed-free areas or expand the distribution or abundance of existing noxious weeds and invasive species populations. Additionally, activities such as excavation and transportation of borrow materials and topsoil, land clearing, and reclamation may contribute to the spread of noxious weeds and invasive species. Vegetation removal, soil disturbance, and the use of materials from outside sources associated with these activities encourage germination of weed seeds and spread of roots and seeds. Disturbed areas may be seeded by airborne seeds from plants in adjacent habitats, which may include seeds from noxious weeds or invasive species. After construction, noxious weeds and invasive species can persist or become established in disturbed and reclaimed areas and those that are present in the construction areas may spread into adjoining habitats.

EPMs and Agency mitigation measures would substantially reduce the potential for the spread of noxious weeds and invasive species that could result from construction of the Project.

WETLANDS

Construction of the Project would impact wetlands and riparian areas in a variety of ways, primarily as a result of the vegetation clearing. Removal of vegetation could alter various functions provided by these areas, including their ability to provide wildlife habitat, and trap sediment and nutrients. Soil disturbances and removal of vegetation within a wetland or riparian area could temporarily alter the area's ability to moderate food flow, control sediments, or facilitate surface water flow. Removal of vegetation

could also increase water and soil temperatures, and alter the species composition within these areas.

Increased soil disturbances can lead to invasions by exotic plant species, which can alter the composition and function of wetlands and riparian areas. Blasting within or adjacent to a wetland could fracture the bedrock and alter the hydrology of a perched water table, thereby leading to drier conditions and impairment of revegetation efforts. Withdrawal of water for use during construction may have temporary effects on wetlands adjacent to streams, by reducing water input. Failure to restore disturbed areas to their preconstruction conditions (contours, hydrology, segregation, and restoration of topsoil) could impede the re-establishment of desirable wetland and riparian vegetation during revegetation efforts.

Although some Project-related disturbances would be temporary and confined to the construction phase, other impacts would continue through the operations phase, especially in areas where construction sites are located within forested wetlands or riparian areas. Construction impacts in forested wetlands and forested riparian areas would generally involve a conversion to a different wetland type (i.e., a change to shrub or herbaceous vegetation cover), rather than a loss of wetland acreage. Similar changes would occur in riparian areas within the ROW. It is likely that recovery would be fairly rapid in herbaceous and shrub wetlands, and construction in these types is not likely to cause a conversion to a different type. Long-term impacts could include soil compaction from heavy equipment, or alteration of surface or subsurface water movement in wetlands and riparian areas from blasting effects.

In general, wetlands and riparian areas were avoided during selection of construction sites; however, some wetlands and riparian areas are intersected by the preliminary Project design. Impacts would be avoided and minimized during final design by rerouting Project components outside of wetlands, and limiting impacts to upland areas to the extent practical; however, there would likely be some locations where this would not be feasible (such as areas within the Bear River floodplain).

WILDLIFE AND FISH

Clearing of vegetation for Project facilities may decrease habitat quantity and quality for wildlife species, and the degree of this impact would vary depending on vegetation type and recovery time. In addition to the direct effects of habitat loss, the proposed Project could indirectly impact wildlife through habitat fragmentation (breaking up of contiguous areas of vegetation/habitat into smaller patches). Fragmentation can affect wildlife and habitat quality by altering nutrient flows/cycling, increasing the rate of invasion by noxious weeds and invasive wildlife species, lowering the carrying capacity of a habitat/patch, and disrupting meta-population dynamics (Sanders et al. 1991). In addition, fragment edges (both natural and created) play a crucial role in ecosystem interactions and landscape function, including the distribution of plants and animals, fire spread, vegetation structure, and wildlife habitat.

Impacts to big game from Project construction would include vehicle collisions, noise, fugitive dust, habitat loss and alteration, and visual disturbance, which is a change in the viewshed of the animal that is perceived as alarming. Noise and visual disturbance

and fugitive dust could displace big game from both winter and parturition areas during crucial periods. This displacement could affect winter survival by causing animals to mobilize energy reserves that are needed to survive the winter. This could also impact reproductive success if females are sufficiently disturbed to not provide adequate care for young.

Direct impacts on migratory birds could include collisions with construction vehicles or other equipment, direct removal of nesting habitat, destruction of nests, induced abandonment of nests due to construction noise, fugitive dust, and visual disturbance. Nesting birds are particularly sensitive to disturbance, and some disturbance could lead to nest failure or abandonment. Because Project construction and vegetation clearing would take place during the spring and summer when migratory birds are nesting, the potential exists for nest destruction and nest abandonment due to disturbance. The Proponents are advised of the need to comply with the Migratory Bird Treaty Act, under which destruction of eggs or nests is prohibited. Migratory birds include songbirds, waterfowl, shorebirds, and raptors.

A potential direct adverse impact from construction of the Project is decreased water quality from suspended sediment. High levels of suspended sediment and associated high turbidity can have adverse effects on fish behavior and physiology (e.g., blood chemistry, gill trauma, immune system resistance), and can cause mortality if levels become high enough. Loss of riparian habitat type and its associated benefits (e.g., shade, large wood, organic input, root stability) from both road presence and the clearing of trees from the transmission line's ROW would continue to occur during operations.

SPECIAL STATUS SPECIES

Impacts from construction activities could result in the crushing or removal of special status plants, as well as direct loss of habitat. Indirect impacts would include fragmentation of suitable habitat, alteration of fire regimes, introduction or spread of invasive exotic species, isolation of subpopulations due to physical separation by access roads or transmission infrastructure, increased erosion, and alteration of habitat microclimates or hydrology. Maintenance of vegetation in the ROW, including cutting of trees and taller shrubs, is not expected to affect any threatened, endangered, or sensitive plant species because, for this Project, all of these species occur in habitats dominated by low-growing vegetation. Whitebark pine, if listed, would be an exception but it would be avoided during final design.

The Proponents have proposed a series of EPMs meant to reduce or prevent impacts to special status plant species as well as to general vegetation (see Appendix C-1). In some cases the Agencies have determined that these EPMs are not sufficient, or are not in compliance with agency stipulations, and, therefore have recommended additional mitigation measures (see Table 2.7-1 for a summary of these measures).

The Project could result in direct mortality, or have direct adverse impacts on special status wildlife species' habitat. Indirect effects could occur if these species avoid the area during construction. Wildlife species likely to be affected include Canada lynx, Columbia spotted frog, greater sage-grouse, Columbia sharp-tailed grouse, grizzly bear,

mountain plover, northern leopard frog, pigmy rabbit, piping plover, least tern, whooping crane, yellow-billed cuckoo, bald eagle, black-tailed and white-tailed prairie dog, burrowing owl, Preble's meadow jumping mouse, and pocket gopher. Fish species that may be affected include Colorado pikeminnow, razorback sucker, humpback chub, bonytail, palled sturgeon, and various trout.

SOILS, GEOLOGIC HAZARDS, AND MINERALS

Project construction activities that would affect soils include clearing, grubbing, and grading along the ROW and at additional temporary workspaces; trenching; backfilling; excavating; and construction of permanent structures, such as transmission line towers, access and service roads, co-generation sites, and substations. The total Project construction disturbance area would comprise approximately 16,000 acres. Ground clearing during construction would increase the potential for erosion, as well as soil compaction. Removal of protective vegetation would expose soil to potential wind and water erosion. The Proposed Route would cross areas with soils that are highly susceptible to wind erosion. Reclamation would be necessary in disturbed soil areas. Appendix C-2 presents the Framework Reclamation Plan for Construction Activities that the Proponents would use for Project reclamation.

Landslides could occur in mountainous portions of the Project area. Landslides are often triggered by other natural events, including earthquakes, or precipitation sufficient to cause earth movements. Certain geologic formations such as the Green River Formation are known to be more susceptible to landslides than others. The greatest landslide risks are in Segment 4, where 46 percent of the routes cross areas of medium to high landslide risks. The route crosses areas where earth quakes may occur, especially in Segments 4, 5, and 7. Transmission lines and associated facilities could be negatively affected by geologic hazards, including earthquakes, landslides, subsidence, and blast vibrations in shallow bedrock.

Subsidence is the vertical sinking of earth, typically because of a natural or man-made void in underlying rock formations. There are no large areas of cavernous limestone or natural voids in the area crossed by the Proposed Route and Alternatives. Human-caused subsidence occurs in areas overlying extensive underground mine workings or in areas of aquifer drawdown or removal of other fluids, such as natural gas or crude oil. Because of their large extent, underground trona and coal mines are particularly susceptible to subsidence. Mineral extractions that could result in subsidence only occur in Segments 1 through 4, the risk is highest in Segment 4.

PALEONTOLOGY

Direct effects due to construction include the possible damage to paleontological specimens and possible loss of associated data. On the other hand, construction activities can also provide opportunities to recover specimens and associated scientific information that might be otherwise lost. Indirect effects due to construction include the unauthorized collecting or destruction of paleontological specimens due to increased access. The two construction sources of greatest potential impact are the excavation and leveling of pads for the towers and in the grading of access roads. The impacts from grading of access roads would be more amenable to mitigation than would the

augering impacts. Monitoring can detect resources as they are uncovered, and grading can be halted or rerouted to permit resource recovery.

WATER RESOURCES

Most of the impacts to water quality would occur due to the crossing of waterbodies by new access roads; as transmission line crossings would only impact small isolated areas of vegetation (due to initial clearing and ongoing tree height maintenance), which would not be expected to result in a substantial increase in stream temperatures, sedimentation, or alterations to stream stability or water quality. Road crossings could result in a potential for localized increases in surface water sedimentation, erosion, and water temperatures, due to the potential for in-water work, and the direct impacts to stream banks and adjacent vegetation. These impacts would be greatest in areas that contain forested riparian vegetation; however, the Project has been routed to avoid these areas to the extent practical. In addition, the Agencies have identified mitigation measures to reduce adverse effects.

It is unlikely that this Project would affect groundwater due to the shallow excavations required for Project foundations. Shallow groundwater of 13 feet or less is present only in Segments 4, 5, and 7. Any impacts to groundwater would be short-lived and consist mainly of temporary sedimentation. Excavations for transmission line structures may contact shallow groundwater; however, the groundwater contact would be unlikely to adversely impact this resource, unless an accidental chemical spill occurs near an open excavation. Fuels, other petroleum products, chemicals, and hazardous materials (including wastes) would be located in upland areas at least 500 feet away from streams, 400 feet for public wells, and 200 feet from private wells. Typically, contact with construction equipment would not impact groundwater quality except to increase turbidity temporarily in a limited area. The Project would not be expected to impact water quality in potable water wells.

LAND USE AND AGRICULTURE

Table ES-1 (above) summarizes land ownership by segment. Approximately 45 percent of the land crossed would be federal, 9 percent state, and nearly 46 percent would be privately owned. Federal land crosses by the Proposed Route are covered by over 20 resource management plans. Portions of the route would not conform with one or more components of many of these plans. Therefore, plan amendments would be required.

The Proposed Route would cross several important historic trails, including the Oregon, California, Mormon Pioneer, and Pony Express NHTs.

Short-term disruption of farming activities along the ROW could occur locally during construction. While agricultural mitigation measures are expected to reduce impacts, farmland and range land within the construction zone would be unavailable to agriculture during the construction interval. With the exception of land that would be occupied by towers and access roads for the life of the Project, farmland and range land within the construction zone would be available for agricultural use following the completion of construction. The Proponents do, however, recognize that the Project

has the potential to have long-term detrimental impacts on farms and would negotiate damage-related issues, such as reductions in the acreage available for cultivation or for use in forage production, with affected farmers compensated during the easement acquisition process. Potential impacts to agricultural property values would also be addressed during the easement acquisition process.

Potentially affected landowners and farmers have also expressed concern that the presence of a transmission line could have long-term negative impacts on agricultural operations in the immediate vicinity. Concerns raised with respect to operations include interference with Global Positioning Systems used to guide farming operations, the potential for the transmission line to accelerate the degradation or corrosion of irrigation systems used in the vicinity, the potential for stray voltage to cause electric shocks to farmers and farm workers in the immediate vicinity, and potential impacts to crop spraying in areas that are usually treated by aerial application. These potential concerns are discussed in detail in the Draft EIS.

AIR QUALITY

The construction activities that would generate emissions include land clearing, ground excavation, and cut and fill operations. These construction activities would occur 6 days per week for up to 12 hours per day during the construction periods. The intermittent and short-term emissions generated by these activities would include dust from soil disruption and combustion emissions from the construction equipment. Emissions associated with construction equipment include particulate matter with a diameter of less than 10 microns and 25 microns, nitrogen oxides, carbon monoxide, volatile organic compounds, sulfur oxides, and small amounts of air toxics. These emissions could result in minor, temporary impacts on air quality in the vicinity of the construction activities.

Emissions from construction of the transmission line, substations, and regeneration facilities are not expected to violate applicable ambient air quality standards because the construction equipment would be operated on an as-needed basis during daylight hours only and the emissions from gasoline and diesel engines would be minimized because the engines must be built to meet the standards for mobile sources established by the U.S. Environmental Protection Agency (USEPA). Most of the construction equipment would be powered by diesel engines that would meet current emissions standards based upon engine size and date of manufacture, and Project-related vehicles and construction equipment would be required to use the new low sulfur diesel fuel as soon as it is commercially available. The Agencies have identified mitigation measures that would substantially reduce impacts on federal lands and recommend that the Proponents implement them Project-wide.

NOISE

Project construction would produce noise from heavy equipment needed to build the proposed transmission line routes and electrical substations. Short-term use of equipment such as backhoes, cranes, front-end loaders, bulldozers, graders, excavators, compressors, generators, and various trucks would be needed for mobilizing crew, transporting and use of materials, line work, and site clearing and

preparation. Use of drill rigs, large augers, and rock drills would be required for the poured-in-place foundations at each tower location. It is not expected that pile driving would be needed during construction. Spur roads and access roads would require use of earthmoving equipment such as bulldozers and graders. Construction noise is usually made up of intermittent peaks and continuous lower levels of noise from equipment cycling through use. Noise levels associated with individual pieces of equipment would generally range between 70 and 90 A-weighted decibels (dBA; USDOT 2006). Maximum instantaneous construction noise levels would range from 80 to 90 dBA at 50 feet from any work site. Additional noise sources may include commuting workers, and trucks and helicopters moving material to and from the work sites.

Noise is expected to vary regularly throughout the construction period, making the calculation of a specific received sound level value at each noise sensitive area (NSA) location difficult. The critical distances corresponding to the USEPA noise guidelines and other criteria developed by the Project to assess construction noise impacts were calculated. Sound generation was modeled according to the grouping of construction equipment provided in Section 23 – Noise, Table 3.23-5, of the Draft EIS. The results of the modeling determined the distance from the construction site where sound levels would attenuate to the criteria levels. These distances included the following:

- A critical distance of 407 feet corresponding to the USEPA 70 dBA $L_{eq\ (24h)}$ guideline, and
- A critical distance of 280 feet corresponding to the USDOT 80 dBA $L_{eq\ (8h)}$ guideline.

Thus, NSAs situated within these critical distances may experience a short-term impact as a result of Project construction noise. While Project construction would generate unavoidable noise impacts at some NSAs, impacts would be temporary and intermittent.

Helicopters would be used in areas where access is limited or where there are environmental constraints to accessing the Project area with standard construction vehicles or equipment. Helicopter uses include delivery of construction laborers, equipment and materials to structure sites, structure placement (except tubular steel poles), hardware installation, and wire stringing operations. When helicopter construction methods are employed, activities would be based at a fly yard, which is a Project-material staging area located within 4 to 8 minutes from the work site. Helicopters generally fly at low altitudes; therefore, potential temporary increases to ambient sound levels would occur in the area where helicopters are operating as well as along their flight path. Typically, helicopters may generate noise levels of 89 to 99 dBA at 50 feet when in flight at 200 feet.

CUMULATIVE EFFECTS

The effects of the proposed Gateway West Project, when taken together with past, present, and reasonably foreseeable future actions, constitute the cumulative effects of the Project and are fully analyzed in Chapter 4. Chapter 4 also discusses the

cumulative effects of land use plan amendments needed to allow for the Proposed or Alternative Routes when the amendment would change one or more land classifications. For many resources, the effects of Gateway West, when combined with the effects of other known projects, are not cumulatively substantial. In other cases, although the effects of Gateway West are minor, when taken together with effects of other past, present, and proposed future actions, many of which collectively already present a substantial cumulative effect, the cumulative impact may be considerable. Finally, there are some effects of Gateway West that are by themselves large, and when considered with other effects, are also cumulatively substantial.

Resources for which Gateway West effects are minor and even when considered together with other projects remain less than cumulatively substantial include socioeconomics, environmental justice, weeds, wetlands, federally listed invertebrate species, lynx, wolf, yellow-billed cuckoo, bald eagle, minerals, paleontological resources, geologic hazards, transportation, air quality, electrical environment, public safety, and noise. Additional details are found in Chapter 4.

Gateway West, by itself, has minor effects on vegetation, soils, and waterbodies where crossed by access roads and therefore on habitat for most wildlife and fish species, including specifically sagebrush-obligate species (Columbian sharp-tailed grouse, mountain plover, white- and black-tailed prairie dogs, pygmy rabbits, greater sage-grouse, Wyoming pocket gopher, and burrowing owl) and riparian-obligate species (Columbia spotted frog, northern leopard frog, and Preble's meadow jumping mouse). However, even without Gateway West's effects, the loss of habitat and fragmentation from past and present events alone is considerable. When the Gateway West effects are taken together with historic and present events and projects as well as with multiple future projects, the level of soil and habitat loss and fragmentation continues to be considerable. The Proponents have offered off-site compensatory mitigation in recognition of the current critical condition of some types of habitat and the contribution that Gateway West may make to that loss. BLM has required additional mitigation and is considering further mitigation for habitat losses from the Project as detailed in Chapter 3.

The Gateway West Project would not have a measurable adverse effect on migratory bird populations or significant bird conservation sites. It would, however, have a small adverse effect on migratory bird habitats and ecological conditions through vegetation removal, fragmentation of native habitats, and possible increases in predation pressure due to adding perching substrate for avian predators and adding service roads sometimes used by canid predators. When taken together with the existing substantial habitat loss caused by past, present, and reasonably foreseeable actions, the cumulative impact on migratory bird habitat and ecological conditions is substantial.

Gateway West, by itself, would have minor adverse effects to private land uses or to agriculture with the degree of impact varying by alternative. When taken together with many of the factors that constrain and limit agriculture, including availability of irrigation water and development pressure on property values, additional land withdrawals for utility uses can be very important to individual farmers and to agricultural communities. On federal lands, both the Proposed Route and some alternatives would require changes in existing land use plans. In particular, visual resource or scenic management

objectives would not be met if some of the proposed or alternative routes were chosen, and existing specifications for allowable levels of visual contrast would have to be altered. Also, several land management plans would require amendments to allow the Project. In some cases, large areas of public lands would be reclassified, possibly allowing for additional projects without additional plan amendments. These impacts to land use planning goals are considerable, particularly when taken together with other transmission lines requesting similar consideration, which if granted along the same route would create a large utility corridor.

Any new water withdrawals in the watersheds of the Platte and Colorado Rivers (Segments 1 to 4 in Wyoming) would require either participation in the recovery programs for those rivers (provided for in programmatic biological opinions for each) or a separate consultation with the USFWS. Gateway West and all new proposed construction projects in those watersheds in Wyoming would require some water during construction and would be subject to concerns regarding withdrawals. BLM would participate in the USFWS recovery program and would require the Proponents to pay the assigned fee for water uses during construction over in either watershed. Any new withdrawals from either river are considered a significant adverse impact on warm-water fisheries and associated endangered fish species as well as riparian-obligate species of plants. However, participation in the recovery program relieves the Project of a jeopardy decision.

Gateway West, by itself, would have significant adverse effects on some cultural resources, particularly on historic properties for which visual setting is important like historic trails. When considered together with other past, present, and foreseeable future projects, including additional transmission lines, the cumulative effect is also significant. Similarly, the visual impact of the Gateway West set of lattice towers in some areas would be a substantial negative effect, and when taken together with the several proposed transmission lines and other developments, would form a cumulatively considerable adverse impact.

CONFORMANCE WITH FEDERAL MANAGEMENT PLANS

Table ES-2 lists the areas of non-conformance with Resource Management Plans, Management Framework Plans, and Forest Plans.

Table ES-2. Non-conformance with Resource Management Plans, Management Framework Plans, and Forest Plans

Plan	Routes not in Conformance
Casper Resource Management Plan (RMP)	Proposed 1E; Proposed 1W(a), 1W(c); Alternative 1E-C
Medicine Bow National Forest Revised Land and Resource Management Plan (Forest Plan)	Proposed 1E; Proposed 1W(a), 1W(c); Alternative 1E-C
Rawlins RMP	Proposed 1E, Alternative 1E-B; Proposed 2
Green River RMP	Proposed 3; Proposed 4, Alternatives 4B, 4C, 4D, 4E
Kemmerer RMP	Proposed 4, Alternatives 4A, 4B, 4C, 4D, 4E, 4F
Caribou Revised Forest Plan	Proposed 4
Malad Management Framework Plan (MFP)	Proposed 5, Alternative 5A, Alternative 5B; Proposed 7, Alternative 7A, Alternative 7B

Table ES-2. Non-conformance with Resource Management Plans, Management Framework Plans, and Forest Plans (continued)

Plan	Routes not in Conformance
Sawtooth Forest Plan	Alternatives 7H, 7I, 7J
Cassia RMP	Proposed 7, Alternatives 7E, 7H, 7I, 7J
Twin Falls MFP	Proposed 9, Alternative 9A; Alternatives 7I, 7J
Jarbidge RMP	Proposed 8, Alternative 8A; Proposed 9, Alternatives 9B, 9D/9G
Morley Nelson Snake River Birds of Prey National Conservation Area RMP	Proposed 8, Alternatives 8D, 8E; Proposed 9, Alternatives 9D, 9E, 9F, 9G, 9H
Bennett Hills/Timmerman Hills RMP	Proposed 8
Wells RMP	Alternatives 7I, 7J
Bruneau MFP	Proposed 9
Kuna MFP	Proposed 8, Alternatives 8B, 8C[1/]

1/ Additional alternatives would cross the Kuna MFP Management Area; however, these alternatives are addressed under the SRBOP RMP, which replaces the Kuna MFP in these areas.

PREFERRED ROUTE ALTERNATIVES AND BLM LAND USE PLAN AMENDMENTS

PREFERRED ROUTE ALTERNATIVES

Because of the broad range of positions on preferred route alternatives among cooperating agencies on some segments of the Project, the BLM is postponing identification of its preferred route alternative until the 90-day public comment period on this Draft EIS has closed and the BLM has completed its analysis of the comments received.

Some cooperating agencies have identified route preferences. They are:

- State of Wyoming:
  - Segment 1W: Construct adjacent to the existing 230-kV line (a combination of the Proposed Route and Alternative 1W-A)
  - Segment 1E: Alternative 1E-C
  - Segment 2: The Proposed Route, except in the vicinity of Hanna, Wyoming, where the State prefers Alternative 2C
  - Segment 3: The Proposed Route
  - Segment 4: Alternative 4A
- Idaho Army National Guard
  - Alternative 8D and place the proposed route outside of the Bravo Sector of the Orchard Training Area
- Cassia County, Idaho
  - Alternative 7I
  - Although not located in Cassia County, the County supports Alternative 7J

- Owyhee County, Idaho
    - First preference: Alternative 9D (the County expresses a strong preference for this alternative)
    - Second preference: Alternative 9E
- Power County, Idaho
    - Alternatives 5C and 5E
    - Although not located in Power County, the County supports Alternative 7J
- Twin Falls County, Idaho
    - Alternatives 7I and 7J

PREFERRED BLM LAND USE PLAN AMENDMENTS

BLM land use planning regulations require the BLM to identify preferred plan amendments in the Draft EIS that are needed to bring the project into conformance with land use plan management objectives. Preferred plan amendments are different from preferred routes. They are identified in the Draft EIS because proposed land use plan decisions (i.e., plan amendments) are **protested** during the Final EIS phase of the NEPA process as opposed to implementation decisions (i.e., approving a ROW grant), which are **appealed** at the Record of Decision phase of the NEPA process.

For the Gateway West Project, the BLM identified each potential situation of nonconformance by proposed and alternative routes with the respective land use plan. A plan amendment that would allow the proposed or alternative route to conform with the land use plan is presented and it is the BLM's preferred plan amendment for that situation. Plan amendments will only be implemented for those Project routes that are finally authorized. The needed plan amendments will be apparent in the Final EIS, when the BLM identified its preferred route alternative.

Table of Contents

VOLUME 1a

1.0 PURPOSE AND NEED 1-1
1.1 INTRODUCTION 1-1
1.2 FEDERAL AGENCIES' PURPOSE AND NEED 1-3
1.2.1 BLM Purpose and Need 1-3
1.2.2 Forest Service Purpose and Need 1-4
1.2.3 U.S. Army Corps of Engineers Decision 1-5
1.3 PROPONENTS' PURPOSE AND NEED FOR THE PROJECT 1-7
1.3.1 Proponents of the Project 1-7
1.3.2 Demand Side Management 1-9
1.3.3 Existing Transmission System Constraints 1-9
1.3.4 Purpose of the Gateway West Proposed Action 1-13
1.4 AUTHORIZING LAWS AND REGULATIONS 1-16
1.4.1 Overview 1-16
1.4.2 Major Federal Consultations 1-20
1.5 RELATIONSHIP TO POLICIES, PLANS, AND PROGRAMS 1-22
1.5.1 Plan Amendments 1-23
1.5.2 West-Wide Energy Corridors 1-23
1.6 RIGHT-OF-WAY EASEMENT ACQUISITION PROCESS FOR NON-FEDERAL OWNERS 1-24
1.7 SCOPE OF THE ANALYSIS 1-24
1.7.1 Geographic Scope 1-24
1.7.2 Temporal Scope 1-25
1.7.3 Actions Not Connected 1-26
1.8 SCOPING AND PUBLIC INVOLVEMENT 1-28
1.9 ISSUES TO BE ANALYZED 1-29
1.9.1 Purpose and Need for the Project 1-29
1.9.2 Alternative Development Issues 1-30
1.9.3 Effects and Analysis Content Issues 1-31
1.9.4 Mitigation Measures and Monitoring 1-38
1.10 CHANGES IN THE PROPOSED AND ALTERNATIVE ACTIONS 1-40
1.11 ORGANIZATION OF THIS EIS 1-40
2.0 ALTERNATIVES 2-1
2.1 OVERALL PROJECT 2-1
2.1.1 Proposed Action 2-2
2.1.2 Design Variation 2-14
2.1.3 Structure Variation 2-17
2.1.4 Schedule Variation 2-20
2.2 ALTERNATIVE DEVELOPMENT 2-23
2.2.1 Alternatives Developed by the Proponents 2-23
2.2.2 Alternatives Developed by the BLM 2-23
2.2.3 Alternatives Identified Since Scoping 2-24
2.2.4 Alternatives Requiring Plan Amendments 2-24

2.3 NO ACTION ALTERNATIVE 2-24
2.4 ROUTE ACTION ALTERNATIVES 2-41
2.4.1 Segment 1E – Windstar to Aeolus 2-46
2.4.2 Segment 1W – Windstar to Aeolus 2-51
2.4.3 Segment 2 – Aeolus to Creston 2-55
2.4.4 Segment 3 – Creston to Anticline 2-58
2.4.5 Segment 4 – Anticline to Populus 2-60
2.4.6 Segment 5 – Populus to Borah 2-74
2.4.7 Segment 6 – Borah to Midpoint 2-78
2.4.8 Segment 7 – Populus to Cedar Hill 2-79
2.4.9 Segment 8 – Midpoint to Hemingway 2-91
2.4.10 Segment 9 – Cedar Hill to Hemingway 2-100
2.4.11 Segment 10 – Midpoint to Cedar Hill 2-108
2.4.12 Use of West-wide Energy Corridor, Designated, and Existing Corridors 2-109
2.5 SUBSTATION ALTERNATIVES 2-114
2.5.1 Proposed Substations 2-114
2.5.2 Planned Substations 2-117
2.5.3 Existing Substations 2-120
2.6 DESIGN ALTERNATIVES 2-123
2.6.1 Proposed Structure Design 2-123
2.6.2 Structure Design Alternatives 2-124
2.6.3 Structure Finish and Surface Treatment Alternatives 2-128
2.6.4 Underground Alternatives 2-129
2.7 COMPONENTS COMMON TO ALL ACTION ALTERNATIVES 2-138
2.7.1 System Components 2-138
2.7.2 System Construction 2-139
2.7.3 Operations and Maintenance 2-140
2.7.4 Decommissioning 2-141
2.7.5 Proposed EPMs and Agency Mitigation Measures 2-141
2.8 SUMMARY COMPARISON OF EFFECTS OF ALTERNATIVES 2-173
2.8.1 Alternatives 1E-A, 1E-B, and 1E-C Compared to the Proposed Route 2-173
2.8.2 Alternative 1W-A Compared to the Proposed Route 2-176
2.8.3 Alternatives 2A, 2B, and 2C Compared to the Proposed Route 2-179
2.8.4 Alternatives 4A, 4B, 4C, 4D, 4E, and 4F Compared to Proposed Route 2-182
2.8.5 Alternatives 5A, 5B, 5C, 5D, and 5E Compared to Proposed Route 2-185
2.8.6 Alternatives 7A, 7B, 7C, 7D, 7E, 7F, 7G, 7H, 7I, and 7J Compared to Proposed Route 2-188
2.8.7 Alternatives 8A, 8B, 8C, 8D, and 8E Compared to the Proposed Route 2-195
2.8.8 Alternatives 9A, 9B, 9C, 9D, 9E, 9F, 9G and 9H Compared to the Proposed Route 2-199
2.9 PREFERRED ALTERNATIVES 2-203
2.9.1 BLM 2-203

2.9.2 State of Wyoming Preferred Alternatives 2-204
2.9.3 Power County 2-206
2.9.4 Cassia County 2-206
2.9.5 Twin Falls County 2-206
2.9.6 Owyhee County 2-207
2.9.7 Idaho Army National Guard 2-207
2.10 CUMULATIVE EFFECTS SUMMARY 2-208
2.10.1 Proposed Project 2-208
2.10.2 No Action 2-209
2.11 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES 2-210
3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS 3.1-1
3.1 INTRODUCTION 3.1-1
3.1.1 Where to Find Information 3.1-1
3.1.2 Proposed Action and Market-driven Variations 3.1-2
3.1.3 Outline 3.1-3
3.1.4 Estimation of Ground Disturbance 3.1-4
3.2 VISUAL RESOURCES 3.2-1
3.2.1 Affected Environment 3.2-1
3.2.2 Direct and Indirect Effects 3.2-82
3.2.3 Mitigation Measures 3.2-201
3.3 CULTURAL RESOURCES 3.3-1
3.3.1 Introduction 3.3-1
3.3.2 Affected Environment 3.3-4
3.3.3 Direct and Indirect Impacts 3.3-68
3.3.4 Mitigation Measures 3.3-278
3.4 SOCIOECONOMICS 3.4-1
3.4.1 Affected Environment 3.4-1
3.4.2 Direct and Indirect Effects 3.4-27
3.4.3 Mitigation Measures 3.4-84
3.5 ENVIRONMENTAL JUSTICE 3.5-1
3.5.1 Affected Environment 3.5-1
3.5.2 Direct and Indirect Effects 3.5-7
3.5.3 Mitigation Measures 3.5-13
3.6 VEGETATION COMMUNITIES 3.6-1
3.6.1 Affected Environment 3.6-1
3.6.2 Direct and Indirect Effects 3.6-10
3.6.3 Mitigation Measures 3.6-50
3.7 SPECIAL STATUS PLANTS 3.7-1
3.7.1 Affected Environment 3.7-1
3.7.2 Direct and Indirect Effects 3.7-19
3.7.3 Mitigation Measures 3.7-55
3.8 INVASIVE PLANT SPECIES 3.8-1
3.8.1 Affected Environment 3.8-1
3.8.2 Direct and Indirect Effects 3.8-6
3.8.3 Mitigation Measures 3.8-27

3.9 WETLANDS AND RIPARIAN AREAS 3.9-1
3.9.1 Affected Environment 3.9-1
3.9.2 Direct and Indirect Effects 3.9-6
3.9.3 Mitigation Measures 3.9-33

VOLUME 1b

3.10 GENERAL WILDLIFE AND FISH 3.10-1
3.10.1 Affected Environment 3.10-1
3.10.2 Direct and Indirect Effects 3.10-18
3.10.3 Mitigation Measures 3.10-98
3.11 SPECIAL STATUS WILDLIFE AND FISH SPECIES 3.11-1
3.11.1 Affected Environment 3.11-1
3.11.2 Direct and Indirect Effects 3.11-51
3.11.3 Mitigation Measures 3.11-158
3.12 MINERALS 3.12-1
3.12.1 Affected Environment 3.12-1
3.12.2 Direct and Indirect Effects 3.12-14
3.12.3 Mitigation Measures 3.12-31
3.13 PALEONTOLOGICAL RESOURCES 3.13-1
3.13.1 Affected Environment 3.13-1
3.13.2 Direct and Indirect Effects 3.13-10
3.13.3 Mitigation Measures 3.13-23
3.14 GEOLOGIC HAZARDS 3.14-1
3.14.1 Affected Environment 3.14-1
3.14.2 Direct and Indirect Effects 3.14-12
3.14.3 Mitigation Measures 3.14-26
3.15 SOILS 3.15-1
3.15.1 Affected Environment 3.15-1
3.15.2 Direct and Indirect Effects 3.15-12
3.15.3 Mitigation Measures 3.15-33
3.16 WATER RESOURCES 3.16-1
3.16.1 Affected Environment 3.16-1
3.16.2 Direct and Indirect Effects 3.16-14
3.16.3 Mitigation Measures 3.16-45
3.17 LAND USE AND RECREATION 3.17-1
3.17.1 Affected Environment 3.17-1
3.17.2 Direct and Indirect Effects 3.17-47
3.17.3 Mitigation Measures 3.17-140
3.18 AGRICULTURE 3.18-1
3.18.1 Affected Environment 3.18-1
3.18.2 Direct and Indirect Effects 3.18-10
3.18.3 Mitigation Measures 3.18-44
3.19 TRANSPORTATION 3.19-1
3.19.1 Affected Environment 3.19-1
3.19.2 Direct and Indirect Effects 3.19-6
3.19.3 Mitigation Measures 3.19-30

3.20 AIR QUALITY 3.20-1
3.20.1 Affected Environment 3.20-1
3.20.2 Direct and Indirect Effects 3.20-11
3.20.3 Conclusions 3.20-23
3.20.4 Mitigation Measures 3.20-24
3.21 ELECTRICAL ENVIRONMENT 3.21-1
3.21.1 Affected Environment 3.21-1
3.21.2 Direct and Indirect Effects 3.21-13
3.21.3 Mitigation Measures 3.21-47
3.22 PUBLIC SAFETY 3.22-1
3.22.1 Affected Environment 3.22-1
3.22.2 Direct and Indirect Effects 3.22-6
3.22.3 Mitigation Measures 3.22-14
3.23 NOISE 3.23-1
3.23.1 Affected Environment 3.23-1
3.23.2 Direct and Indirect Effects 3.23-6
3.23.3 Mitigation Measures 3.23-19
4.0 CUMULATIVE EFFECTS 4-1
4.1 BASIS FOR ASSESSMENT 4-1
4.1.1 Regulatory Framework 4-1
4.1.2 Scope of the Analysis 4-2
4.1.3 Land Management Plan Amendments 4-8
4.2 PROJECTS OR ACTIONS WITH POTENTIAL FOR CUMULATIVE EFFECT WITH GATEWAY WEST 4-20
4.2.1 Past and Present Actions 4-20
4.2.2 Reasonably Foreseeable Actions 4-38
4.3 ACTIVITIES AND POTENTIAL SHARED RESOURCE IMPACTS 4-52
4.4 CUMULATIVE IMPACT ANALYSIS 4-54
4.4.1 Introduction 4-54
4.4.2 No Action Alternative 4-54
4.4.3 Visual Resources 4-55
4.4.4 Cultural Resources 4-59
4.4.5 Socioeconomics 4-60
4.4.6 Environmental Justice 4-62
4.4.7 Vegetation Communities 4-63
4.4.8 Special Status Plants 4-63
4.4.9 Invasive Plant Species 4-64
4.4.10 Wetlands 4-65
4.4.11 General Wildlife and Fish 4-66
4.4.12 Special Status Wildlife and Fish Species 4-72
4.4.13 Minerals 4-84
4.4.14 Paleontological Resources 4-85
4.4.15 Geologic Hazards 4-85
4.4.16 Soils 4-86
4.4.17 Water Resources 4-86
4.4.18 Land Use 4-87

4.4.19 Agriculture 4-92
4.4.20 Transportation 4-94
4.4.21 Air Quality 4-94
4.4.22 Electrical Environment 4-95
4.4.23 Public Safety 4-95
4.4.24 Noise 4-96
5.0 CONSULTATION AND COLLABORATION 5-1
5.1 PUBLIC INVOLVEMENT AND SCOPING 5-1
5.1.1 Scoping Period 5-1
5.1.2 Stakeholder Outreach 5-3
5.1.3 Routing Announcements 5-5
5.2 CONSULTATION 5-5
5.2.1 Government-to-Government 5-6
5.2.2 Federal Agencies 5-9
5.2.3 State Agencies 5-9
5.3 PREPARERS AND CONTRIBUTORS 5-10
5.3.1 Bureau of Land Management 5-10
5.3.2 USDA Forest Service 5-13
5.3.3 Third-Party Contractor Team 5-14
5.4 DRAFT EIS DISTRIBUTION 5-16
5.4.1 Native American Tribal Governments 5-16
5.4.2 Federal Agencies 5-17
5.4.3 Local Governments 5-17
5.4.4 County Governments 5-19
5.4.5 U.S. House of Representatives and U.S. Senate 5-19
5.4.6 State of Idaho 5-20
5.4.7 State of Nevada 5-21
5.4.8 State of Wyoming 5-21
5.4.9 Public Reading Rooms 5-22
5.4.10 Bureau of Land Management Offices 5-23
5.4.11 U.S. Department of Agriculture Forest Service Offices 5-24
6.0 GLOSSARY AND INDEX 1
7.0 REFERENCES 7-1

List of Appendices

Appendix A Gateway West Transmission Line Project Maps (Vol. 3)

Appendix B Transmission Line and Substation Components Common to All Action Alternatives (Vol. 2)

Appendix C Environmental Protection Plans and Measures (Vol. 2)

C-1: Revised Environmental Protection Measures and Plans

C-2: Revised Framework Reclamation Plan for Construction

C-3: Revised Plant and Wildlife Conservation Plan – Construction Activities

C-4: Revised Plan for Operations, Maintenance, and Emergency Response Activities

C-5: Greater Sage-grouse Avoidance, Minimization, and Mitigation Measures

C-6: Draft Framework for Compensatory Mitigation for and Monitoring of Unavoidable Impacts to Waters of the U.S.

Appendix D Large Format Data Tables (Vol. 3)

Appendix E Large Format Figures (Vol. 3)

Appendix F Proposed Land Use Plan Amendments (Vol. 2)

F-1: BLM

F-2: Forest Service

Appendix G VRM Amendment Analysis (Vol. 2)

G-1: BLM

G-2: Forest Service

Appendix H West-wide Energy Corridor Interagency Operating Procedures (Vol. 2)

Appendix I Wildlife Seasonal Stipulations (Vol. 3)

Appendix J Framework for Sage-Grouse Impacts Analysis for Interstate Transmission Lines (Vol. 2)

List of Tables

Table 1.3-1. Rating and Capacity of Paths with and without the Gateway West Project 1-11
Table 1.3-2. Substations to be Connected by Gateway West 1-14
Table 1.3-3. Gateway West Transmission Line Segments 1-15
Table 1.4-1. Major Permits, Approvals, and Consultations for the Gateway West Transmission Line Project 1-16
Table 1.5-1. BLM and Forest Service Land Use Plan Status along Gateway West Proposed Route 1-22
Table 1.7-1. Land Ownership Distribution in the Gateway West Siting Study Area 1-24
Table 1.7-2. Land Ownership Distribution in the Gateway West Proposed Action ROW 1-25
Table 1.9-1. Alternative Development Issues and Alternatives Considered in Detail 1-30
Table 2.1-1. Proposed Action Summary of Miles and Percent Crossed by Ownership 2-2
Table 2.1-2. Summary of Project Facilities for Proposed Action and Design and Schedule Variations 2-4
Table 2.1-3. Proposed Action Construction Schedule 2-13
Table 2.1-4. Design Variation Construction Schedule 2-15
Table 2.1-5. Comparison of One Double-Circuit 500-kV Lattice Tower and Two Single-Circuit 500-kV Lattice Towers 2-16
Table 2.1-6. Summary/Comparison of Single-Circuit 500-kV Lattice Towers, Self-Supporting vs. Guyed Towers 2-18
Table 2.1-7. Schedule Variation Construction Schedule 2-21
Table 2.2-1 Land Use Plan Conformance and Proposed Amendment Summaries 2-25
Table 2.4-1. Summary of Proposed Route and Route Alternatives Considered 2-42
Table 2.4-2. Length and Percentage of Proposed Route and Route Alternatives That Align with West-wide Energy Corridors and Existing Corridors 2-110
Table 2.6-1. Proposed Structures by Segment 2-123
Table 2.6-2. Alternative 500-kV Conductor Support Structure Comparison 2-125
Table 2.6-3. Summary/Comparison of Single-Circuit 500-kV Lattice Tower vs. Tubular Steel H-frame 2-127
Table 2.7-1. Proponent and Agency Proposed Mitigation Measures 2-143
Table 2.8-1. Alternatives 1E-A, 1E-B, and 1E-C Compared to the Proposed Route 2-174

Table 2.8-2. Alternative 1W-A Compared to the Proposed Route 2-177
Table 2.8-3. Alternatives 2A, 2B, and 2C Compared to the Proposed Route 2-180
Table 2.8-4. Alternatives 4A, 4B, 4C, 4D, 4E, and 4F Compared to the Proposed Route 2-183
Table 2.8-5. Alternatives 5A, 5B, 5C, 5D, and 5E Compared to the Proposed Route 2-186
Table 2.8-6. Alternatives 7A, 7B, 7C, 7D, 7E, 7F, 7G, 7H, 7I, and 7J Compared to the Proposed Route 2-191
Table 2.8-7. Alternatives 8A, 8B, 8C, 8D, and 8E Compared to the Proposed Route 2-197
Table 2.8-8. Alternatives 9A, 9B, 9C, 9D, 9E, 9F, 9G, and 9H Compared to the Proposed Route 2-201
Table 2.11-1. Irreversible and Irretrievable Commitments of Resources, Gateway West Project 2-211
Table 3.1-1. Quick EIS Information Reference..... 3.1-1
Table 3.2-1. Visual Impact Assessment for Each KOP in the Segment 1E Proposed Route 3.2-88
Table 3.2-2. Visual Impact Assessment for Each KOP in Alternative 1E-A 3.2-91
Table 3.2-3. Visual Impact Assessment for Each KOP in Alternative 1E-B 3.2-92
Table 3.2-4. Visual Impact Assessment for Each KOP in Alternative 1E-C 3.2-93
Table 3.2-5. Visual Impact Assessment for Each KOP in the Segment 1W(a) Proposed Route 3.2-97
Table 3.2-6. Visual Impact Assessment for Each KOP in the Segment 1W(c) Proposed Route 3.2-99
Table 3.2-7. Visual Impact Assessment for Each KOP in Alternative 1W-A . 3.2-100
Table 3.2-8. Visual Impact Assessment for Each KOP in the Segment 2 Proposed Route 3.2-103
Table 3.2-9. Visual Impact Assessment for Each KOP in Alternative 2A 3.2-105
Table 3.2-10. Visual Impact Assessment for Each KOP in Alternative 2B 3.2-106
Table 3.2-11. Visual Impact Assessment for Each KOP in Alternative 2C 3.2-107
Table 3.2-12. Visual Impact Assessment for Each KOP in the Segment 3 Proposed Route 3.2-109
Table 3.2-13. Visual Impact Assessment for Each KOP in the Segment 4 Proposed Route 3.2-110
Table 3.2-14. Visual Impact Assessment for Each KOP in Alternative 4A 3.2-115
Table 3.2-15. Visual Impact Assessment for Each KOP in Alternative 4B 3.2-117
Table 3.2-16. Visual Impact Assessment for Each KOP in Alternative 4C 3.2-118
Table 3.2-17. Visual Impact Assessment for Each KOP in Alternative 4D 3.2-119
Table 3.2-18. Visual Impact Assessment for Each KOP in Alternative 4E 3.2-120
Table 3.2-19. Visual Impact Assessment for Each KOP in Alternative 4F 3.2-120

Table 3.2-20. Visual Impact Assessment for Each KOP in the Segment 5 Proposed Route 3.2-126
Table 3.2-21. Visual Impact Assessment for Each KOP in Alternative 5A 3.2-127
Table 3.2-22. Visual Impact Assessment for Each KOP in Alternative 5B 3.2-128
Table 3.2-23. Visual Impact Assessment for Each KOP in Alternative 5C 3.2-129
Table 3.2-24. Visual Impact Assessment for Each KOP in Alternative 5D 3.2-131
Table 3.2-25. Visual Impact Assessment for Each KOP in Alternative 5E 3.2-132
Table 3.2-26. Visual Impact Assessment for Each KOP in the Segment 7 Proposed Route 3.2-136
Table 3.2-27. Visual Impact Assessment for Each KOP in Alternative 7A 3.2-139
Table 3.2-28. Visual Impact Assessment for Each KOP in Alternative 7B 3.2-139
Table 3.2-29. Visual Impact Assessment for Each KOP in Alternative 7C 3.2-140
Table 3.2-30. Visual Impact Assessment for Each KOP in Alternative 7D 3.2-141
Table 3.2-31. Visual Impact Assessment for Each KOP in Alternative 7E 3.2-141
Table 3.2-32. Visual Impact Assessment for Each KOP in Alternative 7F 3.2-141
Table 3.2-33. Visual Impact Assessment for Each KOP in Alternative 7G 3.2-142
Table 3.2-34. Visual Impact Assessment for Each KOP in Alternative 7H 3.2-142
Table 3.2-35. Visual Impact Assessment for Each KOP in Alternative 7I 3.2-148
Table 3.2-36. Visual Impact Assessment for Each KOP in Alternative 7J[1/] 3.2-154
Table 3.2-37. Visual Impact Assessment for Each KOP in the Segment 8 Proposed Route 3.2-164
Table 3.2-38. Visual Impact Assessment for Each KOP in Alternative 8A 3.2-167
Table 3.2-39. Visual Impact Assessment for Each KOP in Alternative 8B 3.2-169
Table 3.2-40. Visual Impact Assessment for Each KOP in Alternative 8C 3.2-171
Table 3.2-41. Visual Impact Assessment for Each KOP in Alternative 8D 3.2-171
Table 3.2-42. Visual Impact Assessment for Each KOP in Alternative 8E 3.2-172
Table 3.2-43. Visual Impact Assessment for Each KOP in the Segment 9 Proposed Route 3.2-177
Table 3.2-44. Visual Impact Assessment for Each KOP in Alternative 9A 3.2-180
Table 3.2-45. Visual Impact Assessment for Each KOP in Alternative 9B 3.2-181
Table 3.2-46. Visual Impact Assessment for Each KOP in Alternative 9C 3.2-183
Table 3.2-47. Visual Impact Assessment for Each KOP in Alternative 9D 3.2-183
Table 3.2-48. Visual Impact Assessment for Each KOP in Alternative 9E 3.2-186
Table 3.2-49. Visual Impact Assessment for Each KOP in Alternative 9F 3.2-187
Table 3.2-50. Visual Impact Assessment for Each KOP in Alternative 9G 3.2-188
Table 3.2-51. Visual Impact Assessment for Each KOP in the Segment 10 Proposed Route 3.2-193
Table 3.2-52. Comparison of Proposed Action and Design Variation 3.2-195
Table 3.3-1. NEPA and NHPA Terminology (Note: Terms are not interchangeable) 3.3-3

Table 3.3-2. Status of Native American Consultation 3.3-10
Table 3.3-3. Summary of Prehistoric Resources by Segment and Type[1/] 3.3-28
Table 3.3-4. Summary of Historic Resources by Segment and Type[1/] 3.3-37
Table 3.3-5. Summary of Previous Survey Coverage in Segment 4, Wyoming 3.3-68
Table 3.3-6. Summary of Cultural Resource Visual Impact Analysis by Segment and Resource 3.3-74
Table 3.3-7. Analysis of Impacts by Segment 3.3-243
Table 3.3-8. Historic Trail Crossings in Segment 1E 3.3-264
Table 3.3-9. Historic Trail Crossings in Segment 1W 3.3-265
Table 3.3-10. Historic Trail Crossings in Segment 2 ..... 3.3-266
Table 3.3-11. Historic Trail Crossings in Segment 3 ..... 3.3-267
Table 3.3-12. Historic Trail Crossings in Segment 4 ..... 3.3-267
Table 3.3-13. Crossing by NHT Trail Classes in the Kemmerer FO 3.3-268
Table 3.3-14. Historic Trail Crossings in Segment 5 ..... 3.3-270
Table 3.3-15. Historic Trail Crossings in Segment 7. ..... 3.3-272
Table 3.3-16. Historic Trail Crossings in Segment 8 ..... 3.3-274
Table 3.3-17. Historic Trail Crossings in Segment 9 ..... 3.3-276
Table 3.3-18. Historic Trail Crossings in Segment 10 ..... 3.3-277
Table 3.4-1. States and Counties Crossed by Segment 3.4-1
Table 3.4-2. Miles by County (Proposed Route) 3.4-2
Table 3.4-3. Project Components and Affected Counties by Region 3.4-2
Table 3.4-4. Demographic Characteristics in the Potentially Affected Counties 3.4-5
Table 3.4-5. Population for Communities Crossed by the Proposed Route or Route Alternative 3.4-6
Table 3.4-6. Population for Communities Located within 1 Mile of the Proposed Route or Route Alternatives 3.4-7
Table 3.4-7. Economic Conditions in the Potentially Affected Counties 3.4-9
Table 3.4-8. Summary of Agriculture by County and State, 2007 ..... 3.4-12
Table 3.4-9. Agricultural Employment, 2008 ..... 3.4-13
Table 3.4-10. Timber Harvest in Affected Wyoming Counties, 2000 and 2005 (MBF) 3.4-14
Table 3.4-11. Housing Data by State and County 3.4-15
Table 3.4-12. School Districts in the Analysis Area – Selected Characteristics (2005/2006) 3.4-19
Table 3.4-13. Police and Fire Departments and Crime Rates by County 3.4-20
Table 3.4-14. Medical Facilities Located near the Project Area 3.4-22
Table 3.4-15. Municipal Services by County 3.4-23

Table 3.4-16. Sales, Use, and Lodging Tax Revenues in Wyoming Counties, Fiscal Year 2010 ..... 3.4-24
Table 3.4-17. Sales, Use, and Travel and Convention Tax Revenues in Idaho Counties, Fiscal Year 2010 ..... 3.4-25
Table 3.4-18. Ad Valorem Tax Revenues in Wyoming Counties, 2010 ..... 3.4-25
Table 3.4-19. Beneficiaries of Ad Valorem Tax Revenues in Wyoming, 2010 ..... 3.4-26
Table 3.4-20. Property Tax Revenues in Idaho Counties, Fiscal Year 2010 ..... 3.4-26
Table 3.4-21. Beneficiaries of Property Tax Revenues in Idaho, 2007 ..... 3.4-27
Table 3.4-22. Projected Construction Workforce by EPC Analysis Area 3.4-31
Table 3.4-23. Projected Temporary Change in Population During Construction by EPC Analysis Area 3.4-32
Table 3.4-24. Projected Temporary Change in Population During Construction by County 3.4-32
Table 3.4-25. Proposed Action Inputs Used for the Economic Impact Analysis 3.4-35
Table 3.4-26. Proposed Action Projected Total (Direct, Indirect, and Induced) Economic Impacts 3.4-36
Table 3.4-27. Projected Timber Harvest Volume and Estimated Value 3.4-44
Table 3.4-28. Projected Housing Demand by Housing Type and EPC Analysis Area 3.4-46
Table 3.4-29. Projected Demand for Education Resources by Analysis Area .. 3.4-58
Table 3.4-30. Estimated Sales and Use Tax Revenue in Wyoming Counties .. 3.4-61
Table 3.4-31. Estimated Sales and Tax Revenue in Idaho Counties ($000s) ... 3.4-62
Table 3.4-32. Estimated Ad Valorem (Wyoming) and Property (Idaho) Tax Revenues 3.4-63
Table 3.4-33. Alternatives by Segment 3.4-65
Table 3.4-34. Projected Construction Workforce for Route Alternatives by County 3.4-66
Table 3.4-35. Projected Total Employment for Other Alternatives by EPC Analysis Area 3.4-67
Table 3.4-36. Projected Tax Revenues for the Other Alternatives by County ... 3.4-70
Table 3.4-37. Schedule Variation Projected Construction Workforce by EPC Analysis Area 3.4-77
Table 3.4-38. Schedule Variation Projected Temporary Change in Population During Construction by EPC Analysis Area 3.4-77
Table 3.4-39. Schedule Variation Projected Temporary Change in Population During Construction by County 3.4-78
Table 3.4-40. Schedule Variation Inputs Used for the Economic Impact Analysis 3.4-79

Table 3.4-41. Schedule Variation Projected Total (Direct, Indirect, and Induced) Economic Impacts 3.4-80
Table 3.4-42. Schedule Variation Projected Housing Demand by Housing Type and Analysis Area 3.4-82
Table 3.5-1. Race and Ethnicity by County, 2010 ..... 3.5-3
Table 3.5-2. Race and Ethnicity Census Block Group Comparison 3.5-5
Table 3.5-3. Income and Poverty by State and Affected County 3.5-5
Table 3.5-4. Poverty Census Block Comparison 3.5-7
Table 3.5-5. Potential Minority Populations by Proposed Route / Route Alternative 3.5-11
Table 3.5-6. Potential Low Income Populations by Proposed Route / Route Alternative 3.5-11
Table 3.6-1. Vegetation Types in Gateway West Analysis Area 3.6-5
Table 3.6-2. Impacts (acres) to Vegetation on Federal Lands under the Proposed Action 3.6-20
Table 3.6-3. Comparison of Construction-related Vegetation Impacts (acres) for Segment 1E Proposed Route and Alternatives 1E-A, 1E-B, and 1E-C 3.6-26
Table 3.6-4. Operations and Maintenance Vegetation Impacts (acres) for Segment 1E Proposed Route and Alternatives 1E-A, 1E-B, and 1E-C 3.6-27
Table 3.6-5. Comparison of Construction-related Vegetation Impacts (acres) for Segment 1W Proposed Routes and Alternative 1W-A 3.6-28
Table 3.6-6. Comparison of Operations and Maintenance Vegetation Impacts (acres) for Segment 1W Proposed Routes and Alternatives 1W-A 3.6-29
Table 3.6-7. Comparison of Construction-related Vegetation Impacts (acres) for Segment 2 Proposed Route and Alternatives 2A, 2B, and 2C 3.6-30
Table 3.6-8. Comparison of Operations and Maintenance Vegetation Impacts (acres) for Segment 2 Proposed Route and Alternatives 2A, 2B, and 2C 3.6-31
Table 3.6-9. Acreage Affected by Construction and Operations of Segment 3 Proposed Route 3.6-32
Table 3.6-10. Comparison of Construction-related Vegetation Impacts (acres) for Segment 4 Proposed Route and Alternatives 4A through 4F 3.6-33
Table 3.6-11. Comparison of Operations and Maintenance Vegetation Impacts (acres) for Segment 4 Proposed Route and Alternatives 4A through 4F 3.6-35

Table 3.6-12. Comparison of Construction-related Vegetation Impacts (acres) for Segment 5 Proposed Route and Alternatives 5A through 5E 3.6-36
Table 3.6-13. Comparison of Operations-related Vegetation Impacts (acres) for Segment 5 Proposed Route and Alternatives 5A through 5E 3.6-37
Table 3.6-14. Acreage Affected by Construction and Operations of Segment 6 Proposed Route 3.6-38
Table 3.6-15. Comparison of Construction-related Vegetation Impacts (acres) for Segment 7 Proposed Route and Alternatives 7A through 7J 3.6-39
Table 3.6-16. Comparison of Operations-related Vegetation Impacts (acres) for Segment 7 Proposed Route and Alternatives 7A through 7J 3.6-42
Table 3.6-17. Comparison of Construction-related Vegetation Impacts (acres) for Segment 8 Proposed Route and Alternatives 8A through 8E 3.6-44
Table 3.6-18. Comparison of Operations-related Vegetation Impacts (acres) for Segment 8 Proposed Route and Alternatives 8A through 8E 3.6-45
Table 3.6-19. Comparison of Construction-related Vegetation Impacts (acres) for Segment 9 Proposed Route and Alternatives 9A through 9H 3.6-47
Table 3.6-20. Comparison of Operations-related Vegetation Impacts (acres) for Segment 9 Proposed Route and Alternatives 9A through 9H 3.6-48
Table 3.6-21. Summary of Construction- and Operations-related Vegetation Impacts (acres) for Segment 10 Proposed Route 3.6-49
Table 3.7-1. Agency Data Sources Used to Determine the Location of TES Plant Species 3.7-4
Table 3.7-2. Federally Listed Threatened, Endangered, Proposed, and Candidate Plant Species That May Occur in the Counties Crossed by the Project 3.7-6
Table 3.7-3. Other Special Status Plant Species Known to Occur Within 5 Miles of the Analysis Area 3.7-11
Table 3.7-4. Pre-construction Survey Windows for Five ESA-listed or Candidate Plant Species 3.7-21
Table 3.7-5. Impacts to Threatened, Endangered, Proposed, and Candidate Plant Species 3.7-28
Table 3.7-6. Potential Impacts to Other Special Status Plant Species along Segment 1E Proposed and Alternative Routes 3.7-34
Table 3.7-7. Potential Impacts to Other Special Status Plant Species along Segment 1W Proposed and Alternative Routes 3.7-36

Table 3.7-8. Potential Impacts to Other Special Status Plant Species along Segment 2 Proposed and Alternative Routes 3.7-37
Table 3.7-9. Potential Impacts to Other Special Status Plant Species along Segment 3 Proposed and Alternative Routes 3.7-39
Table 3.7-10. Potential Impacts to Other Special Status Plant Species along Segment 4 Proposed and Alternative Routes 3.7-41
Table 3.7-11. Potential Impacts to Slickspot Peppergrass Habitat along Segment 8 Proposed and Alternatives Routes 3.7-46
Table 3.7-12. Potential Impacts to Other Special Status Plant Species along Segment 8 Proposed and Alternative Routes 3.7-48
Table 3.7-13. Potential Impacts to Other Special Status Plant Species along Segment 9 Proposed and Alternative Routes 3.7-50
Table 3.7-14. Potential Impacts (acres) to Other Special Status Plant Species Associated with the Design Variation Along Segments 2, 3, and 4 Proposed and Alternative Routes 3.7-53
Table 3.9-1. Comparison of Wetland/Riparian Impacts for Segment 1E Proposed Route and Alternatives 1E-A, 1E-B, and 1E-C 3.9-17
Table 3.9-2. Comparison of Wetland/Riparian Impacts for Segment 1W(a) Proposed Route and Alternative 1W-A 3.9-18
Table 3.9-3. Comparison of Wetland/Riparian Impacts for Segment 2 Proposed Route and Alternatives 2A, 2B, and 2C 3.9-20
Table 3.9-4. Wetland/Riparian Impacts for Segment 3 Proposed Route 3.9-21
Table 3.9-5. Comparison of Wetland/Riparian and AIZ Impacts for Segment 4 Proposed Route and Alternatives 4A through 4F. 3.9-22
Table 3.9-6. Comparison of Wetland/Riparian Impacts for Segment 5 Proposed Route and Alternatives 5A through 5E 3.9-24
Table 3.9-7. Comparison of Wetland/Riparian and RCZ Impacts for Segment 7 Proposed Route and Alternatives 7A through 7J..... 3.9-27
Table 3.9-8. Comparison of Wetland/Riparian Impacts for Segment 8 Proposed Route and Alternatives 8A through 8E 3.9-28
Table 3.9-9. Comparison of Impacts for Segment 9 Proposed Route and Alternatives 9A through 9H 3.9-30
Table 3.10-1. Extended Analysis Areas for General Wildlife (species discussed in Section 3.10.1.5) 3.10-3
Table 3.10-2. Typical Wildlife Species in the Analysis Area by Habitat Type.. 3.10-10
Table 3.10-3. River Crossings Where Flight Diverters Would Be Installed in Order to Reduce the Potential for Avian Collisions 3.10-33
Table 3.10-4. Comparison of Designated Winter Range Impacted by the Segment 1E Proposed Route and Alternatives 1E-A through 1E-C (acres)..... 3.10-52

Table 3.10-5. Comparison of Raptor Nests within 1 mile of the Segment 1E Proposed Route and Alternatives 1E-A through 1E-C, Showing How Many Nests are on Federal Land 3.10-52
Table 3.10-6. Comparison of Stream Crossings (and the number on federal land, if any) and Acres of Riparian Clearing during Construction for the Segment 1E Proposed Route and Alternatives 1E-A through 1E-C (and amount on federal land, if any) 3.10-53
Table 3.10-7. Comparison of Habitat Fragmentation from Roads and Transmission Lines by Habitat Type for the Segment 1E Proposed Route and Alternatives 1E-A through 1E-C 3.10-54
Table 3.10-8. Comparison of Acres of Designated Winter Range Impacted during Operations by the Segment 1E Proposed Route and Alternatives 1E-A through 1E-C (acres) 3.10-54
Table 3.10-9. Road Densities on NFS Lands before and after Project Implementation (miles per square mile) 3.10-55
Table 3.10-10. Big Game Designated Winter Range Impacted by Segments 1W(a) and 1W(c) Proposed Routes and Alternative 1W-A During Construction (acres) 3.10-57
Table 3.10-11. Comparison of Raptor Nests within 1 mile of Segment 1W(a) and 1W(c) Proposed Routes and Alternative 1W-A, Showing How Many are on Federal Land, if any 3.10-58
Table 3.10-12. Comparison of Stream Crossings (and the number on federal land, if any) and Acres of Riparian Clearing During Construction for Proposed Segments 1W(a) and 1W(c) and Alternative 1W-A (and the amount on federal land, if any) 3.10-58
Table 3.10-13. Habitat Fragmentation from Roads and Transmission Lines by Habitat Type for Segment 1W 3.10-59
Table 3.10-14. Acres of Big Game Designated Winter Range Affected by Project Operations in the Proposed Routes of Segments 1W(a) and 1W(c) and Alternative 1W-A 3.10-59
Table 3.10-15. Comparison of Designated Winter Range Impacted by the Segment 2 Proposed Route and Alternatives 2A through 2C During Construction (acres) 3.10-61
Table 3.10-16. Comparison of Raptor Nests within 1 Mile of the Segment 2 Proposed Route and Alternatives 2A through 2C, Showing How Many are on Federal Land, if any 3.10-62
Table 3.10-17. Comparison of Acres of Permanent Riparian Clearing for Proposed Segment 2 and Alternatives 2A through 2C (and the amount on federal land, if any) 3.10-62
Table 3.10-18. Comparison of Habitat Fragmentation from Roads and Transmission Lines by Habitat type for the Segment 2 Proposed Route and Alternatives 2A through 2C 3.10-63

Table 3.10-19. Acres of Big Game Designated Winter Range Affected by Project Operations of the Segment 2 Proposed Route and Alternatives 2A through 2C 3.10-63
Table 3.10-20. Comparison of Designated Winter Range Impacted by the Segment 4 Proposed Route and Alternatives 4A through 4F (acres) 3.10-67
Table 3.10-21. Comparison of Raptor Nests within 1 Mile of the Proposed Route and Route Alternatives, Segment 4 Proposed Route and Alternatives 4A through 4F, and How Many are on Federal Land, if any 3.10-67
Table 3.10-22. Comparison of Stream Crossings (and the number on federal land, if any) and Acres of Riparian Clearing during Construction for the Segment 4 Proposed Route and Alternatives 4A through 4F (and the amount on federal land, if any) 3.10-68
Table 3.10-23. Comparison of Habitat Fragmentation from Roads and Transmission Lines by Habitat Type for the Segment 4 Proposed Route and Alternatives 4A through 4F 3.10-69
Table 3.10-24. Acres of Big Game Designated Winter Range Affected by Operations, Segment 4 Proposed Route and Alternatives 4A through 4F 3.10-70
Table 3.10-25. Road Densities along the Proposed Route of Segment 4 on Forest Service Land before and after Project Implementation (miles per square mile) 3.10-70
Table 3.10-26. Comparison of Designated Winter Range Impacted by the Segment 5 Proposed Route and Alternatives 5A through 5E (acres) 3.10-73
Table 3.10-27. Comparison of Stream Crossings (and the number on federal land, if any) and Acres of Riparian Clearing During Construction for the Segment 5 Proposed Route and Alternatives 5A through 5E (and the amount on federal land, if any) 3.10-73
Table 3.10-28. Comparison of Habitat Fragmentation from Roads and Transmission Lines by Habitat Type for the Segment 5 Proposed Route and Alternatives 5A through 5E 3.10-74
Table 3.10-29. Acres of Big Game Designated Winter Range Affected by Operations, Segment 5 Proposed Route and Alternatives 5A through 5E 3.10-75
Table 3.10-30. Comparison of Big Game Designated Winter Range Impacted during Construction by Proposed Segment 7 and Alternatives 7A through 7J (acres) 3.10-77
Table 3.10-31. Comparison of Raptor Nests within 1 mile of the Proposed Route and Route Alternatives for Segment 7, and How Many are on Federal Land, if any 3.10-79

Table 3.10-32. Comparison of Stream Crossings (and the number on federal land, if any) and Acres of Riparian Clearing During Construction for the Segment 7 Proposed Route and Alternatives 7A through 7J (and the amount on federal land, if any) 3.10-80
Table 3.10-33. Comparison of Habitat Fragmentation from Road and Transmission Lines for the Segment 7 Proposed Route and Alternatives 7A through 7J 3.10-81
Table 3.10-34. Acres of Big Game Designated Winter Range Affected by Operations of the Segment 7 Proposed Route and Alternatives 7A through 7J 3.10-82
Table 3.10-35. Road Densities on NFS Land before and after Project Implementation (miles per square mile) 3.10-83
Table 3.10-36. Comparison of Big Game Designated Winter Range Impacted by the Segment 8 Proposed Route and Alternatives 8A through 8E during Construction (acres) 3.10-85
Table 3.10-37. Comparison of Raptor Nests within 1 mile of Proposed Segment 8 and Alternatives 8A through 8E, and How Many are on Federal Land, if any 3.10-86
Table 3.10-38. Comparison of Stream Crossings (and the number on federal land, if any) and Acres of Permanent Riparian Clearing for the Segment 8 Proposed Route and Alternatives 8A through 8E (and the amount on federal land, if any) 3.10-86
Table 3.10-39. Comparison of Habitat Fragmentation from Roads and Transmission Lines by Habitat Type for the Segment 8 Proposed Route and Alternatives 8A through 8E 3.10-87
Table 3.10-40. Acres of Big Game Designated Winter Range Affected by Operations, Segment 8 and Alternatives 8A through 8E..... 3.10-88
Table 3.10-41. Comparison of Big Game Designated Winter Range Impacted by Proposed Segment 9 and Alternatives 9A through 9H (acres) 3.10-90
Table 3.10-42. Comparison of Raptor Nests within 1 mile of the Segment 9 Proposed Route and Alternatives 9A through 9H, and the Number that are on Federal Land 3.10-91
Table 3.10-43. Comparison of Perennial Stream Crossings (and the number on federal land, if any) and Acres of Permanent Riparian Clearing for Proposed Segment 9 and Alternatives 9A through 9H (and the amount on federal land, if any)..... 3.10-92
Table 3.10-44. Comparison of Habitat Fragmentation from Roads and Transmission Lines by Habitat Type for the Segment 9 Proposed Route and Alternatives 9A through 9H (continued) .. 3.10-93
Table 3.10-45. Acres of Big Game Designated Winter Range Affected by Operations, Segment 9 Proposed Route and Alternatives 9A through 9H 3.10-93

Table 3.10-46. Comparison of Habitat Fragmentation from Roads and Transmission Lines by Habitat Type for the Segment 10 Proposed Route 3.10-96
Table 3.11-1. Expanded Analysis Area for Selected Species with Available Data 3.11-2
Table 3.11-2. Total Size of Lynx Analysis Units Crossed by the Project 3.11-23
Table 3.11-3. Miles of Agency Designated Greater Sage-Grouse Habitat Crossed by the Proposed Route's Centerline 3.11-27
Table 3.11-4. Number of Greater Sage-Grouse Leks within Specified Distances of the Proposed Route's Centerline 3.11-28
Table 3.11-5. Number of Columbian Sharp-Tailed Grouse Leks within Specified Distances of the Proposed Route's Centerline 3.11-43
Table 3.11-6. Number of White-tailed Prairie Dog Colonies along the Proposed Route and Its Alternatives within the Analysis Area .. 3.11-46
Tables 3.11-7a–g. Alternative Comparison Tables for Segment 1E 3.11-128
Tables 3.11-8a–g. Alternative Comparison Tables for Segment 1W 3.11-131
Tables 3.11-9a–h. Alternative Comparison Tables for Segment 2 ..... 3.11-134
Tables 3.11-10a–j. Alternative Comparison Tables for Segment 4 ..... 3.11-138
Tables 3.11-11a–f. Alternative Comparison Tables for Segment 5 ..... 3.11-142
Tables 3.11-12a–f. Alternative Comparison Tables for Segment 7 ..... 3.11-147
Tables 3.11-13a–e. Alternative Comparison Tables for Segment 8 ..... 3.11-151
Tables 3.11-14a–f. Alternative Comparison Tables for Segment 9 ..... 3.11-154
Table 3.12-1. Mineral Resources Within the Analysis Area (percent of area) ... 3.12-6
Table 3.12-2. Mining Activities Within 1,000 Feet of Transmission Line Routes, Observed From Aerial Photograph Reconnaissance and Topographic Maps 3.12-7
Table 3.12-3. Acres of Active Claims, Leases, or Saleable Mineral Areas within Construction Disturbance Areas 3.12-17
Table 3.12-4. Acres of Active Claims, Leases, or Saleable Mineral Areas within Operations Disturbance Areas 3.12-20
Table 3.12-5. Number of Active Oil and Gas Wells within the Analysis Area, Construction Disturbance Area, and Operations Disturbance Area 3.12-23
Table 3.12-6 Acres of Active Claims, Commodities, or Mineral Leases within Two Single Circuit Design Variation (Construction) 3.12-30
Table 3.13-1. BLM Sensitivity Ratings for Geologic Units Encountered in Wyoming 3.13-2
Table 3.13-2. BLM Sensitivity Ratings for Geologic Units Encountered in Idaho 3.13-4
Table 3.13-3. Paleontology Risk Factor of Proposed and Alternative Routes. 3.13-14
Table 3.14-1. OPS Earthquake Hazard Risk by Segment 3.14-7

Table 3.14-2. Earthquake Magnitude Buffers by Segment 3.14-9
Table 3.14-3. OPS Landslide Risk by Segment 3.14-9
Table 3.14-4. Potential Subsidence Areas by Segment 3.14-11
Table 3.14-5. Areas of Shallow Bedrock by Segment 3.14-11
Table 3.14-6. Risks from Blasting by Segment 3.14-14
Table 3.14-7. Summary of Potential Geologic Hazards in Proposed Routes and Alternatives 3.14-16
Table 3.15-1. Soil Factors in the Gateway West Project Analysis Area (percent of area) 3.15-11
Table 3.16-1. Water Resources in Analysis Area 3.16-13
Table 3.16-2. Wells within the Analysis Area and Wells near Potential Blasting Areas 3.16-14
Table 3.16-3. Percentage of Crossing Type and Stream Type on Proposed Route 3.16-15
Table 3.16-4. Acres of Woody Vegetation within 500 Feet of Temperature Impaired Streams Impacted by Construction and Operation Disturbance 3.16-20
Table 3.16-5. Number of Stream Crossings in National Forests 3.16-26
Table 3.17-1. Idaho Endowment Land 3.17-10
Table 3.17-2. BLM Management Plan Jurisdiction Crossed by the Proposed Route 3.17-14
Table 3.17-3. Miles Crossed by Land Ownership 3.17-23
Table 3.17-4. Existing Land Uses within the Analysis Area 3.17-23
Table 3.17-5. OHV Designations on Federal Lands for the Proposed Route (miles) 3.17-40
Table 3.17-6. Miles Crossed by Land Ownership – Segment 1E 3.17-59
Table 3.17-7. Miles Crossed by Land Use – Segment 1E 3.17-62
Table 3.17-8. Miles Crossed by Land Ownership – Segment 1W 3.17-67
Table 3.17-9. Miles Crossed by Land Use – Segment 1W 3.17-69
Table 3.17-10. Miles Crossed by Land Ownership – Segment 2 ..... 3.17-72
Table 3.17-11. Miles Crossed by Land Use – Segment 2 ..... 3.17-73
Table 3.17-12. Special Management Areas Crossed by the Proposed Route and Route Alternatives for Segment 2 ..... 3.17-75
Table 3.17-13. Miles Crossed by Land Ownership – Segment 3 ..... 3.17-77
Table 3.17-14. Miles Crossed by Land Ownership – Segment 4 ..... 3.17-79
Table 3.17-15. Miles Crossed by Land Use – Segment 4 ..... 3.17-82
Table 3.17-16. Number of Residences within 1,000 feet and 300 feet – Segment 4 ..... 3.17-83
Table 3.17-17. Special Management Areas Crossed by the Proposed Route and Route Alternatives for Segment 4 ..... 3.17-84

Table 3.17-18. Miles Crossed by Land Ownership – Segment 5 ..... 3.17-89
Table 3.17-19. Miles Crossed by Land Use – Segment 5 ..... 3.17-92
Table 3.17-20. Number of Residences within 1,000 feet and 300 feet – Segment 5 ..... 3.17-92
Table 3.17-21. Miles Crossed by Land Ownership – Segment 7 ..... 3.17-97
Table 3.17-22. Miles Crossed by Land Use – Segment 7 ..... 3.17-103
Table 3.17-23. Number of Residences within 1,000 feet and 300 feet – Segment 7 ..... 3.17-105
Table 3.17-24. Miles Crossed by Land Ownership – Segment 8 ..... 3.17-110
Table 3.17-25. Miles Crossed by Land Use – Segment 8 ..... 3.17-114
Table 3.17-26. Number of Residences within 1,000 feet and 300 feet – Segment 8 ..... 3.17-115
Table 3.17-27. Special Management Areas Crossed by the Proposed Route and Route Alternatives for Segment 8 ..... 3.17-120
Table 3.17-28. Miles Crossed by Land Ownership – Segment 9 ..... 3.17-124
Table 3.17-29. Miles Crossed by Land Use – Segment 9 ..... 3.17-130
Table 3.17-30. Number of Residences within 1,000 feet and 300 feet – Segment 9 ..... 3.17-132
Table 3.17-31. Special Management Areas Crossed by the Proposed Route and Route Alternatives for Segment 9 ..... 3.17-133
Table 3.17-32. Miles Crossed by Land Ownership – Segment 10 ..... 3.17-138
Table 3.17-33. Difference in ROW Acres for Design Variation 3.17-139
Table 3.18-1. Agricultural Land Use in the Analysis Area 3.18-2
Table 3.18-2. Prime Farmland within the Analysis Area by Segment 3.18-5
Table 3.18-3. Grazing Allotments within the Analysis Area by Segment 3.18-7
Table 3.18-4. CRP Lands crossed by Segment (miles) 3.18-10
Table 3.18-5. Agricultural Land Disturbed during Construction – Segment 1E 3.18-26
Table 3.18-6. Agricultural Land Disturbed during Operations – Segment 1E .. 3.18-26
Table 3.18-7. Agricultural Land Disturbed during Construction – Segment 1W 3.18-27
Table 3.18-8. Agricultural Land Disturbed during Operations – Segment 1W 3.18-27
Table 3.18-9. Agricultural Land Disturbed during Construction – Segment 2 . 3.18-28
Table 3.18-10. Agricultural Land Disturbed during Operations – Segment 2 .... 3.18-29
Table 3.18-11. Agricultural Land Disturbed during Construction – Segment 4 . 3.18-30
Table 3.18-12. Agricultural Land Disturbed during Operations – Segment 4 .... 3.18-30
Table 3.18-13. Agricultural Land Disturbed during Construction – Segment 5 . 3.18-32
Table 3.18-14. Agricultural Land Disturbed during Operations – Segment 5 .... 3.18-32
Table 3.18-15. CRP Lands Crossed by Segment 5 ..... 3.18-33
Table 3.18-16. Agricultural Land Disturbed during Construction – Segment 7 . 3.18-35

Table 3.18-17. Agricultural Land Disturbed during Operations – Segment 7 .... 3.18-36
Table 3.18-18. CRP Lands Crossed by Segment 7 ..... 3.18-37
Table 3.18-19. Agricultural Land Disturbed during Construction – Segment 8 . 3.18-39
Table 3.18-20. Agricultural Land Disturbed during Operations – Segment 8 .... 3.18-39
Table 3.18-21. Agricultural Land Disturbed during Construction – Segment 9 . 3.18-41
Table 3.18-22. Agricultural Land Disturbed during Operations – Segment 9 .... 3.18-41
Table 3.19-1. Public Airports, Landing Strips, and Heliports Within the Analysis Area 3.19-5
Table 3.19-2. Transportation Facilities Crossed by Route Alternatives Compared to Proposed Route 3.19-18
Table 3.20-1. Regulatory Applicability Summary..... 3.20-4
Table 3.20-2. Fugitive Dust Regulations 3.20-4
Table 3.20-3. Ambient Air Quality Standards 3.20-9
Table 3.20-4. GHG Summary by State (CO_2e) 3.20-11
Table 3.20-5. Estimated Emissions of Criteria Pollutants from Project Construction 3.20-12
Table 3.20-6. Operations Emissions (Inspection/Maintenance) 3.20-14
Table 3.20-7. Total Project Estimated Emissions..... 3.20-14
Table 3.20-8. Emissions Breakdown by State..... 3.20-14
Table 3.20-9. Annualized Construction Emissions Breakdown by State 3.20-15
Table 3.20-10. Construction Period Emissions per Mile Basis..... 3.20-15
Table 3.20-11. Construction Period Emissions per Mile per Year Basis 3.20-15
Table 3.20-12. Annualized Construction Emissions Estimates for Areas of Concern 3.20-16
Table 3.20-13. Alternative Route Emissions (tons) 3.20-18
Table 3.20-14. Emissions Comparison for Proposed Action, Design Variation, and Schedule Variation for Segments 2 through 4 ... 3.20-23
Table 3.21-1. International Guidelines for AC Electric and Magnetic Field Levels..... 3.21-2
Table 3.21-2. State Regulated AC Electric and Magnetic Field Levels 3.21-2
Table 3.21-3. Summary of USEPA Guidelines for Audible Noise 3.21-3
Table 3.21-4. Line Segments 3.21-5
Table 3.21-5. Existing Ambient Levels 3.21-7
Table 3.21-6. Electric Fields..... 3.21-17
Table 3.21-7. Magnetic Fields (Peak Loading)..... 3.21-18
Table 3.21-8. Induced Current Factors 3.21-21
Table 3.21-9. EMF Conclusions of Multidisciplinary Review Groups 3.21-24
Table 3.21-10. Audible Noise in Foul Weather 3.21-30
Table 3.21-11. Audible Noise in Fair Weather 3.21-30
Table 3.21-12. Common Audible Noise Levels 3.21-31

Table 3.21-13. Radio Noise in Foul Weather 3.21-35
Table 3.21-14. Radio Noise in Fair Weather 3.21-35
Table 3.21-15. Electric Fields: Two Single-Circuit 500-kV Structures Alternative 3.21-39
Table 3.21-16. Magnetic Fields: Two Single-Circuit 500-kV Structures Alternative 3.21-41
Table 3.21-17. Audible Noise (Foul Weather): Two Single-Circuit 500-kV Structures Alternative 3.21-42
Table 3.21-18. Audible Noise (Fair Weather): Two Single-Circuit 500-kV Structures Alternative 3.21-44
Table 3.21-19. Radio Noise (Foul Weather): Two Single-Circuit 500-kV Structures Alternative 3.21-44
Table 3.21-20. Radio Noise (Fair Weather): Two Single-Circuit 500-kV Structures Alternative 3.21-46
Table 3.23-1. Summary of USEPA Noise Levels 3.23-2
Table 3.23-2 Summary of USDOT Short Duration Construction Noise Guidelines 3.23-3
Table 3.23-3. Summary of Vibration Impact Guidelines 3.23-3
Table 3.23-4. Applicable County Noise Ordinances and Standards 3.23-4
Table 3.23-5. Typical Noise Levels from Construction Equipment 3.23-7
Table 3.23-6. Critical Distances by Project Transmission Line Voltage 3.23-11
Table 3.23-7. Noise Sensitive Areas within Construction Analysis Area of Proposed Route and Route Alternatives 3.23-12
Table 3.23-8. Noise Sensitive Areas within Operation Analysis Area of Proposed Route and Route Alternatives 3.23-15
Table 4.1-1. Cumulative Impact Analysis Area by Resource 4-2
Table 4.2-1. Existing Transmission Lines that Parallel or Cross Gateway West 4-21
Table 4.2-2. Existing Large Diameter Pipelines within the Gateway West Study Area 4-24
Table 4.2-3. Locations Where Existing Major Roads (Interstate, U.S., and State Highways) Parallel Gateway West 4-26
Table 4.2-4. Existing Coal-Fired Power Plants in Idaho and Wyoming 4-27
Table 4.2-5. Existing Oil-Fired Power Plants in Idaho and Wyoming 4-28
Table 4.2-6. Existing Natural Gas-Fired Power Plants 20 MW or Larger in Idaho and Wyoming 4-29
Table 4.2-7. Existing Wind Energy Facilities 10 MW and Larger In Wyoming and Idaho 4-30
Table 4.2-8. Existing Hydroelectric Projects 10 MW and Larger in Idaho and Wyoming 4-32

Table 4.2-9. Existing Biomass and Cogeneration Projects 10 MW and Larger in Idaho 4-34
Table 4.2-10. Existing Non-Renewable Resource Extraction Activities 4-34
Table 4.2-11. Oil and Gas Wells within 10 Miles of Gateway West 4-35
Table 4.2-12. Proposed Transmission Lines 4-40
Table 4.2-13. Proposed Coal-Fired Power Plants in Idaho and Wyoming 4-44
Table 4.2-14. Proposed Geothermal Projects in Idaho 4-45
Table 4.2-15. Proposed Wind Energy Facilities in Idaho and Wyoming 4-46
Table 4.2-16. Pumped Storage Projects with 3-year Pre-Permits Approved 4-50
Table 4.3-1. Types of Activities and Areas of Shared Resource Impacts with Gateway West 4-53
Table 4.4-1. Existing and Planned Actions within Big Game Wintering and Parturition Habitat Units Crossed by Gateway West 4-68
Table 4.4-2. Existing and Proposed Activities within Sage-Grouse Key and Core Habitat Units 4-79
Table 4.4-3. Summary of Plan Amendments by Route 4-88
Table 5.1-1. Legal Notices in Newspapers of Record 5-2
Table 5.1-2. Community Calendar Notices in Newspapers 5-2
Table 5.1-3. Public Scoping Meeting Dates, Locations, and Attendance 5-3
Table 5.1-4. Summary of Stakeholder Outreach 5-4
Table 5.2-1. Summary of Consultation Meetings 5-5
Table 5.2-2. Status of Native American Consultation 5-7

List of Figures

Figure 1.1-1. Project Overview 1-2
Figure 2.4-1. Consolidation/Relocation Alternatives 2-65
Figure 2.4-2. Pinchpoint Alternative 2-86
Figure 2.5-1. Proposed Access to Aeolus Substation 2-118
Figure 2.5-2. Looking Westerly Toward the Existing CR 121 Bridge 2-119
Figure 2.6-1. Direct Burial Installation 2-134
Figure 2.6-2. Cable Construction ROW with Single Cable Trench Open 2-135
Figure 2.6-3. Typical Overhead to Underground Transition Station 2-136
Figure 3.1-1. Disturbance Areas for Tower Structures 3.1-5
Figure 3.1-2. Typical Disturbance Area 3.1-6
Figure 3.1-3. Example Access Roads and Tower Locations 3.1-7
Figure 3.2-1. Existing Lattice Transmission Structure Visibility at Varying Distances 3.2-16
Figure 3.2-2. Visual/Cultural KOP Locations Segment 4 – Kemmerer Vicinity 3.2-31
Figure 3.2-3. Visual/Cultural KOP Locations Segment 7 – Sawtooth National Forest Independence Lakes Management Detail 3.2-52
Figure 3.2-4. Visual KOP Locations Segment 7 – City of Rocks National Reserve 3.2-58
Figure 3.2-5. Existing Conditions at Power County KOPs 3.2-135
Figure 3.2-6. Photo Simulation Comparing Design Variation Structures from KOP 822 ..... 3.2-197
Figure 3.2-7. Photo Simulation Comparing Design Variation Structures from KOP C40 ..... 3.2-198
Figure 3.2-8. Photo Simulation Comparing Design Variation Structures from KOP C53 ..... 3.2-199
Figure 3.3-1. KOP C43. View of Rock Creek and Fort Fetterman Road facing north. Photo taken 11/05/09 at 3:05 p.m. 3.3-89
Figure 3.3-2. KOP C43. View from Rock Creek and Fort Fetterman Road facing southeast towards Alternative 1E-B. Photo taken 11/05/09 at 3:05 p.m. 3.3-89
Figure 3.3-3. KOP C48. View of trail facing north. Note the concrete structure in the middleground and the transmission line on the distant hills. Photo taken 11/08/09 at 12:40 p.m. 3.3-90
Figure 3.3-4. KOP C48. View from trail looking southeast towards Alternative 1E-A. Note modern buildings and transmission lines. Photo taken 11/08/09 at 12:40 p.m. 3.3-91
Figure 3.3-5. KOP C48. View from trail looking northwest towards Alternative 1W-A. Note modern buildings and transmission lines on distant hill. Photo taken 11/08/09 at 12:40 p.m. 3.3-91

Figure 3.3-6. KOP C47. View looking south toward Unthank Grave (fenced area). Photo taken 11/08/09 at 10:02 a.m. 3.3-92
Figure 3.3-7. KOP C47. View from the Unthank Grave interpretive sign facing northeast. Photo taken 11/08/09 at 10:02 a.m. 3.3-93
Figure 3.3-8. KOP C47. View from the Unthank Grave interpretive sign facing west-northwest toward the Proposed Route in Segment 1W(c) and Segment 1E and Alternatives 1E-A and 1W-A. Photo taken 11/08/09 at 10:02 a.m. 3.3-93
Figure 3.3-9. KOP C45. View looking toward Child's Cutoff facing east toward the Proposed Route in Segment 1W(a). Photo taken 11/07/09 at 3:45 p.m. 3.3-94
Figure 3.3-10. KOP C45. View from trail area facing south toward railroad. Photo taken 11/07/09 at 3:45 p.m. 3.3-95
Figure 3.3-11. KOP C49. View of Child's Cutoff facing northwest. Photo taken 11/09/09 at 8:35 a.m. 3.3-96
Figure 3.3-12. KOP C49. View from Child's Cutoff facing north toward the Proposed Route in Segment 1W(a). Photo taken 11/09/09 at 8:35 a.m. 3.3-97
Figure 3.3-13. KOP C49. View from Child's Cutoff facing east toward Alternative 1W-A. Photo taken 11/09/09 at 8:35 a.m. 3.3-97
Figure 3.3-14. KOP C49. View from Child's Cutoff facing southeast toward Alternative 1W-A. Photo taken 11/09/09 at 8:35 a.m. 3.3-98
Figure 3.3-15. KOP C98. View of historic cabins facing north. Photo taken 07/17/08 at 11:05 a.m. 3.3-99
Figure 3.3-16. KOP C98. View from cabins facing east toward Alternative 1E-C, the Proposed Route in Segment 1-W(c), and the Proposed Route in Alternative 1W-A. Photo taken 07/17/08 at 11:05 a.m. 3.3-99
Figure 3.3-17. KOP C19. View of Rawlins to Fort Washakie Road facing west. A two-track road extends horizontally across the middleground of the photograph, at the base of the shallow terrace in background. Photo taken 10/07/09 at 2:35 p.m. 3.3-101
Figure 3.3-18. KOP C19. View from Rawlins to Fort Washakie Road facing southeast toward the Proposed Route in Segment 2. Photo taken 10/07/09 at 2:35 p.m. 3.3-101
Figure 3.3-19. KOP C2. View from Lincoln Highway facing north toward Alternative 2A and 2C. Photo taken 9/13/09 at 1:25 p.m. 3.3-102
Figure 3.3-20. KOP C2. View from Lincoln Highway facing southeast toward the Proposed Route in Segment 2. Photo taken 9/13/09 at 1:25 p.m. 3.3-103
Figure 3.3-21. KOP C3. Overview of Lincoln Highway, facing northeast. Photo taken 9/13/09 at 3:00 p.m. 3.3-104

Figure 3.3-22. KOP C3. View from Lincoln Highway facing north towards Alternative 2A and 2C. Wooden, H-frame transmission line is visible in the middle ground of the photo. Photo taken 9/13/09 at 3:00 p.m. 3.3-104
Figure 3.3-23. KOP C3. View from Lincoln Highway, facing south towards the Proposed Route in Segment 2. Photo taken 9/13/09 at 3:00 p.m. 3.3-105
Figure 3.3-24. KOP C4. View from Lincoln Highway, facing north towards Alternatives 2A and 2C. Photo taken 9/13/09 at 3:45 p.m. 3.3-106
Figure 3.3-25. KOP C4. View from Lincoln Highway, facing south towards the Proposed Route in Segment 2. Photo taken 9/13/09 at 3:45 p.m. 3.3-106
Figure 3.3-26. KOP C20. View from Lincoln Highway, facing south toward the Proposed Route in Segment 2. Photo taken 10/7/09 at 4:30 p.m. 3.3-107
Figure 3.3-27. KOP C1. View of Rawlins to Bagg's Stage Road (48CR3648), looking north toward the Proposed Route in Segment 2. Photo taken 9/11/09 at 11:42 a.m. 3.3-108
Figure 3.3-28. KOP C51. View looking south toward the Proposed Route in Segment 2 and Alternatives 2A and 2B, standing on CR 347, just north of the entry gate to Fort Fred Steele. Photo taken 11/09/09 at 4:00 p.m. 3.3-109
Figure 3.3-29. KOP C52. View from Lincoln Highway, facing north toward the Proposed Route in Segment 3. Photo taken 11/10/09 at 12:26 p.m. 3.3-110
Figure 3.3-30. KOP C53. View of the Lincoln Highway facing southwest. I-80 is visible in the middleground. Photo taken 11/10/09 at 12:26 p.m. 3.3-111
Figure 3.3-31. KOP C53. View from the Lincoln Highway, facing north toward wooden, H-frame transmission line and the Proposed Route in Segment 3. Photo taken 11/10/09 at 12:26 p.m. 3.3-112
Figure 3.3-32. KOP C13. View of Rock Springs to Lander Stage Road, near Fourteen Mile Ranch, facing southwest toward the Proposed Route in Segment 4. Photo taken 10/02/09 at 2:47 p.m. 3.3-113
Figure 3.3-33. KOP C14. View looking north from Rock Springs to Lander Stage Road toward the Proposed Route in Segment 4. Note warehouse structure in middleground of photo. Photo taken 10/03/09 at 10:00 a.m. 3.3-114
Figure 3.3-34. KOP C15. Overview of New Fork Wagon Road facing southeast. Note lattice transmission line blending with backdrop. Photo taken 10/03/09 at 10:00 a.m. 3.3-115
Figure 3.3-35. KOP C15. View of shallow two-track road extending south from the recorded segment of New Fork Wagon Road. Photo taken 10/03/09 at 10:00 a.m. 3.3-115

Figure 3.3-36. KOP C15. View from New Fork Wagon Road, looking south towards the Proposed Route in Segment 4. Note lattice transmission line blending with the backdrop. Photo taken 10/03/09 at 10:00 a.m. 3.3-116
Figure 3.3-37. KOP C40. View of Green River/South Pass Stage Road looking south toward the Proposed Route in Segment 4. Photo taken 9/30/09 at 12:59 p.m. 3.3-117
Figure 3.3-38. KOP C12. View of 1849 Evans Cherokee Trail swale facing northeast toward the Proposed Route in Segment 4. Photo taken 10/02/09 at 11:07 a.m. 3.3-118
Figure 3.3-39. KOP C16. View of 1849 Evans Cherokee Trail swale with ruts. Standing on trail looking west-southwest. Photo taken 10/03/09 at 1:17 p.m. 3.3-119
Figure 3.3-40. KOP C16. Looking towards the Proposed Route in Segment 4. Standing on trail looking south. Photo taken 10/03/09 at 1:17 p.m. 3.3-119
Figure 3.3-41. KOP C18. View from 1849 Evans Cherokee Trail facing southwest toward the Proposed Route in Segment 4. Photo taken 10/06/09 at 1:51 p.m. 3.3-120
Figure 3.3-42. KOP C27. View of the trail, visible in middle and extending into the shallow hill pass at the left. Looking northwest. Photo taken 10/21/09 at 2:50 p.m. 3.3-121
Figure 3.3-43. KOP C27. View looking west from trail toward the Proposed Route in Segment 4. Lattice transmission line visible on skyline. Photo taken 10/21/09 at 2:50 p.m. 3.3-121
Figure 3.3-44. KOP C27. View looking south from trail toward Alternatives 4B, 4C, 4D, and 4E. Lattice transmission line visible on skyline. Photo taken 10/21/09 at 2:50 p.m. 3.3-122
Figure 3.3-45. KOP C35. View of the trail looking toward the northwest from Rusty Hill. Photo taken 9/30/09 at 9:36 a.m. 3.3-123
Figure 3.3-46. KOP C35. View south from Rusty Hill toward the Proposed Route in Segment 4 and Alternative 4A/4F. The lattice transmission line is visible on the horizon. Photo taken 9/30/09 at 9:36 a.m. 3.3-123
Figure 3.3-47. KOP C36. Overview of trail facing south toward the Proposed Route in Segment 4 Alternative 4A/4F. Existing lattice transmission line is visible on the horizon. Photo taken 9/30/2009 at 11:16 a.m. 3.3-124
Figure 3.3-48. KOP C37. View of Oregon/California NHT facing southwest toward the Proposed Route in Segment 4, Alternative 4A, and Alternative 4F. Trail marker visible in center left of photo. Photo taken 9/30/2009 at 11:34 a.m. 3.3-125

Figure 3.3-49. KOP C38. View of trail facing southwest toward the Proposed Route in Segment 4 and Alternatives 4A and 4F. Note wooden, single-pole transmission line paralleling trail and crossing trail in background of photo. Photo taken 9/30/2009 at 1:47 p.m. 3.3-126

Figure 3.3-50. KOP C39. Overview of trail facing south towards the Proposed Route in Segment 4 and Alternatives 4A and 4F. Wooden, single-pole transmission line visible in background of photo, paralleling State Highway 372. Photo taken 9/30/2009 at 2:05 p.m. 3.3-127

Figure 3.3-51. KOP C105. View of Big Hill historic marker along U.S. Highway 30. Photo taken 10/09/08 at 2:58 p.m. 3.3-128

Figure 3.3-52. KOP C105. View from Big Hill historic marker toward the Sheep Creek Hills and the Proposed Route in Segment 4. Lattice transmission line is visible on the edge of the agricultural landscape in the middleground of the photo. Photo taken 10/09/08 at 2:58 p.m. 3.3-129

Figure 3.3-53. KOP C110. View northeast toward the Proposed Route in Segment 4 of the Project from KOP C110. The lattice transmission line is visible in the middle ground. Photo taken 9/23/2008 at 9:57 a.m. 3.3-130

Figure 3.3-54. KOP C6. Overview of Opal Wagon Road (48LN949), looking southwest toward Alternative 4F. Photo taken 9/16/09 at 1:15 p.m. 3.3-131

Figure 3.3-55. KOP C6. View from Opal Wagon Road (48LN949), looking southeast toward Alternative 4F with lattice transmission line in skyline view. Photo taken 8/2/10 at 7:53 a.m. 3.3-131

Figure 3.3-56. KOP C42. Overview of Slate Creek Cutoff looking east toward the Proposed Route in Segment 4. Oil and gas tanks are visible in the middle ground. Photo taken 11/11/09 at 11:17 a.m. 3.3-132

Figure 3.3-57. KOP C58. Overview of Slate Creek Cutoff looking southwest toward the Proposed Route in Segment 4. Photo taken 11/11/09 at 11:54 a.m. 3.3-133

Figure 3.3-58. KOP C7. View from Sublette Cutoff looking northeast toward Alternatives 4A and 4F. Note lattice transmission line in the valley in center of photo. Photo taken 9/17/09 at 10:27 a.m. ... 3.3-134

Figure 3.3-59. KOP C8. View of Sublette Cutoff swale, looking east where it is adjacent to the Nancy Hill grave. Photo taken 9/17/09 at 10:27 a.m. 3.3-135

Figure 3.3-60. KOP C8. View from Sublette Cutoff swale, looking northeast toward lattice transmission line. Photo taken 9/17/09 at 10:27 a.m. 3.3-135

Figure 3.3-61. KOP C9. View from Sublette Cutoff near Emigrant Spring looking northeast toward Alternative 4A. Photo taken 9/17/09 at 11:43 a.m. 3.3-136
Figure 3.3-62. KOP C11. View of Sublette Cutoff, standing at trail marker, facing southwest toward Alternative 4F. The lattice transmission line is visible ascending Commissary Ridge on the horizon. Photo taken 9/25/08 at 7:03 a.m. 3.3-137
Figure 3.3-63. KOP C28. View of northeast trending variant of the Sublette Cutoff, standing at junction, facing northeast toward Alternative 4A. Photo taken 10/22/09 at 10:50 p.m. 3.3-138
Figure 3.3-64. KOP C29. View from Sublette Cutoff on the summit, facing northeast toward lattice transmission line. Photo taken 10/22/09 at 11:55 p.m. 3.3-139
Figure 3.3-65. KOP C30. View of Sublette Cutoff from Stoffer Ridge, facing south/southeast toward Alternative 4A. Trail ruts are visible in the foreground and middle ground. Photo taken 10/23/09 at 2:10 p.m. 3.3-140
Figure 3.3-66. KOP C30. View from Sublette Cutoff from Stoffer Ridge, facing south/southeast toward Alternative 4A. Trail ruts are visible in the foreground and middle ground. The lattice transmission line is visible on top of the ridge to the south. Photo taken 8/1/10 at 12:12 p.m. 3.3-140
Figure 3.3-67. KOP C30. View of Sublette Cutoff from Stoffer Ridge facing northeast toward Alternative 4F. Photo taken 8/1/10 at 12:12 p.m. 3.3-141
Figure 3.3-68. KOP C31. View of Sublette Cutoff from Rock Creek Ridge facing northeast toward Alternative 4A. Photo taken 10/25/09 at 10:30 a.m. 3.3-142
Figure 3.3-69. KOP C31. View from Sublette Cutoff on Rock Creek Ridge facing west toward Alternatives 4D and 4E. Photo taken 10/25/09 at 10:30 a.m. 3.3-142
Figure 3.3-70. KOP C56. View from Sublette Cutoff facing northeast toward the Proposed Route in Segment 4. Note ranching structures and wooden, H-frame transmission line in middleground of photo. Photo taken 11/11/09 at 9:40 a.m. 3.3-143
Figure 3.3-71. KOP C57. View of Sublette Cutoff Trail south of Sullivan Hollow. View is facing northeast towards the Proposed Route in Segment 4. Trail swale is visible in center of photograph. Photo taken 11/11/09 at 10:08 a.m. 3.3-144
Figure 3.3-72. KOP C121. View of the Sublette Cutoff, facing north/northwest. Trail is visible as two-track in center of photo. Photo taken 8/2/10 at 8:52 a.m. 3.3-145

Figure 3.3-73. KOP C121. View from the Sublette Cutoff, facing south/southwest toward the Proposed Route in Segment 4. Johnny Williams' gravesite is visible at the edge of the sage and agricultural field just to the right of the utility pole in the foreground. Photo taken 8/2/10 at 8:52 a.m. 3.3-146
Figure 3.3-74. KOP C122. View of the Sublette Cutoff, facing east/southeast. Trail is visible as two-track in center of photo. Photo taken 8/2/10 11:47 a.m. 3.3-147
Figure 3.3-75. KOP C122. View from the Sublette Cutoff, facing east/southeast toward the Proposed Route in Segment 4. Photo taken 8/2/10 11:47 a.m. 3.3-147
Figure 3.3-76. KOP C122. View from the Sublette Cutoff, facing east/southeast toward the Proposed Route in Segment 4. Photo taken 8/2/10 11:47 a.m. 3.3-148
Figure 3.3-77. KOP C123. View of the Sublette Cutoff, facing west. Trail is visible as two-track in center of photo. Photo taken 8/2/10 12:24 p.m. 3.3-149
Figure 3.3-78. KOP C123. View of the Sublette Cutoff, facing south. Trail is visible as two-track in center of photo. Photo taken 8/2/10 12:24 p.m. 3.3-149
Figure 3.3-79. KOP C123. View from the Sublette Cutoff, facing south toward the Proposed Route in Segment 4. Photo taken 8/2/10 12:24 p.m. 3.3-150
Figure 3.3-80. KOP C123. View from the Sublette Cutoff, facing southwest toward the Proposed Route in Segment 4. Photo taken 8/2/10 12:24 p.m. 3.3-150
Figure 3.3-81. KOP C126. View of the Sublette Cutoff, facing northeast. Trail is visible as vegetation change. Photo taken 8/3/10 10:59 a.m. 3.3-151
Figure 3.3-82. KOP C126. View from the Sublette Cutoff, facing northeast toward Alternative 4F. Existing transmission line is visible ascending ridge in background. Photo taken 8/3/10 10:59 a.m. 3.3-152
Figure 3.3-83. KOP C10. Overview of the Sublette Cutoff, facing north and slightly west, as it turns westward to join the Dempsey-Hockaday Cutoff in the saddle. Photo taken 9/17/09 at 1:27 p.m. 3.3-153
Figure 3.3-84. KOP C10. Looking northeast across Dempsey Basin toward Alternative 4F from the Sublette Cutoff trail marker. Photo taken 9/17/09 at 1:27 p.m. 3.3-153
Figure 3.3-85. KOP C41. View from Dempsey-Hockaday Cutoff, facing west, across the Dempsey Basin, toward Alternative 4F. Note ranch houses in middleground of photo. Photo taken 9/16/09 at 5:04 p.m. 3.3-154

Figure 3.3-86. KOP C41. View from Dempsey-Hockaday Cutoff, facing south toward Alternative 4F. Photo taken 9/16/09 at 5:04 p.m. 3.3-155
Figure 3.3-87. KOP C124. View of the Dempsey-Hockaday Cutoff, facing southwest. Photo taken 8/2/10 3:57 p.m. 3.3-156
Figure 3.3-88. KOP C124. View from the Dempsey-Hockaday Cutoff, facing west toward Alternative 4F. Photo taken 8/2/10 3:57 p.m. 3.3-156
Figure 3.3-89. KOP 620. View of a Segment of the California/Oregon NHT Dempsey-Hockaday Cutoff, facing east. Photo taken 9/24/08 3:33 p.m. 3.3-157
Figure 3.3-90. KOP C125. View of the Dempsey-Hockaday Cutoff, facing east toward Alternative 4F. Photo taken 8/2/10 4:25 p.m. 3.3-158
Figure 3.3-91. KOP C32. View from the Susanna Lewis Homestead, looking west towards Alternatives 4B and 4C. Photo taken 10/25/09 at 1:10 p.m. 3.3-159
Figure 3.3-92. KOP C32. View from the homestead facing south towards Alternatives 4B and 4C. Photo taken 10/25/09 at 1:10 p.m. 3.3-159
Figure 3.3-93. KOP C33. View of one of the standing structures at the Rawlings Homestead facing southwest toward Alternatives 4B and 4C. Photo taken 10/25/09 at 1:40 p.m. 3.3-160
Figure 3.3-94. KOP C33. View from the Rawlings Homestead looking southeast towards Alternatives 4B and 4C. Note view of existing transmission lines. Photo taken 10/25/09 at 1:40 p.m. 3.3-161
Figure 3.3-95. KOP C21. View of Red Rock Pass Cemetery (Jefferson Hunt Memorial), looking northeast from top of the roadside monument. Photo taken 10/15/09 at 9:23 a.m. 3.3-162
Figure 3.3-96. KOP C21. View from the cemetery looking northeast toward the Proposed Route in Segment 4. Photo taken 10/15/09 at 9:23 a.m. 3.3-162
Figure 3.3-97. KOP C24. View from Hudspeth Cutoff facing southwest toward the Proposed Route in Segment 5. Photo taken 10/17/09 at 12:13 p.m. 3.3-163
Figure 3.3-98. KOP C25. View of Hudspeth Cutoff, looking north-northeast towards the Proposed Route in Segment 5. The trail is located in the bottom right corner of photograph, obscured by dense vegetation. Photo taken 10/17/09 at 3:19 p.m. 3.3-164
Figure 3.3-99. KOP C26. View of trail at Massacre Rocks State Park. Standing near trail looking southwest at trail marker and trail ruts sign. Trail swale is located 3 feet south of trail signs. Photo taken 10/18/09. ..... 3.3-165

Figure 3.3-100. KOP C26. View from trail at Massacre Rocks State Park facing northeast toward Alternative 5D and the Proposed Route in Segment 5. Highway and rest stop in middleground view. Photo taken 10/18/09 12:08 p.m. 3.3-166
Figure 3.3-101. KOP C22. View from Hudspeth Cutoff facing northwest toward Alternatives 7B, 7H, 7I/7J, and 5B. Photo taken 10/5/09 at 1:36 p.m. 3.3-167
Figure 3.3-102. KOP C23. View of Hudspeth Cutoff facing west toward Alternatives 7B, 7H, 7I/7J, and 5B. Photo taken 12/3/09 at 11:35 a.m. 3.3-168
Figure 3.3-103. KOP C65. View from Hudspeth Cutoff facing southeast toward Alternatives 7H and 7I/7J. Photo taken 11/15/09 at 3:05 p.m. 3.3-169
Figure 3.3-104. KOP C66. View of Hudspeth Cutoff facing southwest toward Alternative 7H. Photo taken 11/15/09 at 3:30 p.m. 3.3-170
Figure 3.3-105. KOP C68. View of Hudspeth Cutoff looking east toward Alternative 7H and 7I/7J. Trail is visible as swale to the left of the marker. Photo taken 11/16/09 at 10:21 a.m. 3.3-171
Figure 3.3-106. KOP C69. View of Hudspeth Cutoff looking southeast toward Alternatives 7H and 7I/7J. Photo taken 11/16/09 at 10:21 a.m. 3.3-172
Figure 3.3-107. KOP C70. View from Hudspeth Cutoff facing northwest toward Alternatives 7H and 7I/7J. Photo taken 11/16/09 at 11:22 a.m. 3.3-173
Figure 3.3-108. KOP C63. View of the Oregon NHT at Parting of the Ways facing east. Trail is visible in middle of photo, extending into the agricultural field. Photo taken 11/15/09 at 9:07 a.m. 3.3-174
Figure 3.3-109. KOP C63. View of the California NHT at Parting of the Ways, facing northeast toward the Proposed Route in Segment 7. Photo taken 11/15/09 at 9:07 a.m. 3.3-174
Figure 3.3-110. KOP C63. View of California NHT, visible at left side of photograph, from Parting of the Ways sign, facing south toward the proposed Alternative 7C. Photo taken 11/15/09 at 9:07 a.m. 3.3-175
Figure 3.3-111. KOP C64. View of the Oregon NHT looking west. Trail is visible in middle of photo and extending onto the rolling plains. Photo taken 11/15/09 at 10:37 a.m. 3.3-176
Figure 3.3-112. KOP C64. View from the Oregon NHT looking southwest toward Alternative 7C. Photo taken 11/15/09 at 10:37 a.m. 3.3-176
Figure 3.3-113. KOP C64. View from the Oregon NHT looking north toward Proposed Route in Segment 7. Photo taken 11/15/09 at 10:37 a.m. 3.3-177
Figure 3.3-114. KOP C67. View of California NHT facing south toward Alternative 7H. Photo taken 11/15/09 at 4:14 p.m. 3.3-178

Figure 3.3-115. KOP C78. View from the California NHT facing west toward Alternative 7I/7J. Photo taken 11/17/09 at 11:30 a.m. 3.3-179
Figure 3.3-116. KOP C79. View of California NHT from KOP C79 looking down slope at the swale and facing west toward Alternative 7I/7J. Note trail marker on the left. Photo taken 11/17/09 at 3:30 p.m. 3.3-180
Figure 3.3-117. KOP C80. View from California NHT facing south toward Alternative 7I/7J. Photo taken 12/3/09 at 11:35 a.m. 3.3-181
Figure 3.3-118. KOP C80. View from California NHT facing east toward Alternative 7I/7J. Photo taken 12/3/09 at 11:35 a.m. 3.3-181
Figure 3.3-119. KOP C72. View from Salt Lake Alternate Trail, looking west-northwest, toward Alternative 7I/7J. Trail swale is visible on the left, paralleling the jeep trail. Photo taken 11/16/09 at 3:15 p.m. 3.3-182
Figure 3.3-120. KOP C73. View from Salt Lake Alternate Trail, looking south toward Alternative 7I/7J. Photo taken 11/16/09 at 3:50 p.m. ... 3.3-183
Figure 3.3-121. KOP C74. View from Salt Lake Alternate Trail facing southeast toward Alternative 7I/7J. Photo taken 11/16/09 at 4:15 p.m. 3.3-184
Figure 3.3-122. KOP C75. View of Salt Lake Alternate Trail facing west. Trail visible as swale to left of utility meter. Photo taken 11/17/09 at 9:57 a.m. 3.3-185
Figure 3.3-123. KOP C75. View from Salt Lake Alternate Trail facing southeast toward Alternative 7I/7J. Photo taken 11/17/09 at 9:57 a.m. 3.3-185
Figure 3.3-124. KOP C76. View from Salt Lake Alternate Trail facing south toward Alternative 7I/7J. Photo taken 11/17/09 at 10:16 a.m. . 3.3-186
Figure 3.3-125. KOP C77. View from Salt Lake Alternate trail in Emigrant Canyon, City of Rocks facing east toward Alternative 7I/7J. Photo taken 11/17/09 at 10:50 a.m. 3.3-187
Figure 3.3-126. KOP C83. View of North Alternate Oregon NHT looking east. Photo taken 12/08/09 at 9:10 a.m. 3.3-188
Figure 3.3-127. KOP C83. Looking north toward the Proposed Route in Segment 8. Photo taken 12/08/09 at 9:10 a.m. 3.3-189
Figure 3.3-128. KOP C84. View from North Alternate Trail facing north toward the Proposed Route in Segment 8. Photo taken 11/17/09 at 10:50 a.m. 3.3-190
Figure 3.3-129. KOP C84. View from North Alternate Trail facing east toward the Proposed Route in Segment 8. Wooden, H-frame transmission line in view. Photo taken 11/17/09 at 10:50 a.m. 3.3-190
Figure 3.3-130. KOP C85. View of North Alternate Trail facing south toward the Proposed Route in Segment 8. Photo taken 12/8/09 at 12:35 p.m. 3.3-191

Figure 3.3-131. KOP C87. View of North Alternate Oregon NHT looking east. Photo taken 12/08/09 at 4:10 p.m. 3.3-192
Figure 3.3-132. KOP C87. View from the North Alternate Oregon NHT looking north towards the Proposed Route in Segment 8. Photo taken 12/08/09 at 4:10 p.m. 3.3-192
Figure 3.3-133. KOP C87. View from the North Alternate Oregon looking south towards Alternative 8A. Photo taken 12/08/09 at 4:10 p.m. 3.3-193
Figure 3.3-134. KOP C112. View of the North Alternate Oregon Trail, facing west, visible as a shallow depression in center of photo. Photo taken 7/27/10 at 1:23 p.m. 3.3-194
Figure 3.3-135. KOP C112. View from the North Alternate Oregon Trail, facing south/southeast toward the Proposed Route in Segment 8. Photo taken 7/27/10 at 1:23 p.m. 3.3-194
Figure 3.3-136. KOP C118. View of the North Alternate Oregon Trail, facing west/southwest. Photo taken 7/30/10 at 9:25 a.m. 3.3-195
Figure 3.3-137. KOP C118. View from the North Alternate Oregon Trail, facing south/southwest with transmission line structures in view. Photo taken 7/30/10 at 9:25 a.m. 3.3-196
Figure 3.3-138. KOP C119. View of the North Alternate Oregon Trail, facing south toward the Proposed Route in Segment 8 and Alternative 8A. Trail is visible as swale that descends down the valley in the center of the photo. Photo taken 7/30/10 at 10:32 a.m. 3.3-197
Figure 3.3-139. KOP C61. View of Oregon NHT, facing west. Trail swale located to the right of the trail marker. Gravel pit is visible on left side of photo in middle ground. Photo taken 11/18/09 at 2:18 p.m. 3.3-198
Figure 3.3-140. KOP C61. View from Oregon NHT, facing northeast toward Alternative 8A. Photo taken 11/18/09 at 2:18 p.m. 3.3-199
Figure 3.3-141. KOP C61. View from Oregon NHT, facing southwest toward the Proposed Route in Segment 9. Photo taken 11/18/09 at 2:18 p.m. 3.3-199
Figure 3.3-142. KOP C95. View of Oregon NHT facing northeast toward Alternative 8A. Note wooden, H-frame and lattice transmission lines in background. Photo taken 12/11/09 at 9:30 a.m. 3.3-200
Figure 3.3-143. KOP C96. View of Oregon NHT variants looking east toward Big Pilgrim Gulch. Photo taken 12/11/09 at 11:05 a.m. 3.3-201
Figure 3.3-144. KOP C96. View southward toward Alternative 8A and Alternative 9B. Photo taken 12/11/09 at 11:05 a.m. 3.3-202
Figure 3.3-145. KOP C97. View from trail facing northeast toward Alternative 8A. Photo taken 12/11/09 at 3:15 p.m. 3.3-203

Figure 3.3-146. KOP C97. View from trail facing southwest toward the Proposed Route in Segment 9 and Alternative 9B. Photo taken 12/11/09 at 3:15 p.m. 3.3-203
Figure 3.3-147. KOP C100. View of Canyon Creek Station Marker. Foundation walls of the station are visible in background of photo. Photo taken 8/5/08 at 1:51 p.m. 3.3-204
Figure 3.3-148. KOP C100. View from Canyon Creek Station facing southwest toward the Proposed Route in Segment 8. Photo taken 08/21/08 at 11:40 a.m. 3.3-205
Figure 3.3-149. KOP C102. View of Rattlesnake Station Marker facing southeast. Photo taken 08/21/08 at 11:40 a.m. 3.3-206
Figure 3.3-150. KOP C102. View toward the Proposed Route in Segment 8 from Rattlesnake Station Marker. Photo taken 08/21082008 at 11:40 a.m., looking southeast, from the historic marker. 3.3-206
Figure 3.3-151. KOP C106. View of Oregon NHT/Kelton Road facing south toward Alternative 9B and the Proposed Route in Segment 9. Photo taken 12/11/08 at 2:14 p.m. 3.3-207
Figure 3.3-152. KOP C106. View from Oregon NHT/Kelton Road facing northeast toward Alternative 8A. Wooden, H-frame and lattice transmission lines visible in background. Photo taken 12/11/08 at 2:14 p.m. 3.3-208
Figure 3.3-153. KOP C107. View from trail facing west toward Alternative 8A from Kelton Road. Photo taken 12/11/08 at 3:12 p.m. 3.3-209
Figure 3.3-154. KOP C108. View from Oregon NHT facing northeast toward Alternative 8A and the Proposed Route in Segment 8. Photo taken 12/12/08 at 3:50 p.m. 3.3-210
Figure 3.3-155. KOP C111. View of Bonneville Point interpretive kiosk. Photo taken 7/27/10 at 9:25 a.m. 3.3-211
Figure 3.3-156. KOP C111. View of Oregon NHT looking west toward interpretive kiosk. Photo taken 7/27/10 at 9:25 a.m. 3.3-211
Figure 3.3-157. KOP C111. View from Bonneville Point interpretive kiosk parking area looking south toward the Proposed Route in Segment 8 and Alternatives 8B and 8C. Photo taken 7/27/10 at 9:25 a.m. 3.3-212
Figure 3.3-158. KOP C88. View from parking lot at Walter's Ferry Recreational Area looking northwest toward the Snake River and Alternative 8B. Photo taken 8/18/08 at 10:08 a.m. 3.3-213
Figure 3.3-159. KOP C88. View from parking lot at Walter's Ferry Recreational Area looking southwest toward the Proposed Route in Segments 8 and 9. Photo taken 8/18/08 at 10:08 a.m. 3.3-213
Figure 3.3-160. KOP C89. Boise to Silver City Road. Standing on the road looking toward the northeast. Swale is visible in the left foreground. Photo taken 12/09/2009 at 11:35 a.m. 3.3-214

Figure 3.3-161. KOP C89. Standing on Boise City to Silver City Road facing south toward Alternative 8B. Photo taken 12/09/2009 at 11:40 a.m. 3.3-215
Figure 3.3-162. KOP C103. View facing southeast toward the Project from north of Guffey Bridge at Celebration Archaeological Park. Photo taken 08/18/08 at 8:40 a.m. 3.3-216
Figure 3.3-163. KOP C92. View from Toana Freight Road facing east toward Alternative 9C. Photo taken 12/10/09 at 10:14 a.m. 3.3-217
Figure 3.3-164. KOP C93. View looking north toward Alternative 9B with the Toana Freight and Wagon Road in foreground. Photo taken 12/10/09 at 1:45 p.m. 3.3-218
Figure 3.3-165. KOP C93. View from Toana Freight Road facing east toward Alternative 9B. Existing transmission line is visible on skyline. Photo taken 12/10/09 at 1:45 p.m. 3.3-218
Figure 3.3-166. KOP C60. View of Three Island Crossing overlook, facing northwest with interpretive signs in foreground and three islands in the background. Photo taken 11/13/09 at 12:30 p.m. 3.3-219
Figure 3.3-167. KOP C60. View from Three Island Crossing overlook looking southwest toward the Proposed Route in Segment 9. Photo taken 11/13/09 at 12:52 p.m. 3.3-220
Figure 3.3-168. KOP 62. View from Oregon NHT facing southeast toward Alternative 9B. Photo taken 11/13/09 at 4:01 p.m. 3.3-221
Figure 3.3-169. KOP 62. View from Oregon NHT facing north toward Alternative 8A. Photo taken 11/13/09 at 4:01 p.m. 3.3-221
Figure 3.3-170. KOP C81. View to south from behind Stricker Cabin toward the Proposed Route in Segment 9. Photo taken 12/03/09 at 4:15 p.m. 3.3-222
Figure 3.3-171. KOP C81. View to east from behind Stricker Cabin toward the Proposed Route in Segment 10. Photo taken 12/03/09 at 4:15 p.m. 3.3-223
Figure 3.3-172. KOP C90. View of the Oregon NHT-South Alternate, standing on trail and facing northwest. Photo taken 12/09/09 at 1:30 p.m. 3.3-224
Figure 3.3-173. KOP C90. View from the Oregon NHT – South Alternate, standing on trail and facing southwest toward town of Murphy, the Proposed Route in Segment 9. and Alternative 9E. Photo taken 12/09/09 at 1:30 p.m. 3.3-224
Figure 3.3-174. KOP C90. View from the Oregon NHT – South Alternate facing north toward Alternative 9D. Photo taken 12/09/09 at 1:35 p.m. 3.3-225
Figure 3.3-175. KOP C91. View from the Oregon NHT – South Alternate facing northeast toward Alternative 9D. Photo taken 12/09/09 at 3:45 p.m. 3.3-226

Figure 3.3-176. KOP C113. View of the Oregon NHT – South Alternate, facing west. Photo taken 7/28/10 at 11:55 a.m. 3.3-227
Figure 3.3-177. KOP C113. View from the Oregon NHT-South Alternate, facing southeast toward the Proposed Route in Segment 9. Photo taken 7/28/10 at 11:55 a.m. 3.3-227
Figure 3.3-178. KOP C115. View of the Oregon NHT – South Alternate, facing northwest. Trail is visible as gradual swale in the foreground with trail markers in the background. Photo taken 7/29/10 at 11:24 a.m. 3.3-228
Figure 3.3-179. KOP C115. View from the Oregon NHT-South Alternate, facing southeast toward the Proposed Route in Segment 9. Photo taken 7/29/10 at 11:24 a.m. 3.3-229
Figure 3.3-180. KOP C115. View from the Oregon NHT – South Alternate, facing south toward the Proposed Route in Segment 9. Photo taken 7/29/10 at 11:24 a.m. 3.3-229
Figure 3.3-181. KOP C116. View of the Oregon NHT – South Alternate, facing southeast. Photo taken 7/29/10 at 12:45 p.m. 3.3-230
Figure 3.3-182. KOP C116. View from the Oregon NHT – South Alternate, facing northwest toward Alternative 9D with view of utility line, agricultural field, and State Highway 78. Trail is visible as swale in foreground. Photo taken 7/29/10 at 12:45 p.m. 3.3-231
Figure 3.3-183. KOP C116. View from the Oregon NHT – South Alternate, facing north toward Alternative 9D with view of utility line and H-frame transmission line. Photo taken 7/29/10 at 12:45 p.m. . 3.3-231
Figure 3.3-184. KOP C117. View of the Oregon NHT – South Alternate, facing west. Photo taken 7/29/10 at 1:39 p.m. 3.3-232
Figure 3.3-185. KOP C117. View from the Oregon NHT – South Alternate, facing south toward Alternative 9D. Photo taken 7/29/10 at 1:39 p.m. 3.3-233
Figure 3.3-186. KOP C120. View of the Oregon NHT – South Alternate, facing southwest toward Alternative 9D. Trail is visible as swale with marker partially visible in shrubs. Photo taken 7/30/10 at 12:43 p.m. 3.3-234
Figure 3.3-187. KOP C101. View northward toward the Proposed Route in Segment 9 from the Hollister School. Photo taken 08/19/08 at 1:24 p.m. 3.3-235
Figure 3.3-188. KOP C104. View toward Alternative 9E from Our Lady Queen of Heaven Catholic Church. Photo taken 08/18/08, facing northwest, 42 feet north of church. 3.3-236
Figure 3.3-189. KOP C109. View to southwest toward the Proposed Route in Segment 9 and Alternative 9E from the northwest side of the Owyhee County Courthouse. Photo taken 12/11/08 at 10:13 a.m. 3.3-237

Figure 3.3-190. KOP C82. View looking southwest towards the Proposed Route in Segment 10. Photo taken 12/04/09 at 9:50 a.m. 3.3-238
Figure 3.3-191. KOP C99. View northwest toward the Proposed Route in Segment 10 from Minidoka National Historic Site. Photo taken 07/31/08 at 10:04 a.m. 3.3-239
Figure 3.3-192. Segment 1, Alternatives 1E-A, 1E-B, Windstar to Aeolus 3.3-248
Figure 3.3-193. Segment 1, Alternatives 1E-C, 1W-A, Windstar to Aeolus 3.3-249
Figure 3.3-194. Segment 2, Alternatives A-C, Aeolus to Creston 3.3-250
Figure 3.3-195. Segment 4, Alternatives A-D, Jim Bridger to Idaho Border 3.3-251
Figure 3.3-196. Segment 4, Alternatives E-F, Jim Bridger to Idaho Border 3.3-252
Figure 3.3-197. Segment 5, Alternatives A-C, Populus to Borah 3.3-253
Figure 3.3-198. Segment 5, Alternatives D-E, Populus to Borah 3.3-254
Figure 3.3-199. Segment 7, Alternatives A-C, Populus to Cedar Hill 3.3-255
Figure 3.3-200. Segment 7, Alternatives D-F, Populus to Cedar Hill 3.3-256
Figure 3.3-201. Segment 7, Alternatives G-I, Populus to Cedar Hill 3.3-257
Figure 3.3–202. Segment 7, Alternative J, Populus to Cedar Hill 3.3-258
Figure 3.3-203. Segment 8, Alternatives A-C, Midpoint to Hemingway 3.3-259
Figure 3.3-204. Segment 8, Alternatives D-E, Midpoint to Hemingway 3.3-260
Figure 3.3-205. Segment 9, Alternatives A-D, Cedar Hill to Hemingway 3.3-261
Figure 3.3-206. Segment 9, Alternatives D-E, Cedar Hill to Hemingway 3.3-262
Figure 3.3-207. Segment 9, Alternatives E-H, Cedar Hill to Hemingway 3.3-263
Figure 3.4-1. Total Project Labor Force by EPC Analysis Area and Week 3.4-29
Figure 3.4-2. Project Workforce – EPC 1 ..... 3.4-29
Figure 3.4-3. Project Workforce – EPC 2 ..... 3.4-30
Figure 3.4-4. Project Workforce – EPC 3 ..... 3.4-30
Figure 3.4-5. IMPLAN Model Analysis Areas 3.4-34
Figure 3.4-6. Total Employment – EPC 1 ..... 3.4-37
Figure 3.4-7. Total Employment – EPC 2 ..... 3.4-37
Figure 3.4-8. Total Employment – EPC 3 ..... 3.4-37
Figure 3.4-9. Schedule Variation – Total Project Labor Force by EPC Analysis Area and Week 3.4-75
Figure 3.4-10. Schedule Variation—Project Workforce – EPC 1 ..... 3.4-75
Figure 3.4-11. Schedule Variation—Project Workforce – EPC 2 ..... 3.4-76
Figure 3.4-12. Schedule Variation—Project Workforce – EPC 3 ..... 3.4-76
Figure 3.4-13. Schedule Variation Total Employment – EPC 1 ..... 3.4-81
Figure 3.4-14. Schedule Variation Total Employment – EPC 2 ..... 3.4-81
Figure 3.4-15. Schedule Variation Total Employment – EPC 3 ..... 3.4-81
Figure 3.6-1. Comparison of Typical Double Circuit 500-kV Clearing in Forested Areas for Construction and Operation 3.6-13

Figure 3.6-2. ROW Integrated Vegetation Management Zones 3.6-17
Figure 3.12-1. Mineral Resources 3.12-2
Figure 3.14-1. Physiographic Provinces 3.14-2
Figure 3.14-2. Earthquake Epicenters 3.14-8
Figure 3.14-3. Landslide Zones 3.14-10
Figure 3.15-1. Major Soil Orders 3.15-2
Figure 3.16-1. River Basins 3.16-2
Figure 3.17-1. Generalized Land Use 3.17-2
Figure 3.17-2. Idaho City Impact Areas 3.17-9
Figure 3.17-3. Military Operations Areas and Training Routes 3.17-21
Figure 3.17-4. Medicine Bow-Routt NF Proposed Route and Route Alternatives 3.17-60
Figure 3.17-5. Foxley Airstrip – Alternative 1E-C 3.17-63
Figure 3.17-6. Ice Cave – Alternative 1E-C 3.17-63
Figure 3.17-7. Fort Fred Steele Vicinity – Proposed Route and Route Alternatives 3.17-74
Figure 3.17-8. Power County – Alternative 5E 3.17-94
Figure 3.17-9. Dry Creek Sky Ranches Planned Airstrip 3.17-107
Figure 3.17-10. Alternative 8B – Vicinity of Kuna 3.17-117
Figure 3.17-11. Orchard Training Area – Proposed Route and Route Alternatives 3.17-120
Figure 3.17-12. Salmon Falls Creek ACEC Proposed & Alternative Routes 3.17-129
Figure 3.18-1. Transmission Line Structures Located along the Edge of a Center Pivot Irrigation Field, Approximately 8 Miles West of the Midpoint Substation 3.18-18
Figure 3.18-2. Example of Transmission Line Layout (Segment 7) 3.18-19
Figure 3.18-3. Transmission Line Structures Crossing Dryland Farming at a Diagonal and Structures in Line with the Rows 3.18-20
Figure 3.19-1. Condor 201S Aerial Lift Crane That Would Be Used During Construction Activities (roadable length 52 feet; width 8 feet 6 inches) 3.19-8
Figure 3.19-2. Typical Road Sections for Different Terrains 3.19-9
Figure 3.19-3. Typical Disturbance Footprint Double 500-kV Circuit with Pulling and Tensioning Sites, Greenfield Line 3.19-10
Figure 3.19-4. Typical Disturbance Footprint Double 500-kV Circuit with Pulling and Tensioning Sites, Parallel Existing Transmission Line 3.19-11
Figure 3.20-1. Air Quality Features 3.20-10
Figure 3.21-1. Plot of the Electric Field for Segment 1W Considering Two Parallel Lines 1W(a) and 1W(c) Separated from Each Other by 1,500 Feet in the Electric Field Calculations 3.21-6

Figure 3.21-2. Plot of the Electric Field for Segment 1W Calculating the Electric Fields Separately for each of the Two Parallel Lines 1W(a) and 1W(c) 3.21-6
Figure 3.21-3. Electric Field Profile at Midspan for 230-kV H-frame Structure. 3.21-15
Figure 3.21-4. Electric Field Profile at Midspan for Single-Circuit 500-kV Lattice Structure 3.21-15
Figure 3.21-5. Electric Field Profile at Midspan for Double-Circuit 500-kV Lattice Structure with two 500-kV Circuits 3.21-16
Figure 3.21-6. Electric Field Profile at Midspan for Double-Circuit 500-kV Lattice Structure with a 500-kV Circuit and a 230-kV Circuit 3.21-16
Figure 3.21-7. Magnetic Field Profile at Midspan for 230-kV H-frame Structure 3.21-18
Figure 3.21-8. Magnetic Field Profile at Midspan for 500-kV Lattice Structure 3.21-19
Figure 3.21-9. Magnetic Field Profile at Midspan for Double-Circuit 500-kV Lattice Structure with Two 500-kV Circuits 3.21-19
Figure 3.21-10. Magnetic Field Profile at Midspan for Double-Circuit 500-kV Lattice Structure with a 500-kV Circuit and a 230-kV Circuit 3.21-20
Figure 3.21-11. Audible Noise Profile at Midspan for Single-Circuit 230-kV H-frame Structure 3.21-28
Figure 3.21-12. Audible Noise Profile at Midspan for Single-Circuit 500-kV Lattice Structure 3.21-28
Figure 3.21-13. Audible Noise Profile at Midspan for Double-Circuit 500-kV Lattice Structure with Two 500-kV Circuits 3.21-29
Figure 3.21-14. Audible Noise Profile at Midspan for Double-Circuit 500-kV Lattice Structure with a 500-kV Circuit and a 230-kV Circuit 3.21-29
Figure 3.21-15. Radio Noise Profile at Midspan for Single-Circuit 230-kV H-frame Structure 3.21-33
Figure 3.21-16. Radio Noise Profile at Midspan for Single-Circuit 500-kV Lattice Structure 3.21-33
Figure 3.21-17. Radio Noise Profile at Midspan for Double-Circuit 500-kV Lattice Structure with Two 500-kV Circuits 3.21-34
Figure 3.21-18. Radio Noise Profile at Midspan for Double-Circuit 500-kV Lattice Structure with a 500-kV Circuit and a 230-kV Circuit 3.21-34
Figure 3.21-19. Proposed Design Variation for Two 500-kV Single Circuits 3.21-39
Figure 3.21-20. Electric Field Profile at Midspan for Two Single-Circuit 500-kV Lattice Tower Structures Both Energized at 500 kV (Segments 2, 3, and 4 under final energization plan) 3.21-40
Figure 3.21-21. Electric Field Profile at Midspan for Two Single-Circuit 500-kV Lattice Tower Structures 3.21-40
Figure 3.21-22. Magnetic Field Profile at Midspan for Two Single-Circuit 500-kV Lattice Structures 3.21-41

Figure 3.21-23. Magnetic Field Profile at Midspan for Two Single-Circuit 500-kV Lattice Structures 3.21-42
Figure 3.21-24. Audible Noise Profile at Midspan for two Single-Circuit 500-kV Lattice Structures 3.21-43
Figure 3.21-25. Audible Noise Profile at Midspan for two Single-Circuit 500-kV Lattice Structures 3.21-43
Figure 3.21-26. Radio Noise Profile at Midspan for Two Single-Circuit 500-kV Lattice Structures both Energized at 500 kV 3.21-45
Figure 3.21-27. Radio Noise Profile at Midspan for Two Single-Circuit 500-kV Lattice Structures 3.21-45

Acronyms and Abbreviations

AASHTO	American Association of State Highway and Transportation Officials
AC	alternating current
ACEC	Area of Critical Environmental Concern
ACHP	Advisory Council on Historic Preservation
ACSR	aluminum conductor steel reinforced
Agencies	BLM and the cooperating agencies
AGL	above ground level
AIRFA	American Indian Religious Freedom Act
AIZ	Aquatic Influence Zone
AM	amplitude modulation
ANSI	American National Standards Institute
APLIC	Avian Power Line Interaction Committee
AOI	Area of Inconsistency
ARPA	Archaeological Resources Protection Act
ATV	all-terrain vehicle
AUM	Animal Unit Month
AWEA	American Wind Energy Association
BA	Biological Assessment
BE	Biological Evaluation
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BMP	best management practice
BO	Biological Opinion
BP	Before Present
BPA	Bonneville Power Administration
BWM	Bureau of Waste Management (NDEP)
CAFE	Corona and Field Effects
CAFO	concentrated animal feeding operation
CDC	Conservation Data Center
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CGP	Construction General Permit

CH_4	methane
CIAA	Cumulative Impact Analysis Area
CMP	Comprehensive Management Plan
CO	carbon monoxide
CR	County Route
CRP	Conservation Reserve Program
CUP	conditional use permit
CWA	Clean Water Act
CWCS	Comprehensive Wildlife Conservation Strategies
dB	decibel
dBA	decibel, A-weighted
DC	direct current
DDC	density disturbance calculation
DICIAA	Direct Impact Change Impact Analysis Area
DOE	U.S. Department of Energy
DPS	Distinct Population Segment
Eagle Act	Bald and Golden Eagle Protection Act
EA	Environmental Assessment
EHS	extra high strength
EIS	environmental impact statement
ELF	extremely low frequency
EMF	electric and magnetic fields
EO	Executive Order
EPC	Engineering, Procurement, and Construction
EPCRA	Emergency Planning and Community Right-to-Know Act
EPM	environmental protection measure
EPRI	Electrical Power Research Institute
ERMA	Extensive Recreation Management Area
ERS	Economic Research Service
ESA	Endangered Species Act
ESRP	Eastern Snake River Plain
ESRI	Environmental Systems Research Institute
FAA	Federal Aviation Administration
FCC	Federal Communication Commission
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FLPMA	Federal Land Policy and Management Act

FM	frequency modulation
FO	Field Office
Forest Plan	Land and Resource Management Plan
Forest Service	U.S. Department of Agriculture Forest Service
FSA	USDA Farm Service Agency
FSH	Forest Service Handbook
FSM	Forest Service Manual
FTE	full-time equivalent
G	Gauss
GAP	Gap Analysis Program
Gateway West	Gateway West Transmission Line Project
GHG	greenhouse gas
GIL	Gas Insulated Transmission Line
GIS	Geographic Information System
GMP	General Management Plan
GPS	Global Positioning System
GW	gigawatt
GYRA	Greater Yellowstone Recovery Area
HEA	Habitat Equivalency Analysis
HMA	Herd Management Area
HPFF	High Pressure Fluid Filled
HSWA	Hazardous and Solid Waste Act
HUC	Hydrologic Unit Code
Hz	hertz
I	Interstate
IBA	Important Bird Area
IBC	International Building Code
IDAPA	Idaho Administrative Procedures Act
IDANG	Idaho Army National Guard
IDEQ	Idaho Department of Environmental Quality
IDFG	Idaho Department of Fish and Game
IDL	Idaho Department of Lands
IDT	Interdisciplinary Team
IDWR	Idaho Department of Water Resources
IEEE	Institute of Electrical and Electronic Engineers
IMPLAN	Impact Analysis for Planning
IOP	Interagency Operating Procedure

IPUC	Idaho Public Utilities Commission
IR	Instrument Route
IRA	Inventoried Roadless Area
IRMP	Integrated Resource Management Plan
IRP	integrated resource plan
ISC	(Wyoming) Industrial Siting Council
ISDA	Idaho State Department of Agriculture
IV	Impact Value
kcmil	one thousand circular mils
kHz	kilohertz
KOP	Key Observation Point
kV	kilovolt
kV/m	kilovolt per meter
LAU	Lynx Analysis Unit
L_{dn}	day-night sound level
L_{eq}	equivalent sound level
LWD	large woody debris
µV/m	microvolt per meter
mA	milliampere
MA	Management Area
MBF	thousand board feet
MBTA	Migratory Bird Treaty Act
MFP	Management Framework Plan
mG	milligauss
MHz	megahertz
MIS	Management Indicator Species
mm	millimeter
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MP	milepost
mph	mile per hour
MTR	Military Training Route
MUA	multiple use areas
MW	megawatt
MWh	megawatt-hours
NAGPRA	Native American Graves Protection and Repatriation Act
NAIP	National Agriculture Imagery Program

NAICS	North American Industrial Classification System
NDEP	Nevada Department of Conservation and Energy Resources, Division of Environmental Protection
NEPA	National Environmental Policy Act
NERC	North American Electrical Reliability Corporation
NESC	National Electrical Safety Code
NESHAP	National Emission Standards for Hazardous Air Pollutants
NF	National Forest
NFMA	National Forest Management Act
NFS	National Forest System
NHPA	National Historic Preservation Act
NHT	National Historic Trail
NIEHS	National Institute of Environmental Health Sciences
NLCS	National Landscape Conservation System
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NPUC	Nevada Public Utilities Commission
NRHP	National Register of Historic Places
NRCS	Natural Resources Conservation Service
NRS	Nevada Revised Statutes
NSA	noise sensitive area
NSO	no surface occupancy
NSR	New Source Review
NTTG	Northern Tier Transmission Group
NVCS	National Vegetation Classification System
NWI	National Wetland Inventory
NWR	National Wildlife Refuge
OATT	Open Access Transmission Tariff
OCTA	Oregon-California Trails Association
OHGW	overhead ground wire
OHV	off-highway vehicle
OPGW	fiber optic shield ground wire
OPS	Office of Pipeline Safety
ORV	outstandingly remarkable value
OSHA	Occupational Safety and Health Administration
OSLI	Office of State Lands and Investment

OVI	Overall Visual Impact
PA	Programmatic Agreement
PCA	Primary Conservation Area
PEIS	programmatic environmental impact statement
PFA	post-fledging area
PIAA	Project Impact Analysis Area
P.L.	Public Law
PM_{10}	particulate matter greater than 10 microns
POD	Plan of Development
ppb	part per billion
PPE	personal protective equipment
Project	Gateway West Transmission Line Project
Proponents	Rocky Mountain Power and Idaho Power
PRRIP	Platte River Recovery Implementation Program
PSC	Public Service Commission
PSD	Prevention of Significant Deterioration
R2	Region 2 (Forest Service)
R4	Region 4 (Forest Service)
RCRA	Resource Conservation and Recovery Act of 1976
RCZ	Riparian Conservation Zone
ReGAP	Regional Gap Analysis Program
Reserve	City of Rocks National Reserve
RM	river mile
RMP	Resource Management Plan
RMO	Road Management Objective
RN	Roaded Natural
ROD	Record of Decision
ROS	Recreation Opportunity Spectrum
ROW	right-of-way
RV	recreational vehicle
SCFF	Self-Contained Fluid Filled
SCI	Survey Coverage Index
SGCN	Species of Greatest Conservation Need
SHPO	State Historic Preservation Office
SIO	Scenic Integrity Objective
SMA	Special Management Area
SMS	Scenery Management System

SO_x	sulfur oxides
SOPA	Schedule of Proposed Actions
SPCC	Spill Prevention, Countermeasures, and Control
SPM	Semi-primitive Motorized
SR	State Route
SRBOP	Morley Nelson Snake River Birds of Prey National Conservation Area
SRMA	Special Recreation Management Area
SSA	sole source aquifer
STATSGO	State Soil Geographic
SWIP	Southwest Intertie Project
SWPPP	Stormwater Pollution Prevention Plan
T/A/Y	tons per acre per year
TCP	traditional cultural property
TEH	Transmission Export Hub
TES	threatened, endangered, and sensitive
THPO	Tribal Historic Preservation Officer
TIRMP	Tribal Integrated Resource Management Plan
TMDL	total maximum daily load
UPRR	Union Pacific Railroad
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDA	United States Department of Agriculture
USDOT	United States Department of Transportation
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VCR	visual contrast rating
VMS	Visual Management System
VOC	volatile organic compound
VQO	Visual Quality Objective
VR	Visual Route
VRM	Visual Resource Management
WDEQ	Wyoming Department of Environmental Quality
WECC	Western Electricity Coordinating Council
WGFD	Wyoming Game and Fish Department
WIA	Wyoming Infrastructure Authority

WIZ	Water Influence Zone
WSA	wilderness study area
WSR	Wild and Scenic River
WWE	West-wide Energy
WYNDD	Wyoming Natural Diversity Database
XLPE	Cross-Linked Polyethylene

1.0 PURPOSE AND NEED

1.1 INTRODUCTION

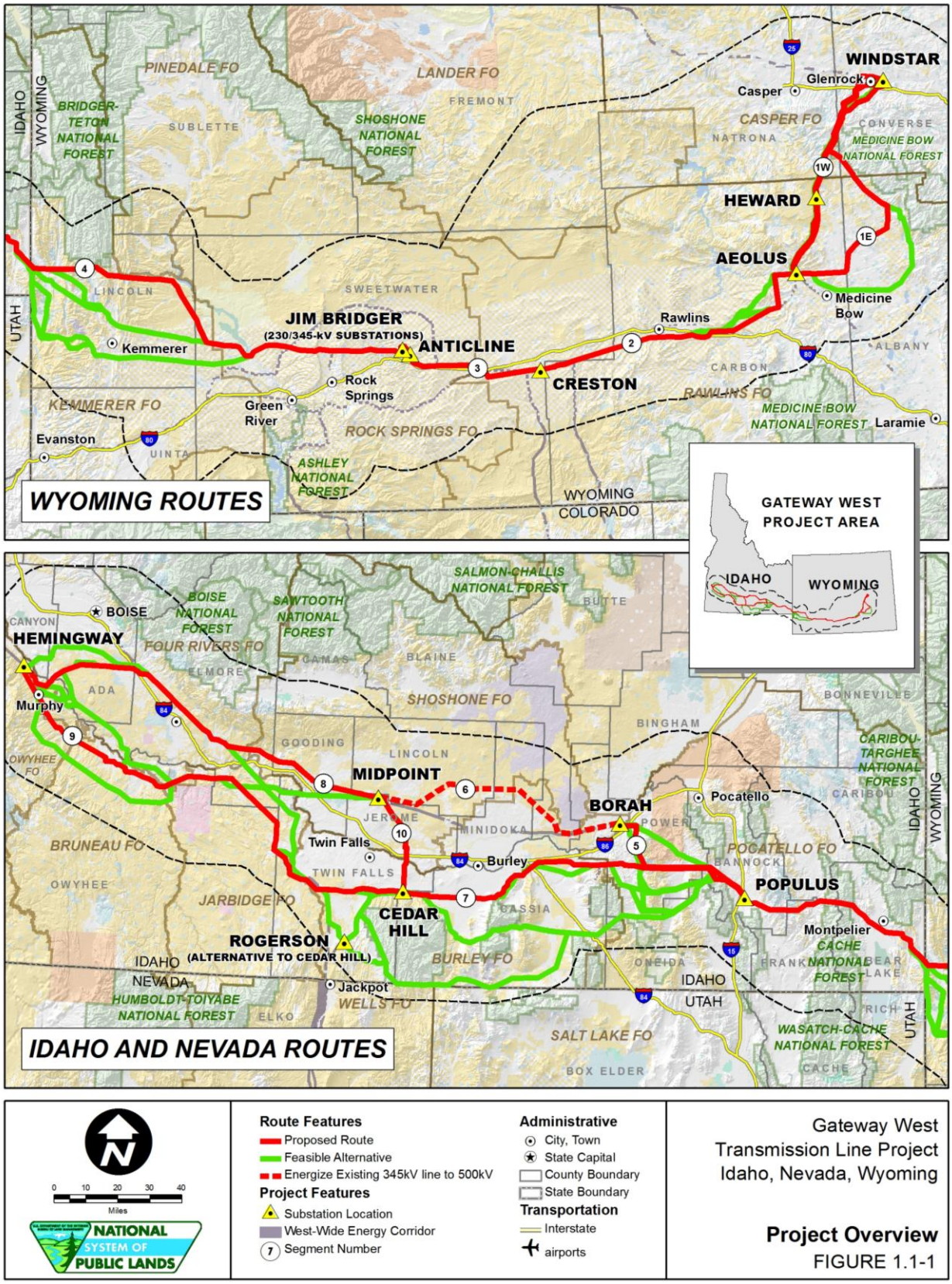
Idaho Power Company and PacifiCorp (doing business as Rocky Mountain Power), collectively known as the Proponents, applied to the Bureau of Land Management (BLM) for a right-of-way (ROW) grant to use the National System of Public Lands for portions of the Gateway West Transmission Line Project (Gateway West or Project) on May 7, 2007. The original application was revised in October 2007, August 2008, May 2009, and January 2010 to reflect changes and refinements in their proposed Project and in response to feedback from the public regarding routing alternatives. This application was assigned the case file numbers of IDI-35849 for Idaho, WYW-174598 for Wyoming, and NVN-089270 for Nevada.

The Proponents are proposing to construct and operate approximately 1,103 miles of new 230-kilovolt (kV) and 500-kV alternating current (AC) electric transmission system consisting of 10 segments between the Windstar Substation at Glenrock, Wyoming, and the Hemingway Substation approximately 30 miles southwest of Boise, Idaho. Figure 1.1-1 illustrates the initial siting study area (see Section 1.7.1 for a definition of the study area): the route proposed by the Proponents is shown in red, and the alternatives that are being analyzed in detail in this environmental impact statement (EIS) are shown in green. Greater detail is shown for each segment in maps found in Appendix A.

The proposed transmission line is needed to supplement existing transmission lines in order to relieve operating limitations, increase capacity, and improve reliability in the existing electric transmission grid, allowing for the delivery of up to 3,000 megawatts (MW) of additional energy for the Proponents' larger service areas and to other interconnected systems. The Project is principally necessary to serve future needs in Utah and Idaho, though other markets may also be served, including Wyoming's oil and gas field electricity needs. While the earliest phase of the Project needs to be in service by 2016, each segment has its own construction schedule. A more detailed description of the route, design, and an extended construction schedule alternative is presented in Chapter 2.

Under Federal Energy Regulatory Commission (FERC) tariff requirements, utilities must plan, design, construct, operate, and maintain an adequate electric transmission system that meets not only the customers' energy demands (measured in megawatt-hours) but also meet the customer's peak load demands (measured in megawatts). Both are important in determining the need for the project.

BLM is the lead federal agency under the National Environmental Policy Act (NEPA) and will coordinate the preparation of the environmental analysis. The cooperating agencies include the U.S. Department of Agriculture (USDA) Forest Service (Forest Service) (the Caribou-Targhee, Medicine Bow-Routt, and Sawtooth National Forests [NFs]); the National Park Service (NPS; including the National Trails Office, Minidoka National Historic Site, Hagerman Fossil Beds National Monument, Fossil Butte National Monument, Craters of the Moon National Monument and Preserve, and the City of Rocks National Reserve); the U.S. Fish and Wildlife Service (USFWS; Ecological Services Division, Seedskadee and Cokeville Meadows National Wildlife Refuges



Gateway West Transmission Line Project
Idaho, Nevada, Wyoming

Project Overview
FIGURE 1.1-1

[NWRs]); the U.S. Army Corps of Engineers (USACE); the Bureau of Indian Affairs (BIA); the States of Idaho and Wyoming; Idaho Army National Guard (IDANG); Cassia, Power, and Twin Falls Counties, Idaho; Elko County, Nevada; Lincoln, Sweetwater, and Carbon Counties, Wyoming; the Medicine Bow and Saratoga Encampment-Rawlins Conservation Districts in Wyoming; and the City of Kuna in Idaho.[1]

The role of cooperating agencies is derived from the NEPA requirement of federal, state, and local governments to cooperate with the goal of achieving "productive harmony" between humans and their environment. The Council on Environmental Quality's (CEQ's) regulations implementing NEPA allow the lead agency to invite any other federal, state, tribal, or local agency that has jurisdiction by law or special expertise with respect to any environmental issue which will be addressed by the NEPA analysis, to serve as cooperating agencies in the preparation of EISs (40 Code of Federal Regulations [CFR] Part 1501.6).

1.2 FEDERAL AGENCIES' PURPOSE AND NEED

The purpose of the federal action on federally managed lands is to determine if providing for the use of those lands for portions of the Gateway West Transmission line is in the public interest. The need for the action is established by the federal agencies' responsibility under the Federal Land Policy and Management Act (FLPMA[2]) to respond to an application for a ROW. In addition, the USACE must respond under the Clean Water Act (CWA[3]) to an application for a permit to dredge or fill waters of the United States, including wetlands. The purpose and need for major federal authorizing actions requested for the proposed Project to proceed are further described below.

1.2.1 BLM Purpose and Need

The BLM has received ROW applications from the Proponents and must determine whether to allow the use of the National System of Public Lands for portions of the Gateway West Transmission Line. Specific to the proposed action, 43 CFR Part 2801.9 requires a BLM ROW grant for use of public lands for "systems or facilities over, under, on, or through public lands," including transmission lines. BLM must also determine the environmental impact of granting a ROW across the National System of Public Lands. The Proponents have identified a public need (described in Section 1.5). The BLM will consider this application in accordance with 43 CFR Part 2800 and decide whether to issue a ROW grant to meet the public need. Subpart 2804 describes the process for filing applications for a ROW grant, which was followed by the Proponents in submitting the applications described in Section 1.1.

BLM must consider the existing Resource Management Plans (RMPs) and Management Framework Plans (MFPs) in the decision to issue a ROW grant in accordance with 43 CFR Part 1610.0-5(b). RMPs and MFPs allocate public land resource use and establish management objectives. Applicable RMPs and MFPs are listed in Table 1.5-1. Portions of the proposed transmission line are not in conformance

1 BLM and the cooperating agencies may be referred to collectively hereafter as "the Agencies."
2 Federal Land Policy and Management Act of 1976, as amended, 43 U.S.C. § 1701
3 Clean Water Act of 1972, as amended, 33 U.S.C. § 1251

with several BLM land management plans and therefore amendments to these plans are analyzed as part of the Proposed Route and Route Alternatives.

The decision whether to authorize the Proposed Action or an Action Alternative will be documented in the BLM's Record of Decision (ROD). The BLM decisions to be made are to:

- Decide if a ROW grant should be issued for the transmission line;
- Decide if one or more BLM land use plans should be amended to allow the proposed transmission line;
- Determine the most appropriate location for the transmission line on the National System of Public Lands, considering multiple-use objectives; and
- Determine the terms and conditions (stipulations) that should be applied to the construction, operation, and maintenance of the transmission line on the National System of Public Lands.

The BLM has prepared this EIS to meet the disclosure requirements under NEPA, to facilitate public participation, to assist the BLM decision-makers in determining whether to issue a ROW grant, and to determine under what terms and conditions the ROW grant would be issued. The BLM Wyoming state director is the agency official who will be making the decision(s) in the ROD.

1.2.2 Forest Service Purpose and Need

The Project as proposed would cross the Medicine Bow-Routt and the Caribou-Targhee NFs. Alternative routes cross portions of the Sawtooth NF. Therefore, the Proponents have applied for a Special Use Permit from the Forest Service, which will determine whether to issue the Special Use Permit. The Forest Service, as a cooperating federal agency, will participate in all aspects of the environmental analysis. The Forest Service will use this EIS as a basis for its decision regarding a preferred alternative and the issuance of a Special Use Permit and to determine under what terms and conditions a permit should be issued. The agency official who will be making the decision(s) is the Forest Supervisor of each of the respective NFs.

Title 36 CFR Part 251, Subpart B provides authority for reviewing and granting Special Use Permits for transmission lines. Further direction is provided in Forest Service Manuals 2701 and 2710.1. For a transmission line with a capacity of 66 kV or higher, the Forest Service is required to notify the U.S. Department of Energy (DOE) when an application is received (Forest Service Handbook 2709.11). The Proponents submitted an SF-299, Application for Transportation and Utility Systems and Facilities on Federal Lands, to both the BLM and the Forest Service (Section 1.1).

Land and Resource Management Plans (these will be hereafter referred to as "Forest Plans") [4] establish similar management allocations and guidelines as BLM RMPs and

[4] The Caribou-Targhee NF includes two "proclaimed" National Forests, the Caribou and Targhee and portions of the "proclaimed" Cache NF that it administers. The Caribou and Targhee NFs each have their own management plan, and the Caribou Forest Plan also covers the portion of the Cache NF crossed by Segment 4 of the Proposed Route that it administers. Therefore, when referring to the Forest Plan, the term "Caribou Forest Plan" will be used. When referring to the administrative unit, the term "Caribou-Targhee NF" will be used.

MFPs (see Section 1.5). The Caribou portion of the Caribou-Targhee NF is managed according to the Revised Forest Plan for the Caribou NF (Forest Service 2003a). The Medicine Bow portion of the Medicine Bow-Routt NFs is managed according to the Medicine Bow NF Revised Land and Resource Management Plan (Forest Service 2003b). The Sawtooth NF is managed according to the Sawtooth NF Revised Forest Plan (Forest Service 2003c). Portions of the proposed Project are not consistent with aspects of these Forest Plans; therefore, the Forest Service has determined that amendments to these plans would be needed to implement some of the proposed action or alternatives (see Section 1.5, Table 1.5-1).

The decision whether to authorize the Proposed Action or an Action Alternative will be documented in a joint ROD prepared by BLM and the Forest Service, which would include the decisions made by the Forest Service, or as a separate ROD prepared by the Forest Service. The Forest Service decisions to be made are to:

- Decide if a Special Use Permit should be issued for the transmission line;
- Decide if one or more Forest Plans should be amended to allow the proposed or alternative routes of the proposed transmission line;
- Determine the most appropriate location for the transmission line on National Forest System (NFS) lands, considering multiple-use objectives; and
- Determine the terms and conditions (stipulations) that should be applied to the construction, operation, and maintenance of the transmission line on NFS lands.

1.2.3 U.S. Army Corps of Engineers Decision

Authorization from the USACE is required for Project features that cross over, through, or under navigable waters as defined under Section 10 of the Rivers and Harbors Act of 1899 (33 United States Code [U.S.C.] § 401 et seq.). Navigable waters must be designated as such by the USACE Division Commander following procedures defined at 33 CFR Part 329. The Snake River is navigable up to river mile 445.5 near Noble Island. The Proposed Route would cross the Snake River upstream of the navigable reach. Alternative 8B would cross farther downstream near Brooks Island within the navigable reach.

Authorization from USACE is also required for any activity that results in discharges of dredged or fill material into waters of the United States as defined under Section 404 of the CWA (33 U.S.C. § 1344). The term "waters of the United States" has been broadly defined by statute, regulation, and judicial interpretation to include all waters that were, are, or could be used in interstate commerce such as rivers, streams (including ephemeral streams), canals, reservoirs, lakes, and adjacent wetlands. The USACE Wetlands Delineation Manual dated January 1987 (USACE 1987) and its current supplements must be used to determine if an area has sufficient wetland characteristics to be a water of the United States.

The Medicine Bow-Routt NFs include two "proclaimed" National Forests, the Medicine Bow and Routt. The Medicine Bow and Routt NFs each have their own management plan. Therefore, when referring to the Forest Plan, the term “Medicine Bow Forest Plan” will be used. When referring to the administrative unit, the term “Medicine Bow-Routt NFs” will be used.

On June 5, 2007, the U.S. Environmental Protection Agency (USEPA) and USACE Headquarters in Washington D.C. implemented temporary guidance that requires an extensive evaluation and coordination procedure before exerting jurisdiction over many streams and wetlands. The guidance was based primarily on a ruling by the U.S. Supreme Court on June 19, 2006, in the case of *Rapanos et ux., et al. v. United States* (Nos. 04-1034 and 04-1384). The guidance was revised by Regulatory Guidance Letter 08-02 issued by USACE on June 26, 2008, clarifying appropriate uses of approved and preliminary jurisdictional determinations. The guidance was also revised by agency memoranda on January 28, 2008; October 16, 2008; and December 2, 2008. Additional revisions are likely in the future.

Many activities with "minimal" impacts on waters of the United States can be authorized by general permits and the most common are nationwide permits. On March 12, 2007, USACE published nationwide permits in Part II of the Federal Register (Vol. 72, No. 47). Nationwide permits provide authorization in accordance with Section 404(e) of the CWA. The permits are available for a period of 5 years, currently until March 18, 2012. Standard (Individual) permits are required for activities with more than minimal impacts on waters of the United States.

Individual permits authorize activities in accordance with Section 404(a) of the CWA. The permit evaluation must be conducted in accordance with Section 404(b)(1) of the CWA as specified in guidelines promulgated by the USEPA (40 CFR Part 230). No discharge shall be permitted if there is a practicable alternative to the proposed discharge that would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences. An alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of the overall project purpose. In addition, where a discharge is proposed for a special aquatic site (wetland), all practicable alternatives to the proposed discharge which do not involve a discharge into a special aquatic site are presumed to have less adverse impact on the aquatic ecosystem, unless clearly demonstrated otherwise.

Reasonable alternatives as defined under the NEPA and practicable alternatives as defined above are not necessarily synonymous because some reasonable alternatives may not be available to the Proponents. The BLM is the agency that must select the preferred alternative on federally managed lands. Executive Order 11990, promulgated in 1977 for the protection of wetlands, requires "each agency, to the extent permitted by law, [to] avoid undertaking or providing assistance for new construction located in wetlands unless the head of the agency finds (1) that there is no practicable alternative to such construction, and (2) that the proposed action includes all practicable measures to minimize harm to wetlands which may result from such use. In making this finding the head of the agency may take into account economic, environmental and other pertinent factors (Section (2)(b)." Further, "When Federally-owned wetlands or portions of wetlands are proposed for lease, easement, right-of-way or disposal to non-Federal public or private parties, the Federal agency shall (a) reference in the conveyance those uses that are restricted under identified Federal, State or local wetlands regulations; and (b) attach other appropriate restrictions to the uses of properties by the grantee or purchaser and any successor, except where prohibited by law; or (c) withhold such properties from disposal (Section 4)."

When the preferred alternative is selected and approved in the ROD, it will reflect the agencies' full consideration of impacts to wetlands and all other resources. The ROD will then define the only alternative available to the Proponents for which a ROW could be granted on federally managed lands. The Proponents would be required to obtain ROW on non-federal lands through negotiated easements or under eminent domain laws. Therefore, ROW granted by the BLM, supplemented by acquisition of congruent ROW that can be obtained by the Proponents, will define the only practicable alternative for the transmission line. However, it may be necessary for the USACE to evaluate alternatives for specific activities within the ROW such as tower locations and road alignments during the authorization process.

The USACE will determine whether authorization of proposed activities by nationwide permits is appropriate or whether certain activities require an individual permit evaluation. Evaluation of practicable alternatives is not applicable to nationwide permit authorizations as specified in 40 CFR Part 230.7(b)(1). However, mitigation measures in the form of avoidance, minimization, and compensation would be considered in all permit decisions. Verification by the USACE that activities are already authorized by nationwide permits is not a new federal action. The USACE would prepare a separate ROD for individual permit authorizations because issuance of a permit would be a new federal action.

1.3 PROPONENTS' PURPOSE AND NEED FOR THE PROJECT

This section provides basic information about why the Proponents are proposing this Project and a description of the electrical transmission system needs that would be met by the Project.

1.3.1 Proponents of the Project

1.3.1.1 Idaho Power

Idaho Power is a wholly owned subsidiary of IDA-CORP, a holding company. Idaho Power is responsible for providing electrical service to its service area, which includes most of southern Idaho and a portion of eastern Oregon. The number of customers in Idaho Power's service area is expected to increase from around 490,000 in 2009 to over 680,000 by 2029. Firm peak-hour load (the peak hourly electricity that the system must supply when demand is at its highest) has increased from 2,052 MW in 1990 to over 3,000 MW in 2006, 2007, 2008, and 2009. In June 2008, the peak-hour load reached 3,214 MW, which was a new system peak-hour record. Average firm load (the average annual demand from customers) has increased from 10,500,000 megawatt hours (MWh) in 1990 to 15,800 MWh in 2008 (excluding Astaris/FMC) (IPC 2009). While the economic downturn is expected to depress customer demand for electricity in the near term, Idaho Power forecasts that on average their load will continue to grow at about 0.7 percent per year to approximately 17,500,000 MWh in 2019. During the same period, the peak-hour load is expected to increase at a rate of 57 MW per year, adding an additional 570 MW of peak-hour demand by 2019 (IPC 2009).

Idaho Power is a regulated public utility under the laws of the State of Idaho whose mission is to provide reliable, responsible, fair-priced energy. Idaho Power operates under the oversight and regulatory controls of the Idaho Public Utility Commission

(IPUC). Under Title 61 of the IPUC regulations, Idaho Power "shall furnish, provide and maintain such service, instrumentalities, equipment and facilities as shall promote the safety, health, comfort and convenience of its patrons, employees and the public, and shall be in all respects adequate, efficient, just and reasonable."

Idaho Power is also a public utility under the jurisdiction of the FERC. Idaho Power is obligated to expand its transmission system to provide requested firm transmission service, and to construct and place in service sufficient capacity to reliably deliver resources to network and native load customers as provided in their Open Access Transmission Tariff (OATT) under Sections 15.4 and 28.3 (FERC 2008). Idaho Power's Attachment K of the OATT requires planning for the expansion of the system to ensure that its transmission system meets industry, regulatory, and reliability standards.

1.3.1.2 PacifiCorp (Rocky Mountain Power)

Rocky Mountain Power is the trade name under which PacifiCorp delivers electricity to more than 955,000 customers in the Rocky Mountain Power service area, which includes portions of Utah, Wyoming, and Idaho. PacifiCorp's primary goal is to provide safe, reliable electricity to its customers at a reasonable cost. It transmits electricity via a grid of transmission lines throughout a six-state region. PacifiCorp serves 1.7 million retail customers through its distribution system. The company sells electricity primarily in the retail market, with sales to residential, commercial, industrial, and other customers. It also sells electricity in the wholesale market to benefit the region during off-peak periods when additional electricity is required elsewhere or when required for other system balancing activities.

PacifiCorp's system peak-hour load is forecast to increase from 9,883 MW in 2010 to 12,112 MW in 2019, a 2.3 percent growth rate. These forecasts include a marginal decrease in customer demand for electricity in the near term that has been accounted for in this forecast. PacifiCorp's system customer megawatt-hour energy load is forecasted to grow at a 2.3 percent rate from 2010 to 2019, from 59,400,000 MWh to 72,900,000 MWh. This average forecasted growth rate is moderately higher than the average growth rate experienced from 1995 to 2005 when the average increase per year was 1.6 percent. PacifiCorp's three highest state loads in Oregon, Utah, and Wyoming (included in the MWh loads above) are forecasted to grow at a rate of 1.1 percent, 2.7 percent, and 3.6 percent respectively, through the same 2010–2019 period (PacifiCorp 2009). PacifiCorp's customer base in Wyoming is anticipated to increase by approximately 420 MW in the same time frame. This growth rate is only reflective of their large industrial customer segment and does not include any other customers such as residential, lighting, irrigation, or small commercial customers.

Rocky Mountain Power operates under oversight and regulatory controls of the public utility commissions of Wyoming, Utah, and Idaho. The Wyoming Public Service Commission (PSC) regulates rates, integrated resource plans, construction of large electric facilities, and transactions between utilities. The Wyoming PSC's primary regulatory responsibility is rates. The Wyoming PSC does not regulate environmental impacts from facilities or siting (other than how siting influences rates). The IPUC regulates investor-owner or privately-owned utilities that provide gas, water, electricity, or telephone service for profit. The primary responsibility of the Utah PSC is to ensure safe, reliable, adequate, and responsibly priced utility service.

PacifiCorp is a public utility under the jurisdiction of the FERC. PacifiCorp is obligated to expand its transmission system to provide requested firm transmission service and to construct and place in service sufficient capacity to reliably deliver resources to customers requesting service and existing customers as provided in their OATT under Sections 15.4, 28.2, and 28.3 (FERC 2008). PacifiCorp's Attachment K of the OATT also requires planning for the expansion of the system to ensure that its transmission system meets industry, regulatory, and reliability standards.

1.3.2 Demand Side Management

As regulated utilities, both Idaho Power and Rocky Mountain Power are required to produce and periodically update an Integrated Resource Plan (IRP). The Public Utilities Commissions of the states where these utilities operate review and acknowledge these IRPs and their updates. Part of the planning process includes addressing conservation and other means of reducing or controlling the growth of the demand for electricity among the utilities' customers. When the Public Utilities Commission for a given state acknowledges the IRP, it is agreeing that the balance of demand-side measures and development of additional generation resources, including associated transmission, is appropriate to meet the needs of the customers of its state while complying with the various laws and regulations on renewable energy requirements, carbon emissions, and other energy-related issues. The Proponents have detailed their demand-side management in their respective IRPs, which have been acknowledged by the Public Utilities Commissions for which they were written, and have shown to the satisfaction of the Public Utilities Commissions that additional transmission capacity is needed to meet their customers' needs (RMP 2009; IPC 2009).

1.3.3 Existing Transmission System Constraints

1.3.3.1 General Studies

Since 2001, several regional initiatives have evaluated the cost and benefits of the transmission additions from Wyoming to load centers farther west. Two specific studies are the Rocky Mountain Area Transmission Study of 2004 and Western Electricity Coordinating Council (WECC) Seams Steering Group-Western Interconnection of 2005. The results of the 2005 WECC study were included in the 2006 DOE National Electric Transmission Congestion Study (DOE 2006). All of these studies show that the existing generation resources are using all of the transmission capacity from Wyoming and that the addition of generation resources will require more transmission capacity.

The 2006 DOE study states:

> *Concerns about energy security and the need for greater diversification in electricity supplies are leading to increased emphasis on development of domestic energy resources.*

This study also identifies the region from Wyoming to the west as a conditional constrained area, meaning that any generation developed in Wyoming will require additional transmission. The 2006 DOE study states:

> *This area is rich in coal and wind resources that, if developed, could provide important sources of low-cost energy and fuel diversity while improving domestic*

> *energy self-sufficiency and enhancing the economic development in the resource areas. This resource development scenario has been thoroughly explored in analyses sponsored by the Western Governors Association.*

Additional planning studies were performed in 2007 through the Northern Tier Transmission Group (NTTG) Fast Track Project Process. The NTTG is a group of energy suppliers, transmission providers, customers, and regulators actively involved in the planning, usage, sale, and purchase of transmission capacity that delivers electricity in the Pacific Northwest and Rocky Mountain states. This coordinated subregional planning effort indicates a strong need for a series of independent transmission segments, each of which addresses an independent purpose, though all are part of the larger grid. This subregional planning effort is subsequently input into the WECC Regional Planning process, which has further supported the need for the Project. Gateway West is proposed as one necessary component of the needed grid expansion in the WECC region.

1.3.3.2 Capacity

Capacity refers to the amount of power (megawatts) a transmission facility (a line, groups of lines, transformers, etc.) can reliably deliver. Capacity is measured in megawatts and is determined by the current (in amperes) that the facility can carry or the minimum voltage levels present at a substation (under either steady-state or contingency conditions). Voltages below minimum levels may damage or cause improper operation of customer equipment and generally reduced performance of the electric grid. Voltage limits used by the Proponents for system planning studies follow industry design standards for transmission systems requiring that the rated voltage must be maintained within performance standards established by the WECC and North American Electricity Reliability Corporation (NERC).

Transmission paths consist of single lines or combinations of lines operated together as a single transmission unit to maximize capacity of the system and to maintain reliability. Path capacities are usually limited by the line in the path with the least capacity. The capacity ratings of the paths are based on maintaining established reliability criteria (see Section 1.3.2.3 below for further information). The existing path capacity "bottlenecks" and how the path rating will increase with the Gateway West segments in place are shown in Table 1.3-1.

1.3.3.3 Reliability

Transmission systems in the United States must be planned, operated, and maintained under NERC[5] reliability performance standards. Additionally, the Proponents are

[5] NERC's mission is to improve the reliability and security of the bulk power system in North America. To achieve that, NERC develops and enforces reliability standards; monitors the bulk power system; assesses future adequacy; audits owners, operators, and users for preparedness; and educates and trains industry personnel. NERC is a self-regulatory organization that relies on the diverse and collective expertise of industry participants. As the Electric Reliability Organization, NERC is subject to audit by the FERC and governmental authorities in Canada (NERC 2010).

Table 1.3-1. Rating and Capacity of Paths with and without the Gateway West Project

Path Name	Path Rating Limit (Present Operational Maxima) (MW)	Existing Available Transmission Capacity (MW)	Proposed Gateway West Parallel Segments[1/]	Planned Rating/Capacity Increase from Gateway West (MW)	Proposed Path Rating/Capacity with Gateway West (MW)
TOT 4A (WY East to WY Southwest)	820	0	Segments 1E and 1W Windstar-Aeolus	840	1,660
<not previously established>	NA	0	Segments 2 and 3 (Aeolus West, carrying TOT 4A plus new resources)	3,000	3,000
Bridger West	2,400[2/]	0	Segment 4 Jim Bridger-Populus	3,000	5,400
Borah West	2,757	0	Segments 4, 5, 6, 7 and 10 Populus-Borah, Borah-Midpoint, and Populus-Cedar Hill	3,000	5,757
Midpoint West	2,287	0	Segments 8 and 10 Midpoint-Hemingway and Cedar Hill-Hemingway	3,000	5,287

1/ Refer to Figure 1.1-1 for segments and substations.

2/ According to the Proponents, "Idaho Power and PacifiCorp will be increasing the rating of the Bridger West and Borah West transmission paths by 200 MW (from 2,200 MW to 2,400 MW for Bridger West and from 2,557 MW to 2,757 MW for Borah West). This increase in transfer capability on the two paths will utilize existing and/or future equipment that will be in-service prior to the addition of the Gateway West project." Also, according to the Proponents, "With the addition of Segment 2 and 3 facilities (Aeolus – Creston – Bridger) plus anticipated resources at Windstar and Aeolus, the West of Bridger transfers would increase by about 3,000 MW. It is anticipated that transfers west of Aeolus (including 500 kV and 230 kV facilities) would be as high as 2,200 MW. Each of the paths listed in Table 1.3-1 are part of the Gateway West Project and are dependent on each other to move power from east to west (Wyoming to Idaho)."

governed by the WECC[6] policy procedures, criteria, and standards that may be more stringent than those required by NERC. In compliance with the above standards, transmission systems must be planned, built, and continually operated with sufficient levels of redundancy to enable the transmission system to reliably operate in the event of the loss of any single element (i.e., generation unit, transmission line segment or substation equipment) or of multiple elements, thereby providing continuous service to consumers. Adding new transmission facilities to a network allows facilities (new and old) to back each other up during outage conditions when elements of the system are out of service.

In siting new transmission facilities, the Proponents state that they are obliged to be prudent and site and install facilities to avoid a potential "common mode failure" (lines

[6] WECC and the nine other regional reliability councils were formed due to national concern regarding the reliability of the interconnected bulk power systems, the ability to operate these systems without widespread failures in electric service, and the need to foster the preservation of reliability through a formal organization. The Western Interconnection encompasses a vast area of nearly 1.8 million square miles. It is the largest and most diverse of the eight regional councils of the NERC. WECC's territory extends from Canada to Mexico. It includes the provinces of Alberta and British Columbia, the northern portion of Baja California, Mexico, and all or portions of the 14 western states in between (WECC 2010).

adjacent to each other on a common transmission tower or two parallel transmission lines in close proximity to each other). Common mode failures include, but are not limited to, a snagged shield wire from one line being dragged into the adjacent line, an aircraft flying into more than one line, smoke from a fire across the ROW shorting out more than one line, lightning strikes affecting more than one line, high winds, dust storms, ice storms, blizzards, landslides, earthquakes, vandalism, and equipment failure. As a minimum requirement, NERC/WECC reliability performance standards require that a multiple contingency analysis (an analysis of the simultaneous failure of two lines) must be performed to evaluate the impact resulting from the loss of multiple transmission lines to the remaining transmission system. The power flowing on the two transmission lines removed from service must now flow across the remaining transmission system and subsequently overloads portions of the remaining system. In this event, the useable system capacity limit is reduced in order to protect the remaining system from this overload condition. When transmission lines are separated from each other, common mode failures do not pose a risk and prudent planning only requires evaluation of one line out of service at a time.

Due to the high megawattage load requirements necessary for the Gateway West Project, multiple high-capacity lines on separate corridors are required in key segments of the Project.

Due to questions that have surfaced recently concerning common mode failure of transmission lines constructed adjacent to other transmission lines, the WECC Board of Directors approved a regional transmission planning criterion (TPL [001-004]-WECC-1-CR), on April 18, 2008. This planning criterion specifies that utilities must plan for two lines to be out of service at the same time if they are located adjacent to each other unless those lines are separated by at least “the longest span length of the two transmission circuits at the point of separation or 500 feet, whichever is greater, between the transmission circuits” (WECC 2008)[7].

For the purposes of the initial Gateway West siting study, the longest span was assumed to be 1,500 feet, thereby dictating the minimum distance between existing and proposed transmission lines serving the same load. In the final design, the separation distance could increase where existing line spans are determined to be greater than 1,500 feet thereby requiring Gateway West to be located the maximum span distance away when adjacent to longer spans. This assumption is also incorporated into the proposed Project description (Chapter 2). This criterion in itself does not guarantee transmission system reliability or future system performance. Utilities are expected to use their history of experience and prudent judgment in planning, siting, and design of transmission systems to ensure the reliability of the interconnected grid. Utilities can and do elect to provide wider separation or select an alternate transmission line route to reduce the risk of multiple line outages along common routes used by high capacity lines.

The Proponents report several instances where outages on their systems and others have led to serious consequences. In 2007, a fire burned through the Jim Bridger

[7] A transmission “circuit” is a set of wires energized at transmission voltages extending beyond a substation which has its own protection zone and set of breakers for isolation, and the “span length” is the distance between two transmission line support structures. See also Glossary.

transmission line ROW resulting in an outage of all three 345-kV lines and three of the four Jim Bridger generating units (Gerrard 2010). Also in 2007, a fire caused the Mona – Huntington and Mona – Bonanza 345-kV lines in Central Utah to de-energize (Gerrard 2010). In California, two adjacent 500-kV line towers failed in 2005, leaving an estimated 5.2 million customers in California, Nevada, Oregon, and Texas without power (California ISO Corporation 2005).

To further ensure reliability requirements are met, the Proponents have proposed that a permanent service road to each transmission structure be retained (see Appendix B, Section 1.5, for further detail) to control vegetation in the ROW for safe operation and for periodic inspections and maintenance (IPC and RMP 2010).

1.3.4 Purpose of the Gateway West Proposed Action

This Project is designed to provide for the delivery of up to 3,000 MW to the service areas of the Proponents and possibly other markets. Idaho Power forecasts a peak-hour load growth of 57 MW per year over the next 10 years. PacifiCorp forecasts the megawatt-hour growth between 2010 and 2019 for Utah, Wyoming, and Oregon will be 6.8 million, 3.7 million, and 1.1 million megawatt-hours, respectively. These forecasts are based on the IRPs prepared by each company as required to fulfill the regulatory requirements and guidelines established by the public utilities commissions of the states served by the Proponents (PacifiCorp 2011; Idaho Power 2009). Each IRP addresses the obligations of each company pursuant to its OATT to plan for and expand its respective transmission systems in a non-discriminatory manner based on the needs of its native load customers, network customers, and all eligible customers that agree to expand their transmission systems. This includes entities that generate or plan to generate electricity, including coal-fired, natural-gas-fired, and renewable energy sources (biogas, wind, and geothermal). As of June 2011, all of the generators requesting transportation on Gateway West were wind energy (PacifiCorp 2011).

Gateway West is independent of, and would be built regardless of, any particular new generation project. The transmission grid of which it would become a part can be thought of in terms of hub and spokes, with a backbone connecting to the hubs. Each substation is a hub and receives or sends electricity along the spokes. For this system to work, a backbone of high-capacity transmission lines is needed to connect the hubs and transport the electricity from where it is or can be generated (in this case, mostly Wyoming but also Idaho), to where it is needed (in this case, mostly Idaho and Utah, though other markets may also be served).

1.3.4.1 Gateway West Substation Purposes

This Project proposes to connect 12 substations, which are essential control points for the route. These are illustrated in Appendix A, Figure A-1, and in subsequent maps by segment. The purposes of the individual substations to support the need for the overall location of the Gateway West Project are displayed in Table 1.3-2. Eight of the substations are in service now, one is being planned independent of this Project, and three are proposed as part of this Project.

Table 1.3-2. Substations to be Connected by Gateway West

Substation	Description	Purpose
Windstar	Existing: interconnection and generation-driven	The purpose of this substation is to integrate future wind and thermal resources with the existing transmission system by looping two existing 230-kV transmission lines into the substation. The Gateway West Project would start at this substation because of the recent large development of nearby energy sources needing transmission to points west, including Glen Rock 1 & III – 138.5 MW, Rolling Hills – 99 MW, Three Buttes – 99 MW, and Casper Wind – 17 MW. The Proponents anticipate that by December 2010, an additional 200 MW will be integrated at the Windstar 230-kV Substation.
Heward	Existing: interconnection and generation-driven	This substation will be expanded because the existing 230-kV bus and other equipment within the Heward Substation is under-rated for accommodating the additional electrical capacity that would be added by rebuilding and reconductoring Segment 1W(c).
Aeolus	Planned: independent of Gateway West, generation-driven	This substation is intended to serve high wind areas identified in portions of Wyoming and will be the location for interconnecting new wind-driven sourced energy. The Proponents state that the Aeolus 230-kV substation will be integrated into the RMP transmission system by looping the Dave Johnston – Heward – Shirley Basin – Miners 230-kV line into Aeolus. Aeolus will be used to interconnect future wind generation projects.
Creston	Proposed: part of Gateway West, load-driven	This substation would be used to serve load (oil and gas) south of Wamsutter, Wyoming, and utilize the proposed Aeolus – Creston – Bridger lines constructed as part of Gateway West and initially operated at 230 kV.
Anticline	Proposed: part of Gateway West, generation-driven	The new transmission lines would interconnect to the existing transmission system in the vicinity of the Jim Bridger Power Plant by constructing a new substation nearby. The purpose of the proposed substation is to support the existing thermal generation hub as well as an expanded hub for new wind resources expected to be sited in the area.
Jim Bridger Power Plant 345-kV	Existing: interconnection and generation-driven	This substation would be expanded to connect the Jim Bridger Power Plant with a new transmission line. No new generation would be added at the Jim Bridger Power Plant as a result or as part of this Project.
Jim Bridger Power Plant 230-kV	Existing: interconnection and generation driven	This substation would be expanded within to connect the Jim Bridger Power Plant with a new transmission line. No new generation would be added at the Jim Bridger Power Plant as a result or as part of this Project.
Populus	Existing: interconnection and generation-driven	This substation would interconnect with the proposed Gateway West 500-kV transmission lines, the existing Jim Bridger West 345-kV system, and the 345-kV transmission lines running north-south. The north-south 345-kV transmission lines (not part of Gateway West) begins at the Populus Substation (near Downey, Idaho), runs south to the Wasatch Front1/, and transports new resources south to the Wasatch Front demand centers.
Borah	Existing: interconnection and load-driven	The substation expansion would allow the interconnection of new 500-kV transmission lines between Populus and Midpoint, as well as a new termination of a 345-kV line to Kinport.
Midpoint	Existing: interconnection and load-driven	The substation expansion would allow interconnection of new transmission lines from Cedar Hill and Hemingway and allow for the existing 345-kV transmission line between Borah and Midpoint Substations to be energized at 500 kV, thereby creating a continuous 500-kV system expansion and reliability tie with the Cedar Hill Substation.

Table 1.3-2. Substations to be Connected by Gateway West (continued)

Substation	Description	Purpose
Cedar Hill[2/]	Proposed: part of Gateway West, load-driven	The station would serve two purposes: 1) a reliability tie between the proposed Gateway West north and south transmission lines, and 2) a 500-kV to 230-kV transformation station for serving the Magic Valley load. This would complement the existing service from Midpoint to the north of the Magic Valley. The Magic Valley Electrical Plan is under development, with this station being considered as a future source to the valley.
Hemingway	Existing; interconnection and load-driven	The station would serve two purposes: 1) an interconnection point for the Gateway West, Summer Lake, Boardman, and Captain Jack transmission lines; and 2) a facility to serve the Treasure Valley load. The station would be the southwestern 500-kV to 230-kV transformation point in the Treasure Valley 500-kV loop, as defined in the Treasure Valley Electrical Plan. The Hemingway Substation is the western terminus of the Gateway West Project because it is the major load point for the generation resources brought in from the east, primarily Wyoming.

1/ About 75 to 80 percent of all of the electricity use in the state of Utah is in the area known as the Wasatch Front. This area includes the entire electrical load served out of the Spanish Fork Substation in the south up to the electrical load served out of the Ben Lomond Substation in the north. This includes parts of Juab and Sanpete Counties, and all of Utah, Salt Lake, Summit, Tooele, Wasatch, Davis, Morgan, and Weber Counties.

2/ The Southern Idaho Task Force proposes a substation be built near Rogerson, Idaho, rather than at the Cedar Hill location.

1.3.4.2 Gateway West Transmission Line Segment Purposes

Table 1.3-3 summarizes the purpose for each of the segments of Gateway West. Each segment's Project description is presented in detail in Chapter 2.

Table 1.3-3. Gateway West Transmission Line Segments

Transmission Line Segment	Purpose
Segment 1E—Windstar to Aeolus, single-circuit 230-kV line	Transport existing and new resources to load centers farther west. This line also represents the Proponent's portion of a future 230-kV network of lines that would be required to integrate other project's wind resources.
Segment 1W—Windstar to Aeolus, single-circuit 230-kV, rebuilt 230-kV line	Transport existing and new resources to load centers farther west. This line also represents the Proponent's portion of a future 230-kV network of lines that would be required to integrate other project's wind resources.
Segment 2—Aeolus to Creston, double-circuit 500-kV line [1/]	Transport new resources to load centers farther west. Additionally would serve future oil and gas field load demand centers south of Wamsutter, Wyoming. One circuit would initially be operated at 230 kV.
Segment 3—Creston to Anticline, double-circuit 500-kV line [1/]	Transport new resources to load demand centers farther west. One circuit would initially be operated at 230 kV.
Segment 4—Anticline to Populus, double-circuit 500-kV line 1/	Transport new resources to load demand centers farther west and interconnect with existing systems.
Segment 5—Populus to Borah, single-circuit 500-kV line	Transport Wyoming energy resources from Populus to loads in southern Idaho and the Pacific Northwest. Additionally, this line would transport Pacific Northwest sourced energy to Populus to serve load in the Salt Lake City metropolitan area. Provide physical separation to meet reliability criteria between a northern route (Populus – Borah – Midpoint – Hemingway) and a southern route (Populus – Cedar Hill – Hemingway). Physical separation is needed due to existing transmission line congestion (multiple lines in the same area) and wildland fires resulting in outages.

Table 1.3-3. Gateway West Transmission Line Segments (continued)

Transmission Line Segment	Purpose
Segment 6—Borah to Midpoint, energize existing 345-kV line to 500 kV	Increase the capacity of the existing line to transport existing and new energy resources in the service areas of the two Proponents. Replace or reconfigure up to five spans at each end to accommodate new connections in substations to new 500-kV bays. No new transmission line construction.
Segment 7—Populus to Cedar Hill, single-circuit 500-kV line	Transport existing and new energy resources to load demand centers to the west. Additionally, this line would transport existing and new Pacific Northwest energy resources to serve load demand centers to the east. Provide physical separation to meet reliability criteria between a northern route (Populus – Borah – Midpoint – Hemingway) and a southern route (Populus – Cedar Hill – Hemingway). Physical separation is needed due to existing transmission line congestion (multiple lines in the same area) and wildland fires resulting in outages.
Segment 8—Midpoint to Hemingway, single-circuit 500-kV line	Transport existing and new energy resources to load demand centers throughout the system. Provide physical separation to meet reliability criteria between a northern route (Populus – Borah – Midpoint – Hemingway) and a southern route (Populus – Cedar Hill – Hemingway). Physical separation is needed due to existing transmission line congestion (multiple lines in the same area) and wildland fires resulting in outages.
Segment 9—Cedar Hill to Hemingway, single-circuit 500-kV line	Transport energy resources to serve load demand centers throughout the system. Provide physical separation to meet reliability criteria between a northern route (Populus – Borah – Midpoint – Hemingway) and a southern route (Populus – Cedar Hill – Hemingway). Physical separation is needed due to existing transmission line congestion (multiple lines in the same area) and wildland fires resulting in outages.
Segment 10—Midpoint to Cedar Hill, single-circuit 500-kV line	Provide a midway tie between the northern and southern routes, which is required for system reliability to move flows of the north system or the south system when transporting greater than 2,500 MW of power.

1/ The Proponents are considering an optional ROW configuration that would replace the double-circuit structure with two single-circuit structures.

1.4 AUTHORIZING LAWS AND REGULATIONS

1.4.1 Overview

Table 1.4-1 lists the major federal, state, and local permits, approvals, and consultations identified for the construction and operations of Gateway West. The Proponents would be responsible for obtaining all permits and approvals required to implement the proposed Project regardless of whether they appear in this table.

Table 1.4-1. Major Permits, Approvals, and Consultations for the Gateway West Transmission Line Project

Regulatory Agency	Required Permit, Approval, or Consultation	Agency Action
Federal		
Advisory Council on Historic Preservation	Section 106 Consultation, National Historic Preservation Act (NHPA)	Has the opportunity to comment if the Project may affect cultural resources that are either listed on or eligible for listing on the National Register of Historic Places (NRHP).
U.S. Department of Agriculture, Forest Service	Temporary Use Permit	Consider issuance of a Temporary Use Permit for temporary activities in a construction right-of-way (ROW) on National Forest System (NFS) lands.
	Special Use Permit	Consider issuance of a Special Use Permit for use of NFS lands for construction and operation of electric transmission lines and associated facilities.

Table 1.4-1. Major Permits, Approvals, and Consultations for the Gateway West Transmission Line Project (continued)

Regulatory Agency	Required Permit, Approval, or Consultation	Agency Action
U.S. Department of Agriculture, Forest Service (cont.)	Operation and Maintenance Plan	Consider approval of detailed Operations and Maintenance Plan.
	Notice to Proceed	Following issuance of the Special Use Permit and approval of the Construction, Operations, and Maintenance Plan on NFS lands, consider issuance of a Notice to Proceed with Project development and mitigation activities.
U.S. Department of Defense, Army Corps of Engineers (USACE), Omaha District, Walla Walla District, Los Angeles District	Section 10, Rivers and Harbors Act Permit	Consider issuance of a Section 10 permit for construction across the Snake River.
	Section 404, Clean Water Act Permit	Consider issuance of a Section 404 permit for the placement of dredge or fill material into all waters of the United States, including jurisdictional wetlands.
U.S. Department of the Interior, Bureau of Land Management	Antiquities and Cultural Resource Use Permit	Consider issuance of antiquities and cultural resources use permit to conduct surveys and to excavate or remove cultural resources on federal lands.
	Various Resource Management Plans	Consider amending the plans.
	ROW Grant	Consider issuing long-term ROW grant for operations and maintenance of those portions of the Project that would encroach on the National System of Public Lands, including easements across federally owned waterways.
	Short-Term ROW Grant	Consider issuance of a short-term ROW grant for temporary activities in the construction ROW, on lands leading into the ROW, and associated areas such as staging areas that are within the National System of Public Lands.
	Plan of Development	Consider approval of detailed Plan of Development.
	Notice to Proceed	Following issuance of a ROW grant and approval of a Plan of Development, consider issuance of a Notice to Proceed with Project development and mitigation activities.
U.S. Department of the Interior, Bureau of Indian Affairs Fort Hall Indian Reservation	ROW Grant	Consider issuing a ROW grant if Alternative 5C is chosen across the Fort Hall Indian Reservation.
U.S. Department of the Interior, Bureau of Reclamation	License Agreement	Consider issuing a license agreement (valid for 25 years) for lands withdrawn for the purposes of the Seedskadee Project.
U.S. Department of Transportation, Federal Highway Administration	Encroachment Permit	Consider issuance of permit for transmission line crossing of federally funded highways (typically delegated to the state department of transportation).

Table 1.4-1. Major Permits, Approvals, and Consultations for the Gateway West Transmission Line Project (continued)

Regulatory Agency	Required Permit, Approval, or Consultation	Agency Action
U.S. Environmental Protection Agency, Regions 8, 9, and 10	Section 401, Clean Water Act (CWA) Water Quality Certification	In conjunction with states, consider issuance of water use and crossing permits.
	Section 402, CWA, National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction Activity for Idaho	Review and issue NPDES permit for discharge of Stormwater in Idaho. In Nevada and Wyoming, NPDES permitting is delegated to the Wyoming Department of Environmental Quality (see below).
	Section 404, CWA	Review CWA, Section 404 applications for dredge-and-fill applications for the USACE with 404(c) veto power for permits issued by the USACE.
U.S. Fish and Wildlife Service (USFWS), Regions 1, 6, and 8	Section 7 Consultation, Biological Opinion (Endangered Species Act)	Consider lead agency finding of impact on federally listed or proposed species. Provide Biological Opinion if the Project is likely to adversely affect federally listed or candidate species or their habitats.
	Fish and Wildlife Coordination Act	Provide comments to prevent loss of and damage to wildlife resources.
	Migratory Bird Treaty Act	Provide comments for the protection of migratory birds.
	Bald and Golden Eagle Protection Act	Provide comments for the protection of eagles.
U.S. Fish and Wildlife Service (Refuge Division)	Compatibility Determination	Provide concurrence for BLM to issue a ROW grant covering USFWS fee lands within National Wildlife Refuges (no fee lands presently crossed by proposed or alternative routes as of July 2011).
Wyoming		
All state agencies	Compliance with Executive Order (EO) 2011-5	Requires that all agencies demonstrate that activity proposed for permitting be compliant with the requirements of the EO in sage-grouse core areas.
Wyoming Department of Environmental Quality (WDEQ) and the Wyoming Industrial Siting Council	Industrial Siting Permit Wyoming Industrial Information and Siting Act under Chapters 1 and 2, Rules and Regulations of the Industrial Siting Council	Considers approval of construction and siting of projects with construction cost of $176 million or more or 160 kV or greater.
WDEQ Air Quality Division	Construction Permit	Consider measures to control fugitive dust emissions during construction.
WDEQ Water Quality Division	Section 401, CWA, Water Quality Certification	Consider certification of a 404 permit issued by the USACE as consistent with state law and Section 401.
	Section 402, CWA, NPDES General Permit for Stormwater Discharges Associated with Construction Activity for Wyoming	Review and issue NPDES permit for discharge of stormwater.
Wyoming Game and Fish Department	Potential Project Impacts to Fish and Wildlife Species and Their Habitat	Coordinate with BLM, Forest Service, and USFWS on wildlife issues/impacts associated with the Project.

Table 1.4-1. Major Permits, Approvals, and Consultations for the Gateway West Transmission Line Project (continued)

Regulatory Agency	Required Permit, Approval, or Consultation	Agency Action
Wyoming State Historic Preservation Office	Section 106 Consultation, NHPA	Consult with the BLM, the Proponents, other land management agencies, and others regarding activities potentially affecting cultural resources.
Wyoming Office of State Lands and Investments	Easement Across State Lands	Consider issuance of a right-of-way across state lands.
Wyoming Public Service Commission,	Certificate of Public Convenience and Necessity	Consider issuance of a certificate to allow construction of a public utility, including transmission lines
Wyoming Department of Transportation	Encroachment Permit	Consider issuance of permit to cross or bore under state highways or be within a state highway ROW.
Various (may also require federal and county approvals)	Explosives Permit	Consider issuance of a license to store and use explosives.
Idaho		
Idaho Department of Environmental Quality	Fugitive Dust Control Plan	Consider measures to control fugitive dust emissions at each construction site.
	Section 401, CWA, Water Quality Certification	Consider certification of a 404 permit issued by the USACE as consistent with state law and Section 401.
Idaho Department of Transportation	Encroachment Permit	Consider issuance of permit to cross or bore under state highways or be within a state highway ROW.
Idaho Public Utility Commission,	Certificate of Public Convenience and Necessity	Consider issuance of a certificate to allow construction of a public utility, including transmission lines
Idaho State Historic Preservation Office	Section 106 Consultation, NHPA	Consult with the BLM, the Proponents, other land management agencies, and others regarding activities potentially affecting cultural resources.
Idaho Department of Lands	Easement Across State Lands or Rivers (IC Title 58 Chapter 6)	Consider issuance of ROWs across state lands.
Idaho Department of Fish and Game	Potential Project Impacts to Fish and Wildlife Species and Their Habitat	Coordinate with BLM, Forest Service, and USFWS on wildlife issues/impacts associated with the Project.
Idaho Department of Water Resources	Stream Channel Alteration Permit and Wetland Removal Fill Permit (IC Title 42 Chapter 38)	Consider alteration of any stream channel or wetland.
Various (may also require federal and local approvals)	Explosives Permit	Consider issuance of a license to store and use explosives.
Nevada		
Nevada Division of Environmental Protection	Stormwater general NPDES permit for construction	Consider issuance of permit when more than 1 acre will be disturbed.
	Section 401, CWA, Water Quality Certification	Consider certification of a 404 permit issued by the USACE as consistent with state law and Section 401.

Table 1.4-1. Major Permits, Approvals, and Consultations for the Gateway West Transmission Line Project (continued)

Regulatory Agency	Required Permit, Approval, or Consultation	Agency Action
Nevada Division of Environmental Protection-Bureau of Air Quality	Surface area disturbance permit for disturbance over 5 acres	Issue permit when more than 5 acres will be disturbed.
Nevada Department of Wildlife	Potential Project Impacts to Fish and Wildlife Species and Their Habitat	Coordinate with BLM, Forest Service, and USFWS on wildlife issues/impacts associated with the Project.
Nevada Public Utility Commission	Utility Environmental Protection Act Permit For Electric Transmission Line Project	Determine whether the proposed utility facility will serve the public interest as detailed in Nevada Administrative Code 703.4255.
Nevada State Historic Preservation Office	Section 106 Consultation, NHPA	Consult with the BLM, the Proponents, other land management agencies, and others regarding activities potentially affecting cultural resources.
Local and County (Idaho, Wyoming, and Nevada)		
County Commissioners	Conditional Use Permits	Consider issuance of conditional use permits for construction of transmission line and substations (varies by county).
Planning Department	Temporary Use Permit	Consider issuance of Temporary Use Permit for material and contractor yards.
Public Works Department	Encroachment Permit	Consider issuance of an encroachment permit for new access roads where they intersect with existing county roads.
	Road Crossing Permit	Consider issuance of road crossing permit for overhead transmission lines.
City of Kuna, Idaho	Variance and special use permits	Consider issuance of a variety of exceptions to existing land use plans, zones, etc.

1.4.2 Major Federal Consultations

Before the BLM can decide to grant the ROW, consultation with several Indian Tribes and federal and state agencies is required, including concurrence from the USFWS in the form of a concurrence letter or Biological Opinion (BO), concurrence from the Wyoming and Idaho State Historic Preservation Offices (SHPOs) concerning the treatment of historic properties, and concurrence from the Forest Service as part of the above consultations where NFS lands are involved.

1.4.2.1 Government-to-Government Consultation

The BLM is responsible for compliance with a host of laws, Executive Orders (EOs) and Memorandums, treaties, departmental policies, and other mandates regarding their legal relationships with and responsibilities to Native Americans. The government-to-government relationship that the United States has with federally recognized Indian Tribes started with the Commerce Clause of the U.S. Constitution where Tribes were recognized as sovereign nations, and has continued in federal laws and policies including but not limited to National Historic Preservation Act (NHPA)[8], NEPA,

[8] 16 U.S.C. § 470, as amended by Public Law (P.L.) 91-243, P.L.93-54, P.L.94-422, P.L.94-458, P.L.96-199, P.L.96-244, P.L.96-515, P.L.98-483, P.L.99-514, P.L.100-127, and P.L.102-575.

Archaeological Resources Protection Act (ARPA), American Indian Religious Freedom Act (AIRFA), Native American Graves Protection and Repatriation Act (NAGPRA), and EOs 12875, 12898, 13007, 13084, and 13175. Compliance with this body of law requires consultation with Tribes on the effects of proposed actions. Specific guidance includes, but is not limited to, formal government-to-government consultation, treatment of discoveries of burials and Native American objects, and treatment of traditional cultural properties [TCPs] and sacred sites and landscapes.

A list of Tribes that have been contacted to date and invited to government-to-government consultation is found in Chapter 5. Tribes have also been invited to participate as concurring parties in a Programmatic Agreement (PA) under development for this Project under Section 106 of the NHPA.

1.4.2.2 U.S. Fish and Wildlife Service

Consultation with the USFWS may be required to comply with the Endangered Species Act (ESA) under Section 7 of the ESA, as amended 16 U.S.C. § 1536(a)(2)(1988), for species listed as threatened or endangered or a candidate for listing. The BLM must analyze the effects of the proposed Project on the species and on their designated critical habitat if present. A Biological Assessment (BA) will identify the nature and extent of impacts and recommend mitigation measures to reduce potential impacts. If the BLM concludes that there could be an adverse impact to a listed species or candidate for listing, it would submit the BA to the USFWS with a request for concurrence with the impact assessment in either informal or formal consultation.

If the USFWS concludes that there could be an adverse effect on one or more listed or candidate species, but that the action would not jeopardize the existence or recovery of the species, then the USFWS would provide a BO regarding the action, accompanied by required terms and conditions to minimize the adverse impact, and by an Incidental Take Permit. Mitigation measures identified in the BO would be incorporated into the terms and conditions of a ROW grant.

1.4.2.3 Advisory Council on Historic Preservation

Federal agencies are required by Section 106 of the NHPA to consider the effects on historic properties (listed or eligible for listing on the National Register of Historic Places [NRHP][9]). The BLM, as the lead federal agency, must provide the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on adverse effects on properties listed on or eligible for the NRHP.

1.4.2.4 State Historic Preservation Officers

The BLM would consult with each state’s SHPO regarding adverse effects from the Project and to determine site eligibility. If historic properties would be subjected to adverse effects that cannot be avoided, the BLM would consult with each state's SHPO and the ACHP to determine eligibility and effect. The treatment of adverse effects would be addressed in a PA.

[9] Authorized by the NHPA of 1966 (P.L. 102-575).

1.5 RELATIONSHIP TO POLICIES, PLANS, AND PROGRAMS

Land use plans, in various forms, are written by agencies to guide the management of resources and uses within their jurisdiction. The BLM has RMPs or MFPs in place for all lands affected by this Project. The Forest Service has Forest Plans in place for the NFs that may be affected. Table 1.5-1 lists the various federal land use plans that provide direction and management standards for activities within their jurisdiction, their year of publication, and the status of their revision. Some of the plans are currently under revision, but because no decision has been made, the current plan (and not the proposed or draft plan) is the applicable land use plan to determine whether the Project complies with the land use plan. The BLM will make no decision that would preclude the authorized officer from selecting any of the RMP alternatives under consideration in a plan revision before final plan decisions are made. The BLM will reconsider its determination of conformance with a plan if new plans are approved prior to the publication of the Final EIS.

Table 1.5-1. BLM and Forest Service Land Use Plan Status along Gateway West Proposed Route

Segment/Alternative	Administrative Unit	Applicable Plan Name	Plan Year
Wyoming			
1E, 1E-A, 1W(a), 1W(c)	Casper BLM Field Office	Casper RMP	2007
1E, 1W(a), 1W(c)	Medicine Bow-Routt National Forests	Medicine Bow National Forest Revised Forest Plan	2003
1E, 1E-B, 1W(a), 1W(c), 2, 2A, 2B, 3	Rawlins BLM Field Office	Rawlins RMP	2009
3, 4, 4A, 4B, 4C, 4D, 4E, 4F	Rock Springs BLM Field Office	Green River RMP	1997
4, 4A, 4B, 4C, 4D, 4E, 4F	Kemmerer BLM Field Office	Kemmerer RMP	2010
Idaho			
4, 4A, 4B, 4C, 4D, 4E, 4F, 5, 5A, 5B, 5C, 7, 7A, 7B, 7H, 7I, 7J	Pocatello Field Office	Pocatello RMP	1988
5, 5A, 5B, 5C, 5D, 7, 7A, 7B, 7H, 7I, 7J	Pocatello Field Office	Malad MFP	1981
4	Caribou-Targhee National Forest	Revised Forest Plan for the Caribou National Forest	2003
6, 8, 8A,10	Shoshone Field Office	Monument RMP	1986
8	Shoshone Field Office	Bennett Hills/Timmerman Hills MFP	1980
7H, 7I, 7J	Sawtooth National Forest	Sawtooth National Forest Revised Forest Plan	2003
5	Burley Field Office	Monument RMP	1985
5, 6, 7, 9, 10	Burley Field Office	Cassia RMP	1985
7I, 7J, 9, 9A, 9B, 9C, 10	Burley Field Office	Twin Falls MFP	1982
8A, 9, 9B	Jarbidge Field Office	Jarbidge RMP	1987
8	Four Rivers Field Office	Jarbidge RMP	1987
8, 8B, 8C	Four Rivers Field Office	Kuna MFP	1983
8, 8B, 8D, 9, 9D, 9E	Four Rivers Field Office	Morley Nelson Snake River Birds of Prey National Conservation Area RMP	2008
9, 9E	Bruneau Field Office	Bruneau MFP	1983
8, 8B, 9, 9D, 9E	Owyhee Field Office	Owyhee RMP	1999
Nevada			
7I, 7J	Wells Field Office	Wells RMP	1985

1.5.1 Plan Amendments

In some cases, the Proposed Route or Route Alternatives do not conform with the management objectives provided in the applicable plan. In these cases, the BLM and the Forest Service can deny the Project, require modifications to the Proposed Route or Route Alternatives so that they are in conformance, or amend the applicable plan. Where possible, the proposed Project has already been modified to conform with the plans. Portions of the Proposed Route and the Route Alternatives still do not conform with one or more of the plans. As part of the ROD, the BLM and the Forest Service will decide whether to implement an amendment for a corresponding route or alternative if the decision is to grant a ROW. Section 2.2.1 identifies whether an amendment would be needed for each Proposed Route and Route Alternative and what sections of Chapter 3 would be affected if a plan amendment were required. Chapter 3 resource sections discuss plan amendment consequences. Appendix F contains the specific plan amendment language and Appendix G contains the rationale and analyses for consideration of amending Visual Resource Management (VRM) classifications. Documentation on the need to amend plans is located in the administrative record.

1.5.2 West-Wide Energy Corridors

In addition to the BLM land use plans, and in response to Section 368 of the Energy Policy Act of 2005, the BLM has participated in a programmatic EIS (PEIS) for the designation of energy corridors on federal land in the 11 western states (DOE/EIS-0386 [DOE and BLM 2008]), commonly known as West-wide Energy corridors or WWE corridors, in which the DOE and the BLM were the lead federal agencies, and the Forest Service and other agencies were cooperators.

A Final PEIS was published on November 28, 2008 (DOE and BLM 2008). A ROD on the PEIS signed January 14, 2009, designates energy corridors and provides guidance, best management practices, and mitigation measures to be used where linear facilities are proposed crossing federally managed lands. Where the PEIS identifies corridors that are new corridors for the managing agencies, the ROD also amends 92 relevant land management plans to include the new corridor. Designation of corridors does not require their use nor does such designation exempt the federal agencies from conducting an environmental review on each project. While the PEIS amended the relevant land management plans to add a corridor, it did not necessarily amend underlying land allocations, including visual resource management designations, to allow for overhead transmission lines.

The Final ROD is available online at http://corridoreis.anl.gov/eis/guide/index.cfm. The Gateway West EIS takes into consideration the corridors and tiers to the Final PEIS. Further discussion regarding the use of the WWE corridors for the Project is found in Section 2.4.13. The Final ROD contains Interagency Operating Procedures (IOPs), which were developed under the Section 368 Corridor program. These IOPs establish minimum requirements that would be incorporated as appropriate into projects such as Gateway West. Appendix H describes the consideration given to Final ROD IOPs for the Gateway West Project.

1.6 RIGHT-OF-WAY EASEMENT ACQUISITION PROCESS FOR NON-FEDERAL OWNERS

The Proponents would negotiate details regarding needed land acquisition across privately owned lands, either in fee or as an easement, for the transmission line and associated facilities (substations, etc.) with each landowner. In exchange for the right to operate the transmission line and facilities, the Proponents would compensate the landowner for the use of the land. The negotiations between the Proponents and the individual landowner could include compensation for loss of use during construction, loss of nonrenewable or other resources, and the restoration of unavoidable damage to property during construction. BLM does not have the legal authority to impose stipulations on private lands. Private landowners may negotiate stipulations as part of their agreements.

If a fee ownership or an easement cannot be negotiated with the landowner, the Proponents may acquire the rights needed under eminent domain laws prevailing in the affected states. State statutes have been enacted that define the acquisition process on private and non-federal public lands for utilities.

1.7 SCOPE OF THE ANALYSIS

1.7.1 Geographic Scope

The geographic scope of this analysis varies by resource. In Chapter 3, each resource section begins by defining the geographic area of analysis relevant to that resource. In addition to larger geographic areas specifically defined for individual resource analyses, two areas are defined here and used consistently throughout this EIS.

Siting Study Area – This is the area shown on Figure 1.1-1. The study area was used during initial siting to allow the selection of the Proposed Route and Route Alternatives, and was initially defined as being 10 miles on either side of the centerlines of the Proposed Route and Route Alternatives considered in the initial siting process. The siting study area is also large enough to include all facilities, including roads, substations, structures, and any areas needed for construction. As mapped, the siting study area includes 29.4 million acres, distributed by ownership as shown in Table 1.7-1. As the Project study proceeded, the Proposed Route and Route Alternatives were refined and Analysis Areas more narrowly defined. See Chapter 3 for details.

Table 1.7-1. Land Ownership Distribution in the Gateway West Siting Study Area

Landowner/Land Manager	Percent of Study Area
BLM	41.9
Bureau of Reclamation	1.1
State of Idaho	1.8
Indian Reservation	1.4
Department of Defense	0.4
National Park	0.6
National Wildlife Refuge	0.3
Private	42.6
National Forest	6.0
State of Utah	0.2
State of Wyoming	3.7

Right-of-Way – The ROW refers to the area, generally centered on the proposed transmission line centerline, requested by the Proponents of BLM and of other landowners and managers for the construction, operations, and maintenance of the transmission line. The width depends on the number of circuits and voltage; a 300-foot ROW is requested for the double-circuit 500-kV sections, a 250-foot ROW for the 500-kV single-circuit sections of the Project, and a 125-foot ROW for the 230-kV single-circuit sections of the Project[10]. Agreed ROW width on non-federal lands may vary based on local agency permits or landowner negotiations. Additional lands would be required for associated facilities such as substations and access roads. Access roads may be within the ROW, but also may occur outside of the ROW. Estimated acres of land required for construction and operations including ROW and associated facilities by landowner are summarized in Table 1.7-2 and detailed in Chapter 2 and Appendix B.

Table 1.7-2. Land Ownership Distribution in the Gateway West Proposed Action ROW

Landowner/ Land Manager	Construction		Operations	
	Acres 1/, 2/	Percent 2/	Acres 2/	Percent 2/
BLM	16,252	44.4	14,680	45.1
Bureau of Reclamation	170	0.5	167	0.5
Military Reservations/ Corps of Engineers	<1	<0.1	<1	<0.1
National Forest	489	1.3	460	1.4
Other State Lands	8	<0.1	8	<0.1
Private	17,119	46.8	15,039	46.2
State	2,532	6.9	2,194	6.7
State Fish and Game	2	<0.1	2	<0.1
Water	17	<0.1	17	<0.1
Total	**36,590**	**100.0**	**32,568**	**100.0**

1/ Construction ROW acres are greater than operations ROW acres due to additional areas needed for staging areas, fly yards, and wiring pulling/splicing sites; however, not all of the ROW would actually be disturbed.
2/ Numbers are rounded to the nearest acre/percent; therefore, columns may not sum exactly.

Right-of-Way for Geotechnical Assessment – The Proponents conducted geotechnical surveys on federal lands under a short-term ROW granted by the BLM. These surveys were needed to collect geotechnical soil property information for the design of tower foundations and support structures. An Environmental Assessment (EA) was completed in June 2010 to analyze the application for the ROW. The EA is incorporated by reference into this EIS (BLM 2010a).

1.7.2 Temporal Scope

The analysis will address the effects of the Proposed Action, No Action Alternative, or Route Alternatives, including construction (short-term), operations and maintenance (long-term), and decommissioning and abandonment (long-term). Construction would occur between 2013 and 2018. Therefore, short-term effects occur within that 5-year time frame. Typically, transmission lines of this size are designed for a working life of 50 years although, in practice, the useful life is often much longer. Therefore, 50 years is considered long term.

[10] The Proponents have proposed a Design Variation for detailed analysis that would replace the double-circuit 500-kV structures on Segments 2 through 4 with two single-circuit 500-kV structures using a 350-foot wide ROW (see Chapter 2, Section 2.1.2).

1.7.3 Actions Not Connected

Connected actions (those that are closely related and therefore should be discussed in the same impact statement) are defined by CEQ (40 CFR Part 1508.25) as actions that are automatically triggered that may require an EIS, cannot or will not proceed unless other actions are taken previously or simultaneously, or are interdependent parts of a larger action and depend on the larger action for their justification. For this Project, interdependent actions considered as part of the overall Project include construction and operations for all 10 segments, the associated substation expansions or constructions, the fiber optic communication system and its regeneration stations, access roads, and all temporary staging areas and fly yards used during construction. Potentially related energy considerations and development actions discussed below were reviewed to determine if they were connected to the Proposed Action. There are no actions currently proposed that are connected actions.

1.7.3.1 Generation

Given the CEQ's definition, electrical generating sources that might use the Gateway West Project to transmit their power are not connected actions. Therefore, electrical generating sources are not analyzed in the direct and indirect effects analysis, but are included in the consideration of cumulative impacts. The requests for generation interconnection, whether they be fossil or renewable, to which the Proponents must respond under FERC regulations, are made to multiple carriers, including other utilities. If they are unable to respond to an interconnection request due to a denial of a ROW grant from BLM, other carriers may respond. Therefore, the new generation requests do not qualify as connected actions under the "automatically trigger" criterion.

The Gateway West Project can proceed without any one generation project. Multiple generators have made interconnection requests. The overall demand, rather than any one project, provides part of the impetus for the Project. Therefore, no particular generation project is necessarily tied to Gateway West.

Independent producers are building new wind farms and have proposed many more. Some of these projects would be constructed, sending power into the grid before the Gateway Project is permitted. Therefore, their wind farms are not driving the Project and are not "connected actions" under the "part of a larger action" criterion.

There are other proposals to carry new generation to various markets, including markets farther south in Nevada, California, and Arizona. If Gateway West is not built, the generation would likely still be built and other projects could reasonably be expected to carry the additional electricity to market. Therefore, the generation projects do not induce or automatically trigger the Project.

1.7.3.2 Load Growth (Demand)

Load growth, whether industrial, commercial, or residential, puts a strain on the existing grid to supply additional electricity. While the existing grid can, and does, supply the demand, as the load on each of the transmission lines grows, the opportunity for spreading that load on remaining transmission lines, should one fail, drops until the loss of a single transmission line can cause a cascading blackout scenario reminiscent of the Northeast disaster of August 14, 2003. While Gateway West would alleviate the

strain on the grid, it is not "automatically triggered" by load growth. There are other transmission lines that use other routes from other generation sources that could also help to supply and support the load, such that the Project is not required simply because of load growth.

Another connected action question is whether Gateway West "automatically triggers" load growth. Because the public utilities commissions of Idaho and Wyoming must allow the utilities to pass on the capital costs of system improvements, including but not limited to Gateway West, those commissions prohibit "speculative" construction and only permit capital improvements that show a clear demand ahead of construction. While this does include predictive models that estimate future growth, they are subject to review and approval by the commissions. Therefore, a project like Gateway West is in response to, rather than in anticipation of, load growth.

There is some concern that the mere presence of a competent grid that can manage current and future loads would incur further or greater growth than would occur without the grid in place. A large industrial facility, for example, if sited in the service area of either utility, could bring its own load growth and also bring direct and indirect employment that might increase local populations and therefore further increase load growth. In the absence of reassurances from the utilities that electrical supplies in the volumes needed by the industry would be available, the industry would locate elsewhere. While that is true for the grid as a whole, no individual project is responsible for the presence or absence of growth, because there are multiple paths along which such load demand could be satisfied. Gateway West, in and of itself, is not required to meet such growth nor would it, by itself, trigger such growth.

Load growth is a cumulative term assigned to a variety of smaller events, including population increases and new commercial and industrial projects that provide jobs to that population. None of those events is directly linked to Gateway West, and Gateway West would proceed independent of any one of those events. They do not qualify as a "larger action" because they are not, individually or collectively, part of any federal action, and are not an organized "action" in any permitting venue.

1.7.3.3 Other Electric Transmission Lines in the Region

Rocky Mountain Power's Web page[11] includes the Project as part of its larger system planning for an "Energy Gateway" for its service area. Idaho Power's Web page[12] includes the Project as part of its larger vision for improved grid efficiency, which includes other transmission lines. The WECC[13] and the NTTG[14] Web sites all show the Gateway West Project as one of several new projects needed to complete an efficient Northwest electrical service grid.

The other lines are either planned to be in service before Gateway West, planned well after the in-service dates of Gateway West, or serve different components of the service area. The construction of one of these components of the grid does not automatically trigger another because each can and will be built and operated

11 http://www.rockymountainpower.net/ed/tp/eg.html
12 http://www.idahopower.com/AboutUs/PlanningForFuture/ProjectNews/GatewayWest/default.cfm
13 http://www.wecc.biz/Planning/TransmissionExpansion/Transmission/Pages/default.aspx
14 http://www.nttg.biz/site/

independently. Each responds to a set of generation requests and demand growth projections for different parts of the overall service area. Some parts of the projected new grid have not yet been formally proposed and therefore would not be considered "connected" actions in any case.

While other proposed new transmission lines must be considered as part of the cumulative impacts analysis for Gateway West, they are not "connected" actions as they fail all three tests for connectivity:

1. No new transmission line would "automatically trigger" the construction of the Gateway West and the Project would not "automatically trigger" the construction of other transmission lines. Each of these lines serves a particular purpose in strengthening the overall grid. Though the grid will be more robust when several additional transmission lines are built, each is designed to function as a single addition to the grid, and must calculate how the grid would carry its increased load if for some reason the new transmission line fails. The grid only allows the construction of a new line if the old grid can still carry its additional load. Therefore, new transmission lines do not "automatically trigger" one another.
2. Gateway West has sufficient justification to be built in the absence of the other proposed transmission lines. It does not require the construction of another transmission line to be put into service. Therefore, it can and would proceed without other actions taken previously or simultaneously, failing the second test for connected action.
3. The electrical grid that supplies energy to North America, including Canada, is a complex and interconnected system. Any new transmission line proposed will be part of the interconnected whole. Therefore, Gateway West, along with any other new or existing transmission line, is part of an electric system. However, the mere existence of an interconnected electric grid is not an "action" in and of itself. Instead, it is an existing system with requirements for new participants, which Gateway West must meet to interconnect. Further, the justification for the Project is expressed in terms of a required response to new generation and an equally required response to increased load demand, rather than in terms of meeting the needs of "the grid." Therefore, it fails the third test because it is not part of a larger action or dependent on the larger action for its justification.

1.8 SCOPING AND PUBLIC INVOLVEMENT

The agencies initiated public scoping with publication of a Notice of Intent to prepare an EIS in the Federal Register on May 16, 2008 (73 Federal Register 28425). The Notice of Intent was followed by a series of nine public meetings in 2008:

- Tuesday, June 3, 2008, in Twin Falls, Idaho;
- Tuesday, June 3, 2008, in Murphy, Idaho;
- Wednesday, June 4, 2008, in Pocatello, Idaho;
- Wednesday, June 4, 2008, in Boise, Idaho;
- Thursday, June 5, 2008, in Montpelier, Idaho;
- Monday, June 9, 2008, in Casper, Wyoming;

- Tuesday, June 10, 2008, in Rawlins, Wyoming;
- Wednesday, June 11, 2008, in Rock Springs, Wyoming; and
- Thursday, June 12, 2008, in Kemmerer, Wyoming.

Information about the Project was provided at the public meetings and via a BLM-hosted Internet Web site. Public comments were taken at the public meetings (oral and written), through the Web site, via e-mail, and regular postal service.

The public scoping period closed after 45 days on July 3, 2008. Due to the Independence Day holiday on July 4, any comments received by July 11, 2008, were included in the scoping comment analysis. Once all the comments were collected, they were read and substantive comments were sorted by subject. Comments were grouped and issues were identified that could be used to develop alternatives (including suggestions for alternate routes, mitigation measures or design criteria) and identify resource effects and sources of information.

After the formal public scoping period and during an internal review by the BLM and cooperating agencies, non-federal cooperating agencies requested an extended period of time to develop additional alternatives. The BLM responded by incorporating all comments received by September 4, 2009, into a revised scoping report. More information on details of the scoping comment analysis process and outcome can be found in the Gateway West Transmission Line Project Scoping Summary Report (Tetra Tech 2009a).

In addition, the Proponents have conducted multiple meetings to which landowners within a 2-mile-wide corridor were invited in 2008 and 2009. The comments received from these meetings or provided in writing thereafter were documented and submitted to BLM and were incorporated, if received by September 4, 2009, in the revised scoping report. The Scoping Report is posted on the BLM project Web site (http://www.wy.blm.gov/nepa/cfodocs/gateway_west).

Chapter 5 of this EIS, Consultation and Coordination, describes the outreach and scoping conducted. Although the formal scoping period has closed, additional scoping comments from agencies and the public at large regarding the Project will continue to be accepted through the release of the Draft EIS. The next formal opportunity to comment is during the 90-day comment period after the publication of this Draft EIS.

1.9 ISSUES TO BE ANALYZED

Development of this EIS, including the alternatives considered and the analysis, is driven by issues. Issues were determined through internal and public scoping, direction in agency handbooks, and requirements of federal and state laws and regulations. The following describes the issues that were determined from public scoping and where in the EIS these issues are addressed depending on how they were categorized.

1.9.1 Purpose and Need for the Project

Concerns about the purpose and need for the Project were related to why it is needed, who would benefit, and questions about the use of other, renewable energy sources.

These issues are addressed in this chapter, except where otherwise noted.

- Why is this line needed?
- Who would benefit from this transmission line?
- Could the need for this transmission line be avoided with conservation, improved efficiency, using renewable resources, or other management actions?
- Could the transmission line be designed so that sources of renewable energy may be incorporated?
- How fiscally sound are the Project and the Proponents?
- Is it physically feasible to construct and operate the Project on some of the rugged areas proposed?
- Why is redundancy needed in some parts of the line and not others?
- Would the transmission line benefit local utility customers?

1.9.2 Alternative Development Issues

Many suggestions have been made and considered regarding the location of the Proposed Route, or methods and timing of construction. These issues are addressed in Chapter 2 as part of the alternative development process and description of the alternatives (including design features and environmental protection measures).

Requests were made to analyze or dictate the type of electricity generation that would or should be carried on the transmission line. Section 1.7.3 provides an explanation of why generation is not considered a connected action and therefore is not included in the direct and indirect effects analysis. Some known, proposed generation sources that occur within the cumulative effects analysis area were considered in the cumulative effects analysis where applicable.

Route Alternatives were identified that could reduce the impacts suggested for each issue. The feasibility of each Route Alternative was then considered, such as physical ability to construct the Project in that location and other resource impacts. If it was determined that an Alternative was not feasible, it is described as an *Alternative Considered but Eliminated from Detailed Analysis* in Chapter 2. Alternative development issues and the alternatives that were considered in detail in the EIS are described in Table 1.9-1.

Table 1.9-1. Alternative Development Issues and Alternatives Considered in Detail

Alternative Development Issue	Alternatives Considered in Detail
Can the transmission line follow the West-Wide Energy (WWE) corridor as much as possible?	1E-A, 1W-A, 2A, 8A, and 9B
Can the transmission line follow existing transmission lines more closely?	2A, 4A, 5C, and 9B
Can the visual impacts on historical trails be reduced by moving the line away from the historic trails?	4B, 4C, 4D, 4E, and 7C
Can the transmission line be routed to avoid Cokeville Meadows NWR?	4C
Can the transmission line be routed to avoid impacts on active coal mines?	4D and 4E
Can the transmission line be routed to avoid visual impacts on Fossil Butte National Monument?	4C, 4D, and 4E

Table 1.9-1. Alternative Development Issues and Alternatives Considered in Detail (continued)

Alternative Development Issue	Alternatives Considered in Detail
Can the impacts on BLM VRM I and II and Forest Service VQOs/Scenic Integrity Objectives (SIO) Preservation, Retention, Partial Retention, and Modification Class lands be reduced or avoided?	5A, 5B, 7A, and 7A, 7B, 7H, 7I, & 7J
Is there a more direct (shorter) route?	4A, 5C,
Can the amount of high-quality forested habitat affected on BLM lands be reduced?	5A, 5B, 7A, and 7B
Can more sage grouse leks, lek buffers, or core/key sage grouse habitat be avoided?	4A, 4F 7C, and 7F
Can an alternative be developed that avoids areas where ROWs are not excluded by the Cassia RMP?	7D
Can the hang gliding launch area be avoided?	7E and 7F
Can the BLM motorized vehicle closure (winter range, mule deer, sage-grouse) be avoided to reduce the need for exceptions in order to access the line?	7G
Can the transmission line be moved away from active farms, residential developments, and planned infrastructure projects?	5C, 5E, 7H, 7I, 7J, 8B, 8C, 9A, 9B, 9C, 9D, 9E
Can routes be located more on public lands than private lands?	1E-C, 5C, 7E, 7F, 7H, 7I, 7J, 9D, 9E

1.9.3 Effects and Analysis Content Issues

Some of the issues raised in scoping dealt with the effects of the Project and what should be included in the analysis. These issues, summarized below, are detailed in Chapter 3 sections on affected environment, direct and indirect effects, in Chapter 4 on cumulative effects analysis for each resource, and in Chapter 5 on consultation.

Visual Resources

- Would an inventory of all potentially affected viewsheds be carried out?
- Could the transmission line be located where it is not visible from residences?
- Do the visual effects conform to Visual Resource Management or Visual/Scenic Quality Objectives established in land use plans?
- How would visual effects conform to goals in RMPs and Forest Plans?
- Would increased public access degrade visually sensitive areas?
- How would sensitive viewing areas be affected?
- Would the effects on visuals interfere with the public's enjoyment of the site?
- Would public views be obstructed?
- What would visual impacts of construction be on natural formations such as mountains?
- How would impacts on visual resources affect income from tourism?
- What would be the effects on light pollution at night?
- What would be the impact on designated areas of scenic importance, such as Scenic Byways?

- How would visual effects be mitigated?

Cultural Resources

- What values do the area's Native American communities ascribe to places of historic and traditional significance?
- Would all impacted Native American tribes be consulted?
- What would be the impact on Native American Tribes and would their treaty rights and privileges be addressed?
- Would a complete inventory of potentially impacted cultural sites be carried out?
- Would the design of structures such as towers and substations minimize their visual impact to the setting of historic properties?
- What are the impacts on eligible prehistoric resources?
- What are the impacts on eligible historic resources?
- What would be the visual and recreational impacts on historic trails?
- Would TCPs be affected?
- Where the setting is an important aspect of the integrity of a property, would the setting be affected?

Socioeconomics

- Is there sufficient housing available for temporary and permanent workers?
- Would the temporary workforce have detrimental effects on existing services in local municipalities?
- What would be the effects on population numbers?
- What would be the effects on economic conditions?
- Would education or schools be affected?
- Would public services such as police or fire protection be impacted?
- How would the Project affect tax income to local governments?
- How would development of the Project impact municipal infrastructure and other planned development?
- How would the presence of the transmission line affect the quality of life of and enjoyment of the land by local residents?
- What would be the economic impacts to individuals?
- How would this Project affect tourism and recreation?
- Would construction or operations of the Project disrupt delivery of any public utilities such as electricity or sewer?
- What municipalities and other population concentrations would be impacted?
- Under what circumstances would private land be condemned, and what would the effects of this be?

Environmental Justice

- What would be the effects on minority populations or communities?
- What would be the effects on low income populations or communities?
- What would be the effects on Tribes?

Vegetation Communities

- How much vegetation would be cleared, and how much would be kept clear or otherwise maintained during operations?
- How quickly would the various vegetation communities that are cleared for construction but allowed to regrow during operations recover from disturbance?
- How much disturbance would occur in sagebrush communities and what would be the effects?
- How much disturbance would occur in native grasslands and what would be the effects?
- Would old-growth forest stands be affected, and what measures would be taken to protect this vegetation type?
- What would be the effects of construction, operations, and maintenance on fire occurrence, frequency, and severity; especially as they relate to important shrub-steppe and forest habitats?

Special Status Plants

- What would be the effects to endangered and threatened species, both individuals and populations?
- What would be the effects from changes in habitat for threatened, endangered, or sensitive (TES) plants?
- What effect would the potential spread of noxious weeds have on special status plants?
- Would hydrology be altered in occupied habitat for TES species associated with wetlands and what effect would the alteration have on those species?

Invasive Plant Species

- Would noxious weeds be introduced or spread into the ROW and adjacent areas?
- How would the presence of the Project impact efforts to control existing noxious weeds?
- Would a noxious weed prevention and abatement plan be developed in conjunction with the appropriate agencies?

Wetlands

- What would be the effects on permanent and seasonal wetlands?
- Would riparian areas be affected?

- Can equipment staging and/or refueling areas be kept away from wetlands and riparian areas?

General Wildlife and Fish

- What would the effects of Project construction and operations be on general, non-special-status wildlife, including birds, reptiles and amphibians, and large and small mammals?
- When routing the Project, would key wildlife habitats be avoided?
- What would the effects be on migratory bird species?
- Would there be a loss or fragmentation of wildlife habitat, especially for sagebrush-obligate and forest-dependent species?
- What wildlife mortality would occur during construction?
- Would there be a potential for disruption of breeding and reproductive activities of raptors?
- What would be the effects on big game migration?
- What would be the effects on big game and crucial big game winter range—habitat removal and disturbance during seasonal occupancy?
- What would be the effects on big game parturition areas from habitat removal and disturbance during seasonal occupancy?
- What would be the potential for avian collision during operations and what measures would be taken to minimize this risk?
- Would noise created during transmission line operations affect wildlife?
- What best management practices would be used during construction and operations to protect fish resources?
- How would disturbed instream habitats be protected and restored?
- What would be the potential for electrocution of large birds during operations?
- What would be the impacts on wildlife or wildlife habitat within an NWR, State Park, State Wildlife Management Area, or Special Management Area on federal lands specifically managed for one or more species of wildlife?

Special Status Wildlife and Fish Species

- What would be the effects of Project activities on species federally listed as threatened, endangered, candidate, or proposed?
- How would Project construction and operations affect predation on sage-grouse and sharp-tailed grouse, and how would these risks be minimized?
- How would the Project affect sage-grouse and sharp-tailed grouse habitat?
- Would the Project comply with sage-grouse and sharp-tailed grouse Conservation Plans?
- What agencies and conservation groups would be consulted?
- What would be the impacts on nesting and wintering eagles and their habitat?

- What would be the effects on species listed as sensitive by the BLM? Specifically, what would be the impacts to greater sage-grouse breeding and brood rearing areas and where would these impacts occur?
- What would be the effects on species listed as sensitive by the Forest Service?

Minerals

- What effects would the Project have on coal, trona, and phosphate mining areas and leases?
- What effects would the Project have on oil and natural gas wells and leases?

Paleontological Resources

- Would a full inventory of potentially affected paleontological resources be carried out?
- Would fossils be damaged during construction?
- Would fossils be removed or destroyed by increased access to protected areas?

Geologic Hazards

- Would a full inventory of potentially affected geological resources be carried out?
- What would be the potential for earthquakes to damage the transmission line and associated structures?
- What effect would subsidence from underground mining have on the transmission line, and what would be the hazard to workers or infrastructure?
- What effect would landslides have on the transmission line?
- What effect would construction blasting in shallow bedrock have on unstable landforms (landslide-prone areas) or on adjacent man-made structures not related to the transmission line?

Soils

- What would be the effect on soil erosion, and the potential for increased soil erosion from Project construction, operations, and decommissioning?
- What would be the effect on Project soils from compaction by vehicle and equipment traffic?
- What effect would topsoil disturbance have on soil productivity after construction and reclamation?

Water Resources

- What would be the impacts to water quality from roads and other causes of erosion?
- Would state water quality standards be met?
- Which pollutants could enter waterbodies and what would be the impacts from them?
- What would be the impacts on drinking water, wells, and springs?
- Would municipal water service to individual properties be affected?

- What would be the handling procedures for hazardous materials near waterbodies and wells?
- Would water be drawn from surface waterbodies, and what would the effects of that be?
- What storm water permits would be required, and would their stipulations be met?
- Would there be any impacts on water rights?
- What would be the impacts from sedimentation and temperature increases in sediment and temperature-impaired water bodies?
- Would there be a risk of floods?
- Would groundwater be affected?

Land Use and Recreation

- How would the project affect concentrated animal feeding operations (CAFO)?
- How would the project affect current agricultural systems, including pivot irrigation and advanced positioning systems used in farm equipment?
- What residential areas, planned development, and specially designated uses would be affected?
- How would the Project affect specially designated areas including NWRs, National Parks, National Monuments, Special Management Areas, and recreation sites, and roadless areas?
- How would the transmission line affect timber and fire management activities?
- What would be the effect on Indian Reservations?
- To what extent would the Project be co-located with existing developments?
- Would hunting or fishing be affected?
- Would there be any losses of recreational opportunities?
- Would the Project adhere to local land use plans and policies?
- Would the Project impact any military activities?
- How would construction of this transmission line influence the installation of more developments and projects in the same area in the future?
- Would construction buffers around buildings be maintained?
- What permits and plan amendments would be required for this project?
- What would be the plan for re-entries and maintenance activities on private land which would continue for decades into the future?

Agriculture

- How much agricultural land would be impacted, and what would the effects be?
- What would be the effects on livestock grazing of construction and operations of the transmission line?
- Would there be a loss of prime farmland?

- What would be the impacts to agricultural production including equipment operation and aerial spraying?
- Would there be a disruption to dairy operations and other types of CAFOs?
- How would the transmission line interfere with crop dusting?
- Would the transmission line cause electronic interference with agricultural equipment?

Transportation

- Would a full map and inventory of all new temporary and permanent access roads for the Project be developed?
- How would vehicles taking materials and personnel to and from the Project site affect traffic patterns?
- How would roads, highways, railroads, and airports be affected?
- How would pipelines be affected?
- Would there be an increase in off-highway vehicle use, and what would be the environmental impacts of this?
- Would construction and operations of the Project cut off access to any previously-accessible areas?
- How would roads affect livestock and grazing operations?
- What would be the environmental effects of new temporary and permanent roads constructed for this Project?

Air Quality

- Would the proposed Project be inconsistent with the applicable air quality plans?
- What would be the effects on human health of any increase in airborne pollutants caused by the Project?
- Would the proposed Project generate emissions of air pollutants that would exceed established thresholds, or cause adverse impacts on air quality?
- Would the proposed Project cause or contribute to any violation of any state or federal ambient air quality standards?
- Would the proposed Project expose sensitive receptors to substantial pollutant concentrations?
- What would be the methods used to control dust?
- What would be the steps taken to minimize air quality impacts?
- How much greenhouse gas emissions would be associated with this project, and what would be the effect of the Project on climate change?

Electrical Environment

- Would voltage on the conductors of the transmission lines build up, for example in large vehicles or pivot irrigation systems, and produce nuisance shocks, or lead to fuel ignition?

- Would electric and magnetic fields (EMF) associated with transmission lines cause health effects?
- Would the audible noise during operations be loud enough to be annoying or interfere with normal communication?
- Would stray voltage be a concern in the context of animal care where unwanted voltage on feeders, watering stations, or equipment such as milking machines, can lead to reduced food or water intake.
- Would services such as Global Positioning System (GPS) receivers, satellite dish receivers, cell phones, AM/FM (amplitude modulation/frequency modulation) radio, two-way radio communication, television, and internet be disrupted?

Public Safety

- Would the Project cause environmental contamination or expose workers or the public to contamination?
- What would be the effects of electric and magnetic fields?
- Would the transmission line withstand wind and ice storms?
- Would the transmission line cause fires or create a fire hazard?
- Would workers or the public be safe from electrocution?
- What would be the effects of the transmission line on human health?
- What would the Proponents do to prevent the dangers of downed lines and tower failure?
- How would the Proponents protect against potential vandalism or acts of terrorism to Project structures?
- Would electrical safety procedures be followed?

Noise

- Would people be exposed to noise levels in excess of standards established by existing regulations, ordinances, and standards?
- Would there be a substantial temporary or permanent increase in ambient noise levels in the Project vicinity above levels existing prior to Project construction and operation?
- Would people be exposed to ground-borne vibration or ground-borne noise levels?

1.9.4 Mitigation Measures and Monitoring

Mitigation measures were suggested that would minimize impacts to natural resources and to other areas of concern, such as public utilities. Monitoring and mitigation are addressed in each resource section in Chapter 3 and measures are summarized in Chapter 2 (Table 2.2-2).

- What would be the mitigation measures for air quality?
- Could the line be buried in order to reduce environmental impacts?
- What would be the measures taken to avoid interfering with existing utilities?

- What would be the mitigation measures for conflicts with existing uses for public lands?
- What would be the mitigation measures for impacts to private lands?
- Would alternatives be assessed using the CEQ's mitigation hierarchy?
- What would be the mitigation measures for cumulative impacts on biodiversity?
- What would be the mitigation measures for impacts to critical habitat?
- What would be the mitigation measures for impacts to soil?
- What would be the mitigation measures for impacts to visual resources?
- What would be the mitigation measures for impacts to historic and cultural resource sites?
- What would be the mitigation measures for impacts to conflicting uses of public lands?
- What would be the mitigation measures for impacts to grazing land?
- What would be the mitigation measures for impacts to water quality?
- What would be the mitigation measures for the loss of native plants and the spread of noxious weeds?
- Would accepted best management practices to protect water quality be implemented?
- What would the mitigation measures be to protect soil and water from fuel spills and other hazardous materials?
- What would be the mitigation measures for impacts to riparian areas and wetlands?
- What would be the mitigation measures for impacts to drinking water supplies?
- What would be mitigation measures and alternatives associated with the discharge of dredged or fill material into waters of the U.S.?
- What would be the mitigation measures that would prevent the spread of noxious weeds due to Project activities?
- What would be the mitigation measures related to impacts to vegetation communities such as mature sagebrush?
- What would be the mitigation measures for impacts to threatened, endangered, and special status wildlife species?
- What would be the mitigation measures for impacts to big game winter and parturition areas?
- What would be the mitigation measures for impacts to nesting raptors?
- What would be the mitigation measures for impacts to fish resources?
- What would be the mitigation measures for impacts from surface disturbance?
- What would be the mitigation measures for impacts to vegetation from clearing?
- Would there be a vegetation management plan that addresses noxious weeds?

1.10 CHANGES IN THE PROPOSED AND ALTERNATIVE ACTIONS

Since the Proponents first filed ROW grant applications in May 2007 with the BLM to request a ROW through Wyoming and Idaho for the Gateway West Transmission Line Project, the process of siting and routing has been a collaborative one. The Proponents have worked with the BLM; the Forest Service; other federal, state, and local agencies; local taskforces; and private landowners to find a route that minimizes impacts as much as possible consistent with the Proponents' purpose and need. Where BLM and others have recommended alternatives to be considered in detail, the Proponents have worked with the agencies to make each alternative as feasible from a cost and engineering standpoint as possible. This process has resulted in many small, and some rather large changes, and will continue to do so as more agency staff and members of the public are informed about the Project and weigh in with constructive suggestions for route improvement.

The environmental analysis for over 1,100 miles of transmission line with thousands of miles of already-identified alternatives required an agreed-upon set of proposed and alternative routes in order to prepare the Geographic Information System (GIS) and other analytical tools and to complete the writing of the Draft EIS. Therefore, for the purpose of this Draft EIS, the Proposed Route and the majority of the Route Alternatives, including their locations and descriptions, as of December 2010 were analyzed. Additional analysis was conducted in April 2011 for five Route Alternatives, including a new substation, added in early 2011.

1.11 ORGANIZATION OF THIS EIS

This document is organized into several chapters. Chapter 2 presents the Proposed Action and a range of reasonable alternatives to that action, including Route Alternatives and Schedule, Design, and Structure Variations. Chapter 3 presents the affected environment and environmental consequences, by resource and by segment, of the Proposed Route and Route Alternatives. Chapter 4 describes cumulative effects of the Project in combination with past, present, and other reasonably foreseeable projects overlapping in geography and time. Chapter 5 provides a record of consultation and coordination conducted during the NEPA process, including a summary of the public scoping process, and a list of preparers. Chapter 6 contains a glossary and index for this document. Chapter 7 contains the references for other chapters of the EIS. Appendices A, B, and C of this EIS contain maps of the Proposed Route and Route Alternatives; a detailed description of construction, operations, and maintenance actions common to all alternatives; and the environmental protection measures proposed by the Proponents, respectively. Appendix D contains oversized or lengthy tables referenced in the EIS sections, and Appendix E contains oversized figures referenced in the EIS sections. Appendix F provides proposed amendments to BLM RMPs, MFPs, and NFS Forest Plans for the Project. Appendix G provides the visual resource analysis that supports the proposed amendments in Appendix F. Appendix H describes consistency of the Gateway West Project with IOPs found in the Final RODs on the *Programmatic Environmental Impact Statement, Designation of Energy Corridors on Federal Land in the 11 Western States* (BLM 2009a; Forest Service 2009a). Appendix I contains a table listing wildlife season stipulations on federal and state lands, and Appendix J provides the framework for the analysis of sage-grouse impacts due to interstate transmission lines.

2.0 ALTERNATIVES

This chapter includes information on how alternatives were developed, describes the alternatives that are evaluated in the EIS, describes alternatives that were considered but not given detailed study and preferred alternatives, details system components common to all Action Alternatives, compares the key features and effects of the alternatives studied, and describes conformance with BLM and Forest Service land use plans.

Appendix A contains the figures referenced herein. Appendix B details the components common to all Action Alternatives, including construction and operation.

2.1 OVERALL PROJECT

As explained in the Purpose and Need section of Chapter 1, this Project was developed to meet the needs of the Proponents. The BLM, as lead agency for NEPA, is responsible for the environmental analysis of the Project. The analysis, in turn, will disclose the impacts of the Proposed Action, No Action, and a range of reasonable Action Alternatives, as well as supply the decision makers, including the BLM, the Forest Service, the BIA, and USACE, with information pertinent to deciding whether to issue a ROW grant and Special Use Permit, Rivers and Harbors Act Section 10 permit, and CWA Section 404 permit, respectively, and if so, under what conditions. This analysis may also be used by state and local governmental agencies to advise their decision-making processes.

As proposed, the Gateway West Project is composed of 10 segments of high-voltage transmission lines that would run between planned, proposed, or existing substations. These segments start at the existing Windstar Substation close to the Dave Johnston Power Plant near Glenrock, Wyoming, and continue west until reaching the existing Hemingway Substation approximately 30 miles southwest of Boise, Idaho. An overview map of the Project location and facilities is provided in Appendix A, Figure A-1. Figure A-1 shows the Proposed Route (red), feasible alternatives (green), and alternatives considered but eliminated from detailed study (purple). Maps of each segment are shown on Figures A-2 through A-12 in Appendix A. Maps of each existing, planned, or proposed substation are provided in Appendix A as Figures A-13 through A-24. Segments 5, 7, 8, 9, and 10 would be single-circuit 500-kV lines.[1] Segment 1E would be single-circuit 230-kV line and Segments 1W(a) and 1W(c) would consist of a new 230-kV line for part of their length and a reconstruction of an existing 230-kV line for the remaining part. Segment 6 would use an existing 345-kV line energized to 500 kV. The Project consists of double-circuit 500-kV structures for Segments 2 through 4 with one circuit initially operated at 230 kV.[2] The Proponents have also identified three

[1] A single-circuit transmission line (whether 230-kV or 500-kV) is composed of three electrical phases and two lightning protection shield wires. One of the lighting protection shield wires is a steel overhead ground wire (OHGW), and the other is typically a fiber optic shield ground wire (OPGW). The OPGW contains glass fibers used for communication along the fiber path for data transfer between the Proponents' facilities. The data transferred are required for system control and monitoring.

[2] A double-circuit 500-kV transmission line is composed of six electrical phases (two independent circuits of three phases each) and two lightning protection shield wires. One of the lighting protection shield wires is a steel OHGW, and the other is an OPGW. The OPGW contains glass fibers used for communication along the fiber path for data transfer between the Proponents' facilities. The data transferred are required for system control and monitoring.

variations to the overall Project for detailed analysis: 1) a ROW Design Variation for Segments 2, 3, and 4 using two single circuits in place of the single double circuit, 2) a Structure Variation in which guyed rather than self-supporting lattice structures would be used for some in-line (tangent) areas without land use or wildlife conflicts, and 3) a Schedule Variation that would entail two single circuits for Segments 2, 3, and 4 as well as phased construction over a longer time frame. If the Project is approved, the Proponents would select among the Proposed Action and the three variations based on economic conditions prior to construction. The Design, Structure, and Schedule Variations are described in Sections 2.1.2 through 2.1.4 and evaluated in Chapter 3. BLM could approve options on federally managed lands from which the Proponents could choose.

2.1.1 Proposed Action

The Project starts in Wyoming at the Windstar Substation and takes two paths to the Aeolus Substation—one that swings to the east (Segment 1E) and one (Segment 1W) that for the most part follows or parallels the WWE corridor and an existing 230-kV line (proposed for reconstruction as Segment 1W[c]). It then proceeds as a double-circuit 500-kV line from Aeolus to Populus (though in Segments 2 and 3 with one of the circuits initially energized at 230 kV between the Aeolus and Anticline Substations). At Populus, the Gateway West Project splits into two single-circuit 500-kV roughly parallel paths. Segments 5, 6, and 8 travel on a more northerly route toward the Hemingway Substation through the Borah and Midpoint Substations, while Segments 7 and 9 travel a more southerly route through the Cedar Hill Substation to the Hemingway Substation. Segment 10 provides an interconnection between the Cedar Hill and Midpoint Substations and also provides an interconnection between the more northerly and more southerly routes. The Proponents have proposed this split because of the need to serve loads along the way and also to increase reliability.

The transmission line segments would cross federal, state, and private lands. Table 2.1-1 summarizes miles crossed by ownership for the Proposed Action. The total

Table 2.1-1. Proposed Action Summary of Miles and Percent Crossed by Ownership

Segment	Length (Miles)						Percent of Total				
	BLM	NF[1/]	State	Private	Other[2/]	Total	BLM	NF	State	Private	Other
Segment 1E – Windstar to Aeolus	11.6	2.8	22.0	64.0	0.1	100.6	11.5	2.8	21.9	63.7	0.1
Segment 1W(a) – Windstar to Aeolus	26.6	2.3	18.5	29.1	–	76.5	34.7	3.0	24.2	38.0	
Segment 1W(c) – Dave Johnston to Aeolus	24.2	2.3	15.4	28.7	0.1	70.6	34.2	3.3	21.8	40.6	0.1
Segment 2 – Aeolus to Creston	36.9	–	6.2	53.5	0.1	96.7	38.2	–	6.4	55.3	0.1
Segment 3 – Creston to Anticline[3/]	29.0	–	1.0	26.5	–	56.5	51.3	–	1.8	46.9	–
Segment 4 – Anticline to Populus	82.2	9.2	10.7	97.7	3.2	203.0	40.5	4.5	5.3	48.1	1.6
Segment 5 – Populus to Borah	13.2	–	3.5	37.8	0.1	54.6	24.2	–	6.4	69.2	0.2
Segment 6 – Borah to Midpoint[4/]	–	–		0.5	–	0.5		–		100.0	–
Segment 7 – Populus to Cedar Hill	28.1	–	4.3	85.7	–	118.1	23.8	–	3.6	72.6	–
Segment 8 – Midpoint to Hemingway	86.5	–	9.3	33.4	1.8	131.0	66.0	–	6.9	25.5	1.6
Segment 9 – Cedar Hill to Hemingway	128.7	–	4.6	28.4	–	161.7	79.6	–	2.8	17.6	–
Segment 10 – Midpoint to Cedar Hill	13.1	–	–	20.3	0.1	33.6	39.2	–	–	60.6	0.3
Total Project[5/]	480.5	16.7	95.2	506.7	5.7	1,103.4	43.5	1.5	8.6	45.9	0.5

1/ Totals reflect mileage crossed on National Forest System (NFS) land.
2/ Other includes Bureau of Reclamation, U.S. Fish and Wildlife Service, etc.
3/ Segment 3 includes 5.5 miles of 345-kV and 4.3 miles of 230-kV single circuit line.
4/ Segment 6 does not include ground-disturbing activity except in association with the expanded Borah and Midpoint Substations.
5/ Totals may not equal 100 percent due to rounding.

length of all segments requiring new transmission line construction is approximately 1,103 miles. The ROW width requested for the transmission line ranges from 125 feet for single-circuit 230-kV segments, 250 feet for single-circuit 500-kV segments, and 300 feet for double-circuit 500-kV segments.

Facilities to be evaluated are as follows:

- Ten transmission line segments, including access roads, material laydown and staging areas, and other temporary construction ground disturbances;
- Three proposed substations, expansion at one planned substation to be constructed for other purposes, and expansion at eight existing substations; and
- Other associated facilities including communication systems, optical fiber regeneration stations, and substation distribution supply lines.

Details of construction and operations, common to all alternatives, are summarized in Section 2.7 and detailed in Appendix B. Environmental protection measures (EPMs), framework reclamation plan, plant and wildlife conservation measures and operations, maintenance, and emergency response measures proposed by the Proponents are briefly summarized in Section 2.7 and discussed in detail in Appendix C and are considered part of the Project description for the Proposed Route and Route Alternatives and Design, Structural, and Schedule Variations. Table 2.1-2 illustrates and summarizes the Proposed Action. Table 2.1-3 shows the construction schedule for the Proposed Action.

Table 2.1-2. Summary of Project Facilities for Proposed Action and Design and Schedule Variations

Project Facility	Description
Transmission Line Segments	
Transmission Line Features Common to All Proposed 500-kV Segments	• Three-phase 500-kV construction for all tower designs, conductor spacing and clearances[1]. • Conductors: Bundled 1949.6 kcmil 42/7 aluminum conductor steel reinforced (ACSR)/TWD "Athabaska/TW", with three subconductors per phase. Non-specular (dull) finish rather than a shiny finish. • Estimated subconductor diameter: 1.504 inches. • Bundle spacing: Distance between subconductors is 18 inches and 25 inches. • One overhead fiber optic shield ground wire (OPGW) containing 48 fibers. • One OPGW wire diameter: 0.637 inch. • One extra high strength (EHS) steel overhead ground wire. • Steel overhead ground wire diameter: approximately 0.495 inch. • Typical ground clearance: 35 feet. • Structure types: lattice steel single- and double-circuit structures. Dulled galvanized steel finish. • Structure heights: Single-circuit structure varies between 145 and 180 feet. Average height of 156 feet. • Structure heights: Double-circuit structure varies between 160 and 190 feet. Average height of 170 feet. • Approximate distance between structures: 1,200 to 1,300 feet. • ROW width for double-circuit: 300 feet. • ROW width for single-circuit: 250 feet. • The exact quantity, distance between, and placement of the structures would depend on the final detailed design of the transmission line, which is influenced by the terrain, land use, environmental constraints, and economics. Alignment options may also slightly increase or decrease the quantity, location, and height of structures.
Transmission Line Features Common to All Proposed 230-kV Segments	• Three-phase 230-kV construction for all structure designs, conductor spacing and clearances[1]. • Conductors: Bundled 1272 kcmil 45/7 ACSR "Bittern," with two subconductors per phase. Non-specular finish. • Estimated subconductor diameter: 1.196 inches. • Bundle spacing: 18 inches vertical. • One OPGW containing 48 fibers where communication is required. • One OPGW wire diameter: 0.637 inch. • Two EHS steel overhead ground wires where communication is not required. One EHS steel overhead ground wire where communication is required. • Estimated shield wire diameter: approx. 0.495 inch. • Typical ground clearance: 28 feet. • Structure types: steel H-frame structures. • Above-ground structure heights: varies between 60 and 90 feet. • Approximate distance between structures: 700 feet. • ROW width: 125 feet. • The exact quantity, distance between and placement of the structures would depend on the final detailed design of the transmission line, which is influenced by the terrain, land use, environmental constraints, and economics. Alignment options may also slightly increase or decrease the quantity, location, and height of structures.

Table 2.1-2. Summary of Project Facilities for Proposed Action and Design and Schedule Variations (continued)

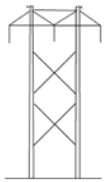
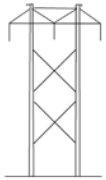
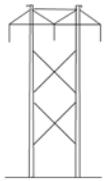
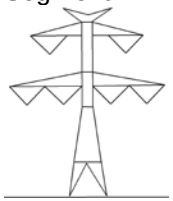
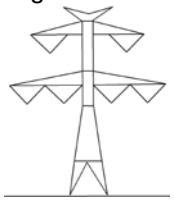
Project Facility	Description
Segment 1E – Windstar to Aeolus 	• Single circuit 230-kV transmission line in one ROW. • Single circuit H-frame steel structures. • Approximate number of structures: 732. • Line length: Approximately 100.6 miles. • No OPGW regeneration sites. • See Figure A-2.
Segment 1W(a) – Windstar to Aeolus 	• Single circuit 230-kV transmission line in one ROW. • Single circuit H-frame steel structures. • Approximate number of structures: 588. • Line length: Approximately 76.5 miles. • One OPGW regeneration site. • See Figure A-2.
Segment 1W(c) – Dave Johnston to Aeolus 	• Existing single circuit 230-kV transmission line to be re-constructed with single circuit H-frame steel structures. • Approximate number of structures to be replaced: 531. • Line length: Approximately 70.6 miles. • No OPGW regeneration sites. • See Figure A-2.
Segment 2 – Aeolus to Creston 	• Double-circuit 500-kV transmission line in one ROW initially energized to 230 kV on one side and 500-kV on the other side. • Double-circuit lattice steel structures. • Approximate number of structures: 414. • Line length: Approximately 96.7 miles. • One OPGW regeneration site. • See Figure A-3.
Segment 3 – Creston to Anticline 	• Double-circuit 500-kV transmission line in one ROW initially energized to 230-kV on one side and 500-kV on the other side. • Double-circuit lattice steel structures. • Approximate number of structures: 199. • Line length: Approximately 46.6 miles. • No OPGW regeneration sites. • See Figure A-4.

Table 2.1-2. Summary of Project Facilities for Proposed Action and Design and Schedule Variations (continued)

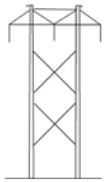
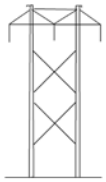
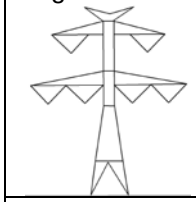
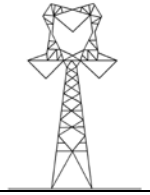
Project Facility	Description
Segment 3A – Anticline to Bridger 345-kV Yard 	• Single-circuit 345-kV transmission line in one ROW. • Single-circuit H-Frame steel structures. • Approximate number of structures: 25. • Line length: Approximately 5.5 miles. • No OPGW regeneration sites. • See Figure A-4.
Segment 3B – Anticline to Bridger 230-kV Yard 	• Single circuit 230-kV transmission line in one ROW. • Single circuit H-frame steel structures. • Approximate number of structures: 29. • Line length: Approximately 4.3 miles. • No OPGW regeneration sites. • See Figure A-4.
Segment 4 – Anticline to Populus 	• Double-circuit 500-kV transmission line in one ROW with both circuits energized at 500-kV. • Double-circuit lattice steel structures. • Approximate number of structures: 893. • Line length: Approximately 203.0 miles. • Three OPGW regeneration sites. • See Figures A-5 and A-6.
Segment 5 – Populus to Borah 	• Single-circuit 500-kV transmission line in one ROW. • Single-circuit lattice steel structures. • Approximate number of structures: 245. • Line length: Approximately 54.6 miles. • No OPGW regeneration sites. • See Figure A-7.
Segment 6 – Borah to Midpoint	• Re-energize existing 345-kV system to 500-kV (this line segment was previously constructed to 500-kV standards). • Single-circuit lattice steel structures. • Transmission line construction only required at segment ends to reroute from the existing 345-kV substation bays to the proposed 500-kV substation bays. • Structure type illustration is only for the new structures required. • Approximate number of structures: 10. • See Figure A-8.

Table 2.1-2. Summary of Project Facilities for Proposed Action and Design and Schedule Variations (continued)

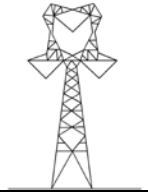
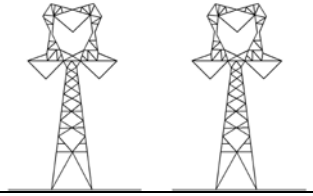
Project Facility	Description
Segment 7 – Populus to Cedar Hill	• Single-circuit 500-kV transmission line in one ROW. • Single-circuit lattice steel structures. • Approximate number of structures: 534. • Line length: Approximately 118.1 miles. • Two OPGW regeneration sites. • See Figure A-9.
Segment 8 – Midpoint to Hemingway 	• Single-circuit 500-kV transmission line in one ROW. • Single-circuit lattice steel structures. • Approximate number of structures: 577. • Line length: Approximately 131.0 miles. • Two OPGW regeneration sites. • See Figure A-10.
Segment 9 – Cedar Hill to Hemingway	• Single-circuit 500-kV transmission line in one ROW. • Single-circuit lattice steel structures. • Approximate number of structures: 707. • Line length: Approximately 161.7 miles. • Two OPGW regeneration sites. • See Figure A-11.
Segment 10 – Midpoint to Cedar Hill	• Single-circuit 500-kV transmission line in one ROW. • Single-circuit lattice steel structures. • Approximate number of structures: 155. • Line length: Approximately 33.6 miles. • No OPGW regeneration sites. • See Figure A-12.
Segments 2, 3, and 4 – Design and Schedule Variation 	• Single-circuit 500-kV transmission lines in one ROW. • Two single-circuit lattice steel structures. • Approximate number of structures: Segment 2—828, Segment 3—398, Segment 4—1,786. • Line length: same as for double-circuit 500-kV structure. • Four OPGW regeneration sites: same as for double-circuit 500-kV structure.

Table 2.1-2. Summary of Project Facilities for Proposed Action and Design and Schedule Variations (continued)

Project Facility	Description
Substation Facilities	
Windstar Substation	• Expansion of existing substation. • Developed acreage: increase the fenced area of the 230-kV substation by approximately 10 acres. • Existing access road is gravel and would not need extension for Gateway West. • 230-kV circuit breakers and related switching equipment, bus and support structures, potential and current transformers, 230-kV shunt capacitor banks. • 230-kV line termination structures approximately 70 feet in height. • Control, protection, and communications equipment. • Addition of new control building within the substation fenced area. • See Figure A-18.
Heward Substation	• Expansion of existing substation. • Developed acreage: increase the fenced area by approximately 3 acres. • 230-kV circuit breakers and related switching equipment, bus, and support structures. • 230-kV line termination structures approximately 70 feet in height. • Control, protection, and communications equipment. • Addition of new control building within substation fenced area. • See Figure A-19.
Aeolus Substation	• Expansion of planned substation. • Developed acreage: increase the fenced area by approximately 90 acres. • Expansion of the Aeolus Substation will require upgrading County Route 121. This upgrade will result in approximately 64 acres of construction disturbance and 33 acres of new permanent roadway. • 500-kV and 230-kV circuit breakers and related switching equipment, bus and support structures, 500/230-kV transformer bank, 500-kV shunt reactor bank on bus and on Anticline line, potential and current transformers. • Control, protection, and communications equipment. • 500-kV line termination structures approximately 135 feet in height. • 230-kV line termination structures approximately 70 feet in height. • New control buildings for the 230-kV and 500-kV substation yards. • New Static Var Compensator that will occupy about 10 to 15 acres in the substation fenced area and will be housed in a building that contains power electronic equipment and associated cooling equipment. • See Figure A-17.
Creston Substation	• Proposed new substation. • Developed acreage: Approximately 13 acres fenced with access road. • A gravel access road of approximately 500 feet long would connect to an existing road. • 230-kV circuit breakers and related switching equipment.

Table 2.1-2. Summary of Project Facilities for Proposed Action and Design and Schedule Variations (continued)

Project Facility	Description
Substation Facilities	
Creston Substation (cont'd)	• Bus and support structures. • Potential and current transformers. • 230-kV line termination structures approx. 70 feet in height. • Control, protection, and communications equipment. • Addition of new control building within the substation fenced area. • See Figure A-13.
Jim Bridger 230-kV Substation	• Expansion of existing substation. • Existing access road is adequate. • Additions to existing Jim Bridger 230-kV substations, 230-kV breakers, bus equipment, and line termination structures. • Jim Bridger 230-kV Substation modification to be accomplished within existing station. • See Figure A-15.
Jim Bridger 345-kV Substation	• Expansion of existing substation. • Existing access road is adequate. • Expansion of 345-kV yard by 10 acres. • Additions to Jim Bridger 345-kV yard, including 345-kV breakers, bus equipment, and line termination structures. • Development of a new 345-kV transmission line termination structure approximately 100 feet in height to connect with the proposed line to Anticline Substation.
Anticline Substation	• Proposed substation. • Developed acreage: Approximately 125 acres fenced with an improved access road. • To access the new 500-kV yard, an existing dirt road about a mile long will be improved with construction of an all-weather surface with improved access approaches, main highway entrance, and Union Pacific Railroad (UPRR) crossing arrangements. • Bus and support structures, 500/345-kV transformer bank, 345-kV phase shifting transformer, 500-kV shunt reactor bank on bus and on the Aeolus and Populus lines, 500-kV series capacitor bank added to Aeolus line, and 500-kV shunt capacitor banks. • 500-kV line termination structures approximately 135 feet in height. • Control, protection, and communications equipment. • New control building. • See Figure A-14.

Table 2.1-2. Summary of Project Facilities for Proposed Action and Design and Schedule Variations (continued)

Project Facility	Description
Substation Facilities	
Populus Substation	• Expansion of existing substation. • Developed acreage: increase the fenced area by approximately 80 acres. • Existing access road is adequate • 500/345-kV transformer bank. • 500-kV and 345-kV circuit breakers and related switching equipment. • Bus and support structures. • 500-kV line termination structures approximately 135 feet in height. • Control, protection, and communications equipment. • Control building. • 500-kV series capacitor bank added to Anticline line. • 500-kV Shunt reactor banks added to the Anticline, Cedar Hills, and Borah lines. • See Figure A-20.
Borah Substation	• Expansion of existing substation. • Developed acreage: increase the fenced area by approximately 35 acres. • Existing access road is gravel and will not need extension. • 500-kV circuit breakers and related switching equipment. • Bus and support structures. • 500-kV line termination structures approximately 135 feet in height. • Control, protection, and communications equipment added inside the existing control building. • 500-kV series capacitor bank added to Populus line. • 500-kV shunt reactor bank added to the Midpoint line. • 1000MVA 500/230-kV transformer bank. • Up to 5 single circuit 500-kV structure relocations required on existing line from Midpoint Substation. • See Figure A-21.
Cedar Hill Substation	• Proposed substation. • Developed acreage: approximately 45 acres fenced with access road. • 500-kV circuit breakers and related switching equipment. • Adjacent existing road is gravel and will not need extension. • Bus and support structures. • 500-kV line termination structures approximately 135 feet in height. • 500-kV shunt reactors added to Populus and Hemingway lines. • 500-kV series capacitor bank added to the Populus line. • Control, protection, and communications equipment added to new control building. • Up to 5 single circuit 500-kV structure relocations required on existing line from Borah Substation. • See Figure A-16.

Table 2.1-2. Summary of Project Facilities for Proposed Action and Design and Schedule Variations (continued)

Project Facility	Description
Substation Facilities	
Midpoint Substation	• Expansion of existing substation. • Developed acreage: increase the fenced area by approximately 40 acres. • Existing access roads are paved and will not need extension. • 500-kV circuit breakers and related switching equipment. • Bus and support structures. • 500-kV line termination structures approximately 135 feet in height. • Control, protection, and communications equipment added to existing control building. • 500-kV series capacitor bank and shunt reactor bank added to Borah line. • 500-kV shunt reactor bank added to the Hemingway line. • See Figure A-22.
Hemingway Substation	• Expansion of existing substation. • Expansion of existing station to add a 500-kV line bay for termination of the Hemingway – Midpoint and the Hemingway – Cedar Hill transmission lines. • All construction will be inside the existing fence line. No additional area is required. • Existing access is adequate. • 500-kV circuit breakers and related switching equipment. • Bus and support structures. • 500-kV line termination structures approximately 135 feet in height. • Potential and current transformers. • Control, protection, and communications equipment added to the existing control building. • 500-kV shunt reactors added to each line. • 500-kV series capacitor bank added to each line. • See Figure A-23.
Ancillary Facilities	
Communications and Control Facilities – Fiber Optic Cable Regeneration Sites	• Regeneration sites are required to amplify the system control and monitoring signals carried over the fiber optic cable attached to the transmission towers. • A total of up to 11 regeneration sites would be needed for the Project. Segments requiring regeneration sites are noted in the transmission line section of this summary table. The locations for the regeneration sites would be determined after the preferred route is identified and detailed design engineering is completed. • Regeneration sites would be located either within a substation or at another location along the route. • Regeneration sites would be within a 75- X 75-foot fenced area. • Typical building dimensions within the fenced area would be 12 feet wide X 32 feet long X 9 feet tall. • The fiber OPGW cable supported on the transmission structures would be routed in and out of the regeneration site building from the nearest transmission structure either underground or overhead along two independent diverse paths. • Electronic equipment, required to support the fiber optic cable installation, would be located inside the building.

Table 2.1-2. Summary of Project Facilities for Proposed Action and Design and Schedule Variations (continued)

Project Facility	Description
Ancillary Facilities	
Communications and Control Facilities – Fiber Optic Cable Regeneration Sites (cont'd)	• At sites not within a substation, a liquid propane fueled emergency generator would be installed to provide backup power during an outage of the local electric distribution system supply. • Maximum regeneration site spacing is 55 miles or less depending on access and proximity to local electric distribution lines. • The primary siting criteria for a regeneration site would be: adjacent to the Gateway West transmission line ROW, proximity to existing low-voltage electric distribution lines to provide power to the facility, and the ability to easily access the site by vehicle.
Distribution Supply Lines	• Distribution line extensions are required to provide operational power and station service power at: o Up to 11 regeneration sites (locations to be determined during final design) o Creston Substation (500 feet across BLM-managed land) o Anticline 500-kV Substation (3.3 miles across private land) o Cedar Hill Substation (less than 200 feet across private land). • Typically provided from an existing distribution line located in proximity to the site. • Not required for expansions at Windstar, Heward, Jim Bridger, Populus, Borah, Midpoint, and Hemingway Substations since these substations exist or are currently planned and will exist at the time of the Gateway West construction.

1/ Project design follows the Avian Power Line Interaction Committee recommendations. Details for tower construction and components such as conductor spacing are provided in Appendix B.

Table 2.1-3. Proposed Action Construction Schedule

Segment Number	Segment or Substation Name	Primarily Wyoming		Primarily Idaho			
		Phase 1		Phase 1		Phase 2	
		Start June 2013	End Dec 2018	Start Mar 2013	End Dec 2018	Start May 2015	End Dec 2018
	Windstar Substation	Windstar Expansion					
	Heward Substation	Heward Substation					
	Aeolus Substation	Aeolus Expansion					
	Creston Substation	Creston Substation					
	Populus Substation	Populus Expansion					
	Anticline Substation	Anticline (Includes 230-kV and 345-kV bays at existing Jim Bridger Substation)					
1E	Windstar – Aeolus #2	Single-Circuit 230-kV					
1W(a)	Windstar – Aeolus #1	Single-Circuit 230-kV and rebuild a short section of the existing single-circuit 230-kV line					
1W(c)	Dave Johnston – Heward –Aeolus	Rebuild the existing single circuit 230-kV and build a short section a new single-circuit 230 kV line					
2	Aeolus – Creston	Double-Circuit 500-kV [1/]					
3	Creston – Anticline	Double-Circuit 500-kV [1/]					
3A	Anticline – Jim Bridger 345-kV Substation	Single-Circuit 345-kV					
3B	Jim Bridger 230-kV Substation [2/]	Single-Circuit 230-kV					
4	Anticline – Populus	Double-Circuit 500-kV					
	Populus Substation			Populus Expansion			
	Cedar Hill Substation			Cedar Hill Substation			
	Hemingway Substation			Hemingway Expansion			
7	Populus – Cedar Hill			Single-Circuit 500-kV			
9	Cedar Hill – Hemingway			Single-Circuit 500-kV			
10	Midpoint – Cedar Hill			Single-Circuit 500-kV			
	Borah Substation					Borah Expansion	
	Midpoint Substation					Midpoint Expansion	
	Hemingway Substation					Hemingway Expansion	
5	Populus – Borah					Single-Circuit 500-kV	
6	Borah – Midpoint [3/]					Existing single-circuit	
8	Midpoint – Hemingway					Single-Circuit 500-kV	

1/ Constructed to 500-kV standards but one circuit initially operated at 230 kV and the other at 500 kV.
2/ Termination for Creston – Anticline circuit when initially operated at 230 kV.
3/ Existing single circuit constructed to 500-kV standards (energized from 345 kV to 500 kV).

2.1.2 Design Variation

After analysis and comparison with the alternative structure types considered, the double-circuit 500-kV delta lattice tower has been proposed for those line segments requiring a double-circuit configuration (Segments 2, 3, and 4). However, two single-circuit 500-kV structures in a ROW expanded to 350-foot width (as opposed to the standard 300-foot width of the proposed single-tower, double-circuit structure) are also an economically feasible structure alternative for Segments 2, 3, and 4 that require two 500-kV circuits. Initially, one circuit would be operated at 230 kV. Table 2.1-4 shows the construction schedule for the Design Variation.

The alternative of two single-circuit lines in place of one double-circuit line presents some potential advantages for construction schedule, maintainability, and operational availability. For example, as opposed to the heavier double-circuit tower, the lower structure weight and configuration of the single-circuit structure would allow helicopter-aided construction techniques, providing the Proponents with the option of taking less time to construct. Separating the two 500-kV circuits onto two separate structures would allow energized maintenance procedures to proceed more easily than when both circuits are on the same structure. During a structure failure event, if a double-circuit tower fails, both circuits would be out of service. With two single-circuit lines, it is less likely that both circuits would be affected to the same degree during the same event. Thus, the two single-circuit structure alternative would have a higher operational availability during a tower failure event. However, in the isolated situation where spans between structures would exceed 1,800 feet as compared to the average span of 1,200 to 1,300 feet, a parallel circuit separation distance of greater than 175 feet would be required for protection in the unlikely event of towers tipping into the adjacent line because tower heights would need to be increased to allow for greater span lengths. Longitudinal offsets of tall towers may also be required.

Table 2.1-4. Design Variation Construction Schedule

Segment Number	Segment or Substation Name	Primarily Wyoming		Primarily Idaho			
		Phase 1		Phase 1		Phase 2	
		Start June 2013	End Dec 2018	Start Mar 2013	End Dec 2018	Start May 2015	End Dec 2018
	Windstar Substation	Windstar Expansion					
	Heward Substation	Heward Substation					
	Aeolus Substation	Aeolus Expansion					
	Creston Substation	Creston Substation					
	Populus Substation	Populus Expansion					
3A	Anticline – Jim Bridger 345-kV Yard	Single-Circuit 345-kV					
	Anticline Substation	Anticline (Includes 230-kV and 345-kV bays bay at existing Jim Bridger Substation)					
1E	Windstar – Aeolus #2	Single-Circuit 230-kV					
1W(a)	Windstar – Aeolus #1	Single-Circuit 230-kV and rebuild a short section of the existing single-circuit 230-kV line					
1W(c)	Dave Johnston – Heward – Aeolus	Rebuild the existing single-circuit 230-kV line and build a short section of new single-circuit 230-kV line					
2	Aeolus – Creston	Two 500-kV Single Circuits 1/					
3	Creston – Anticline	Two 500-kV Single Circuits 1/					
3A	Anticline – Jim Bridger 345-kV Substation	Single-Circuit 345-kV					
3B	Jim Bridger 230-kV Substation 2/	Single-Circuit 230-kV					
4	Anticline – Populus	Two 500-kV Single Circuits					
	Populus Substation			Populus Expansion			
	Cedar Hill Substation			Cedar Hill Substation			
	Hemingway Substation			Hemingway Expansion			
7	Populus – Cedar Hill			Single-Circuit 500-kV			
9	Cedar Hill – Hemingway			Single-Circuit 500-kV			
10	Midpoint – Cedar Hill			Single-Circuit 500-kV			
	Borah Substation					Borah Expansion	
	Midpoint Substation					Midpoint Expansion	
	Hemingway Substation					Hemingway Expansion	
5	Populus –Borah					Single-Circuit 500-kV	
6	Borah – Midpoint 3/					Existing Single-Circuit	
8	Midpoint - Hemingway					Single-Circuit 500-kV	

1/ Constructed to 500-kV standards but one circuit initially operated at 230 kV and the other at 500 kV.
2/ Termination for Creston – Anticline circuit when initially operated at 230 kV.
3/ Existing single circuit constructed to 500-kV standards (energized from 345 kV to 500 kV).

The Proponents wish to consider this variation and have requested that it be considered in the detailed study for Segments 2, 3, and 4.

Appendix B, Figure B-5 illustrates the two single-circuit ROW configuration compared to the proposed double-circuit ROW configuration. Table 2.1-5 compares the double-circuit and two single-circuit ROW configurations for several factors.

Table 2.1-5. Comparison of One Double-Circuit 500-kV Lattice Tower and Two Single-Circuit 500-kV Lattice Towers

Topic	One Double-Circuit 500-kV Lattice Steel Tower in ROW	Two Single-Circuit 500-kV Lattice Steel Towers in ROW	Comments
Tangent Tower Type	D5A (delta configuration)	S5A (delta configuration)	
Tower Finish	Dull Galvanized	Dull Galvanized	
Height Range	160–190 feet	145–180 feet	
Typical Tower Height	170 feet	156 feet	Double-circuit tower is on average 14 feet taller than single-circuit tower.
Typical Tangent Tower Weight	82,237 pounds	45,660 pounds for one tower 91,320 pounds for two towers	
ROW Width	300 feet	350 feet	
Average Span	Approximately 1,200–1,300 feet	Approximately 1,200–1,300 feet	
Number of towers for Segments 2, 3, and 4	1,506	3,012	
Max Span within ROW	2,650 feet	2,000 feet	
Short Term Ground Disturbance	Temporary disturbance = 300 feet (ROW width) x 250 feet = 75,000 square feet (1.72 acres) per structure	Temporary disturbance = 350 feet (ROW Width) x 250 feet = 87,500 square feet (2.01 acres) per set of structures	The two side-by-side single-circuit ROW configuration results in approximately 1.25 more acres per mile of temporary ground disturbance due to construction.
Long Term Ground Disturbance	Long-term disturbance = 50 feet x 50 feet = 2,500 square feet (0.06 acre)	Long-term disturbance = 50 feet x 50 feet = 2,500 square feet (0.06 acre) x 2 = 0.12 acre	
Actual Footprint	46 feet x 41 feet per tower (1,886 square feet = 0.043 acre)	46 feet x 41 feet per tower (1,886 square feet = 0.043 acre), 0.086 acres per pair of towers	The two side-by-side single-circuit ROW configuration results in twice as much footprint area because there are two towers.
Foundation Sizes	Four 5-foot x 26-foot drilled pier foundations per tower	Four 4-foot x 22-foot drilled pier foundations per tower	
Foundation Volume	75.6 cubic yards per tower	41.0 cubic yards per tower 81.0 cubic yards for two towers	The two side by side single-circuit ROW configuration results in approximately 23.3 more cubic yards per mile of concrete volume for foundations.

Table 2.1-5. Comparison of One Double-Circuit 500-kV Lattice Tower and Two Single-Circuit 500-kV Lattice Towers (continued)

Topic	One Double-Circuit 500-kV Lattice Steel Tower in ROW	Two Single-Circuit 500-kV Lattice Steel Towers in ROW	Comments
Constructability	Cranes only	Cranes and/or helicopter	The potential for helicopter erection allows for shorter construction durations. Access roads would still be required to each tower, but the road would not be as large with helicopter construction.
Maintenance Activities	Live-line maintenance - similar. Helicopter maintenance - similar.		
Estimated Costs	Approximately 5-15% less than two side by side single-circuit towers.	Approximately 5-15% more than one double-circuit tower.	Does not include costs for angle and dead-end structures (i.e. only tangents). The costs shown do not include ROW costs.
Visual Appearance	The lower cross arm of the double-circuit tower is 162 feet wide, making the tower look as wide as it is tall.	The single-circuit tower cross arms are 94 feet wide, but there are two of them.	When visible, the ROW will appear 25-30% wider and more structures will be visible although they will be approximately 14 feet shorter for the two single-circuit design variation.
Raptor Perching	Fewer perching opportunities.	More perching opportunities.	

2.1.3 Structure Variation

In addition to the proposed self-supporting single-circuit steel lattice 500-kV structure, the Proponents wish to consider an alternative single-circuit 500-kV guyed structure for use where terrain, land cover, and land use allow. During final design, the Proponents would identify specific locations where this structure would be proposed for review and approval. Figure B-6 in Appendix B shows the ROW configuration for the guyed “Delta” and guyed “V” structures. Table 2.1-6 compares the self-supporting and guyed “Delta” structures for several factors.

Table 2.1-6. Summary/Comparison of Single-Circuit 500-kV Lattice Towers, Self-Supporting vs. Guyed Towers

Topic	One Single-Circuit Self-Supporting 500-kV Lattice Tower	One Single-Circuit Guyed Delta 500-kV Lattice Tower	One Single-Circuit Guyed-V 500-kV Lattice Tower	Comments
Tangent Tower Type	S5A (delta configuration)	Guyed Delta (delta configuration)	Guyed-V (horizontal configuration)	Delta is the Proponents' preferred electrical configuration.
Tower Finish	Dull Galvanized	Dull Galvanized	Dull Galvanized	
Typical Tower Height	156 feet	156 feet	133 feet	
Typical Tangent Tower Weight	45,660 lbs	29,679 lbs	25,113 lbs	Guyed tower weights are approximated based on experience.
ROW Width [1/]	250 feet			
Average Span [2/]	Approximately 1,200 – 1,300 feet			
Maximum Span within ROW	2,800 feet	2,800 feet	2,400 feet	For the same ROW width, the maximum span is less for guyed-V structures due to the larger spacing between outside phases.
Short-term Ground Disturbance	All short-term ground disturbances associated with construction will be approximately equal for self-supporting and guyed tangent towers.			
Long-term Ground Disturbance	Long-term disturbance = 50 feet x 50 feet = 2,500 sq feet (0.06 acre)	Long-term disturbance = 50 feet x 50 feet = 2,500 sq feet (0.06 acre) Additionally, permanent disturbance at the anchors = 4 x 4 sq feet = 16 sq feet	Long-term disturbance = 50 feet x 50 feet = 2,500 sq feet (0.06 acre) Additionally, permanent disturbance at the anchors = 4 x 4 sq feet = 16 sq feet	A pad with level terrain is necessary at each tower location so that live-line maintenance can be performed on the structures; however, the pad will be revegetated. This is the case for both self-supporting and guyed towers. Long-term disturbances would be approximately equal for self-supporting and guyed structures.
Actual Footprint	46 feet x 41 feet (1886 sq feet = 0.043 ac)	For average tower height, 140 feet x 190 feet = 26,600 sq feet (0.61 ac)	For average tower height, 195 feet x 190 feet = 37,050 sq feet (0.85 ac)	The stated guyed tower footprint encompasses a boundary defined by the 4 anchors and increases with tower height. It should be noted that this is not the actual permanent disturbance boundary.
Foundation Sizes	Four 4-foot x 15-foot drilled pier foundations	3-foot x 2-foot pedestal on top of a 6-foot x 6-foot x 2-foot bearing pad	3-foot x 2-foot pedestal on top of a 6-foot x 6-foot x 2-foot bearing pad	

Table 2.1-6. Summary/Comparison of Single-Circuit 500-kV Lattice Towers, Self Supporting vs. Guyed Towers (continued)

Topic	One Single-Circuit Self-Supporting 500-kV Lattice Tower	One Single-Circuit Guyed Delta 500-kV Lattice Tower	One Single-Circuit Guyed-V 500-kV Lattice Tower	Comments
Foundation Volume	22.0 cubic yds per tower	13.6 cubic yds per tower	13.6 cubic yds per tower	The stated concrete volume for guyed towers assumed that no concrete is required for the anchors (i.e., helical screw or disk type anchors used).
Constructability	Cranes and/or Helicopter			Helicopter construction is more efficient/ effective with lighter guyed towers as they require fewer helicopter picks.
Maintenance Activities	Live-line maintenance - similar. Helicopter maintenance - similar.			
Relative Cost	Highest	Middle (approximately 70-80% of self-supporting installed cost)	Lowest (approx 60-70% of self-supporting installed cost)	Does not include costs for angle and dead-end structures (i.e., only tangents). The costs shown do not include ROW costs.
Visual Appearance	The guyed-V tower is approximately 23 feet shorter than the self-supporting and guyed delta tower, but the cross arm is approximately 36 feet wider. Guyed towers have less visual impact as they contain less steel, and are narrower than self-supporting towers.			
Raptor Perching	There are slightly more perching opportunities in the body of the self-supporting tower than in the mast(s) of the guyed towers. The geometry of the mast(s) provides less space for perching.			
Bird Collisions	Guy structures have higher potential for birds colliding with guys.			

1/ Two single-circuit self-supporting 500-kV lattice towers side by side require a 350-foot ROW. Two “delta” guyed structures side by side require a 375-foot ROW.

2/ The number of structures for each side-by-side configuration would be the same except the guyed “delta” span length is limited beyond 2,400 feet. Therefore, in those limited circumstances, it would require more structures.

Guyed 500-kV single-circuit transmission towers, whether of the “delta” or “V” configuration, would have a single foundation in the center to support the mast(s) and four down guys to support the tower. The delta-type tower has a single mast and the V-type tower has two masts that meet at the single foundation in the center of the tower. The single foundation would be either a pre-cast or poured in place reinforced concrete bearing pad, approximately 6 feet by 6 feet square and 1 to 2 feet deep. Resting on top of the bearing pad would typically be a 3-foot by 2-foot pedestal that supports the bottom of the mast(s).

The bearing pad would be set in an excavation 2 to 4 feet deep depending on the soil at the site. Excavations for the bearing pad foundation would typically be made with a backhoe. In rocky areas, the bearing pad excavation may be completed by drilling and blasting or by installing special rock anchors.

The four guy wires are typically 1 inch in diameter and attached to 15-inch helical screw anchors, "screwed" into the ground with a specially equipped drilling rig, at depths ranging from 10 to 20 feet, depending on soil conditions at the site. Other types of anchors, such as disk anchors, may also be used depending on the soil type encountered at each tower location. For example, rock requires special anchor types.

The guyed tower takes up more operational space than the self-supporting structure due to the guy wires but would generally be accommodated within a 250-foot ROW where only a single circuit is planned. Guy wires may extend outside the ROW on the downhill side on steep slopes to maintain an appropriate slope for the guy. For the Design Variation in which two single circuits would be constructed on the same ROW, the guyed structures would be guyed delta towers and would require a ROW 375 feet wide. The extra ROW would be required only where the structure locations the guy anchors and wires would extend beyond the ROW.

Guyed structures would be used in areas of level to hilly terrain and areas with good anchor conditions. Guyed structures would only be used for "tangent" or in-line structures, not for angles or corners. Guyed structures would be used in rangeland, grassland, and shrub steppe. They would not be used in areas farmed with heavy equipment or using aircraft, in residential areas, within 1 mile of sagebrush habitats occupied by greater sage-grouse within the Kemmerer Field Office (FO), or near airports. In those land use types, self-supporting lattice towers would be used. During the final design phase, the Proponents would identify specific areas where the guyed structure type would be proposed. BLM would approve or not approve their use on federally managed lands or require mitigation measures as appropriate.

2.1.4 Schedule Variation

The Proposed Action construction plan involved constructing all substation and transmission line facilities in the 2013 to 2018 time frame. The Proponents report that based on uncertain economic conditions, some of the potential customers that have requested transportation on Gateway West have cancelled or deferred project development plans. To maintain flexibility in an uncertain market and still meet customer requests, the Proponents have proposed a Schedule Variation for detailed analysis applicable to Segments 1 through 4. Table 2.1-7 shows the Schedule Variation construction schedule. Key elements of the Schedule Variation are described below.

- Constructing Segments 1E, 1W(a), 3A (345-kV line between the Anticline yard and the existing Jim Bridger Substation); one circuit of Segments 2, 3, and 4; construction of the Heward and Anticline Substations; and modifications to the Windstar, Aeolus, and Populus Substations.
- Shifting construction of Segment 1W(c); one circuit of Segments 2, 3, and 4; and modifications to the Windstar, Aeolus, Creston, Anticline, and Populus Substations to the 2018 to 2020 time frame[3].
- The second circuit for Segments 2, 3, and 4 would be operated at 500 kV when constructed; the Creston Substation would be constructed as a 500-kV substation; and Segment 3B (230 kV to the existing Jim Bridger Substation) would not be needed.

[3] The exact time frame for construction of the second single-circuit 500-kV transmission line and associated substation modification depends on market conditions and could occur from 1 to 5 years after completion of the first single-circuit 500-kV line. For the purpose of the environmental analysis, a midrange of 2018 to 2020 was selected.

Table 2.1-7. Schedule Variation Construction Schedule

Segment Number	Segment Name	Primarily Wyoming				Primarily Idaho			
		Phase 1		Phase 2		Phase 1		Phase 2	
		June 2013	Dec 2016	Nov 2018	Jan 2020	Jan 2015	Dec 2018	May 2018	Dec 2020
	Windstar Substation	Windstar Expansion							
	Heward Substation	Heward Substation							
	Aeolus Substation	Aeolus Expansion							
	Populus Substation	Populus Expansion							
	Anticline Substation	Anticline (Includes 345-kV bay at existing Jim Bridger Substation)							
1E	Windstar – Aeolus #2	Single-Circuit 230-kV							
1W(a)	Windstar – Aeolus #1	Single-Circuit 230-kV and rebuild a short section of the existing single-circuit 230-kV line							
2	Aeolus – Creston	Single-Circuit 500-kV							
3	Creston – Anticline	Single-Circuit 500-kV							
3A	Anticline – Bridger 345-kV	Single-Circuit 345-kV							
4	Anticline – Populus	Single-Circuit 500-kV							
	Populus Substation					Populus Expansion			
	Cedar Hill Substation					Cedar Hill Substation			
	Hemingway Substation					Hemingway Expansion			
7	Populus – Cedar Hill					Single Circuit 500-kV			
9	Cedar Hill – Hemingway					Single Circuit 500-kV			
10	Midpoint – Cedar Hill					Single Circuit 500-kV			
	Windstar Substation			Windstar Expansion					
	Aeolus Substation			Aeolus Expansion					
	Creston Substation			Creston Substation					
	Populus Substation			Populus Expansion					
	Anticline Substation			Anticline Expansion					
1W(c)	Dave Johnston - Heward – Aeolus			Rebuild the existing single-circuit 230-kV line and build a short section of new single-circuit 230 kV line					
2	Aeolus – Creston			Single-Circuit 500-kV					
3	Creston – Anticline			Single-Circuit 500-kV					
4	Anticline – Populus			Single-Circuit 500-kV					
	Borah Substation							Borah Expansion	
	Midpoint Substation							Midpoint Expansion	
	Hemingway Substation							Hemingway Expansion	

Table 2.1-7. Schedule Variation Construction Schedule (continued)

Segment Number	Segment Name	Primarily Wyoming				Primarily Idaho			
		Phase 1		Phase 2		Phase 1		Phase 2	
		June 2013	Dec 2016	Nov 2018	Jan 2020	Jan 2015	Dec 2018	May 2018	Dec 2020
5	Populus – Borah							Single Circuit 500-kV	
6	Borah – Midpoint [1/]							Existing Single Circuit	
8	Midpoint – Hemingway							Single Circuit 500-kV	

1/ Segment 3B, the proposed 230-kV line in the vicinity of the proposed Anticline Substation and Jim Bridger Power Plant, would not be needed under the Design Variation.

2.2 ALTERNATIVE DEVELOPMENT

2.2.1 Alternatives Developed by the Proponents

In developing the Proposed Route, the Proponents have reported that they considered a number of options, collected data, identified major features on the ground, coordinated with land management agencies and landowners, and tried to minimize issues and effects related to implementing the proposal. The process used in evaluating alternatives while developing the Proposed Route is documented in the *Gateway West Transmission Line Project Siting Study* (IPC and RMP 2008, 2009). Alternative routes, substation sites, and structures considered by the Proponents, but not evaluated in detail, are summarized further in the EIS, along with the BLM Interdisciplinary Team (IDT) rationale for not considering them.

The Proponents must meet the WECC minimum separation distance (1,500 feet or greater for longer spans) between transmission lines to prevent the loss of multiple circuits from a single event such as a wildland fire. This was a major constraint on what alternatives the Proponents could consider in detail. See Chapter 1, Section 1.3.3.3, for more detail regarding reliability requirements of the regional and national electrical grid.

The Proponents' overall Project siting approach was to use the WWE corridor and other designated ROW corridors and existing utility corridors, if feasible, unless there was a compelling reason not to. In many cases the proposed routing closely follows the WWE corridor; however, the WWE corridor is only mapped for federal land, and about half of the lands along the route are privately owned. In some locations, the WWE corridor is too narrow to allow for the minimum separation requirement from existing transmission lines already in the corridor (see discussion above), or no WWE corridor has been designated between required substation interconnections. Reasons for not using the WWE corridors are listed by each segment for the Proposed Route or Route Alternatives. Section 2.4.13 and Table 2.4-2 describe use of the WWE corridor by alternative. Appendix A, Figures A-2 through A-12 show the WWE corridor as determined in the Final PEIS, published November 2008 (DOE and BLM 2008).

2.2.2 Alternatives Developed by the BLM

The BLM IDT developed alternatives to the Proposed Route in order to address issues raised by land management agencies, including the BLM and Forest Service, state and local agencies, and the public. Proponents provided input on the reasonableness and suitability of the BLM-developed alternatives (IPC and RMP 2008).

The IDT used the following criteria to evaluate alternatives for further consideration:

- Did the alternative meet the underlying purpose and need for the proposed Project?
- Was the alternative technically and economically feasible?
- Did the alternative address and resolve identified issues?
- Did the alternative cause measurably less adverse environmental effects (fewer detrimental effects, less severe effects, or shorter-term effects) than the Proposed Route for at least some resources?

2.2.3 Alternatives Identified Since Scoping

Since issuance of the Scoping Report, the BLM has continued to receive public comments that have resulted in the identification of additional alternative routes. In December 2008, the Proponents held informational meetings with landowners within a 2-mile-wide corridor focused on the Proposed Route and Route Alternatives finalized after scoping. These meetings led to the identification of additional alternatives for consideration. Further analysis and public input during 2009 and 2010 have resulted in additional routes and route changes described in this chapter and analyzed in detail in Chapter 3 as well as in the Revised Siting Study (IPC and RMP 2009).

2.2.4 Alternatives Requiring Plan Amendments

Table 2.2-1 lists federal land use plans affected by the Project. In some cases, the Proposed and Alternative Routes are not in compliance with the management objectives provided in the plans. In these cases, the BLM and the Forest Service can deny the Project, require modifications to the Proposed and Alternative Routes so that they are in compliance, or amend the applicable plan. Therefore, the land use plan amendments in Table 2.2-1 are included as part of the analysis of the Proposed and Alternative Routes. The effects of these amendments are analyzed in Chapters 3 and 4. Appendix F describes the proposed amendments and Appendix G provides the analysis for Visual Resource Management (VRM), Scenic Integrity Objective (SIO), and Visual Quality Objective (VQO)-driven amendments. As part of the ROD, the BLM and Forest Service will decide whether to implement the amendment, as well as the significance of the amendment, when the corresponding route or alternative is selected.

2.3 NO ACTION ALTERNATIVE

The action triggering this environmental review is described in the Proponents' applications to BLM and the Forest Service for a ROW grant and a Special Use Permit for the portion of the Project on federal lands. The agencies may deny the respective applications or approve the Project with or without conditions. Therefore, the No Action Alternative analyzed in the EIS is the predicted result of the denial of the applications. Under the No Action Alternative, the Gateway West Project would not be constructed (no construction of the new substations, substation expansion, or the transmission line). The objectives of the Project, which include providing increased transmission capacity and a more reliable transmission line system for transport of primarily wind energy to meet existing and future needs (as described in Section 1. 3, Purpose and Need), would not be met. The cumulative effects of the No Action Alternative are found Chapter 4 and summarized in Section 2.10.

Table 2.2-1 Land Use Plan Conformance and Proposed Amendment Summaries

Plan	Routes	Management Direction	Proposed Amendment	EIS Section
Casper Resource Manage-ment Plan (RMP)	Proposed 1E, 1W(a), 1W(c); Alternative 1E-C	Visual resource values will be managed under the VRM classes defined as mapped in the Casper Field Office GIS database. Changes in the number of acres within each VRM class depict a balance between development activities and protection of visual resources. The foreground/middle ground of NHTs will be managed as Class II until inventories are completed. Trail segments contributing to the overall eligibility that have integrity of setting will be managed as VRM Class II. Where integrity of setting is lacking, the foreground/ middle ground of NHTs, will be managed as Class III. Manage 367,151 acres of BLM-managed surface and 816,310 acres of federal mineral estate as VRM Class II. Manage 433,799 acres of BLM-managed surface and 1,211,145 acres of federal mineral estate as VRM Class III. Manage 560,627 acres of BLM-managed surface and 2,629,717 acres of federal mineral estate as VRM Class IV.	The Gateway West Transmission Line Project will be allowed as a visually altering action resulting in the reclassification of 630 acres of VRM II to VRM III in the AOI C-1 (Deer Creek). The Gateway West Transmission Line Project will be allowed as a single-use visually altering action without changing the VRM classification for AOI C-2, C-3.1, C-3.3, and C-3.4 (Dugway Rim, Spruce Creek, and Bates Creek). Manage 366,521 acres of BLM-managed surface and 815,680 acres of federal mineral estate as VRM Class II. Manage 434,429 acres of BLM-managed surface and 1,211,775 acres of federal mineral estate as VRM Class III. Manage 560,627 acres of BLM-managed surface and 2,629,717 acres of federal mineral estate as VRM Class IV.	3.2.1.5, Appendix G-1, 3.3.3.3, 3.3.3.4, 3.10.1.5, 3.11.2.3, 3.6.1.5, 3.17.1.5
Medicine Bow National Forest Revised Land and Resource Manage-ment Plan (Forest Plan)	Proposed 1E, Alternative 1E-C	Management Prescription 3.31: Allow uses and activities only if they do not degrade the primitive character of the area.	The Gateway West transmission line will be allowed and the land crossed by the Project will be allocated to MA 8.3 Roaded Natural.	3.2.1.5, 3.10.1.5, 3.11.2.3, 3.6.1.5, 3.17.1.5, 3.19.2.3
	Proposed 1E, 1W(a), 1W(c); Alternative 1E-C	Scenery Standard 1: Apply the Scenery Management System (SMS) to all NFS lands. Travel routes, use areas, and water bodies determined to be of primary importance are a concern Level 1 and appropriate scenic integrity objectives are established according to the SMS. Area has SIO of Moderate.	The Gateway West transmission line will be allowed and mitigation measures applied to minimize visual impacts.	3.2.1.5, Appendix G-2, 3.17.1.5
	Proposed 1E, 1W(a), 1W(c); Alternative 1E-C	TES Standard 4: Within each occupied northern goshawk territory, select three nests and protect 30 acres of dense vegetation surrounding each, defining the boundaries of each area based on habitat quality. If fewer than 3 nests are found within an occupied territory, substitute 30-acre areas with characteristics of nesting habitat.	The Gateway West Transmission Line Project will be allowed and Medicine Bow National Forest timing restrictions for northern goshawks will be followed.	3.6.1.5, 3.10.1.5, 3.11.2.3

Table 2.2-1 Land Use Plan Conformance and Proposed Amendment Summaries (continued)

Plan	Routes	Management Direction	Proposed Amendment	EIS Section
Medicine Bow Forest Plan (cont.)	Proposed 1E, 1W(a), 1W(c); Alternative 1E-C	TES Standard 5: Within each occupied northern goshawk territory, designate a northern goshawk post-fledging area (PFA) of a minimum of 200 acres that includes the three 30-acre nest sites selected. The large tree component within the PFA should include snags, down dead wood, and clumps of trees with interlocking crowns. Within the PFA, prohibit management activities that may degrade goshawk foraging habitat.	The Gateway West Transmission Line Project will be allowed and the Medicine Bow National Forest timing restrictions for northern goshawks will be followed.	3.10.1.5, 3.11.2.3, 3.6.1.5
	Proposed 1E, 1W(a), 1W(c); Alternative 1E-C	TES Standard 11: Allow no loss or degradation of known or historic habitat for the boreal toad, wood frog, or northern leopard frog.	The Gateway West Transmission Line Project will be allowed and mitigation measures, to be approved by the Medicine Bow Forest, applied to prevent impacts to the boreal toad, wood frog, or northern leopard frog.	3.10.1.5, 3.11.2.3, 3.6.1.5
Rawlins RMP 2009	Proposed 1E, Alternative 1E-B, Proposed 2	Visual Resource Management In VRM II class as shown on Map 2-50 (Table 2-9 and Appendix 25 or the RNP),	The Gateway West Transmission Line Project will be allowed as a single-use visually altering action without changing the VRM classification for AOI R-1 and R-2 (Laramie North and North Platte). The Gateway West Transmission Line Project will be allowed as a visually altering action resulting in the reclassification of 177 acres of VRM II to VRM III in the AOI R-2 (Laramie South).	Appendix G-1, 3.2.1.5, 3.10.1.5, 3.11.2.3, 3.6.1.5, 3.17.1.5
	Proposed 2	Surface-disturbing activities on public lands within 0.25 mile on either side of the North Platte River will be intensively managed to maintain the quality of the visual resource	"Surface disturbing activities on public lands within one-quarter mile on either side of the river will be considered on a case-by-case basis to maintain, to the extent possible the quality of the visual resource. The Gateway West Transmission Line Project will be allowed as a visually altering action without changing the VRM classifications in AOI R-3. Mitigation actions would aim to minimize visual disturbance to the river corridor."	3.2.1.5, 3.2.2.3, 3.17.1.5, 3.17.2.3
Green River RMP	Proposed 4	VRM – Projects and facilities will be designed to meet the objectives of the established visual classifications and appropriate mitigation will be included.	The Gateway West Transmission Line Project which will be permitted as a one-time allowance for the construction of access roads, placement of towers and double-circuit cables between towers where it would otherwise be in violation of the existing visual classifications for Segment 4 of the Proposed Route.	Appendix G-1, 3.2.1.5

Table 2.2-1 Land Use Plan Conformance and Proposed Amendment Summaries (continued)

Plan	Routes	Management Direction	Proposed Amendment	EIS Section
	Proposed 4	VRM – Management actions on public lands with a Class II visual resource management classification must be designed to blend into and retain the existing character of the natural landscape.	The Gateway West Transmission Line Project will be allowed as a single-use visually altering action without changing the VRM classification.	Appendix G-1, 3.2.1.5
	Proposed 4, Alternatives 4B, 4C, 4D, 4E	Aboveground facilities (power lines, storage tanks fences, etc.) are prohibited on or within 1/4 mile of grouse breeding grounds (leks). Placement of facilities, 'on' (very low profile) or below ground, and temporary disruptive activities, such as occur with pipeline construction, seismic activity, etc., could be granted exceptions within 1/4 mile of leks, in certain circumstances.	Allow the Gateway West Transmission Line Project within 0.25 mile of sage grouse leks, this would include the construction of access and maintenance roads for the Project, with appropriate mitigation measures.	3.11.2.3
	Proposed 3, Proposed 4, Alternatives 4B, 4C, 4D, 4E	Project components, such as permanent and high profile structures, i.e., buildings, storage tanks, powerlines, roads, well pads, etc. are prohibited within an appropriate distance of active raptor nests. The appropriate distance (usually less than 1/2 mile) will be determined on a case-by-case basis and may vary depending upon the species involved, natural topographic barriers, and line-of-sight distances, etc. Placement of facilities, "on" (very low profile) or below ground, and temporary disruptive activities, such as occur with pipeline construction, seismic activity, etc., could be granted exceptions within 1/2 mile of active raptor nests, in certain circumstances.	Permit the Gateway West Transmission Line Project as a one-time allowance for the construction and placement of Project transmission lines and towers within ½ mile of active raptor nests, with appropriate mitigation measures.	3.10.2.3, 3.11.2.2

Table 2.2-1 Land Use Plan Conformance and Proposed Amendment Summaries (continued)

Plan	Routes	Management Direction	Proposed Amendment	EIS Section
Kemmerer RMP	Proposed 4, Alternatives 4A,4F	Heritage Resources – Protect the physical evidence of NHTs designated under the National Trails System Act (ruts and traces, graves, campsites, landmarks) that exist on lands within federal jurisdiction by prohibiting all surface-disturbing activities that do not benefit the preservation and (or) interpretation of trails within the following distances: (1) Class 1 segments: ¼-mile on each side of trail segments and within a ¼-mile radius of gravesites and landmarks. (2) Class 2 segments: 500 feet on each side of trail segments and within a 500-foot radius of gravesites and landmarks. (3) Class 3 segments: 100 feet on each side of trail segments and within a 100-foot radius of gravesites and landmarks. Crossings at right angles to trails could be permitted on a case-by-case basis. This could require boring beneath the trail trace. (see Glossary for definitions of NHT and Class Segments).	Protect the physical evidence of NHTs designated under the national trails system act (routes and traces, grades, campsites, landmarks) that exists on lands within federal jurisdiction by prohibiting whole surface disturbing activities that do not benefit the preservation and or interpretation of trails within the following distances: Class I segments: ¼ mile on each side of trails segments and within ¼ mile radius of gravesites and landmarks. Crossings at right angles to trails could be permitted on a case-by-case basis with micrositing and mitigation. Proposed Route: Permit a one-time allowance for Gateway West Project to cross the Dempsey Hockaday NHT in section 32, T 24 N, R 117 W. Place towers as far from the trail as feasible. Alternative 4A: Permit a one-time allowance for Gateway West Project to cross the Sublette NHT in section 11, T 23 N, R 118 W. Place towers as far from the trail as feasible. Alternative 4F: Permit a one-time allowance for Gateway West Project to cross the Sublette NHT in section 12, T 23 N, R 114 W. Place towers as far from the trail as feasible.	3.2.1.5, Appendix G-1, 3.3.3.3, 3.3.3.4
	Alternatives 4B, 4D	Historic Trails – Utility corridors are not designated where they are in conflict with NHT's management objectives. High-voltage powerline corridors are established north of and parallel to I-80, and along Wyoming SH 89 from the junction of I-80 and the Wyoming state line.	Designate a utility corridor 1 mile in width, generally centered on the transmission line if either Alternative Route 4B or 4D is selected. (The Project is not in conformance with this requirement but the BLM recommends identifying a utility corridor along the Gateway West route if either alternative is selected.)	3.2.1.5, Appendix G-1, 3.3.3.3, 3.3.3.4

Table 2.2-1 Land Use Plan Conformance and Proposed Amendment Summaries (continued)

Plan	Routes	Management Direction	Proposed Amendment	EIS Section
	Proposed 4, Alternatives 4A,4B,4C,4D, 4E,4F	"VRM Class II areas: A visual corridor extending up to 1 mile on either side of the Sublette Cutoff and the Slate Creek Cutoff north of U.S. Highway 189 and east of Slate Creek Ridge in consideration of NHT views.	Proposed Route, Alternative Route 4A, and portions of Alternative Routes 4C and 4E north and east of highway 30/state Highway 89: Permit a one-time allowance for Gateway West Project without changing the VRM class for areas affected by the route. Alternative routes 4B, 4C, 4D, 4E: Reclassify the VRM Class designation to VRM Class III in the portion of the planning area south and west of U.S. highway 30 (the highway) beginning on a north-south line along the high ridgeline approximately ¼ mile west of the current active coal leases (west of the town of Kemmerer); south along the high ridgeline to the ridgeline behind the active coal leases in T21N, R117W, Sec 25; then west following the high points of the topography approximately 3 miles south of the highway to T21N, R118W, Sec 28; then north-west following the high points of the topography within approximately 3 miles of the highway to T21N, R118 W, Sec 18; then north-west following the high points to within approximately ½ mile of the highway in T21N, R118W, Sec 12; then west to the junction of U.S. Highway 30/State Highway 89. Alternative route 4F: Permit a one-time allowance for Gateway West Project without changing the VRM class for areas affected by the route.	Appendix G-1, 3.2.1.5, 3.2.2.3, 3.3.3.3, 3.3.3.4, 3.17.1.5

Table 2.2-1 Land Use Plan Conformance and Proposed Amendment Summaries (continued)

Plan	Routes	Management Direction	Proposed Amendment	EIS Section
	Proposed 4, Alternative 4A, 4F	"Manage the viewsheds of NHT segments as follows: (1)(a) Preserve the viewshed within 3 miles of Class 1 segments north and east of U.S. Highway 30 and west of the Hams Fork river (Tunp/Dempsey Trail area), where the visual characteristics of the setting contribute to the eligibility of the site, by managing projects in federal sections to retain the existing character of the landscape so developments do not dominate the visible area to detract from the feeling or sense of the historic time period of the trail setting. Design ROW to preserve the visual integrity of the settings consistent with the BLM visual resources handbook and manual. (1)(b) Preserve the viewshed within 1 mile of Class 1 segments outside of the Tunp/Dempsey Trail area and the checkerboard land pattern area, where the visual characteristics of the setting contribute to the eligibility of the site, by managing projects in federal sections to retain the existing character of the landscape so developments do not dominate the visible area to detract from the feeling or sense of the historic time period of the trail setting. Design ROW to preserve the visual integrity of the settings consistent with the BLM visual resources handbook and manual. (1)(c) On Class 1 trail segments within the checkerboard land pattern area, manage the viewshed to preserve the existing character of the landscape within the federal section where the trail occurs. (2)(a) Preserve the viewshed within ½ mile of Class 2 segments that exist in blocked federal lands west of U.S. Highway 189 (south of Kemmerer) and south of U.S. Highway 30 by managing projects in federal sections to retain the existing character of the landscape so developments do not attract the attention of the casual observer. (2)(b) On Class 2 trail segments outside of the area described in (2)(a) manage the viewshed to preserve the existing character of the landscape within the federal section where the trail occurs. (2)(c) On Class 3 segments, manage the viewshed according to the appropriate VRM class for the area."	Permit a one-time allowance for the Gateway West Project where it would otherwise be in conflict with the historic viewshed preservation management actions. Micrositing and mitigation measures will be implemented to minimize visual impacts to affected historic sites and trail segments.	Appendix G-1, 3.2.1.5, 3.3.3.3, 3.3.3.4, 3.17.1.5

Table 2.2-1 Land Use Plan Conformance and Proposed Amendment Summaries (continued)

Plan	Routes	Management Direction	Proposed Amendment	EIS Section
	Proposed 4	"Preserve the viewshed within 3 miles of the sites listed below, where the visual characteristics of the setting contribute to the eligibility of the site, by managing projects in federal sections to retain the existing character of the landscape so developments do not dominate the visible area to detract from the feeling or sense of the historic time period of the site. ROW will be designed to preserve the visual integrity of the sites consistent with BLM visual resources handbook/manual. The management action is intended to manage developments to maintain setting qualities and not to have an exclusion zone. . ."	Permit a one-time allowance for Gateway West Project if micrositing cannot reduce impacts to a level that meets the RMP Decision requirements.	Appendix G-1, 3.2.1.5, 3.3.3.3, 3.3.3.4, 3.6.1.5, 3.17.1.5
	Alternatives 4A, 4C, 4E	"Manage the Rock Creek/Tunp area of significant resource concern with the objective of preserving and enhancing the critical wildlife habitats and cultural values that occur within the area…. Restrict all new ROW actions to existing disturbance zones. No net loss of habitat function allowed from any construction activity within the boundaries of the management area. Successful re-establishment or improvement of habitats could offset any new disturbance areas. Pursue opportunities to reclaim existing roads not necessary to attain management objectives. Restrict OHV use to existing roads and trails. No off-trail travel is allowed without prior approval from the authorized officer. Manage NHTs and sites, settings, and all surface-disturbing activities to retain the existing character of the landscape in federal sections so developments do not dominate settings to detract from the feeling or sense of the historic period of use….."	Permit a one-time allowance for the Gateway West Project where it would otherwise be in conflict with the management objectives of Decision 7014. Micrositing and mitigation measures would be required to minimize impact to affected areas and resources.	Appendix G-1, 3.2.1.5, 3.3.3.3, 3.3.3.4, 3.6.1.5, 3.17.1.5, 3.10.1.5, 3.11.2.2

Table 2.2-1 Land Use Plan Conformance and Proposed Amendment Summaries (continued)

Plan	Routes	Management Direction	Proposed Amendment	EIS Section
Caribou Forest Plan	Proposed 4	1. Existing and proposed rights-of-way of the following types shall be designated as corridors (Rx 8.1). This does not prevent the inclusion of lower-rated transmission lines or smaller pipelines within the corridors. --Communication lines and zones for interstate use. --Railroads. --Federal, state, interstate, and forest highways. --Electric transmission lines of 66 kV and greater, including fiber optics. --Oil, gas, slurry, or other pipelines 10 inches or larger in diameter.	The management prescription will be changed to Prescription 8.1 –Concentrated Development areas to allow the Gateway West Transmission Line Project.	3.15.2.3, 3.17.2.3
	Proposed 4	Scenic Resources, Guideline 2. Until the Scenery Management System is fully implemented, projects should be planned and implemented to meet the Visual Quality Objectives (VQOs) as displayed on the Forest VQO map	The management prescription will be changed to Prescription 8.1 –Concentrated Development areas to allow the Gateway West Transmission Line Project.	2.4.5.2, 3.15.2.3, 3.17.2.3
	Proposed 4	Recreation, Guideline 4. Projects should be planned and implemented to meet the ROS as depicted on the Forest ROS map	The area within 500 feet of the transmission line and new permanent roads will be changed to Roaded Natural (affecting approximately 835 acres).	2.4.5.2, 3.15.2.3, 3.17.2.3
	Proposed 4	Goshawk Nesting Territories. The management Standards and Guidelines in Table 3.5, Management Standards and Guidelines within Active Goshawk Nesting Territories (Forest Plan page 3-30), apply to all forest types within active and historic goshawk nesting territories.	Permit the Gateway West Transmission Line with required mitigation.	2.4.5.2 3.15.2.3, 3.10.2.3

Table 2.2-1 Land Use Plan Conformance and Proposed Amendment Summaries (continued)

Plan	Routes	Management Direction	Proposed Amendment	EIS Section
Malad MFP	Proposed 5, Alternative 5A; Proposed 7, Alternative 7A	VRM – Specific development proposals will be allowed, located and designed in accordance with the existing VRM class restrictions with emphasis on Class I areas.	The Gateway West Transmission Line Project will be allowed as a single-use visually altering action without changing the VRM classification.	Appendix G-1, 3.2.1.5, 3.10.1.5, 3.11.2.2, 3.17.1.5
	Proposed 5, Alternative 5A, 5B; Proposed 7, Alternative 7A, 7B	Future major utilities will be routed across public lands within the existing corridor systems.	Permit the Gateway West Transmission Line Project.	Appendix G-1, 3.2.1.5, 3.3.3.3, 3.3.3.4, 3.6.1.5, 3.17.1.5, 3.10.1.5, 3.11.2.2
	Proposed 5, Alternative 5A, Proposed 7, Alternative 7A	Establish a protective corridor of 330 feet on visible segments of the Hudspeth Cutoff Trail. Continue adequate stipulation on permits, leases etc., to protect the trail	Allow the Gateway West Transmission Line Project with appropriate mitigation and micrositing.	Appendix G-1, 3.2.1.5, 3.3.3.3, 3.3.3.4, 3.6.1.5, 3.10.1.5, 3.11.2.2
Sawtooth Forest Plan	Alternatives 7H, 7I, and 7J	VQO – All projects shall be designed to meet the adopted Visual Quality Objectives (VQOs) as displayed on the Forest VQO map. Portions of Alternative Segment are currently designated as Partial Retention (VMS). There should be minimal distraction from scenic quality in foreground PR from road construction, reconstruction, and other excavation management. Roads and other excavation may be visible in middleground and background landscapes, but should blend into the characteristic landscape of the surroundings.	The Gateway West transmission line will be allowed; Mitigation measures, including micrositing and feathering the ROW edges, will be applied to minimize visual impacts.	3.2.1.5, Appendix G-2, 3.17.2.3, 3.15.2.3
	Alternative 7H	ROS – All projects and activities should maintain or enhance the adopted ROS classes as displayed on the Forest ROS strategy maps. New road construction should not occur within the summer Primitive and Semi-Primitive Non-Motorized areas. Facilities identified as being necessary should blend with the surrounding landscape character and ROS setting.	The affected area (at least 500 feet on each side of the transmission line and along new permanent roads) would be designated (mapped) as roaded natural.	3.2.1.5, Appendix G-2, 3.17.2.3, 3.15.2.3

Table 2.2-1 Land Use Plan Conformance and Proposed Amendment Summaries (continued)

Plan	Routes	Management Direction	Proposed Amendment	EIS Section
Cassia RMP	Proposed 7	Limit rights-of-way (ROWs) to existing facilities/localities	Permit the Gateway West Transmission Line Project.	3.2.1.5, 3.3.3.4, 3.3.3.4, 3.10.1.5, 3.11.2.2, 3.6.1.5, 3.17.2.3
	Alternatives 7I, 7J	Preserve scenic values in the Goose Creek Travel Zone (within ½ mile of the Goose Creek Road between Wilson Pass and the Utah border).	"The area classified as VRM Class II in the Goose Creek Travel Zone (within one-half mile of the Goose Creek Road Between Wilson Pass and the Utah border), will be reclassified as VRM Class III."	3.2.1.5, 3.3.3.3, 3.3.3.4, 3.10.1.5, 3.11.2.2, 3.6.1.5, 3.17.2.3
	Alternatives 7E, 7H, 7I, 7J	Consideration of scenic values will be included in the analysis of all activities involving alteration of the natural character of the landscape. The degree of alteration allowed is determined through an inventory process which results in the classification of all public lands into one of five Visual Resource Management classes, each class allowing for a different degree of modification.	The Gateway West Transmission Line Project will be allowed as a visually altering action resulting in the reclassification of: 122 acres of VRM II to VRM III in the AOI CA-1 (Jim Sage), 806 acres of VRM III to VRM IV in the AOI CA-2 (Cottonwood Creek), and 122 acres of VRM II to VRM III in the AOI CA-3 (Spring Canyon), and 20 acres of VRM II to VRM III in AOI CA-4 (Goose Creek). Permit a one-time allowance for the Project across VRM III in AOI CA-4 without changing the VRM classification.	Appendix G-1, 3.2.1.5
Twin Falls MFP	Proposed 9, Alternative 9A; Alternative 7I, 7J	L-4.1 Allow future major power transmission lines (line of at least 46-138 kV which originate and terminate outside of the MFP area) to be constructed within the recommended corridors. Also allow construction of transmission lines between the corridors. Do not permit power lines to the west or the east of the two corridors. Exempt service lines from restriction.	The Gateway West ROW will be allowed outside of existing corridors.	3.2.1.5, 3.3.3.3, 3.3.3.4, 3.10.1.5, 3.11.2.2, 3.6.1.5, 3.17.2.3
	Proposed 9	VRM I – VRM 1.1 Manage Salmon Falls Canyon between the Salmon Falls Dam and Lilly Grade for natural ecological change in accordance with a VRM Class I designation. This designation would include only the area from rim to rim. Manage the canyon from Lilly Grade to Balanced Rock under a VRM Class II designation.	An amendment to allow the Gateway West Project either by changing the VRM class or as a single-use visually altering action without changing the VRM classification cannot be approved while this segment of the river is an eligible WSR.	Appendix G-1, 3.2.1.5, 3.10.1.5, 3.11.2.2, 3.6.1.5, 3.17.1.5

Table 2.2-1 Land Use Plan Conformance and Proposed Amendment Summaries (continued)

Plan	Routes	Management Direction	Proposed Amendment	EIS Section
Twin Falls MFP (cont.)	Alternatives 7I, 7J	VRM 1.2 Designate 12,695 acres as VRM Class II. This class requires management activities to be designated and located to blend into the natural landscape and not to be visually apparent to the casual visitor. The following resource management guidelines shall apply: 1) Range Management – Juniper and sagebrush removal must be made to simulate adjacent natural openings. Fences, water developments, etc., would require construction with mostly hand tools and be of natural materials. No red fence posts allowed. 2) Structures – Structures must incorporate the natural lines, colors, and materials of the natural landscape, skylined structures would be prohibited. 3) Roads – Required roads must be concealed by vegetation, follow natural landforms, and be seeded as soon as possible. Overland "roads" may be necessary in some areas to protect the scenic values. Cut and fill areas that exceed 5 feet will generally not be accepted unless the fill can be replaced and vegetation established in 2 years.	Designate 12,625 acres as VRM Class II. This Class requires management activities to be designated and located to blend into the natural landscape and not to be visually apparent to the casual visitor. Designate 32,889 acres as VRM Class III. (see overlay D.5 and include 70 acres of previously VRM II land in the Rock Creek Area, north of the section line).	Appendix G-1, 3.2.1.5, 3.10.1.5, 3.11.2.2, 3.6.1.5, 3.15.2.3, 3.17.1.5, 3.19.1.5
Jarbidge RMP	Alternative 8A	MAU-7 C) Lands, 1. Utility avoidance/restricted area – Oregon Trail 5,888 acres (overhead, surface, underground); Dove Springs (160 acres) and 96 paleontologic sites (surface and underground).	Lands, 1. Utility avoidance/restricted area – no surface disturbance within 330 feet of the Oregon Trail; Dove Springs (160 acres); and 96 paleontologic sites (surface and underground).	Appendix G-1, 3.2.1.5, 3.3.3.3,3.3.3.4, 3.13.2.3
	Proposed 8, Alternative 8A	MUA-3 Utility avoidance/restricted area – three paleontological areas (Sugar Bowl, Glenns Ferry, & McGinnis Ranch) & Oregon Trail ruts (7,200 acres/22.5 miles) to overhead and surface disturbance and underground utilities.	Utility avoidance/restricted area – three paleontological areas (Sugar Bowl, Glenns Ferry, & McGinnis Ranch) & Oregon Trail ruts (7,200 acres/22.5 miles) to overhead and surface disturbance and underground utilities. The current lands decision is amended in the area identified as restricted in T 04 S R 09 E Section 35 and T 05 S R 09 E Section 2Section 35 to reclassify these areas as avoidance to accommodate a 500-kV powerline right of way.	3.2.1.5, 3.17.1.5
	Proposed 9	MUA-14 C) Lands, 1. Utility avoidance/restricted area – entire canyon (2,947 ac) (overhead, surface, underground).	The Gateway West ROW will be allowed to cross the ACEC. (The BLM has stated that they would not approve this amendment.)	3.2.1.5, 3.2.3, 3.10.1.5, 3.11.2.2, 3.6.1.5, 3.17.1.5

Table 2.2-1 Land Use Plan Conformance and Proposed Amendment Summaries (continued)

Plan	Routes	Management Direction	Proposed Amendment	EIS Section
Jarbidge RMP (cont.)	Proposed 9	No Development in the Salmon Falls Creek ACEC. "VRM 1.1 Manage Salmon Falls Canyon between the Salmon Falls Dam and Lilly Grade for natural ecological change in accordance with a VRM Class I designation. This designation would include only the area from rim to rim. Manage the canyon from Lilly Grade to Balanced Rock under a VRM Class II designation. 1,532 acres."	An amendment would be needed to allow the crossing of the ACEC; however, the BLM cannot approve an amendment allowing a transmission line to cross the ACEC while this segment of the river is an eligible WSR.	Appendix G-1, 3.2.1.5, 3.3.3.5, 3.3.3.3
	Proposed 8	The existing ruts of the main route, north and south alternate routes of the Oregon Trail and Kelton Road will be protected by not allowing incompatible uses to occur within ½ mile corridor through which these routes pass.	The existing ruts of the main route, north and south alternate routes of the Oregon Trail and Kelton Road will be protected by not allowing incompatible uses to occur within ½ mile corridor through which these routes pass, except where within the WWEC. No surface disturbance will be allowed within 330 feet of the trail.	Appendix G-1, 3.2.1.5, 3.3.3.3, 3.3.3.5
	Proposed 8	The visual or scenic values of the public lands will be considered whenever any physical actions are proposed on BLM lands. The degree of alterations to the natural landscape will be guided by the criteria established for the four Visual Resource Management Classes as outlined in BLM 8400. VRM Classes will be managed as shown on Map 9.	The VRM Management decision and Map 9 are amended to accommodate a major powerline R/W. Approximately 2,800 acres of VRM Class I associated with the Oregon Trail is reclassified to Class III.	Appendix G-1, 2.4.9, 3.2.1.5, 3.2.3.3, 3.3.3.3,3.3.3.4, 3.17.1.5
	Alternative 8A	The visual or scenic values of the public lands will be considered whenever any physical actions are proposed on BLM lands. The degree of alterations to the natural landscape will be guided by the criteria established for the four Visual Resource Management Classes as outlined in BLM 8400. VRM Classes will be managed as shown on Map 9.	The VRM Management decision and Map 9 are amended to accommodate a major powerline R/W. Approximately 5,200 acres of VRM Class I associated with the Oregon Trail is reclassified to Class III.	Appendix G-1, 2.4.9, 3.2.1.5, 3.2.3.3, 3.3.3.3, 3.3.3.4, 3.17.1.5
	Proposed 9, Proposed 8, Alternative 8A Alternatives 9B, 9D/9G	The visual or scenic values of the public lands will be considered whenever any physical actions are proposed on BLM lands. The degree of alterations to the natural landscape will be guided by the criteria established for the four Visual Resource Management Classes as outlined in BLM 8400. VRM Classes will be managed as shown on Map 9.	The area within the WWE Corridor will be reclassified as VRM III (affects AOIs, J-2, BOP-1/J-3, J-4, and J-5)."	Appendix G-1, 2.4.9, 2.4.10, 3.2.1.5, 3.2.3.3,3.3.3.3 3.3.3.4, 3.17.1.5

Table 2.2-1 Land Use Plan Conformance and Proposed Amendment Summaries (continued)

Plan	Routes	Management Direction	Proposed Amendment	EIS Section
Morley Nelson Snake River Birds of Prey National Conservation Area (SRBOP) RMP	Proposed 8	VRM II Protect the Oregon Trail as a Visual Resource Management (VRM) Class II area, the Army National Guard Orchard Training Area (OTA) as Class IV and remaining areas as Class III. [Visual Resource Management (VRM Map)]	"Manage the areas along the Oregon Trail and the Snake River Canyon as VRM Class II, the OTA as Class IV and remaining areas as Class III. Approximately 6,400 acres of Class II areas associated with the Oregon Trail and scenic values associated with the Oregon Trail and scenic values associated with the Snake River Canyon would be designated as Class III to accommodate a major transmission line R/W.	Appendix G-1, 3.2.1.5, 3.3.3.3, 3.3.3.5
	Proposed 8	2.16 Transportation – Lose the following areas to motorized vehicles: … Halverson Bar – 1,150 acres (Transportation Map A-145)	The Gateway West Project will be allowed to cross the Halverson Bar non-motorized area. (The BLM has indicated that this amendment would not be approved. An alternative route [8E] avoids this area.)	2.4.9.2, 2.4.9.4, 3.17.1.5, 3.17.2.4
	Alternatives 9D, 9G	2.16 Transportation – Close the following areas to motorized vehicles: … Cove – 1,600 acres (Transportation Map A-145)	The Gateway West Project will be allowed to cross the Cove non-motorized area. (The BLM has indicated that this amendment would not be approved, an alternative route [9F/9H] avoids this area.)	2.4.9.2, 2.4.9.4, 3.17.1.5, 3.17.2.4
	Alternatives 9D, 9F, 9G, 9H	VRM II Protect the Oregon Trail as a Visual Resource Management (VRM) Class II area, the Army National Guard Orchard Training Area (OTA) as Class IV and remaining areas as Class III. [Visual Resource Management (VRM Map)]	Manage the areas along the Oregon Trail and the Snake River Canyon as VRM Class II, the OTA as Class IV and remaining areas as Class III. Approximately 3,100 acres of Class II areas associated with the Oregon Trail and scenic values associated with the Snake River Canyon is designated as Class III to accommodate a major transmission line ROW. For Alternative 9G/9H: VRM Class II areas that are in view of the proposed transmission line would be inconsistent with the VRM II classification and would be reclassified to VRM III.	Appendix G-1, 3.2.1.5, 3.3.3.3, 3.3.3.5

Table 2.2-1 Land Use Plan Conformance and Proposed Amendment Summaries (continued)

Plan	Routes	Management Direction	Proposed Amendment	EIS Section
	Proposed 8, Alternatives 8B, 8D, 8E; Proposed 9, Alternatives 9D, 9E, 9F, 9G, 9H	Sensitive Plant Habitat Include in all BLM authorizations permitting surface disturbing activities (non-grazing), requirements that (1) affected areas be reseeded with a perennial vegetative cover, and (2) surface disturbing activities be located at least 1/2 mile from occupied sensitive plant habitat. "Require all permit holders in slickspot peppergrass habitat to conform to applicable conservation measures from the CA (Appendix 8)"	Gateway West will be allowed within ½ mile of occupied, sensitive plant habitat, with appropriate mitigation to protect sensitive plants, including slickspot peppergrass; where no construction, including roads, will occur within 50 feet of known or surveyed slickspot peppergrass habitat. Surveys shall be conducted that meet USFWS protocols prior to construction. Remediation will use weed-free seed mix and non-till methods in sensitive habitat and no soil placement over slickspot peppergrass Require all permit holders in slickspot peppergrass habitat to conform to applicable conservation measures from the CA (Appendix 8). The Gateway West Transmission Line will be allowed to remove limited amounts of sagebrush for construction while maintaining a distance of at least 50 feet from existing or known peppergrass occurrences. These activities will be monitored and mitigated.	3.6.1.5, 3.7.2.3
	Proposed 8, Alternatives 8D, 8E; Proposed 9, Alternatives 9D, 9E, 9F, 9G, 9H	Utility and Communication Corridors: Restrict major utility developments to the two utility corridors identified (Lands Map 3).	Restrict major utility developments to the two utility corridors identified and allow an additional major powerline ROW.	Appendix G-1, 3.2.1.5, 3.3.3.3, 3.3.3.4, 3.17.1.5
	Proposed 8, Alt. 8E, Alts. 9D, 9F, 9G, 9H	Retain all public lands in the 43,000-acre ROW avoidance area to protect the visual corridor along the historic Oregon Trail and the resources along the Snake River canyon (Lands Map 1).	Retain all public lands in the 43,000-acre ROW avoidance area to protect the visual corridor along the historic Oregon Trail and the resources along the Snake River canyon. Allow the Gateway West Transmission Line Project as a one-time exception with required mitigation.	Appendix G-1, 3.2.1.5, 3.3.3.3, 3.3.3.5, 3.17.2.3
	Proposed 8	This SRMA consists of 22,300 acres in the Snake River Canyon downstream from Grandview, Idaho that is managed for the protection of cultural and scenic values. (2.14 Recreation 2-20).	This SRMA consists of 15,900 acres in the Snake River Canyon downstream from Grandview, Idaho that is managed for the protection of cultural and scenic values. The SRMA designation has been reduced by approximately 6,400 acres to accommodate a major transmission line.	Appendix G-1, 3.2.1.5, 3.3.3.3, 3.3.3.5, 3.17.1.5

Table 2.2-1 Land Use Plan Conformance and Proposed Amendment Summaries (continued)

Plan	Routes	Management Direction	Proposed Amendment	EIS Section
	Alternative 9D, 9G	C.J. Strike SRMA: This SRMA consists of 20,000 acres surrounding C.J. Strike Reservoir along the Snake River. The purpose of the SRMA is to provide enhanced recreation management associated with the reservoir, and protection of the Oregon Trail adjacent to the reservoir (2.14 Recreation 2-20).	C.J. Strike SRMA: This SRMA consists of 16,900 acres surrounding C.J. Strike Reservoir along the Snake River. The purpose of the SRMA is to provide enhanced recreation management associated with the reservoir, and protection of the Oregon Trail adjacent to the reservoir. The SRMA designation has been reduced by approximately 3,100 acres to accommodate a major transmission line R/W.	Appendix G-1, 3.2.1.5, 3.3.3.3, 3.3.3.5, 3.17.1.5
Bennett Hills/ Timmer-man Hills RMP	Proposed 8	REC 4.1 No management activity should be allowed to cause any evident changes in the form, line color or texture that is characteristic of the landscape within this Class II area.	The area within 3,000 feet to the north of the existing transmission line ROW will be reclassified from VRM II to VRM III (including the existing ROW).	Appendix G-1, 3.2.1.5
	Proposed 8	REC 14.6 Prohibit all land disturbing developments and uses on archeological sites.	Prohibit all land disturbing developments within 330 feet of the Oregon Trail and manage archaeological sites as required by Section 106 of the National Historic Preservation Act.	3.3.3.3, 3.3.3.4,
Wells RMP	Alternative 7I, 7J	Corridor Designation 3. Locate new facilities in identified planning corridors.	The Gateway West Project will be allowed outside of identified planning corridors.	Appendix G-1, 3.2.1.5, 3.3.3.3, 3.3.3.4, 3.17.1.5
		The RMP classified the FO into visual resource management classes following BLM Manual 8400. A portion of the route crossed by the project is classified as VRM II.	The project will be allowed as a one-time, visually altering action without reclassifying the area.	
Bruneau MFP	Proposed 9	Manage all public lands in a manner which will protect and maintain the existing visual qualities, provide for enhancement where consistent with management policies, and provide for rehabilitation of land which presently do not meet the visual quality standards of surrounding lands. Use VRM contrast rating and project application design process for all management activities without unduly reducing commodity production or limiting program effectiveness.	The entire VRM II parcel near Castle Creek would be reclassified to VRM III.	Appendix G-1, 3.2.1.5
	Proposed 9	Designate 136,000 acres as VRM Class II where activities are designed and located to blend into the natural landscape and not visually apparent to the casual visitor.	The entire VRM II parcel near Castle Creek would be reclassified to VRM III.	Appendix G-1, 3.2.1.5, 3.17.2.3

Table 2.2-1 Land Use Plan Conformance and Proposed Amendment Summaries (continued)

Plan	Routes	Management Direction	Proposed Amendment	EIS Section
Kuna MFP	Proposed 8, Alternatives 8B and 8C[1/]	L-4.1 Confine major new utility R/Ws (i.e., 500 kV or larger or 24-inch pipeline) to existing corridors, as shown on Overlay L-4. The R/Ws will subject to reasonable stipulations to protect other resource uses.	The Gateway West Project will be allowed outside of existing corridors.	3.2.1.5, 3.3.3.3, 3.3.3.4, 3.17.2.5
	Proposed 8, Alternatives 8B and 8C	CRM-2.1 Manage parcels containing historic site 10-AA-155 and a 1/4-mile-wide corridor on either side of the Union Pacific (Oregon Short Line) Railroad for the protection of cultural resource values. Nominate these sites to the National Register of Historic Places, but do not designate them as ACECs (Other recommended management is listed).	Allow one transmission line crossing with micrositing required to minimize presence in the restricted area such that the transmission line will not affect the railroad's status as a Historic Place.	3.2.1.5, 3.3.2.5, 3.3.3.5

1/ Additional alternatives would cross the Kuna MFP Management Area; however, these alternatives are addressed under the SRBOP RMP, which replaces the Kuna MFP in these areas.

R/W – right-of-way; WSR – Wild and Scenic River; WWEC – West-wide Energy Corridor

2.4 ROUTE ACTION ALTERNATIVES

The Proponents state that their overall Project approach was for the Proposed Route to follow the WWE corridor, other designated corridors, or existing utility ROWs where feasible (IPC and RMP 2008, 2009). Therefore, many of the Route Alternatives were developed to consider various ways of following these existing corridors. In addition to alternatives suggested because they more closely follow the WWE corridor or existing utility corridors, several other alternatives were proposed and considered feasible (e.g., routes that would avoid certain sensitive resources), and therefore are also considered in detail in this EIS.

Several alternatives were considered, but upon closer examination, were eliminated from further consideration because it became clear that they provided no environmental benefit over the Proposed Action or one of the other alternatives considered in detail, they were not feasible for environmental, physical, or economic reasons, or they did not meet the Proponents' purpose and need. Site-specific alternatives considered and eliminated are shown on Figure A-1 for the whole Project and on Figures A-2 through A-12 (in Appendix A) for each segment. Each of these Route Alternatives is described in the following sections (Sections 2.4.1 through 2.4.12).

The naming convention and map labeling style, used in this EIS for alternatives, is to identify the Proposed Route for each segment in red type in Table 2.4-1 and in red on the maps in Appendix A, and alternatives studied in detail with green type in the table and green color on the maps and to label them with the segment number and a letter (e.g., 2A). Alternatives considered but eliminated from detailed study are identified in purple type in Table 2.4-1 and purple color on the maps. They are labeled with geographically descriptive names (e.g., Shirley Basin Alternative). In all cases reference points (e.g., 2h, 2g, 2i) were established in text, tables, and maps to aid in identifying Proposed and Alternative Route locations.

The reason for proposing these alternatives is explained in each description. These alternatives could replace portions of the segments they are named after in the Proposed Route (e.g., Alternative 7A could replace a portion of the Proposed Route along Segment 7 if this alternative is selected). In the analysis, the alternatives are compared with the Proposed Route based on the same beginning and ending points. The portion of the Proposed Route segment they could replace is identified by reference point, so all the Route Alternatives can be compared equally. Not all of the Proposed Route segments had alternatives that were considered in detail.

Because the Project connects a series of three proposed, one planned, and eight existing substations, alternatives proposed by the IDT or suggested by the public and those not considered in detail are described by segment between substations. Table 2.4-1 lists the alternatives considered by segment. The reference points are illustrated in Appendix A, Figures A-2 through A-12 by segment.

Table 2.4-1. Summary of Proposed Route and Route Alternatives Considered

Figure	Designation	Reference Points	Determination
Segment 1 E – Windstar to Aeolus			
A-2	Segment 1E – Proposed	1, 1Ed, 1Ee, 1Ee.1, 1Ef, 1Eg, 1Ei, 1Ek, 2	**Proposed**
	Alternative 1E-A	1, 1Ee	**Feasible Alternative**
	Alternative 1E-B	1Eg, 1Eh, 1Ej, 1Ek	**Feasible Alternative**
	Alternative 1E-C	1Ee.1, 2	**Feasible Alternative**
	Central Laramie Mountains Alternative	1, 1Eg, 1Eb, 1Ec, 1Ek, 2	**Eliminated from Detailed Study**
	East of Laramie Mountains	1, 1Eh, 1Ej, 1Ek, 2	**Eliminated from Detailed Study**
	Fetterman Road Alternative	1, 1Ea, 1Eb	**Eliminated from Detailed Study**
	Medicine Bow Alternative	1Eb, 2	**Eliminated from Detailed Study**
Segment 1 W – Windstar to Aeolus			
A-2	Segment 1W(a) – Proposed	1, 1Wa, 1Wb, 1Wc, 1Wd, 2	**Proposed**
	Segment 1W(c) – Proposed	1x, 1x.1, 1x.2, 2	**Proposed**
	Alternative 1W-A	1, 1Wb	**Feasible Alternative**
	Shirley Basin Alternative	1, 2	**Eliminated from Detailed Study**
Segment 2 – Aeolus to Creston			
A-3	Segment 2 – Proposed	2, 2a, 2d, 2e, 2e.1, 2e.2, 2e3, 2f, 2h, 2i, 3	**Proposed**
	Alternative 2A	2d, 2f	**Feasible Alternative**
	Alternative 2B	2e.1, 2e.3	**Feasible Alternative**
	Alternative 2C	2a.1, 2d.1, 2e.4	**Feasible Alternative**
	Rawlins Alternative	2h, 2g, 2i	**Eliminated from Detailed Study**
	Seven Mile Alternative	a – 2, 2a, 2c, 2d	**Eliminated from Detailed Study**
		b – 2, 2b, 2c, 2d	
Segment 3 – Creston to Bridger			
A-4	Segment 3 – Proposed	3, 3a, 4	**Proposed**
	Segment 3A	4, 3d, 3c	**Proposed**
	Segment 3B	4, 3e	**Proposed**
	Tipton Alternative	3, 3b, 4	**Eliminated from Detailed Study**

Table 2.4-1. Summary of Proposed Route and Route Alternatives Considered (continued)

Figure	Designation	Reference Points	Determination
Segment 4 – Bridger to Populus			
A-5, A-6	Segment 4 – Proposed	4, 4a, 4b, 4f, 4e, 4f.6, 4f.4, 4j, 4k, 4m, 4n, 4o, 4p, 5	**Proposed**
	Alternative 4A	4b, 4f, 4e, 4f.1, 4f.2, 4g.1, 4g, 4f.4, 4j	**Feasible Alternative**
	Alternative 4B	4b, 4b.1, 4b.2, 4b.3, 4b.4, 4b.5, 4b.6, 4b.7, 4b.8, 4b.12, 4b.13, 4j	**Feasible Alternative**
	Alternative 4C	4b, 4b.1, 4b.2, 4b.3, 4b.4, 4b.5, 4b.6, 4b.7, 4b.13, 4j	**Feasible Alternative**
	Alternative 4D	4b, 4b.1, 4b.2, 4b.3, 4b.5, 4b.6, 4b.8, 4b.12, 4b.13, 4j	**Feasible Alternative**
	Alternative 4E	4b, 4b.1, 4b.2, 4b.3, 4b.5, 4b.6, 4b.7, 4b.13, 4j	**Feasible Alternative**
	Alternative 4F	4b, 4f, 4e, 4f.1, 4f.2, 4f.5, 4f.3, 4f.4, 4j	**Feasible Alternative**
	Caribou-Targhee Alternative	4n, 4p	**Eliminated from Detailed Study**
	Consolidation/Relocation Alternatives	(see Figure 2.4-1)	**Eliminated from Detailed Study**
	Kemmerer Alternative A	4b, 4f, 4c, 4g, 4f.4	**Eliminated from Detailed Study**
	Kemmerer Alternative B	4.b.2, 4b.9, 4b.11, 4b.12	**Eliminated from Detailed Study**
	Kemmerer Alternative C	4b, 4f, 4f.2	**Eliminated from Detailed Study**
	Montpelier Alternative	4k, 4l, 4n	**Eliminated from Detailed Study**
	Populus Alternative	4p, 4q, 5	**Eliminated from Detailed Study**
	Rock Springs Alternative	4a, 4d, 4e	**Eliminated from Detailed Study**
	Southern WWE Corridor - Utah Alternative	4b, 7e	**Eliminated from Detailed Study**
Segment 5 – Populus to Borah			
A-7	Segment 5 – Proposed	5, 5a, 5a.1, 5g, 5b, 5i, 5j. 5l, 6	**Proposed**
	Alternative 5A	5a.1, 5x, 5c, 5k, 5j	**Feasible Alternative**
	Alternative 5B	5a.1, 5x, 5f, 5c, 5k, 5j	**Feasible Alternative**
	Alternative 5C	5g, 5l	**Feasible Alternative**
	Alternative 5D	5i, 5d, 5e, 5h, 6	**Feasible Alternative**
	Alternative 5E	5l, 5m, 6	**Feasible Alternative**
	Craters of the Moon (North) Alternative	5, 5n, 8	**Eliminated from Detailed Study**
	Craters of the Moon (South) Alternative	5, 5n, 5o, 8	**Eliminated from Detailed Study**
	Deep Creek Alternative A	5, 5a, 5d	**Eliminated from Detailed Study**
	Deep Creek Alternative B	5b, 5e	**Eliminated from Detailed Study**
Segment 6 – Borah to Midpoint			
A-8	Segment 6 – Proposed	6, 8	**Proposed**

Table 2.4-1. Summary of Proposed Route and Route Alternatives Considered (continued)

Figure	Designation	Reference Points	Determination
Segment 7 – Populus to Cedar Hill			
A-9	Segment 7 – Proposed	5, 7a.0, 7b.0, 7c, 7d, 7e, 7v, 7g, 7h, 7j, 7j.1, 7k, 7l, 7y, 7m.1, 7t, 7s, 7s.3, 7s.1, 7z, 9	**Proposed**
	Alternative 7A	7b.0, 7b.1, 7b, 7d	**Feasible Alternative**
	Alternative 7B	7b.0, 7b.1, 7a.2, 7a.1, 7b, 7d	**Feasible Alternative**
	Alternative 7C	7e, 7f, 7g	**Feasible Alternative**
	Alternative 7D	7g, 7w, 7h	**Feasible Alternative**
	Alternative 7E	7j, 7j.2, 7l	**Feasible Alternative**
	Alternative 7F	7h, 7j.2, 7m.1	**Feasible Alternative**
	Alternative 7G	7s.1, 7s.2, 7z	**Feasible Alternative**
	Alternative 7H	5, 7a.0, 7b.0, 7b.1, 7a.2, 7r.4, 7r.1, 7g.2, 7q.1, 7s.3, 7s.1, 7z, 9	**Feasible Alternative**
	Alternative 7I	5, 7a.0, 7b.0, 7b.1, 7a.2, 7r.4, 7r.1, 7r.2, 7r.3, 9a.1, 9	**Feasible Alternative**
	Alternative 7J / Rogerson Substation	5, 7a.0, 7b.0, 7b.1, 7a.2, 7r.4, 7r.1, 7r.2, 7r.3, 13 + 13, 9a.6 + 9, 9a.1, 13	**Feasible Alternative**
	Deep Creek Alternative	5, 7b, 7d	**Eliminated from Detailed Study**
	Burley Alternative	7e, 7u, 7g	**Eliminated from Detailed Study**
	Oakley Alternative	7m, 7p, 7o, 7q, 7t, 7s	**Eliminated from Detailed Study**
	Artesian City Alternative	7m, 7p, 7q, 7t, 7s	**Eliminated from Detailed Study**
	Cassia Alternative	7j.1, 7x, 7n, 7s	**Eliminated from Detailed Study**
	I-84 South Alternative	7g, 7i, 9g, 9h	**Eliminated from Detailed Study**
	Foothills Alternative	7j.1, 7x, 7y	**Eliminated from Detailed Study**
	Malta Bypass Alternative 1	7r.4, 7g.1, 7g.2	**Eliminated from Detailed Study**
	Malta Bypass Alternative 2	7g, 7g.1, 7g.2, 7q.1, 7s.3	**Eliminated from Detailed Study**
	Pinchpoint and Borah Substation Alternative	7d, 12, 8	**Eliminated from Detailed Study**
Segment 8 – Midpoint to Hemingway			
A-10	Segment 8 – Proposed	8, 8a, 8b, 8c, 8c.1, 8c.2, 8q, 8r, 8r.1, 8r.3, 8r.4, 8r.5, 9t, 9v, 11	**Proposed**
	Alternative 8A	8, 8c.1	**Feasible Alternative**
	Alternative 8B	8q, 8r, 8s, 8g, 8h, 8j, 8k, 8l, 8m, 8n, 8p, 11	**Feasible Alternative**
	Alternative 8C	8q, 8o, 8s	**Feasible Alternative**
	Alternative 8D	8r.1, 8r.2, 8r.3	**Feasible Alternative**
	Alternative 8E	8r.4, 9r.4, 9r.5, 8r.5	**Feasible Alternative**
	Bennett Hills Alternative	8b, 8f, 8o	**Eliminated from Detailed Study**
	Blair Trail Alternative	8c, 8d, 8e, 8f, 8o	**Eliminated from Detailed Study**

Table 2.4-1. Summary of Proposed Route and Route Alternatives Considered (continued)

Figure	Designation	Reference Points	Determination
	Gooding North Alternative	8, 8e, 8c.2	**Eliminated from Detailed Study**
	I-84 North Alternative	8, 8c, 8c.1	**Eliminated from Detailed Study**
	I-84 North Variation Alternative	8, 8a, 8c, 8c.1	**Eliminated from Detailed Study**
	King Hill Alternative	8b, 8e, 8f, 8o	**Eliminated from Detailed Study**
	McElroy Butte Alternative	8h, 8i, 8j, 8l, 8n, 11	**Eliminated from Detailed Study**
	Summer Lake-Midpoint Alternative	8g, 8p, 11	**Eliminated from Detailed Study**
	WWE Corridor Alternative	8c.1, 8d, 8e, 8f, 8o	**Eliminated from Detailed Study**
Segment 9 – Cedar Hill to Hemingway			
A-11	Segment 9 – Proposed	9, 9a, 9a.2, 9a.3, 9a.4, 9a.5, 9c.1, 9e.1, 9e.2, 9h, 9i, 9n, 9l, 9m, 9m.1, 9p, 9w, 11	**Proposed**
	Alternative 9A	9a, 9a.3	**Feasible Alternative**
	Alternative 9B	9a.5, 9b, 9c, 9d, 9e, 9g, 9h	**Feasible Alternative**
	Alternative 9C	9a.5, 9b, 9c, 9c.1	**Feasible Alternative**
	Alternative 9D	9n, 9n.1, 9r, 9r.1, 9r.4, 9r.5, 9p	**Feasible Alternative**
	Alternative 9E	9n, 9s, 9p	**Feasible Alternative**
	Alternative 9F	9n, 9l, 9m, 9m.1, 9n.1, 9r, 9r.1, 9r.4, 9r.5, 9p	**Feasible Alternative**
	Alternative 9G	9n, 9n.1, 9r, 9r.1, 9r.2, 9p	**Feasible Alternative**
	Alternative 9H	9n, 9l, 9m, 9m.1, 9n.1, 9r, 9r.1, 9r.2, 9p	**Feasible Alternative**
	I-84 South Alternative	7g, 7i, 9g, 9h	**Eliminated from Detailed Study**
	Blue Ridge Alternative	9c.1, 9f	**Eliminated from Detailed Study**
	Magic Valley Alternative	9, 9e, 9e.1, 9f, 9h	**Eliminated from Detailed Study**
	Magic Valley-Saylor Creek Alternative	9b, 9m	**Eliminated from Detailed Study**
	Saylor Creek Alternative	9i, 9j, 9l	**Eliminated from Detailed Study**
	Central Birds of Prey NCA Alternative	9m, 9r, 11	**Eliminated from Detailed Study**
	I-78 Alternative	9q, 9t, 9v, 11	**Eliminated from Detailed Study**
Segment 10 – Cedar Hill to Midpoint			
A-12	Segment 10 – Proposed	8, 10a, 10c, 9	**Proposed**
	Minidoka Alternative	10a, 10b, 10c	**Eliminated from Detailed Study**

2.4.1 Segment 1E – Windstar to Aeolus

2.4.1.1 General Description and Issues

Segment 1E would include construction and operation of one single-circuit 230-kV transmission line between the existing Windstar Substation near the Dave Johnston Power Plant at Glenrock, Wyoming, and the planned Aeolus Substation near Hanna, Wyoming. Segment 1E would be about 100.6 miles long. The 230-kV line would be carried on steel H-frame structures between 60 and 90 feet tall (Appendix B, Figure B-1). Appendix A, Figure A-2 shows the Segment 1E Proposed Route and Route Alternatives between the Windstar and the Aeolus Substations.

Eastern routes between Windstar and Aeolus were considered. In the northern portion of Segment 1E, routes were identified to avoid multiple transmissions lines across landowners located along the existing Dave Johnston – Rock Springs transmission line corridor. The southern end of the Proposed Route was routed by the Proponents to more easily access the wind energy resources north of Medicine Bow. Several routes including routes across as well as mostly east of the Laramie Mountains were considered and eliminated by the Proponents resulting from scenic concerns and public opposition to development of a new Greenfield route[4]. Among the key factors considered in routing this segment were visual resources, wildlife resources (sage-grouse, big game winter range, and nesting raptors), and geologic features (an ice cave).

2.4.1.2 Proposed Route

The proposed 100.6-mile transmission line route (points 1, 1Ed, 1Ee, 1Ee.1, 1Ef, 1Eg, 1Ei, 1Ek, 2) begins at the existing Windstar Substation, located just north of the existing Dave Johnston Power Plant, approximately 3.5 miles east of Glenrock, Wyoming, in Converse County. From Windstar, the proposed 230-kV line would proceed west for approximately 6 miles, crossing the Burlington Northern Railroad, then the North Platte River, then Chicago and Northwestern Railroad, and Wyoming Highway 20. At milepost (MP) 6.2, the route would turn to the southwest, crossing Interstate 25 (I-25) and several 69-kV, 115-kV, and 230-kV powerlines on a route approximately 2 miles north and west of Deer Creek.

At MP 15.6, the route would turn south passing into the Laramie Mountains, crossing into Natrona County at MP 23.1. Between MPs 8.7 to 17.5, 31.6 to 33.5, and MPs 61.6 to 77, the Proposed Route would be on a new ROW within the Natrona Sage-Grouse Core Area (Natrona Core Area). Between MPs 17.5 to 27.2 and 30.5 to 31.6, the route would be adjacent to an existing transmission line in sage-grouse core area and crucial big game winter range. Continuing to the south-southwest, the route would pass through portions of the Medicine Bow-Routt NFs (MPs 30.2 to 36.6) crossing both private and NFS lands, and the Bates Hole Management Area (MA; MPs 31 to 33.7). The Casper RMP states that no new utility corridors will be designated in Bates Hole, except within already existing corridors. Approximately 1.7 miles of the route would be outside the WWE corridor in this area.

[4] A “Greenfield route” is a route that would be located away from existing linear corridors, thereby creating a new land use.

At MP 31.3 (point 1Ef) the route would turn to the southeast, re-entering Converse County at MP 36.1, and staying just north of the sage-grouse core area. The route would enter Albany County at MP 43.8, and continue to the southeast for an additional 14 miles.

At mile 57.2 (point 1Eg), the Proposed Route would turn south. Beginning at MP 79, the route would be located within crucial big game winter range, as well as near a proposed wind farm area. At MP 85, the route enters Carbon County and turns west, passing through several miles of crucial big game winter range, intercepting several raptor nest buffers, and one sage-grouse lek buffer.

At MP 95.8 (point 1Ek) the route would pass just north of the Medicine Bow River and into Aeolus Substation. Between MPs 31.3 and 100.5, a new Greenfield route would be developed. The Proposed Route would be Greenfield for 86.5 miles and parallel an existing transmission line for 9.5 miles.

The Proposed Route would not be consistent with the management direction provided in the Medicine Bow Forest Plan, nor would it be in conformance with the Casper and Rawlins RMPs. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the Draft EIS where the effects are analyzed. Appendix F provides the proposed amendment and Appendix G provides the analysis and rationale for visual resource amendments.

2.4.1.3 Alternatives Eliminated from Detailed Study

East of Laramie Mountains Alternative (1, 1Eh, 1Ej, 1Ek, 2)

The East of Laramie Mountains Alternative was initially considered as an easterly alternative to the original Proposed Route through the Central Laramie Mountains. This alternative is 149 miles long and is located at the east edge of the Laramie Mountains. From Windstar Substation, this route would proceed southeast, crossing the Burlington Northern Railroad tracks, the North Platte River, and I-25. Immediately south of I-25, the route parallels to the north of 230-kV and 115-kV transmission lines, going into and out of crucial big game winter range. At MP 33.4, the route becomes predominantly southerly, staying just west of the Platte County border, crossing into Albany County and the Medicine Bow-Routt NFs at MP 44.4, then out of the NFs and into Platte County at MP 47.4. The route continues in and out of crucial big game winter range, turning slightly southeast at MP 56.1, crossing in and out of the Medicine Bow-Routt NFs. The route turns west southwest at MP 82.3, entering Albany County at MP 88.0, and turning west to northwest at MP 90.2 near Red Mountain. Continuous crucial big game range is present between MPs 78.1 and 96.1. The route passes just north of Wheatland Reservoir No. 2 and crosses the Laramie River at MP 106.9. Continuing west, the route passes through planned and proposed wind farm areas and back into crucial big game winter range. The route enters Carbon County at MP 130.6. Several raptor nest buffers are crossed in the last several miles of the route. At MP 143.6 (point 1Ek) the route would intersect with the Segment 1E Proposed Route, passing just north of the Medicine Bow River and into Aeolus Substation.

This alternative was eliminated from detailed study because, as of the date it was originally proposed, it:

- Is 48.5 miles longer than the Proposed Route;
- Crosses 56.1 more miles of big game crucial range;
- Requires construction on 10.0 more miles of steep slopes (> 15 percent); and
- The majority of the route would be Greenfield.

Fetterman Road Alternative (1, 1Ea, 1Eb)

The Fetterman Road Alternative, which would have replaced a portion of the Central Laramie Mountain Alternative between points 1, 1Eg, and 1Eb, was not included for detailed analysis in the original siting analysis. It was initially considered in an attempt to minimize visual impacts from the line by placing the line within a valley and along an existing road. However, upon determining that the visual setting included portions of the old stage route to Fort Fetterman with trail segments that are eligible for the NRHP, the Proposed Route was moved west out of the stage road setting. Following scoping, local landowners raised issues along this route. Based on landowner interest in this area and a request by the Office of the Governor of Wyoming (OGW 2009a) additional analysis, public comment, and further consultation with the Office of the Governor, it was once again eliminated from detailed analysis.

This alternative would exit the Windstar Substation and run eastward, north of the North Platte River, for approximately 4 miles. It then angles generally southward, crossing the North Platte River just west of Careyhurst, crossing the I-25 corridor, and proceeding south through the Medicine Bow-Routt NFs, paralleling just west of the Rock Creek and Fort Fetterman Road, to a location approximately 7 miles west of Garrett. At this point the alternative route turns and heads southwest to reference point 1Eb.

This alternative was eliminated from detailed study because, as of the date it was originally proposed, it:

- Impacts 0.3 mile more historic trail buffer than the portion of the central Laramie Mountains alternative it would have replaced, and it closely parallels the Rock Creek and Fort Fetterman Road;
- Crosses 21.1 miles of big game crucial winter range;
- Crosses 17.7 miles of core sage-grouse habitat; and
- There are more raptor nests are in proximity to this route than the Proposed Route.

Central Laramie Mountains Alternative (1, 1Eg, 1Eb, 1Ec, 1Ek, 2)

The Central Laramie Mountains Alternative was originally the Proposed Route for the 1E corridor. It would begin at the existing Windstar Substation located about 3.5 miles east of the community of Glenrock in Converse County, just north of the Dave Johnston Power Plant, and extends to the planned Aeolus Substation. From Windstar, the line would proceed predominantly south for approximately 54 miles, through Converse and Albany Counties crossing the Burlington Northern Railroad, the North Platte River, the Chicago and Northwestern Railroad, and I-25. Southeast of this highway at MP 7.6, the line crosses into the uplands in the vicinity of Brighton Canyon and east of Little Box Elder Creek. The route continues south parallel to Windy Ridge to MP 27, where it crosses into the Laramie Mountains, which it traverses for approximately 15 miles,

crossing into Albany County at MP 32. This segment continues south, running parallel to the Rock Creek and Fort Fetterman Road, which is approximately 4 miles to the east. The route alternative continues south to the vicinity of the confluence of Sheep Creek and Mule Creek. At MP 54 near Twenty-two Mile Draw, the route turns southwest for about 12.9 miles before turning westward, and then crossing from Albany County into Carbon County at MP 71.1. From the county line, the route continues westward across Greasewood Flats crossing State Route (SR) 487 at MP 76.5. It then proceeds west, south of the Freezeout Mountains and north of the Medicine Bow River to the planned Aeolus Substation.

This alternative was eliminated from detailed study because, as of the date it was originally proposed, it:

- Is entirely a Greenfield route;
- Contains scenic views in the Laramie Mountains outside of existing transmission line corridors;
- Crosses a sage-grouse core area;
- Crosses 18.1 miles of big game crucial winter range;
- Crosses 11.3 miles of forested habitats; and
- There are ferruginous hawk and golden eagle nests located in proximity to this route.

Medicine Bow Alternative (1Eb, 2)

The Medicine Bow Alternative was identified as an alternative at the southern end of the central Laramie Mountain routes between points 1Eb and 2. It extends from point 1Eb through Albany County, across the Thunder Basin Flats, crossing U.S. Highway 487, running along the southern foot of the Freezeout Mountains through sage-grouse core area, and terminating at the Aeolus Substation near the Medicine Bow River.

This alternative was eliminated from detailed study because, as of the date it was originally proposed, it:

- Is entirely a Greenfield route;
- Crosses 12.6 miles of big game crucial winter range;
- Crosses in proximity to raptor nests; and
- Crosses two sage-grouse lek 0.65-mile buffers.

2.4.1.4 Alternatives Studied in Detail

Alternative 1E-A (1, 1Ee)

Alternative 1E-A is considered a feasible alternative to the northern segment of Alternative 1E-C because it would parallel, but be offset 1,500 feet from, the existing Dave Johnston –Rock Springs 230-kV transmission line (line 1W[c]). The Segment 1W(c) utility corridor is also partially a WWE corridor and a BLM-designated ROW corridor. This alternative is approximately 16.1 miles long, compared to 17.6 miles for the corresponding portion of the Proposed Route.

Alternative 1E-A would begin at the existing Windstar Substation heading southwest, crossing the Burlington Northern Railroad, the North Platte River, the Chicago and Northwestern Railroad, Wyoming Highway 87, a 230-kV transmission line, and I-25. The alternative would pass through crucial big game winter range at MPs 3.5 to 6.8, and 8.1 to 15.6, as well as state land between MPs 4.9 to 9.3, 10.9 to 12.4, and 15.3 to 16.1. The alternative would cross Deer Creek at MP 15.5 and terminate at point 1Ee. No sage-grouse core areas would be crossed by this alternative.

No land use plan amendment is required for this alternative.

Alternative 1E-B (1Eg, 1Eh, 1Ej, 1Ek)

Alternative 1E-B is considered a feasible alternative to the southern segment of the Proposed Route, because it would avoid the Natrona sage-grouse core area. This alternative is approximately 59.3 miles long, compared to 37.9 miles for the corresponding portion of the Proposed Route.

Alternative 1E-B begins at MP 58.0 of the Proposed Route. The route parallels, but stays just north of, the sage-grouse core area for a distance of approximately 4 miles to Smith Mountain. The route then proceeds to the south, crossing the Rock Creek and Fort Fetterman Road at MP 6.6. At MP 7, the alternative would be located just east of the sage-grouse core area, continuing for about 19 miles, crossing the North Laramie River at MP 16. Three VRM Class II areas of less than 0.5 mile each are encountered at MPs 11, 13, and 14. At MP 22.8, the alternative turns to the southeast following a bend in the sage-grouse core area passing just north of Red Hill, then re-crossing Rock Creek and Fort Fetterman Road at MP 30. The alternative turns to the west at MP 33.3 (point 1Eh) and crosses big game crucial winter range at MP 41.6. The alternative crosses Rock Creek at MP 46.6, 1 mile north of Aurora Lake. At MP 48.8, the alternative turns to the northwest, intercepting two raptor nest buffers, and staying just north of Slate Ridge. The alternative crosses Little Medicine Bow River at MP 56.3 before rejoining the Proposed Route at MP 59.3 (point 1Ek). It is 21.4 miles longer than the comparison portion of the Proposed Route. This alternative would be a Greenfield route for its entire length.

Alternative 1E-B would not be in conformance with the management direction provided in the Rawlins RMP. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the Draft EIS where the effects are analyzed. Appendix F provides the proposed amendment and Appendix G provides the analysis and rationale for visual resources amendments.

Alternative 1E-C (1Ee.1, 2)

Alternative 1E-C was identified by BLM to maximize the use of existing utility and designated WWE corridors, and because it is the most direct route between points 1Ee.1 and 2. This alternative is approximately 48.7 miles long, compared to 75.4 miles for the corresponding portion of the Proposed Route.

Alternative 1E-C would be parallel to, but separated from, and west of, the proposed location of Proposed Routes 1W(a) and 1W(c) by 1,500 feet for its entire length (it would travel between point 1Ee.1 to the planned Aeolus Substation in Carbon County). Alternative 1E-C is shorter than the comparison portion of the Proposed Route and is

entirely parallel to an existing transmission line. After crossing the Carbon/Converse County line, the alternative would proceed parallel to the existing 230-kV line across the west fork of Duck Creek and over the Deer Creek Range. At approximately MP 10, the alternative crosses Ice Cave Mountain, the "Ice Cave," a local historical site that was a July 4th gathering spot for the community where they would meet to celebrate and cut ice to take home to their ice boxes. The alternative then proceeds generally south, passing east of Bates Creek Reservoir before crossing SR 487. The alternative would parallel the west side of SR 487 for about 14 miles to MP 59.5 (of Proposed Route 1W[c]) where the alternative would turn southwest and proceed along the northwest side of the Freezeout Mountains before terminating at the planned Aeolus Substation. During final design, the alignment may need to be modified to avoid the ice caves.

The one area where BLM has not designated the existing corridor as a ROW corridor is within the Bates Hole MA (crossed between MPs 5.7 and 16.0), in the southern portion of the Casper FO. Bates Hole is identified by BLM as a new ROW exclusion area (BLM 2007a). However, avoidance of this area could not be achieved without substantially compromising several other environmental factors, as described for the similar effects of the alternative (Section 2.4.2.3). Furthermore, the Casper RMP (BLM 2007a) specifically states that while no new utility corridors will be designated in Bates Hole, use of existing corridors in the area is acceptable if it is not feasible to follow one of the designated corridors. This alternative would cross approximately 20 miles of the Natrona Core Area adjacent to the existing Dave Johnston – Difficulty – Rock Springs transmission line.

Alternative 1E-C would neither be consistent with the management direction provided in the Medicine Bow Forest Plan nor be in conformance with the Casper and Rawlins RMPs. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the Draft EIS where the effects are analyzed. Appendix F provides the proposed amendment and Appendix G provides the analysis and rationale for visual resources amendments.

2.4.2 Segment 1W – Windstar to Aeolus

2.4.2.1 General Description and Issues

Segment 1W is composed of two parts, Segment 1W(a) and 1W(c), both consisting of portions of a new single-circuit 230-kV transmission line and reconstruction of a portion of the existing Dave Johnston – Rock Springs 230-kV transmission line between the existing Windstar Substation and the planned Aeolus Substation. Each single-circuit line would be constructed in a separate ROW to meet reliability criteria. The 230-kV lines would be carried on steel H-frame structures between 60 and 90 feet tall (Appendix B, Figure B-1). Appendix A, Figure A-2 is a map of the Segment 1W routes.

The existing transmission line that would be reconstructed along portions of Segment 1W(a) and 1W(c) is necessary to increase the load-carrying capacity of this existing line. The existing single conductor per phase would be replaced with two larger conductors per phase, requiring the replacement of all of the existing wood structures with stronger steel pole H-frame structures, similar in height and appearance to the existing line. Approximately 9 miles of Segment 1W(a) consists of this reconstructed line; the reconstructed line would extend from approximately MP 30 to MP 39 (Segment

1W(a) is about 76.5 miles long in total length). The reconstructed portion of Segment 1W(c) would be approximately 60 miles long and would extend from the existing terminus in the Dave Johnston Power Plant to about MP 24 and from MP 34 to the planned Aeolus Substation (Segment 1W(c) is about 70.6 miles long in total length).

Segment 1W(a) would carry the fiber optic communication system for Segment 1. Because of its length it would need an optical signal regeneration site approximately midway along its route. Final locations for the regeneration station will be determined after the preferred alternative is selected and detailed design engineering completed.

The primary objective during routing of Segment 1W was to follow the existing utility corridor, the WWE corridor, and other designated utility corridors. The proposed 1W(a) and 1W(c) routes, combined, are within or parallel to the WWE corridor or projected (which is also an existing utility corridor in this portion) for a combined total of 125.4 miles out of a combined total route length of 147.1 miles. Among the key factors considered in routing this segment were wildlife resources (sage-grouse, big game winter range, and raptors), cultural resources, historic trails, and wetlands.

2.4.2.2 Proposed Route

The Proposed Route 1W(a) would consist of a new transmission line from the Windstar Substation to about MP 30 (approximately 2 miles north of where the route enters the Medicine Bow-Routt NF) and again from near MP 39 to the endpoint. Between these two points it would consist of a rebuild of an existing 230-kV line. This switch is proposed to avoid a local historic site at Ice Cave Mountain (see Alternative 1E-C above). The rebuild portion of this route would involve replacement of the existing wood H-frame structures with steel pole H-frame structures, similar in height and appearance to the existing line. The route (including the new portion of the line and the rebuild portion together as one route) would extend from the Windstar Substation south and west to the planned Aeolus Substation (points 1, 1Wa, 1Wb, 1Wc, 1Wd, 2). Beginning at Windstar, the proposed line would proceed to the northwest and west staying just north of an existing 230-kV line and about 1 mile north of the North Platte River. At MP 7.4, the line turns to the south, crossing two historic trails, an oil and gas well field, Burlington Northern Railroad, North Platte River, Wyoming Highway 87/20, and I-25. The route crosses one raptor nest buffer north of the interstate. At MP 11.2, the line turns to the southwest for approximately 10 miles, at which point the route is parallel to and west of Segment 1W(c). The routes maintain a minimum of separation of 1,500 feet to meet reliability criteria.

Proposed Route 1W(c) would consist of a rebuild of an existing 230-kV line from the Dave Johnston Power Plant to about MP 24 and from about MP 34 to the Aeolus Substation. Between MPs 24 and 34, the route would consist of a new 230-kV line transmission line to avoid a local historic site at Ice Cave Mountain (see Alternative 1E-C above). The rebuild portion of this route would involve replacement of the existing wood H-frame structures with steel pole H-frame structures, similar in height and appearance to the existing line. The route (including the new portion of the line and the rebuild portion together as one route) would leave the existing substation at the Dave Johnston Power Plant and proceeds south and west to the vicinity of the Aeolus Substation, a distance of approximately 70.6 miles (points 1x, 1x.1, 1x.2, 2). Upon

reaching the Aeolus Substation, the new 230-kV line would be looped in and back out of the Aeolus Substation continuing through intermediate substations to the Rock Springs Substation.

From reference points 1Wb and 1Ee near Banner Mountain, Proposed Routes 1W(a) and 1W(c) follow similar paths, proceeding to the south crossing into Carbon County at approximately MP 25. After crossing the county line, the two Proposed Routes would cross the West Fork of Duck Creek and the Deer Creek Range. After crossing the county line, the two Proposed Routes would cross the West Fork of Duck Creek and the Deer Creek Range. At reference points 1Wc and 1x.1, the Proposed Routes for Segments 1W(a) and 1W(c) would each shift alignment approximately 1,500 feet to the southeast. For about 9 miles, 1W(a) would follow the existing Dave Johnston – Rock Springs alignment to before turning southwest at MP 39. From approximately MP 24, Segment 1W(c) would shift 1,500 feet east of the existing Dave Johnston – Rock Springs line before rejoining it at MP 34. This 9-mile shift in alignment was precipitated by landowner comments about potential impacts to an historic ice cave located west of 1W(a) at MP 37.5. The modified alignment avoids the ice cave by approximately 1,500 to 3,000 feet. Upon resuming their original alignments, 1W(a) and 1W(c), along with Alternative 1E-C, proceed generally south passing east of Bates Creek Reservoir before crossing SR 487. The Proposed Routes would parallel the west side of SR 487 for about 14 miles to MP 59.5 where they would turn southwest and proceed along the northwest side of the Freezeout Mountains before terminating at the planned Aeolus Substation at MP 76.5 (MP 70.6 for the Dave Johnston – Rock Springs line). As with Alternative 1E-C, Segment 1W(a) and 1W(c) Proposed Routes proceed generally south passing east of Bates Creek Reservoir before crossing SR 487. The two Proposed Routes would parallel the west side of SR 487 for about 14 miles to MP 59.5 where the lines would turn southwest and proceed along the northwest side of the Freezeout Mountains before terminating at the planned Aeolus Substation at MP 76.5 (MP 70.6 for 1W[c]).

Alternatives for this segment focused on the feasibility of following the existing utility corridor that is also partially a WWE corridor in portions and BLM- and Forest Service-designated ROW corridor in other portions (BLM 2007a, 2008a). They also cross the Bates Hole MA.

The Proposed Route 1W(c) would neither be consistent with the management direction provided in the Medicine Bow Forest Plan nor be in conformance with the Casper and Rawlins RMPs. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the Draft EIS where the effects are analyzed. Appendix F provides the proposed amendment and Appendix G provides the analysis and rationale for visual resources amendments.

2.4.2.3 Alternatives Eliminated from Detailed Study

Shirley Basin Alternative (1, 2)

The Shirley Basin Alternative was developed in an attempt to avoid crossing the Bates Hole MA with a new 230-kV transmission line; however, avoidance of Bates Hole could not be achieved without substantially affecting several other environmental resources. This alternative includes a 230-kV line on steel H-frame structures that would substitute

for Segment 1W(a), described above. The proposed 230-kV route would exit the Windstar Substation heading generally west, running north of the North Platte River and the I-25 corridor. The alternative passes north of Glenrock, Casper, and the Natrona County International Airport, and then begins to head southwest, crossing U.S. Highway 20/26 and traversing Emigrant Gap Ridge. This alternative would continue southwest for approximately 27 miles until meeting U.S. Highway 220 just north of the Pathfinder NWR. This alternative would then turn south and parallel the Pathfinder Reservoir and NWR about 6 to 7 miles to the west. Next, the alternative would loop east, passing south of the Seminoe Mountains, crossing Seminoe Reservoir and State Park, passing south of the Shirley Mountains, and terminating at the Aeolus Substation near the Medicine Bow River.

This alternative was eliminated from detailed study because, as of the date it was originally proposed, it:

- Is 72 miles longer than the Proposed Route;
- Traverses historic trail buffers, whereas the Proposed Route avoids them;
- Passes through Seminoe State Park, whereas the Proposed Route would avoid this area;
- Crosses portions of the Natrona, Greater South Pass, and Hann sage-grouse core areas; and
- Encroaches upon two sage-grouse lek 0.65-mile buffers.

2.4.2.4 Alternatives Studied in Detail

Alternative 1W-A (1, 1Wb)

Alternative 1W-A was considered as an alternative by the Proponents because it follows an existing transmission line and is parallel to Alternative 1E-A. This alternative is approximately 16.2 miles long, compared to 20.3 miles for the corresponding portion of the Proposed Route.

Alternative 1W-A would be an alternative to the north end of the Proposed Route between points 1, 1Wa, and 1Wb, and would be located parallel to Alternative 1E-A. Therefore, its description is nearly identical to that for Alternative 1E-A. This alternative would begin at the proposed Windstar Substation heading southwest, crossing the Burlington Northern Railroad and the North Platte River. If Proposed Route 1E is constructed, this segment would cross it just west of the river. The route continues west, crossing the Chicago and Northwestern Railroad, Wyoming Highway 87, a 230-kV transmission line, and I-25. The route passes through big game crucial winter range at MPs 3.7 to 6.8 and 8.1 to 15.5, paralleling to the north of Proposed Route 1W(c). The route crosses Deer Creek at MP 15.4 and terminates at reference point 1Wb on the Proposed Route 1W(a).

No land use plan amendment is required for this alternative.

2.4.3 Segment 2 – Aeolus to Creston

2.4.3.1 General Description and Issues

Segment 2 consists of one double-circuit 500-kV transmission[5] line between the Aeolus Substation and the Creston Substation near Wamsutter, Wyoming. The line would be constructed with double-circuit 500-kV designed structures but would be initially energized at 230 kV on one side and 500 kV on the other. This segment generally follows a WWE corridor and existing transmission lines. Appendix A, Figure A-3 is a map of Segment 2 between the Aeolus and Creston Substations.

Segment 2 as proposed would use 500-kV double-circuit lattice towers between 160 and 190 feet tall as shown in Appendix B, Figure B-3. In addition, the Proponents are considering using two single-circuit structures in place of the double-circuit structure (Appendix B, Figure B-5). This variation is discussed in Section 2.1.2. Whether built with one tower in a double-circuit configuration or with two towers in single-circuit configuration, both structures for Segment 2 would be built to 500-kV standards.

Segment 2 is about 96.7 miles long and therefore would need an optical signal regeneration site approximately midway along the route. Final locations for regeneration stations would be determined after the preferred alternative is identified and detailed design engineering is completed.

Alternatives focused on an existing 230-kV utility corridor that is also a WWE corridor and a BLM-designated ROW corridor, as well as a relatively direct route. The proposed route location for the Gateway South Project[6] was also considered. Among the key factors considered in routing this segment were visual resources visible from the Fort Fred Steele State Historic Site and nearby residences, sage-grouse and big game winter range, mining leases, and SRMAs. The current Proposed Route would have the least impact on Fort Fred Steele and residences among the Route Alternatives.

2.4.3.2 Proposed Route

The proposed 96.7-mile-long 500-kV double-circuit line (points 2, 2a, 2a.1, 2d, 2e, 2e.4, 2e.1, 2e.2, 2e.3, 2f, 2h, 2i, 3) would exit the planned Aeolus Substation directly west crossing County Route (CR) 121 and the Medicine Bow River paralleling the north side of the Seven Mile Hill Wind Energy Project. About 4.3 miles west of the substation, this route turns south for about 8.1 miles to the south side of U.S. Highway 30/287 about 3.5 miles east of community of Hanna, Wyoming.

On the south side of U.S. Highway 287/30, the route turns southwest and generally parallels the highway for about 21.2 miles, crossing SR 72, Sand Hills, and Dana Ridge. Approximately 3.0 miles northeast of I-80, the Proposed Route crosses U.S. Highway 287/30 (MP 32.5). At MP 39.7, the route turns southwest crossing BLM-managed land,

[5] A double-circuit 500-kV transmission line is composed of six electrical phases (two independent circuits of three phases each) and two lightning protection shield wires. One of the lighting protection shield wires is a steel OHGW, and the other is an OPGW. The OPGW contains glass fibers used for communication along the fiber path for data transfer between the Proponents' facilities. The data transferred are required for system control and monitoring.

[6] PacifiCorp initiated siting studies for the Gateway South Project, which is a proposed transmission line from Aeolus to Mona in Utah, then from Mona to Crystal in southern Nevada. While part of PacifiCorp's overall expansion of its portion of the western grid, Gateway South is an independent project from Gateway West. See Chapter 4 – Cumulative Effects, for more information on the Gateway South Project.

crossing I-80 at MP 41.3, and continuing between two raptor nest buffers to the east bank of the North Platte River at MP 42.2. From there, the route proceeds west, passing between two Wyoming Game and Fish Department (WGFD) parcels and a BLM SRMA, and north of an east-west ridge containing multiple raptor nests. The alternative route then passes through alternating sections of private and BLM-managed land, following an existing pipeline to the west for 1.6 miles before turning back to the west at MP 46.7.

Proceeding west, the Proposed Route passes north of Jefferson Flats, south of the Greenville Dome and a Wyoming penitentiary before crossing SR 71 about 2.4 miles south of Rawlins. Just west of SR 71, the route traverses Coal Creek and Coal Mine Ridge south and parallel to an existing 230-kV line. The route continues at varying distances from the existing line to the proposed Creston Substation. In this last 40-mile segment, the route crosses Hogback Ridge, Red Rim, and SR 789 before reaching the planned Creston Substation south of Wamsutter. The proposed 230-kV circuit would enter and exit this proposed substation and the 500-kV circuit would bypass the substation on single-circuit steel lattice structures. They resume in a double-circuit 500-kV configuration to the Anticline Substation.

The Proposed Route would follow the WWE corridor, which is also a BLM-designated ROW corridor (BLM 2008a), where feasible. It diverts only to avoid the Fort Fred Steele Historic site, the Seven Mile Hill Wind Energy Project, sage-grouse leks, and oil and gas well infrastructure. The Proposed Route is within or parallel to the WWE corridor (which is also an existing utility corridor) for 52.4 miles out of a total route length of 96.7 miles. Of its 96.7-mile length, the route parallels existing transmission lines for 50 miles. The Proposed Route would be within the Hanna Sage-Grouse Core Area (Hanna Core Area) on a Greenfield route from approximately MPs 3.0 to 17 and MPs 23.0 to 32.0.

The Proposed Route would not be in conformance with the management direction provided in the Rawlins RMP. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the Draft EIS where the effects are analyzed. Appendix F provides the proposed amendment and Appendix G provides the analysis and rationale for visual resources amendments.

2.4.3.3 Alternatives Eliminated from Detailed Study

Seven-Mile Alternative (2, 2b, 2c, 2d)

The Seven-Mile Alternative was initially considered because it would follow an existing 230-kV utility corridor that is also a WWE corridor and a BLM-designated ROW corridor, and it is a relatively direct route between points 2 and 2d. However, as proposed, both Gateway West and Gateway South would exit the planned Aeolus Substation in a southwesterly direction and both must avoid conflicts with PacifiCorp's existing Seven Mile Hill Wind Energy Project. Based on the need for two planned transmission lines to exit Aeolus, the Proponents proposed that Gateway West proceed due west and then south along a route suggested by the BLM IDT. Under that scenario, Gateway South, if approved, would exit the Aeolus Substation in a southerly direction parallel to the existing 230-kV transmission line and would be about 2,250 feet from the nearest wind turbine. This distance would allow adequate distance between

the transmission line and closest turbine but not allow enough distance to accommodate a second transmission line. Therefore, this alternative was eliminated from detailed study because, as of the date it was originally proposed, it:

- Does not allow enough distance to accommodate a second transmission line along this area.

Rawlins Alternative (2h, 2g, 2i)

The Rawlins Alternative was initially considered in order to avoid sage-grouse lek buffers by at least 0.65 mile. It would begin at point 2h, diverging south of the Proposed Route (which follows the existing utility corridor and the WWE corridor) by up to 2 miles (at point 2g) on new ROW before rejoining the Proposed Route at point 2i. The alternative would avoid one sage-grouse lek 0.65-mile buffer, but would be 0.5 mile longer than the Proposed Route. However, the BLM, the State of Wyoming, and the WGFD indicated they would prefer that the Project follow the existing utility corridor and the WWE corridor, in lieu of creating Greenfield routes in order to avoid every sage-grouse lek 0.65-mile buffer. The BLM IDT therefore eliminated this alternative from detailed study because, as of the date it was originally proposed, it:

- Does not follow existing utility corridor or the WWE corridor.

2.4.3.4 Alternatives Studied in Detail

Alternative 2A (2d, 2f)

Alternative 2A was initially considered because it would follow an existing utility corridor that is also a WWE corridor and a BLM-designated ROW corridor. However, this alignment is not the Proposed Route because it would cross within 0.25 mile of a known sage-grouse lek and within 0.65 mile of two other leks, would cross a number of gas or oil well buffers, and would be located in proximity to Fort Steele residents. This alternative is approximately 28.4 miles long, compared to 28.8 miles for the corresponding portion of the Proposed Route.

Alternative 2A would begin at Hanna Junction, just south of the intersection of SR 72 and U.S. Highway 287/30, point 2d. This alternative follows an existing 230-kV transmission line for a total of 23.2 miles beginning at Hanna Junction, crossing to the north side of U.S. Highway 287/30, then heading in a southwesterly direction, crossing Saint Mary's Creek at MP 7.3, running about 1 mile south of Saint Mary's Ridge, and crossing Saint Mary's Creek again at MP 14.3, just north of Walcott at MP 17.6. At this point, this alternative proceeds due west for 5.7 miles, still following the existing 230-kV transmission line, traversing the southern Fort Steele Breaks, crossing Saint Mary's Creek a third time at MP 20.4 and the North Platte River at MP 22.1, to a location south of Fort Steele at MP 23.3. At this point, this alternative would depart from the existing transmission line and head generally southwest, crossing to the south side of I-80 and U.S. Highway 287/30 at MP 25.8, and continuing another 2.5 miles to a location just southeast of Grenville Dome and approximately 2 miles southeast of Sinclair. This alternative would be substantially more visible from the Fort Fred Steele State Historic site than the Proposed Route would be. This alternative would parallel existing transmission lines for 26 miles.

No land use plan amendment would be required for this alternative.

Alternative 2B (2e.1, 2e.3)

Alternative 2B was originally the Proposed Route; however, concerns by rural residents as well as issues related to visual impacts to a historic site resulted in the Proponents changing this route segment from proposed to a feasible alternative. This alternative is approximately 6.2 miles long, compared to 7.0 miles of the corresponding portion for the Proposed Route.

This alternative consists of the original proposed alignment in the vicinity of Fort Fred Steele State Historic site. It would cross immediately south of the historic site main compound. This alternative would make maximum use of following an existing corridor and the designated WWE corridor.

No land use plan amendment would be required for this alternative.

Alternative 2C (2a.1, 2d.1, 2e.4)

Alternative 2C was developed in response to the Wyoming Governor's EO 2011-5, which lays out a series of measures for greater sage-grouse core area protection. Stipulation 16 of the EO establishes a transmission line corridor through core population areas. This 2-mile-wide corridor is the State of Wyoming's preferred alternative for routing transmission lines across the southern portion of the state. The EO provides that new transmission lines within this corridor would be considered consistent with the EO. Therefore, BLM has identified an alignment for Alternative 2C that is within the established corridor as an alternative to the Proposed Route and a portion of Alternative 2A, which are outside the corridor but in the same general area. This alternative is approximately 24.4 miles long, compared to 28.4 miles for the corresponding portion of the Proposed Route.

Alternative 2C would originate at point 2a.1 and extend southwest through point 2d.1 to a connection with the Proposed Route at point 2e.4.

No land use plan amendment would be required for this alternative.

2.4.4 Segment 3 – Creston to Anticline

2.4.4.1 General Description and Issues

A double-circuit 500-kV line is proposed from the proposed Creston Substation south of Wamsutter, Wyoming, to the proposed Anticline Substation near the Jim Bridger Power Plant. Appendix A, Figure A-4 is a map for Segment 3. The line would be designed and constructed to double-circuit 500-kV standards and would be initially energized at 230 kV on one side and 500 kV on the other.

Segment 3 as proposed would use 500-kV double-circuit lattice towers between 160 and 190 feet tall (Appendix B, Figure B-3). In addition, the Proponents are considering using two single-circuit structures in place of the double-circuit structures (Appendix B, Figure B-5). The double circuit (proposed) would require a 300-foot ROW, while the two single circuits would require a 350-foot-wide ROW. Figure B-5 compares the ROW configurations for these design variations, and they are discussed in greater detail in

Section 2.1.2. This segment also includes short segments of 230 kV and 345 kV to connect to the existing Jim Bridger Power Plant Substation.

The Proposed Route would generally follow I-80 and an existing utility corridor, and portions of the Proposed Route would also fall within the WWE corridor on public lands. However, constraints presented by existing development associated with roads, railroads, mining, and oil and gas operations influence siting and the feasibility of using the WWE corridor.

Of the combined total 56.5 miles of the Proposed Route (500 kV, 345 kV, and 230 kV), 15.6 miles are within the WWE corridor and 2.2 miles are parallel to the WWE corridor. Use of the full extent of the WWE corridor is not possible in this segment because of constraints presented by existing energy development. The Proposed Route follows the BLM Rawlins FO management direction to place utilities along the I-80 corridor (BLM 2008a) and the BLM Rock Springs FO management direction to place major utilities along existing corridors (BLM 1997).

The 500-kV portion of Segment 3 is less than 55 miles in length and therefore would not need optical signal regeneration sites, relying rather on signal regeneration at the substations.

2.4.4.2 Proposed Route

The Proposed Route along Segment 3 consists of 3 sub-segments: 3, 3A, and 3B (see Figure A-4). Sub-segment 3 of the Proposed Route is 46.6 miles long, sub-segment 3A is 5.5 miles long, and sub-segment 3B is 4.3 miles long. Segment 3 (in total) parallels existing transmission lines for 42.1 miles.

Sub-segment 3 consists of a 500-kV portion of the Proposed Route, and is located between points 3, 3a, 4. It begins at the Creston Substation and proceeds west for 17 miles, at which point it turns northwest and crosses U.S. Highway 80 at MP 19.1. This 17-mile segment parallels I-80 approximately 2 to 3 miles to the south and then to the north of the Delaney Rim. Once north of I-80, sub-segment 3 stays north of this highway until it reaches the east side of the Jim Bridger Power Plant access road. In this segment, oil and gas pipelines and wells are important routing considerations. Just north of the power plant road, the 500-kV circuit turns west and proceeds for about 2.6 miles before entering the proposed Anticline Substation.

A 5.5-mile interconnecting 345-kV transmission line (subsegment 3A) would be constructed between the proposed Anticline Substation yard and the existing Jim Bridger Substation 345-kV yard to electrically connect the two substations. About 0.5 mile east of the plant access road, this route angles to the north and then northwest on the east side of Deadman Wash. Approximately 2.5 miles north of the turn, the circuit energized at 230 kV (subsegment 3B) would leave the 500-kV line and continue for about 4.3 miles to a termination at the Jim Bridger Substation in the 230-kV yard.

No land use plan amendments would be required for the Segment 3 Proposed Route.

2.4.4.3 Alternative Eliminated from Detailed Study

Tipton Alternative (3, 3b, 4)

The Tipton Alternative was initially considered because it follows that WWE corridor more closely that the Proposed Route**.** This alternative diverges from the Proposed Route just west of Wamsutter Rim, and extends generally west along the WWE corridor for approximately 13 miles, passing through Tipton, to meet I-80/U.S. Highway 30 (where it also bisects the Proposed Route). This alternative then crosses to the north side of I-80/U.S. Highway 30 and continues generally west along the WWE corridor and just north of the I-80/U.S. Highway 30 corridor for an additional 17 miles, passing north of Table Rock, crossing Patrick Draw, and rejoining the Proposed Route at a location approximately 2.5 miles northwest of the intersection of I-80/U.S. Highway 30 and Bitter Creek Road.

This alternative was eliminated from detailed study because as of the date it was originally proposed:

- The WWE corridor along this route contains extensive development including existing roads, railroads, mining, and oil and gas operations, which present substantial constraints to the design and operation of the Gateway West transmission facilities

2.4.4.4 Alternatives Studied in Detail

No alternatives other than the Proposed Route were considered in detail for Segment 3.

2.4.5 Segment 4 – Anticline to Populus

2.4.5.1 General Description and Issues

One double-circuit 500-kV line is proposed between the proposed Anticline Substation and the existing Populus Substation near I-15 in southern Bannock County, Idaho. This segment generally follows an existing transmission line corridor. The line would be constructed to double-circuit 500-kV design standards and both circuits would be energized at 500 kV. Appendix A, Figures A-5 and A-6 show the Proposed Route for Segment 4 in Wyoming and Idaho, respectively.

Segment 4 as proposed would use 500-kV double-circuit lattice towers between 160 and 190 feet tall (Appendix B, Figure B-3). In addition, the Proponents are considering using two single-circuit structures in place of the double-circuit structures (Appendix B, Figure B-5). The double circuit (proposed) would require a 300-foot-wide ROW, while the two single circuits would require a 350-foot-wide ROW. Figure B-5 compares these design variations, and they are discussed in greater detail in Section 2.1.2.

Segment 4 is 203.0 miles long and would need three optical signal regeneration sites spaced approximately equidistant along its route. Final locations for regeneration stations would be determined after the preferred alternative is identified and detailed design engineering is completed.

The major factors influencing routing decisions for this segment were:

- The existing 345-kV transmission ROW, which comprises two or three single-circuit 345-kV lines along the entire length of the segment;
- Routing constraints posed by north-south oriented NWRs (Seedskadee, Cokeville Meadows, and Bear Lake);
- Avoidance of Fossil Butte National Monument;
- Avoidance of sage-grouse core areas;
- Caribou-Targhee NF, which cannot be reasonably avoided and should be traversed within or near the existing NF utility corridor included in the Forest Plan;
- Avoidance of visually sensitive areas, including viewsheds from historic trails; and
- Use of WWE corridor where feasible.

Where practical, the proposed double-circuit 500-kV line was routed to follow the existing 345-kV circuits (with a minimum 1,500-foot centerline offset from the nearest existing line). Where the existing transmission corridor could not be followed due to resource concerns such as sage-grouse leks, oil and gas well, raptor nests, and historic trails, deviations or refinements were incorporated into the alignments.

For Segment 4, the WWE corridor generally trends in a southwest direction beginning at point 4a, while the Proposed Route must trend due west to make a connection with the planned Populus Substation.

Segment 4 includes five subsegments, each having its own set of opportunities and constraints:

- The Rock Springs Subsegment extends approximately 52 miles to the west of the Anticline Substation. It is the only subsegment where a designated WWE corridor exists. It is approximately 52 miles west from the proposed Anticline Substation (from point 4 to 4b along the Proposed Route). The most important constraint in this subsegment is the Seedskadee NWR along the Green River. Other constraints include trona and coal mining, sage-grouse leks and buffers and core area, proximity to the Spring Canyon Subdivision, VRM Class II lands, and raptor nests and buffers. The primary routing opportunities are the existing transmission corridor and the WWE corridor.
- The Kemmerer Subsegment extends approximately 96 miles from the vicinity of Seedskadee NWR to the area east of Bear Lake (from point 4b to 4k). This subsegment has been the subject of multiple stakeholder meetings and discussions concerning resource issues including sage-grouse leks and core areas, historic trails, VRM Class II lands, Special Management Areas (SMAs), the Cokeville Meadows NWR, and big game wintering and parturition areas.
- The Montpelier Subsegment extends approximately 19 miles to the vicinity of the eastern boundary of the Caribou-Targhee NF (from points 4k to 4n). The primary opportunity in this area is the existing 345-kV transmission line corridor.

Constraints in this area include the community of Montpelier, the Bear Lake County airport, Bear Lake NWR, wetlands and waterbodies, agricultural lands, the Bear River, big game crucial winter habitat, and local development, including residences.

- The Cache Subsegment is approximately 9.2 miles long and extends across the NF (from point 4n to 4p). Although there is an existing Forest Service–designated utility corridor through this general area, it is only 600 feet wide and cannot accommodate the proposed 500-kV lines offset from the existing 345-kV lines by the required 1,500 feet. Constraints along this approximately 9.2-mile subsegment include steep and unstable slopes, highly erodible soils, Forest Service Visual Retention and Partial Retention areas, and raptor nests.
- The Populus Subsegment continues approximately 26 miles to the Populus Substation from the vicinity of the Caribou-Targhee NF (from point 4p to 5). Localized constraints include numerous sage-grouse leks, particularly west of the Bear River; the community of Downey; the air strip east of Downey; recreation areas; big game crucial winter range; steep topography; and agricultural land.

2.4.5.2 Proposed Route

The proposed double-circuit 500-kV segment is approximately 203.0 miles long, extending from the proposed Anticline Substation southeast of the Jim Bridger Power Plant and partially along the existing 345-kV corridor in Sweetwater County, Wyoming, to the planned Populus Substation west of the community of Downey in Bannock County, Idaho (points 4, 4a, 4b, 4f, 4e, 4f.6, 4f.4, 4j, 4k, 4m, 4n, 4o, 4p, 5). The Proposed Route would exit the proposed substation to the west and continue parallel to the south side of the existing 345-kV corridor for about 52 miles. In this segment, the Proposed Route crosses Deadman Wash, North Baxter Basin, Killpecker Creek, and U.S. Highway 191. The route turns to the northwest for approximately 48 miles to point 4f.6, entering Lincoln County at MP 76, crossing a historic trail buffer at MP 83, passing through several miles in an oil and gas field, crucial big game winter range, sage-grouse core areas, crossing Slate Creek and associated historic trails, and passing approximately 2 miles west of Fontenelle Reservoir. At point 4f.6 (MP 90) the route turns to the west paralleling the south side of Fontenelle Creek. Constraints include VRM Class II land, crucial big game winter range, historic trails, and encroaching on one raptor nest buffer. Turning slightly to the northwest, the route passes South Fork Mountain, Commissary Ridge natural features and residents, crossing Smith Fork River and passing just south of Quealy Reservoir approximately 3 miles north of Cokeville, then crosses the Bear River.

At MP 134.3 (reference point 4f.4) the route turns to the northwest crossing Boundary Ridge and proceeding from Lincoln County, Wyoming, into Bear Lake County, Idaho, at MP 136.0. From the county line, the Proposed Route parallels the east side of the existing 345-kV corridor across Bear River at MP 140. The Proposed Route then continues west to cross U.S. Highway 30 about 2.8 miles south of the community of Montpelier.

The Proposed Route remains parallel and offset about 1,500 feet northeast of the existing 345-kV corridor crossing Bear Lake Valley, U.S. Highway 89, and the Bear River before proceeding to the eastern boundary of the Caribou-Targhee NF at MP

160. The Proposed Route crosses about 9.2 miles within the NF boundary on a new ROW north of, but offset from, the existing 345-kV line as proposed by the Forest Service. The route then rejoins the existing corridor on the west side of SR 34 crossing Mound Valley and the Bear River again.

At MP 176, the Proposed Route leaves the existing 345-kV corridor and proceeds west passing along the north side of Dry Hollow Mountain and angling northwest toward the community of Downey. About 2 miles south of Downey, the Proposed Route crosses U.S. Highway 91 and the Marsh Valley. It then continues northwest to the Populus Substation located about 1.3 miles west of Downey. The Proposed Route would be within the Greater South Pass Sage-Grouse Core Area adjacent to the existing 345-kV transmission lines. It would then cross the Seedskadee Sage-Grouse Core Area (Seedskadee Core Area) from approximately MPs 58 to 70, adjacent to existing 345-kV lines and Greenfield route from MPs 70 to 71. The route would then cross approximately 14 miles of the Fontenelle Sage-Grouse Core Area (Fontenelle Core Area) and 4 miles of the Sage Sage-Grouse Core Area (Sage Core Area) on a Greenfield route. Of its 203.0-mile length, 80.4 miles would be parallel to existing transmission lines.

The Proposed Route would neither be in conformance with the management direction provided in the Kemmerer Green River RMPs nor would it be consistent with the Caribou Forest Plan. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the Draft EIS where the effects are analyzed. Appendix F provides the proposed amendment and Appendix G provides the analysis and rationale for visual resources amendments.

2.4.5.3 Alternatives Eliminated from Detailed Study

Rock Springs Alternative (Points 4a, 4d, 4e)

The Rock Springs Alternative was developed to maximize the use of the WWE corridor. This alternative follows the Proposed Route to a location 13.5 miles east of the Green River. The alternative route deviates from the Proposed Route at point 4a and then follows the WWE corridor for 21.9 miles to the south around the NWR (5 miles to the north) and rejoins the Proposed Route at reference point 4e.

This alternative was eliminated from detailed study because, as of the date it was originally proposed, it:

- Is approximately 6.5 miles longer than the Proposed Route;
- Passes within 0.25 mile of two sage-grouse leks as compared to none along the Proposed Route;
- Crosses 1.1 more miles of trona lease lands than the Proposed Route;
- Requires 14.7 miles more Greenfield ROW than the Proposed Route;
- Crosses 9.0 miles more big game crucial winter range than the Proposed Route;
- Crosses 1.2 miles more VRM Class II lands than the Proposed Route; and
- Crosses 3.4 miles more of historic trail buffers than the Proposed Route.

Southern WWE Corridor Alternative (4b, 7e)

The Southern WWE Corridor Alternative was initially evaluated in response to the request to consider a route that would follow the WWE corridor along the I-80 corridor. This 266-mile-long alternative is located south of the Proposed Route. From point 4b, the Southern WWE Corridor Alternative would follow the WWE corridor to the southwest through the checkerboard land towards Evanston, Wyoming. Approximately 60 to 70 percent of the alternative in this portion follows I-80, passing through several miles of land currently used for trona mining. At Evanston, the alternative leaves I-80 and the WWE corridor and proceeds to the northwest through a large wetland south of Woodruff Reservoir, then west into Utah, following existing transmission lines over the Wasatch Mountain Range and into the Salt Lake Valley north of Ogden, Utah. The alternative would then turn north for approximately 45 miles, paralleling existing transmission lines on the east side of I-15, then proceed to the northwest on a route through mostly private agricultural land near the towns of Thatcher, Howell, and Snowville, Utah. Roughly half of this interval parallels I-86. The WWE corridor is rejoined as the alternative crosses into Idaho, continuing northwest, then north before rejoining the Proposed Route in Segment 7 at point 7e.

This alternative was eliminated from detailed study because, as of the date it was originally proposed, it:

- Does not meet the Project's Purpose and Need, as It would not be feasible to connect to the Populus Substation nor would this alternative allow for the proposed connection between Populus and Borah Substations along Segment 5;
- Is 64 miles longer than the Proposed Route;
- Crosses 136 more miles of private land than the Proposed Route;
- Crosses 131 miles of Utah, including densely populated portions of the Salt Lake Valley; and
- Although the total length of the corresponding portion of the Proposed Route is 202 miles, only 2 miles are on the WWE corridor. The 30-mile advantage to following the WWE corridor on the Southern WWE Corridor Alternative would be negated by the 64 extra miles of total length of this alternative.

Consolidation/Relocation Alternatives

Figure 2.4-1 shows an area in southwestern Wyoming in the Kemmerer BLM FO that contains important historic, visual, and natural resources. To date, the Proponents and the BLM have proposed a total of seven alternatives in this area. Each alternative was designed to reduce impact on one suite of resources; however, each of these alternatives would result in unavoidable impacts on important resources. These alternatives and their resulting impacts are discussed in the following text.

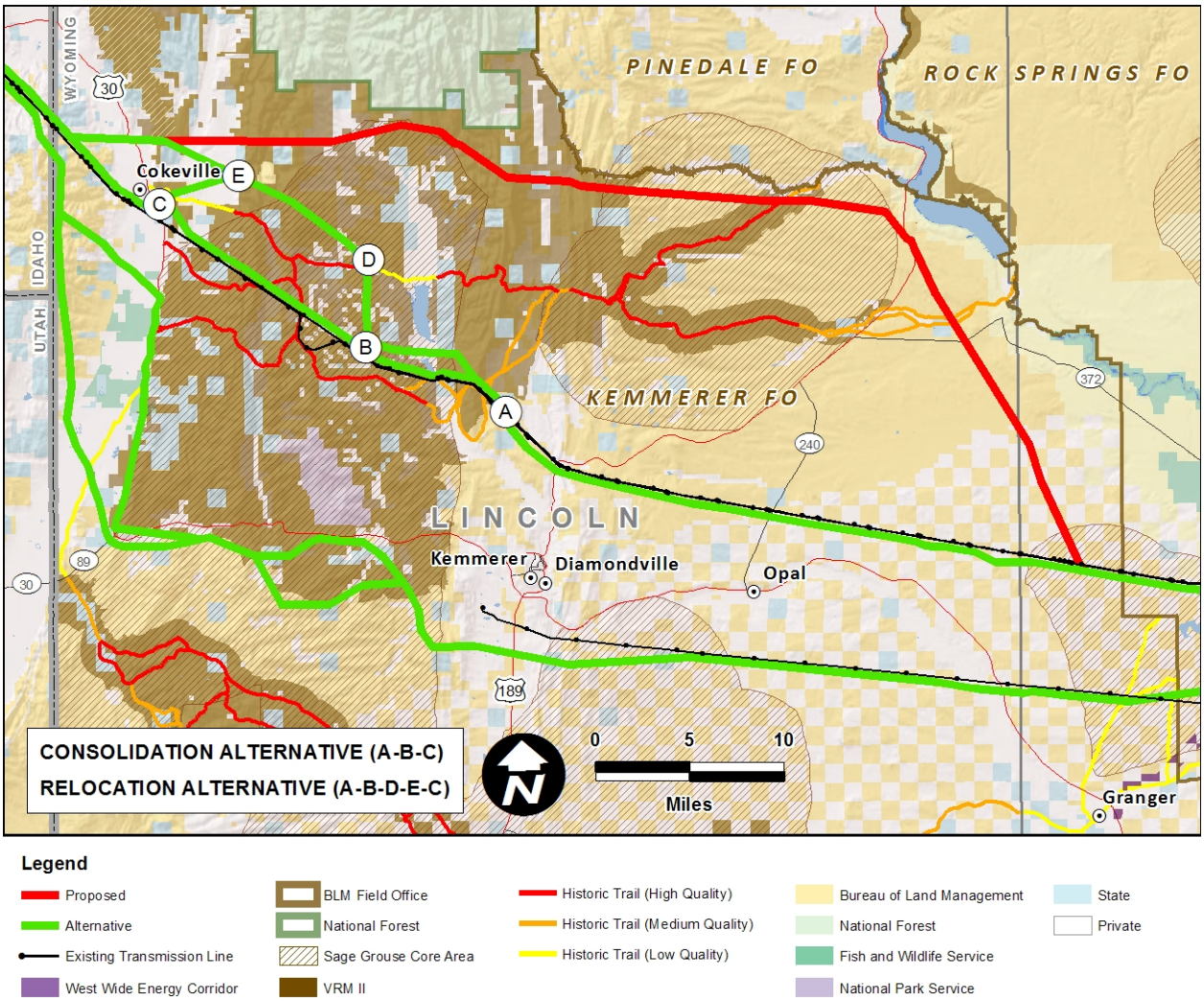


Figure 2.4-1. Consolidation/Relocation Alternatives

In response to concerns regarding impacts to historic trails and the inconsistency with the overall land use plan decisions in the Kemmerer RMP, the Kemmerer FO requested that an alternative be considered that lessens the impacts to the view shed by either combining the existing and the proposed transmission lines onto one large structure, or modifying the existing structures to be less intrusive on the viewshed. Specifically, the FO requested:

> *Need to analyze an alternative that would upgrade the line from (A-B-C, 23.5 miles), by installing new non-reflective towers made of dulled or weathering steel, with non-specular wire that could handle existing transmission and include the new proposal under Gateway.*

The area is currently crossed by three single-circuit 345-kV transmission lines: Bridger West (Bridger – Populus #1 and #2, and Bridger – Three Mile Knoll), constructed in 1970 through 1974. The three 345-kV circuits currently carry a maximum load of approximately 2,400 MW. Two lines continue west to Populus while the third turns

north in the Cokeville area. These transmission lines were constructed with structure and conductor materials that appear shiny under most lighting conditions compared to the dulled finish material to which the Proponents have committed to for the Gateway West Project.

The Gateway West Project proposes to carry up to 3,000 MW on a double-circuit 500-kV structure through this area. When combined with energy carried on the three 345-kV structures, the total is about 5,400 MW. While it would be technically feasible to carry this load on one set of double-circuit 765-kV structures through this area, it would be prohibitively expensive for the following reasons:

- The Western Interconnection does not include 765-kV systems, and there are no substations or transformers in the Western grid that could interconnect with this voltage;
- Therefore, to allow for this possibility, new substations would need to be constructed, or existing substations expanded, to accommodate very large new transformers just for this one line. If such a substation or expansion were created near the Jim Bridger Power Plant, then the new 765-kV line would have to be over 150 miles long, from Bridger to Cokeville; and
- A large new substation would have to be built at Cokeville to allow for the 345-kV line that turns north near Cokeville to continue to supply power to the Three Mile Knoll Substation.

This change in the Proposed Action would likely be prohibitively expensive and out of proportion as a possible mitigation to the impacts being avoided. As an alternative to consolidating all circuits on a single structure of a type not compatible with the Western Interconnection, the Proponents were asked to consider consolidating the existing lines on two structures and locating the Gateway West double-circuit 500-kV structure immediately adjacent to them.

Two transmission alternatives were evaluated to determine the feasibility of consolidating or relocating existing and proposed transmission lines to reduce impact. The alternatives considered are:

- Consolidation Alternative (along a 23.5-mile portion of Alternative 4A) that, at completion, would result in two double-circuit 345-kV lines and one 345-kV single circuit along the alignment of the existing transmission lines (Figure 2.4-1, points A, B, and C).
- Relocation Alternative (along a 28-mile portion of Alternative 4F) that, at completion, would result in two double-circuit 345-kV lines and one 345-kV single circuit (Figure 2.4-1, points A, B, D, E, and C).

The environmental advantages of the Consolidation Alternative would include:

- No increase in number of lines crossing historic trails;
- No increase in number of structures in the vicinity of sensitive visual resources;
- The existing 345-kV line would be rebuilt with dull finish structures, insulators, and conductors; and
- Conformance with management objectives in Kemmerer RMP.

The environmental advantages of the Relocation Alternative would include:

- Removal of three 345-kV crossings of high-quality trails, relocating them to an area of lower sensitivity;
- Reduction in number of structures in the vicinity of sensitive visual resources;
- Avoidance of additional high-quality trail crossings with the Gateway West Project; and
- Conformance with management objectives in Kemmerer RMP.

The main environmental disadvantage for either alternative would be more than doubling the disturbance footprint (due to construction of two new sets of structures and removal of the three old sets of structures that have been in place for 35 to 40 years) in important sage-brush habitat within the Sage Core Area for protection of the greater sage grouse. Also, the Relocation Alternative would not be compliant with the Governor of Wyoming's EO 2011-5, requiring new transmission to be located within a designated corridor.

Because the Consolidation/Relocation Alternatives would involve changes to operating transmission lines, the Proponents were asked to evaluate the electrical, schedule, and reliability advantages or disadvantages (IPC and RMP 2010). In addition to the expense (which would be passed on to all the ratepayers), the Proponents report that:

> *While the rerouting, and rebuilding of Bridger West transmission lines per the BLM proposal is possible, the number of significant transmission outages to address line crossings, line repositions and construction would be prohibitive to Rocky Mountain Power. Additionally, the schedule to perform such a reconstruction is well outside the current Gateway West schedule and would have to be coordinated with planned generation outages at the Jim Bridger Generating Plant.*

Even assuming the cost and schedule issues could be resolved, the more fundamental issue raised by the Proponents is that of reliability. They state:

> *Simultaneous loss of multiple lines or all lines in this corridor (fire, high winds, blizzards, etc.) would result in cascading outages conditions that would impact the entire Western Interconnection. The configurations proposed do not meet the Gateway West project needs and requirements.*

The Gateway South and Gateway Central transmission lines are designed to fully carry the power load if the Gateway West line goes down, to meet system reliability requirements. However, if the Gateway West line was built immediately adjacent to the three Bridger lines, a single event could affect all of these lines. In that event, the Gateway South and Gateway Central lines would be unable to carry the combined Bridger/Gateway West load. The Gateway South/Gateway Central lines are designed to handle the Gateway West load but not the combined Bridger and Gateway West load once the Gateway West line is fully energized.

The Proponents have stated that they cannot support this alternative. System studies have not been conducted on this alternative but it is reasonable to assume that the reliability requirements for common corridor outages would not be met and that

Gateway West would not receive a rating for Segment 4 that would meet the fundamental purpose and need of the Project.

Based on the reliability concerns raised by the Proponents, this alternative was eliminated from detailed analysis.

Caribou-Targhee Alternative (4n, 4p)

The Caribou-Targhee Alternative was originally the Proposed Route; it was an initial attempt at routing through the Caribou-Targhee NF. The first 3 miles of this alternative follow an existing transmission line, after which it heads north towards the Proposed Route. It generally follows the Proposed Route (but somewhat south of it) until rejoining the Proposed Route at point 4p.

This alternative was not selected for detailed analysis because the Forest Service staff, who are familiar with existing conditions and responsible for the management of this area, recommended the Proposed Route described above. The Proponents therefore shifted their Proposed Route to the route recommended by the Forest Service, and the IDT and dropped this (initially Proposed Route) from further study. This route was eliminated from detailed study because, as of the date it was originally proposed, it:

- Is slightly longer than the Proposed Route;
- Has more angle structures that the Proposed Route; and
- The Forest Service recommended another, more feasible route, in regard to constructability and environmental impacts.

Kemmerer Alternative A (4b, 4f, 4c, 4g, 4f.4)

The Kemmerer Alternative A was initially considered to avoid a 0.65-mile buffer around sage-grouse leks, a 250-foot buffer around oil and gas wells, and unstable slopes. It would require an entirely Greenfield ROW for about 61.0 miles. This alternative deviates from the Proposed Route at point 4b; however, it closely follows the Proposed Route until point 4f. At point 4f it heads west, along a path located south of the Proposed Route. It crosses the Union Pacific Railroad (UPRR) twice, before turning northwest and briefly rejoining the Proposed Route near an existing transmission line. This alternative then leaves the Proposed Route again, heading west towards Dempsey Ridge, then turning northwest and approaching the Proposed Route at point 4g. It closely follows the Proposed Route until point 4f.4, where it rejoins this route.

This alternative was eliminated from detailed study because as of the date it was originally proposed, it:

- Requires 36.9 miles more Greenfield ROW than the Proposed Route;
- Crosses 3.3 miles more high-quality historic trail buffer than the Proposed Route;
- Crosses 3.3 miles more irrigated farmland than the Proposed Route;
- Crosses 2.6 miles more National Wetland Inventory (NWI) mapped wetlands than the Proposed Route;
- Crosses 13.4 more miles of big game crucial winter habitat than the Proposed Route;

- Crosses 1.9 more miles of sage-grouse core area than the Proposed Route; and
- Approval could be blocked by a conservation easement secured by the NWR south of Cokeville.

Kemmerer Alternative B (4b.2, 4b.9, 4b.10, 4b.11, 4b.12)

In January 2008, the BLM Kemmerer FO proposed a route alternative to the south of the Proposed Route in order to avoid environmental constraints along the existing 345-kV transmission lines. The Kemmerer Alternative B incorporates segments proposed by both the Proponents and the Kemmerer FO. This alternative departs from the feasible alternatives just west of Route 189 and trends west, crossing active trona mines owned by FMC, to the area just west of the Chevron coal mine south of the community of Kemmerer (point 4b.2). From this point, the Kemmerer Alternative B would proceed to the Wyoming-Utah border south of the Cokeville Meadows NWR through 20.2 miles of Sage Core Area. At the state line, the alternative would turn north to point 4b.12. This area is less disturbed than areas to the north, is within sage-grouse core area, and is big game crucial winter range.

This alternative was eliminated from detailed study because, it:

- Crosses through sage-grouse core areas;
- Crosses through big game crucial winter range; and
- The WGFD expressed concerned that this route alternative would cross high-quality habitat with a new ROW.

Kemmerer Alternative C (4b, 4f, 4f.2)

The Kemmerer Alternative C was developed early in the routing process. This alternative is located adjacent to the north side of the existing 345-kV corridor (4b, 4f, 4f.2). The alignment of this alternative is within the 2-mile-wide corridor for transmission line siting, established by EO 2011-5 in June 2011 by the Wyoming Governor's office. This alternative is very similar to Alternative 4A, in that it is located on the south side of the existing 345-kV corridor and is also within the designated sage-grouse corridor.

This alternative was eliminated from detailed study because as of the date it was originally proposed, it:

- Encroaches on sage-grouse lek buffers; and
- Offers no advantages over Alternative 4A.

Montpelier Alternative (4k, 4l, 4n)

The Montpelier Alternative was initially considered in order to cross fewer miles of irrigated farm land and wetlands compared to the Proposed Route, and to avoid a large ROW with four circuits and three sets of lattice steel structures across the Bear River Valley. This alternative diverges from the Proposed Route at 4k and follows an existing single 345-kV line northwest to reference point 4l. This alternative would proceed northwest, offset 1,500 feet from the existing 345-kV line, and pass east of the community of Montpelier. About 3 miles north of this community, the alternative route would angle west (leaving the existing 345-kV line) and cross U.S. Highway 30, the

Bear River, and the Bear River Valley before proceeding to the west to the uplands and reference point 4n, the majority of which would be on Greenfield ROW.

This alternative was eliminated from detailed study because as of the date it was originally proposed, it:

- Is 1.5 miles longer than the Proposed Route;
- Crosses two scenic highways;
- Crosses 7.3 more miles of steep slopes than the Proposed Route;
- Requires approximately 10.1 more miles of Greenfield ROW;
- Crosses 8.8 more miles of big game crucial winter range than the Proposed Route; and
- Adds a new transmission crossing of Bear Lake Valley and U.S. Highway 30.

Populus Alternative (4p, 4q, 5)

The Populus Alternative was initially considered because it would parallel (1,500 feet to the north) an existing 345-kV route between points 4q to 5.

This alternative was eliminated from detailed study because, as of the date it was originally proposed, it:

- Requires more Greenfield ROW than the Proposed Route;
- Crosses more big game crucial winter range than the Proposed Route;
- Passes within 700 feet of the Downata Hot Springs Resort boundary;
- Traverses one sage-grouse lek and three sage-grouse lek buffers; and
- Results in more environmental effects than the Proposed Route.

2.4.5.4 Alternatives Studied in Detail

Alternative 4A (4b, 4f, 4e, 4f.1, 4f.2, 4g.1, 4g, 4f.4, 4j)

Alternative 4A was specifically requested by the Wyoming Office of the Governor (OGW 2009b) for further detailed analysis. This alternative is approximately 85.2 miles long, compared to 90.2 miles for the corresponding portion of the Proposed Route.

Alternative 4A is coincident with the Proposed Route from 4b to MP 68. Alternative 4A continues to follow the existing transmission lines, except for two short deviations in the vicinity of the two U.S. Highway 30/SR 89 crossings. As a result, this alternative only requires 13.0 miles of Greenfield ROW. Alternative 4A crosses the Seedskadee Core Area between MPs 58.3 to MP 67.8 where it diverges west for another 2 miles before leaving the core area. The route then crosses the Sage Core Area between MPs 53 to 70 adjacent to existing transmission lines. Of its total 85.2-mile length, it parallels existing transmission lines for 75.7 miles.

Although this alternative maximizes paralleling of the existing 345-kV route, minimizes Greenfield ROW requirements, and affects the least amount of sage-grouse core area, it would cross more historic trails, VRM Class II area, and a BLM-designated SMA.

Alternative 4A would not be in conformance with the management direction provided in the Kemmerer RMP for structures in sage-grouse habitat, four historic trail crossings, new roads near sensitive plants, and impacts to lands designated as VRM Class II. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the DEIS where the effects are analyzed. Appendix F provides the proposed amendment and Appendix G provides the analysis and rationale for visual resources amendments.

Alternative 4B (4b, 4b.1, 4b.2, 4b.3, 4b.4, 4b.5, 4b.6, 4b.8, 4b.12, 4b.13, 4j)

Alternative 4B is based on the route alternative originally proposed by the BLM Kemmerer FO. Concerns about that alternative voiced by the WGFD and USFWS were used to modify this alternative in order to change the crossing of the Cokeville Meadows NWR and avoid higher-quality habitats to the south. This alternative is approximately 100.2 miles long, compared to 90.2 miles for the corresponding portion of the Proposed Route.

Alternative 4B would depart from the Proposed Route just west of Seedskadee NWR (point 4b) and head west, crossing active trona mines owned by FMC to the area south of the intersection of U.S. Highway 30/SR 89 south of Kemmerer. The alternative would depart north and west close to U.S. Highway 30/89 and in the valley close to the entrance to Fossil Butte National Monument. It would cross a small portion of a BLM-designated SRMA. Once across the Cokeville Meadows NWR, this alternative continues north for 16.0 miles, generally following the east side of the Wyoming/Utah and then the Wyoming/Idaho state lines. North of Garret Creek, this route angles northwest at point 4b.13, across the state line into Idaho to point 4j.

Alternative 4B would comprise 70.6 miles of Greenfield route and 29.6 miles adjacent to existing transmission lines. The alternative crosses the Seedskadee Core Area between MPs 1.9 to 12 on a Greenfield route and the Sage Core Area on Greenfield route between MPs 35.5 to 43.4 and MPs 49.2 to 70.5 and is adjacent to existing transmissions lines between MPs 12 to 14.5 and 33.4 to 35.5.

Alternative 4B would not be in conformance with the management direction provided in the Kemmerer RMP for structures in sage-grouse habitat and impacts to lands designated as VRM Class II. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the Draft EIS where the effects are analyzed. Appendix F provides the proposed amendment and Appendix G provides the analysis and rationale for visual resources amendments.

Alternative 4C (4b, 4b.1, 4b.2, 4b.3, 4b.4, 4b.5, 4b.6, 4b.7, 4b.13, 4j)

Alternative 4C is also based on the route alternative originally proposed by the BLM Kemmerer FO. This alternative is approximately 101.6 miles long, compared to 90.2 miles for the corresponding portion of the Proposed Route.

Alternative 4C follows the same alignment as Alternative 4B from point 4b to point 4b.6. From point 4b.6 this alternative would turn west to point 4b.7 and then north and parallel the east side of U.S. Highway 30/SR 89 and Cokeville Meadows NWR for 11.5 miles before turning northwest and crossing the highway and the NWR. At point 4b.13 the alternative turns north along the Idaho/Wyoming border for about 3.0 miles where it

would then turn northwest and rejoin the Proposed Route at point 4j. This alternative would cross the NWR north of current NWR-managed lands, although still within the established boundary. It would also cross portions of a BLM-designated SRMA along U.S. Highway 30/SR 89.

Alternative 4C would comprise 72 miles of Greenfield route and 29.6 miles adjacent to existing transmission lines. Alternative 4C differs from Alternative 4B in that it continues another 12 miles through the Sage Core Area as a Greenfield route.

Alternative 4C would not be in conformance with the management direction provided in the Kemmerer RMP for structures in sage-grouse habitat, new roads near sensitive plants, and impacts to lands designated as VRM Class II. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the Draft EIS where the effects are analyzed. Appendix F provides the proposed amendment and Appendix G provides the analysis and rationale for visual resources amendments.

Alternative 4D (4b, 4b.1, 4b.2, 4b.3, 4b.5, 4b.6, 4b.8, 4b.12, 4b.13, 4j)

Alternative 4D was requested by the superintendent of the Fossil Butte National Monument to reduce visual impacts on the monument. This alternative is approximately 100.8 miles long, compared to 90.2 miles for the corresponding portion of the Proposed Route.

Alternative 4D follows the same alignment as Alternatives 4B and 4C from point 4b to point 4b.3. The alternative would modify a portion of Alternatives 4B and 4C between points 4.b3 and 4.b5 by its location farther south, thereby increasing the distance from Fossil Butte National Monument. From point 4b.5 it would follow the same alignment as Alternative 4B and rejoin the Proposed Route at point 4j.

Alternative 4D would comprise 71.2 miles of Greenfield route and 29.6 miles adjacent to existing transmission lines. Alternative 4D crosses the same amount of sage-grouse core area as Alternative 4B.

Alternative 4D would not be in conformance with the management direction provided in the Kemmerer RMP for structures in sage-grouse habitat and impacts to lands designated as VRM Class II. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the Draft EIS where the effects are analyzed. Appendix F provides the proposed amendment and Appendix G provides the analysis and rationale for visual resources amendments.

Alternative 4E (4b, 4b.1, 4b.2, 4b.3, 4b.5, 4b.6, 4b.7, 4b.13, 4j)

Alternative 4E was requested by the superintendent of Fossil Butte National Monument, because most of this route is coincident with Alternative 4D. It differs from Alternative 4D by proceeding north along the east side of the Bear River Valley following an existing transmission line, while Alternative 4D crosses the river valley and proceeds north up the Utah/Wyoming then Idaho/Wyoming state lines. This alternative is approximately 102.2 miles long, compared to 90.2 miles for the corresponding portion of the Proposed Route.

Alternative 4E follows the same alignment as Alternative 4D from point 4b to point 4b.6. From point 4b.6 this alternative would turn north and follow the same alignment as Alternative 4C.

Alternative 4E would comprise 72.6 miles of Greenfield route and 29.6 miles adjacent to existing transmission lines. Alternative 4E crosses approximately the same amount of sage-grouse core area as Alternative 4C.

Alternative 4E would not be in conformance with the management direction provided in the Kemmerer RMP for structures in sage-grouse habitat and impacts to lands designated as VRM Class II. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the Draft EIS where the effects are analyzed. Appendix F provides the proposed amendment and Appendix G provides the analysis and rationale for visual resources amendments.

Alternative 4F (4b, 4f, 4e, 4f.1, 4f.2, 4f.3, 4f.4, 4f.5, 4j)

Alternative 4F was originally proposed by the Proponents; however, over several agency scoping meetings, it was determined that the Proposed Route described in Section 2.4.5.2 would have fewer impacts. Therefore, the Proponents have adopted the suggested route as proposed, and have requested that the original route segment (i.e., Alternative 4F) be carried through detailed analysis as a feasible alternative. This alternative is approximately 87.5 miles long, compared to 90.2 miles for the corresponding portion of the Proposed Route.

From reference point 4b to MP 68 this alternative is the same as the Proposed Route and Alternative 4A. At MP 68, Alternative 4F diverges from the Proposed Route, heading west, paralleling an existing 345-kV transmission line, entering Lincoln County at MP 19 and passing through an oil and gas well field for approximately 6 miles. The alternative continues along the south side of the 345-kV transmission line, passing approximately 5 miles north of the Hams Fork River and the town of Opal, Wyoming, over Oyster Ridge, into Pomeroy Basin, then onto Commissary Ridge. The alternative crosses the existing transmission line at MP 48.5 and two historic trails at MP 50.5. At MP 51.2, Alternative 4A separates to the south, following the existing transmission lines, and Alternative 4F remains slightly north of Alternative 4A, passing just south of Viva Naughton Reservoir. Alternative 4F then turns north for about 5 miles, crossing a historic trail (Dempsey-Hockaday Trail), then back to the northwest for about 12 miles before meeting the Proposed Route at MP 129.4. From there, the alternative is the same as the Proposed Route for the final 13 miles, to reference point 4j.

Alternative 4F would comprise 34.6 miles of Greenfield route and 52.9 miles adjacent to existing transmission lines. The route crosses the Seedskadee Core Area between MPs 58 to MP 68 where it diverges west for another 2 miles before leaving the core area. The route then crosses the Sage Core Area for 14 miles on a Greenfield route.

Alternative 4F would not be in conformance with the management direction provided in the Kemmerer RMP for structures in sage-grouse habitat, one historic trail crossing, and impacts to lands designated as VRM Class II. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the Draft EIS

where the effects are analyzed. Appendix F provides the proposed amendment and Appendix G provides the analysis and rationale for visual resources amendments.

2.4.6 Segment 5 – Populus to Borah

2.4.6.1 General Description and Issues

One single-circuit 500-kV line is proposed between the existing Populus Substation and the existing Borah Substation in Power County, Idaho. This line would be constructed with 500-kV single-circuit lattice steel towers between 145 and 180 feet tall (Appendix B, Figure B-2). Appendix A, Figure A-7 shows the Proposed Route for Segment 5.

Among the key factors considered in routing this segment were visual resources near the Deep Creek Mountains, agriculture in the Arbon and Rockland Valleys, crossing the Fort Hall Indian Reservation, residential developments, the Arbon Elementary School, and the East Fork Rock Creek Recreation Area, as well as potential disturbance to nesting bald eagles along the Snake River.

Segment 5 is 54.6 miles long and therefore would not need optical signal regeneration sites. There are no WWE corridors proposed within Segment 5. One of the alternatives selected for detailed analysis follows the existing 345-kV transmission line corridor.

2.4.6.2 Proposed Route

The proposed single-circuit 500-kV segment is approximately 54.6 miles long between points 5, 5a, 5.a.1, 5g, 5b, 5i, 5j, 5l, and 6. Two existing 345-kV transmission lines extend between the Populus and Borah Substations. The Proposed Route follows the existing lines from Populus northwest for approximately 10 miles to just southeast of reference point 5a, at which point the Proposed Route follows a Greenfield alignment for the remainder of the route, extending northwest through 5g, turning west, south of the Fort Hall Indian Reservation, and then north to the existing Borah Substation. The first part of Segment 5 crosses I-15 about 1.6 miles northwest of the Populus Substation. At MP 14.7, the Proposed Route turns west crossing the existing 345-kV corridor and then the Bannock County/Power County line. The route continues west, parallel to the proposed Populus – Cedar Hill line (Segment 7) crossing Arbon Valley and the Deep Creek Mountains south of the Fort Hall Reservation. At the west side of these mountains, the Proposed Route turns northerly between the Deep Creek Mountains and SR 37.

Proceeding north, the route crosses several drainages, generally avoiding farm land located west of the route. The route enters VRM Class II land at several points, and avoids a bald eagle nesting area in the mountains to the east. At MP 48.9 the route proceeds west crossing I-86, SR 37, and U.S. Highway 30 before crossing the Snake River and entering the Borah Substation.

From MP 32.5 north to the Borah Substation, the current Proposed Route is about 1 to 2 miles east of the Proponents' original Proposed Route. Meetings with local landowners and Power County representatives identified a more acceptable route that was subsequently adopted by the Proponents. As a result, the current Proposed Route

is located more on public land. The original portion of the Segment 5 Proposed Route remains valid for analysis, and is presented below as Alternative 5D.

The Segment 5 Proposed Route is mostly adjacent to, but offset approximately 1,500 feet from, the Segment 7 Proposed Route from reference point 5 to 5d. Of its total, the Proposed Route would be Greenfield for 40.8 miles and parallel to existing transmission lines for 13.8 miles.

The Proposed Route would not be in conformance with the management direction provided in the Malad MFP. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the Draft EIS where the effects are analyzed. Appendix F provides the proposed amendment and Appendix G provides the analysis and rationale for visual resources amendments.

2.4.6.3 Alternatives Eliminated from Detailed Study

Deep Creek Alternative A (5, 5a, 5d)

Deep Creek Alternative A was initially considered as a means of avoiding high-quality forested habitat on BLM-managed lands that are located in the northern portion of the Deep Creek Mountains. This alternative diverges from the Proposed Route at MP 9.3, at which point it heads due west through the Bannock Range, through the Arbon Valley between Pauline and Arbon, and through the Deep Creek Mountains. On the west side of the Deep Creek Mountains, it turns northwest and runs about 3 miles through Rockland Valley, rejoining the Proposed Route at reference point 5d (MP 37), approximately 4 miles northeast of Rockland.

This alternative was eliminated from detailed study because as of the date it was originally proposed, it:

- Is 1.3 miles longer than the Proposed Route;
- Crosses 0.4 mile more big game crucial winter range than the Proposed Route;
- Crosses 1.4 miles more VRM Class II than the Proposed Route;
- Crosses 4.6 miles more irrigated agriculture than the Proposed Route;
- Crosses 0.1 mile more wetlands than the Proposed Route; and
- Because topographic constraints do not allow adequate space to accommodate two transmission lines in this area, it would not allow for co-location with Segment 7.

Deep Creek Alternative B (5b, 5e)

Deep Creek Alternative B was initially considered because it was a more direct route between points 5b and 5e, compared to the Proposed Route. It diverges from the Proposed Route at reference point 5b (MP 28.3) and extends northwest through the Deep Creek Mountains, terminating at reference point 5e (Proposed Route MP 42.2).

While this alignment shortens the length of the line, it would not create an efficient opportunity to co-locate with the Segment 7 route. This alternative was eliminated from detailed study because as of the date it was originally proposed, it:

- Crosses 1.5 miles of VRM Class II areas than the Proposed Route;
- Crosses 0.2 mile more VRM Class III than the Proposed Route;
- Crosses 0.4 more miles of areas containing steep slopes than the Proposed Route;
- Creates a new route across VRM Class II; and
- Crosses more high-quality forested habitat on BLM-managed lands (located in the northern portion of the Deep Creek Mountains).

Craters of the Moon North and South Alternatives (5, 5n, 8; 5, 5n, 5o, 8) and Alternative Borah Substation Site (12)

A combination of Power County, Bannock County, and Cassia County residents asked why the Proposed Route could not be routed directly north from the Populus Substation in order to avoid Power and Cassia Counties altogether. The Proponents reported that any route to the north would have to effectively go through or around Craters of the Moon National Monument and Preserve. Two alternative routes were identified. Alternative 5, 5n, 5o, and 8 through the Monument and Preserve was determined to not be feasible, as it would require Congressional approval, while Alternative 5, 5n, and 8 that went around the Monument and Preserve would be at least 50 miles longer than the Proposed Route. Even if these conditions did not exist, these alternatives do not meet the Proponents' purpose and need of having two geographically diverse, east-west transmission lines north and south of the Snake River for reliability, one of which would interconnect at the Borah Substation.

2.4.6.4 Alternatives Studied in Detail

Alternative 5A (5.a.1, 5x, 5c, 5k, 5j)

Alternative 5A was routed to eliminate the crossings of VRM Class II lands and avoid high-quality forested habitat on BLM-managed land in the northern portion of the Deep Creek Mountains. This alternative is approximately 33.7 miles long, compared to 25.3 miles for the corresponding portion of the Proposed Route.

This alternative would diverge from the Proposed Route near Hawkins Creek (5a.1) and head due west for 4.8 miles to Hawkins Reservoir. It would then turn in a southwesterly direction and proceed through the very northern portion of Oneida County, continue just north of Arbon in the Arbon Valley, and enter the Deep Creek Mountains. This alternative would traverse the Deep Creek Mountains for approximately 9 miles. The alternative then makes a short turn to the northeast before meeting the Proposed Route at Point 5j. This alternative would impact more private land than the Proposed Route. The entire route would be Greenfield.

Alternative 5A would not be in conformance with the management direction provided in the Malad MFP. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the Draft EIS where the effects are analyzed.

Appendix F provides the proposed amendment and Appendix G provides the analysis and rationale for visual resources amendments.

Alternative 5B (5.a.1, 5x, 5f, 5c, 5k, 5j)

Alternative 5B was routed to eliminate the crossings of VRM Class II areas and avoid high-quality forested habitat on BLM-managed land in the northern portion of the Deep Creek Mountain. This alternative is approximately 44.4 miles long, compared to 25.3 miles for the corresponding portion of the Proposed Route.

This alternative would diverge from the Proposed Route near Hawkins Creek (5a.1) and head due west for 4.8 miles to Hawkins Reservoir. It would then turn in a southwesterly direction and proceed southwest to just north of the town Buist at MP 22. At that point it turns west, traverse the Deep Creek Mountains and then heads north through the Rockland Valley, before rejoining Alternative 5C at point 5c. The entire route would be Greenfield.

Alternative 5B would not be in conformance with the management direction provided in the Malad MFP. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the Draft EIS where the effects are analyzed. Appendix F provides the proposed amendment and Appendix G provides the analysis and rationale for visual resources amendments.

Alternative 5C (5g, 5l)

Alternative 5C was identified for detailed analysis because it is the most direct option between the Populus and Borah Substations and because it would follow an existing utility corridor for most of the segment length and has more gentle terrain and less visual impacts. This alternative is approximately 26.1 miles long, compared to 33.2 miles for the corresponding portion of the Proposed Route.

The alternative would depart from the Proposed Route at point 5g. From that point, it would traverse to the northwest for 12.4 miles through the Fort Hall Indian Reservation. West of the reservation it would cross primarily private lands before rejoining the Proposed Route at point 5l. The entire length of this route would be adjacent to an existing transmission line. Power County has formally endorsed this route (Power County 2009a).

No land use plan amendment would be required for this alternative.

Alternative 5D (5i, 5d, 5e, 5h, 6)

Alternative 5D was originally the Proposed Route; however, Power County representatives and residents identified concerns about the impacts that this route could have on farmland in this area. Other issues that have been identified regarding this route include its' proximity to existing and planned residences as well as a bald eagle nest site, and the crossing of the Snake River. Therefore, modifications were made to create the Proposed Route, and this route (i.e., Alternative 5D) became a feasible alternative. This alternative is approximately 17.5 miles long, compared to 19.4 miles for the corresponding portion of the Proposed Route.

Alternative 5D is located 1 to 2 miles west of the Proposed Route. At MP 35.2 the route proceeds west for approximately 2 miles before turning north at the East Fork Rock Creek, about 3 miles east of Rockland, Idaho. The alternative proceeds north and slightly west for about 12.5 miles through predominantly private farmland. The alternative then turns to the northwest, crossing I-86, passing through a bald eagle nest buffer, across the Snake River and into Borah Substation.

No land use plan amendment would be required for this alternative.

Alternative 5E (5l, 5m,6)

Alternative 5E was developed at the request of Power County, which requested that an alternative route be considered along the portion of Segment 5 that approaches the crossing of the Snake River from the east (Power County 2009b). This alternative is approximately 5.3 miles long, compared to 5.8 miles for the corresponding portion of the Proposed Route.

Alternative 5E would begin at reference point 5l and proceed northwest for approximately 0.4 mile before crossing over the existing 230-kV and 345-kV lines. The route would then proceed due west directly adjacent to the existing lines. The proposed and existing lines would remain parallel and adjacent for approximately 4.2 miles, crossing irrigated farmland and Snake River in this interval. The route would then cross a 230-kV transmission line and the three lines would run parallel and adjacent for about 1.1 miles into the Borah Substation (point 6).

No land use plan amendment would be required for this alternative.

2.4.7 Segment 6 – Borah to Midpoint

2.4.7.1 General Description and Issues

In Segment 6, from the existing Borah Substation to the existing Midpoint Substation located approximately 9 miles south of Shoshone, Idaho, the voltage would be increased to 500 kV on the existing Midpoint – Kinport 345-kV transmission line. The line would be routed into the proposed 500-kV yard at the Borah Substation requiring approximately five structure replacements in the immediate vicinity of the Borah and Midpoint Substations but requiring no other transmission line construction. The remaining line from Borah to Kinport terminates in the existing 345-kV yard at the Borah Substation and would remain in operation at 345 kV. The structures utilized for the reroutes on each end of this line segment would be 500-kV single-circuit lattice steel towers between 145 and 180 feet tall (Appendix B, Figure B-2). Appendix A, Figure A-8 shows the locations of the Borah and Midpoint Substations and the existing 345-kV line.

2.4.7.2 Proposed Route

The line segment between the Borah and Midpoint Substations, Segment 6, is part of the existing 345-kV transmission line that was constructed to 500-kV design standards although currently operated at 345 kV. No new transmission line construction would be required along Segment 6 to operate this line segment at 500 kV, except in the vicinity of the Borah and Midpoint Substations. At the Borah and Midpoint Substations, the line would be rerouted and re-terminated from the existing 345-kV line bays into the new

500-kV line bays at each substation. Several new structures and conductors would be needed adjacent the Midpoint Substation to reroute the existing 345-kV line from its termination on the north side of the existing station to the proposed 500-kV yard expansion on the south side. Several new structures and conductors would also be needed at the Borah Substation to reroute the line from the northeast side of the existing station to the proposed 500-kV yard addition on the south side. A new structure would be needed to route the 345-kV line between Borah and Kinport into the existing 345-kV yard on the east side. The line between Borah and Midpoint would then be energized at 500 kV.

No land use plan amendment would be required for the Segment 6 Proposed Route.

2.4.7.3 Alternatives

No alternatives were considered along this segment because the Proposed Action is an increase in voltage carried by structures and conductors of an existing transmission line.

2.4.8 Segment 7 – Populus to Cedar Hill

2.4.8.1 General Description and Issues

One 118.1-mile single-circuit 500-kV transmission line is proposed between the Populus Substation and the proposed Cedar Hill Substation near the county line between Cassia and Twin Falls Counties in Idaho. The line would be constructed utilizing 500-kV single-circuit lattice steel towers between 145 and 180 feet tall (Appendix B, Figure B-2). Appendix A, Figure A-9 shows the Proposed Route for Segment 7.

Key factors considered in routing the first third of Segment 7 were similar to those discussed under Segment 5, because the segments parallel one another to the point west of the Deep Creek Mountains where they diverge. Additional factors considered in routing this segment were impacts to agricultural operations, rural residences, a local hang gliding area, visual resources, NHTs, cultural resources, big game winter range, sage-grouse key habitat, Designated Roadless Areas, and local county planning goals.

There are no existing east-west transmission lines or WWE corridors proposed within Segment 7. However, I-84 creates an east-west corridor and was considered. Another local concern is the potential for future transmission lines not related to this Project to be located in an adjacent corridor to the one created by the Proposed Route. This concern, combined with concerns over agricultural impact of the Proposed Route, led Cassia County, through local landowners, to identify and recommend a route that would swing south to the Idaho/Utah/Nevada border. Commonly referred to as the State Line Route, it is designated in this EIS as Alternative 7I. A variation of 7I, designated as Alternative 7J, was identified by Cassia and Twin Falls Counties. It would expand Alternative 7I by creating a new substation (the Rogerson Substation), approximately 24 miles southwest of the Cedar Hill Substation (point 9.a.6). Cassia County has modified its comprehensive plan to provide that new high-voltage power lines follow either 7I or 7J (Cassia County 2009). In response to the State Line Route,

the Proponents identified Alternative 7H as a means of addressing agricultural impacts and asked that it be considered in detail in the EIS.

Because Segment 7 is 118.1 miles long, it would need two optical signal regeneration sites along its route. Final locations for regeneration stations would be determined after the preferred alternative is identified and detailed design engineering is completed.

2.4.8.2 Proposed Route 7

The proposed single-circuit 500-kV line route (points 5, 7a.0, 7b.0, 7c, 7d, 7e, 7v,7g, 7h, 7j, 7j.1, 7k,7l, 7y, 7m.1, 7t, 7s, 7s.3, 7s.1, 7z, 9) would extend from the expanded Populus Substation about 12.7 miles along the east side of the existing 345-kV lines before turning west and crossing the existing lines south of Cedar Mountain. It generally parallels the south side of the existing 345-kV corridor around Hawkins Reservoir, turning northwest before turning west and leaving the existing transmission corridor and passing along the south side of Pauline. From there, the Proposed Route continues west across the Arbon Valley and the Deep Creek Mountains before crossing SR 37 less than 1 mile south of Rockland at MP 40.6. This segment continues west another 7 miles to point 7d, at the eastern foot of the Sublett Range.

From this point it crosses into Cassia County and then proceeds across the Raft River Valley, where it turns southwest along the western toe of the Albion Mountains before angling west for about 22 miles across an area of extensive irrigated cropland and dairy operations. Of its 118.1-mile length, the Proposed Route would be Greenfield for 102.4 miles and parallel existing transmission lines for 15.6 miles.

The Proposed Route would not be in conformance with the management direction provided in the Cassia RMP and Malad MFP. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the Draft EIS where the effects are analyzed. Appendix F provides the proposed amendment and Appendix G provides the analysis and rationale for visual resources amendments.

2.4.8.3 Alternatives Eliminated from Detailed Study

Deep Creek Alternative (5, 7b, 7d)

The Deep Creek Alternative was initially considered by the Proponents as a direct westerly route from Populus Substation. This alternative heads west out of the Populus Substation, crossing I-15, traversing the Bannock Range and 2.5 miles of the Caribou-Targhee NF and the Pleasantview Hills, then passes through the Arbon Valley 2.5 miles south of Arbon, traversing a portion of the Deep Creek Mountains (MP 21.8).

This alternative was eliminated from detailed study because as of the date it was originally proposed, it:

- Crosses 2.5 miles of NFS land, 0.8 mile of which is a Forest Service Visual Retention Area;
- Crosses areas designated as BLM VRM Class II;
- Does not parallel any existing transmission lines;
- Crosses 2.4 more miles of steep slope areas than the Proposed Route;

- Crosses 0.3 mile of highly erodible soils, whereas the Proposed Route crosses none;
- Crossed 0.7 mile of areas of slope instability, whereas the Proposed Route crosses none; and
- Has no environmental advantages over the Proposed Route.

Burley Alternative (7e, 7u, 7g)

The Burley Alternative was initially considered to avoid one sage-grouse lek 0.65-mile buffer; however, it crosses closer to the intersection of Hudspeth's Cutoff and the Oregon NHT (also known as "Parting of the Ways") than the Proposed Route. This alternative diverges from the Proposed Route approximately 15 miles west of Rockland, Idaho. It proceeds northwest for 2 miles and then southwest for 1 mile back to the Proposed Route.

This alternative was eliminated from detailed study because as of the date it was originally proposed, it:

- Has greater impacts to historic resources compared to the Proposed Route.

Irrigated Cropland Avoidance

The following Segment 7 alternatives were investigated to avoid siting the transmission structures in pivot irrigation areas. Although each achieved this goal to some extent, each had additional disadvantages that appeared substantially greater than avoiding the pivots. After examining these five routes, the Proponents identified the Proposed Route east-west location that avoids most pivots. Cassia County identified an alternative farther south (State Line Route) that avoids all impacts to irrigated agriculture and substantially reduces impact to prime farmland soils. Based on the number of alternatives carried into detailed analysis, the BLM IDT decided not to evaluate the following four alternatives further (see the discussion below for more details regarding the reasons to not to evaluate the following five alternatives).

Oakley Alternative (7m, 7p, 7o, 7q, 7t, 7s)

As discussed above, this alternative was initially considered in order to avoid siting the transmission structures in pivot irrigation areas. This alternative is the southernmost of the irrigation avoidance routes, diverging from the Proposed Route at point 7m, about 5 miles west of Albion. It proceeds southwest along the western foot of the Albion Mountains of the Sawtooth NF, crossing several creeks and washes. After approximately 11 miles, it turns west, passes 2 miles north of Oakley, and continues to the eastern foot of the Sawtooth NF. At that point, it travels northwest for approximately 11 miles where it rejoins the Proposed Route at MP 109, just southeast of Artesian City at point 7s.

The only identified advantage of this alternative route over the Proposed Route is that it passes through 4.3 miles less agricultural area than the Proposed Route. This alternative was eliminated from detailed study because as of the date it was originally proposed, it:

- Is 9.3 miles longer than the Proposed Route;

- Is entirely a Greenfield route (31.9 miles);
- Crosses 4.0 miles more big game crucial winter range than the Proposed Route;
- Crosses four raptor nest 0.5-mile buffers, whereas the Proposed Route impacts none;
- Crosses 3.5 miles more of steep slope areas than the Proposed Route;
- Impacts 4.4 more miles of historic trail buffers than the Proposed Routes;
- Crosses 5.6 miles of VRM Class III, whereas the Proposed Route impacts none; and
- Crosses one sage-grouse lek 0.65-mile buffer, whereas the Proposed Route impacts none.

Artesian City Alternative (7m, 7p, 7q, 7t, 7s)

As discussed above, this alternative was initially considered in order to avoid siting the transmission structures in pivot irrigation areas. This route diverges from the Proposed Route at point 7m, about 5 miles west of Albion. It travels southwest along the western foot of the Albion Mountains of the Sawtooth NF, crossing several creeks and washes. After approximately 8 miles it turns west, passing 3.5 miles north of Oakley, and continuing to the eastern foot of the Sawtooth NF. At that point it travels northwest for approximately 6 miles where it meets the Proposed Route at mile 109, just southeast of Artesian City at Point 7s.

This alternative was eliminated from detailed study because as of the date it was originally proposed, it:

- Is 6.2 miles longer than the Proposed Route;
- Is entirely a Greenfield route (28.8 miles);
- Crosses 3.0 miles more big game crucial winter range than the Proposed Route;
- Crosses four raptor nest 0.5-mile buffers, whereas the Proposed Route impacts none;
- Traverses 2.9 miles more of steep slope areas than the Proposed Route; and
- Impacts 3.6 miles more historic trail buffers than the Proposed Route.

Cassia Alternative (7j.1, 7x, 7n, 7s)

As discussed above, this alternative was initially considered in order to avoid siting the transmission structures in pivot irrigation areas. This route diverges from the Proposed Route at point 7j.1, at the northern edge of the Albion Mountains. It travels generally southwest through Cassia County. It passes 2.5 miles south of Burley and continues to the Cassia/Twin Falls County line. It proceeds an additional 2 miles, where it joins the Proposed Route at point 7s, at the north end of the Sawtooth NF.

This alternative was eliminated from detailed study because as of the date it was originally proposed, it:

- Crosses one more historic trails compared to the Proposed Route;
- Crosses 4.17 miles more of irrigated farm land than the Proposed Route; and

- Crosses one more major road than the Proposed Route;
- There are 54 more occurrences of residences or structures within 750 feet of the centerline, as compared to 11 for the Proposed Route; and
- There are 116 more occurrences of residences or structures within 1,000 feet of the centerline, as compared to 31 for the Proposed Route.

I-84 South Alternative (7g, 7i, 9g, 9h)

As discussed above, this alternative was initially considered to avoid siting the transmission structures in pivot irrigation areas. This alternative was designed to follow the I-84 freeway (Appendix A, Figures A-9 and A-11), and diverges from the Proposed Route at point 7g and travels west, parallel to I-84 on the south side between I-84 and the Snake River. It crosses north of I-84 at one location to avoid developed portions of the town of Burley, and then returns to the south side. It continues west until it reaches point 7i, 5.0 miles south of Eden. The I-84 South Alternative then proceeds northwest parallel to the south side of I-84, passing north of Twin Falls and south of Jerome and Wendell. It then turns west just northeast of Hagerman and crosses U.S. Highway 30, the Gooding/Twin Falls County line, and the Snake River. It continues west through the remainder of Twin Falls County, enters Elmore County, and then joins the feasible alternative route at reference point 9h (Appendix A, Figure A-11) approximately 5 miles west of the Twin Falls/Elmore County line.

The segment between point 7g and 9h was eliminated based on the extent of urban, agricultural, residential, and commercial development along the I-84 corridor. A variation of the I-84 corridor alternative was given further consideration (7g, 7i, 9). This route would turn at point 7i and proceed due south to the Cedar Hill Substation.

This alternative was eliminated from detailed study because as of the date it was originally proposed, it:

- Crosses 23.44 miles more of irrigated farm land than the Proposed Route;
- Crosses 9.05 miles more land considered prime farm land than the Proposed Route;
- Encroaches upon the City of Heyburn;
- A community advisory committee is working with Idaho Power to create a plan to address the Magic Valley's long-term electric demand. The committee has identified as a priority the need to locate a new 500-kV substation at Cedar Hill that will serve as a hub for 230-kV transmission lines to provide reliable service throughout the valley. The I-84 route would add 5.4 miles of additional 500-kV transmission line in a rapidly growing area with no increase in reliability;
- There are 64 more occurrences of residences or structures within 300 feet of the centerline, as compared to 5 for the Proposed Route;
- There are 460 more occurrences of residences or structures within 750 feet of the centerline, as compared to 11 for the Proposed Route; and
- There are 853 more occurrences of residences or structures within 1,000 feet of the centerline, as compared to 31 for the Proposed Route.

Malta Bypass Alternatives

Meadow Creek Farms of Malta, Idaho, opposes the alignment of Alternative 7H as it crosses the Malta Valley. The proposed alignment crosses the valley at its widest point, containing approximately 8 miles of agricultural land, some of which contains center-pivot irrigation. In a letter to BLM dated March 3, 2010 (Yates and Yates 2010), two alternative routes were suggested to eliminate the Malta Valley crossing by Alternative 7H. The Malta Bypass Alternative 1 would move the Raft River Valley/Malta Valley crossing to a point approximately 8 miles north of its proposed location. The Malta Bypass Alternative 2 would be a substantial realignment, shifting the eastern end of Alternative 7H approximately 72 miles west of its proposed location and resulting in a route that avoids the Malta Valley completely. Descriptions and comparisons of the proposed alternatives are presented below.

Malta Bypass Alternative 1 (7c.4, 7g.1, 7g.2)

As discussed above, this alternative was initially considered to avoid the Malta Valley. The Malta Bypass Alternative 1 would cross I-84 at MP 57.6 as it approaches the Raft River Valley from east to west. This alternative would diverge from Alternative 7H at MP 61.0 (point 7r) on the east side of the valley. It would proceed to the northwest, paralleling the interstate for approximately 11.5 miles through the Raft River Valley. It would then turn west for about 4 miles to the west edge of the valley, crossing about 0.8 mile of irrigated agriculture. The route would then turn southwest along the eastern flank of the Cotterell Mountains before rejoining Alternative 7H at MP 77.6 (point 7g.2).

This alternative was eliminated from detailed study because as of the date it was originally proposed, it:

- Adds 7.7 miles to Alternative 7H, a route that is already more than 9 miles longer than the Proposed Route;
- Crosses 20 ferruginous hawk nest buffers, 11 more than Alternative 7H;
- Crosses 14 miles of the Raft River - Curlew Valley Important Bird Area (IBA), 5 miles more than Alternative 7H. The Idaho Department of Fish and Game is a partner in the IBA program, established to identify, monitor, and conserve key sites for birds in each state or province. In 2006, Curlew Valley and the Raft River-Curlew Valley Ferruginous Hawk IBAs were merged into one IBA. This area has long been recognized as a regionally, perhaps nationally, significant area for nesting ferruginous hawks (Moulton 2007); and
- The overall benefit to agriculture would be minimal; avoiding only 2.6 miles of irrigated agriculture at the cost of 7.7 miles of additional length.

Malta Bypass Alternative 2 (7g, 7g.1, 7g.2, 7q.1, 7s.3)

As discussed above, this alternative was initially considered to avoid the Malta Valley. Malta Bypass Alternative 2 would begin on the Segment 7 Proposed Route at point 7g, MP 71.9. This is 71.9 miles west of the proposed beginning of Alternative 7H, at Populus Substation, and does not meet the original intent of Alternative 7H, which the Proponents proposed to provide a southern alternative to the Proposed Route that would also be substantially shorter than Alternative 7I. The Malta Bypass Alternative 2 would leave the Proposed Route and proceed south for approximately 21 miles along

the east flank of the Cotterell Mountains. The new portion of this alternative would end at point 7g.2 on the current Alternative 7H. From there, Alternative 7H would continue for approximately 43 miles to the west to Cedar Hill Substation, following the original western alignment of Alternative 7H.

This alternative was eliminated from detailed study because, as of the date it was originally proposed, it:

- Adds 25 miles to Alternative 7H, a route that is already more than 9 miles longer than the Proposed Route;
- Crosses 9 miles of VRM Class II and VRM Class III areas whereas the Proposed Route avoids nearly all sensitive visual classifications;
- Crosses 38 ferruginous hawk nest buffers (34 more than the Proposed Route) and 17 miles of the Raft River-Curlew Valley IBA whereas the Proposed Route would avoid the IBA; and
- Does not fulfill the Proponents' intent because it leaves no alternative to the eastern portion of Alternative 7I except the Proposed Route. The Proponents have proposed Alternative 7H as an alternative to the local landowner preferred Alternative 7I.

Foothills Alternative (7j.1, 7x, 7y)

The Foothills Alternative was initially considered in order to avoid a local hang gliding operation and sage-grouse leks. This alternative deviates from the Proposed Route at point 7j.1, where it heads west to point 7x. It then heads south, generally following the Proposed Route (somewhat west of the Proposed Route), until rejoining the Proposed Route at point 7y.

This alternative was eliminated from detailed study because as of the date it was originally proposed, it:

- Impacts irrigated farmland;
- Is in proximity to over a dozen residences;
- Crosses a large dairy; and
- Two other alternatives (7E and 7F) were identified that better avoided these types of impacts.

Pinchpoint and Borah Substation Alternative (7d, 8)

The Pinchpoint Alternative was initially considered because Power and Cassia Counties had asked why Segment 7 could not be routed along the existing transmission corridor between Populus and Midpoint Substations. Figure 2.4-2 shows the conceptual path of this alternative. In addition, they wanted to know if the transmission line could connect into a relocated Borah Substation that would allow for more orderly land use development in Power County.

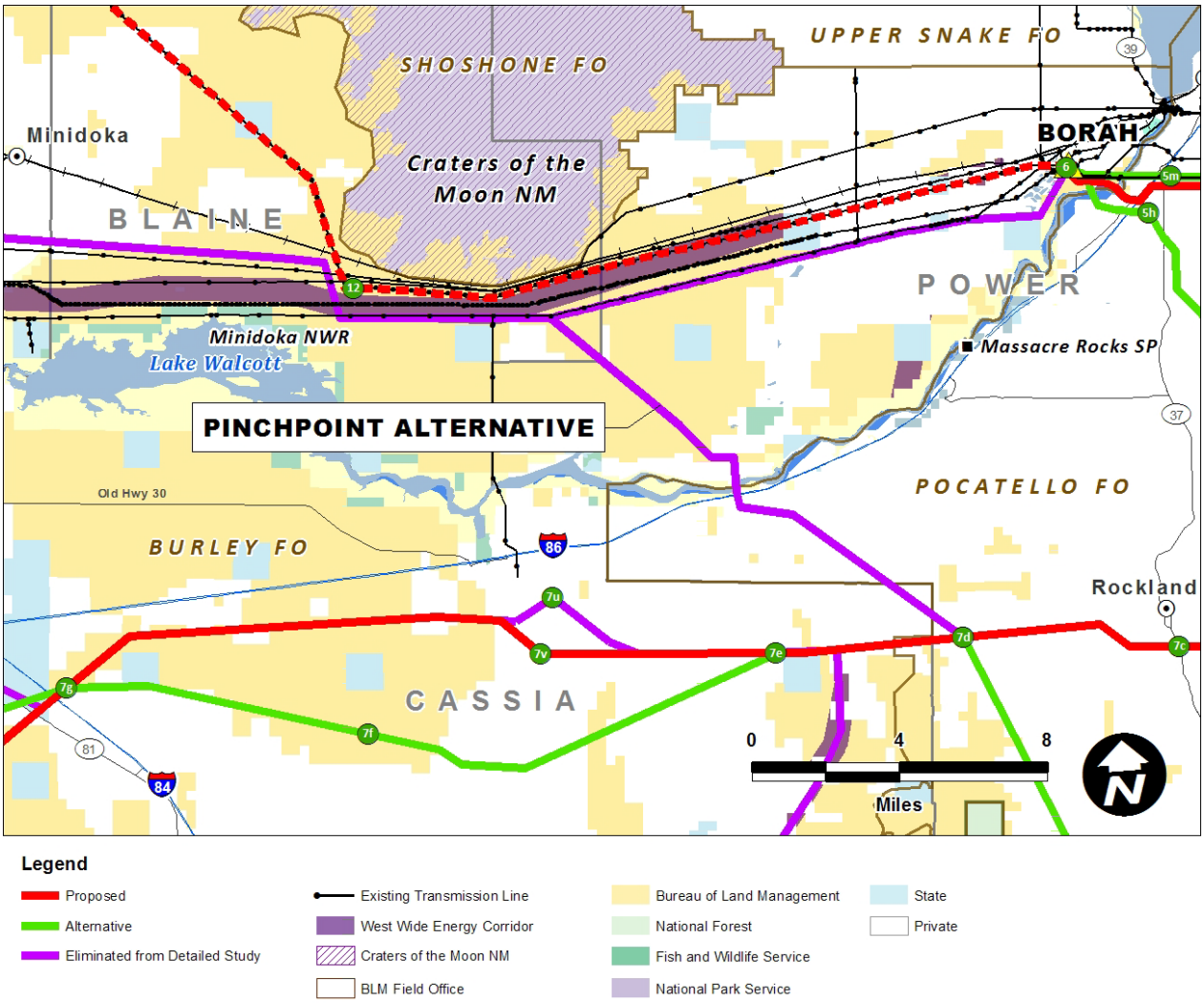


Figure 2.4-2. Pinchpoint Alternative

This alternative was eliminated from detailed study because, as of the date it was originally proposed:

- The Proponents report that it would not meet reliability criteria due to a "pinchpoint" from the congestion of existing transmission lines in the area south of Craters of the Moon National Monument and Preserve; and
- An analysis presented by the Proponents in a county-sponsored public meeting reported that relocation of the substation would be prohibitively expensive.

2.4.8.4 Alternatives Studied in Detail

<u>Alternative 7A (7b.o, 7b.1, 7b, 7d)</u>

Alternative 7A was requested by the Pocatello FO of the BLM to examine in detail alternatives on private and public lands that did not impact public lands in the Deep Creek Mountains along the Proposed Route. Alternative 7A was developed to be co-located with the Segment 5 Deep Creek Alternative 5A for 33.8 miles (note that

selecting the Deep Creek Alternative along either Segment 5 or Segment 7 would require the selection of the Deep Creek Alternative along the other Segment). This alternative is 38.0 miles long, compared to 35.2 miles for the corresponding portion of the Proposed Route.

The Segment 7 Deep Creek Alternative would head due west from point 7a.0 for 4 miles near, but outside, the boundary of the Caribou-Targhee NF. This portion of the NF is an Inventoried Roadless Area (IRA). From this point the route would proceed about 7 miles through the very northern portion of Oneida County. At the border of Power County, it would continue southwest, cross Bannock Creek, pass just north of Arbon in the Arbon Valley, then traverse the Deep Creek Mountains for approximately 8 miles. On the west side of the Deep Creek Mountains it would head northwest through Rockland Valley, cross SR 37, the South Fork of Rock Creek, Cedar Ridge, and Houtz Canyon, and continue for 3 miles to a location 5 miles west of Rockland where it would rejoin the Proposed Route at 7d. The entire route would be Greenfield.

Alternative 7A would not be in conformance with the management direction provided in the Malad MFP. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the Draft EIS where the effects are analyzed. Appendix F provides the proposed amendment and Appendix G provides the analysis and rationale for visual resources amendments.

Alternative 7B (7b.0, 7b.1, 7a.2, 7a.1, 7b, 7d)

Alternative 7B was suggested by BLM to avoid public lands designated as VRM Class II, utilize public lands that have existing roads, and to avoid quality forested habitat. This alternative is 46.4 miles long, compared to 35.2 miles for the corresponding portion of the Proposed Route.

This alternative diverges from Alternative 7A at point 7b.1. From this point it heads southwest and west of the boundary of the Caribou-Targhee NF. At mile 25, it enters Power County and continues southwest west crossing the South Fork and the Deep Creek Mountains. On the west side of the Deep Creek Mountains, this alternative heads northwest through Rockland Valley, crosses SR 37, and intersects with the feasible Alternative 7A at point 7b. The entire route would be Greenfield.

Alternative 7B would not be in conformance with the management direction provided in the Malad MFP. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the Draft EIS where the effects are analyzed. Appendix F provides the proposed amendment and Appendix G provides the analysis and rationale for visual resources amendments.

Alternative 7C (7e, 7f, 7g)

Alternative 7C was identified as a feasible alternative because it is constructible, and it is similar to the Proposed Route in environmental impacts. This alternative is 20.3 miles long, compared to 20.1 miles for the corresponding portion of the Proposed Route.

Alternative 7C diverges from the Proposed Route at point 7e, approximately 10 miles west of Rockland, Idaho. The Proposed Route and Alternative 7C are both 20.3 miles

long. Alternative 7C runs southwest through the Sublett Range for approximately 8 miles. It then proceeds west for 2 miles through Heglar Canyon and northwest through the Raft River Valley for 11 miles, terminating at MP 21 where it rejoins the Proposed Route. This alternative swings south of the Proposed Route to avoid three sage-grouse lek 0.65-mile buffers along the Proposed Route and be farther from the "Parting of the Ways" where the California and Oregon NHTs diverge. The entire route would be Greenfield.

No land use plan amendment would be required for this alternative.

Alternative 7D (7g, 7w, 7h)

Alternative 7D was identified to avoid a BLM-managed area that does not allow new ROWs. This alternative is 6.8 miles long, compared to 6.2 miles for the corresponding portion of the Proposed Route.

The Proposed Route between points 7g and 7h passes through a portion of BLM-managed land that does not allow new ROWs without modification to the Cassia RMP. Alternative 7D passes northwest of the Proposed Route and avoids the BLM-managed land; however, it is closer to the Oregon NHT. The entire route would be Greenfield.

No land use plan amendment would be required for this alternative.

Alternative 7E (7j, 7j.2, 7l)

Alternative 7E diverges slightly east from the Proposed Route to avoid two sage-grouse lek 0.65-mile buffers and to stay east of a hang gliding launch location. This alternative is 4.5 miles long, compared to 3.8 miles for the corresponding portion of the Proposed Route.

Alternative 7E diverges from the equivalent segment of the Proposed Route at point 7j, approximately 4.5 miles north of Albion. It proceeds southeast for about 1 mile and then southwest for about 3 miles back to the Proposed Route. The entire route would be Greenfield.

Alternative 7E would not be in conformance with the management direction provided in the Cassia RMP. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the Draft EIS where the effects are analyzed. Appendix F provides the proposed amendment and Appendix G provides the analysis and rationale for visual resources amendments.

Alternative 7F (7h, 7j.2, 7m.1)

Alternative 7F was identified to avoid locating the Project in the foothills of the Albion Mountains, where scattered residential developments occur. This alternative is 10.8 miles long, compared to 10.5 miles for the corresponding portion of the Proposed Route.

This alternative leaves the Proposed Route at MP 78.1, and heads in a more southerly direction than the Proposed Route. It is located in more mountainous terrain than the Proposed Route and intercepts two sage-grouse lek buffers, four raptor nest buffers, and

passes through 10.7 miles of big game winter range. The entire route would be Greenfield.

No land use plan amendment would be required for this alternative.

Alternative 7G (7s.1, 7s.2, 7z)

The Proposed Route would be located in a BLM motorized vehicle closure (winter range, mule deer, sage-grouse) that would restrict access for maintenance and emergency repairs. Alternative 7G was proposed at the border of the BLM/private land interface with the understanding that if emergency repairs are needed, it would be easier to obtain permission to access the line if it is on the border of the restricted area, rather than placed farther into the restricted area (where a plan amendment would be required). Immediately adjacent to the boundary of the restricted area is a CAFO. This alternative is 3.2 miles long, compared to 3.1 miles for the corresponding portion of the Proposed Route. The entire route would be Greenfield.

No land use plan amendment would be required for this alternative.

Alternative 7H (5, 7a.0, 7b.1, 7a.2, 7r.1, 7q.1, 7s.3, 7s.1, 7z, 9)

This 127.4-mile alternative provides a route that avoids siting the line in proximity to some of the CAFOs and center pivot irrigation facilities located near the Proposed Route. This alternative is 127.5 miles long, compared to 118.1 miles for the corresponding portion of the Proposed Route.

This alternative is the same as Alternative 7I for the first 65.2 miles (point 7r.1). From there, Alternative 7H proceeds to the west, into the Raft River Valley, where two raptor nest buffers and one sage-grouse lek buffer are crossed. Power County endorses the portion of Alternative 7H between points 5, 7a.0, 7b.1, and 7a.2. Portions of this alternative pass through the Raft River-Curlew Valley IBA for ferruginous hawks between MPs 58.2 to 66.4 and 72.0 to 75.9. The alternative continues into the Jim Sage Mountains, the Elba Basin, and the Albion Mountains. The alternative is within the Sawtooth NF from MP 87.6 to 92.0, then re-enters agricultural land passing south of Oakley, Idaho, turning northwest then north before meeting the Proposed Route at point 7s.3 and continuing west into the proposed Cedar Hill Substation.

This alternative is studied in detail although it would cross the Sawtooth NF for 12.1 miles, in multiple locations, most of which is high-quality habitat, and the alternative would be all Greenfield. Also, this alternative would result in substantially more impacts to raptors and sage-grouse compared to the Proposed Route. Overall, this alternative would result in measurably more environmental effects than the Proposed Route. However, the Proponents consider this alternative as superior to Alternative 7I. Of its 127.5-mile length, 116.5 miles would be Greenfield and 11.0 miles would parallel existing transmission lines.

Alternative 7H would neither be in conformance with the management direction provided in the Cassia RMP nor would it be consistent with the Sawtooth Forest Plan. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the Draft EIS where the effects are analyzed. Appendix F provides the

proposed amendment and Appendix G provides the analysis and rationale for visual resource amendments.

Alternative 7I (5, 7a.0, 7b.0, 7b.1, 7a.2, 7r.4, 7r.1, 7r.2, 7r.3, 9)

Substantial landowner opposition has been raised to the Proposed Route in Segment 7 due to potential impacts to agricultural land in Cassia County. Through a lengthy process of meetings and correspondence, a multi-county task force (local landowners) was formed consisting of representatives from Bannock, Oneida, Power, Cassia, and Twin Falls County governments and interested landowners. Input was received from local Idaho state legislators, and the states of Utah and Nevada were contacted with the goal of providing an alternative route. Alternative 7I, or the State Line Route as it is commonly called, is the route recommended by this task force (Cassia County 2009). This alternative is 173.4 miles long, compared to 118.1 miles for the corresponding portion of the Proposed Route.

From the Populus Substation, this alternative is coincident to the Proposed Route for the first 9.2 miles (point 7a.0). It then proceeds to the west, crossing into Oneida County at MP 14.0 and turns southwest at MP 15.2 crossing the Pleasantview Hills, the Arbon Valley, and into the Deep Creek Mountains. At MP 32.9, Alternative 7I turns west and is located along the Power County/Oneida County line through the southern portion of the Rockland Valley and into the Sublette Mountain Range. At MP 45.9, the alternative enters the Sawtooth NF, turning southwest and crossing into Cassia County at MP 52.2. At MP 55.8, the alternative turns west again, crossing I-84 at MP 57.7 and passing through several raptor nest buffers. Much of this alternative passes through the Raft River-Curlew Valley IBA for ferruginous hawks between MPs 58.3 to 72.0, 75.2 to 75.4, and 85.9 to 97.2. At MP 65.2 (point 7r.1), the alternative turns to the southwest, then west passing along the east side and then south side of the Raft River Valley. The alternative crosses the Salt Lake Alternative of the California NHT at MP 82.6, crosses several more raptor nest buffers and comes within 1 mile of Utah in the Cedar Hills at MP 98.2. This portion of the alternative passes just south, but within the viewshed, of the City of Rocks National Reserve. Continuing west, the route enters Junction Valley and re-crosses the California NHT three different times at MPs 103.8, 111.9, and 114.9. The alternative enters the Albion Mountains and the Sawtooth NF at MP 121.0, and dips into Elko County, Nevada, between MPs 122.3 and 129.5 to avoid a designated roadless area in the Sawtooth NF. The alternative re-enters the NF as it re-enters Idaho, eventually turning north and leaving the NF at MP 152.6, and proceeding to a WWE corridor at MP 155.3 (point 9a.1). From here, the alternative follows the WWE corridor and an existing 345-kV transmission line to the northeast, past point 9.a and into the proposed Cedar Hill Substation. Of its 173.4-mile length, 144.6 miles would be Greenfield and 28.8 miles would parallel existing transmission lines.

Alternative 7I would neither be in conformance with the management direction provided in the Cassia and Wells RMPs and Twin Falls MFP, nor would it be consistent with the Sawtooth Forest Plan. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the Draft EIS where the effects are analyzed. Appendix F provides the proposed amendment and Appendix G provides the analysis and rationale for visual resource amendments.

Alternative 7J (5, 7a.0, 7b.0, 7b.1, 7a.2, 7r.4, 7r.1, 7r.2, 7r.3, 13 + 13, 9a.6 + 9, 9a.1, 13)

Local landowners opposed the Proposed Route between Populus and Cedar Hill Substations because 63 percent of this route would be located on private land, much of which is currently used for agricultural purposes. Their preferred route along this portion of the Project is Alternative 7I (as described above). On June 23, 2010, the Twin Falls County Commissioners formally requested that BLM include a proposed realignment for the west end of Alternative 7I, identified here as the Rogerson-Hollister Alternative (Twin Falls County 2010a).

Alternative 7J incorporates all of Alternative 7I from the Populus Substation to point 7r.3, where Alternative 7J would replace the remainder of Alternative 7I. At MP 137.2 (point 7r.3), Alternative 7J would turn west then northwest for approximately 16.6 miles across Shoshone Basin. At point 13, Alternative 7J would cross an existing 345-kV transmission line and the proposed Southwest Inter-tie Project (SWIP; a proposed 500-kV transmission line currently approved but not constructed at this time). The Task Force proposes that the Cedar Hill Substation be moved to this junction, a move of about 24 miles southwest from its current proposed location at point 9. From point 13, Alternative 7J would branch in two directions: one line would continue northwest for approximately 8 miles, then turn north within a WWE corridor to meet Proposed Segment 9 at point 9a.6. The second line would proceed for approximately 10 miles back to the WWE corridor at point 9a.1, continuing to the east along the Alternative 7I alignment, into the current location of the proposed Cedar Hill Substation. Total length of Alternative 7J is 202.1 miles.

Alternative 7J connects with Segment 9 approximately 25.8 miles west of the proposed Cedar Hill Substation, which is the western terminus of Segment 7 and the beginning point for Segment 9. The tables and discussion in this document compare 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

Alternative 7J would neither be in conformance with the management direction provided in the Cassia and Wells RMPs and Twin Falls MFP, nor would it be consistent with the Sawtooth Forest Plan. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the Draft EIS where the effects are analyzed. Appendix F provides the proposed amendment and Appendix G provides the analysis and rationale for visual resource amendments.

2.4.9 Segment 8 – Midpoint to Hemingway

2.4.9.1 General Description and Issues

One single-circuit 500-kV transmission line is proposed between the Midpoint Substation and the Hemingway Substation, located approximately 30 miles southwest of Boise, Idaho. The line would be constructed using steel lattice towers between 145 and 180 feet tall (Appendix B, Figure B-2). Appendix A, Figure A-10 shows the proposed Segment 8 route. The Proposed Route is about 131.0 miles long and therefore two optical signal regeneration sites, about 40 to 50 miles apart, would be needed along the route but their locations have not yet been proposed.

Key factors considered in routing this segment included using the WWE corridor where possible, conflicts with agricultural lands, residential development, visual resources, SRBOP, Halverson Bar and Wees Bar Non-motorized Areas, Guffey Butte-Black Butte Archaeological District, and the IDANG Orchard Training Area. The Proposed Route is within the WWE corridor for 38.1 miles out of its total 131.0-mile length.

2.4.9.2 Proposed Route

The 131.0-mile-long Proposed Route (points 8, 8a, 8b, 8c, 8c.1, 8c.2, 8q, 8r, 8r.1, 8r.3, 9t, 9v, 11) proceeds west-northwest, passing just north of the juncture of the Jerome, Lincoln, and Gooding County lines near MP 9. Between points 8 and 8c.1, the Proposed Route would be located immediately adjacent to an existing 230-kV line. This route continues in the same direction, passing between Gooding and Wendell before crossing the Malad River at MP 19.3. South of Pioneer Reservoir, the route angles northwest crossing the Gooding County/Elmore County line at MP 36.1. Between MPs 45.3 to 47.6 and 49.9 to 50.7, the Proposed Route would cross VRM Class I in an area of multiple transmission lines. At MP 58, the route parallels the existing PacifiCorp 500-kV line offset 1,500 feet to the south and west for reliability reasons. It crosses U.S. Highway 20 at MP 67.5 and turns west, crossing I-84 at MP 89.4 and the Elmore-Ada County line at MP 89.9. Continuing west, the Proposed Route is located approximately 1,500 feet south of the existing Summer Lake to Midpoint 500-kV transmission line through the SRBOP.

The route enters the SRBOP at MP 97.8 and continues to the west, then southwest through Ada County. A 4.7-mile segment of the route passes through a portion of the Alpha Maneuver Sector for the IDANG, which is located in the SRBOP. IDANG has requested that this area be avoided if possible. Alternative 8D provides an avoidance route, as described below. At MP 116, the route turns more to the south and crosses the Snake River between MPs 117 and 119. The Snake River in this area comprises the Ada-Owyhee County line. In this same general area the Proposed Route would cross the Halverson Bar and Wees Bar non-motorized areas and Guffey Butte-Black Butte Archaeological District. The route continues southwest, then west around Guffey Butte through Owyhee County before intercepting a WWE corridor and turning northwest at MP 123.6. The route leaves the SRBOP at MP 125.8 before ending at the proposed Hemingway Substation. Of its 131.0-mile length, 13.9 miles would be Greenfield and 117.1 miles would parallel existing transmission lines.

Several plan amendments would be needed to make the Proposed Route conform with BLM land use plans in effect. The Kuna MFP would need an amendment to allow the transmission line outside of existing corridors. The SRBOP RMP would need amendments to VRM classes, to permit surface-disturbing activity within 0.5 mile of sensitive plant habitat, and to allow a utility corridor outside the two utility corridors identified in the plan. In addition, the Proposed Route would not be in conformance with the management direction provided in the Bennett Hills/Timmerman and SRBOP RMPs and the Kuna MFP. An amendment would be needed to allow the Proposed Route to be constructed within this non-motorized area; however, the Boise District BLM office has stated that the RMP could not be amended in this way to meet objectives. Alternative 8E would avoid this area. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the Draft EIS

where the effects are analyzed. Appendix F provides the proposed amendment and Appendix G provides the analysis and rationale for visual resources.

2.4.9.3 Alternatives Eliminated from Detailed Study

The following eight alternatives were considered during the routing process. Each was explored because it followed existing transmission lines, existing corridors, or the WWE corridor, but each presents more environmental impacts than the Proposed Route or Route Alternative evaluated in detail. The BLM IDT decided not to carry these routes forward for detailed analysis. A scoping comment suggested co-location of the Proposed Route with planned realignment and upgrading of Kuna–Mora Road in the vicinity of points 8h to 8j. Consultation with Ada County confirmed that the highway upgrade was planned for several years later than the in-service date for the Proposed Route.

Summer Lake – Midpoint Alternative (8s, 8g, 8p, 11)

The Summer Lake – Midpoint Alternative was initially considered to parallel the north side of the Summer Lake – Midpoint 500-kV transmission length from where the Project would first encountered this line (at point 8s) all the way east to a termination at the Hemingway Substation (point 11).

This alternative was eliminated from detailed study because as of the date it was originally proposed, it:

- Is parallel to an existing transmission line on the north side for its length; however, the western end of the alternative (in Canyon and Owyhee Counties) would encounter residences and cropland that would make paralleling the existing line infeasible; and
- The concept of paralleling the Project with existing transmission lines was incorporated into the Proposed Route and Alternative 8D, which also avoid residential and agricultural areas that would be impacted by this alternative.

I-84 North Alternative (8, 8c, 8c.1)

The intent of this alternative is to follow the I-84 corridor to the extent possible. This route diverges from the feasible alternative at MP 20 and heads northwest, paralleling the south side of I-84 and the north side of the Snake River. It passes just south of Bliss and then turns west, still paralleling I-84 and the river. In Elmore County, this route crosses the Snake River twice and then meets the Proposed Route at reference point 8c, approximately 4 miles northwest of King Hill. No attempt was made to follow I-84 from point 8c north because the WWE corridor and existing transmission lines presented better siting options.

This alternative was eliminated from detailed study because, as of the date it was originally proposed, it:

- Parallels the Snake River in relatively close proximity, and crosses the Snake River twice;
- Is 2.2 miles longer than the Proposed Route;

- Does not follow the WWE corridor;
- Is parallel to existing transmission lines for less of its' length compared to the Proposed Route (24.3 miles less);
- Impacts 7.1 miles more areas within scenic U.S. Highway 30 buffer; and
- Is in close proximity to developed land uses (agricultural, residential, commercial, recreational) to a much greater extent than the Proposed Route.

I-84 North Variation Alternative (8, 8a, 8c, 8c.1)

This alternative is a slight variation of the previously discussed alternative (i.e., I-84 North Alternative). This option diverges from the Proposed Route at point 8a and travels generally west for 3 miles north of I-84 and the town of Bliss, crosses I-84, and then continues 3 miles west of Bliss, where it joins the I-84 Alternative discussed above. The environmental advantages and disadvantages of this alternative are the same as those presented for the previously discussed alternative, with the exceptions that it impacts more VRM Class III and less VRM Class II.

This alternative was eliminated from detailed study because, as of the date it was originally proposed, it:

- Results in more environmental effects than the Proposed Route (as discussed for the I-84 North Alternative).

WWE Corridor Alternative (8c.1, 8d, 8e, 8f, 8o)

This alternative was considered in the WWE Corridor PEIS (DOE and BLM 2008); however, changes were made to the WWE corridor during the analysis process, and the final designated WWE corridor is actually located farther to the west than this alternative had anticipated it would be. This alternative diverges from the Proposed Route at point 8c.1, and continues northwest, parallel to the Proposed Route and an existing transmission lines, and follows the WWE corridor. It rejoins the Proposed Route at a location a few miles east of Indian Creek Reservoir in the vicinity of point 8o.

This alternative was eliminated from detailed study because, as of the date it was originally proposed, it:

- Is 1.0 mile longer than the Proposed Route;
- Is only within the designated WWE corridor for 0.7 mile, although it would be within or paralleling an alternative WWE corridor for 36.7 miles;
- Parallels an existing transmission line for 0.9 mile less than the Proposed Route;
- Crosses 3.1 miles of VRM Class I (within the draft WWE corridor), whereas the Proposed Route would cross none; and
- Crosses 0.3 mile more irrigated agriculture than the Proposed Route.

Blair Trail Alternative (8c, 8d, 8e, 8f, 8o)

The Blair Trail Alternative was initially considered because it parallels the north side of an existing transmission line corridor containing 138-kV, 230-kV, and 500-kV lines. This alternative diverges from the Proposed Route at point 8c just south of Blair Trail

Reservoir. It travels just northeast of the previously discussed alternative for approximately 11 miles.

This alternative was eliminated from detailed study because, as of the date it was originally proposed, it:

- Is 4.1 miles longer than the Proposed Route;
- Impacts three sage-grouse leks, including both the 0.65-mile and 0.25-mile buffers;
- Crosses 5.1 miles of VRM Class I, whereas the Proposed Route crosses none in this area;
- Crosses 0.9 mile more irrigated agriculture than the Proposed Route;
- Crosses 0.4 mile more steep slopes than the Proposed Route; and
- Impacts 2.4 miles more historic trail buffers than the Proposed Route.

Gooding North Alternative (8, 8e, 8c.2)

Residents of Elmore County have commented that the final route should be located farther north and along an existing transmission line from the point where it leaves Midpoint Substation and heads northwest. In response to these comments, the Gooding North Alternative was sited to follow an existing 230-kV transmission line north of the Proposed Route. This 68.5-mile alternative would cross only 10.2 miles of private property. The route would start at Midpoint Substation (point 8) and proceed to the northwest for approximately 18 miles, before turning to the west-northwest for about 50 miles and rejoining the Proposed Route about 2 miles east of Mountain Home, Idaho, at point 8c.2.

This alternative was eliminated from detailed study because, as of the date it was originally proposed, it:

- Is 1.8 miles more VRM Class I and II land than the Proposed Route;
- Crosses 33.6 miles more elk and mule deer winter range than the Proposed Route;
- Does not follow the WWE corridor;
- Crosses 7.8 miles of pygmy rabbit habitat, whereas the Proposed Route avoids pygmy rabbit habitat;
- Crosses the King Hill Creek Area of Critical Environmental Concern (ACEC), whereas the Proposed Route avoids it; and
- Crosses 2.4 miles of sage-grouse lek 0.65-mile buffers whereas the Proposed Route avoids sage-grouse buffers.

King Hill Alternative (8b, 8e, 8f, 8o)

The King Hill Alternative was routed to reduce impacts to historic trails and sage-grouse leks, the King Hill wilderness study area (WSA), the King Hill Creek ACEC, and topography near King Hill and King Hill Creek (steep drainages and wide canyons), as well as an attempt to follow an existing utility corridor where possible. This route diverges from the Proposed Route at point 8b and extends in a northwest direction,

generally paralleling the north side of the Proposed Route. It passes north of Pioneer Reservoir, across the Gooding/Elmore County line, and north of Blair Trail Reservoir. It then continues along the very southern foot of the Mount Bennett Hills, and rejoins the draft WWE corridor alternative.

This alternative was eliminated from detailed study because, as of the date it was originally proposed, it:

- Does not follow the final WWE corridor;
- Parallels an existing transmission line for 20.6 miles less than the Proposed Route; and
- Crosses 6.2 miles more steep slope areas than the Proposed Route.

Bennett Hills Alternative (8b, 8f, 8o)

The Bennett Hills Alternative was designed to minimize impacts to historic trails. This alternative route diverges from the Proposed Route at point 8b and extends northwest and then west, extending much farther north than the other alternatives in order to avoid constraints such as the King Hill WSA. The majority of this alternative traverses the Bennett Hills. It then rejoins another alternative where the WWE corridor is designated.

A variation of the Bennett Hills Alternative was also considered in which the alternative began at Midpoint Substation (point 8) and extended northwest between Shoshone and Gooding along an existing 230-kV transmission line and joining the alternative in the vicinity of Blair Trail reservoir.

These alternatives were eliminated from detailed study because, as of the date they were originally proposed, they:

- Are 5.0 miles longer than the Proposed Route;
- Cross 0.8 mile more VRM Class I area than the Proposed Route;
- Parallel existing transmission lines for 37.8 miles less than the Proposed Route;
- Are Greenfield routes through the Bennett Hills, presenting construction difficulty due to topography and lack of existing access; and
- Cross 32.4 miles more of steep slope areas than the Proposed Route.

McElroy Butte Alternative (8h, 8i, 8j, 8l, 8n, 11)

The key issue for this portion of the route was determining the approach to siting a new corridor in an environment of active agricultural use, increasing residential development, and additional planned infrastructure projects. The segments comprising this alternative were an attempt to cross this area with a more direct route.

The first segment of this alternative would require relocating and/or rebuilding a portion of an existing 138-kV transmission line to 230-kV (planned for another project) in addition to the 500-kV Gateway West line on double-circuit 230-/500-kV structures. This route diverges from Alternative 8B at point 8h approximately 3.5 miles east of Kuna Butte. It would extend southwest for 3 miles, then due west for 3.5 more miles, passing just south of Kuna Butte before rejoining Alternative 8B at point 8j. Land in this

area is a mix of privately owned and SRBOP-managed lands. This alignment would avoid placing a new transmission line through an area annexed by the City of Kuna. The alternative between points 8j and 8l is 1.2 miles shorter than the 4.3-mile equivalent portion of Alternative 8B, but it cuts diagonally across farmlands instead of following the boundary of public and private lands in the hills. The next segment between points 8l and 8n is 0.2 mile shorter than the 4.7-mile equivalent portion of Alternative 8B but it also would cut diagonally across farmlands instead of following county roads. The southern segment between points 8n and 11 is 0.8 miles shorter than the 3.3-mile equivalent portion of Alternative 8B but also cuts diagonally across farmlands.

This alternative was eliminated from detailed study because, as of the date it was originally proposed, it:

- Resulted in diagonal crossings of farms and parcels rather than following public/private boundaries and county roads. This would create greater impacts to agricultural and residential properties compared to the Proposed Route.

2.4.9.4 Alternatives Studied in Detail

Several feasible alternatives were identified—one that follows the WWE corridor from Midpoint to point 8c.1, and a group of alternatives to the Proposed Route near McElroy Butte, a route to avoid sensitive cultural resources, and another to minimize impacts to the IDANG Orchard Training Area. The Route Alternatives represent the result of discussions with multiple FOs of the BLM and resultant deviations to avoid identified resources within each FO area.

Alternative 8A (8, 8c.1)

Alternative 8A was developed to route the Project within or parallel to the WWE corridor or projected WWE corridor along its full extent. This alternative is 53.6 miles long, compared to 51.4 miles for the corresponding portion of the Proposed Route.

From the Midpoint Substation, this alternative would extend due west passing approximately 3.5 miles north of Wendell, 5.5 miles south of Gooding, and 1 mile north of Hagerman. At the Gooding/Twin Falls County line (MP 26.6), it would cross the Snake River and continue west to the Twin Falls/Elmore County line (at MP 31.2). There, it would begin heading northwest, and beginning at MP 36.2, join an existing transmission corridor. It would parallel the Snake River within approximately 0.5 mile in some locations, crossing Black Mesa and then the Snake River again at MP 46.5 just north of Glenns Ferry. Between MPs 32.8 to 34.1, 36.2 to 38.0, at MP 43, and from MPs 43.3 to 45.6, Alternative 8A would cross VRM Class I land within a WWE corridor. This alternative would continue to follow the existing transmission corridor until it would rejoin the Proposed Route, about 1 mile west of Alkali Creek. This alternative would follow existing transmission lines for almost its entire length.

Alternative 8A would not be in conformance with the management direction provided in the Jarbidge RMP. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the Draft EIS where the effects are analyzed. Appendix F provides the proposed amendment and Appendix G provides the analysis and rationale for visual resources.

Alternative 8B (8q, 8r, 8s, 8g, 8h, 8j, 8k, 8l, 8m, 8n, 8p, 11)

Alternative 8B was originally identified by the Proponents as its Proposed Route; however, the communities of Kuna and Melba expressed strong opposition to this route when it was proposed. The City of Kuna (which is crossed by Alternative 8B) conducted an in-house study and commissioned an outside study of the effects of the then Proposed Route on the communities (ECS 2009; City of Kuna 2009a). The studies contend this route (now Alternative 8B) would affect long-term growth potential by altering the ongoing comprehensive planning process and associated development patterns. Potential effects are described in Sections 3.4 – Socioeconomics and 3.17 – Land Use and Recreation. Representatives of Melba, Kuna, Ada County, the Proponents, and BLM have worked collaboratively to reach a mutually acceptable solution. To that end, the Proponents have now proposed a route that avoids the areas of concern identified by Kuna and Melba. This alternative is 45.8 miles long, compared to 45.3 miles for the corresponding portion of the Proposed Route.

Alternative 8B begins at MP 85.3 of the Proposed Route in Elmore County. It proceeds northwest along the alignment of the Proposed Route to MP 90.5. It then continues northwest for another 1 mile before turning west and northwest adjacent to an existing low voltage transmission line for about 6 miles, where at MP 23.3 it turns west across the railroad and proceeds through a developing area, which includes 0.75 mile within the city of Kuna, existing and planned subdivisions, and BLM-managed lands currently under consideration for inclusion in the SRBOP. From this point, it proceeds along the north side of Kuna Butte before turning generally southwest passing south of Power Butte and McElroy Butte and north of the community of Melba. Between points 8k and 11, the Proposed Route would be located adjacent to roadways and in proximity to residences. At MP 39.8 it crosses U.S. Highway 45 and then the Snake River before entering the expanded Hemingway Substation at MP 45.6. Of its 45.8-mile length, 12.9 miles would be Greenfield and 32.9 miles would parallel existing transmission lines.

Alternative 8B would not be in conformance with the management direction provided in the SRBOP RMP and the Kuna MFP. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the Draft EIS where the effects are analyzed. Appendix F provides the proposed amendment and Appendix G provides the analysis and rationale for visual resources.

Alternative 8C (8q, 8o, 8s)

Alternative 8C was originally a portion of the Proposed Route. It was changed to an alternative in this area because it is close to the planned expansion of the Mayfield subdivision. It is kept as a viable alternative because the comparable portion of the Proposed Route is of similar length and impacts a similar amount of private land. This alternative is 6.4 miles long, compared to 6.5 miles for the corresponding portion of the Proposed Route.

It proceeds northwest along the WWE corridor, then west back to the Proposed Route. This alternative would parallel an existing transmission line for its entire length.

Alternative 8C would not be in conformance with the management direction provided in the Kuna MFP. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the Draft EIS where the effects are analyzed.

Appendix F provides the proposed amendment and Appendix G provides the analysis and rationale for visual resources.

Alternative 8D (8r.1, 8r.2, 8r.3)

Consultation with the IDANG indicates their preference for the line to avoid a portion of the Alpha Maneuver Sector of the Orchard Training Area. Alternative 8D would accommodate the IDANG concerns. This alternative is 8.1 miles long, compared to 6.9 miles for the corresponding portion of the Proposed Route.

This alternative begins at the east boundary of the Alpha Maneuver Sector. At this point, the transmission line would be located on the existing Summer Lake to Midpoint 500-kV structures or on new structures if the existing ones are not adequate to support the proposed conductor. The existing circuits would be relocated to a parallel 4.7-mile-long segment offset approximately 1,500 feet to the north to maintain the reliability separation distance. This alternative would therefore avoid the Alpha area but would still be within the SRBOP.

Alternative 8D would not be in conformance with the management direction provided in the SRBOP RMP and the Kuna MFP. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the Draft EIS where the effects are analyzed. Appendix F provides the proposed amendment and Appendix G provides the analysis and rationale for visual resources.

Alternative 8E (8r.4, 9r.4, 9r.5, 8r.5)[7]

Alternative 8E was proposed by BLM to avoid the Halverson Bar and Wees Bar Non-motorized Areas and the high density of sensitive cultural sites crossed by the Proposed Route in the Guffey Butte-Black Butte Archaeological District (often referred to as the Guffey Butte-Black Butte Historic District) south of Guffey Butte. The portion of the Proposed Route that crosses the north end of the Guffey Butte-Black Butte Archaeological District and the Snake River would be located within an area designated by the BLM as Non-Motorized (i.e., no vehicle travel allowed). The Guffey Butte-Black Butte Archaeological District was listed on the NRHP in 1978 to protect over 200 known prehistoric sites in the area (BLM 2008b). Alternative 8E was sited in consultation with the BLM and would avoid this Non-Motorized land designation and minimize the impacts to cultural sites. This alternative is 18.5 miles long, compared to 7.0 miles for the corresponding portion of the Proposed Route.

Alternative 8E would leave the Proposed Route at point 8r.4 (between MPs 113 and 114), proceeding south, following an existing 138-kV transmission line for approximately 8.2 miles. The route would turn to the west-southwest, following an existing transmission line, through the Guffey Butte-Black Butte Archaeological District and crossing the Snake River south of Swan Falls and Sinker Butte. On the west side of the river, the route would turn to the northwest then west before rejoining the Proposed Route at point 8r.5. The portion of Alternative 8E located west of the Snake River would follow the same route as portions of Alternatives 9D and 9F. However, both

[7] Alternatives 8E and 9D/9F are the same between reference points 9r.4 and 9r.5 – only one of the Alternatives will follow this alignment

Alternative 8E and Alternatives 9D/9F could not be selected for construction, as only one route could be constructed in this area.

Alternative 8E would not be in conformance with the management direction provided in the SRBOP RMP and the Kuna MFP. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the Draft EIS where the effects are analyzed. Appendix F provides the proposed amendment and Appendix G provides the analysis and rationale for visual resources.

2.4.10 Segment 9 – Cedar Hill to Hemingway

2.4.10.1 General Description and Issues

One single-circuit 500-kV transmission line is proposed between the proposed Cedar Hill and the existing Hemingway Substations. The line would be constructed using 500-kV single-circuit lattice steel structures between 145 and 180 feet tall (Appendix B, Figure B-2). Appendix A, Figure A-11 provides details on the transmission line route between the Cedar Hill and Hemingway Substations.

Segment 9 is 161.7 miles long and therefore would need two optical signal regeneration sites along its route. Final locations for regeneration stations would be determined after the preferred alternative is identified and detailed design engineering is completed.

Key factors considered in routing this segment were agricultural and residential development in Owyhee County, visual resources, the Jarbidge Military Operations Area, Saylor Creek Air Force Range, Balanced Rock County Park, Bruneau Dunes County Park, the Cove Non-motorized Area, and Salmon Falls Creek Wild and Scenic River (WSR).

In the Magic Valley, the Proposed Route is within or parallel to the WWE corridor for 15.0 miles out of a total Proposed Route length of 78.1 miles. However, in the western half of Segment 9, the WWE corridor was one of the primary elements used for routing the Proposed Route. In the Saylor Creek area, the Proposed Route is within or parallel to the WWE corridor for 12.9 miles out of a total Proposed Route length of 29.1 miles, and from the Saylor Creek Air Force Range west, the Proposed Route is within or parallel to the WWE corridor for 48.0 miles out of a total Proposed Route length of 52.4 miles. In total, Segment 9 utilizes 78.4 miles of WWE corridor.

2.4.10.2 Proposed Route

The 161.7-mile-long Proposed Route (points 9, 9a, 9a.2, 9a.3, 9a.4, 9a.5, 9a.6, 9c.1, 9e.1, 9e.2, 9h, 9i, 9k, 9m.1 9n, 9l, 9m, 9p, 9w, 11) for the single-circuit 500-kV line proceeds generally west through public and private rangeland. The route continues west about 1 mile south of Twin Falls Military Reservation, and crosses U.S. Highway 93 at MP 17.7. At MP 28.6 the route turns northwest to parallel the east side of Salmon Falls Creek adjacent to an existing 138-kV transmission line for about 4.4 miles before turning west at MP 32 and crossing the Salmon Falls Creek ACEC at Lillie Grade just north of the Salmon Falls Creek WSA (Point 9a.5) but still part of an ACEC and eligible WSR. (The BLM has stated that if cannot approve a route that crosses an eligible WSR). Several raptor nest buffers are crossed as the route continues northwest through the Bruneau Desert. At MP 46.6, the route turns to the north along the Twin

Falls/Owyhee County border for about 10 miles before turning to the northwest and crossing into Owyhee County at MP 55.8, then into Elmore County at MP 63.4. Between MPs 91.2 and 95.8 the Proposed Route would be just inside the east boundary of the general Jarbidge Military Operating Area. Within the general Military Operating Area, the height of the transmission structures normally cannot extend more than 100 feet above ground level. Consultation between Twin Falls County and the U.S. Air Force has determined that this height restriction would not apply and this minor encroachment is acceptable (Postema 2010).

The Proposed Route enters the SRBOP at MP 88.0. Between this point and MP 96.8, a distance of the route would be outside the designated WWE corridor to avoid cultivated agricultural fields at the request of Owyhee County. The Proposed Route would pass through the Saylor Creek Air Force Range restricted area and to the south of Bruneau Dunes State Park in the vicinity of MPs 93 to 97. Consultation between representatives of the BLM, U.S. Air Force, Idaho Department of Parks and Recreation, and the Proponents has determined that the location of the Proposed Route within the restricted Military Operating Area and just to the south of Bruneau Dunes State Park is acceptable. From this point, the Proposed Route proceeds generally southwest across the Bruneau River Valley.

On the west side of this valley the route turns northwest, crosses SR 51, and then continues northwesterly on the southwest side of the Bruneau River, then the Snake River and SR 78. In this portion, the Proposed Route follows the WWE corridor on BLM-managed land but frequently changes direction on private segments to avoid rural residences, the small communities of Murphy and Oreana and as much as possible, cultivated lands. The route intercepts the SRBOP between MPs 142.4 and 146.2 within the WWE corridor and continues north and west into the Hemingway Substation at MP 161.7.

The Proposed Route would not be in conformance with the management direction provided in the Jarbidge and SRBOP RMPs and the Twin Falls and Bruneau MFPs. In addition, it is not in conformance with the Eligible WSR designation for this segment of Salmon Falls Creek. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the Draft EIS where the effects are analyzed. Appendix F discusses the proposed amendment and Appendix G provides the analysis and rationale for visual resources. However, the BLM has concluded that the Proposed Route along Segment 9 could not be approved unless the river is found not to be suitable as a WSR.

2.4.10.3 Alternatives Eliminated from Detailed Study

Magic Valley Alternative (9, 9e, 9e.1, 9f, 9h)

The Magic Valley Alternative was designed to create a more direct route compared to the Proposed Route; however, this alternative passes through more irrigated agricultural land (primarily center pivot), and is in proximity to more rural residential development. This alternative exits the Cedar Hill Substation in a northwesterly direction, generally parallel to and south of the Snake River. It passes through Pleasant Valley, crosses Rock Creek, passes about 3 miles south of Twin Falls, continues through the Melon Valley, crosses Salmon Falls Creek, and reaches reference point 9e.

From this point it continues northwest through the remainder of Twin Falls County, through northern Owyhee County, and into southern Elmore County, where it meets the Proposed Route at reference point 9h.

This alternative was eliminated from detailed study because, as of the date it was originally proposed, it:

- Is within or parallel to the WWE corridor for only 0.9 mile, compared to 15.0 miles for the Proposed Route;
- Parallels existing transmission lines, whereas the Proposed Route does so for 25.0 miles;
- Passes through 29.3 more miles of irrigated agricultural lands (primarily center pivot);
- Is in proximity to rural residential development;
- Encroaches upon an airport buffer zone; and
- Impacts 15.8 miles of a designated scenic highway (i.e., Highway 30).

Saylor Creek Alternative (9i, 9j, 9l)

The Saylor Creek Alternative was an initial design for the constriction point between Bruneau Dunes State Park and the Saylor Creek Air Force Range, which was based on a larger required buffer from the Air Force Range. It deviates slightly from the Proposed Route, beginning at point 9i heads due west, then due south, then southwest to avoid conflicts with the Bombing Range.

This alternative was eliminated from detailed study because, as of the date it was originally proposed, it:

- Is 1.5 miles longer than the Proposed Route;
- Passes through Bruneau Dunes State Park for 0.3 mile, and would have a greater impact on the view from the park;
- Crosses VRM Class II land, which the Proposed Route would not;
- The Proposed Route was agreed upon through agency consultation as a means to avoid conflicts with the Air Force Range and the State Park, whereas this alternative was not; and
- The final WWE corridor was moved to follow the Proposed Routes alignment in this area, by agreement with all adjacent and affected land-managing agencies.

Magic Valley-Saylor Creek Alternative (9b, 9m)

The Magic Valley-Saylor Creek Alternative was designed to avoid both the Saylor Creek Air Force Range and the Bruneau Dunes State Park, and would be located primarily on BLM-managed lands by extending farther south than the other routes considered. This alternative proceeds due west to a crossing of Salmon Falls Creek and then extends westward for approximately 33 miles through the Bruneau Desert, and crosses the East Fork of the Bruneau River, proceeds about 5 miles through the Inside Desert, crosses Bruneau Canyon/Bruneau River, and proceeds 5 miles through the Blackstone Desert. At this point it turns northwest and travels approximately 25 miles, between Big Hill and

Bruneau Canyon/Bruneau River. This alternative then terminates at a location approximately 6 miles west of C.J. Strike Reservoir, where it joins the Proposed Route at MP 107.5 (point 9m).

This alternative was eliminated from detailed study because as of the date it was originally proposed, it:

- Is entirely a Greenfield route;
- Is not within the WWE corridor;
- Crosses 3.6 miles of the Bruneau-Jarbidge Rivers Wilderness Area associated with the Bruneau River in Bruneau Canyon;
- Crosses 2.0 miles of an ACEC associated with the Bruneau River in Bruneau Canyon. This area is designated as an ACEC because of bighorn sheep and cultural resources in the area;
- Crosses 3.5 miles of VRM Class I on BLM-managed land associated with Bruneau Canyon;
- Crosses 0.6 mile of historic trail buffer; and
- Would be within a Military Operating Area for most of its length, which limits obstructions to under 100 feet.

Blue Ridge Alternative (9c.1, 9f)

The Blue Ridge Alternative was part of the original Proposed Route. It was originally proposed by the Proponents because it was the most direct route between Cedar Hill substation and Hemingway substation; however, it is no longer being considered because it would have passed through the Jarbidge Military Operating Area, an area that prohibits structures greater than 100 feet in height. Instead, the Proposed Action was moved several miles to the north, to the east edge of the Military Operating Area. This new location (i.e., the location of the new Proposed Route) is favored by the military over the Blue Ridge Alternative.

State Route 78 Alternative (9p, 9t, 9v, 11)

The SR-78 Alternative was part of the original Proposed Route near Hemingway Substation. In this location, Segments 8 and 9 converge as the routes approach the substation. Impacts to subdivisions along Segment 8 caused a portion of Segment 8 to be pushed to the south, onto points 9t, 9v, and 11. Therefore, the current Proposed Route along Segment 9 has also been moved further south, and the I-78 Alternative was dropped from further evaluation.

Central Birds of Prey Nature Conservation Area (NCA) Alternative (9m, 9r, 11)

The Proponents identified the Central Birds of Prey NCA Alternative during initial scoping as a means of following existing 138-kV and 500-kV transmission lines on the north side of the Snake River. Most of this alternative's route would parallel an existing 138-kV transmission line in a northwesterly direction, until it meets an existing 500-kV line (approximately 15 miles of the far western portion of this alternative). This alternative would then follow this existing 500-kV line to point 11.

This alternative was eliminated from detailed study because, as of the date it was originally proposed:

- Placing the line north of the 500-kV line resulted in impacts to irrigated agricultural land and placing it on the south side of the 500-kV line within the Snake River canyon (in the SRBOP) was deemed infeasible. In addition, it created conflicts with private land uses and subdivisions near Melba

Alternative 9D was developed to deal with conflicts with private land uses and subdivisions that were created by the Central Birds of Prey NCA Alternative. Much of Alternative 9D follows the Central Birds of Prey NCA Alternative, except in three places. In the area south of C.J. Strike Reservoir, the original alternative was moved out of private land. To the northwest of C.J. Strike Reservoir, Alternative 9D was also moved west of the original alternative (onto BLM-managed lands) to avoid private lands. Lastly, instead of extending north up the 138-kV line to the 500-kV line, Alternative 9D turns to the west near Sinker Butte.

I-84 South Alternative (7g, 7i, 9g, 9h)

The analysis leading to the conclusion that the I-84 South Alternative should not be carried forward is addressed earlier in Section 2.4.8.3.

2.4.10.4 Alternatives Studied in Detail

Alternative 9A (9a, 9a.3)

Alternative 9A was originally identified by the Proponents as the Proposed Route. The BLM representatives and the Proponents identified a new route that has been adopted by the Proponents as proposed, based on consultation between local landowners and residents concerned about impacts to irrigated agriculture and dairies. However, Alternative 9A (formerly the Proposed Route) remains a feasible alternative that warrants detailed analysis. This alternative is 7.7 miles long, compared to 7.8 miles for the corresponding portion of the Proposed Route.

The alternative is located about 2 miles south of Hub Butte in Twin Falls County generally parallel to the current Proposed Route.

Alternative 9A would not be in conformance with the management direction provided in the Twin Falls MFP. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the DEIS where the effects are analyzed. Appendix F provides the proposed amendment and Appendix G provides the analysis and rationale for visual resources.

Alternative 9B (9a.5, 9b, 9c, 9d, 9e, 9g, 9h)

Alternative 9B was developed to follow a nearby WWE corridor and to parallel existing utility corridors. This alternative is 53.2 miles long, compared to 49.5 miles for the corresponding portion of the Proposed Route.

Alternative 9B would depart from the Proposed Route about 5 miles south of Castleford (point 9a.5) and rejoin the Proposed Route just west of the Owyhee/Elmore County line about 3 miles south of the Snake River at point 9h. This alternative would diverge from

the Proposed Route by continuing to follow an existing transmission line parallel to the west side of Salmon Falls Creek at a distance ranging between 1 to 4 miles. It would then turn northwest, continue to parallel an existing transmission line on the southwest side of the Snake River before crossing the Twin Falls/Elmore County line at MP 29.5. At point 9g, the route would turn due west, crossing Rosevear Gulch and then Deadman Flat before rejoining the Proposed Route just west of the Owyhee/Elmore County line at point 9h.

Alternative 9B would not be in conformance with the management direction provided in the Jarbidge RMP. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the Draft EIS where the effects are analyzed. Appendix F provides the proposed amendment and Appendix G provides the analysis and rationale for visual resources.

Alternative 9C (9a.5, 9b, 9c, 9c.1)

Alternative 9C was originally identified by the Proponents as the Proposed Route. County representatives and the Proponents, identified a new route that has been adopted by the Proponents as proposed, based on consultation between local landowners and residents concerned about impacts to irrigated agriculture and dairies. However, Alternative 9C (formerly the Proposed Route) remains a feasible alternative that warrants detailed analysis. This alternative is 15.3 miles long, compared to 14.7 miles for the corresponding portion of the Proposed Route.

Alternative 9C follows an existing 138-kV transmission line in a northerly direction. The alternative is parallel to the east of an ACEC in Salmon Falls Creek, passing within 3.5 miles west of Castleford, Idaho. At MP 9, the alternative crosses the existing transmission line, turns to the west passing along the east then the north side of Balanced Rock County Park, and crosses Salmon Falls Creek. The alternative continues west through Blue Gulch, before meeting the Proposed Route at MP 47.2 at reference point 9c.1.

Alternative 9C would not be in conformance with the management direction provided in the Jarbidge and SRBOP RMPs. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the Draft EIS where the effects are analyzed. Appendix F provides the proposed amendment and Appendix G provides the analysis and rationale for visual resources.

Alternative 9D (9n, 9n.1 9r, 9p, 9r.1, 9r.4,)

Alternative 9D has been identified by the Owyhee County Task Force and recommended by Owyhee County for detailed analysis. Avoidance of private lands and maximizing the use of public land has been the primary sitting criteria used by Owyhee County. The specific alignment has been developed through consultation between County Task Force and BLM representatives and the Proponents. Although this alternative substantially deviates from the designated WWE corridor (which is followed by the Proposed Route) and would cross 47.9 miles of the SRBOP (thereby requiring a RMP amendment), it still warrants consideration as a feasible alternative. This alternative is 58.4 miles long, compared to 57.2 miles for the corresponding portion of the Proposed Route.

From point 9n, Alternative 9D would proceed northwest paralleling the north side of Bruneau River, crossing State Highway 51 at MP 5.4, and passing approximately 1.5 miles north of Bruneau, Idaho. After 7 miles, the alternative turns west crossing the Narrows portion of C.J. Strike Reservoir and the Cove Non-motorized Area before turning north and crossing the Snake River approximately 0.5 mile downstream from C.J. Strike Dam. Except for minor detours to avoid agricultural land, the alternative parallels the transmission lines from the dam primarily west on the north side of the Snake River. On the south side of the Snake River, the alternative would cross a BLM-designated non-motorized area. The majority of this alternative (47.9 miles) is within the SRBOP. At MP 45.9 the alternative crosses near the Swan Falls Reservoir into Owyhee County before meeting the Proposed Route at MP 152.6, reference point 9p. The Owyhee County Task Force has made an additional request to shift the crossing farther north of the reservoir. The alignment was revised accordingly.

Alternative 9D would not be in conformance with the management direction provided in the SRBOP RMPs. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the Draft EIS where the effects are analyzed. Appendix F provides the proposed amendment and Appendix G provides the analysis and rationale for visual resources.

Alternative 9E (9n, 9s, 9p)

Alternative 9E has been identified by the Owyhee County Task Force and recommended by Owyhee County for detailed analysis although it is not preferred by the County. The primary County siting criteria have been avoidance of private land and maximizing of the use of public land. The specific alignment has been developed through consultation between Owyhee County Task Force and BLM representatives and the Proponents. Although this alternative substantially deviates from the designated WWE corridor, it still warrants consideration as a feasible alternative. This alternative is 68.7 miles long, compared to 57.2 miles for the corresponding portion of the Proposed Route.

Beginning at MP 95.8 of the Proposed Route, Alternative 9E proceeds south for approximately 5 miles, then turns west crossing the Bruneau River at MP 5.6 and entering crucial big game winter range. The alternative crosses Highway 51 at MP 15.7, continuing through the Owyhee Foothills. At MP 42.6, the alternative crosses Castle Creek, and makes several bends within the next 15 miles to avoid the buffers of sage-grouse leks. At MP 56.7, the alternative turns to the north at Sinker Creek, proceeding approximately 10 miles, before intercepting the Proposed Route at MP 152.6 (reference point 9p).

Alternative 9E would not be in conformance with the management direction provided in the SRBOP RMPs. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the Draft EIS where the effects are analyzed. Appendix F provides the proposed amendment and Appendix G provides the analysis and rationale for visual resources.

Alternative 9F (9n, 9l, 9m, 9m.1, 9n.1, 9r, 9r.1, 9r.4, 9r.5, 9p)[8]

This alternative was proposed by the BLM in order to avoid the Cove Non-motorized Area west of C.J. Strike Reservoir. As discussed above, Alternative 9D was identified by the Owyhee County Task Force and recommended by Owyhee County for detailed analysis. Avoidance of private lands and maximizing the use of public land has been the primary sitting criteria used by Owyhee County. The specific alignment for Alternative 9D was developed through consultation between the Owyhee County Task Force, the Proponents, and BLM. However, Alternative 9D crosses a 2-mile interval that has been subsequently identified as a BLM Non-Motorized Area. The crossing of the Non-Motorized Area by Alternative 9D would not conform with BLM management objectives. Therefore, Alternative 9F is routed to avoid this area, and preserves all but approximately 18 miles of the Alternative 9D route preferred by Owyhee County. This alternative is 62.9 miles long, compared to 57.2 miles for the corresponding portion of the Proposed Route.

From reference point 9n, Alternative 9F would proceed to the west, following the Proposed Segment and the WWE corridor for approximately 18 miles. At reference point 9m.1, just south and west of C.J. Strike Reservoir dam, the route turns to the northeast then north for approximately 3 miles to re-join Alternative 9D. The remainder of Alternative 9F is coincident to Alternative 9D.

Alternative 9F would not be in conformance with the management direction provided in the SRBOP RMPs. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the Draft EIS where the effects are analyzed. Appendix F provides the proposed amendment and Appendix G provides the analysis and rationale for visual resources.

Alternative 9G (9n, 9n.1, 9r, 9r.1, 9r.2, 9p)

Alternative 9G is another alternative route that avoids the Guffey Butte-Black Butte Non-Motorized Area. Alternatives 9D/9F would take a more northerly path than Alternative 9G (Alternatives 9D/9F would be located in the same location as Alternative 8E). Two separate lines cannot be placed in this single location; therefore, if Alternative 8E is selected, Alternatives 9D/9F would no longer be feasible. Alternative 9G is being evaluated in addition to 9D and 9F because it avoids this location conflict with its placement several miles south of the shared alignment, which would allow both Alternatives 9G and 8E to be selected. This alternative is 56.4 miles long, compared to 57.2 miles for the corresponding portion of the Proposed Route.

Alternative 9G follows Alternative 9F for the first 41 miles, proceeding west from reference point 9n along the Proposed Route and WWE corridor. At reference point 9n.1, just south and west of C.J. Strike Reservoir dam, the route turns to the northeast then north for approximately 3 miles to rejoin Alternatives 9D/9F. Alternatives 9D/9F and 9G would then follow the same path, proceeding to the northwest and following an existing 138-kV transmission line. At reference point 9r.1, Alternative 9G turns to the west, crossing the Guffey Butte-Black Butte Archaeological District and the Snake River approximately 4 miles south of Sinker Butte. The route continues to the north and west

[8] Alternatives 8E and 9D/9F are the same between reference points 9r.4 and 9r.5 – only one of the Alternatives will follow this alignment

to point 9p. Like Alternative 9F, Alternative 9G would cross the Cove Non-motorized Area.

Alternative 9G would not be in conformance with the management direction provided in the SRBOP RMPs. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the Draft EIS where the effects are analyzed. Appendix F provides the proposed amendment and Appendix G provides the analysis and rationale for visual resources.

Alternative 9H (9n, 9l, 9m, 9m.1, 9n.1, 9r, 9r.1, 9r2, 9p)

Alternative 9H was identified by the BLM to avoid both the Cove Non-motorized Area and the common alignment with Alternative 8E near Swan Falls and Sinker Butte. The conditions leading to evaluation of Alternative 9H are the same as those discussed for Alternatives 9D, 9F, and 9G. The primary differences between Alternative 9H and Alternatives 9D/9F/9G are the alignment of the first 18 miles and last 15 miles of the route. Like Alternative 9F, Alternative 9H avoids the Cove Non-motorized Area west of C.J. Strike Reservoir. In addition, like Alternative 9G, Alternative 9H avoids the co-location conflict with Alternative 8E that affects Alternatives 9D and 9F (i.e., if Alternative 8E is selected, Alternatives 9D and 9F would no longer be feasible). This alternative is 61.0 miles long, compared to 57.2 miles for the corresponding portion of the Proposed Route.

From reference point 9n, Alternative 9H is coincident to Alternative 9F, proceeding west from reference point 9n along the Proposed Route and WWE corridor. At reference point 9n.1, just south and west of C.J. Strike Reservoir Dam, the route turns to the northeast then north for approximately 3 miles to rejoin Alternative 9D/9G. Alternatives 9D/9F/9G and 9H would then follow the same path, proceeding to the northwest and following an existing 138-kV transmission line to reference point 9r.1. Alternative 9H then turns to the west, and crosses the Guffey Butte-Black Butte Archaeological District and the Snake River approximately 4 miles south of Sinker Butte. The route continues to the north and west to point 9p following the same path as Alternative 9G.

Alternative 9H would not be in conformance with the management direction provided in the SRBOP RMPs. Table 2.2-1 describes the management direction, the proposed amendment, and the sections of the Draft EIS where the effects are analyzed. Appendix F provides the proposed amendment and Appendix G provides the analysis and rationale for visual resources.

2.4.11 Segment 10 – Midpoint to Cedar Hill

2.4.11.1 General Description and Issues

One single-circuit 500-kV transmission line is proposed between the Midpoint and Cedar Hill Substations. The line would be constructed using 500-kV single-circuit lattice steel structures between 145 and 180 feet tall (Appendix B, Figure B-2). Appendix A, Figure A-12 shows the proposed Segment 10 route between Midpoint and Cedar Hill. The Midpoint Substation is described under Segment 8 and the Cedar Hill Substation is described under Segment 9.

The Proposed Route is within the WWE corridor or projected WWE corridor for 30.6 miles out of a total route length of 32.9 miles. For most of this length, the Proposed Route would be immediately adjacent to the existing 345-kV line. Issues for this

segment focused on avoiding impacts to agricultural uses and the Minidoka National Historic Site.

Segment 10 would not need an optical signal regeneration site along its route.

2.4.11.2 Proposed Route (8, 10a, 10c, 9)

The 33.6-mile-long Proposed Route (8, 10a, 10c, 9) exits the Midpoint Substation in a southeast direction for 11.1 miles (point 10a). At this point, the route turns south crossing the North Side Main Canal, and angles southeast again before turning south again at MP 16.1. From MP 19 to the proposed Cedar Hill Substation, except in the vicinity of the Minidoka National Historic Site, the Proposed Route would parallel an existing 345-kV line. The route continues south across Goose Lake west of the community of Eden and then crosses I-84, the Snake River, the Jerome County/Twin Falls County line, and U.S. Highway 30 before entering the proposed Cedar Hill Substation at point 9. The Proposed Route would follow the alignment of the planned SWIP. If the SWIP is constructed, it would serve in place of the Gateway West Segment 10 Proposed Route. Only one transmission line would be constructed under any circumstances.

No land use plan amendment would be required for the Segment 10 Proposed Route.

2.4.11.3 Alternative Eliminated from Detailed Study

Minidoka Variation (10a, 10b, 10c)

This alternative was examined during the siting process because it follows the existing transmission line, which runs through the Minidoka National Historic Site. This alternative diverges from the Proposed Route at point 10a of the Proposed Route, northwest of Eden, and generally parallels 1 to 2 miles east of the corresponding segment of the Proposed Route and just east of the North Side Main Canal. It passes near the Minidoka National Historic Site and rejoins the Proposed Route at point 10c.

This alternative was eliminated from detailed study because, as of the date it was originally proposed, it:

- Is 1.2 miles longer than the Proposed Route;
- Is within the WWE corridor or projected WWE corridor for 6.9 miles less compared to the Proposed Route;
- Crosses 0.5 mile more irrigated agriculture than the Proposed Route; and
- Although the centerline of this alternative does not cross the Minidoka National Historic Site, it would be much closer to the site than the corresponding portion of the Proposed Route.

2.4.11.4 Alternatives Studied in Detail

No alternatives other than the Proposed Route were studied in detail for Segment 10.

2.4.12 Use of West-wide Energy Corridor, Designated, and Existing Corridors

During the course of selecting the Proposed Route and Route Alternatives, and identifying constraints and opportunities, the BLM has evaluated the use of existing transmission and designated utility corridors. Table 2.4-2 presents the length and

Table 2.4-2. Length and Percentage of Proposed Route and Route Alternatives That Align with West-wide Energy Corridors and Existing Corridors

Segment	Segment or Alternative	Total Segment Length (miles)[1/]	Within WWE Corridor (federal land only)		Within Projected WWE Corridor[2/]		Adjacent to Projected WWE Corridor (within 1/3 mile of WWE Corridor)		Within or Adjacent to Existing Transmission Corridor (includes WWE Corridor and existing T-lines)	
			Length (miles)	% Total Length	Length (miles)	% Total Length	Length (miles)	% Total Length	Length (miles)	% Total Length
1E	Proposed – Total Length	100.6	–	–	6.6	6.5	6.7	6.7	13.9	13.8
	Proposed – Comparison portion for Alt. 1E-A	17.6	–	–	–	–	0.4	2.4	3.9	21.9
	Alternative 1E-A	16.1	–	–	7.2	45.0	6.3	39.3	14.2	88.0
	Proposed – Comparison portion for Alt. 1E-B	37.9	–	–	–	–	–	–	–	–
	Alternative 1E-B	59.3	–	–	–	–	–	–	–	–
	Proposed – Comparison portion for Alt. 1E-C	75.4	–	–	1.7	2.2	3.6	4.8	2.4	3.2
	Alternative 1E-C	48.7	2.1	4.2	4.7	9.6	27.0	55.5	14.7	30.2
1W(a)	Proposed – Total Length	76.5	18.8	24.6	14.1	18.4	21.9	28.6	51.4	67.2
	Alternative 1W-A	16.2	–	–	–	–	10.7	66.1	5.3	32.9
	Proposed – Comparison portion for Alt. 1W-A	20.3	–	–	–	–	–	–	8.1	39.8
1W(c)	Proposed – Total Length	70.6	21.0	29.8	38.9	55.1	11.2	15.9	70.6	100.0
2	Proposed – Total Length	96.7	16.5	17.0	24.2	25.0	11.8	12.2	53.9	55.8
	Proposed – Comparison portion for Alt. 2A	28.8	0.7	2.4	4.5	15.5	1.9	6.7	5.6	19.4
	Alternative 2A	28.4	8.0	28.1	13.7	48.3	2.3	8.0	28.3	99.5
	Proposed – Comparison portion for Alt. 2B	7.0	0.4	5.0	–	–	0.4	5.8	0.4	5.0
	Alternative 2B	6.2	1.2	19.0	1.7	27.0	0.4	7.0	5.0	80.2
	Proposed – Comparison portion for Alt. 2C	28.4	0.4	1.5	2.3	8.1	3.1	11.0	4.7	16.7
	Alternative 2C	24.4	1.4	5.8	0.3	1.2	1.5	6.0	3.5	14.3
3	Proposed – Total Length	46.6	7.3	15.6	9.3	20.0	4.0	8.6	40.9	87.8
	Seg 3A (345 kV)	5.5	0.7	11.8	0.1	1.0	0.3	6.0	1.0	17.6
	Seg 3B (230 kV)	4.3	1.2	26.5	0.3	7.8	1.1	25.2	2.9	67.6
4	Proposed – Total Length	203.0	11.9	5.9	14.1	6.9	10.6	5.2	96.4	47.5
	Proposed – Comparison portion for Alts. 4A–4F	90.2	–	–	–	–	–	–	19.8	22.0

Table 2.4-2. Length and Percentage of Proposed Route and Route Alternatives That Align with West-wide Energy Corridors and Existing Corridors (continued)

Segment	Segment or Alternative	Total Segment Length (miles)	Within WWE Corridor (federal land only)		Within Projected WWE Corridor (includes all land ownership)[1/]		Adjacent to Projected WWE Corridor (within 1/3 mile of WWE Corridor)		Within or Adjacent to Existing Transmission Corridor (includes WWE Corridor and existing T-lines)	
			Length (miles)	% Total Length	Length (miles)	% Total Length	Length (miles)	% Total Length	Length (miles)	% Total Length
	Alternative 4A	85.2	–	–	–	–	–	–	77.5	91.0
	Alternative 4B	100.2	–	–	–	–	–	–	35.6	35.6
	Alternative 4C	101.6	–	–	–	–	–	–	35.6	35.0
	Alternative 4D	100.8	–	–	–	–	–	–	35.6	35.3
	Alternative 4E	102.2	–	–	–	–	–	–	35.6	34.8
	Alternative 4F	87.5	–	–	–	–	–	–	54.1	61.8
5	Proposed – Total Length	54.6	–	–	–	–	–	–	16.8	30.8
	Proposed – Comparison portion for Alts.5A, 5B	25.3	–	–	–	–	–	–	1.9	7.6
	Alternative 5A	33.7	–	–	–	–	–	–	1.8	5.3
	Alternative 5B	44.4	–	–	–	–	–	–	1.8	4.0
	Proposed – Comparison portion for Alt.5C	33.2	–	–	–	–	–	–	0.7	2.1
	Alternative 5C	26.1	–	–	–	–	–	–	26.1	100.0
	Proposed – Comparison portion for Alt.5D	19.4	–	–	–	–	–	–	5.8	29.7
	Alternative 5D	17.5	–	–	–	–	–	–	1.3	7.4
	Proposed – Comparison portion for Alt.5E	5.8	–	–	–	–	–	–	5.4	93.8
	Alternative 5E	5.3	–	–	–	–	–	–	5.3	100.0
6	Proposed – Total Length[3/]	85.3	–	–	–	–	–	–		
7	Proposed – Total Length	118.1	0.5	0.4	0.9	0.8	1.1	0.9	16.5	14.0
	Proposed – Comparison portion for Alts.7A, 7B	35.2	–	–	–	–	–	–	4.3	12.2
	Alternative 7A	38.0	–	–	–	–	–	–	–	–
	Alternative 7B	46.5	–	–	–	–	–	–	–	–
	Proposed – Comparison portion for Alt.7C	20.1	–	–	–	–	–	–	–	–
	Alternative 7C	20.3	–	–	–	–	–	–	–	–
	Proposed – Comparison portion for Alt.7D	6.2	–	–	–	–	–	–	–	–
	Alternative 7D	6.8	–	–	–	–	–	–	–	–

Table 2.4-2. Length and Percentage of Proposed Route and Route Alternatives That Align with West-wide Energy Corridors and Existing Corridors (continued)

Segment	Segment or Alternative	Total Segment Length (miles)	Within WWE Corridor (federal land only)		Within Projected WWE Corridor (includes all land ownership)[1/]		Adjacent to Projected WWE Corridor (within 1/3 mile of WWE Corridor)		Within or Adjacent to Existing Transmission Corridor (includes WWE Corridor and existing T-lines)	
			Length (miles)	% Total Length	Length (miles)	% Total Length	Length (miles)	% Total Length	Length (miles)	% Total Length
	Proposed – Comparison portion for Alt.7E	3.8	–	–	–	–	–	–	–	–
	Alternative 7E	4.5	–	–	–	–	–	–	–	–
	Proposed – Comparison portion for Alt.7F	10.5	–	–	–	–	–	–	–	–
	Alternative 7F	10.8	–	–	–	–	–	–	–	–
	Proposed – Comparison portion for Alt.7G	3.1	0.1	1.9	–	–	0.4	11.4	0.2	6.9
	Alternative 7G	3.2	0.1	1.5	–	–	0.3	10.3	0.2	5.6
	Proposed – Comparison portion for Alts.7H, 7I	118.1	0.5	0.4	0.9	0.8	1.1	0.9	16.5	14.0
	Alternative 7H	127.5	0.5	0.4	1.1	0.9	1.2	1.0	12.2	9.6
	Alternative 7I	173.4	8.3	4.8	3.3	1.9	9.1	5.3	30.0	17.3
	Proposed – Comparison portion 7/9 for Alt.7J[4/]	143.9	5.6	3.9	4.1	2.9	2.0	1.4	24.9	17.3
	Alternative 7J[4/]	202.1	19.7	9.7	13.1	6.5	11.4	5.6	41.6	20.6
8	Proposed – Total Length	131.0	18.8	14.4	19.3	14.7	4.7	3.6	114.5	87.4
	Proposed – Comparison portion for Alt. 8A	51.4	–	–	–	–	0.6	1.1	51.1	99.3
	Alternative 8A	53.6	18.9	35.2	10.7	19.9	9.3	17.3	38.3	71.5
	Proposed – Comparison portion for Alt. 8B	45.3	5.3	11.8	1.2	2.7	2.4	5.2	32.0	70.7
	Alternative 8B	45.8	1.0	2.3	0.6	1.3	1.1	2.3	17.1	37.5
	Proposed – Comparison portion for Alt. 8C	6.5	0.8	13.0	–	0.0	0.5	7.7	2.1	31.8
	Alternative 8C	6.4	1.9	28.9	2.5	38.4	0.5	7.2	5.5	86.2
	Proposed – Comparison portion for Alt. 8D	6.9	–	–	–	–	–	–	6.9	100.0
	Alternative 8D	8.1	–	–	–	–	–	–	6.9	85.7
	Proposed – Comparison portion for Alt. 8E	7.0	–	–	–	–	–	–	3.4	49.2
	Alternative 8E	18.5	–	–	–	–	–	–	11.3	61.1

Table 2.4-2. Length and Percentage of Proposed Route and Route Alternatives That Align with West-wide Energy Corridors and Existing Corridors (continued)

Segment	Segment or Alternative	Total Segment Length (miles)	Within WWE Corridor (federal land only)		Within Projected WWE Corridor (includes all land ownership)[1/]		Adjacent to Projected WWE Corridor (within 1/3 mile of WWE Corridor)		Within or Adjacent to Existing Transmission Corridor (includes WWE Corridor and existing T-lines)	
			Length (miles)	% Total Length	Length (miles)	% Total Length	Length (miles)	% Total Length	Length (miles)	% Total Length
9	Proposed – Total Length	161.7	53.9	33.3	13.9	8.6	10.6	6.5	16.9	10.5
	Proposed – Comparison portion for Alt. 9A	7.8	–	–	–	–	0.4	5.4	0.4	4.6
	Alternative 9A	7.7	–	0.5	–	–	2.3	29.2	2.2	28.2
	Proposed – Comparison portion for Alt. 9B	49.5	3.8	7.8	–	0.0	1.5	3.0	1.0	2.1
	Alternative 9B	53.2	28.2	52.9	15.7	29.5	2.8	5.2	23.3	43.7
	Proposed – Comparison portion for Alt. 9C	14.7	–	–	–	–	–	–	1.0	7.0
	Alternative 9C	15.3	–	–	–	–	3.1	20.5	10.4	67.7
	Proposed – Comparison portion for Alts. 9D–9H	57.2	32.8	57.4	8.5	14.8	7.3	12.8		
	Alternative 9D	58.4	0.4	0.7	–	–	1.1	1.9	31.3	53.6
	Alternative 9E	68.7	0.4	0.6	–	–	1.8	2.6		
	Alternative 9F	62.9	8.4	13.4	3.0	4.8	3.6	5.7	28.6	45.5
	Alternative 9G	56.4	0.4	0.7	–	–	1.0	1.8	26.3	46.6
	Alternative 9H	61.0	8.4	13.8	3.0	4.9	3.5	5.8	23.6	38.8
10	Proposed – Total Length	33.6	11.6	34.5	19.7	58.6	0.4	1.3	28.6	85.32

1/ Mileages are rounded to tenths of a mile throughout table; therefore, rows/columns may not sum exactly.
2/ The WWE Corridor PEIS (DOE and BLM 2008) established energy corridors on federally managed land only. Federally managed lands are often not continuous with intervening privately owned land or lands managed by other public entities. Where the WWE corridor predominates because of great extent of federally managed lands, remaining gaps would be logical projectors of where an energy corridor would be projected to occur.
3/ Line to be energized from 345 kV to 500 kV. New construction only at substation approaches.
4/ Alternative 7J connects with Segment 9 approximately 25.8 miles west of the proposed Cedar Hill Substation, which is the western terminus of Segment 7 and the beginning point for Segment 9. The table above compares 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.
T-line = transmission line

percentage of Proposed Route and Route Alternative segments within the proposed WWE corridor, within the projected WWE corridor (private land segments between WWE corridor segments), adjacent to the WWE corridor, and adjacent to existing transmission corridors.[9]

2.5 SUBSTATION ALTERNATIVES

The Project includes three proposed substations, expansion at one planned substation to be constructed for other purposes, and expansions at eight existing substations. Alternative sites were evaluated for the three proposed substations. Alternative sites were not considered where sites already exist or station locations are planned for other projects and would be in place prior to construction of Gateway West. None of the substation alternatives was studied in detail in the EIS for the reasons presented in Section 2.5.1.

2.5.1 Proposed Substations

2.5.1.1 Creston Substation

Proposed Action

The proposed Creston Substation would be located approximately 4 miles south of Wamsutter, Wyoming, on public land, as shown on Appendix A, Figure A-13. The east side of Wamsutter Crooks Gap Road was chosen because the proposed substation can be located adjacent to the road and the existing transmission line and avoid wetlands, oil and gas wells, and pipelines. There appear to be no constraints that would prohibit construction of the proposed substation at this location. It is the western terminus of Segment 2 (Appendix A, Figure A-3). The new Gateway West 230-kV transmission lines from Aeolus Substation and continuing to the Anticline Substation (Segments 2 and 3) would be terminated within the proposed substation fenced area. Line terminals for additional 230-kV line bays would be added to terminate additional 230-kV lines as required to serve PacifiCorp's electrical load in the Creston area.

A substation "bay" is the physical location within the substation fenced area where high-voltage circuit breakers and associated steel transmission line termination structures, high-voltage switches, bus supports, controls, and other equipment would be installed. The 230-kV circuit breakers, high-voltage switches, bus supports, and transmission line termination structures would be installed for the transmission line.

Approximately 13 acres would be developed within the fenced area of the Creston Substation site to accommodate the required line terminations and associated equipment including 230-kV circuit breakers, high-voltage switches, bus supports, and transmission line termination structures. The 230-kV transmission line termination structures would be approximately 70 feet tall. A control house would be constructed within the fenced area to accommodate the necessary system communications and

[9] A route that falls within federal land mapped as WWE corridor is referred to as "within WWE corridor." A route that falls within non-federal land parcels located between federal land parcels mapped as WWE corridor is referred to as "within projected WWE corridor." A route that does not fall within the WWE corridor or projected WWE corridor but that is located adjacent to the WWE corridor, regardless of land ownership status, is referred to as "parallel to the WWE corridor or projected WWE corridor."

control equipment. The proposed site would be located on BLM-managed land. A new gravel access road of approximately 500 feet would be constructed to the site from the existing road.

Alternative Substations Eliminated from Detailed Study

In the vicinity of the oil and gas load, the Proponents considered the areas east and west of Wamsutter Crooks Gap Road and south of the existing 230-kV line, just west of the Carbon County/Sweetwater County line for the planned Creston Substation. These areas feature localized constraints including large wetland areas, numerous pipelines, and active oil and gas wells. Because of these constraints, these sites were dropped from further consideration.

2.5.1.2 Anticline and Jim Bridger Substations

The proposed Anticline Substation is located about 2.5 miles southeast of the Jim Bridger Power Plant, along the east side of Deadman Draw, approximately 30 miles east of Rock Springs, Wyoming, as shown on Appendix A, Figure A-14. The proposed substation would consist of a new 500-kV yard constructed southeast of the power plant occupying a fenced area of about 125 acres on private land (Appendix A, Figure A-4). Equipment to be installed within the fenced area would include 500-kV and 345-kV circuit breaker bays and associated equipment, bus supports, high-voltage switches, transmission line termination structures, 500-kV transformers, 345-kV phase shifting transformer, 500-kV reactors, 500-kV series capacitors, and a new control building to house communications and control equipment. Access to the new 500-kV yard would require improving about 0.3-mile of existing dirt road to a 20- to 24-foot all-weather surface road between the existing Jim Bridger Power Plant access road and proposed Anticline Substation fenceline, improved highway access approaches, and a UPRR crossing. Within the substation site, approximately 0.4 mile of intermittent stream channel would be realigned to provide site drainage.

The new 500-kV line from Creston, part of Segment 3, and the two new 500-kV lines going to Populus Substation (Segment 4) would connect into the Anticline Substation yard.

The existing Jim Bridger Power Plant has separate 230-kV and 345-kV substation yards located east and west of the plant, respectively (Appendix A, Figure A-15). Each substation would require modifications and interconnecting transmission lines as part of Gateway West.

- The new circuit of the Segment 3 double-circuit transmission line from Creston Substation (Segment 3B, initially operated at 230 kV) would extend on single-circuit structures from the vicinity of the proposed Anticline Substation (but not electrically connect to it) 4.3 miles and terminate at the existing 230-kV yard, which would be modified to accommodate the line termination position. No additional land would be required for construction or operation.
- A 5.5-mile interconnecting 345-kV transmission line between the new Anticline Substation 500-kV yard and the existing Jim Bridger Substation 345-kV yard (Segment 3A) would be required to electrically connect the two substations.

The Jim Bridger 345-kV yard would be expanded by about 10 acres to accommodate the line termination position.

The structure types to be used for the short interconnecting 230-kV and 345-kV lines would be determined during final design and would be either single-circuit steel lattice tower types or H-frame weathering steel similar in appearance to the single-circuit 230-kV and 500-kV structures proposed for other Gateway West line segments.

Alternative Substations Eliminated from Detailed Study

West Alternative Anticline Site

This alternative site is located approximately 3,100 feet southwest of the existing Jim Bridger Substation between an active coal mine to the west, gas wells, and the existing transmission corridor to the north, and an existing pond to the east. It would also be bordered on the northeast, southeast, and southwest by existing natural gas pipelines. Topography is irregular and construction would require substantial grading to create a relatively level site. Also, this site would require a new access road to the Jim Bridger Power Plant access road, a distance of approximately 0.5 mile.

Because of substantial earth work required, the lack of current access, and the numerous site constraints, this site was dropped from further consideration.

North Alternative Anticline Site

This alternative substation site is located on grassland (partially pivot irrigated) about 1.5 miles west of the Jim Bridger Power Plant and north of the existing 345-kV transmission corridor. Topography at the site is sloping to the northeast (less irregular and less steep than West Alternative Site). It is bordered by gas wells to the east, but would have considerable room to the west and north, and an access via an existing gravel road (Wamsutter Road) that connects this site to the power plant site. Development of a substation at this alternative site would require an approximately 2.2 mile-long 345-kV transmission line interconnection with the existing Jim Bridger Substation.

This site has a number of encumbrances on the property and would not be available for substation development. Also, this site would require an additional crossing of the three 345-kV single-circuit lines. For these reasons, this site was dropped from further consideration.

2.5.1.3 Cedar Hill Substation

Proposed Action

The proposed Cedar Hill Substation would be located on public and private land approximately 20 miles southeast of Twin Falls, Idaho, as shown on Appendix A, Figure A-16 as the western terminus of Segment 7. The Cedar Hill Substation would be the interconnection point for three new Gateway 500-kV transmission lines. The three lines include the 500-kV line from the Populus Substation (Segment 7), the 500-kV line from the Hemingway Substation (Segment 9), and the 500-kV line from the Midpoint Substation (Segment 10).

Approximately 45 acres would be developed and fenced (Appendix A, Figure A-15). Each of the transmission line bays would contain high-voltage circuit breakers and switches, bus supports, and control equipment. New 500-kV reactors and 500-kV series capacitors would be installed within the fenced area. Transmission line termination structures, approximately 125 to 135 feet tall, would be installed to terminate the 500-kV conductors. A new control building would be constructed to house the 500-kV communications and control equipment for the proposed Gateway 500-kV transmission lines. Approximately 1,000 feet of new access road would be required between the existing county line road and the substation.

Rogerson Alternate Substation Site

Local landowners propose that the Cedar Hill Substation be located near the point where Alternative 7J would cross an existing 345-kV transmission line and the proposed SWIP (a proposed 500-kV transmission line currently approved for construction, but which has not yet been constructed). This junction would be a move of about 24 miles southwest from its current proposed location at point 9 to point 13 near Rogerson, Idaho (Appendix A, Figure A-9). The Alternative 7J Rogerson Substation layout is shown on Figure A-24 in Appendix A.

Alternative Substation Eliminated from Detailed Study

Southern Cedar Hill Site

A southern alternative site was initially identified by the Proponents early in the Project planning phase, prior to the detailed corridor development and evaluation process. However, the routing of the east-west transmission line routes (Segments 7 and 9) to this site would conflict with a VRM Class II area located immediately to the west. In addition, analyses determined it would require moderate grading to prepare the substation site. This site is on BLM-managed land wholly within a VRM Class II area. A substation at this location would not meet visual quality management objectives stated in the RMP and was dropped from further consideration.

2.5.2 Planned Substations

The Aeolus Substation was already planned prior to the initiation of planning for the Gateway West Project. Because the location of this substation is already planned, no alternative sites were considered. The following describes the location and the modifications proposed as part of the Gateway West Project.

2.5.2.1 Aeolus Substation

The Aeolus Substation site is located in Carbon County approximately 10 miles west of Medicine Bow, Wyoming, on private land as shown in Appendix A, Figure A-17. The substation would be the southern terminus of Segment 1. The Aeolus Substation would be expanded to electrically terminate the two new 230-kV lines (1W[a] and 1E), the reconstructed portion of the Dave Johnston – Rock Springs 230-kV line between the Dave Johnston Power Plant and the planned Aeolus Substation, and the two new transmission lines that would extend west to the Creston and Anticline Substations (Segment 2 and 3). One of the new westerly lines to Creston and Anticline would be initially energized at 230 kV and the other line would be energized at 500 kV. The

addition of these new facilities would increase the size of the Aeolus Substation fenced area by about 90 acres (Appendix A, Figure A-17).

Equipment installed would include 500-kV and 230-kV circuit breakers, high-voltage switches, bus supports, transmission line termination structures, and other equipment for each transmission line. The 500-kV transmission line termination structures are approximately 125 to 135 feet tall. Additional equipment including 500/230-kV transformers and 500-kV shunt reactors (which resemble a transformer in appearance) would be installed. In addition, a Static Var Compensator would be installed for system reliability. This equipment would occupy about 10 to 15 acres within the overall substation fenced area. The planned control house would be expanded and/or a new control house added to accommodate the necessary system communications and control equipment.

The Aeolus Substation 500-kV transformers would have an approximate weight of 600,000 pounds during shipment. They would be transported to the Project vicinity, off loaded to a heavy haul transporter, and then transported over the highway to the Aeolus site. The heavy haul transporter would be approximately 190 feet long, have 35 axles, and weigh 300,000 to 325,000 pounds. Due to the size of the vehicle, a route with minimal grade and large turning radii would be necessary.

Figure 2.5-1 shows access routes to the Aeolus site. The site is located nearest to CR 121. CR 121 is approached by way of U.S. Highway 30 from one of two directions: one

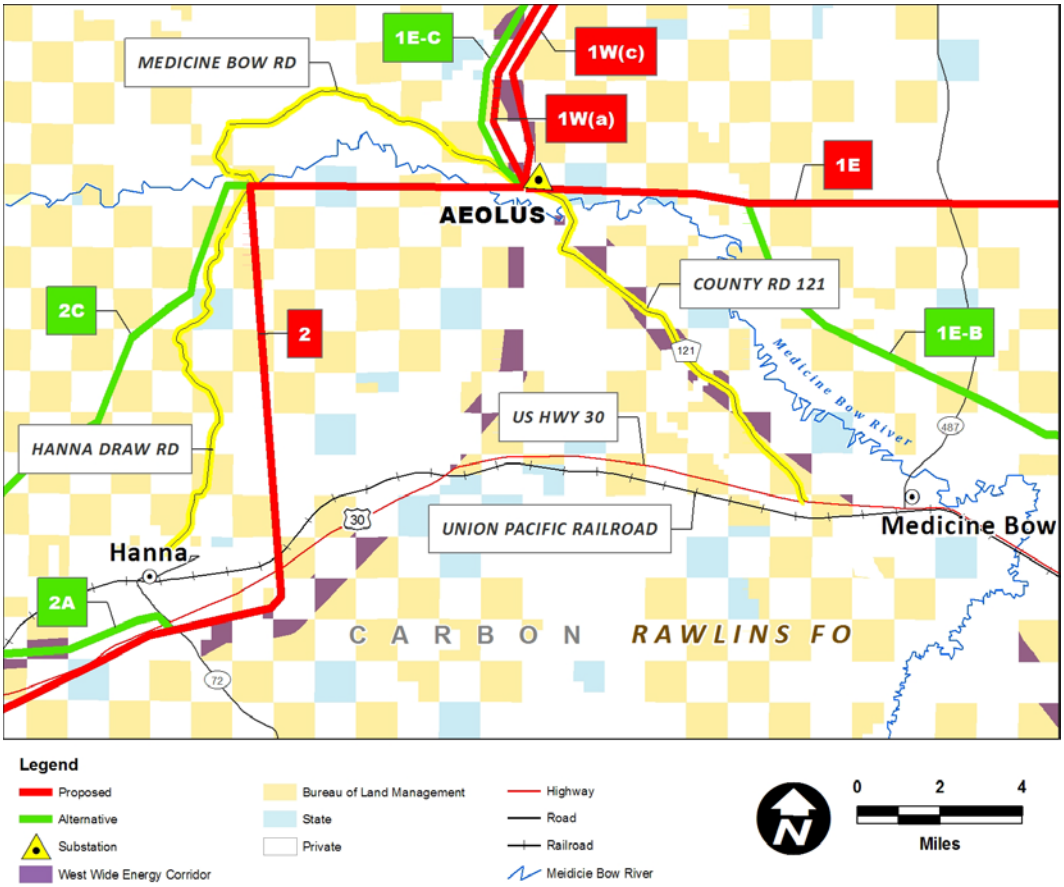


Figure 2.5-1. Proposed Access to Aeolus Substation

route from Hanna and a second from Medicine Bow. The Proponents selected the route from Medicine Bow for use in transporting heavy equipment to the substation site because it is the shortest distance (12 miles) from a rail loading facility and because it avoids sharper curves and steeper grades on the road from Hanna. While both routes have bridge river crossings that would need upgrades, the route from Hanna also has two stream crossings that would need to be upgraded. Due to the need for constant access to the substation site, Carbon County has also indicated a preference for the route from Medicine Bow because they would continue to maintain the roadway into the future.

CR 121 Improvements

Existing Conditions: CR 121 is currently a single-lane road, about 20 feet wide and about 11 miles long, from SR 30 to the Aeolus Substation. It is in poor condition with a thin layer of gravel over a clay base and without turnouts. It includes a single-lane bridge over the Medicine Bow River built in 1914 and refurbished with a metal deck around 1972 (see Figure 2.5-2). The bridge was recently inspected by the Wyoming Department of Transportation and found to be in poor structural condition. Its current weight limitations include a 10-ton weight limit for single axle trucks and 13-ton limit for multiple axle trucks, which would not accommodate the heavy haul transporters.

Figure 2.5-2. Looking Westerly Toward the Existing CR 121 Bridge

Needed Improvements: CR 121 would be reconstructed from SR 30 to the immediate vicinity of the Aeolus Substation. Reconstruction would result in approximately 64 acres of construction disturbance and 33 acres of new permanent roadway. Reconstruction includes:

- Realignment of the roadway to improve negotiability, visibility, and safety;

- Addition of turnouts, expanding the roadway to 30 feet wide for up to 100 feet along the roadway every mile or where existing terrain and alignment would not accommodate the heavy haul transporter or sight distances are inadequate;
- Improved roadway, likely to include subgrade improvement and application of a geotextile fabric covered by 6 to 8 inches of compacted aggregate base;
- Inspection of all culverts for adequacy and replacement of up to 16;
- Inspection of all cattle guards for adequacy and replacement of up to 6;
- Replacement of the bridge with one that would meet Wyoming Department of Transportation standards for HS-20 loading[10]. Based on preliminary engineering, the new bridge would require an approximate span of 125 to 150 feet and a 24-foot travelway width. The new bridge would be installed just downstream (south) of the existing bridge; and
- After the new bridge is completed, removal of the old bridge and its approaches.

Prior to conducting any work, the existing bridge would be evaluated for eligibility for listing on the NRHP and any required mitigation, including photographic recordation, would be completed.

2.5.3 Existing Substations

The substations described in this section are already operational. Alternative locations for these substations were not considered. Expansion of the 345-kV Jim Bridger Substation is described in conjunction with the proposed Anticline Substation (Section 2.5.1.2). The following describes their locations and the modifications proposed as part of the Gateway West Project.

2.5.3.1 Windstar Substation

The Windstar Substation now under construction for another project is located on private lands approximately 3.5 miles east of Glenrock, Wyoming, and approximately 1 mile north of the Dave Johnston Power Plant (Appendix A, Figure A-2).

For the Gateway West Project, two new 230-kV line bays would be added to the Windstar Substation to electrically terminate the two new transmission lines from the Aeolus Substation (Segments 1E and 1W[a]). The substation fenced area would be expanded by about 10 acres (Appendix A, Figure A-18).

The control house would be expanded and/or added to accommodate the necessary system communications and control equipment. The existing access road would be used to reach the site.

2.5.3.2 Heward Substation

The Heward Substation would be an expansion of the existing Difficulty Substation, which is located about 45 miles from Bessemer Bend and approximately 34 miles north

[10] Loading is either H-20 or HS-20 based on an axle load of 32 kilo-pounds (kips). This load is divided by the number of tires on each axle.

of Medicine Bow, Wyoming, as shown on Appendix A, Figure A-19. The Heward expansion would add a new 230-kV yard to the west and immediately adjacent to the existing substation fenced area. The substation expansion would be required because the existing 230-kV bus and other equipment within the Difficulty Substation is under-rated for accommodating the additional electrical capacity that would be added by rebuilding and reconductoring a portion of the existing Dave Johnston – Rock Springs 230-kV line between the Dave Johnston Power Plant and the planned Aeolus Substation (Proposed Route 1W(c)). Adding the new 230-kV yard would increase the flow through capacity of the Difficulty 230-kV bus and also facilitate maintaining power to Difficulty Substation customers during construction.

The new substation 230-kV yard to be developed and fenced would encompass approximately 5 acres. The new 230-kV yard would include three 230-kV circuit breakers, high-voltage switches, bus supports, and transmission line termination structures. The 230-kV transmission line termination structures would be approximately 70 feet tall. A new control house would be constructed within the fenced area to accommodate the necessary system communications and control equipment in the new 230-kV yard. The 230-kV bus would be extended to interconnect to the existing Difficulty Substation 230-kV bus. The existing Difficulty Substation access road would be utilized on the current alignment and state highway entrance. Approximately 500 feet of additional roadway would be developed adjacent to the northern substation fence line to provide alternative equipment access to the Difficulty Substation. The rebuilt Dave Johnston – Heward and Heward – Aeolus 230-kV lines would enter and exit the new substation yard from the north and south as shown in Appendix A, Figure A-19.

2.5.3.3 Populus Substation

The existing Populus Substation (Figure A-20), located near the town of Downey, Idaho, would be expanded by about 80 acres on private land to accommodate the addition of the Gateway West 500-kV transmission lines (Appendix A, Figure A-7). A new 500-kV yard would be constructed in the expansion area north of the existing 345-kV substation yard and interconnected to the then-existing 345-kV station equipment through a new 500/345-kV transformer bank (Appendix A, Figure 20). Five hundred-kV transmission line bays would be installed for connection to the transformer bank and the termination of the four 500-kV line positions for lines to Anticline Substation (Segment 4), Borah Substation (Segment 5), and Cedar Hill Substation (Segment 7).

Each of the transformer and line bays would contain high-voltage circuit breakers and switches, bus supports, and control equipment. A new 500/345-kV transformer bank, 500-kV reactors, and 500-kV series capacitors and 500-kV shunt capacitors would be installed within the fenced area. Transmission line termination structures, approximately 125 to 135 feet tall, would be installed to physically terminate the 500-kV conductors. A new control building would be constructed to house the 500-kV communications and control equipment. The existing access road would be used to reach the site.

2.5.3.4 Borah Substation

The existing Borah Substation is located near American Falls, Idaho. Expansion of the existing substation would require expansion of the fenced area by approximately 35 acres on private land to accommodate the new 500-kV facilities (Appendix A, Figure A-8). The existing Midpoint – Kinport 345-kV line, which currently bypasses the Borah Substation, would be reconnected into an existing 345-kV line bay at this substation and the remaining line segment to Midpoint Substation (Segment 6 – upgrade to 500 kV) and the 500-kV line from Populus Substation (Segment 5) would terminate in the new expansion area. The new 500-kV facilities would be connected to the existing station by the addition of a 500/345-kV transformer bank (Appendix A, Figure A-21).

Each of the transformer and line bays would contain high-voltage circuit breakers and switches, bus supports, and control equipment. The new 500/345-kV transformer bank, 500-kV reactors, and 500-kV series capacitors would be installed within the fenced area. Transmission line termination structures, approximately 125 to 135 feet tall, would be installed to physically terminate the 500-kV conductors. The existing control building would be enlarged and/or a new control building would be added to house the new 500-kV communications and control equipment. The existing access road would be used to reach the site.

2.5.3.5 Midpoint Substation

The existing Midpoint Substation is approximately 9 miles south of Shoshone, Idaho, on Highway 93 (Appendix A, Figure A-10). The Midpoint Substation would be expanded by 40 acres on private land to accommodate the new Gateway West 500-kV lines. The three 500-kV transmission lines from Hemingway Substation (Segment 8), Cedar Hill Substation (Segment 10), and Borah Substation (Segment 6) would terminate in the expansion area (Appendix A, Figure A-22).

Each of the transmission line bays would contain high-voltage circuit breakers and switches, bus supports, and control equipment. New 500-kV reactors and 500-kV series capacitors would be installed within the fenced area. Transmission line termination structures, approximately 125 to 135 feet tall, would be installed to physically terminate the 500-kV conductors. The existing control building would be enlarged and/or a new control building would be added to house the 500-kV communications and control equipment for the new Gateway West 500-kV transmission lines. The existing access road would be used to reach the site.

2.5.3.6 Hemingway Substation

The existing Hemingway Substation is located approximately 30 miles southwest of Boise, Idaho, just off of Highway 78 near Wilson Creek Cemetery, shown on Appendix A, Figure A-10 as the western terminus of Segment 8.

The Hemingway Substation has sufficient space planned within the existing fenced area to accommodate the two new 500-kV transmission line bays for Gateway West (Appendix A, Figure A-23). One bay would be for the 500-kV line from the Midpoint Substation (Segment 8) and one for the 500-kV line from the Cedar Hill Substation

(Segment 9). Each of the transmission line bays would contain high-voltage circuit breakers and switches, bus supports, and control equipment.

New 500-kV reactors and 500-kV series capacitors would be installed within the fenced area. Transmission line termination structures, approximately 125 to 135 feet tall, would be installed to physically terminate the 500-kV conductors. The communications and control equipment for the Gateway 500-kV transmission lines would be housed within the existing control building. The existing access road would be used to reach the site.

2.6 DESIGN ALTERNATIVES

The Proponents considered a range of alternative overhead structure designs, structure finish and surface treatment materials and finishes, and underground technologies prior to selecting the proposed design.

2.6.1 Proposed Structure Design

During the initial study phase of the Project, the Proponents considered a number of different steel structure types for the Project. The structure types to be considered for the Project were selected based on the Proponents' experience to date with their existing 230-kV, 345-kV, and 500-kV transmission systems; industry experience; and the Proponents' current design standards for 500-kV systems.

The Proposed Action for each of the segments, as summarized in Section 2.1, includes a brief description of the proposed structures to be used. Appendix B, Section 1.1, provides further details of each structure type. The Proponents propose H-frame steel structures (Appendix B, Figure B-1) for the 230-kV segments of the Project. They propose either single-circuit (Appendix B, Figure B-2) or double-circuit (Appendix B, Figure B-3) steel lattice structures for the 500-kV segments. The Proponents report that the steel lattice configuration is the least cost option for the 500-kV segments.

Table 2.6-1 summarizes the structure types proposed by the Proponents by segment. Details for each of these structure types, including descriptions, illustrations, and comparative tables, can be found in Appendix B.

Table 2.6-1. Proposed Structures by Segment

Segment	Circuits and Voltage	Proposed Structure Type
1E	New Single-Circuit 230-kV	Steel H-frame
1W(a)	New Single-Circuit 230-kV	Steel H-frame
1W(c)	Reconstructed Existing Single-Circuit 230-kV	Replace existing wooden H-frame with steel H-frame
2	New Double-Circuit 500-kV	Double-circuit 500-kV steel lattice tower
3	New Double-Circuit 500-kV	Double-circuit 500-kV steel lattice tower
4	New Double-Circuit 500-kV	Double-circuit 500-kV steel lattice tower
5	New Single-Circuit 500-kV	Single-circuit 500-kV steel lattice tower
6	Re-Energize existing 345-kV line to 500-kV	Approximately five structures approaching each substation to be replaced with single-circuit 500-kV lattice towers; no tower replacement elsewhere
7	New Single-Circuit 500-kV	Single-circuit 500-kV steel lattice tower
8	New Single-Circuit 500-kV	Single-circuit 500-kV steel lattice tower
9	New Single-Circuit 500-kV	Single-circuit 500-kV steel lattice tower
10	New Single-Circuit 500-kV	Single-circuit 500-kV steel lattice tower

2.6.2 Structure Design Alternatives

A comparison of various structure types is shown in Table 2.6-2. Appendix B, Figures B-1 through B-7 illustrate the different structure types considered and not considered.

2.6.2.1 Double-Circuit 500-kV Structures

Vertical Steel Lattice

The proposed double-circuit 500-kV structures use a horizontal delta configuration to reduce height. For the vertical steel lattice tower, one circuit of three phases is installed on each side of the tower in a vertical configuration. While the vertical configuration is lower in cost for some projects, the average height of the vertical configuration tower would have to be over 200 feet for the Gateway West Project to satisfy the Proponents required phase to phase spacing for live-line maintenance activities. Federal Aviation Administration regulations require structures over 200 feet in height to be lighted (USDOT 2000). Lighting these structures, in addition to the human and wildlife impacts, would also substantially increase costs, because each tower light must be supplied with low-voltage electricity, requiring additional distribution lines to supply the lighting. Lights would have to be maintained and replaced, further adding to increased access to the ROW including maintenance disturbances and costs.

The Proponents considered reducing the height of the vertical steel lattice to avoid the need for lighting. However, to maintain required phase-to-phase and phase-to-ground clearances for live-line maintenance activities, additional towers would be needed because span lengths would have to be shortened, adding to the cost of the vertical steel lattice tower alternative. The vertical steel lattice configuration is therefore not carried forward for detailed analysis, because it has the disadvantage and cost impact of requiring lighting of each structure, and has the potential for an increased number of towers per mile to avoid lighting.

Tubular H-Frame

The double-circuit 500-kV tubular H-frame horizontal configurations represent the highest unit costs and have higher construction impacts than those of lattice towers. While the lattice structures are designed with four widely-spaced feet to provide lateral stability against the weight of the conductor and adverse environmental conditions, including high winds and ice storms, tubular H-frame structures have deeper and wider diameter foundations, which require more concrete per structure to provide the same lateral stability. The structures also weigh more than the lattice structures, requiring larger cranes for their installation and wider roads with greater surface stability.

Table 2.6-2. Alternative 500-kV Conductor Support Structure Comparison

Single- or Double-Circuit Design	Single-Circuit Towers				Double-Circuit Towers			
Tower Material	Lattice Steel	Lattice Steel	Tubular Steel	Tubular Steel	Lattice Steel	Lattice Steel	Tubular Steel	Tubular Steel
Tower Finish	Dulled Galvanized	Dulled Galvanized	Weathering Steel	Weathering Steel	Dulled Galvanized	Dulled Galvanized	Weathering Steel	Weathering Steel
Tower Type - Tangent	Guyed Delta [1/]	Four-legged	H-Frame	Single Pole	Four-legged	Four-legged	Horizontal H-Frame	Delta H-Frame
Conductor Configuration	Delta	Delta	Horizontal	Delta	Vertical	Delta	Delta	Horizontal
Average Tower Height - Feet	156	156	133	165	205	170	165	165
Proposed ROW Width - Feet	250	250	250	250	300	300	300	300
Average Span - Feet	1,200 – 1,300	1,200 – 1,300	1,200 – 1,300	1,200 – 1,300	1,200 – 1,300	1,200 – 1,300	1,200 – 1,300	1,200 – 1,300
Approximate Tangent Tower Weight - Pounds.	29,700	45,660	56,500	60,000	55,000	82,237	101,300	111,000
Foundation Type	Bearing Pad & Screw Anchors for Guys	Drilled Pier	Drilled Pier	Drilled Pier	Drilled Pier	Drilled Pier	Drilled Pier	Drilled Pier
Typical Foundation Diameter - Feet	1.2	4	7	9	5	5	8.5	8.5
Typical Foundation Depth - Feet	4 feet for Pad 10 – 20 feet for Guy Anchors	22	25	35	30	26	30	32
Number of Foundations	1 for Mast & 4 for Guy Anchors	4	2	1	4	4	2	2
Construction Methods	Crane Helicopter	Crane Helicopter	Crane Helicopter	Crane	Crane	Crane	Crane	Crane
Cost	Lower	Lower	High	Highest	Lower	Mid-Range	High	Highest
Comments	Guyed "V" structure would be 25' lower and approx 4600 lbs lighter	Smaller foundations can be dug with smaller drill rig	Large Foundation sizes require larger drilling rig	Large Foundation sizes require larger drilling rig	Most towers would require lighting	Smaller foundations can be dug with smaller drill rig	Very large foundations and weight increase construction costs	Tower configuration makes live line work difficult to the upper center phase
Conclusions	Carried forward for use under certain conditions	Proposed Single-Circuit Structure	Carried forward as mitigation only	Not carried forward for detailed analysis	Not carried forward for detailed analysis	Proposed Double-Circuit Structure	Not carried forward for detailed analysis	Not carried forward for detailed analysis

1/ A guyed "V" structure is also a feasible structure type with many of the same characteristics as the guyed "Delta."

Note: Structure heights, weights, foundation depths and diameters are either taken from Proponents' engineering vendor's analysis for 500-kV structures, from Society of American Engineer's bid drawings, or estimated from preliminary calculations and/or experience. These values are representative of what might be expected as the result of detailed design and are based on comparisons with other projects and the Mona-Oquirrh design criteria memorandum received from PacifiCorp. Designed values would be expected to vary from these values.

Once these transmission lines are in service, any needed maintenance must be conducted while the line is “hot” or energized. This presents danger to the line workers and requires careful measures to ensure their safety. Because of the horizontal configuration of the electrical phase conductors, the center phase on the upper circuit cannot practically be accessed with the lines energized. As a result, the horizontal H-frame double-circuit structure alternative is not feasible when energized line maintenance capability is required. Horizontal double-circuit structures were therefore not carried forward to detailed analysis.

The other double-circuit 500-kV H-frame configuration considered was a delta configuration. Although the H-frame delta structure configuration can technically be maintained with the system energized, its additional foundation and crane requirements present a larger environmental impact than equivalent lattice structures. Because it offers no clear advantage over the proposed lattice structures and is more expensive, the H-frame delta configuration is not carried forward into detailed analysis.

2.6.2.2 Single-Circuit 230- kV Structures

Lattice

The Proponents considered steel lattice towers where 230-kV line configurations are needed. Unlike the 500-kV configuration, lattice towers do not offer the same advantages over the H-frame configuration at the 230-kV voltage level. Smaller towers can be used at 230 kV than at 500 kV due to the reduced conductor to tower and conductor to ground spacing requirements. Because of the smaller size of the structures, it is feasible to design and construct H-frame structures at a lower cost than for lattice towers. Further, the H-frame structures provide advantages in controlling perching opportunities for raptors, crows, and ravens and were therefore proposed by the Proponents. Because there is no economic or environmental advantage to using lattice towers, only the H-frame structure was carried forward for detailed analysis.

2.6.2.3 Single-Circuit 500 – kV Structures

Table 2.1-6 provides a description and comparison of the proposed single-circuit lattice and guyed structures.

Tubular Single-Pole

Tubular single-pole tangent structures are self-supporting but angles and corners typically require guyed structures. While H-frames can achieve lateral stability against the weight of the conductor and ice and wind conditions by virtue of the braced H-frame design, single-pole structures require deeper foundations and heavier steel poles to provide the same lateral stability, because each pole must be designed to independently withstand operational and ice and wind loads. Single-pole structures are more expensive to purchase and install, offer no technical or operational advantage over the proposed H-frame structure and were therefore not carried into detailed analysis.

Single-Circuit Tubular H-Frame Design Considered for Detailed Study

The single-circuit 500-kV steel pole H-frame structure is more expensive than the lattice tower alternative. Table 2.6-3 compares the single-circuit lattice steel tower and single-circuit steel pole H-frame ROW configurations for several factors. The Proponents do not wish to propose this alternative as a Project-wide option, but propose that, where needed for mitigation, the H-frame tangent configuration for single-circuit 500 kV is feasible. Therefore, this alternative is carried forward for consideration as a mitigation measure where the use of lattice towers presents an adverse impact to the environment.

The Proponents consider the use of H-frames feasible for use as tangent (in-line structures) but not feasible for angle or dead-end structures for tangent use.

Table 2.6-3. Summary/Comparison of Single-Circuit 500-kV Lattice Tower vs. Tubular Steel H-frame

Topic	Single-Circuit 500-kV Lattice Steel Tower (LST)	Single-Circuit 500-kV Tubular Steel Pole (TSP) H-Frame	Comments
Tangent Tower Type	S5A (delta configuration)	H-frame (horizontal configuration)	Delta is the Proponents' preferred electrical configuration.
Tower Finish	Dull Galvanized	Weathering Steel	
Typical Tower Height	156 feet	133 feet	S5A tower is on average 23 feet taller than an H-frame structure.
Typical Tangent Tower Weight	45,660 lbs	56,500 pounds	
ROW Width	250 feet		
Average Span	Approximately 1,200 – 1,300 feet	Approximately 1,200 – 1,300 feet	
Maximum Span within ROW	2,800 feet	2,400 feet	For the same ROW width, the max span is less for an H-frame structure due to the larger spacing between outside phases.
Short-term Ground Disturbance	All short-term ground disturbances associated with construction would be approximately equal for LST and TSP H-frame construction.		
Long-term Ground Disturbance	Long-term disturbance = 50 feet (ROW Width) x 50 feet = 2,500 square feet (0.06 acre) A construction pad with level terrain is necessary at each tower location so that live-line maintenance can be performed on the structures. This is the case for both LST and TSP H-frame construction.		
Actual Footprint	46 feet x 41 feet per tower (1,886 square feet = 0.043 acre)	10 feet x 45 feet per tower (450 square feet = 0.010 acre)	
Foundation Sizes	Four 4-foot x 22-foot drilled pier foundations	Two 7-foot x 25-foot drilled pier foundations	
Foundation Volume	41.0 cubic yards per tower	71.3 cubic yards per structure	
Constructability	Cranes and/or Helicopter		Helicopter construction not as efficient/effective with TSP H-frame structures.

Table 2.6-3. Summary/Comparison of Single-Circuit 500-kV Lattice Tower vs. Tubular Steel H-frame (continued)

Topic	Single-Circuit 500-kV Lattice Steel Tower (LST)	Single-Circuit 500-kV Tubular Steel Pole (TSP) H-Frame	Comments
Maintenance Activities	Live-line maintenance - similar. Helicopter maintenance - similar.		
Estimated Costs(excluding ROW costs)	Approximately 5-15% less than TSP H-frame.		
Visual Appearance	An LST is on average 23 feet taller than the TSP H-frame. However, one can see through the framework of an LST.		
Perching	The TSP has fewer and larger structural members than the LST resulting in fewer perching opportunities.		

2.6.3 Structure Finish and Surface Treatment Alternatives

The proposed surface finish for the single- and double-circuit lattice steel towers is a galvanized finish, treated after the initial galvanizing process to produce a dulled finish to reduce surface reflectivity. This process results in an installed tower with more visual absorption and thus allows the towers to blend in better with the terrain, while at the same time preserving the corrosion resistant properties of the galvanized coating on the steel. The 500-kV transmission line lattice steel towers would be specified to have a dull galvanized finish. There are two other steel finishes that are used in the industry on transmission line structures, including painting and the use of weathering steel as a material for tower fabrication.

2.6.3.1 Painting

Painting of the lattice tower structures is not proposed and is considered operationally and economically infeasible by the Proponents for several reasons:

- Unlike a galvanized surface, which would provide corrosion protection and preserve the surface appearance of the steel for decades, a painted surface would require repainting several times during the life of the Project to maintain the painted surface and the desired appearance. The need to keep up with the painting of the structures would create an added expense during operation and maintenance of the transmission lines.
- The 500-kV transmission line circuit would have to be de-energized to repaint each of the structures. Given the importance of the Gateway West 500-kV transmission lines to the reliable operation of the western United States transmission grid, taking the circuits out of service for painting would not be feasible from either a transmission operations or economic perspective.
- While the need to paint the structures would add cost, the need to de-energize the circuits during painting would result in much greater added costs for replacement transmission or energy if a circuit were taken out of service. Operational experience over the last several decades has shown that because of the importance of these 500-kV bulk power lines to the system, an outage of a

circuit is difficult to schedule, and even then there are only very short windows (days) in the spring and fall when an outage is possible.

2.6.3.2 Weathering Steel

Weathering steel, proposed for all H-frame structures, is a group of steel alloys that were developed to eliminate the need for painting. This type of steel alloy forms a stable rust-like appearance if exposed to the weather for several years. This is because during the wetting and drying cycles due to weather, it rusts and forms a protective layer on its surface. This layer protects the surface of the steel, prevents further rusting, and the layer develops and regenerates continuously when subjected to the influence of the weather. Weathering steel is commonly used by the Proponents, and throughout the industry, when tubular steel structures are specified for transmission lines.

The use of weathering steel for lattice towers is not practical, nor is it recommended. Lattice towers are composed of many members of various sizes of steel angles, bolted together in a latticework to form the tower. The bolts holding the members together are torqued to a specific tightness during construction. The tightness of each of the bolted connections on the tower is essential to maintain the rigidity and strength of the tower. With a galvanized steel surface, the surface does not degrade and so the bolts stay tight and the integrity of the tower is maintained. On the other hand, attempts to use weathering steel on lattice towers have demonstrated a phenomena now known as “pack-out.” Pack-out occurs when the weathering steel under the bolt head or washer rusts and expands to form the protective layer during the weather cycles. Pack-out has the effect of loosening or breaking the bolted connections on the tower, thus compromising the towers rigidity and structural integrity, which is why weathering steel is not used for lattice transmission structures.

2.6.4 Underground Alternatives

Several scoping comments were received requesting consideration for installing the transmission lines underground. In theory, burying transmission lines would eliminate many of the visual impacts of these lines and would reduce the susceptibility of the system to weather and fire hazards. In response to the request, the BLM requested that the Proponents provide a data response on the existing technology and the engineering feasibility of underground technology applicability to the Project. This section is based upon their response.

While underground systems are relatively immune to weather conditions in comparison to overhead lines, they are vulnerable to washouts, seismic activity, and inadvertent excavation, all resulting in extensive and time-consuming repairs. From a visual perspective, reactive compensation stations, similar to a substation in appearance, would be required every 7 to 20 miles depending on the voltage level, terrain, and cable technology for 230-kV and 500-kV underground lines. Combined with the typical open-cut trench excavation required for the entire length of the transmission line route, the visual impacts would be noticeable, although substantially less than an overhead line.

The Proponents report that while recent research is developing new techniques for manufacturing, design, construction, and maintenance of underground transmission lines, there are several important issues that make the technology for extra high voltage transmission lines impractical for long length installations as described below:

- Cost—One major reason that utilities do not normally install extra high voltage transmission lines underground is that the construction costs are increased by 12 to 17 times over an overhead counterpart (National Grid 2009). These additional costs must be approved by the public utilities commission and are passed on to all the ratepayers, not just those near the area of underground installation.
- Reliability—While underground systems comparatively have fewer forced outages than overhead lines, damage to the cable or components often results in longer outage durations. When a failure does occur, overhead lines can be quickly visually inspected and repaired. In contrast, underground line cable failures cannot be visually diagnosed. The cable system must be tested with specialized equipment to locate the damaged sections of the cable. Upon locating the faulty component or cable, specially trained workmen must be mobilized to repair or replace the failed components or cable resulting in potential outages of weeks or months; depending on the type of failure to be repaired and the availability of replacement materials.
- Reactive Power Compensation—The capacitive characteristics of the underground cable insulating material and the close proximity of the cables to one another results in the cable system introducing high capacitive reactive loads onto the electrical system. These capacitive reactive loads would have to be offset with inductive compensation at above ground compensation stations located every 7 to 20 miles along the transmission line route. A further consideration is that the electrical system as a whole may or may not be capable of reliably accommodating these large reactive power loads, making the integration of long underground AC powerlines into the overall power grid questionable or infeasible.
- Environmental—While access road requirements are similar for both underground and overhead lines, underground transmission lines require a continuous excavation through all habitat types. This is in contrast to overhead lines, which result in a disturbance only at the structure locations. Furthermore, the potential for fluid leaks and pipe corrosion creates additional environmental concerns, much like pipelines.

2.6.4.1 Underground Technologies

For both 230-kV and 500-kV AC underground transmission lines, a number of cable technologies exist. While some have long running track records of high reliability, others are relatively new and untested. At the 500-kV voltage level, only a few underground installations exist, namely in Japan and China. Within the U.S., 500-kV underground installations are limited to test sections, while 230-kV systems have been utilized in urban environments for a number of years. Alberta Electric Systems Operations is conducting a Feasibility Study to place approximately 12 miles underground on the Heartland Transmission Project (AESO 2010).

There are four basic technologies to consider for both 230-kV and 500-kV AC underground circuits:

- Solid Dielectric (Cross-Linked Polyethylene [XLPE]);
- Gas Insulated transmission Line (GIL);
- Pipe-type (High Pressure Fluid-Filled [HPFF]); and
- Self-Contained Fluid Filled (SCFF); and
- Superconducting Cables.

Solid Dielectric Cable—Considered only for distances of up to a few miles at the 500-kV voltage level, solid dielectric insulation or XLPE cable construction has been used only in special situations. While the technology is progressively emerging, lack of practical experience results in major reliability concerns for operating larger scale 500-kV underground systems. At the 230-kV voltage level, solid dielectric cables have been selected for numerous cable installations both in the U.S. and worldwide. This cable technology has the benefits of a simplified installation method, in turn reducing operations and maintenance costs compared to other cable systems, while maintaining a high level of reliability.

Gas Insulated Transmission Line—GIL technology at the 230-kV and 500-kV voltage levels has been implemented primarily within substations and not for longer transmission lines. GIL has been incorporated into substation designs with the length typically limited to distances less than 1,000 feet. However, the high cost and lack of experience with longer underground transmission lines, as well as questions of reliability, are more of a concern than with the other more prominent cable technologies.

High Pressure Fluid-Filled Cable—HPFF cable systems are a pipe-type system in which three single-phase cables are located within a single steel pipe. HPFF cables use Kraft paper insulation or a laminated polypropylene paper insulation that is impregnated with dielectric fluid to minimize the insulation breakdown under electrical stress. Since the system requires a continuous high pressure, pumping plants are required every 7 to 10 miles along the route, assuming relatively flat topography. The pumping plants are responsible for maintaining a constant pressure on the system, but must have large reserve tanks to facilitate the expansion and contraction of the dielectric fluid as the system undergoes thermal cycling. To maintain an operable pipe-type system, cathodic protection must be applied to the cable pipes to mitigate corrosion. This in turn helps prevent fluid leaks, which pose both an operational and an environmental concern. Using an HPFF system does provide high reliability but it also requires additional equipment, resulting in additional opportunity for component failure, while specially trained personnel are required to maintain these systems. Industry sponsored testing has proven that this technology can operate at the 500-kV voltage level; however, there are no 500-kV HPFF pipe-type systems currently installed within the U.S. and few installations can be found throughout the world. That being said, of the available cable technologies, an HPFF cable system may be considered the most logical for a 500-kV system.

Self-Contained Fluid Filled Cable—SCFF cable systems are similar to the HPFF systems. The cable is typically constructed around a hollow tube, used for fluid circulation, and uses the same Kraft paper or laminated polypropylene paper insulation materials. Because the fluid system is "self-contained," the volume of fluid required is less; however, the same distribution of pumping plants would be required. While SCFF cable systems have the longest running history at the extra high voltage levels, their use is typically restrained to long submarine cable installations. This technology has been implemented on inland applications with high reliability at both the 230-kV and 500-kV voltage levels.

HPFF Pipe Installation

Superconducting Cables—Research is currently underway in the advancement of high-temperature superconductors. Utilizing a unique cable design where all three phases are centered concentrically on a single core, the cables are capable of displaying low electric losses with the same power transfer capabilities as a standard non-superconducting cable. The core, filled with a cryogenic fluid, supercools the conducting material resulting in extremely low losses and high electrical power transfer capacities. Most high temperature superconductor systems are located adjacent to large metropolitan areas, where they are capable of transferring large quantities of power a few thousand feet, at the distribution level. However, technological advances in the last few years have seen the first 138-kV AC system installed in Long Island, New York, in early 2008. Because high-temperature superconductor systems have neither been established at the 230-kV or 500-kV voltage levels nor over long distances, superconducting cable would not be a technology option to consider for the Gateway West Project.

High Temperature Superconductor AC Cable Design

Design of Cable Systems

The following are key considerations for underground transmission line design for both 230-kV and 500-kV cable systems:

- Both 230-kV and 500-kV cable systems would consist of multiple cables per phase to achieve the target power transfer requirements and to provide redundancy in the case of a cable failure.
- Concrete encased duct banks would be installed at a minimum cover depth of 3-feet, or as required by routing design, and would be backfilled with specially engineered thermally favorable backfill to assist in heat dissipation.
- To obtain further redundancy, multiple duct banks per circuit can be utilized to minimize common mode failures of the cable installation.
- Depending upon installation location, a permanent access road approximately 14-feet wide may be required to perform operation and maintenance procedures.
- The total construction surface impact of the underground cable system is at a minimum approximately 30 feet, and includes any permanent access roads.
- Splicing of the cable would be required approximately every 1,500 to 2,000 feet. Splicing would be performed inside large underground vault structures. Vault dimensions would be approximately 12 feet wide by 28 to 40 feet long by 8 to 9-feet deep depending upon the cable manufacturer splice and cable racking requirements.
- Depending on the terrain characteristics, burial depths may need to be increased to avoid heating the soil and changing the conditions of the vegetation and wildlife habitat above the duct bank or pipe type cables.
- Underground to overhead transition stations would be required at each end of the underground transmission line, and at each intermediate reactive compensation and pumping stations. Requiring 2 to 4 acres, each site would consist of pedestal-type termination structures, reactors (similar to a large power transformer in appearance), and pumping plants, dependent upon cable system. In addition to these structures, A-frame dead-end structures, approximately 80 feet tall, would be required at each end of the system.
- Underground to overhead transitions at the 230-kV level can be accomplished with a single steel structure design if a solid dielectric cable system is implemented.
- Pumping plants would be required every 7 to 10 miles along the route, for either HPFF or SCFF cable systems.
- Reactive compensation would be required every 7 to 20 miles along the route to offset the capacitive reactance of the cable system, depending on the cable technology employed and electrical system requirements.

Reliability and Maintenance

Long-term reliability of underground cable systems is a major concern. While 230-kV underground lines have been used extensively, 500-kV lines are largely an unproven

technology, as they have been implemented in a limited number of circumstances. In conjunction with their limited use, all installations to date have been relatively short compared to the Gateway West Project, raising concern about the reliability of an extensive cross-country cable system. A catastrophic failure of any portion of the system—underground cable, splices, terminations, or fluid systems—could result in the cable system being inoperable and out of service.

Basic maintenance of the aforementioned cable systems consists of a thorough yearly inspection, while any fluid systems must be inspected and tested monthly. Inspections include all terminations and splices, all bonding systems, as well as all valves, gauges, switches, and alarms within the pumping plant. Cathodic protection systems are monitored as an ongoing process.

2.6.4.2 Construction Process

For both the 230-kV and 500-kV voltage levels, the installation of underground transmission lines uses similar techniques. Large open trench installation or the more costly trenchless technologies are utilized to place the cables underground. Construction includes, but may not be limited to clearing of the ROW, trenching, installation of duct banks or pipe networks, installation of vaults, cable splicing and terminating, and termination structure construction.

Trenching—Generally the most common technique for placing underground lines, open cut trenching utilizes a large surface excavation to place the required infrastructure. The typical trench dimensions vary by cable type, voltage level, and required power transfer, but in all cases require a minimum cover depth of 3 feet (see Figure 2.6-1). While a number of cable arrangements can be achieved, soil

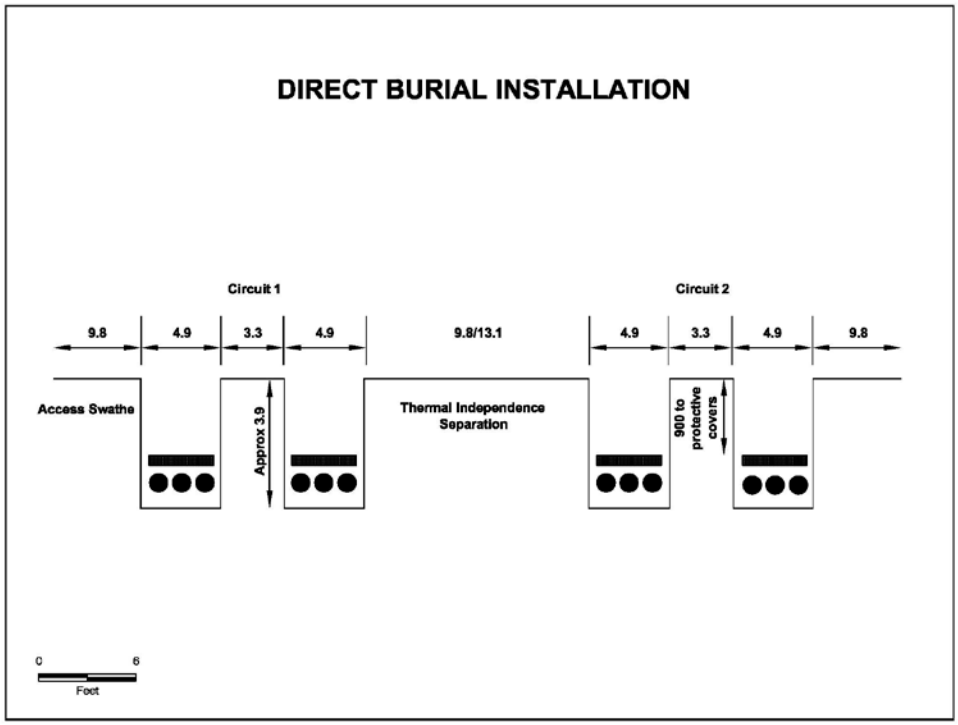


Figure 2.6-1. Direct Burial Installation

characteristics and existing infrastructure often play the largest role of how the installations are designed. Trenching operations are typically staged such that a maximum of 300 to 500 feet of trench is open at any one time. Steel plating may be positioned over the open trench to minimize surface disruptions, while traffic controls alleviate congestion through the project area. Emergency vehicle and local access must be coordinated with local jurisdictions as necessary.

Installation—Single- and double-circuit solid dielectric cable systems are often installed in duct bank configurations. Another method is duct burial. Figure 2.6-1 illustrates the space requirements. Figure 2.6-2 also shows a cable construction ROW.

Figure 2.6-2. Cable Construction ROW with Single Cable Trench Open

Pipe-type cable systems use steel pipes to encase each set of cables. Pipe-type cable systems can be utilized both at the 230-kV voltage level and the 500-kV level.

Vault Installation—In a vault installation, preformed concrete splice vaults are placed at approximately 1,500- to 2,000-foot intervals depending on the maximum cable per reel length. The vaults, initially used to install the cables into the conduits, are primarily used to house the splice assemblies, and to provide access for yearly inspections of the system. The vaults are used to sectionalize segments of cable in the event of a failure to locate the faulted cable and repair the required

Typical XLPE Vault Installation

section. The typical installation time frame of each vault is approximately one week beginning with excavation, placement, compaction, and finally resurfacing of the excavated area.

Cable Pulling, Splicing, and Termination—Upon completion of the civil construction, cables are installed within the duct banks or steel pipes. Each cable segment is installed, spliced at each of the vaults along the route, and terminated at the transition sites where the cable connects to overhead conductors. To install the cable, a reel of cable is positioned at one end of a cable section, while a pulling rig is located at the other end. Using wire rope, each section of cable is installed into its respective conduit/steel pipe, while workers apply either water-based lubricant for solid dielectric cable or dielectric fluid for pipe type cable, to the cable jacket to minimize the frictional forces placed on the cables. Before termination or splicing operations begin, the cables are trained into the correct position using heat blankets. This process removes the curvature of the cable from being on the reel while also relieving any longitudinal strain exerted on the cable during pulling operations.

Termination Structure Construction—Depending upon the cable technology used, at the 230-kV voltage level either single structure transitions or larger transitions sites, resembling those of 500-kV lines, are required. Because of the large size of cable equipment required for 500-kV lines, large transition sites are the only option. Figure 2.6-3 shows a typical transition station.

Figure 2.6-3. Typical Overhead to Underground Transition Station

Special Construction Methods—In locations where open trench construction is not feasible, such as water crossings, airports, railway crossings, large roadway interchanges, etc., methods of trenchless installation must be utilized. Three main types of trenchless technologies exist. These are:

- Jack and Bore Tunneling
- Horizontal Directional Drilling
- Microtunneling

Jack and Bore Tunneling—Jack and bore tunneling is an auguring operation that simultaneously jacks or pushes a steel casing into the excavated cavity. As the equipment progresses forward, subsequent casing segments are added, while the spoils are removed through the center of the casing. Upon completing the crossing, the duct system is positioned inside of the steel casing using specially designed spacers, and the entire casing is then backfilled with thermally designed grout. The grout not only solidifies the installation from any movement, but also helps dissipate heat away from

the cable system. For pipe type cable systems, the jacked casing can double as the cable pipe and may be welded to the trenched cable pipe.

Jack and Bore Casing Installation

Horizontal Directional Drilling—The horizontal directional drilling method uses a steerable cutting head to create a pilot hole along a predetermined route. Using progressively larger reamers, the hole is enlarged to the intended diameter. A product casing is then pulled through the hole and duct work, using specially designed spacers, is positioned within the casing. Grout is pumped into the voids within the casing to secure the installation and assist with the thermal transfer of heat away from the cable system. As with the jack and bore method, the casing can be used as the cable pipe in a pipe type cable system.

Microtunneling—Microtunneling resembles the jack and bore method; however, the casing diameters and distances can typically be increased. Microtunneling uses a remotely operated tunneling machine to create the desired diameter hole. A casing is then placed into the excavated hole and duct work is positioned within the casing. As before, the casing is filled with grout, or the casing can be used as the product pipe in a pipe-type cable system.

2.6.4.3 Construction Time

Installing large segments of underground transmission lines can require as much as twice the construction time of overhead lines, if not more, due to the extensive excavation required to complete the trenching and installation of the cable system infrastructure, cable splicing, and construction of transition stations.

2.6.4.4 Conclusion

Underground cable system installation has historically been justifiable in terms of cost and reliability only in urban or metropolitan areas, and for limited distances. Because of the high cost of an underground line compared to overhead 230-kV and 500-kV lines, unproven technology over long distances for 500-kV, reliability and reactive compensation issues for long installations, and increased land disturbance, the alternative of placing the 230-kV or 500-kV Gateway West lines underground was not considered feasible for the Project.

2.7 COMPONENTS COMMON TO ALL ACTION ALTERNATIVES

Regardless of the route chosen or the structure type or configuration chosen, the construction, operations, maintenance, and decommissioning of the transmission line would be conducted in the same manner. This section provides a general outline, description, and references portions of Appendix B, which provides details on each component. Both this section and Appendix B are organized into four parts based on information provided by the Proponents. The first part describes the components of the transmission line system, including the transmission line itself and its supporting structures, substations, and the communication system. The second part describes the construction techniques and addresses both the permanent alterations and the temporary disturbances needed as well as providing a description of the construction workforce, equipment, and traffic. The third part describes the operations and maintenance of the new system, while the fourth part discusses decommissioning and restoration of the ROW. The final part of this section (not in Appendix B) lists the Proponents' EPMs and Agency recommended mitigation measures that would apply to all routes.

2.7.1 System Components

The new transmission system is composed of the transmission structures themselves, the conductors, other hardware, the communications system, access roads, and substations. Each is summarized below and detailed in Appendix B.

2.7.1.1 Land Requirements and Construction Disturbance

Appendix B, Section 2.1.1 details the typical ROW land areas needed for the various components over the operational life of the Project. This is a greater area than that disturbed by the Project during construction, because transmission line disturbances are limited to the areas of structure installation and access roads. Temporary facilities like material laydown and fly yards are the exception and are areas that would be disturbed only during construction. Because it is fairly common that these yards would be located outside the requested ROW, their disturbance footprint must be added to the overall disturbance footprint within the ROW.

In addition to discussing the construction disturbance, Appendix B, Section 2.1.2 describes how private easements are obtained for the Project.

2.7.1.2 Transmission Line System

Appendix B, Section 1.1 describes transmission structures, including their types and sizes, the clearances needed between phases of the system and between the lowest conductor and the top of vegetation, and their foundations. It goes on to describe the conductor types and the other hardware used. Both steel H-frames and lattice steel towers are detailed.

2.7.1.3 Communication System

To control the transmission line and manage the flow of electricity, a sophisticated communication system is required. This communication system's backbone is a fiber optic system contained within one of the overhead grounding wires carried along the

length of the transmission system. The fiber optic signal needs to be "boosted" or regenerated about every 55 miles along the system, requiring optical signal regeneration stations. These stations consist of a building 12 by 32 by 9 feet tall, a fenced yard, access road, and distribution power supply from the local distribution system. They are typically built close to the transmission line as land use and physical features allow. Details are found in Appendix B, Section 1.4.2.

2.7.1.4 Access Roads and Material Laydown Yards

Appendix B, Section 1.5 specifies the typical access roads and the general description for laydown yards. Exact locations for both roads and yards will be developed during the detailed design phase once the BLM has selected a preferred alternative, but preliminary design has provided indicative locations for roads and laydown yards along the entire ROW. These indicative locations have been used in GIS to develop the "disturbance footprint" of the Project. While the vast majority of the access roads to be used by the Project would be within the ROW requested, some access roads and laydown areas would be outside the ROW. With few exceptions, all access roads are considered permanent, although most will only be used infrequently to meet maintenance requirements. Operation roads and structure construction pads would be revegetated but not recontoured. Laydown yards are temporary disturbances or temporary uses of areas already developed for storage or other industrial uses.

2.7.1.5 Substations

The description of substations includes their access roads, the types of buildings, transformers, and other infrastructure needed to convert incoming voltage to either another long-distance transmission voltage or to a lower voltage appropriate for distribution to load centers nearby. Details of substation contents are found in Appendix B, Section 1.6.

2.7.2 System Construction

2.7.2.1 Transmission Line Construction

The installation of transmission structures requires preparation of each site where a structure would be installed, including vegetation removal and grading to obtain a relatively flat surface for the operation of the large cranes used to install the structures. Then, either the directly embedded H-frame structure piers need to be drilled or excavated to accept the two poles of each structure, or else four foundations for each of the four legs of the lattice steel towers must be established. Appendix B, Table B-2 describes in detail the ranges of foundation sizes, depths, and amounts of concrete needed for each. In addition to the general description of foundation installation, Section 2.5.1 of Appendix B discusses the procedures if rock is encountered and blasting is needed. After the holes are dug for H-frame installation or the foundations completed for the lattice steel towers, the structures are brought in either by truck or by helicopter. If ground transportation is used, cranes would be employed for lifting and installing the structures. Structures are assembled at fly yards if helicopters are used (see also Section 2.5.2 of Appendix B specifying helicopter use procedures).

After the structures are assembled and in place, the conductors and the overhead ground wires would be strung from tower to tower. This is generally accomplished using a helicopter but may be conducted from the ground if the access road travels directly between towers. Details are found in Section 2.2.7 of Appendix B.

2.7.2.2 Communication Systems

Construction of the fiber optic "backbone" of the communication system would be accomplished at the same time as the conductors are strung. Regeneration station construction is also detailed in Section 2.3.1 of Appendix B.

2.7.2.3 Substation Construction

Appendix B, Section 2.4 provides details of substation construction, including development of all-weather access roads, staging areas, clearing and grading of the site, establishment of grounding mats and systems, fencing, foundation excavation, structure and equipment installation, oil containment system installation, control building installation, and finally cleanup and landscaping.

2.7.2.4 Construction Elements

Section 2.6 in Appendix B concludes by providing details of the construction workforce to be employed, the construction equipment and likely daily traffic patterns during the peak of construction, and the proposed construction schedule. Removal of temporary facilities and waste disposal are also discussed.

2.7.3 Operations and Maintenance

The Proponents have prepared Project-specific operations and maintenance policies and procedures designed to meet the requirements of the NERC, WECC, and the state public utility commissions, while remaining in compliance with the applicable codes and standards with respect to maintaining the reliability of the electrical system. Operations and maintenance activities would include transmission line patrols, climbing inspections, tower and wire maintenance, insulator washing in selected areas as needed, and access roads repairs. Periodic inspection and maintenance is also a key part of operating and maintaining the electrical system. The following key topics are described in detail in Appendix B:

- Routine system inspection, maintenance, and repair;
- Transmission line maintenance;
- Hardware maintenance and repairs;
- Access road and work area repair;
- Vegetation management; and
- Substation and regeneration site maintenance.

In addition, Chapter 3 contains additional mitigation measures identified by the agencies to protect resources, as summarized in Section 2.7.5 below.

2.7.4 Decommissioning

The projected life of the Gateway West Project is 50 years. Typically, transmission lines that have been maintained through that period will continue to provide service for a much longer lifetime. At the end of the service life of the Project, assuming that it is not upgraded or otherwise kept in service, the structures and conductors would be removed. The substations and regeneration stations, if not needed for other existing transmission line projects, would also be removed. Appendix B, Section 4.0 provides information regarding the removal of materials and the restoration of the sites.

2.7.5 Proposed EPMs and Agency Mitigation Measures

As part of their Proposed Action, the Proponents have included measures designed to reduce or avoid environmental impacts. Identified as Environmental Protection Measures (or EPMs), these measures cover the following topics:

- Construction, operations, and maintenance;
- Visual resources;
- Cultural and paleontological resources;
- Plant and wildlife resources, including TES;
- Geologic hazards and soil resources;
- Water resources;
- Safety measures;
- Reclamation of construction activities;
- Land use and agriculture;
- Traffic and transportation management;
- Air quality;
- Electrical environment;
- Public safety; and
- Noise.

The Proponents' EPMs are discussed further in Appendix C. Many of the EPMs were developed in cooperation with the BLM and cooperating agencies. As a part of the Proposed Action, EPMs are assumed to be applied project-wide, regardless of land ownership or management jurisdiction. The analysis assumes they would be followed on all routes, as site-specific circumstances dictate.

The BLM has not modified EPMs because they are a part of the Proponents' proposal. However, the BLM or cooperating agencies have identified additional mitigation measures when they determined that an EPM is insufficient to protect affected resources or is not consistent with agency requirements. These additional measures are referred to as mitigation measures in this EIS. In some cases, the BLM or cooperating agencies have identified mitigation measures that would be applied instead of EPMs.

Mitigation measures are applicable to the jurisdictional extent of the agency. For example, BLM mitigation measures apply only to public lands managed by the BLM and

county requirements apply only within the individual county. Some federal requirements, such as those under the ESA and CWA, would apply Project-wide.

Table 2.7-1 presents a summary of the Proponents' proposed EPMs as well as the mitigation measures required by the BLM and cooperating agencies. The effects analysis, found in Chapter 3, was conducted based on the Project description, including the Proponents' proposed EPMs. The effects analysis assumed that the EPMs would be implemented Project-wide (regardless of landownership) except for the EPMs that are not sufficient to protect sensitive resources, could ultimately result in increased impacts to resources, or are not in compliance with agency stipulations. In these cases, it was assumed that the BLM and cooperating agencies' mitigation measure would be implemented on federal lands (or private lands if the measure's federal jurisdiction extended to these lands, e.g., ESA measures). It is anticipated that as the NEPA process proceeds, additional coordination between the Proponents and the BLM and cooperating agencies will result in alterations to the EPMs and mitigation measures, ultimately resulting in many mutually agreed-to measures that can be applied Project-wide to further protect sensitive resources.

Table 2.7-1. Proponent and Agency Proposed Mitigation Measures

Number	Description
GENERAL	
Proponent Proposed EPMs	
OM-1	The Proponents will comply with the road maintenance standards of the federal or state agency controlling the land.
OM-2	Roads will be maintained to have crossroad drainage in order to minimize the amount of channeling or ditches needed. Water bars will be installed at all alignment changes (curves), significant grade changes, and as requested by the federal or state agency.
OM-3	All existing service road drainage structures will be maintained or repaired by the Proponents during O&M activities or emergency response.
OM-4	Although routine and corrective O&M is of limited duration and impact, the Proponents will attempt to adhere to specific closure periods and areas and are proposing not to conduct any routine and corrective O&M activities during the timeframes and at the locations identified in Table 1 [page 7 in Appendix C-4] to the greatest extend practical. The federal or state agency will notify the Proponents of any spatial or temporal restrictions that are in effect for the Project area (e.g., fire restrictions).
OM-5	Existing improvements (fences, gates, etc.) will be repaired or replaced if they are damaged by O&M activities, as agreed to by the parties involved.
OM-6	The Agencies may restrict general public access to closed federal or state roads and service roads that the Proponents maintain. In cases of restricted access, the Proponents will physically close the road with a gate. Gates will be locked with both a lock supplied by the Proponents, and with a federal agency lock. This Plan will be updated as necessary to reflect current road closures and gate locations.
OM-8	Any integrated vegetation management (IVM) control method including those listed on pages 9 and 10 [in Appendix C-4] may be used to control the growth of trees and tall shrubs to maintain clearances, the IVM recommended wire and border zones as indicated in Table 2 [page 10 in Appendix C-4], and improve access to facilities
OM-9	Any IVM control method including those listed on pages 9 and 10 in Appendix C-4 may be used to control the growth of additional vegetation to maintain clearances, the IVM recommended wire and border zones as indicated in Table 2 [page 10 in Appendix C-4], and improve access to facilities.
OM-10	Where possible, low-growing vegetation and small tree species within the ROW that will not grow into the minimum required clearance distance will be left in place; trees may be removed on a subsequent maintenance cycle as they increase in size. Hazard trees are typically those trees or snags within or adjacent to the ROW that are likely to interfere with or fall into transmission lines or associated facilities. Hazard trees and other “hot spots” (high priority areas requiring vegetation management actions) are identified during routine line inspections and removed annually. In addition to hazard trees, other critical conditions that may require immediate attention include trees that interfere with transmission conductors and trees whose growth will not allow safe clearance until the next scheduled maintenance cycle.
OM-11	Any control method may be used for vegetation maintenance on access and service roads; this is typically scheduled at the same time as vegetation maintenance within the ROW. However, in cases where vegetation grows quickly, removal may occur annually. Vegetation that will not interfere with the safe operation of vehicles and equipment will be left in place.
OM-12	Slash will be lopped and scattered throughout the surrounding land. Stumps resulting from vegetation treatments will not be over 1 foot tall (unless the tree is not able to be safely cut at or below one foot from the ground surface), and lopped slash will be left as close to the ground as possible. Lopped slash will be a maximum of 18 inches in length for small trees and limb wood. If the federal land managing agency determines that fuel levels are unacceptable, they shall notify the Proponents and develop a mutually agreed upon method to reduce fuels. This may include, but is not limited to, chipping.
OM-13	Hazard trees will be felled in a direction away from the ROW. Slash and limbs that fall within the ROW will be treated as described above; boles of trees greater than eight inches will be left in place.
OM-18	Routine and corrective O&M activities in streams with sensitive fish species will occur from July 1 to September 1 in an effort to minimize impact to spawning and migration activities. These activities include, but are not limited to, culvert installation and or replacement, stream bank stabilization. Fording streams at existing crossings on existing roads (e.g., dip, culvert, bridge) will occur as necessary throughout the year.
OM-19	Woody vegetation management within 50 feet of streams will be conducted by hand crews.
OM-20	Herbaceous plants and low-growing shrubs will be left in place if they do not interfere with the safe O&M of Project lines and equipment as described in Table 2 [page 10 in Appendix C-4].
OM-21	The Proponents will use existing stream crossings or new, permanent crossings that were approved as part of the Project, and will not create additional crossings without prior agency permitting and approval.

Table 2.7-1. Proponent and Agency Proposed Mitigation Measures (continued)

Number	Description
OM-25	If sensitive wildlife species are discovered during O&M activities, and the animals are not directly within ground disturbance areas, they will be protected by marking the edges of the ROW and service roads in the general vicinity to ensure that workers do not leave those areas. If the animals are within work areas that have, or will have, ground disturbance, the Proponents will establish an appropriate buffer zone and will contact the federal or state land manager immediately. The federal or state agency may evaluate the adequacy of the buffer on a case by case basis. Unless the Proponents are informed otherwise, work outside of the buffer area will continue. If the Proponents need to work within the buffer area, the Agencies and Proponents will work together to develop a solution that is acceptable to both parties and will allow for the Proponents to complete the work in a timely manner or within the scheduled outage window, if applicable. After the O&M activities are completed, or no longer pose a threat to the species, the marking (stakes) will promptly be removed to protect the site's significance and location from unwanted attention. As needed, marking will be reinstated during the land rehabilitation period.
OM-30	If sensitive wildlife species are killed or injured due to O&M activities, the appropriate federal agency will be notified.
OM-31	All on-site personnel will be made aware that all birds of prey are protected by federal and state laws.
Agency Proposed Mitigation Measures	
G-1	Resource Management Plan (as amended) design criteria, Best Management Practices (BMPs) and mitigation requirements will apply on BLM-managed lands.
G-2	Forest Plan Standards and Guidelines (as amended) will apply on National Forest System (NFS) lands. Ground disturbing and vegetation management activities will comply with all Agency wide, Regional, and State BMPs.
VISUAL	
Proponent Proposed EPMs	
VR-1	The 500-kV transmission line lattice steel towers would be specified to have a dull galvanized finish. The proposed surface finish is a galvanized finish, treated after the initial galvanizing process to produce a dulled finish to reduce surface reflectivity. This process results in an installed tower with more visual absorption and thus allows the towers to blend in better with the landscape.
VR-2	The three subconductor (500-kV) and two subconductor (230-kV) that make up the conductor bundles would be specified to have a non–specular finish. Similar to the dulled finish of the transmission structures, the conductors reduce surface reflectivity. This process results in eliminating the shiny ribbon effect often seen in older untreated transmission lines and thus allows the conductors to blend in better with the landscape.
VR-3	The proposed 230-kV transmission lines between Windstar and Aeolus would use a steel H-frame structure configuration similar to the existing 230-kV in the same general location. The steel pole H-frame would utilize self weathering steel. Weathering steel is manufactured from a group of steel alloys that were developed to eliminate the need for painting. This type of steel alloy forms a stable rust-like appearance if exposed to the weather for several years.
VR-4	Table 2.6-3 compares the single-circuit lattice steel tower and single-circuit steel pole H-frame ROW configurations for several factors. The Proponents do not wish to propose this alternative as a Project-wide option due to the increased expense but propose that, where needed for mitigation, the H-frame tangent configuration for single-circuit 500-kV is feasible. The Proponents are unwilling to propose that H-frames be used for angle or dead-end structures, but are willing to propose them for tangent use only. Lattice steel towers will need to be specified at turning tower locations and at long spans because tubular steel poles do not have the strength to withstand the forces exerted by the conductors at these locations
Agency Proposed Mitigation Measures	
VIS-1	No paint or permanent discoloring agents would be applied to rocks or vegetation to indicate limits of survey or construction activity.
VIS 2	To minimize ground disturbance and/or reduce scarring (visual contrast) of the landscape, the alignment of any new access roads or cross-country routes will follow the landform contours in designated areas where practicable, providing that such alignment does not impact resource values additionally.
VIS-3	To minimize sensitive feature disturbance and/or visual contrast, in designated areas structures will be placed so as to avoid sensitive features such as, but not limited to, riparian areas, water courses and cultural sites and/or to allow conductors to clearly span the features, with limits of standard tower design.
VIS-4	To reduce visual impacts on federal land, including potential impacts on recreation values and safety, towers are to be placed at the maximum feasible distance from the highway, canyon and trail crossings within limits of standard design and to the extent practical.
VIS-5	Crossings of rivers shall be at approximately right angles where practical. Strategic placement of structures shall be done both as a means to screen views of the transmission line and rights-of-way and to minimize the need for vegetative clearing.

Table 2.7-1. Proponent and Agency Proposed Mitigation Measures (continued)

Number	Description
VIS-6	All insulators shall be made of materials that have reduced potential to reflect and refract light. Glass insulators shall be avoided when there is an alternative insulator type with lower refractive characteristics.
VIS-7	For segments of the line 1) within the 0- to 0.5-mile zone of Interstate highways where existing lines of the same voltage are paralleled and 2) within the 0- to 0.5-mile zone of residences where existing lines of the same voltage are paralleled, locate new towers to be adjacent to existing towers, within the limits of standard transmission line design and considering the ruling span length of adjacent proposed and existing lines.
VIS-8	Site-specific "micrositing" will be required near certain sensitive areas, as identified by the agencies, where proposed transmission facilities would be present and could impact visual quality; these situations include: • Crossings over major highways; • Crossings of high quality historic trails; • Crossings over the North Platte Snake Rivers; • Crossing the Albion Mountains in the Sawtooth NF; • Sensitive travelways, use areas, residential areas, recreational facilities as identified by the agencies (including national recreation and scenic trails, campgrounds, recreation areas, and trailheads), and other areas identified by management plans; and • Along Forest Service roads in forested areas.
VIS-9	In specific areas identified by the applicable federal land manager (such as VRM Class II, erosive soils, steep slopes, areas near NHT Trails) the access road used for construction will be restored and an alternative access route for operations will be designated.
VIS-10	In areas in proximity to existing residential developments with an urban or suburban character, such as in the Kuna area, steel pole H-frame tubular steel poles may be specified to provide tower structures that are visually more appealing. Lattice steel towers will need to be specified at turning tower locations and at long spans because tubular steel poles do not have the strength to withstand the forces exerted by the conductors at these locations.
VIS-11	The lighting specified for the marshaling yards shall be the minimum required to meet safety and security standards. All light fixtures within 1,000 feet of a residence shall be hooded to eliminate any potential for glare and to prevent light from spilling off the site or up into the sky. Additionally, the fixtures shall have sensors and switches to permit the lighting to be turned off at times when it is not required.
VIS-12	Where the route would be visible on timbered slopes, limit tree removal to areas required for safety rather than from the entire ROW in order to prevent a linear feature on the landscape from clear-cutting trees. Vegetation removal requirements will consider Appendix A, "Standards and Practices for Electric System Reliability."
VIS-13	To reduce visual contrast in areas where overstory vegetation is removed for access, tower pads, or conductor clearance, specific sections of the clearing edges on federal land will be feathered to give a natural appearance, where not in conflict with regulatory requirements (e.g., NERC, WECC, and Occupational Safety and Health Administration requirements).
VIS-14	Crossing federal land along a transmission corridor shall require the preparation of a vegetation management plan for the utility corridor to minimize scenic impacts and plan for rehabilitation of existing impacts. This plan will be approved by the land-management agency prior to vegetation clearing.
VIS-15	To mitigate potential visual impacts on federal land, the construction and maintenance plan shall to be developed by the Proponents will include measures to reduce ROW scarring and enhance restoration. The plan will be approved by the land management agency prior to ground clearing and construction.
VIS-16	Realignment of a portion of Alternative 1E-B, adjacent to the Rock Creek and Fort Fetterman Road (KOP 993), to follow the rugged terrain and foothills of Smith Mountain should be evaluated to determine absorption effectiveness.
VIS-17	Single-circuit H-frame structures shall be used to reduce visual impact to Fort Fred Steele between MP 38.0 to MP 43.0 for Alternative 2B and MP 18.0 to MP 24.0 for Alternative 2A to match the existing structures.
VIS-18	If Alternative 7I were to be constructed, H-frame single-circuit structures would be required in the Nevada portion of the alternative as requested by the Wells FO.
VIS-19	If any of Alternatives 7H, 7I, or 7J were to be constructed, H-frame single-circuit structures would be required in the Sawtooth NF.
CULTURAL	
Proponent Proposed EPMs	
CUL-1	All work conducted under the Cultural Resources and Paleontological Monitoring and Mitigation Plan will be performed by qualified paleontologists and archeologists with trained assistants.

Table 2.7-1. Proponent and Agency Proposed Mitigation Measures (continued)

Number	Description
CUL-2	An Unanticipated Discovery Plan will be included as part of the Cultural Resources and Paleontological Monitoring and Mitigation Plan. This plan will specify what steps will be taken if a subsurface cultural resource or fossil is discovered during construction, including stopping construction in the vicinity of the find, notification of the appropriate land management agency, identification of a qualified archaeologist or paleontologist to conduct an evaluation of the find, and the development of an approved data recovery program or other mitigation measures.
CUL-3	The Cultural Resource and Paleontological Monitoring and Mitigation Plan will include provisions for the preparation and curation of any fossil collections from federal lands and for the preparation of a final report based on the data recovered for activities on federal lands.
CUL-4	Literature reviews and Class III surveys will be completed for cultural resources. A literature review will be conducted on public and private lands and will cover a study area of one-half mile on either side of the proposed and alternate transmission line alignments as well as areas identified for use as staging areas and access roads. Class III surveys covering a 500-foot-wide area centered on the transmission line will be conducted on 100 percent of federal and state lands, and for those private lands for which survey access is granted, prior to the completion of the NEPA process. A good-faith effort will be made to obtain survey permission prior to the completion of the NEPA process.
CUL-5	If construction will adversely affect any properties listed on, or eligible for listing on, the NRHP, mitigation will be required. Mitigation may include, but not be limited to, one or more of the following measures: a) avoidance through the use of relocation of structures through the design process, realignment of the route, relocation of temporary workspace, or changes in the construction and/or operational design; b) data recovery, which may include the systematic professional excavation of an archaeological site or the preparation of photographic and/or measured drawings documenting standing structures; and c) the use of landscaping or other techniques that will minimize or eliminate effects on the historic setting or ambience of standing structures.
CUL-6	Avoidance areas will be flagged prior to construction activities. Flagging will be removed once construction is completed in an area.
CUL-7	To minimize unauthorized collecting of archaeological material or vandalism to known archaeological sites, all workers will attend mandatory training on the significance of cultural resources and the relevant federal regulations intended to protect them.
CUL-8	If human remains are discovered, construction will be halted and the coroner will be notified. If human remains of Native American origin are discovered, or if associated grave goods, or objects of cultural patrimony are discovered on lands managed by a federal agency, the provisions of NAGPRA will be followed.
Agency Proposed Mitigation Measures	
CR-1	(for historic properties in all segments): • Avoid direct impacts by designing the route so that no Project facilities, including access roads, are placed within the boundaries of historic properties. • Assess magnitude and location of adverse effects, should avoidance of historic properties not be feasible.
CR-2	(for historic trails and other linear routes in all segments): • Design the transmission line to cross where existing modern development occurs. • Cross the resource as close to a 90-degree angle as possible using a dog-leg or S curve. • Adjust tower placement to use the maximum span distance to achieve maximum tower distance from the linear resource. • Avoid paralleling the linear resource as much as possible and obtain maximum tower distance by shifting alignment and maximize topographic screening with lower structures, such as the two single-circuit steel-lattice design alternative.

Table 2.7-1. Proponent and Agency Proposed Mitigation Measures (continued)

Number	Description
CR-3	Compensatory Mitigation Measures – The BLM, in consultation with the Wyoming, Nevada, and Idaho SHPOs, and consulting parties is developing a PA and a Historic Properties Treatment Plan. Compensatory mitigation measures may be developed as appropriate for specific historic resources. The following example measures may be considered for adversely affected properties, or other measures required: • Fund or provide interpretive, educational exhibits placed in museums or nearby interpretive centers. • Develop an illustrated guide to the regional archaeology and history, which would present the results of the Project's archaeology/history in layperson's terms for the general public. • Provide new markers for the BLM and other public groups to position along historic trails, highways, and other linear resources. • Fund or provide outdoor, interpretive wayside exhibits along access points to trails, highways, and other linear resources • Fund or provide educational films or curriculum for area school districts about the history and significance of the linear resources. • Acquire or trade land with willing seller(s). • Preserve landscapes from a cultural landscape perspective. • Bury elsewhere other (non-Project) lower kilovolt transmission or distribution lines. • Commission studies of associated historic sites along the corridor to support a regional context. • Re-vegetate disturbed areas to protect or restore viewsheds. • Provide monetary support to historic trail-related state parks.
CR-4	Conservation Easements – Where feasible and appropriate, conservation easements will be considered to preserve important archaeological and historic sites, and high integrity linear resource segments, or to preserve viewsheds. A conservation easement (sometimes called a conservation covenant) creates a legally enforceable land preservation agreement between a landowner and a government agency (federal, state, county, or municipality) or a qualified land protection organization ("land trust") for the purposes of conservation. It restricts real estate development, commercial and industrial uses, and certain other activities on a property to a mutually agreed upon level. The property remains the private property of the landowner.
CR-5	On NFS lands, a management plan should be developed for each historic property nominated to the NRHP. The plan should be drafted during the nomination process. The National Heritage Strategy should be used to guide decisions on issues related to the Heritage Program.
SOCIOECONOMIC	
Proponent Proposed EPMs	
	None Proposed
Agency Proposed Mitigation Measures	
SOC-1	Housing Plan: Contract with local motels and hotels for temporary accommodation within daily commuting distance of the Project site. Temporary accommodations will be selected based on value, cleanliness, and proximity to the Project site. • Contract with local RV parks for rental spaces to accommodate workers who have access to RVs. • If temporary accommodation is not available within the Project area, seek motel and hotel accommodations outside the Project area. In this event, the Proponents would provide transportation to the Project site in the form of buses or vans, depending on workforce numbers, to ensure workers arrive at the Project site safely. • If sufficient temporary accommodation is not available, depending on the location and the number of workers involved, the Proponents would explore other temporary housing options, including the use of temporary housing facilities established for other projects, establishing temporary RV lots on public lands, and developing Project-specific temporary housing camps. The Proponents would provide bus or other transportation to the Project site if these facilities were located outside the Project area.
VEGETATION	
Proponent Proposed EPMs	
REC-2	Pre-construction weed treatment would be conducted prior to the start of ground-disturbing activities and at the time most appropriate for the target species.
REC-3	Pre-construction weed treatment would be limited to the areas that are expected to have surface-disturbing activities. The final Reclamation Plan will include a schedule showing the phased in-service dates for different segments. Pre-construction weed treatment will be scheduled accordingly.

Table 2.7-1. Proponent and Agency Proposed Mitigation Measures (continued)

Number	Description
REC-4	Pre-construction treatment may use mechanical control, hand spraying, grazing, or herbicides. The final Reclamation Plan will discuss those options, as applicable.
REC-5	All herbicide applications would comply with label restrictions, federal, state and/or county regulation, the Proponents' specifications and landowner agreements. No spraying would occur prior to notification of the applicable land management agency. On federal or state controlled lands, a herbicide use plan will be submitted prior to any herbicide application as recommended in the BLM herbicide EIS http://www.blm.gov/wo/st/en/prog/more/veg_eis.html. The herbicide use plan will include the dates and locations of application, target species, herbicide, adjuvants, and application rates and methods (e.g., spot spray vs. boom spray). No herbicide would be applied to any private property without written approval of the landowner. The final Reclamation Plan will contain a list of herbicides that may be used, target species, best time for application, application rates, and if they are approved for use on BLM-managed and NFS lands.
REC-6	Herbicides may be applied using a broadcast applicator mounted on a truck or all-terrain vehicle (ATV), backpack sprayers, or with hand sprayers as conditions dictate. Herbicide applications would be conducted only by licensed operators or under the supervision of a licensed operator. Where allowed, a broadcast applicator would likely be used. In areas where noxious weeds are more isolated and interspersed with desirable vegetation, noxious and invasive weeds would be targeted, thereby avoiding other plants. Pre-construction herbicide applications would not occur adjacent to known special status species or near water bodies.
REC-7	All areas treated would be documented using GPS technologies and included in the annual report.
REC-8	Areas of existing noxious weeds and invasive species will be avoided where possible.
REC-9	Project vehicles will arrive at the job site clean of all soil and herbaceous material.
REC-10	When the contractors demobilize from the job site where identified infestations of noxious weeds are present, they will use appropriate decontamination measures as defined in the final Reclamation Plan.
REC-11	Soil stockpiles from areas that did not have noxious weeds or invasive species present, will not be placed adjacent to populations of noxious weeds or invasive species, where practicable.
REC-12	Areas disturbed by Project activities are susceptible to the establishment and spread of noxious weeds. Erosion control measures identified in the SWPPP(s) would also assist in preventing the establishment of weeds on exposed soils.
REC-13	Project-related storage and staging yards, fly yards, and other areas that are subject to regular long-term disturbance will be kept weed-free through regular site inspections and herbicide applications, subject to the consent of the land owner.
REC-14	Where pre-construction surveys have identified noxious or invasive weed species infestations, topsoil and other soils will be placed next to the infested area and clearly identified as coming from an infested area. Topsoil would be returned to the area it was taken from and will not be spread in adjacent areas. If the topsoil is not suitable for backfill, then it will be spread in another previously disturbed area and clearly identified for future weed treatments as applicable.
REC-15	Straw or hay that may be used as a BMP to control erosion and sedimentation must be certified weed free. If certified weed-free materials are not available, then alternative BMPs will be used. The use of alternative BMPs will be coordinated with the construction storm water inspector.
REC-16	The topsoil layer will be removed, taking care not to mix it with the underlying sub-soil. Where topsoil separation is employed, topsoil will be stored in a separate stockpile.
REC-17	Certified weed-free straw, mulch, grave, and other BMPs as appropriate, will be used as described in the SWPPP to stabilize the stockpile and limit erosion and standing water, control dust, and control the establishment of noxious or invasive weeds in stockpiled soils.
REC-23	The Proponents will utilize soil amendments (e.g., fertilizer, wood or straw mulches, tackifying agents, or soil stabilizing emulsions) on a case-by-case basis and with landowner or land management agency approval. Specific soil amendments would be identified in the final Reclamation Plan and be consistent with the SWPPP.
REC-24	Broadcast seeding will apply the seed directly on the ground surface. The type of broadcast spreader will depend on the size of the area to be seeded, and the terrain. Seed will be placed in direct contact with the soil, ideally at a depth of approximately 0.5 to 1-inch deep. It will then be covered by raking or dragging a chain or harrow over the seed bed; to remove air pockets.
REC-25	Drill seeding would be used on areas of sufficient size with moderate or favorable terrain to accommodate mechanical equipment. Drill seeding provides the advantage of planting the seed at a uniform depth.
REC-26	Hydroseeding, which is the spraying of seeds and water onto the ground surface, or hydroseeding/hydromulching, which is the spraying of seeds, mulch and water, may be implemented on steeper slopes. Tackifier may be added to facilitate adherence of hydromulch to slopes greater than 25%.

Table 2.7-1. Proponent and Agency Proposed Mitigation Measures (continued)

Number	Description
Agency Proposed Mitigation Measures	
VEG-1	The Proponents shall consult with each appropriate local land management agency (Forest Service and BLM) office or land owner to determine appropriate seed mix for revegetation. Also see WEED-1.
VEG-2	During construction, blading of native plant communities should be minimized, consistent with safe construction practices. Where feasible, shrubs should be cut at or near ground level to facilitate re-growth after construction. The footprint of construction and operations facilities should be kept to the minimum necessary.
VEG-3	Where feasible, locate new access roads to minimize the number of trees to be removed during construction.
VEG-4	In areas where revegetation would be completed, topsoil salvage and replacement should be used for areas larger than 1 acre where soils would be disturbed during construction. In areas where revegetation would be completed, topsoil salvage will be used in all areas of cut or fill in order to facilitate revegetation.
VEG-5	The Proponents' employees and contractors will employ typical practices to prevent fire during construction and operations including brush clearing prior to work, stationing a water truck at the job site to keep the ground and vegetation moist in extreme fire conditions, enforcing red flag warnings, providing training to all pertinent personnel, keeping vehicles on designated roads and within work areas, and providing fire suppression and emergency notification numbers at each construction site. Brush clearing will be limited to the construction ROW.
VEG-6	The Reclamation, Revegetation, and Weed Management Plan must provide a site-specific plan for access road and ROW vegetation management in areas where removal of trees is proposed. The site-specific plan must include tree removal, slash disposal plans, and BMPs to avoid erosion or sedimentation of watercourses or wetlands. This plan will be submitted to each applicable land management agency for approval prior to clearing.
VEG-7	Herbicide use must conform to the existing types and application methods approved by those land managing agencies. The Reclamation, Revegetation, and Weed Management Plan must specify where herbicides would be used, what types would be used, and what application methods would be used. The plan must be in conformance with regulations regarding herbicide use from the land-managing agency or county in which herbicide use is proposed.
VEG-8	Prior to the start of construction and maintenance activities, all contractor vehicles and equipment (including personal protective equipment) shall be cleaned of soil and debris capable of transporting invasive plant seeds or other propagates. All vehicles and equipment shall be inspected by Agency-approved inspectors and certified as weed free by agency approved personnel, in order to ensure they have been cleaned properly. The final Reclamation, Revegetation, and Weed Management Plan will include the location of all cleaning stations, how materials cleaned from vehicles at these stations would be either captured or treated so that cleaning station locations would not also become infected, and who would confirm/certify that vehicles leaving cleaning stations and/or entering construction sites are free of invasive plant materials.
VEG-9	Agency staff will approve weed-free straw or other erosion control on federal lands prior to application.
VEG-10	Agency staff will approve tree seedlings planted in decommissioned roadbeds and other temporarily disturbed areas on federal lands to assure seedlings are matched to site conditions.
VEG-11	The Proponents will consult with appropriate Forest Service staff to identify the top soil layer on NFS lands.
VEG-12	Post-construction monitoring and treatment of invasive plants on closed roads and fly yards shall continue for at least 3 years. If after 3 years post-construction conditions are not equivalent or better than pre-construction conditions, monitoring and treatment will continue until these conditions are met.
VEG-13	The Proponents will meet Wyoming State Forest Practices Act requirements and apply Region 4 BMPs for timber removal operations on the Medicine Bow NF and meet Idaho State Forest Practices Act requirements and apply Region 2 BMPs for timber removal operations on the Caribou-Targhee and Sawtooth NFs.
VEG-14	Where the route would be visible on timbered slopes on lands managed by the Kemmerer FO, allow tree removal only at structure locations and where required for safety rather than from the entire ROW in order to prevent a linear feature on the landscape from clear-cutting trees. Vegetation removal requirements will consider Appendix A, Key Standards Relating to Electric System Reliability and Safety, of the MOU with the Edison Electric Institute (2006).

Table 2.7-1. Proponent and Agency Proposed Mitigation Measures (continued)

Number	Description
TES-PLANTS	
General	
Proponent Proposed EPMs	
OM-23	Prior to the start of O&M activities, all supervisory personnel will be instructed on the protection of natural resources, including sensitive plant and wildlife species and habitats. If a contractor is used, the construction contract will address (a) the sensitive plant species that may be present in a particular area based on previous surveys and literature review; (b) the federal and state laws regarding protection of plants and wildlife; (c) the importance of these resources; (d) the purpose and necessity of protecting them; and (e) methods for protecting sensitive resources (e.g., Endangered Species Act, Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, and BLM wildlife policy).
OM-24	Sensitive plant populations that occur within or near the ROW and work areas will be marked on the ground, where practical, to ensure that they are avoided. If species are discovered during the work, the Proponents will establish a spatial buffer zone, will contact the appropriate Agency within 24 hours, and will continue with the O&M activities outside of the established buffer unless otherwise directed. The Agency may evaluate the adequacy of the buffer on a case-by-case basis. Unless the Proponents are informed otherwise, work outside of the buffer area will continue. If the Proponents need to work within the buffer area, the Agencies and Proponents will work together to develop a solution that is acceptable to both parties and will allow for the Proponents to complete the work in a timely manner or within the scheduled outage window, if applicable. After the project is complete or no longer poses a threat to the plant population, the marking (stakes), if used, will be promptly removed to protect the site's significance and location from unwanted attention. As needed, marking will be reinstated during the land rehabilitation period.
OM-28	The Proponents will provide crews and contractors with maps showing avoidance areas; these maps will include work zones as well as ROW areas where overland travel will be avoided.
OM-29	In the event any sensitive plants require relocation, permission will be obtained from the federal agency. If avoidance or relocation is not practical, the topsoil surrounding the plants will be salvaged, stored separately from subsoil, and respread during the restoration process.
Agency Proposed Mitigation Measures	
TESPL-3	Qualified botanists shall conduct pre-construction surveys during a season when target species are readily identifiable for special status or globally rare species. Where feasible, micrositing of project facilities shall avoid direct impacts to identified populations. Survey reports documenting the surveys, their results, and recommendations must be provided to land management agency for approval prior to construction. Agency botanists may evaluate individual sites based on site-specific conditions. Documentation of the evaluation of avoidance of impacts to sensitive and globally rare plants must be provided to the agencies prior to construction.
TESPL-4	Environmental monitors shall be used to identify and mark aboveground populations of slickspot peppergrass and higher-quality microsites within 50 feet of the construction area, including access roads, so that they are avoided by construction equipment and vehicles. Full field clearances shall be conducted that meet USFWS protocols prior to construction. No construction shall occur within 50 feet of any slickspot peppergrass plant or habitat, including known occurrences of slickspot peppergrass (based on Idaho CDC data) even if aboveground plants are not observed during the surveys. Seeding during reclamation must use methods that minimize soil disturbance such as no-till drills or rangeland drills with depth bands, in areas of suitable habitat. Reclamation must use certified weed-free native seed. Excess soils will not be stored or spread on slickspots.
TESPL-6	Sand dune and cushion plant communities should be avoided, where feasible.
Blowout Penstemon	
Proponent Proposed EPMs	
PPC-1	Surface disturbance will be allowed in suitable habitat where species-specific surveys have determined that no populations are present. The species-specific surveys will be conducted the year prior to construction, and the proposed disturbance areas will be redesigned to avoid direct impact to populations.
Agency Proposed Mitigation Measures	
	None proposed
Goose Creek Milkvetch	
Proponent Proposed EPMs	
	None

Table 2.7-1. Proponent and Agency Proposed Mitigation Measures (continued)

Number	Description
Agency Proposed Mitigation Measures	
TESPL-1	Surface disturbance will be allowed in suitable habitat for Goose Creek milkvetch where species-specific surveys have determined that no populations are present. The species-specific surveys will be conducted the year prior to construction, and the proposed disturbance areas will be redesigned to avoid direct impacts to populations.
Colorado Butterfly Plant	
Proponent Proposed EPMs	
PPC-2	Surface disturbance will be allowed in suitable habitat where species-specific surveys have determined that no populations are present. The species-specific surveys will be conducted the year prior to construction, and the proposed disturbance areas will be redesigned to avoid direct impact to populations.
Agency Proposed Mitigation Measures	
	None proposed
Slickspot Peppergrass	
Proponent Proposed EPMs	
PPC-3	Surface disturbance will be allowed in suitable habitat where species-specific surveys have determined that no populations are present. The species-specific surveys will be conducted the year prior to construction, and the proposed disturbance areas will be redesigned to avoid direct impact to populations.
Agency Proposed Mitigation Measures	
	None proposed
Ute Ladies'-tresses	
Proponent Proposed EPMs	
PPC-4	Surface disturbance will be allowed in suitable habitat where species-specific surveys have determined that no populations are present. The species-specific surveys will be conducted the year prior to construction, and the proposed disturbance areas will be redesigned to avoid direct impact to populations.
Agency Proposed Mitigation Measures	
TESPL-2	Pre-construction surveys for the Ute ladies' tresses shall be conducted by qualified botanists in all areas of potential habitat, in accordance with federal land management agency and USFWS requirements. These pre-construction surveys shall be conducted during the appropriate survey window, for a total of 3 years.
TESPL-3	Qualified botanists shall conduct pre-construction surveys during a season when target species are readily identifiable for special status or globally rare species. Where feasible, micrositing of project facilities shall avoid direct impacts to identified populations. Survey reports documenting the surveys, their results, and recommendations must be provided to land management agency for approval prior to construction. Agency botanists may evaluate individual sites based on site-specific conditions. Documentation of the evaluation of avoidance of impacts to sensitive and globally rare plants must be provided to the Agencies prior to construction.
Whitebark pine	
Proponent Proposed EPMs	
	None proposed
Agency Proposed Mitigation Measures	
TESPL-5	If a whitebark pine or limber pine (a similar species that can be difficult to distinguish from whitebark pine) stand cannot be avoided, off-site mitigation in the form of appropriate silvicultural treatments of adjacent stands, collection of seed, identification of "plus" trees or other acceptable mitigations will be done to offset the loss of the stand in addition to replanting whitebark pine on reclaimed areas.

Table 2.7-1. Proponent and Agency Proposed Mitigation Measures (continued)

Number	Description
WEEDS	
Proponent Proposed EPMs	
REC-1	Company personnel and their contractors will be trained on noxious and invasive weed identification to facilitate avoidance of infestations where possible or identification of new infestations.
REC-2–15	[Described in Vegetation]
OM-14	Any chemical control will be done in accordance with any applicable local, state, and federal rules and regulations. Herbicides or other chemical control will be selected from the BLM and Forest Service's list of previously approved herbicides and in accordance with any herbicide plans. If the federal land managing agency determines that a previously approved herbicide and/or plan is unacceptable, they shall notify the Proponents.
OM-16	Before beginning an O&M project on federal or state land, the Proponents or their subcontractors will clean all equipment that will operate off-road or disturb the ground. Tracks, skid plates, and other parts that can trap soil and debris will be removed for cleaning when feasible, and the entire vehicle and equipment will be cleaned at an off-site location.
OM-17	To help limit the spread and establishment of noxious weed species in disturbed areas, desired vegetation needs to be established promptly after disturbance. The Proponents will rehabilitate significantly disturbed areas as soon as possible after ground-disturbing activities and during the optimal period. Seed and mulch will be certified "noxious weed free" and seed mix will be agreed to in advance by the landowner or land managing agency.
OM-22	Only herbicides approved by the land managing agency as safe to use in aquatic environments and reviewed by the Proponents for effectiveness will be used within 100 feet of sensitive aquatic resources.
Agency Proposed Mitigation Measures	
WEED-1	The Proponents shall consult with each appropriate local land management agency (Forest Service and BLM) office or landowner to determine appropriate seed mix and commercial seed source for revegetation. The Reclamation, Revegetation, and Weed Management Plan must specify the approved seed mixes for each area (also see VEG-1).
WEED-2	Weed control and prevention measures shall adhere to all agency standards and guidelines. These measures shall be developed in consultation with local, state, and federal weed agencies; all implemented measures would follow the principle of integrated weed management.
WEED-3	Gravel and other materials used for road construction on federal lands shall come from certified weed-free sources.
WEED-4	Annual post-construction monitoring and treatment of invasive plants shall continue for at least 3 years. If after 3 years post-construction conditions are not equivalent or better than pre-construction conditions, monitoring and treatment will continue until these conditions are met (also see VEG-12).
WEED-5	During operations, access roads and maintenance areas shall be surveyed annually between May 1 and September 30 (or as determined by Agency staff) for the presence of new weed introductions and existing invasive plant species. Coordinate with Agency specialists to identify the most appropriate time for survey. A weed control program would be implemented if new weeds were found, which would define how and when these invasive plants would be treated. Weeds shall be treated before their seed heads have become viable, or if heads will become viable, whole plant removal of all weeds shall occur before seed drop occurs.
WEED-6	Soil stockpiles in areas containing invasive plants shall be reseeded or revegetated as soon as feasible, or the soil replaced in or near the original excavation. If requested by the applicable land-management agency, soil stockpiles shall be covered with plastic during the time prior to reseeding or replacement; however, plastic coverings will not be used on lands where the managing agency or landowner have requested that these piles not be covered with plastic (e.g., the Forest Service).
VEG-7	See description under Vegetation.
WETLANDS	
Proponent Proposed EPMs	
REC-1	[Described in Weeds]
REC-2–17	[Described in Vegetation]
REC-18	Topsoil and sub-surface soils will be replaced in the proper order during reclamation.
REC-19	Where it is necessary to spread soils (subsurface soils or waste rock resulting from excavations or foundation drilling), it will be done where practicable and in close proximity to where the disturbance occurred (within the ROW). Material will be spread uniformly to match existing contours and covered with topsoil when available and reseeded.

Table 2.7-1. Proponent and Agency Proposed Mitigation Measures (continued)

Number	Description
REC-20	Re-contouring: Temporarily disturbed lands within the ROW will be re-contoured to blend with the surrounding landscape. Re-contouring will emphasize restoration of the existing drainage patterns and landform to pre-construction conditions, to the extent practicable. (Tower pads would not be recontoured.)
REC-21	De-compaction: Areas within the ROW, laydown or staging yards, and other areas of extensive vehicle travel will typically contain compacted soils. These soils will be de-compacted on a case-by-case basis through negotiation with the landowner or land management agency.
REC-22	Final Cleanup: Final cleanup will ensure that all construction areas are free of any construction debris including but not limited to: assembly scrap metals, oil or other petroleum based liquids, construction wood debris and worker generated litter. Permanent erosion control devices will be left in place.
SW-1, 4–5	[See description under Water Quality]
SW-6	Migration of construction-related sediment to all adjacent surface waterbodies will be prevented.
SW-7–12	[See description under Water Quality]
SPC-1	Construction industry standard practices and BMPs will be used for spill prevention and containment.
SPC-2	Construction spills will be promptly cleaned up and contaminated materials hauled to a disposal site that meets local jurisdictional requirements.
SPC-3	All staging areas will contain fueling areas with containment. Where fueling must be conducted along the ROW, the plan will specify BMPs.
SPC-4	If an upland spill occurs during construction, berms will be constructed with available equipment to physically contain the spill. Absorbent materials will be applied to the spill area. Contaminated materials will be excavated and temporarily placed on and covered by plastic sheeting in a containment area a minimum of 100 feet away from any wetland or waterbody, until proper disposal is arranged.
SPC-6	For spills in standing water, floating booms, skimmer pumps, and holding tanks will be used as appropriate by the contractor to recover and contain released materials on the surface of the water.
SPC-9	Materials such as fuels, other petroleum products, chemicals, and hazardous materials including wastes will be located in upland areas at least 500 feet away from streams, 400 feet for public wells, and 200 feet from private wells.
Agency Proposed Mitigation Measures	
WET-1	Impacts on wetland and riparian areas shall be avoided unless physically or economically infeasible. Land management agencies' plans (RMPs and Forest Plans) that have standards, guidelines, stipulations, or avoidance buffers will be adhered to. Where these do not exist, Inland Fish Strategy (INFISH) buffers for fish-bearing and nonfish-bearing waters and wetlands will be followed.
WET-2	Wetland delineations will be performed prior to construction to support CWA Section 404 permitting and to minimize Project impacts. The delineation will identify both wetland and non-wetland waters of the United States that would be affected by the Project.
WET-4	To meet USACE requirements for CWA 404 permitting, the Proponents must submit a plan for mitigation and full compensation for all losses of waters of the United States. This plan must be approved by the USACE. The framework for this plan is included in the Draft EIS (see Appendix C-6) and must be fully detailed for the Final EIS.
Agency Proposed Mitigation Measures Adopted by the Proponents	
WET-3	Where impacts on wetlands are not avoidable, site-specific crossing plans and measures to mitigate impacts shall be submitted to the appropriate regulatory agency, as well as the land managing agency. The Proponent shall apply directly to the appropriate permitting agency (USACE and/or State agency) for approval.
Fish	
Proponent Proposed EPMs	
OM-18	See description under General
BLA-2	See description under Geologic Hazards

Table 2.7-1. Proponent and Agency Proposed Mitigation Measures (continued)

Number	Description
Agency Proposed Mitigation Measures	
FISH-1	On BLM-managed land, all culverts, whether temporary or permanent, must be designed to meet BLM Manual 9113 standards. Culverts should be located, designed, constructed, and maintained according to standards that preserve or improve streambed gradients and velocities to allow fish passage and that minimize erosion and sediment damage. On federal lands, unless the applicable management plan has specific requirements for stream crossings, use the following for culverts in channels with less than 3 percent slope: • The minimum culvert width shall be equal to or greater than 1.5 times the active channel width. • The culvert shall be placed level (zero percent slope). • The bottom of the culvert shall be buried into the streambed at not less than 20 percent of the culvert height at the outlet, and not more than 40 percent of the culvert height at the inlet. Embedment does not apply to bottomless culverts. At sites where the channel slope is greater than 3 percent, additional consideration should be given to alternate design options such as bottomless arch culverts or fords (low-water crossings). This is because of the difficulty of providing for the passage of aquatic species through culverts installed at these sites. Also, the culvert would be installed so that its slope would match the average grade of the stream immediately up- and down-stream of the culvert site. Follow RMP guidelines where specific requirements are included. On NFS lands, Forest Plan standards and guidelines shall apply.
FISH-2	All in-stream construction actions will be conducted when critical fish life stages can be avoided as designated by the appropriate state and federal agencies. All culverts placed in fish habitat will be suitable, as determined by the federal or state agency, for passage by all life stages present or potentially present within the stream reach. Riparian vegetation removal should be kept to the minimum along fish bearing streams. Blasting in or adjacent to fish-bearing streams will require the state fish agency approval prior to blasting. Channel morphology data (e.g., streambank composition, bank slope, stream substrate characteristics, stream slope, riparian vegetation characteristics) will be obtained anywhere a road will cross a stream prior to construction and be used to restore the site of the crossing to pre-Project conditions when temporary roads are decommissioned.
FISH-3	When taking water from TES fish-bearing streams for road and facility construction and maintenance activities, intake hoses shall be screened with the most appropriate mesh size (generally 3/32 of an inch), or as determined through coordination with NMFS and/or USFWS.
FISH-4	If an aquatic invasive species is discovered during surveys for wetlands and waters of the U.S. conducted for USACE and state permitting prior to construction, the waterbody will be flagged and noted on the construction drawings. After work is complete in that waterbody, any equipment involved in construction in that waterbody must be washed to remove any propagules of aquatic invasive species and to prevent the spread of those species to other waterbodies in the Analysis Area.
WILDLIFE	
General	
Agency Proposed Mitigation Measures	
WILD-1	Requests for exceptions from closure periods and areas must be submitted by the Proponents to the appropriate land management agency office in which the exception is requested. Established exception processes on federally-managed lands must be followed. The appropriate agency, or a contractor chosen by the Proponents and approved by the agency, shall conduct any surveys and coordinate with any other agencies as necessary. Factors considered in granting the exception include animal conditions, climate and weather conditions, habitat conditions and availability, spatial considerations (e.g., travel routes and landscape connectivity), breeding activity levels, incubation or nestling stage, and timing, intensity, and duration of the Proposed action. Requests must be submitted in writing no more than 2 weeks prior to the proposed commencement of the construction period, to ensure that conditions during construction are consistent with those evaluated. The authorized officer, on a case-by-case basis, may grant exceptions to seasonal stipulations, and has the authority to cancel this exception at any time.
WILD-12	Any areas that may require blasting will be identified and a blasting plan will be submitted to the appropriate agency for approval. Blasting within 0.25 mile of a known sensitive wildlife resource will require review and approval by the appropriate agency.
WILD-5	Surveys will be conducted within 0.5 mile of the route prior to construction for caves, abandoned mines, and adits. If suitable bat roosts are identified, the Proponents will consult with the applicable land management agency to determine appropriate protective measures.
Big Game	
Proponent Proposed EPMs	
	None proposed

Table 2.7-1. Proponent and Agency Proposed Mitigation Measures (continued)

Number	Description
Agency Proposed Mitigation Measures	
WILD-2	Vehicular speeds during construction and operation shall be limited to 25 mph on all unsurfaced access roads. Crew and vehicle travel will be restricted to designated routes while on federally designated big game winter range (except for areas within the ROW).
WILD-1	See description under General Wildlife.
Raptors	
Proponent Proposed EPMs	
	None proposed
Agency Proposed Mitigation Measures	
WILD-4	On federal lands, accurate monitoring, including identifying nest occupancy, shall be conducted in order to ensure that raptor nests are located in advance of any construction activities. This would be needed to ensure that all construction activities would cease in areas near active nests. Biological monitor on site would perform these surveys ahead of construction. If an occupied nest is found, the appropriate restrictions and closures would be adhered to. All encounters of nesting raptors in the Analysis Area must be reported to the biological monitor and to appropriate agencies.
WILD-1	See description under General Wildlife.
WILD-6	As part of their annual aerial flight line maintenance activities, the Proponents will document perching and nesting activity (by species) on any towers constructed as a result of this Project. This would occur after the first year of construction until year 10 of operations. Results would be provided to the applicable land-management agency.
WILD-7	On federal lands, guy wires should be marked with bird deterrent devices to avoid avian collisions with structures on public lands (I.M. 2010-022).
WILD-8	Flight diverters will be installed and maintained where the transmission line crosses rivers at the locations identified in Table 3.10-3. The flight diverters will be placed on at least one of the higher conductors or ground wires at each crossing in order to reduce avian collisions. Additional locations may be identified by the Agencies.
WILD-3	The Project shall be designed and constructed in compliance with Avian Power Line Interaction Committee standards (APLIC 2006) in order to reduce impacts to avian species. Any changes to the Project's design, as requested by federal, state, or local jurisdictions, as well as any changes considered by the Proponents should also be in compliance with Avian Power Line Interaction Committee standards.
Agency Proposed Mitigation Measures Adopted by the Proponents	
WILD-9	Pre-construction pedestrian or aerial surveys will be completed during the appropriate nesting time periods needed to identify each raptor species. The Proponent will provide survey results to the authorized officer for approval (see WILD-1).
Within Antelope Fawning Areas	
Proponent Proposed EPMs	
PGC-1	No construction May 1 to May 30 in identified areas.
PGC-2	Weekly monitoring will commence May 15 and continue until PGC-3 is met. The Proponents will provide monitoring results to the appropriate land management agency.
PGC-3	If animals are present after May 15, no construction until two consecutive weekly monitoring sessions show no animals present or until July 1 if animals are present.
Agency Proposed Mitigation Measures	
WILD-1	See description under General Wildlife.
Within Antelope Critical Winter Range	
Proponent Proposed EPMs	
PGC-4	Weekly monitoring will commence November 15 in identified areas (see PGC-5). The Proponents will provide monitoring results to the appropriate land management agency.

Table 2.7-1. Proponent and Agency Proposed Mitigation Measures (continued)

Number	Description
PGC-5	Construction may continue past November 15 if no animals are detected, but contractor must be prepared to shut down once four or more antelope are seen in mapped habitat, and may not start work until March 1 at the earliest and if PGC-6 and 7 are met.
PGC-6	Weekly monitoring will be reinitiated, beginning February 15 and continue until PGC-7 is met. The Proponents will provide monitoring results to the appropriate land management agency.
PGC-7	If animals are present, no construction until May 1 or until two consecutive weekly monitoring sessions confirm no animals are present.
Agency Proposed Mitigation Measures	
WILD-1	See description under General Wildlife.
Within Bighorn Sheep Lambing Grounds	
Proponent Proposed EPMs	
PGC-8	No construction May 1 to May 30 in identified areas.
PGC-9	Weekly monitoring will commence May 15 and continue until PGC-10 is met. The Proponents will provide monitoring results to the appropriate land management agency. .
PGC-10	If animals are present after May 30, no construction until two consecutive weekly monitoring sessions show no animals present or until July 1 if animals are present.
Agency Proposed Mitigation Measures	
WILD-1	See description under General Wildlife.
Within Bighorn Sheep Critical Winter Range	
Proponent Proposed EPMs	
PGC-11	Weekly monitoring will commence November 15 in identified areas (see PGC-12).
PGC-12	Construction may continue past November 15 if no animals are detected, but contractor must be prepared to shut down once one or more bighorn sheep are seen in mapped habitat, and may not start work until March 1 at the earliest, and if PGC-13 and -14 are met.
PGC-13	Weekly monitoring will be reinitiated beginning February 15 and continue until PGC-14 is met. The Proponents will provide monitoring results to the appropriate land management agency.
PGC-14	If animals are present, no construction until May 1, or until two consecutive weekly monitoring sessions confirm no animals are present.
Agency Proposed Mitigation Measures	
WILD-1	See description under General Wildlife.
Within Bighorn Sheep Year-long Habitat	
Proponent Proposed EPMs	
PGC-15	Surface disturbance is prohibited year-round within mapped habitat.
Agency Proposed Mitigation Measures	
WILD-1	See description under General Wildlife.
Elk Calving Areas	
Proponent Proposed EPMs	
PGC-16	No construction May 1 to May 30 in identified areas.
PGC-17	Weekly monitoring will commence May 15 and continue until PGC18 is met. The Proponents will provide monitoring results to the appropriate land management agency.
PGC-18	If animals are present after May 30, no construction until two consecutive weekly monitoring sessions show no animals present or until July 1 if animals are present.

Table 2.7-1. Proponent and Agency Proposed Mitigation Measures (continued)

Number	Description
Agency Proposed Mitigation Measures	
WILD-1	See description under General Wildlife.
Within Elk Critical Winter Range	
Proponent Proposed EPMs	
PGC-19	Weekly monitoring will commence November 15 (see PGC-20).
PGC-20	Construction may continue past November 15 if no animals are detected, but contractor must be prepared to shut down once four or more elk are seen in mapped habitat, and may not start work until March 1 at the earliest, and if the following conditions are met.
PGC-21	Weekly monitoring will be reinitiated beginning February 15 and continue until PGC-22 is met. The Proponents will provide monitoring results to the appropriate land management agency.
PGC-22	If animals are present, no construction until May 1 or until two consecutive weekly monitoring sessions confirm no animals are present.
Agency Proposed Mitigation Measures	
WILD-1	See description under General Wildlife.
Within Moose Calving Areas	
Proponent Proposed EPMs	
PGC-23	No construction May 1 to May 30 in identified areas.
PGC-24	Weekly monitoring will commence May 15 and continue until PGC-25 is met. The Proponents will provide monitoring results to the appropriate land management agency.
PGC-25	If animals are present after May 30, no construction until two consecutive weekly monitoring sessions show no animals present or until July 1 if animals are present.
Agency Proposed Mitigation Measures	
WILD-1	See description under General Wildlife.
Within Moose Critical Winter Range	
Proponent Proposed EPMs	
PGC-26	Weekly monitoring will commence November 15 in identified areas (see PGC-27).
PGC-27	Construction may continue past November 15 if no animals are detected, but contractor must be prepared to shut down once one or more moose are seen in mapped habitat, and may not start work until March 1 at the earliest, and if the following conditions are met.
PGC-28	Weekly monitoring will be reinitiated beginning February 15 and continue until PGC-29 is met. The Proponents will provide monitoring results to the appropriate land management agency.
PGC-29	If animals are present, no construction until May 1 or until two consecutive weekly monitoring sessions confirm no animals are present.
Agency Proposed Mitigation Measures	
WILD-1	See description under General Wildlife.
Within Mule Deer Fawning Areas	
Proponent Proposed EPMs	
PGC-30	No construction May 1 to May 30 in identified areas.
PGC-31	Weekly monitoring will commence May 15 and continue until PGC-32 is met. The Proponents will provide monitoring results to the appropriate land management agency.
PGC-32	If animals are present after May 30, no construction until two consecutive weekly monitoring sessions show no animals present or until July 1 if animals are present.

Table 2.7-1. Proponent and Agency Proposed Mitigation Measures (continued)

Number	Description
Agency Proposed Mitigation Measures	
WILD-1	See description under General Wildlife.
Within Mule Deer Critical Winter Range	
Proponent Proposed EPMs	
PGC-33	Weekly monitoring will commence November 15 in identified areas (see PGC-34).
PGC-34	Construction may continue past November 15 if no animals are detected, but contractor must be prepared to shut down once four or more mule deer are seen in mapped habitat, and may not start work until March 1 at the earliest, and if the following conditions are met.
PGC-35	Weekly monitoring will be reinitiated beginning February 15 and continue until PGC-36 is met. The Proponents will provide monitoring results to the appropriate land management agency.
PGC-36	If animals are present, no construction until May 1 or until two consecutive weekly monitoring sessions confirm no animals are present.
Agency Proposed Mitigation Measures	
WILD-1	See description under General Wildlife.
Golden Eagle	
Proponent Proposed EPMs	
PRC-12	A pedestrian or aerial survey of known nest locations will be conducted weekly during the appropriate seasons, beginning no more than 2 weeks prior to construction. The Proponents will provide survey results to the appropriate land management agency.
PRC-13	If nesting eagles are present, monitoring will be conducted until the young have fledged or the nest fails, at which point construction can begin.
PRC-14	If no active nests are detected during the pre-construction surveys construction will occur without further monitoring.
Agency Proposed Mitigation Measures	
WILD-1	See description under General Wildlife.
All Other Raptors	
Proponent Proposed EPMs	
PRC-18	Pre-construction surveys will be conducted during the appropriate seasonal timeframe prior to construction, to identify active nests within 0.5 of a mile of the ROW within suitable habitat. The Proponents will provide survey results to the appropriate land management agency.
PRC-19	If an active nest is found during the protocol level surveys, construction is prohibited within 0.5 mile of the nest until monitoring shows that the young have fledged or the nest fails, whichever occurs sooner. The Proponents will provide survey results to the appropriate land management agency.
PRC-20	If no active nests are detected during the pre-construction surveys construction will occur without further monitoring.
Agency Proposed Mitigation Measures	
WILD-1	See description under General Wildlife.
Migratory Birds	
Proponent Proposed EPMs	
	None proposed
Agency Proposed Mitigation Measures	
WILD-10	To the extent feasible, all vegetation clearing would be conducted prior to the onset of the avian breeding season (generally April 15 through July 31, depending on local conditions and federal land management plan requirements), in order to limit the potential impact of clearing on nesting birds. In addition, pre-construction surveys within the disturbed portion of the ROW and extending a minimum of 30 feet on either side of the ROW shall be conducted. If an active nest is found during pre-construction surveys, the nest will be identified to species, flagged and avoided until any young have fledged. Avoidance distances are species-specific and must be approved by a USFWS-approved biologist.
WILD-11	Snags shall be maintained to the extent practical along the outer portions of the Project's ROW in order to reduce the impacts to habitat for cavity nesters.

Table 2.7-1. Proponent and Agency Proposed Mitigation Measures (continued)

Number	Description
WILD-3	See description under Raptors.
TES-WILDLIFE	
Proponent Proposed EPMs	
	None proposed
Agency Proposed Mitigation Measures	
FISH-3	[See description under Fish]
WILD-3	[See description under Wildlife]
TESWL-1	For the protection of aquatic and riparian/wetland dependent species, surface disturbing and disruptive activities should be avoided in the following areas: 1) identified 100-year floodplains; 2) areas within 500 feet of perennial waters, springs, wells, and wetlands; and 3) areas within 100 feet of the inner gorge of ephemeral channels on federally managed lands. Where it is not possible to avoid wetland and riparian habitat, crossing-specific plans must be developed. These plans shall: 1) demonstrate that vegetation removal is minimized; 2) show how sediment would be controlled during construction and operation within wetland and riparian areas; 3) attempt to intersect the wetland or riparian habitat at its edge; and 4) provide measures to restore habitat and ensure conservation of riparian microclimates. This plan must be submitted to the appropriate land management agency and approved prior to construction of any portion of the Project within sensitive riparian habitat.
TESWL-2	The Proponents shall work with the applicable land-management agencies to develop a survey protocol that would be conducted in conjunction with annual operations and maintenance surveys (as outlined in the Proponent's Avian Protection Plans). The goal of these raptor-raven surveys shall be to identify whether populations of raptors and ravens are consolidating along the Project, and will be done during the appropriate time of year. These surveys shall be conducted, at a minimum, along portions of the line that are located within 1 mile of identified concentrations of sensitive raptor and raven prey species (including the black-footed ferret, mountain plover, burrowing owl, grouse species, as well as white- and black-tailed prairie dogs). The Proponents and applicable land-management agencies shall work together to identify measures to limit predation rates on sensitive species within areas where raptor and raven populations are considered to be consolidating (limited to areas near sensitive species).
TESWL-3	H-frame structures shall be equipped with anti-perch devices to reduce raven and raptor use, and limit predation opportunities on special status prey species.
Black-footed Ferret	
Proponent Proposed EPMs	
PMC-1	No surface disturbance would occur in black footed ferret non-block-cleared areas that are part of a white-tailed prairie dog complex that is greater than 200 acres and identified by USFWS as a potential black footed ferret reintroduction area (USFWS 1989) until cleared by species-specific presence/absence protocol level surveys.
PMC-2	Pre-construction presence/absence surveys (USFWS 1989) would be conducted in suitable habitat within mapped non-block-cleared areas, as necessary. Results of surveys would be valid for a 12-month period.
PMC-3:	In the event that black footed ferrets are documented, construction would cease within the vicinity of the documented occurrence and the USFWS would be notified. In addition, the transmission line or structures would be relocated to minimize direct impacts to prairie dog colonies to the extent possible.
Agency Proposed Mitigation Measures	
TESWL-4	In the event that an ESA listed species is discovered during surveys, construction would cease, the USFWS would be notified, and Section 7 consultation would be initiated. In addition, the transmission line or structures would be relocated to minimize direct impacts to newly discovered ESA species, to the extent practical.
TESWL-5	Pre-construction surveys must be conducted for the black-tailed prairie dog (in addition to those already proposed for the white-tailed prairie dog and the black-footed ferret) in Segments 1E and 1W. If prairie dogs or their habitat are documented, then surveys for black-footed ferrets must occur. If black-footed ferrets are found, construction in that area must halt and consultation with the USFWS be initiated. If black-tailed prairie dogs are discovered during construction, all construction activities must cease and a survey for the black-footed ferret shall be conducted. If black-footed ferrets are found, construction in that area must halt and consultation with the USFWS would be re-initiated.

Table 2.7-1. Proponent and Agency Proposed Mitigation Measures (continued)

Number	Description
Bald Eagle Active Nests	
Proponent Proposed EPMs	
PRC-1	A pedestrian or aerial survey of known nest locations within a 1 mile buffer of active project facilities will be conducted no more than 2 weeks prior to construction. The Proponents will provide survey results to the appropriate land management agency.
PRC-2	If nesting bald eagles are present, the USFWS will be notified and monitoring will be conducted until the young have fledged or the nest fails, at which point construction can begin.
PRC-3	If no nesting activity has been initiated by April 1, construction will be permitted for the remainder of the nesting season without further monitoring.
Agency Proposed Mitigation Measures	
TESWL-6	Requests for exceptions from bald eagle closure periods and areas must be submitted by the Proponents to the appropriate land-management agency office in which the exception is requested. Established exception processes on federally managed lands must be followed (see WILD-1).
Bald Eagle Winter Roosts	
Proponent Proposed EPMs	
PRC-4	If roosting activity has been initiated, then no construction will be initiated within the prescribed buffer; however, if no roosting activity has been initiated by January 1, then construction will be permitted for the remainder of the roosting season without further monitoring.
Agency Proposed Mitigation Measures	
	None proposed
Ferruginous Hawk	
Proponent Proposed EPMs	
PRC-6	A pre-construction pedestrian or aerial survey will be conducted two weeks prior to construction, to identify active nests within 1 mile of the ROW.
PRC-7	If an active nest is present, monitoring will be conducted until the young have fledged or the nest fails, whichever occurs sooner, and no surface-disturbing activities will occur within 1 mile of the nest while the nest is active. Monitors will observe the nests from an appropriate distance to avoid disturbing birds.
PRC-8	If no active nests are detected during the pre-construction surveys construction will occur without further monitoring.
Agency Proposed Mitigation Measures	
TESWL-20	Requests for exceptions from ferruginous hawk closure periods and areas must be submitted by the Proponents to the appropriate land-management agency office in which the exception is requested. Established exception processes on federally managed lands must be followed (see WILD-1).
Flammulated Owl	
Proponent Proposed EPMs	
PRC-9	Pre-construction protocol level surveys (USFS 1993, 2008) will be conducted during the appropriate seasonal timeframe prior to construction in suitable habitat, to identify active nests within 0.25 of a mile of the ROW. The Proponents will provide survey results to the appropriate land management agency.
PRC-10	If an active nest is found during the protocol level surveys, construction is prohibited within 0.25 mile of the nest until monitoring shows that the young have fledged or the nest fails, whichever occurs sooner.
PRC-11	If no active nests are detected during the pre-construction protocol surveys, construction will occur without further monitoring.
Agency Proposed Mitigation Measures	
TESWL-21	Requests for exceptions from northern goshawk closure periods and areas must be submitted by the Proponents to the appropriate land-management agency office in which the exception is requested. Established exception processes on federally managed lands must be followed (see WILD-1).
Northern Goshawk	
Proponent Proposed EPMs	
PRC-15	Pre-construction pedestrian surveys (USFS 1993, 2008) will be conducted during the appropriate seasonal timeframe prior to construction in suitable habitat, to identify active nests within 0.5 of a mile of the ROW within suitable habitat. The Proponents will provide survey results to the appropriate land management agency.

Table 2.7-1. Proponent and Agency Proposed Mitigation Measures (continued)

Number	Description
PRC-16	If an active nest is found during the protocol level surveys, construction is prohibited within 0.25 mile of the nest until monitoring shows that the young have fledged or the nest fails, whichever occurs sooner, and no surface-disturbing activities will occur within 0.5 mile of the nest while the nest is active.
PRC-17	If no active nests are detected during the pre-construction surveys construction will occur without further monitoring.
Agency Proposed Mitigation Measures	
	None proposed
Pygmy Rabbit	
Proponent Proposed EPMs	
PMC-4	The year prior to construction, protocol level surveys (Ulmschneider 2004) would be conducted in suitable habitat (defined by both Project-specific mapping conducted in 2008 and agency habitat mapping) within 300 feet of and including the ROW. Survey results shall be provided to the appropriate land management agency. (A distance of 300 feet was chosen because burrow systems have been found to extend to approximately 300 feet [Bradfield 1974].)
PMC-5	During the protocol level surveys, any areas of occupied habitat will be mapped with a GPS unit. No surface disturbances of active burrows will occur.
PMC-6	Where feasible and if needed, the transmission line would be microsited to avoid occupied habitat.
PMC-7	Within 30 days prior to construction, previously occupied habitat would be re-visited to document presence using protocol level surveys (Ulmschneider 2004). Occupied habitat would be re-mapped electronically and flagged in the field to allow additional micrositing to avoid the occupied habitat to the extent possible.
Agency Proposed Mitigation Measures	
	None proposed
Wyoming Pocket Gopher	
Proponent Proposed EPMs	
PMC-8	Protocol level surveys (Keinath and Beauvais 2006) would be conducted within suitable habitat in Segments 2, 3, and 4, in order to determine species presence in areas that could be impacted by Project components. Proponents will provide survey results to the appropriate land management agency.
PMC-9	All ground disturbances would be avoided to the extent practical where the Wyoming pocket gopher is documented.
PMC-10	Previously documented occurrences of the Wyoming pocket gopher would be avoided during operation and maintenance activities.
Agency Proposed Mitigation Measures	
	None proposed
Burrowing Owl	
Proponent Proposed EPMs	
PRC-5	Within 30 days prior to construction, protocol level surveys (CDOW 2007) will be conducted in suitable or occupied habitat. Active burrows will be mapped electronically and flagged in the field to determine if transmission line features can avoid burrows. If avoidance is not feasible, construction will not begin until August 16. The Proponents will provide survey results to the appropriate land management agency.
Agency Proposed Mitigation Measures	
TESWL-7	Requests for exceptions from burrowing owl closure periods and areas must be submitted by the Proponents to the appropriate land-management agency office in which the exception is requested. Established exception processes on federally managed lands must be followed (see WILD-1).
TESWL-8	A wildlife biologist will accompany site engineers during the final engineering design, in order to verify and flag the location of any known occupied structures (e.g., nests, burrows, colonies) utilized by sensitive species. This will include, but not be limited to, known burrowing owl burrows (including artificial burrows that have been constructed as part of research/restoration efforts), prairie dog colonies, and raptor nests, which could be impacted by the Project based on the indicative engineering design. The final engineering design will be routed to avoid direct impact to these occupied structures to the extent practical.

Table 2.7-1. Proponent and Agency Proposed Mitigation Measures (continued)

Number	Description
Sharp-tailed Grouse	
Proponent Proposed EPMs	
PAC-1	All previously identified Columbian sharp-tailed grouse leks within 1 mile of the center line of the Project will be surveyed during the breeding season (March 15 to June 15) prior to construction to determine if the lek is active. If no lek activity is observed by April 15th, no further restrictions apply for that year. Measures PAC-2, -3, and -4 will not apply if lek is not active. The Proponents will provide survey results to the appropriate land management agency.
PAC-2	Surface disturbance will be prohibited year-round within 0.25 mile of previously documented leks.
PAC-3	No surface disturbance from 0.25 mile to 0.65 mile of a known active lek from March 1 to June 30. If no lek activity is observed by April 15th, no further restrictions apply for that year. If lek activity is observed, surface disturbance from 0.25 mile to 0.65 mile may not occur until after June 30.
PAC-4	Surface disturbance occurring more than 0.65 mile from the lek may occur at any time.
PAC-5	Notification will be placed in areas frequented by on-site personnel (such as break rooms) to advertise the importance of complying with these restrictions.
PAC-6	Operation and maintenance activities will be scheduled to avoid working within 0.65 mile of previously documented leks from March 15 to July 15.
Agency Proposed Mitigation Measures	
TESWL-9	Requests for exceptions from Columbia sharp-tailed grouse closure periods and areas must be submitted by the Proponents to the appropriate land-management agency office in which the exception is requested. Established exception processes on federally managed lands must be followed (see WILD-1).
TESWL-10	Proponents shall provide the Agencies a list of the protocols that the Proponents would use during greater sage-grouse and sharp-tailed grouse pre-construction surveys. The Agencies shall either approve these protocols, or suggest alternative protocols to be used.
TESWL-11	In areas where sharp-tailed grouse leks occur in proximity to greater sage-grouse leks, surface disturbance shall be avoided within 4 miles of occupied or undetermined greater sage-grouse leks from March 1 to July 15. In areas where sharp-tailed grouse leks occur in isolation from greater sage-grouse leks, surface disturbance shall be avoided within 1.2 miles of occupied or undetermined sharp-tailed grouse leks from March 15 to July 15.
Mountain Plover	
Proponent Proposed EPMs	
PAC-19	Pre-construction protocol level surveys (USFWS 2002b) will be conducted during the appropriate seasonal timeframe prior to construction in suitable habitat, to identify active nests within 0.25 mile of the ROW. If no nests are found, construction can commence. The Proponents will provide survey results to the appropriate land management agency.
PAC-20	If an active nest is found during the protocol level surveys, monitoring will be conducted until the young have fledged or the nest fails, whichever occurs sooner, and no surface-disturbing activities will occur within 0.25 mile of the nest while the nest is active.
PAC-21	If no active nests are discovered during the pre-construction surveys (USFWS 2002b), construction will be permitted for the remainder of the nesting season without further monitoring.
Agency Proposed Mitigation Measures	
TESWL-12	Requests for exceptions from mountain plover closure periods and areas must be submitted by the Proponents to the appropriate land management agency office in which the exception is requested. Established exception processes on federally-managed lands must be followed (See WILD-1).
Three-toed Woodpecker	
Proponent Proposed EPMs	
PAC-22	Pre-construction protocol level surveys will be conducted during the appropriate seasonal timeframe prior to construction in suitable habitat, to identify active nests within the ROW.
PAC-23	If an auditory response is received and an active nest is found, monitoring will be conducted until the young have fledged or the nest fails, whichever occurs sooner, and no surface-disturbing activities will occur within 0.25 mile of the nest while the nest is active. The Proponents will provide survey results to the appropriate land management agency.
PAC-24	If no nests are discovered, construction will be permitted for the remainder of the nesting season without further monitoring.
Agency Proposed Mitigation Measures	
	None proposed

Table 2.7-1. Proponent and Agency Proposed Mitigation Measures (continued)

Number	Description
Columbia spotted frog	
Proponent Proposed EPMs	
	None proposed
Agency Proposed Mitigation Measures	
TESWL-1	See the description under TES Wildlife above
Yellow billed cuckoo	
Proponent Proposed EPMs	
	None proposed
Agency Proposed Mitigation Measures	
TESWL-13	A pre-construction survey for the yellow-billed cuckoo must be conducted at any proposed crossing of suitable habitat. If these birds are detected within 1 mile of the centerline (within existing habitat), construction must not occur until the young have fledged or the nest is abandoned. The crossing-specific plan must contain proposed monitoring measures to assure compliance with this measure.
Midget faded rattlesnake	
Proponent Proposed EPMs	
	None proposed
Agency Proposed Mitigation Measures	
TESWL-18	Pre-construction surveys for occupied or potential midget faded rattlesnake hibernacula (i.e., rock outcrops with south to east aspect) will be conducted.
Sage-Grouse	
Proponent Proposed EPMs	
PAC-7	All greater sage-grouse leks determined to be within 1 mile of the centerline of the Project would be surveyed using protocols, which have been approved by federal and state agencies, during the breeding season immediately prior to construction to determine whether the lek is active. The Proponents will provide survey results to the appropriate land management agency.
PAC-8	There would be no construction activities through Idaho's key and restoration greater sage-grouse habitats and Wyoming's core habitats within 1 mile of active leks from March 1 to May 15 between 6 p.m. and 9 a.m. Off-limit areas would be marked so that workers in the area are aware of these sensitive areas.
PAC-9	If no lek activity has been observed by April 25, construction activities may proceed.
PAC-10	Surface disturbance would be prohibited year-round within 0.25 mile of previously documented leks.
PAC-11	Notification would also be placed in areas frequented by on-site personnel (such as break rooms) to advertise the importance of complying with these restrictions.
PAC-12	Temporal and spatial restrictions do not apply when lek or nesting and brood rearing habitat is separated from Project activities by other forms of human disturbance (e.g., agriculture, highways) or by line of sight barriers.
Agency Proposed Mitigation Measures	
TESWL-14	Surface disturbance shall be avoided within 0.6 to 4 miles of occupied or undetermined greater sage-grouse leks from March 15 to July 15 in all portions of the Project except for Nevada. In Nevada, surface disturbance shall be avoided within view of or within 0.3 mile of all leks from March 1 to May 15; and within areas designated by Nevada as greater sage-grouse brood rearing areas from May 15 to August 15..
TESWL-15	There shall be no surface occupancy (NSO) within 0.6 mile of the perimeter of occupied greater sage-grouse leks. "No surface occupancy," as used here, means no surface facilities, including roads, shall be placed within the NSO area. Other activities may be authorized with the application of appropriate seasonal stipulations, provided the resource's protected area is not adversely affected.
TESWL-16	Requests for exceptions from greater sage-grouse closure periods and areas must be submitted by the Proponents to the appropriate land management agency office in which the exception is requested. Established exception processes on federally-managed lands must be followed (See WILD-1).

Table 2.7-1. Proponent and Agency Proposed Mitigation Measures (continued)

Number	Description
TESWL-19	There shall be no surface disturbances within areas designated as Winter Concentration Areas for the greater sage-grouse from November 1 through March 15.
TESWL-22	No structures that require guy wires would be used in occupied sagebrush obligate habitats within the area managed under the Kemmerer RMP.
TESWL-23	If the Kemmerer RMP is amended to allow Alternatives 4A, 4C, 4E, or 4F to be selected, existing fences within 1 mile of the portion of the Gateway West Project located on lands managed by the Kemmerer RMP shall be modified with FireFly Grouse Flight diverters (or a similar product) in order to prevent greater sage-grouse mortalities. Additional site-specific reclamation, such as transplanting sagebrush seedlings within previous disturbed habitats, may also be required to off-set the net loss of sagebrush habitats within the Rock Creek/Tunp management area.
Colorado River T&E Fishes	
Agency Proposed Measures Adopted by the Proponents	
TESWL-17	A payment of a one-time fee, based on a fee schedule provided by the USFWS, shall be made based on the amount of water used during construction of any segments that cross the Colorado River system.
MINERALS	
Proponent Proposed EPMs	
	None proposed
Agency Proposed Mitigation Measures	
MN-1	A geotechnical investigation will be conducted by the Proponents in areas where abandoned underground mines are known to occur to determine the presence of methane and the likelihood of subsidence.
MN-2	An accounting of damages will be conducted by the Proponents to current operators to determine the potential loss of mineral resources. There may be mining claims under the 1872 Mining Law that would have precedence over the Project. Similarly, federal and state mineral lease agreements provide rights to lessees that could interfere with the Gateway West Project. The Proponents will resolve mineral claim and lease agreements prior to Project initiation, as with site access agreements on private property.
PALEONTOLOGICAL RESOURCES	
Proponent Proposed EPMs	
CUL-1–3	[See description under Cultural Resources]
CUL-9	If significant fossil materials are discovered during Project construction, all surface-disturbing activities in the vicinity of the find will cease until notification to proceed is given by the authorized officer. The site will be protected to reduce the risk of damage to fossils and context. Appropriate measures to mitigate adverse effects to significant paleontological resources will be determined by the authorized officer.
Agency Proposed Mitigation Measures	
PALEO-1	The Proponents shall prepare a Paleontological Monitoring Plan for the Project, focusing on Segments 4, 7, 8, and 9 where the potential for adverse impacts is the greatest. This plan shall be submitted to appropriate agencies for review and approval prior to commencing construction. The plan should specify that: • Monitoring of excavation and grading in sensitive sediments, especially access roads and tower sites, must occur when construction is near or in those geologic formations. • Monitoring of excavations in sensitive sediments, screening the excavated spoils, and processing of bulk sediment samples for microvertebrate fossils must occur where there is a significant potential for data recovery from those spoils. • Monitoring must be performed by a qualified paleontologist and in consultation with a designated paleontologist in each state, NF, or BLM district. The Authorized Officer will designate the appropriate paleontologist depending on project location.
PALEO-3	Areas with Fossil Potential Classification sensitivity rankings of 3, 4, or 5 on NFS lands will be surveyed and posted.
Agency Proposed Mitigation Measures Adopted by the Proponents	
PALEO-2	Where fossil-bearing sediments are exposed by construction, the sediments must be covered with a 4-inch layer of soil where feasible to reduce unauthorized removal or disturbance of resources.

Table 2.7-1. Proponent and Agency Proposed Mitigation Measures (continued)

Number	Description
GEOLOGIC HAZARDS	
Proponent Proposed EPMs	
BLA-1	The Blasting Plan will identify blasting procedures including safety, use, storage, and transportation of explosives that will be employed where blasting is needed, and will specify the locations of needed blasting.
BLA-2	All blasting will be performed by registered licensed blasters who will be required to secure all necessary permits and comply with regulatory requirements in connection with the transportation, storage, and use of explosives, and blast vibration limits for nearby structures, utilities, wildlife, and fish (where blasting is conducted in waterbodies).
Agency Proposed Mitigation Measures	
GEO-1	A site-specific landslide mitigation plan that addresses measures to be taken in the design, construction, and operation to minimize failure due to landslides must be prepared and submitted by the Proponents with the construction POD prior to issuance of a ROW grant on federally managed lands.
GEO-3	On-site slope stability examinations will be performed on NFS lands for slopes over 40 percent prior to designing project features that require the removal of forest.
GEO-4	A site-specific soil analysis shall be conducted prior to construction to verify any areas identified as unstable or marginally unstable in the Caribou National Forest Soil Resource Inventory.
Agency Proposed Mitigation Measures Adopted by the Proponents	
GEO-2	Review the final location of the preferred alternative with affected mine operators and lessees to ensure all measures are taken to protect against subsidence.
SOILS	
Proponent Proposed EPMs	
SW-1, 4, 5, 7–12	[See description under Water Quality]
SW-2, 3	[See description under Water Quality]
SW-6	[See description under Water Quality]
SW-13	In areas of droughty soils, the soil surfaces will be mulched and stabilized to minimize wind erosion and to conserve soil moisture in accordance with the SWPPPs.
SPC-1–4, 6	[See description under Wetlands]
SPC-5	If a spill occurs which is beyond the capability of on-site equipment and personnel, an Emergency Response Contractor will be identified and available to further contain and clean up the spill.
SPC-7	If pre-existing contamination is encountered during operations, work will be suspended in the area of the suspected contamination until the type and extent of the contamination is determined. The type and extent of contamination; the responsible party; and local, state, and federal regulations will determine the appropriate cleanup method(s) for these areas.
SPC-8	The SPCC Plan will include details on the types and quantities of absorbent and protective materials (e.g., visqueen, booms) that must be readily available to construction personnel and requirements for the restocking of materials.
SPC-10	Pumps and temporary fuel tanks for the pumps will be stored in secondary containment. Containment will provide a minimum volume equal to 110 percent of the volume of the largest storage vessel located in the yard.

Table 2.7-1. Proponent and Agency Proposed Mitigation Measures (continued)

Number	Description
Agency Proposed Mitigation Measures	
SOIL-1	Efforts will be made to preserve topsoil and minimize mixing with subsoil. In agricultural areas, the landowner or land management agency will be asked to provide input on placement of removed topsoil. The Wyoming State Reclamation Policy and applicable Agency management plan requirements for soil management will be followed. Soil disturbances in agricultural areas will be developed to minimize impacts to existing agricultural activities where possible. Unless the landowner or land management agency specifically approves otherwise, the Proponents will prevent the mixing of topsoil with subsoil by stripping topsoil from the portion of the construction work area that will be restored (construction pad, storage yards, and fly yards) in actively cultivated or rotated croplands and pastures and other areas at the landowner's or land-managing agency's request. Where topsoil segregation is required, the Proponents will maintain separation of salvaged topsoil and subsoil throughout all construction activities. Immediately after construction, topsoil will be restored to the areas not dedicated to operational requirements and revegetated as specified in the EPMs.
SOIL-5	Disturbed soil will not be allowed to support the growth of noxious weeds, or invasive weedy species. Prevention of noxious weeds will apply to all phases of the Project.
SOIL-7	The Proponents are responsible for monitoring to ensure soil protection is achieved, and providing monitoring reports on reseeding success or other methods to stabilize soils to the Forest Service by the end of each growing season for areas on NFS lands.
SOIL-8	Reclamation of all temporary disturbances on NFS lands (such as road cuts) should include replacement of material to original contours. Re-compaction to pre-existing compaction percentage (which should be identified before disturbance) should be included in the plan. Guidelines for streambank re-compaction to maximize vegetative regrowth and mechanical stability are covered in USACE publication ERDC TN-EMRRP-SR-26 (Goldsmith et al. 2001).
SOIL-9	On federal land, follow land management plan requirements on the location of waste material (silt, sand, gravel, soil, slash, debris, chemical, etc.)
SOIL-10	On NFS lands, soil resources will be inventoried to National Cooperative Soil Survey Standards, and volumes and suitability of soil resources for reclamation will be determined prior to disturbance.
SOIL-11	In specific sensitive areas (such as erosive soils, steep slopes) on lands managed by the Kemmerer FO, the access road used for construction will be restored and an alternative access route for operations designated.
Agency Proposed Mitigation Measures Adopted by the Proponents	
SOIL-2	The Proponents will submit a Compaction Monitoring Plan for review and Agency approval prior to construction that specifies the conditions under which construction will either not start or will be shut down due to excessively wet soils. Conditions will be measurable in the field and easy to demonstrate to construction workers.
SOIL-3	During decommissioning, some obviously compacted areas, such as established service roads, will require loosening prior to revegetation. If necessary to re-establish vegetation, the Proponents will use a ripper blade, till, or similar instrument to loosen the surface soil layer.
SOIL-4	Reclamation will include revegetation unless pre-existing conditions were not vegetated (rocky areas, agricultural fields). On public land the appropriate agency will provide input on the extent of reclamation, the type of vegetation to be planted, and the monitoring necessary to ensure reclamation success.
SOIL-6	Detrimental soil disturbance such as compaction, erosion, puddling, and displacement will be limited or mitigated to meet long-term soil productivity goals on NFS lands. Treatment should include road ripping, frequent waterbars, cross-ditching (e.g., rolling-dips) or other methods to reduce compaction while preventing gully formation. Ripping pattern should be altered to a crossing, diagonal, or undulating pattern of tine paths to avoid concentrated runoff patterns that can lead to gullies.
WATER RESOURCES/AQUATIC	
Proponent Proposed EPMs	
SW-1	The appropriate NPDES permits for construction activities that disturb one acre or more of land will be obtained from the Department of Environmental Quality and USEPA or their designees.
SW-2	NPDES permit requirements will be met. This includes implementing and maintaining appropriate BMPs for minimizing impacts to surface water.
SW-3	One or more responsible persons will be designated to manage stormwater issues, conduct the required stormwater inspections, and maintain the appropriate records to document compliance with the terms of the NPDES permit.
SW-4	The SWPPPs will be modified as necessary to account for changing construction conditions.
SW-5	The SWPPPs will identify areas with critical erosion conditions that may require special construction activities or additional BMPs to minimize soil erosion.
SW-7	Stormwater BMPs will be maintained on all disturbed lands during construction activities, as described in the SWPPP.
SW-8	Approved sediment and erosion control BMPs will be installed and maintained until disturbed areas meet final stabilization criteria.

Table 2.7-1. Proponent and Agency Proposed Mitigation Measures (continued)

Number	Description
SW-9	Temporary BMPs will be used to control erosion and sediment at staging areas (equipment storage yards, fly yards, lay down areas) and substations.
SW-10	The construction schedule may be modified to minimize construction activities in rain-soaked or muddy conditions.
SW-11	Damaged temporary erosion and sediment control structures will be repaired in accordance with the SWPPP.
SW-12	Upon completion of construction, permanent erosion and sediment BMPs will be installed along the transmission line within the ROW, at substations, and at related facilities in accordance with the SWPPPs.
SPC-1–4, 6, 9	[See description under Wetlands]
SPC-5, 7, 8, 10	[See description under Soils]
Agency Proposed Mitigation Measures Adopted by the Proponents	
WQA-1	Avoid placement of road bed material in channels (perennial, intermittent or ephemeral). Road bed material contains considerable fines that would create sedimentation in coarse cobble dominated stream channels. Even in seasonally dry reaches those fines could be transported during flow periods and negatively impact fish spawning reaches below.
WQA-2	On federal lands, consult with appropriate land management agency staff prior to siting and design for stream crossings (location, alignment, and approach for culvert, drive-through, and ford crossings). This may include a hydrologist, engineer and, for perennial and many intermittent streams, an aquatic biologist.
WQA-5	On non-federal lands, culvert placement should comply with state BMPs. The minimum size culvert will be 12 inches in diameter. If a channel width exceeds 3 feet, additional pipes may be used until the cross sectional area of the pipes is greater than 60 percent of the cross sectional area of the existing channel. Filter cloth should be placed on the streambed and banks prior to placement of the pipe, and the culvert should be covered with a minimum of 1 foot of aggregate.
WQA-3	All culverts on NFS lands, both permanent and temporary, shall be designed and installed to meet desired conditions for riparian and aquatic species as identified in the applicable Forest Plan. Culverts should not be hydraulically controlled. Hydraulically controlled culverts create passage problems for aquatic organisms. Culvert slope should not exceed stream gradient and should be designed and implemented (typically by partial burial in the streambed) to maintain streambed material in the culvert
WQA-4	Culvert sizing on NFS lands should also comply with *Guidance for Aquatic Species Passage Design, Forest Service Northern Region & Intermountain Region* (Forest Service 2003f) , and culvert sizing on BLM-administered land shall comply with BLM Manual 9113.
SOIL-4	[See description under Soils]
VEG-3, -6	[See description under Vegetation]
FISH-1, -2	[See description under Fish]
LAND USE	
Proponent Proposed EPMs	
TR-7	Unauthorized vehicles will not be allowed within the construction right-of-way (ROW) or along roadsides near the ROW.
Agency Proposed Mitigation Measures	
LU-1	To assist agency and county law enforcement in minimizing unauthorized OHV use on public and private lands, monitor OHV use and post signs along access roads where OHV activity has increased in areas on public lands where OHVs are regulated by a land use plan, and on private, state, and Tribal lands at the request of the landowner, agency, or Tribal government. Signs shall indicate the restriction or regulation, location, penalty for violation, and appropriate contact information for reporting violations. Signage shall be maintained and replaced as part of the routine maintenance. Consult with appropriate Agencies on additional measures to block unauthorized OHV use.
LU-2	Coordinate with the Foxley Airstrip owner to realign the location of Alternative 1E-C to eliminate the impact to the airstrip or in some manner compensate for any loss of use.
LU-3	Work with the private landowner of the ice cave along Alternative 1E-C and microsite the facilities during final design to reduce effects.
LU-4	Coordinate with the Chokecherry-Sierra Madre Wind Farm and TransWest Express Project developers and BLM along the Segment 2 Proposed Route to ensure mutually compatible siting of transmission lines and wind energy facilities.

Table 2.7-1. Proponent and Agency Proposed Mitigation Measures (continued)

Number	Description
LU-5	Work with the owners of potentially affected industrial buildings and microsite the transmission line during final design to avoid impact to these structures.
LU-6	Review the final location of the Segment 3 Proposed Route with any affected oil/gas well operators to ensure measures are taken to protect against any impacts to wells. This measure also applies to any segment where the Proposed Route would be near oil/gas wells.
LU-7	Once the final locations of towers where crossings of the MTR would occur are known, IDANG should be consulted to ensure that the proper information is made available for proper warnings.
LU-8	Coordinate with the owner of the planned Dry Creek Sky Ranches airstrip to realign the Segment 7 Proposed Route or airstrip or in some way compensate for loss of use.
LU-9	Alternative 8C along Segment 8 should be realigned in the vicinity of the Mayfield Springs subdivision during final design to reduce impact on the planned Mayfield Springs community.
LU-10	Consult with the IDANG to determine if the Segment 8 Proposed Route can be sited in such a way as to not compromise the training mission in the Alpha Maneuver Sector of the Orchard Training Area, thereby avoiding relocation of the existing transmission line if possible.
LU-11	Consult with the BLM to determine how best to construct and maintain the Proposed Route transmission line through the area closed to motorized vehicles along the Snake River to ensure no impacts to existing natural, cultural, and historic resources.
AGRICULTURE	
Proponent Proposed EPMs	
REC-13, REC-18, & OM-29	See description under Vegetation.
REC-21	See description under WETLANDS.
Agency Proposed Mitigation Measures	
AGRI-1	Provide for a qualified Agricultural Specialist to assist construction planning, construction, restoration, post-construction monitoring, and follow-up restoration.
AGRI-2	Maintain an active program of liaison with landowners and tenants, including specific points of contact whose responsibilities shall include pre-construction inventory, notices, complaint resolution, damage assessment, and negotiation and compensation.
AGRI-3	Establish procedures for determining ingress and egress routes with landowners and tenants, protection methods for off-ROW roads over agricultural lands and on ROW pads, including methods such as geotextile matting to segregate temporary rock fill.
AGRI-4	Establish the location of temporary roads to be used for construction purposes through negotiation with the landowner, with existing farm lanes or two tracks as preferred temporary access roads, restoring temporary access roads to pre-construction condition and leaving temporary access roads intact through mutual agreement with the landowner and tenant unless located in flood areas or drainage hazard areas, or otherwise restricted by federal, state, or local regulations.
AGRI-5	Maintain landowner and tenant access across construction areas for farm equipment and livestock to fields isolated by construction activities and install temporary fences and gates across the construction area, as necessary, to facilitate agricultural operations.
AGRI-6	Protect topsoil by stripping and segregating topsoil in the disturbance area on agricultural lands unless negotiated differently with the landowner or tenant. They shall prevent segregated topsoil from being mixed with cut-and-fill materials, rock, construction debris, excavated materials, or other subsoil.
AGRI-7	Restrict the operation of vehicles and heavy equipment, or take other appropriate action, so that deep rutting does not result in mixing of topsoil and subsoil on excessively wet soils on the portion of the construction work area in agricultural land where the topsoil is not stripped.
AGRI-8	Protect irrigation operations and drain tiles by 1) contacting landowners and tenants to identify the location of irrigation systems and wells, identified underground irrigation water pipes, well systems, and drain tiles that intersect the construction area; 2) repairing disrupted irrigation and drain tile systems as soon as possible; 3) maintaining the flow of irrigation water during construction or coordinating a temporary shut-off with affected parties; and 4) compensating affected parties for crop losses that result from irrigation and drain tile system interruptions due to construction.
AGRI-9	Protect agricultural lands from dewatering activities by pumping into a constructed energy-dissipating structure that shall minimize damage to adjacent agricultural land, drainage systems, and crops.
AGRI-10	Restore the land to the pre-construction condition or provide compensation.

Table 2.7-1. Proponent and Agency Proposed Mitigation Measures (continued)

Number	Description
AGRI-11	Decompaction of exposed subsoil before topsoil replacement shall be accomplished utilizing an agricultural subsoiler or other appropriate implement. After decompaction and prior to topsoil replacement, a disc or harrow shall be utilized, as necessary, to smooth the subsoil surface.
AGRI-12	Following final grading and topsoil replacement in agricultural lands, deep tillage shall be used to relieve soil compaction in construction areas or the Proponents shall test soils for compaction at regular intervals. Where soil compaction is tested, construction areas shall be compared to adjacent areas not disturbed by construction.
AGRI-13	Decompact agricultural lands where topsoil has not been removed by using a non-inversion, deep-tillage agricultural subsoiler specifically designed for soil decompaction and designed to minimize surface disturbance and the mixing of subsoil with topsoil.
AGRI-14	Existing range improvements that are damaged or modified during construction shall be repaired. Additionally, temporary fences and gates shall be removed after construction if requested by landowner or land-management agency.
AGRI-15	If a dairy farm reports problems with stray voltage, complete a free, on-site investigation and determine the level of voltage and fix any problems resulting from their transmission line to less than 1 volt.
AGRI-16	Align the transmission line to avoid the CAFO approximately 14.5 miles east of the proposed Cedar Hill Substation if this route is approved.
AGRI-17	Realign the transmission line route during final design to avoid affecting any CAFOs.
AGRI-18	Consult with the Farm Service Agency and landowners to determine if construction would affect the CRP status of the land currently enrolled in CRP or if special construction or revegetation techniques would be necessary.
TRANSPORTATION	
Proponent Proposed EPMs	
TR-1	A Traffic and Transportation Management Plan will be developed and implemented to provide site-specific details showing how the Project will comply with the EPMs listed in this attachment. This plan will be submitted to and approved by the appropriate federal, state, and local agencies with authority to regulate use of public roads, and approved, prior to the issuance of a Notice to Proceed with construction.
TR-2	[See description under Air Quality]
TR-3	If the Project proposes to obtain water from wells or surface water sources to suppress dust, written approval from the landowner or regulatory agency will be obtained prior to appropriation.
TR-4	If a construction method requires the closure of a state- or county-maintained road for more than 1 hour, a plan will be developed to accommodate traffic as required by a county or state permit.
TR-5	On county- and state-maintained roads, caution signs will be posted on roads, where appropriate, to alert motorists of construction and warn them of slow traffic. Traffic control measures such as traffic control personnel, warning signs, lights, and barriers will be used during construction to ensure safety and to minimize traffic congestion.
TR-6	To reduce traffic congestion and roadside parking hazards, an equipment yard will be provided for primary parking for employee personal vehicles.
TR-7	[See description under Land Use]
TR-8	Construction vehicles will follow a 25 mph speed limit on unposted project roads.
TR-9	All temporary culverts and associated fill material will be removed from stream crossings after construction, and banks will be re-contoured to their pre-disturbance conditions.
TR-10	Landowners will be notified at least 48 hours prior to the start of construction within 0.25 mile of a residence.
TR-11	Emergency vehicle access to private property will be maintained.
TR-12	Roads in residential areas will be restored as soon as possible, and construction areas near residences will be fenced off at the end of the construction day.
TR-13	Roads negatively affected by construction and as identified by the agencies, will be returned to pre-construction condition.
TR-14	Roads developed specifically for this project that are identified by the Proponents as no longer necessary will be reclaimed as specified in the Reclamation, Revegetation, and Weed Management Plan.
Agency Proposed Mitigation Measures Adopted by the Proponents	
TRANS-1	The Proponents will attempt to identify existing two-track trails as preferred temporary access roads for construction.

Table 2.7-1. Proponent and Agency Proposed Mitigation Measures (continued)

Number	Description
TRANS-2	Temporary roads will be designed so proper drainage is not impaired and will be built to minimize soil erosion on or near the temporary roads. Consult with appropriate Agencies on additional design measures.
TRANS-3	Permanent and temporary roads on NFS lands and BLM-administered lands will be consistent with appropriate National Forest and BLM Transportation Management Plans, as amended, and other applicable rules. Permanent roads built for the Project on NFS lands and BLM-administered lands shall be closed to the public. Signs shall indicate the restriction or regulation, location, penalty for violation, and appropriate contact information for reporting violations. Signage shall be maintained and replaced as part of the routine maintenance. Proponents will monitor permanent roads on NFS land and BLM-administered lands yearly, and the applicable land-managing agency shall be provided with annual monitoring reports. Roads will be maintained as required by the Special Use Permit.
TRANS-4	Upon abandonment, temporary access roads may be left intact through mutual agreement of the land management agency, landowner, the tenant, and the Proponents, unless located in flood areas or drainage hazard areas or otherwise restricted by federal, state, or local regulations.
AIR QUALITY	
Proponent Proposed EPMs	
TR-2	Dust suppression techniques will be applied, such as watering construction areas or removing dirt tracked onto a paved road as necessary to prevent safety hazards or nuisances on access roads and in construction zones near residential and commercial areas and along major highways and interstates.
Agency Proposed Mitigation Measures	
VEG-5	[See description under Vegetation]
Agency Proposed Mitigation Measures Adopted by the Proponents	
AIR-1	Minimize idling time for diesel equipment whenever possible.
AIR-2	Ensure that diesel-powered construction equipment is properly tuned and maintained, and shut off when not in direct use.
AIR-3	Prohibit engine tampering to increase horsepower.
AIR-4	Reduce construction-related trips as feasible for workers and equipment, including trucks.
ELECTRICAL ENVIRONMENT	
Proponent Proposed EPMs	
	None Proposed
Agency Proposed Mitigation Measures Adopted by the Proponents	
EE-1	During final design, limit the conductor surface gradient in order to meet the IEEE Radio Noise Guideline.
EE-2	During construction, identify objects such as fences, metal buildings, pipelines, and other metal objects within or near the proposed ROW that have the possibility for induced potentials and currents and implement electrical grounding of these objects according to the utility's and National Electric Code standards.
EE-3	During final design and construction, identify areas where large equipment is anticipated and provide sufficient conductor clearance to ground to meet the NESC 5 mA rule or limit size or access of large equipment.
PUBLIC SAFETY	
Proponent Proposed EPMs	
BLA-1	[See description under Geologic Hazards]
BLA-2	[See description under Geologic Hazards]
BLA-3	Appropriate flags, barricades, and warning signals will be used to ensure safety during blasting operations. Blast mats will be used when needed to prevent damage and injury from fly rock.
BLA-4	Blasting in the vicinity of pipelines will be coordinated with the pipeline operator, and will follow operator-specific procedures, as necessary.
BLA-5	Damages that result from blasting will be repaired or the owner fairly compensated.

Table 2.7-1. Proponent and Agency Proposed Mitigation Measures (continued)

Number	Description
Agency Proposed Mitigation Measures	
FIRE-1	Train all personnel about the measures to take in the event of a fire including fire dangers, locations of extinguishers and equipment, and individual responsibilities for fire prevention and suppression.
FIRE-2	Equip all construction equipment operating with internal combustion engines with spark arresters.
FIRE-3	Restrict motorized equipment, including worker transportation vehicles, to the designated and approved work limits.
FIRE-4	Clear equipment parking areas, the ROW, staging areas, and designated vehicle-parking areas of all flammable material.
FIRE-5	Require all motor vehicles and equipment to carry, and individuals using handheld power equipment to have, specified fire prevention equipment.
FIRE-6	Provide a list of equipment capable of being adapted to fighting fires to local fire protection agencies.
FIRE-7	Notify the appropriate fire suppression agencies of scheduled road closures.
FIRE-8	Prohibit burning of slash, brush, stumps, trash, explosives storage boxes, or other Project-generated debris unless authorized by the applicable land management agency.
FIRE-9	Designate a Fire Guard on each construction crew prior to the start of construction activities each day and provide a communications system for maintaining contact with fire control agencies.
FIRE-10	Restrict or cease operations on federal lands during periods of high fire danger at the direction of the responsible land-managing agency representative.
FIRE-11	Use direct control for emergency the wildland fire control. When possible, where fire suppression is necessary, use techniques, which minimize soil and vegetation disturbance.
ENV-1	After a route has been selected and before construction, the route would be reviewed for areas within 0.5 mile of petroleum or gas pipelines, oil or gas wells, municipal solid waste landfills, service stations, railroads, municipal landfills, caves, and active and abandoned mines. The locations intersected by the route and these facilities would be compared against state Department of Environmental Quality databases which contain the locations of contaminated facilities and sites undergoing remediation. If contaminated sites are identified, further information would be obtained from Department of Environmental Quality personnel, and the authorized officer would be notified.
ENV-2	Construction crews would be trained to look for pre-existing environmental contamination. Indications of contamination could include mine waste rock stockpiles, drums or containers of unknown products, discolored soil, or unusual soil odors. Should indications of contamination be encountered, all surface disturbing activities in the vicinity of the contamination would cease. The location would be marked and project access restricted to eliminate the spread of contamination by construction equipment. The authorized officer would be notified, and the applicable Department of Environmental Quality personnel, and property owner or land management agency informed. To protect site workers, and minimize environmental effects, no work would occur at this location until the environmental conditions have been resolved. The Proponents would not assume responsibility for discovery of pre-existing contamination.
NOISE	
Proponent Proposed EPMs	
BLA-1	[See description under Geologic Hazards]
BLA-2	[See description under Geologic Hazards]
BLA-3	[See description under Public Safety]
BLA-4	[See description under Public Safety]
BLA-5	[See description under Public Safety]
Agency Proposed Mitigation Measures	
NOISE-1	Provide notice by mail prior to construction to all sensitive receptors and residences within 300 feet of construction sites, staging areas, and access roads. The announcement will state specifically where and when construction will occur in the area.
Agency Proposed Mitigation Measures Adopted by the Proponents	
NOISE-2	Identify and provide a public liaison person before and during construction to respond to concerns of neighboring receptors, including residents, about noise construction disturbance.

Table 2.7-1. Proponent and Agency Proposed Mitigation Measures (continued)

Number	Description
NOISE-3	Establish a toll-free telephone number for receiving questions or complaints during construction and develop procedures for responding to callers.
NOISE-4	Implement and maintain a noise complaint review process to deal with residents' or other potential queries and complaints as they arise. Such complaints would be logged and investigated on an individual basis to facilitate resolution of the issue of concern.

AGRI – agricultural resources; AIR – air resources; BLA – blasting; CR – cultural resources; CUL – cultural resources; EE – electrical environment; FIRE – fire; GEO – geological resources; LU – land use; MN – mineral resources; OM – operation & maintenance; PAC – proposed avian conservation; PALEO – paleontological resources; PGC – wildlife; PMC – proposed mammal conservation; PPC – proposed plant conservation; PRC – proposed raptor conservation; REC – recreational resources; SOC – socioeconomic resources; SOIL – soil resources; SPC – spill prevention; SW – stormwater; TESPL – TES plants; TESWL – TES wildlife; TR – transportation resources; TRANS – transportation resources; VEG – vegetation; VIS – visual resources; VR – visual resources; WILD – wildlife

2.8 SUMMARY COMPARISON OF EFFECTS OF ALTERNATIVES

Sections 2.8.1 through 2.8.8 are a summary by segment of the environmental effects of the Proposed Route and Route Alternatives, based on the evaluation criteria identified within each resource analysis section. In some cases, the impact assessment is based on assessment methodologies that provide adequate disclosure for NEPA analysis but will require more detailed analysis to meet the requests of other laws such as Section 106 of the NHPA or Section 404 of the CWA. Segments 1W(c), 3, 6, and 10 are not discussed in this section because no feasible alternatives were identified for these routes. A full explanation of the evaluation criteria and the environmental consequences of choosing each alternative is found by resource in Chapter 3. Tables in Sections 2.8.1 through 2.8.8 present the Proposed Route, the Route Alternatives, and their comparison portions. All impact analysis was conducted based on a Project description that includes the Proponents' EPMs contained in Appendix C. Residual impacts identified after implementation of the EPMs were further mitigated where appropriate with resource-specific measures identified in Chapter 3. EPMs would apply to all Action Alternatives. Additional mitigation measures identified by the Agencies would apply to all alternatives; however, they would only apply to federal land (except for measures required by the USFWS to meet requirements under the ESA).

2.8.1 Alternatives 1E-A, 1E-B, and 1E-C Compared to the Proposed Route

Segment 1E of the Proposed Route was developed to avoid multiple transmission lines on private lands in the Dave Johnston – Rock Springs transmission corridor in the north and to access planned wind energy resources in the southeast. Among the key factors considered in routing this segment were visual resources, wildlife resources (sage-grouse, big game winter range, and nesting raptors), and geologic features (an ice cave). Table 2.8-1 compares effects to a range of resources under each Route Alternative. Figure A-2 in Appendix A shows the Proposed Route and Route Alternatives.

Alternative 1E-A was developed as an alternative to the northern segment of the Proposed Route in response to visual and land use impact concerns expressed by local citizens along the Proposed Route. This alternative would minimize the effect of separate transmission lines on private lands located along the existing Dave Johnston – Rock Springs transmission line corridor. Alternative 1E-A is shorter than the comparison portion of the Proposed Route (16.1 miles vs. 17.6) but would have more impacts on visual resources as seen from residences in the Glenrock area. This alternative would parallel an existing transmission line corridor (Segment 1W[c]) for over 80 percent of its length versus approximately 2 percent for the comparison portion of the Proposed Route. However, if Segment 1W(a) of the Proposed Route is built as proposed, Segment 1E of the Proposed Route would be adjacent to the 1W(a) line for approximately half of its length. Alternative 1E-A would cross more big game winter range (30.8 miles vs. 28.0) but less sage-grouse core area (0.5 acre vs. 8.9) than the comparison portion of the Proposed Route. This alternative would be within the buffer of one raptor nest whereas the comparison portion of the Proposed Route would not.

Table 2.8-1. Alternatives 1E-A, 1E-B, and 1E-C Compared to the Proposed Route

Comparison Features	Unit	Proposed Segment 1E Total Length	Proposed Comparison Portion for Alt. 1E-A	Alternative 1E-A	Proposed Comparison Portion for Alt. 1E-B	Alternative 1E-B	Proposed Comparison Portion for Alt. 1E-C	Alternative 1E-C
General								
Total Length	miles[1/]	100.6	17.6	16.1	37.9	59.3	75.4	48.7
Construction Disturbance Area	acres[2/]	1,096	213	125	393	729	832	311
Operations Disturbance Area	acres	283	51	39	91	164	218	92
Land Ownership and Use								
BLM	miles	11.6	–	–	3.8	8.7	11.2	24.0
Forest Service	miles	2.8	–	–	–	–	2.8	2.1
Other federal	miles	–	–	–	–	–	–	–
State	miles	22.0	11.4	6.6	3.9	4.9	8.2	8.3
Private	miles	64.0	6.1	9.5	30.1	45.6	53.2	14.2
Indian Reservation	miles	–	–	–	–	–	–	–
WWE Corridor[3/]	miles	–	–	–	–	–	–	4.8
Within or Adjacent to Existing Transmission Corridors	miles	13.9	3.9	14.2	–	–	2.4	24.5
Resource Summaries								
Visual								
Forest Service Modification SIO crossed	miles	2.8	–	–	–	–	2.8	2.0
VRM I or II crossed	miles	5	–	–	–	2.6	4.8	0.9
Cultural								
Potentially affected cultural resources	number	74	29	37	16	28	31	23
Historic trails crossed	number	2	2	2	0	2	0	0
Wildlife								
Designated big game winter range crossed	miles	85.2	28.0	30.8	25.3	58.8	49.1	32.3
Big game parturition range crossed	miles	–	–	–	–	–	–	–
Raptor nests within 1 mile	number	14	–	1	11	12	14	6

Table 2.8-1. Alternatives 1E-A, 1E-B, and 1E-C Compared to the Proposed Route (continued)

Comparison Features	Unit	Proposed Segment 1E Total Length	Proposed Comparison Portion for Alt. 1E-A	Alternative 1E-A	Proposed Comparison Portion for Alt. 1E-B	Alternative 1E-B	Proposed Comparison Portion for Alt. 1E-C	Alternative 1E-C
Sage-grouse core area crossed	miles	37.2	8.9	0.5	15.4	–	20.8	17.8
Vegetation								
Forest and woodland vegetation removed (construction) [4/]	acres	318	–	1	15	84	290	39
Wetland disturbance (construction)	acres	3.3	t[6/]	2.2	0.2	1.8	3.3	1.3
Riparian disturbance (construction)	acres	7.9	1.5	2.1	2.7	2.5	6.4	1.2
Water/Fish								
Water body crossed	number	319	18	34	92	135	282	103
Temperature- or sediment-impaired stream crossings	number	–	–	–	–	–	–	–
Soils/Minerals								
Highly erodible soils impacted (construction)	acres	21	10	23	–	–	–	–
Mineral area (construction)	acres	60	16	12	30	5	40	34
Land Use/Recreation								
BLM or Forest Service Plan Amendment would be required	yes/no	yes	yes	no	yes	yes	yes	yes
Residences within 300 feet of the centerline	number	–	–	1	–	–	–	–
Residences within 1,000 feet of the centerline	number	9	–	1	–	–	–	–
Agriculture								
Dryland farming and irrigated agriculture impacted (construction)	acres	1	–	–	–	–	1	–
CRP[5/] land crossed	miles	–	–	–	–	–	–	–

1/ Mileages rounded to the nearest tenth of a mile; rows may not sum exactly.
2/ Acreages rounded to the nearest acre; rows may not sum exactly.
3/ WWE = West-wide Energy, a utility corridor generally 3,000 feet wide
4/ Includes all construction clearing (i.e., ROW clearing, off-ROW fly yards, staging areas, wire-pulling areas, roads, regeneration stations, and substations as applicable).
5/ CRP = Conservation Reserve Program
6/ Value is less than 0.1 acre.

Alternative 1E-B was primarily developed as an alternative to the southern portion of the Proposed Route to avoid sage-grouse core areas. Alternative 1E-B would not cross any sage-grouse core areas whereas the Proposed Route would cross 15.4 miles of this habitat. This alternative would be consistent with the State of Wyoming's Sage-Grouse Core Area strategy, whereas the comparison portion of the Proposed Route would not. This route would cross more Visual Resource Management (VRM) Class II lands (2.6 miles vs. 0) and would result in a new transmission line in the foothills of the Laramie Mountains, creating greater permanent disturbance.

Alternative 1E-C was developed to be approximately 1,500 feet from an existing 230-kV transmission line. Therefore, this alternative would be consistent with the State of Wyoming's Sage-Grouse Core Area strategy, whereas the comparison portion of the Proposed Route would not. This alternative would cross fewer miles of VRM Class I and II lands (0.5 mile vs. 4.8 miles for the comparison portion of the Proposed Route). Alternative 1E-C would be in close proximity to an ice cave, a geologic feature located on private land, which the Proposed Route would avoid. This alternative would cross less big game winter range (32.3 miles vs. 49.1) and would cross the buffers on 6 raptor nests compared to 14 for the comparison portion of the Proposed Route. Alternative 1E-C would not meet the Proponents need to provide 230-kV infrastructure farther east where wind energy resources are planned.

2.8.2 Alternative 1W-A Compared to the Proposed Route

Segment 1W of the Proposed Route was developed to follow an existing utility corridor for most of its length. Among the key factors considered in routing this segment were wildlife resources (sage-grouse, big game winter range, and raptors), cultural resources, historic trails, and wetlands. Table 2.8-2 compares resource characteristics between the Proposed Route and its Route Alternative. Figure A-2 in Appendix A shows the Proposed Route and Route Alternative.

Alternative 1W-A was developed as an alternative to the north end of the Proposed Route that uses existing BLM- and Forest Service-designated ROW corridors. This alternative would be parallel to an existing transmission line corridor for 10.7 miles vs. 6.4 miles for the comparison portion of the Proposed Route. Alternative 1W-A would be shorter than the comparison portion of the Proposed Route (16.2 miles vs. 20.3) and, therefore, would result in less overall disturbance. However, it would result in up to three transmission lines on some private parcels. Alternative 1W-A would cross one raptor nest buffer whereas the Proposed Route would not cross any. Both Alternative 1W-A and the comparison portion of the Proposed Route would be consistent with the state's Sage-Grouse Core Area strategy identified in the Wyoming Governor's EO 2011-5. This alternative would impact 3.6 acres of wetlands whereas the comparison portion of the Proposed Route would not cross any. Alternative 1W-A would potentially affect slightly more cultural resource sites (36 vs. 34) than the comparison portion of the Proposed Route. Alternative 1W-A would cross one fewer historic trail than the comparison portion of the Proposed Route (two vs. three).

Table 2.8-2. Alternative 1W-A Compared to the Proposed Route

Comparison Features	Unit	Proposed Segment 1W(a) Total Length	Proposed Comparison Portion for Alternative 1W-A	Alternative 1W-A
General				
Total Length	miles[1/]	76.5	20.3	16.2
Construction Disturbance Area	acres[2/]	623	210	136
Operations Disturbance Area	acres	182	47	40
Land Ownership and Use				
BLM	miles	26.6	–	–
Forest Service	miles	2.3	–	–
Other Federal	miles	–	–	–
State	miles	18.5	10.3	5.5
Private	miles	29.1	10.0	10.7
Indian Reservation	miles	–	–	–
WWE Corridor[3/]	miles	18.8	–	–
Within or Adjacent to Existing Transmission Corridor	miles	51.4	8.1	5.3
Resource Summaries				
Visual				
VRM I or II crossed	miles	0.7	–	–
Cultural				
Potentially affected cultural resources	number	69	34	36
Historic trails crossed	number	3	3	2
Wildlife				
Designated big game winter range crossed	miles	76.6	35.3	30.7
Big game parturition range crossed	miles	–	–	–
Raptor nests within 1 mile	number	6	0	1
Sage-grouse core area crossed	miles	34.0	8.5	0.7
Vegetation				
Forest and woodland vegetation removed (construction)	acres	75	2	<1

Table 2.8-2. Alternative 1W-A Compared to the Proposed Route (continued)

Comparison Features	Unit	Proposed Segment 1W(a) Total Length	Proposed Comparison Portion for Alternative 1W-A	Alternative 1W-A
Wetland disturbance (construction)	acres	3.1	t[5/]	3.6
Riparian disturbance (construction)	acres	3.8	0.7	1.5
Water/Fish				
Waterbodies crossed	number	165	23	26
Temperature- or sediment-impaired stream crossings	number	–	–	–
Soils/Minerals				
Highly erodible soils impacted (construction)	acres	7	–	22
Mineral area (construction)	acres	86	28	6
Land Use/Recreation				
BLM or FS Plan Amendment would be required	yes/no	Yes	yes	no
Residences within 300 feet of the centerline	number	1	1	–
Residences within 1,000 feet of the centerline	number	8	7	2
Agriculture				
Dryland farming and irrigated agriculture impacted (construction)	acres	–	–	–
CRP[4/] land crossed	miles	–	–	–

1/ Mileages rounded to the nearest tenth of a mile; rows may not sum exactly.
2/ Acreages rounded to the nearest acre; rows may not sum exactly.
3/ WWE = West-wide Energy, a utility corridor generally 3,000 feet wide
4/ CRP = Conservation Reserve Program.
5/ Value is less than 0.1 acre.

2.8.3 Alternatives 2A, 2B, and 2C Compared to the Proposed Route

Segment 2 of the Proposed Route was developed to follow the WWE corridor and existing BLM-designated ROW corridor where feasible. Among the key factors considered in routing this segment were visual resources visible from the Fort Fred Steele State Historic Site and nearby residences, sage-grouse and big game winter range, mining leases, and SRMAs. The current Proposed Route would have the least impact on Fort Fred Steele and residences among the Route Alternatives. Table 2.8-3 compares effects to key resources under each Route Alternative. Figure A-3 in Appendix A shows the Proposed Route and Route Alternatives.

Alternative 2A was developed to maximize the use of the WWE corridor and existing BLM-designated ROW corridor. This alternative is similar in length to the comparison portion of the Proposed Route; however, visual impacts to visitors to Fort Fred Steele State Historic Site would be greater compared to the other alternatives and the comparison portion. Alternative 2A would disturb more sage-grouse core area than the comparison portion of the Proposed Route (16.8 acres vs. 14.9) and would impact more acres of mineral leases (92 acres vs. 83). Alternative 2A would cross less big game winter range than the comparison portion of the Proposed Route (39.4 miles vs. 62.8). Both Alternative 2A and the comparison portion of the Proposed Route would cross the Continental Divide SRMA and the North Platte River SRMA.

Alternative 2B was originally considered by the Proponents as the Proposed Route. Due to local landowner concerns and visual impacts to visitors to the Fort Fred Steele State Historic Site located on the North Platte River as well as several eagle nests in the area, the Proponents relocated the Proposed Route several miles to the south and BLM left the original Proposed Route as an alternative to be analyzed in detail. This alternative would not impact sage-grouse core area and would affect slightly less big game winter range than the comparison portion of the Proposed Route (10.4 miles vs. 16.8). Alternative 2B would affect fewer acres of mineral leases (34 acres vs. 54). Alternative 2B would cross the Continental Divide SRMA whereas the corresponding portion of the Proposed Route would cross the Continental Divide SRMA and the North Platte River SRMA. Alternative 2B would be less visible from the Fort Fred Steele State Historic Site than the comparison portion of the Proposed Route.

Alternative 2C was developed to maximize use of the Wyoming Governor's sage-grouse transmission line corridor to be consistent with EO 2011-5. This alternative would cross less sage-grouse core area than the Proposed Route (24.1 acres vs. 27.7). This route would be shorter than the Proposed Route or the other alternatives, and thus would result in less disturbance; however, it would impact more acres of mineral leases (63 acres vs. 57). It would also lie on more public and less private land than the comparison portion of the Proposed Route. Neither Alternative 2C nor the corresponding portion of the Proposed Route would cross an SRMA or be near the Fort Fred Steele State Historic Site.

Table 2.8-3. Alternatives 2A, 2B, and 2C Compared to the Proposed Route

Comparison Features	Unit	Proposed Segment 2 Total Length	Proposed Comparison Portion for Alt. 2A	Alt. 2A	Proposed Comparison Portion for Alt.2B	Alt. 2B	Proposed Comparison Portion for Alt. 2C	Alt. 2C
General								
Total Length	miles[1/]	96.7	28.8	28.4	7.0	6.2	28.4	24.4
Construction Disturbance Area	acres[2/]	1,544	398	446	104	80	369	322
Operations Disturbance Area	acres	401	74	90	16	18	77	52
Land Ownership and Use								
BLM	miles	36.6	10.1	10.2	4.2	2.3	9.6	11.4
Forest Service	miles	–	–	–	–	–	–	–
Other Federal	miles	–	–	–	–	–	–	–
State	miles	6.2	2.4	1.7	–	–	1.0	–
Private	miles	53.4	16.2	16.5	2.7	3.8	17.8	13.0
Indian Reservation	miles	–	–	–	–	–	–	–
WWE Corridor[3/]	miles	16.5	0.7	8.0	0.4	1.2	0.4	1.4
Within or Adjacent to Existing Transmission Corridor	miles	53.9	5.6	28.3	0.4	5.0	4.7	3.5
Resource Summaries								
Visual								
VRM I or II crossed	miles	–	–	–	–	–	–	–
Cultural								
Potentially affected cultural resources	number	466	111	123	31	34	79	82
Historic trails crossed	number	9	5	6	2	3	6	–
Wildlife								
Designated big game winter range crossed	miles	190.1	62.8	39.4	16.8	10.4	55.0	31.6
Big game parturition range crossed	miles	–	–	–	–	–	–	–
Raptor nests within 1 mile	number	120	20	15	7	5	33	47
Sage-grouse core area crossed	miles	44.5	14.9	16.8	–	–	27.7	24.1

Table 2.8-3. Alternatives 2A, 2B, and 2C Compared to the Proposed Route (continued)

Comparison Features	Unit	Proposed Segment 2 Total Length	Proposed Comparison Portion for Alt. 2A	Alt. 2A	Proposed Comparison Portion for Alt.2B	Alt. 2B	Proposed Comparison Portion for Alt. 2C	Alt. 2C
Vegetation								
Forest and woodland vegetation removed (construction)	acres	7	–	–	–	–	–	–
Wetland disturbance (construction)	acres	2.5	2.1	2.3	t[5/]	0.2	0.2	–
Riparian disturbance (construction)	acres	7.2	1.3	8.0	0.1	5.7	1.6	0.1
Water								
Waterbodies crossed	number	276	62	78	9	15	70	17
Temperature- or sediment-impaired stream crossings	number	–	–	–	–	–	–	–
Soils/Minerals								
Highly erodible soils impacted (construction)	acres	53	–	–	–	–	–	–
Mineral area (construction)	acres	396	83	92	54	34	57	63
Land Use/Recreation								
BLM Plan Amendment would be required	yes/no	Yes	yes	no	yes	no	yes	no
Residences within 300 feet of centerline	number	–	–	–	–	1	–	–
Residences within 1,000 feet of centerline	number	1	–	–	–	7	–	–
Agriculture								
Dryland farming and irrigated agriculture impacted (construction)	acres	–	–	–	–	–	–	–
CRP[4/] land crossed	miles	–	–	–	–	–	–	–

1/ Mileages rounded to the nearest tenth of a mile; rows may not sum exactly.
2/ Acreages rounded to the nearest acre; rows may not sum exactly.
3/ WWE = West-wide Energy, a utility corridor generally 3,000 feet wide..
4/ CRP = Conservation Reserve Program.
5/ Value is less than 0.1 acre.

2.8.4 Alternatives 4A, 4B, 4C, 4D, 4E, and 4F Compared to Proposed Route

Initial routing for Segment 4 of the Proposed Route focused on an existing east-west 345-kV ROW with three existing lines originating at the Jim Bridger Power Plant and heading west/northwest into southeastern Idaho. Concerns regarding sage-grouse core area, big game winter range, cultural resources, historic trails, visual resources, and siting on private versus public lands resulted in the identification of six alternative routes. Table 2.8-4 compares effects to key resources between each Route Alternative. Figures A-5 and A-6 in Appendix A show the Proposed Route and Route Alternatives.

Alternative 4A was developed to parallel the existing 345-kV corridor where feasible. This alternative would be consistent with EO 2011-5 and was recommended by the Office of the Governor of Wyoming whereas the comparison portion of the Proposed Route would not be consistent. This alternative would be 5 miles shorter and would result in less overall disturbance than the corresponding portion of the Proposed Route. Alternative 4A would cross less VRM Class II lands (13.5 miles vs. 19.1) than the comparison portion of the Proposed Route and less big game winter range (80.1 miles vs. 127.0). Alternative 4A would impact fewer cultural resources than the Proposed Route (300 compared to 451) but would cross historic trails more times (11 compared to 7).

Alternatives 4B through 4F would not be consistent with EO 2011-5. Alternative 4F would cross the least sage-grouse core area (27 miles) and 4C and 4E would cross the most (approximately 57 miles); the comparison portion of the Proposed Route would cross 31.9 miles and Alternative 4A would cross 28.4 miles. Alternatives 4B through 4F would cross, or be in proximity to, more land uses where visual impacts to recreationally and culturally sensitive areas are possible, such as the Cokeville NWR (Alternatives 4B through 4E), the Bear River Special Management Area (Alternatives 4B through 4D), the Raymond Mountain Special Management Area (Alternative 4F), and Fossil Butte National Monument (Alternatives 4B and 4C); however, these alternatives would cross less VRM Class II land than the comparison portion of the Proposed Route. Overall, visual impacts would be least under Alternative 4D. Alternatives 4B through 4E would cross between 102.3 to 117.8 miles of designated big game winter range, whereas the comparison portion of the Proposed Route would cross 127.0 miles and Alternatives 4A and 4F 70.1 and 80.1, respectively. Alternatives 4D, 4E, and 4F would have the fewest cultural resource impacts; Alternative 4B would affect the most cultural resources. Alternatives 4B through 4E would cross historic trails approximately the same number of times as the comparison portion of the Proposed Route (6 to 7), while Alternatives A and F would cross more times (11 and 10, respectively).

Table 2.8-4. Alternatives 4A, 4B, 4C, 4D, 4E, and 4F Compared to the Proposed Route

Comparison Features	Unit	Proposed Segment 4 Total Length	Proposed Comparison Portion for Alt. 4A–4F	Alt. 4A	Alt. 4B	Alt. 4C	Alt. 4D	Alt. 4E	Alt. 4F
General									
Total Length	miles[1/]	203.0	90.2	85.2	100.2	101.6	100.8	102.2	87.5
Construction Disturbance Area	acres[2/]	2,846	1,234	1,250	1,484	1,478	1,505	1,495	1,260
Operations Disturbance Area	acres	651	262	277	348	341	355	345	280
Land Ownership and Use									
BLM	miles	82.2	53.0	43.0	50.6	46.9	52.1	48.4	45.2
Forest Service	miles	9.2	–	–	–	–	–	–	–
Other Federal	miles	3.1	3.1	3.1	0.6	1.2	0.6	1.2	3.1
State	miles	10.7	2.7	4.5	8.1	8.6	6.7	7.2	3.6
Private	miles	97.7	31.4	34.4	41.0	44.9	41.4	45.3	35.7
Indian Reservation	miles	–	–	–	–	–	–	–	–
WWE Corridor[3/]	miles	11.9	–	–	–	–	–	–	–
Within or adjacent to existing transmission corridors	miles	96.4	19.7	77.5	35.6	35.6	35.6	35.6	54.1
Resource Summaries									
Visual									
Forest Service Retention and Partial Retention VQOs Crossed	miles	9.2	–	–	–	–	–	–	–
VRM I or II crossed	miles	19.1	19.1	13.5	7.3	12.5	4.3	9.5	16.4
Cultural									
Potentially affected cultural resources	number	656	451	300	470	262	244	242	238
Historic trails crossed	number	16	7	11	6	7	6	7	10
Wildlife									
Designated big game winter range crossed	miles	254.8	127.0	80.1	102.7	117.8	102.3	117.5	70.1
Big game parturition range crossed[4/]	miles	6.4	6.4	8.2	–	–	–	–	8.2
Raptor nests within 1 mile	number	51	9	12	19	19	19	19	11

Table 2.8-4. Alternatives 4A, 4B, 4C, 4D, 4E and 4F Compared to the Proposed Route (continued)

Comparison Features	Unit	Proposed Segment 4 Total Length	Proposed Comparison Portion for Alt. 4A–4F	Alt. 4A	Alt. 4B	Alt. 4C	Alt. 4D	Alt. 4E	Alt. 4F
Wyoming Sage-Grouse Core Area crossed	miles	43.8	31.9	28.4	44.0	56.4	44.6	57.0	27.0
Idaho Key Habitat crossed	miles	14.2	2.6	2.6	4.9	4.9	4.9	4.9	2.6
Vegetation									
Forest and woodland vegetation removed (construction)	acres	941	373	51	5	4	9	7	97
Wetland disturbance (construction)	acres	45.2	10.1	28.0	21.6	14.9	18.9	15.3	16.7
Riparian disturbance (construction)	acres	20.1	6.5	27.5	21.5	21.4	21.0	20.8	26.3
Water/Fish									
Waterbodies crossed	number	414	224	242	375	354	413	387	220
Temperature- or Sediment-impaired stream crossings	number	3	1	1	1	1	1	1	1
Soils/Minerals									
Highly erodible soils impacted (construction)	acres	896	92	266	306	405	319	406	248
Mineral area (construction)	acres	502	303	254	516	438	564	492	234
Land Use/Recreation									
BLM or Forest Service Plan Amendment would be required	yes/no	yes	yes	yes	yes	yes	yes	yes	yes
Residences within 300 feet of the centerline	number	4	1	–	–	–	–	–	–
Residences within 1,000 feet of the centerline	number	11	3	2	1	2	1	2	3
Agriculture									
Dryland farming and Irrigated Agriculture Impacted (construction)	acres	158	5	7	37	3	34	3	19
CRP[5/] land crossed	miles	6.1	–	–	–	–	–	–	–

1/ Mileages rounded to the nearest tenth of a mile; rows may not sum exactly.
2/ Acreages rounded to the nearest acre; rows may not sum exactly.
3/ WWE = West-wide Energy, a utility corridor generally 3,000 feet wide.
4/ Data are for the Wyoming portion of Segment 4; Idaho does not map big game parturition range.
5/ CRP = Conservation Reserve Program.

2.8.5 Alternatives 5A, 5B, 5C, 5D, and 5E Compared to Proposed Route

Segment 5 alternatives were identified through scoping and in discussions with various stakeholders. Among the key factors considered in routing this segment were visual resources near the Deep Creek Mountains, agriculture in the Arbon and Rockland Valleys, crossing the Fort Hall Indian Reservation, residential developments, the Arbon Elementary School, and the East Fork Rock Creek Recreation Area, as well as potential disturbance to nesting bald eagles along the Snake River. Table 2.8-5 compares effects to resources under each Route Alternative. Figure A-7 in Appendix A shows the Proposed Route and Route Alternatives.

Alternatives 5A and 5B were developed to reduce visual impacts and limit road construction on forested BLM-managed lands in the Deep Creek Mountains. Unlike the Proposed Route, both alternatives would avoid the recreation area. They would also avoid all raptor nest buffers, as would the comparison portion of the Proposed Route. Alternative 5A would come within 1,000 feet of three residences, compared to four for Alternative 5B and the comparison portion of the Proposed Route.

Alternative 5C would parallel an existing transmission line through the Fort Hall Indian Reservation, rather than create a new corridor. In doing so, the length and overall visual impacts would be less under Alternative 5C than the comparison portion of the Proposed Route. However, Alternative 5C would result in additional visual and cultural impacts to the Fort Hall Indian Reservation. Alternative 5C is the preferred route of Power County. Neither Alternative 5C nor the comparison portion of the Proposed Route would be within 1,000 feet of a residence or school.

Alternative 5D was the Proponents' original Proposed Route, but issues were raised by local landowners about impacts to agricultural land. The Proponents agreed to move their Proposed Route several miles to the east and keep the original Proposed Route as an alternative to be analyzed in detail (Alternative 5D). Alternative 5D would affect more agricultural land than would be impacted by the comparison portion of the Proposed Route. Additionally, Alternative 5D would be more visible from residences in the Rockland Valley compared to the Proposed Route, which takes better advantage of topography to minimize visual impacts from the valley. However, it would cross within 1,000 feet of an elementary school (the only alternative to do so) and 24 residences, compared to 10 for the comparison portion of the Proposed Route.

Alternative 5E was developed as an alternative approach to the crossing of the Snake River as requested by Power County. However, it would not meet the separation criteria (minimum of 1,500 feet) from existing high-voltage transmission lines the Proponents established as part of the Project purpose and need. Because it would be adjacent to an existing line, Alternative 5E would have fewer visual effects than the comparison portion of the Proposed Route, would also avoid potential disturbance to nesting raptors, and would affect less agricultural land. It would cross within 1,000 feet of 2 residences compared to 10 for the comparison portion of the Proposed Route.

Table 2.8-5. Alternatives 5A, 5B, 5C, 5D, and 5E Compared to the Proposed Route

Comparison Features	Unit	Proposed Segment 5 Total Length	Proposed Comparison Portion for Alts. 5A and 5B	Alt. 5A	Alt. 5B	Proposed Comparison Portion for Alt. 5C	Alt. 5C	Proposed Comparison Portion for Alt. 5D	Alt. 5D	Proposed Comparison Portion for Alt. 5E	Alt. 5E
General											
Total Length	miles[1/]	54.6	25.3	33.7	44.4	33.2	26.1	19.4	17.5	5.8	5.3
Construction Disturbance Area	acres[2/]	982	439	554	683	590	433	411	366	138	104
Operations Disturbance Area	acres	175	73	87	99	94	56	63	53	24	24
Land Ownership and Use											
BLM	miles	13.2	8.7	10.1	10.3	8.8	–	2.7	–	1.2	0.1
Forest Service	miles	–	–	–	–	–	–	–	–	–	–
Other Federal	miles	–	–	–	–	–	12.4	–	–	–	–
State	miles	3.6	3.0	0.3	0.3	3.5	0.7	0.6	0.8	0.1	–
Private	miles	37.8	13.5	23.3	33.8	20.9	13.0	16.1	16.4	4.5	5.0
Indian Reservation	miles	–	–	–	–	–	12.4	–	–	–	–
WWE Corridor[3/]	miles	–	–	–	–	–	–	–	–	–	–
Within or Adjacent to Existing Transmission Corridor	miles	16.8	1.9	1.8	1.8	0.7	26.1	5.8	1.3	5.4	5.3
Resource											
Visual											
VRM I or II crossed	Miles	1.6	1.5	–	–	1.5	–	0.1	–	0.1	–
Cultural											
Potentially affected cultural resources	number	29	2	9	4	1	–	23	23	22	17
Historic trails crossed	number	3	1	1	1	–	–	2	2	2	2
Wildlife											
Designated big game winter range crossed	miles	32.9	9.6	14.3	22.2	21.6	16.4	16.9	14.4	3.5	3.6
Big game parturition range crossed	miles	No data; Idaho Department of Fish and Game does not map big game parturition areas.									
Raptor nests within 1 mile	number	3	–	–	–	–	–	2	2	2	–
Idaho Sage-Grouse Key Habitat crossed	miles	–	–	2.9	9.1	–	–	–	–	–	–

Table 2.8-5. Alternatives 5A, 5B, 5C, 5D, and 5E Compared to the Proposed Route (continued)

Comparison Features	Unit	Proposed Segment 5 Total Length	Proposed Comparison Portion for Alts. 5A and 5B	Alt. 5A	Alt. 5B	Proposed Comparison Portion for Alt. 5C	Alt. 5C	Proposed Comparison Portion for Alt. 5D	Alt. 5D	Proposed Comparison Portion for Alt. 5E	Alt. 5E
Vegetation											
Forest and woodland vegetation removed (construction)	acres	500	362	316	244	396	156	143	155	6	–
Wetland disturbance (construction)	acres	3.8	2.8	0.2	0.1	1.3	3.5	1.1	2.6	–	–
Riparian disturbance (construction)	acres	5.9	1.8	0.8	1.4	2.3	2.7	3.4	7.5	1.1	0.1
Water/Fish											
Waterbodies crossed	number	177	88	84	103	147	52	75	51	5	6
Temperature- or sediment-impaired stream crossings	number	40	34	20	21	40	8	6	6	–	–
Soils/Minerals											
Highly erodible soils impacted (construction)	acres	853	390	464	651	540	432	337	297	63	38
Mineral area (construction)	acres	–	–	–	–	–	–	–	–	–	–
Land Use/Recreation											
BLM or Forest Service Plan Amendment would be required	yes/no	yes	yes	yes	yes	yes	no	yes	no	yes	no
Residences within 300 feet of centerline	number	2	3	4	4	–	–	–	2	–	–
Residences within 1,000 feet of centerline	number	22	4	3	4	–	–	10	24	10	2
Agriculture											
Dryland farming and irrigated agriculture impacted (construction)	acres	210	85	102	212	102	68	91	115	43	27
CRP[4/] land crossed	miles	18.4	6.5	9.5	11.3	5.5	2.5	5.6	6.5	0.3	1.0

1/ Mileages rounded to the nearest tenth of a mile; rows may not sum exactly.
2/ Acreages rounded to the nearest acre; rows may not sum exactly.
3/ WWE = West-wide Energy, a utility corridor generally 3,000 feet wide.
4/ CRP = Conservation Reserve Program.

2.8.6 Alternatives 7A, 7B, 7C, 7D, 7E, 7F, 7G, 7H, 7I, and 7J Compared to Proposed Route

Key factors considered in routing the first third of Segment 7 were similar to those discussed under Segment 5, because the segments parallel one another to the point west of the Deep Creek Mountains where they diverge. Additional factors considered in routing this segment were impacts to agricultural operations, rural residences, a local hang gliding area, visual resources, historic trails, cultural resources, big game winter range, sage-grouse key habitat, Designated Roadless Areas, and local planning goals. Table 2.8-6 compares effects on key resources by each Route Alternative and comparison portion. Figure A-9 in Appendix A shows the Proposed Route and Route Alternatives.

Alternatives 7A and 7B would parallel Alternatives 5A and 5B to the point where they exit the Deep Creek Mountains; therefore, their purpose for development and issues were discussed in Section 2.8.5. Both alternatives would cross less big game winter range than the comparison portion of the Proposed Route (6.9 and 10.3 acres, respectively, vs. 16.9) but more sage-grouse key habitat (4.6 and 7.9 miles, respectively, vs. 0 miles). Alternative 7B would impact more agricultural land (244 acres vs. 150) than the comparison portion, Alternative 7A approximately the same; both alternatives would cross within 1,000 feet of three residences, compared to two for the comparison portion of the Proposed Route.

Alternative 7C was developed to avoid impacts to sage-grouse, whereas the comparison portion of the Proposed Route would cross 0.2 mile of key habitat. Alternative 7C would cross more big game winter range (7.3 miles vs. 4.8). It would affect less agricultural land than the comparison portion of the Proposed Route (71 acres vs. 119). This alternative would be farther from the Parting of the Ways location on the NHT system. This alternative would cross within 1,000 feet of two residences, compared to none for the comparison portion of the Proposed Route.

Alternative 7D was developed to avoid BLM-managed lands that have an easement restriction that does not allow both transmission line segments cross the Oregon and California NHTs. Alternative 7D would cross 2.5 miles of sage-grouse key habitat compared to 1.7 miles for the comparison portion of the Proposed Route and would cross the same amount of big game winter range (2 miles). Neither Alternative 7D nor the comparison portion of the Proposed Route would cross within 1,000 feet of a residence and both impact a similar amount of agricultural land (37 acres).

Alternative 7E was developed to avoid two sage-grouse leks, sage-grouse habitat in the Water Canyon area, and a local recreational area used as a hang glider launch site. Alternative 7E would cross slightly more sage-grouse key habitat than the comparison portion of the Proposed Route (3.2 miles vs. 3.0). Alternative 7E would cross within 1,000 feet of four residences, compared to seven for the comparison portion of the Proposed Route, and would impact a similar amount of agricultural land (12 and 14 acres, respectively).

Alternative 7F was developed to avoid visual impacts to residential development in the Delco area. This alternative would cross less private land than the comparison portion

of the Proposed Route; however, it would cross a scenic byway to the town of Albion. Alternative 7F would cross more big game winter range (10.7 miles vs. 9.3) but less sage-grouse key habitat (3.3 miles vs. 5.1) than the comparison portion of the Proposed Route, although it would not avoid the Water Canyon area. This alternative would impact less agricultural land (29 acres vs. 66) than the comparison portion of the Proposed Route. It would not cross within 1,000 feet of a residence whereas the comparison portion of the Proposed Route would cross within 1,000 feet of seven. Both Alternative 7F and the Proposed Route would affect a planned runway at the Dry Creek Sky Ranch.

Alternative 7G was developed to minimize the extent to which the transmission line would be within a BLM motorized vehicle winter closure area. This vehicle closure area is designated for wintering big game and sage-grouse. Alternative 7G would run along the northern border of the vehicle closure area, whereas the comparison portion of the Proposed Route would run farther within. Despite this difference, Alternative 7G would disturb a comparable amount of big game winter range (3.2 miles vs. 3.1) and sage-grouse key habitat (also 3.2 miles vs. 3.1) as the comparison portion of the Proposed Route. Alternative 7G would also disturb more agricultural land than the comparison portion of the Proposed Route (17 acres vs. 7). Both Alternative 7G and the comparison portion of the Proposed Route would cross within 1,000 feet of one residence.

Through a lengthy process of collaboration with the landowners; local, state, and federal agencies, and the Proponents, Alternative 7I was developed to avoid proximity to agricultural facilities (e.g., dairies and agricultural land). It should be noted that Alternative 7I was presented and supported by local landowners over the Proposed Route but was not supported by the Proponents. As a compromise to the Proposed Route and Alternative 7I, the Proponents developed and support Alternative 7H (which was originally considered but eliminated during their siting study). Cassia County has stated its objection to Alternative 7H. After additional consideration, local landowners proposed Alternative 7J, which requires that the Cedar Hill Substation be relocated 24 miles southwest of the proposed location (Rogerson Substation).

Alternatives 7H, 7I, and 7J would be longer than the comparison portions of the Proposed Route (9.4, 55.3, and 58.2 miles, respectively). Alternatives 7H, 7I, and 7J would impact less agricultural land (between approximately 490 and 580 acres less) than the comparison portions of the Proposed Route. The three alternative routes would impact less big game winter range, 37.3, 45.4, and 47.9 miles, respectively, than the comparison portions of the Proposed Route (50.1 miles for the 7H and 7I comparison portion and 60.0 miles for the 7J portion). Alternatives 7H, 7I, and 7J, being longer, would result in greater amounts of ground disturbance during construction, operations, and maintenance than the comparison portions of the Proposed Route; they would also have a greater visual impact to sensitive federal lands. Alternatives 7I and 7J would have the potential to impact visitors to the City of Rocks National Reserve as well as local sensitive viewing areas such as Sparks Basin, Granite Pass, the Sawtooth National Forest, and the California NHT. Alternatives 7I and 7J would pass along the southern edge of the proposed Tunnel Hill Archaeological District. In addition, Alternatives 7I and 7J would cross into Nevada for 7.2 miles, the

only alternatives that would cross that state. Finally, these alternatives would cross more sage-grouse key habitat (41.1, 67.8, and 73.0 miles, respectively, vs. 11.9 and 16.8) and cross more nesting raptor buffers (54, 66, and 85, respectively, vs. 12 and 32) than the comparison portions of the Proposed Route.

Table 2.8-6. Alternatives 7A, 7B, 7C, 7D, 7E, 7F, 7G, 7H, 7I, and 7J Compared to the Proposed Route

Comparison Features	Unit	Proposed Segment 7 Total Length	Proposed Comparison Portion for Alts. 7A and 7B	Alt. 7A	Alt. 7B	Proposed Comparison Portion for Alt. 7C	Alt. 7C	Proposed Comparison Portion for Alt. 7D	Alt. 7D
General									
Total Length	miles[1/]	118.1	35.2	38.0	46.4	20.1	20.3	6.2	6.8
Construction Disturbance Area	acres[2/]	1,804	499	618	746	288	289	112	125
Operations Disturbance Area	acres	231	47	96	99	36	28	11	13
Land Ownership and Use									
BLM	miles	28.1	7.0	7.2	7.7	9.1	7.2	1.7	0.1
Forest Service	miles	–	–	–	–	–	–	–	–
Other Federal	miles	–	–	–	–	–	–	–	–
State	miles	4.3	3.8	–	–	–	1.0	0.5	1.0
Private	miles	85.7	24.4	30.7	38.7	11.0	12.0	4.0	5.7
Indian Reservation	miles	–	–	–	–	–	–	–	–
WWE Corridor[3/]	miles	0.5	–	–	–	–	–	–	–
Within or Adjacent to Existing Transmission Corridor	miles	16.5	4.3	–	–	–	–	–	–
Resource Summaries									
Visual									
Forest Service Retention and Partial Retention VQOs crossed	miles	–	–	–	–	–	–	–	–
Forest Service Modification VQO Crossed	miles	–	–	–	–	–	–	–	–
VRM I or II crossed	miles	1.3	1.3	–	–	–	–	–	–
Cultural									
Potentially affected cultural resources	number	33	5	9	6	4	3	6	2
Historic trails crossed	number	6	1	1	1	3	3	1	1
Wildlife									
Designated big game winter range crossed	miles	50.1	16.9	6.9	10.3	4.8	7.3	2.0	2.0
Big game parturition range crossed	miles	No data; Idaho Department of Fish and Wildlife does not map big game parturition areas.							
Raptor nests within 1 mile	number	12	–	–	–	4	2	1	1
Idaho Sage Grouse Key Habitat crossed	miles	11.9	–	4.6	7.9	0.2	–	1.7	2.5

Table 2.8-6. Alternatives 7A, 7B, 7C, 7D, 7E, 7F, 7G, 7H, 7I, and 7J Compared to the Proposed Route (continued)

Comparison Features	Unit	Proposed Comparison Portion for Alt. 7E	Alt. 7E	Proposed Comparison Portion for Alt. 7F	Alt. 7F	Proposed Comparison Portion for Alt. 7G	Alt. 7G	Proposed Comparison Portion for Alts. 7H and 7I	Alt. 7H	Alt. 7I	Proposed Comparison Portion for Alt. 7J	Alt. 7J[5/]
General												
Total Length	miles[1/]	3.8	4.5	10.5	10.8	3.1	3.2	118.1	127.5	173.4	143.9	202.1
Construction Disturbance Area	acres[2/]	67	78	201	169	48	72	1,804	2,118	2,735	2,231	3,180
Operations Disturbance Area	acres	6	8	27	24	6	6	231	340	451	294	512
Land Ownership and Use												
BLM	miles	0.3	1.9	1.3	4.4	2.4	1.8	28.1	46.6	72.5	28.1	58.9
Forest Service	miles	–	–	–	–	–	–	–	11.4	27.7	–	13.0
Other Federal	miles	–	–	–	–	–	–	–	–	–	–	–
State	miles	–	–	–	–	–	–	4.3	5.0	7.9	4.3	8.9
Private	miles	3.5	2.6	9.2	6.4	0.8	1.4	85.7	64.5	65.3	91.6	92.4
Indian Reservation	miles	–	–	–	–	–	–	–	–	–	–	–
WWE Corridor[3/]	miles	–	–	–	–	0.1	–	0.5	0.5	8.3	5.8	19.7
Within or Adjacent to Existing Transmission Corridor	miles	–	–	–	–	0.2	0.2	16.5	12.2	30.0	24.9	41.6
Resource Summaries												
Visual												
Forest Service Retention and Partial Retention VQOs crossed	miles	–	–	–	–	–	–	–	2.9	0.8	–	0.8
Forest Service Modification VQO Crossed	miles	–	–	–	–	–	–	–	5.5	9.2	–	6.2
VRM I or II crossed	miles	<0.1	0.3	<0.1	–	–	–	1.4	0.9	0.6	1.4	0.6
Cultural												
Potentially affected cultural resources	number	2	2	2	3	3	3	31	60	119	48	123
Historic trails crossed	number	–	–	–	–	–	–	6	6	9	3	9
Wildlife												
Designated big game winter range crossed	miles	3.0	4.5	9.3	10.7	3.1	3.2	50.1	37.3	45.4	60.0	47.9
Big game parturition range crossed	miles	No data; Idaho Department of Fish and Game does not map big game parturition areas.										
Raptor nests within 1 mile	number	7	7	7	7	–	–	12	54	66	32	85
Idaho Sage-Grouse Key Habitat crossed	miles	3.0	3.2	5.1	3.3	3.1	3.2	11.9	41.1	67.8	16.8	73.0

Table 2.8-6. Alternatives 7A, 7B, 7C, 7D, 7E, 7F, 7G, 7H, 7I, and 7J Compared to the Proposed Route (continued)

Comparison Features	Unit	Proposed Segment 7 Total Length	Proposed Comparison Portion for Alts. 7A and 7B	Alt. 7A	Alt. 7B	Proposed Comparison Portion for Alt. 7C	Alt. 7C	Proposed Comparison Portion 7/9 for Alt. 7D	Alt. 7D
Vegetation									
Forest/woodland vegetation removed (construction)	acres	418	238	266	132	–	–	8	8
Wetland disturbance (construction)	acres	3.4	1.3	2.2	0	t[6/]	–	1.1	1.1
Riparian disturbance (construction)	acres	4.6	2.2	2.5	1.2	t[6/]	–	1.9	1.8
Water/Fish									
Streams crossed	number	209	43	110	101	17	24	17	18
Temperature- or sediment-impaired streams crossed	number	15	15	29	25	1	–	–	–
Soils/ Minerals									
Highly erodible soils impacted (construction)	acres	1,740	463	529	723	288	289	112	125
Mineral area (construction)	acres	–	–	–	–	–	–	–	–
Land Use/ Recreation									
BLM or Forest Service Plan Amendment would be required	yes/no	yes	yes	yes	yes	yes	no	yes	no
Residences within 300 feet of centerline	number	6	1	–	1	–	–	–	–
Residences within 1,000 feet of centerline	number	21	2	3	3	–	2	–	–
Agriculture									
Dryland farming and irrigated agriculture impacted (construction)	acres	750	150	143	244	119	71	37	37
CRP[4/] land crossed	miles	25.6	12.5	14.6	16.8	1.0	4.0	0.4	0.2

Table 2.8-6. Alternatives 7A, 7B, 7C, 7D, 7E, 7F, 7G, 7H, 7I, and 7J Compared to the Proposed Route (continued)

Comparison Features	Unit	Proposed Comparison Portion for Alt. 7E	Alt. 7E	Proposed Comparison Portion for Alt. 7F	Alt. 7F	Proposed Comparison Portion for Alt. 7G	Alt. 7G	Proposed Comparison Portion for Alts. 7H and 7I	Alt. 7H	Alt. 7I	Proposed Comparison Portion 7/9 for Alt. 7J[5/]	Alt. 7J[5/]
Vegetation												
Forest/woodland vegetation removed (construction)	acres	14	25	98	106	–	–	418	704	896	418	798
Wetland disturbance (construction)	acres	–	–	0.4	t[6/]	t[6/]	t[6/]	3.4	5.4	12.3	3.6	9.5
Riparian disturbance (construction)	acres	–	–	t[6/]	t[6/]	t[6/]	0.8	4.6	4.5	13.2	4.6	11.0
Water/Fish												
Waterbodies crossed	No.	6	7	38	19	4	–	209	448	525	257	536
Temperature- or Sediment-impaired stream crossings	No.	–	–	–	–	–	–	15	10	21	18	20
Soils/ Minerals												
Highly erodible soils impacted (construction)	acres	67	78	201	169	48	72	1,740	1,981	2,351	1,899	2,372
Mineral area (construction)	acres	–	–	–	–	–	–	–	11	406	3	406
Land Use/ Recreation												
BLM or Forest Service Plan Amendment would be required	yes/ no	yes	yes	yes	no	yes	no	yes	yes	yes	yes	yes
Residences within 300 feet of centerline	No.	1	1	1	–	1	–	6	1	2	7	2
Residences within 1,000 feet of centerline	No.	7	4	7	–	1	1	21	6	5	23	5
Agriculture												
Dryland farming and irrigated agriculture impacted (construction)	acres	14	12	66	29	7	17	750	258	258	837	258
CRP[4/] land crossed	miles	–	–	0.8	0.2	–	–	13.8	13.6	13.7	TBD[7/]	TBD[7/]

1/ Mileages rounded to the nearest tenth of a mile; rows may not sum exactly.
2/ Acreages rounded to the nearest acre; rows may not sum exactly.
3/ WWE = West-wide Energy, a corridor that is generally 3,000 feet wide.
4/ CRP = Conservation Reserve Program.
5/ Alternative 7J connects with Segment 9 approximately 25.8 miles west of the proposed Cedar Hill Substation, which is the western terminus of Segment 7 and the beginning point for Segment 9. The table above compares 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.
6/ Value is less than 0.1 acre.
7/ Information on the miles of Alternative 7J that would cross CRP land has been requested from the Farm Service Agency and will be added to Table 3.18-18 upon receipt.

2.8.7 Alternatives 8A, 8B, 8C, 8D, and 8E Compared to the Proposed Route

Key factors considered in routing this segment included using the WWE corridor where possible, conflicts with agricultural lands, residential development, visual resources, the SRBOP, Guffey Butte-Black Butte Archaeological District, and the IDANG Orchard Training Area. Table 2.8-7 compares effects to key resources from the Proposed Route and each Route Alternative. Figure A-10 in Appendix A shows the Proposed Route and Route Alternatives.

Alternative 8A was developed to maximize use of the WWE corridor. This alternative would cross 6.2 miles of VRM Class I (but no Class II) land whereas the comparison portion of the Proposed Route would cross 3.2 miles of class I and 8.1 miles of Class II. The comparison portion of the Proposed Route would be close to the communities of Hagerman and Glenns Ferry, the Hagerman Fossil Beds, and the Billingsley Creek Wildlife MA. This alternative would impact more cultural resources than its comparison portion of the Proposed Route (84 vs. 33). It would cross within 1,000 feet of 46 residences compared to 14 for the comparison portion of the Proposed Route. It would affect slightly less agricultural land (182 vs. 188 acres).

Alternative 8B, originally considered for the Proposed Route to avoid the SRBOP and the IDANG Orchard Training Area, became an alternative due to opposition from the cities of Kuna and Melba, Idaho. Alternative 8B is in close proximity to several residential areas, crossing within 1,000 feet of 55 residences compared to 12 for the comparison portion of the Proposed Route, resulting in greater visual effects on these communities. This alternative would cross within the Kuna city boundary and may affect future development patterns. This alternative would avoid crossing the SRBOP. Alternative 8B would affect more agricultural land (213 acres vs. 29) than the comparison portion of the Proposed Route. Unlike the Proposed Route, it would not cross the archaeological district.

Alternative 8C was also originally considered as part of the Proposed Route. However, it would have an adverse visual impact on residential areas. Although it would only cross within 1,000 feet of one residence, this route would be close to planned expansion of the planned Mayfield Springs community. The comparison portion of the Proposed Route would not be within 1,000 feet of a residence and would not affect the planned subdivision. Alternative 8C would cross more agricultural land (12 acres vs. 0) than the comparison portion of the Proposed Route.

Alternative 8D was developed to avoid the Alpha Maneuver Sector of the IDANG Orchard Training Area (but not the Bravo Sector). The IDANG recently commented that it would prefer a route that completely avoids the training area. Other environmental impacts would be similar to the comparison portion of the Proposed Route.

Alternative 8E was developed to avoid the Halverson Bar non-motorized area in the Guffey Butte-Black Butte Archaeological District. This route would still cross the SRBOP. Neither this alternative nor the comparison portion of the Proposed Route would cross within 1,000 feet of a residence. However, it would follow a portion of Alternative 9D. If that route were selected, Alternative 8E could not be used. Conversely, if Alternative 8E were selected, the Alternative 9D route could not be used.

An amendment would be needed to allow the Proposed Route to be constructed within this non-motorized area; however, the Boise District BLM office has stated that the RMP could not be amended in this way to meet objectives. Alternative 8E would avoid this area.

Table 2.8-7. Alternatives 8A, 8B, 8C, 8D, and 8E Compared to the Proposed Route

Comparison Features	Unit	Proposed Segment 8 Total Length	Proposed Comparison Portion for Alt. 8A	Alt. 8A	Proposed Comparison Portion for Alt. 8B	Alt. 8B	Proposed Comparison Portion for Alt. 8C	Alt. 8C	Proposed Comparison Portion for Alt. 8D	Alt. 8D	Proposed Comparison Portion for Alt. 8E	Alt. 8E
General												
Total Length	miles[1/]	131.0	51.4	53.6	45.3	45.8	6.5	6.4	6.9	8.1	7.0	18.5
Construction Disturbance Area	acres[2/]	2,125	815	824	754	779	139	138	123	143	98	286
Operations Disturbance Area	acres	246	99	102	87	69	15	16	19	15	10	27
Land Ownership and Use												
BLM	miles	86.5	29.1	25.1	41.9	14.2	5.5	2.3	6.9	2.9	6.4	18.0
Forest Service	miles	–	–	–	–	–	–	–	–	–	–	–
Other Federal	miles	3.7	–	–	2.7	1.5	–	–	–	–	0.1	0.1
State	miles	9.3	2.3	6.3	–	2.8	–	0.3	–	1.0	–	–
Private	miles	33.4	20.0	21.9	2.5	27.1	0.8	3.9	–	4.2	0.4	0.3
Indian Reservation	miles	–	–	–	–	–	–	–	–	–	–	–
WWE Corridor[3/]	miles	18.8	–	18.9	5.3	1.0	0.8	1.9	–	–	–	–
Within or Adjacent to Existing Transmission Corridor	miles	114.5	51.1	38.3	32.0	17.1	2.1	5.5	6.9	6.9	3.4	11.3
Resource Summaries												
Visual												
VRM I or II crossed	miles	15.5	11.35	6.8	4.15	–	–	–	–	–	1.4	2.4
Cultural												
Potentially affected cultural resources	number	116	43	102	64	34	2	2	8	7	36	20
Wildlife												
Designated big game winter range crossed	miles	67.6	39.5	20.4	4.1	4.1	4.1	5.6	–	–	0	1.5
Big game parturition range crossed	miles		No data; Idaho Department of Fish and Game does not map big game parturition areas.									
Raptor nests within 1 mile	number	301	1	–	283	52	12	17	50	57	184	510
Idaho Sage-grouse Key Habitat crossed	miles	13.2	6.0	–	–	–	–	–	–	–	–	–

Table 2.8-7. Alternatives 8A, 8B, 8C, 8D, and 8E Compared to the Proposed Route (continued)

Comparison Features	Unit	Proposed Segment 8 Total Length	Proposed Comparison Portion for Alt. 8A	Alt. 8A	Proposed Comparison Portion for Alt. 8B	Alt. 8B	Proposed Comparison Portion for Alt. 8C	Alt. 8C	Proposed Comparison Portion for Alt. 8D	Alt. 8D	Proposed Comparison Portion for Alt. 8E	Alt. 8E
Vegetation												
Forest/woodland vegetation removed (construction)	acres	–	–	–	–	–	–	–	–	–	–	–
Wetland disturbance (construction)	acres	3.3	1.6	0.4	–	5.8	–	–	–	–	–	–
Riparian disturbance (construction)	acres	1.4	0.5	6.0	0.7	1.6	0.1	t[5/]	–	–	–	–
Water/Fish												
Waterbodies crossed	number	259	57	55	112	18	18	21	8	8	6	12
Temperature- or Sediment-impaired stream crossings	number	30	1	2	28	5	5	2	7	5	–	–
Soils/Minerals												
Highly erodible soils impacted (construction)	acres	1,540	288	280	696	727	138	138	123	142	59	267
Mineral area (construction)	acres	–	–	–	–	2	–	–	–	–	–	–
Land Use/Recreation												
BLM or Forest Service Plan Amendment would be required	yes/no	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	yes
Residences within 300 feet of centerline	number	6	3	7	2	24	–	–	–	1	–	–
Residences within 1,000 feet of centerline	number	27	14	46	12	55	–	1	–	1	–	–
Agriculture												
Dryland Farming and Irrigated Agriculture Impacted (construction)	acres	219	188	182	29	213	–	12	0	12	9	0
CRP[4/] land crossed	miles	–	–	–	–	–	–	–	–	–	–	–

1/ Mileages rounded to the nearest tenth of a mile; rows may not sum exactly.
2/ Acreages rounded to the nearest acre; rows may not sum exactly.
3/ WWE = West-wide Energy
4/ CRP = Conservation Reserve Program.
5/ Value is less than 0.1 acre.

2.8.8 Alternatives 9A, 9B, 9C, 9D, 9E, 9F, 9G and 9H Compared to the Proposed Route

Key factors considered in routing this segment were agricultural and residential development in Owyhee County, visual resources, the Jarbidge Military Operations Area, Saylor Creek Air Force Range, Balanced Rock County Park, Bruneau Dunes County Park, the Cove Non-motorized Area, and Salmon Falls Creek WSR. Table 2.8-8 compares effects to key resources under each route alternative. Figure A-11 in Appendix A shows the Proposed Route and Route Alternatives.

Alternative 9A was the Proponents' original Proposed Route. The Proponents worked with local citizens, landowners, and the BLM to move a 7.8-mile portion of the Proposed Route about a mile to the south to avoid impacts to irrigated agriculture and dairies, leaving the original Proposed Route as an alternative to be analyzed in detail. Alternative 9A and the comparison portion of the Proposed Route would both cross within 1,000 feet of one residence, and Alternative 9A would impact an additional 3 acres of agriculture land compared to the comparison portion of the Proposed Route.

Alternative 9B was developed to maximize use of the WWE corridor and to parallel existing utility corridors; however, Alternative 9B would have greater visual impacts due to its proximity to private lands, historic trails, and VRM Class I lands. Alternative 9B would be within 1,000 feet of seven residences, compared to none for the comparison portion of the Proposed Route. It would disturb more agricultural land than the comparison portion of the Proposed Route (206 acres vs. 45). Alternative 9B would avoid crossing both the WSR and the eligible WSR portions of Salmon Falls Creek; the comparison portion of the Proposed Route would cross the eligible portion only. Both Alternative 9B and the comparison portion of the Proposed Route would avoid crossing Balanced Rock County Park.

Alternative 9C would parallel existing transmission lines in corridors for a greater extent than the comparison portion of the Proposed Route (10.4 miles vs. 1.0) but would have a greater visual impact on Balanced Rock County Park due to its proximity. Alternative 9C would be within 1,000 feet of five residences, compared to none for the comparison portion of the Proposed Route. This alternative would impact more agricultural lands than the comparison portion of the Proposed Route (62 acres vs. 0). Alternative 9C would not cross the eligible WSR portion of Salmon Falls Creek whereas the comparison portion of the Proposed Route would. The Idaho State Office of the BLM has indicated that an amendment cannot be written to allow the crossing of the Salmon Falls Creek WSR eligible portion at the Proposed Route location.

Alternatives 9D and 9E were developed as a result of collaboration with citizens, landowners, the BLM, the Owyhee County Task Force, and the Proponents to avoid private lands and maximize the use of public lands in Owyhee County. Both alternatives would deviate from the WWE corridor, which would be followed by the comparison portion of the Proposed Route; however, both alternatives would cross less private land (3.3 and 1.3 miles, respectively, vs. 18.4 miles). Alternatives 9D and 9E would not cross within 1,000 feet of a residence, whereas the comparison portion of the Proposed Route would be within 1,000 feet of nine residences. Both alternatives would

impact less agricultural lands (19 and 3 acres, respectively, vs. 199 acres). Alternative 9D would cross more BLM-managed VRM Class II lands (11.5 miles vs. 0.2) than the comparison portion of the Proposed Route. Alternative 9D would be within the SRBOP for well over half of its length.

Alternatives 9F and 9G were proposed by the BLM to avoid the non-motorized portion of Swan Falls, avoiding both the Cove Non-motorized Area and the non-motorized portion of the Guffey Butte-Black Butte Archaeological District. It would cross the river twice, once near the C.J. Strike SRMA and again near the Swan Falls Dam. However, the route it would follow to avoid the non-motorized area in the historic district would be the same alignment that Alternative 8E would follow. If 8E were selected, Alternative 9F could not also be selected. Therefore, Alternative 9G was proposed by the BLM. It would avoid the non-motorized portion of the historic district but not the Cove Non-motorized Area. It would cross the river approximately 3 miles south of the Alternative 9F crossing point. Alternative 9F would be within 1,000 feet of eight residences, compared to nine for the comparison portion of the Proposed Route, whereas Alternative 9G would not be within 1,000 feet of any residences. Impacts to agricultural land from Alternative 9G would be similar to those for Alternative 9D.

Alternative 9H is another route developed by the BLM that would avoid the Cove Non-motorized Area and the non-motorized portion of the Guffey Butte-Black Butte Archaeological District. Like Alternative 9G, this route was proposed in the event that Alternative 8E was selected and Alternative 9F could not be used. As with Alternative 9F, Alternative 9H would be within 1,000 feet of eight residences, compared to nine for the comparison portion of the Proposed Route. Both Alternatives 9F and 9H would cross within 300 feet of two residences, less than the six residences along the comparison portion. Impacts to agricultural land would be similar to those for Alternative 9F.

Table 2.8-8. Alternatives 9A, 9B, 9C, 9D, 9E, 9F, 9G, and 9H Compared to the Proposed Route

Comparison Features	Unit	Proposed Segment 9 Total Length	Proposed Comparison Portion for Alt. 9A	Alt. 9A	Proposed Comparison Portion for Alt. 9B	Alt. 9B	Proposed Comparison Portion for Alt. 9C	Alt. 9C	Proposed Comparison Portion for Alts. 9D–H	Alt. 9D	Alt. 9E	Alt. 9F	Alt. 9G	Alt. 9H
General														
Total Length	miles[1/]	161.7	7.8	7.7	49.5	53.2	14.7	15.3	57.2	58.4	68.7	62.9	56.4	61.0
Construction Disturbance Area	acres[2/]	2,670	117	133	825	816	239	279	955	815	1,004	971	848	979
Operations Disturbance Area	acres	359	15	18	121	85	26	31	106	80	135	93	83	96
Land Ownership and Use														
BLM	miles	128.7	6.0	5.6	46.0	33.1	13.6	8.3	37.6	51.1	65.1	46.5	49.4	44.8
Forest Service	miles	–	–	–	–	–	–	–	–	–	–	–	–	–
Other Federal	miles	–	–	–	–	–	–	–	–	–	–	0.2	0.2	0.2
State	miles	4.6	–	–	1.1	1.0	1.1	–	1.1	3.9	2.3	3.9	3.9	3.9
Private	miles	28.4	1.8	2.1	2.4	19.1	–	7.0	18.4	3.3	1.3	12.3	2.9	12.0
Indian Reservation	miles	–	–	–	–	–	–	–	–	–	–	–	–	–
WWE Corridor[3/]	miles	53.9	–	–	3.8	28.2	–	–	32.8	0.4	0.4	8.4	0.4	8.4
Within or Adjacent to Existing Transmission Corridor	miles	16.9	0.4	2.2	1.0	23.3	1.0	10.4	0	31.3	–	28.6	26.3	23.6
Resource														
Visual														
VRM I or II crossed	miles	5.7	–	–	3.85	1.6	3.85	0.1	0.2	11.5	0	5.25	17.9	11.7
Cultural														
Potentially affected cultural resources	number	116	5	2	66	40	43	37	28	96	32	46	103	28
Historic trails crossed	number	1	–	–	1	2	1	1	–	5	–	3	4	5
Wildlife														
Designated big game winter range crossed	miles	29.9	1.9	2.1	–	–	–	–	13.4	1.9	38.5	1.9	2.1	2.1
Big game parturition range crossed	miles	No data; Idaho Department of Fish and Wildlife does not map big game parturition areas.												

Table 2.8-8. Alternatives 9A, 9B, 9C, 9D, 9E, 9F, 9G, and 9H Compared to the Proposed Route (continued)

Comparison Features	Unit	Proposed Segment 9 Total Length	Proposed Comparison Portion for Alt. 9A	Alt. 9A	Proposed Comparison Portion for Alt. 9B	Alt. 9B	Proposed Comparison Portion for Alt. 9C	Alt. 9C	Proposed Comparison Portion for Alts. 9D–H	Alt. 9D	Alt. 9E	Alt. 9F	Alt. 9G	Alt. 9H
Raptor nests within 1 mile	number	78	2	2	32	12	17	5	12	582	13	539	606	563
Idaho Sage-Grouse Key Habitat crossed	miles	11.5	0.2	2.2	6.6	–	5.3	–	–	–	18.2	–	–	–
Vegetation														
Forest/woodland vegetation removed (construction)	acres	1	–	–	1	–	1	–	–	1	–	–	1	–
Wetland disturbance (construction)	acres	0.8	0.3	–	–	–	–	–	0.6	0.7	0.8	1.3	1.1	1.8
Riparian disturbance (construction)	acres	2.4	t[5/]	0.3	0.3	0.5	0.2	–	2.1	1.8	1.4	4.7	2.4	4.5
Water/Fish														
Waterbodies crossed	number	322	16	13	69	58	27	21	136	45	139	57	35	47
Temperature- or sediment-impaired stream crossings	number	20	–	1	12	6	–	2	3	5	22	6	6	7
Soils/Minerals														
Highly erodible soils impacted (construction)	acres	1,224	63	58	672	557	196	146	227	568	630	568	559	559
Mineral area (construction)	acres	10	–	–	2	3	2	2	–	4	135	4	4	4
Land Use/Recreation														
BLM or Forest Service Plan Amendment would be required	yes/no	yes	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes
Residences within 300 feet of the centerline	number	8	–	–	–	1	–	1	6	–	–	2	–	2
Residences within 1,000 feet of centerline	number	20	1	1	–	7	–	5	9	–	–	8	–	8
Agriculture														
Dryland farming and irrigated agriculture impacted (construction)	acres	356	–	3	45	206	–	62	199	19	3	109	26	111
CRP[4/] land crossed	miles	–	–	–	–	–	–	–	–	–	–	–	–	–

1/ Mileages rounded to the nearest tenth of a mile; rows may not sum exactly.
2/ Acreages rounded to the nearest acre; rows may not sum exactly.
3/ WWE = West-wide Energy
4/ CRP = Conservation Reserve Program.
5/ Value is less than 0.1 acre.

2.9 PREFERRED ALTERNATIVES

Gateway West represents the largest and most complex proposed high-voltage transmission line in the western United States. Unlike interstate natural gas pipelines, there is no equivalent overarching federal authority empowered with siting interstate high-voltage transmission lines. Rather, approval of interstate transmission lines involves a mix of authorizations from local, state, and federal agencies. Siting preference on public versus private lands is a top issue in some Project segments. BLM coordinated with federal, state, and local government cooperating agencies to identify reasonable alternatives that would result in complementary siting decisions by all authorizing entities.

There is no impact-free route choice for a large transmission line. In some segments of the Gateway West Project, where there are multiple resource conflicts, alternative routes often show dramatically different impacts on certain resources, and some alternatives were put forward to emphasize protection of one resource or land value over another. There are substantial segments of the public than have not had a chance to express their opinions on the issues and alternatives so far proposed. It is reasonable to expect those entities to propose additional alternatives or perhaps to present new information on alternatives currently considered.

2.9.1 BLM

Department of Interior regulations (43 CFR 46.425) suggest departmental agencies should identify preferred alternatives in Draft EISs but do not require them to do so: "Unless another law prohibits the expression of a preference, the draft environmental impact statement ***should*** identify the bureau's preferred alternative or alternatives, if one or more exist." Agencies are required to identify preferred alternatives in Final EISs: "Unless another law prohibits the expression of a preference, the final environmental impact statement ***must*** identify the bureau's preferred alternative" [added emphasis].

The BLM has typically identified preferred alternatives in most of the Draft EISs it has prepared. The BLM portion of the Project approval covers only the federal lands it administers, between 40 and 50 percent of the total length. It does not extend to state-managed or private lands. The BLM recognizes that any route it proposes to approve influences that route's location on adjacent private lands. Faced with this multiple use management situation, it is prudent for the BLM to reserve its identification of a preferred alternative until it has received input on the routes from all sectors of the public. Therefore, the BLM will defer identification of its preferred alternative until the Final EIS for the above reasons. Following the public comment period on the Draft EIS, the BLM pledges to work collaboratively with cooperating agencies and the public to reach a consensus on the preferred route for the Gateway West Project. In the absence of a consensus, the BLM will identify in the Final EIS its preferred alternative based on its multiple-use mandate in the FLPMA. In consideration of the potential changes to the environmental analysis between the draft and final document, the BLM will hold a sufficient public comment period on the Final EIS.

2.9.2 State of Wyoming Preferred Alternatives

As a cooperating agency, the State of Wyoming has reviewed all of the alternatives incorporated into this Draft EIS and evaluated each based on consistency with state rules, regulations, and policies and on the impacts to natural resources unique to each alternative. Of particular concern for this project, the State determined consistency of each the alternatives with EO 2011-5, which outlines protection of sage-grouse core areas within the state. That EO allows the authorization and implementation of new development in sage-grouse core areas only when it can be demonstrated by state agencies (in this case primarily the Industrial Siting Council and Public Service Commission) that the activity will not cause declines in sage-grouse populations. The EO outlines two primary criteria for determining consistency of new transmission lines with core area protection. First, new transmission development will be considered consistent with the EO if construction of the new transmission occurs within 0.5 mile of either side of existing 115-kV or greater transmission lines in the core area. Second, in response to numerous interstate transmission proposals and a desire to reduce the impacts of high-voltage transmission across the southern portion of the state, the EO establishes a 2-mile-wide corridor through the Sage, Seedskadee, Greater South Pass, and Hanna Core Areas. New transmission constructed in the 2-mile-wide corridor through these core areas will be considered consistent with the EO. Any new transmission (including collector) lines constructed in core areas within the state that cannot meet one of these criteria will be considered inconsistent with the EO unless the applicant can demonstrate to appropriate state agencies that construction will not cause declines in sage-grouse populations. The state currently lacks scientifically valid information to conclude that construction outside of the corridors described above would not result in declines in sage-grouse populations.

2.9.2.1 Segment 1

The State of Wyoming's preferred alternatives for Segment 1W and 1E are to construct adjacent (within 0.5 mile) to the existing (to be reconstructed) Dave Johnston – Aeolus segment (1W[c]) of the Dave Johnston – Rock Springs 230-kV line. Therefore, the State of Wyoming preferred alternatives are a combination of Alternative 1W-A and Proposed Route 1W(a) for Segment 1W and Alternative 1E-C for Segment 1E (see Appendix A, Figure A-2). The state's preferred alternative for this segment is consistent with EO 2011-5 because both new transmission segments (1E and 1W[a]) could be constructed within 0.5 mile of an existing transmission line through sage-grouse core area.

The Proposed Route for Segment 1E would be inconsistent with EO 2011-5 through the Natrona Core Area and would result in higher levels of impacts to nearly all resources when compared to following Alternative 1E-C adjacent to a portion of the existing Dave Johnston – Rock Springs transmission line. While Alternative 1E-B avoids construction of new transmission within core areas outside existing corridors, it would also result in higher levels of impacts to nearly all resources when compared to constructing Segment 1E adjacent to the existing Dave Johnston – Rock Springs transmission line.

2.9.2.2 Segment 2

The EO 2011-5 Proposed Route for Segment 2 is also the State's preferred alternative except in the vicinity of Hanna, Wyoming (Appendix A, Figure A-3 between points 2a.1, 2d, 2e.4) where the State prefers Alternative 2C (points 2a.1, 2d.1, 2e.4).

EO 2011-5 designates a 2-mile-wide corridor through the Hanna Core Area that is generally located north and west of Hanna. The Proposed Route is aligned through the core area east and south of Hanna. Realigning the Proposed Route to follow Alternative 2C would make it consistent with the corridor established in the EO. The Proposed Route through the Greater South Pass Sage-Grouse Core Area is within the corridor established by the EO. With the minor variation near Hanna, Segment 2 would be consistent with the EO.

Alternative 2B and the western portion of Alternative 2A would result in significant adverse impacts to the community and residents of Fort Steele, Wyoming, as well as to Fort Fred Steele State Historic site. The Proposed Route in the vicinity of Fort Steele avoids these impacts.

2.9.2.3 Segment 3

Segment 3 does not cross sage-grouse core area and the State agrees with the Proposed Route for this segment.

2.9.2.4 Segment 4

Numerous conflicts exist with transmission routing along this segment and a number of alternatives have been developed to address these concerns. However, to date it has not been possible to identify a single alternative that minimizes to acceptable levels impacts to all the resources that occur along this segment.

The State's preferred alternative for Segment 4 is Alternative 4A (see Appendix A, Figure A-5). This alternative follows three existing 345-kV transmission lines between the Jim Bridger Power Plant and Cokeville, Wyoming. EO 2011-5 establishes a 2-mile-wide corridor through the Sage and Seedskadee Core Areas centered on the three existing transmission lines. For most resources, constructing this segment adjacent to the existing transmission lines would significantly reduce impacts.

This alternative may, however, result in higher impacts to historic trails and therefore mitigation should be developed, with input from the SHPO, to adequately compensate for impacts to the trails.

The Proposed Route departs from the existing transmission line corridor west of Seedskadee NWR and proceeds north to Fontenelle Reservoir and then west along the southern end of the Bridger NF. Most of the area traversed by the Proposed Route is undeveloped (compared to the area crossed by the existing transmission lines) and impacts to most natural resources are expected to be significantly higher compared to construction adjacent to the existing transmission. The Proposed Route is also inconsistent with EO 2011-5 because it would cross through the Fontenelle Core Area 15 miles north of the existing transmission line corridor. A transmission corridor has not been designated for this core area.

Similarly, alternatives south of Diamondville and Kemmerer would cross the Seedskadee and Sage Core Areas outside the corridors designated by the EO. The impacts to nearly all natural resources along the southern alternatives would be higher compared to constructing Alternative 4A along the existing transmission line corridor.

2.9.3 Power County

Power County, a cooperating agency, passed ordinance No. 2010-03 on November 23, 2009, designating two alternatives as preferred for those portions of Segments 5 and 7 in Power County (Power County 2009a). The County states that the Proposed Route would have extremely detrimental impacts on the health, safety, welfare, and economic viability of the County, particularly irrigated agriculture and future economic development within the County.

2.9.3.1 Segment 5

Power County's preferred alternative follows Alternatives 5C and 5E (see Appendix A, Figure A-7). Alternative 5C (5g, 5l) follows the existing transmission corridor across the Fort Hall Indian Reservation. Alternative 5E (5i, 5m, 6) follows an existing transmission corridor across the Snake River to a termination at the Borah Substation.

2.9.3.2 Segment 7

Power County's preferred alternative is that portion of Alternative 7I that would originate at point 5 and extend through points 7a.0, 7b.0, 7b.1, 7a.2, and 7r.1 (see Appendix A, Figure A-9). In addition, Power County supports Alternative 7J (see discussion below for Twin Falls County).

2.9.4 Cassia County

Cassia County is a cooperating agency. Commissioners designated county entry and exit points for Segment 7 at an August 24, 2009, meeting attended by representatives of Cassia, Twin Falls, Power, Oneida, and Bannock Counties in Idaho and Box Elder County in Utah (Cassia County 2009).

2.9.4.1 Segment 7

Cassia County's preferred alternative is that portion of Alternative 7I in Cassia County (see Appendix A, Figure A-9). The preferred alternative would originate at the Power-Cassia County line at MP 52 and extend through point 7r.1 to a crossing into Nevada before returning to Cassia County and then passing into Twin Falls County at MP 130. In addition, Cassia County supports Alternative 7J (see discussion below for Twin Falls County).

2.9.5 Twin Falls County

Twin Falls County has identified Alternative 7J (originally called the Rogerson-Hollister Alternative) as their preferred route (Twin Falls County 2010b). This Alternative would connect alternative 7I with the Propose Route along Segment 9, as well as relocating the proposed Cedar Hill Substation in order to provide a point of interconnection between Alternative 7I and Segment 9.

2.9.5.1 Segments 7 and 9

Alternative 7J would deviate from Alternative 7I at point 7r.3 and continue through point 13 where the relocated Cedar Hill Substation would be located and reconnect with the Segment 9 Proposed Route at point 9a.6 (see Appendix A, Figure A-9).

2.9.6 Owyhee County

Owyhee County, a cooperating agency, identified two preferred alternatives to the Proposed Route in Segment 9 by letter dated September 1, 2009 (Owyhee County, 2009). Of these routes, the Northern Route (9D) is strongly preferred and the Southern Route (9E) is considered as only a marginal improvement over the Proposed Route. The County states that the Proposed Route would have significant detrimental effect on the County's landowners, farmers, economy, future development, and tax base.

2.9.6.1 Segment 9

Owyhee County's preferred northern alternative corresponds to Alternative 9D (see Appendix A, Figure A-11). It would originate at point 9n northeast of the Saylor Creek Air Force Range, cross Snake River, traverse the SRBOP through point 9r, and intersect back with the Proposed Route north of the town of Murphy at point 9p. Alternative 9E, the southern and less preferred route, also originates at point 9n but proceeds south and west through point 9s before rejoining the Proposed Route at point 9p.

2.9.7 Idaho Army National Guard

IDANG became a cooperating agency in April 2011. IDANG has a federal mission to provide trained units available for active duty in time of war or national emergency. The Orchard Training Area, which is on BLM-managed land within the SRBOP, is an important training area used by IDANG.

2.9.7.1 Segment 8

IDANG believes Segment 8 of the Proposed Route could adversely affect ground maneuver and aerial combat training operations within the Orchard Training Area. It could adversely affect approximately 3,500 acres of lands in the northern portion of the Orchard Training Area by limiting or restricting training near tower and line safety buffers. The Proposed Route could also negatively affect cultural sites and known populations of slickspot peppergrass (*Lepidium papilliferum*), a federally listed plant species.

Alternative 8D was designed to avoid the Alpha Sector of the training area but would not protect the Bravo Sector. In May 2011, IDANG recommended a new alternative route that would avoid adversely affecting the training area. Their preferred route would remain on the north side of the existing 500-kV transmission line from a point east of the Orchard Training Area to a point west of the area.

2.10 CUMULATIVE EFFECTS SUMMARY

2.10.1 Proposed Project

The effects of the proposed Gateway West Project, when taken together with past, present, and reasonably foreseeable future actions, constitute the cumulative effects of the Project and are fully analyzed in Chapter 4. Chapter 4 also discusses the cumulative effects of land use plan amendments needed to allow for the Proposed or Alternative Routes when the amendment would change one or more land classifications. For many resources, the effects of Gateway West, when combined with the effects of other known projects, are not cumulatively substantial. In other cases, although the effects of Gateway West are minor, when taken together with effects of other past, present, and proposed future actions, many of which collectively already present a substantial cumulative effect, the cumulative impact may be considerable. Finally, there are some effects of Gateway West that are by themselves large, and when considered with other effects, are also cumulatively substantial.

Resources for which Gateway West effects are minor and even when considered together with other projects remain less than cumulatively substantial include socioeconomics, environmental justice, weeds, wetlands, federally listed invertebrate species, lynx, wolf, yellow-billed cuckoo, bald eagle, minerals, paleontological resources, geologic hazards, transportation, air quality, electrical environment, public safety, and noise. Additional details are found in Chapter 4.

Gateway West, by itself, has minor effects on vegetation, soils, and waterbodies where crossed by access roads and therefore on habitat for most wildlife and fish species, including specifically sagebrush-obligate species (Columbian sharp-tailed grouse, mountain plover, white- and black-tailed prairie dogs, pygmy rabbits, greater sage-grouse, Wyoming pocket gopher, and burrowing owl) and riparian-obligate species (Columbia spotted frog, northern leopard frog, and Preble's meadow jumping mouse). However, even without Gateway West's effects, the loss of habitat and fragmentation from past and present events alone is considerable. When the Gateway West effects are taken together with historic and present events and projects as well as with multiple future projects, the level of soil and habitat loss and fragmentation continues to be considerable. The Proponents have offered off-site compensatory mitigation in recognition of the current critical condition of some types of habitat and the contribution that Gateway West may make to that loss. BLM has required additional mitigation and is considering further mitigation for habitat losses from the Project as detailed in Chapter 3.

The Gateway West Project would not have a measurable adverse effect on migratory bird populations or significant bird conservation sites. It would, however, have a small adverse effect on migratory bird habitats and ecological conditions through vegetation removal, fragmentation of native habitats, and possible increases in predation pressure due to adding perching substrate for avian predators and adding service roads sometimes used by canid predators. When taken together with the existing substantial habitat loss caused by past, present, and reasonably foreseeable actions, the cumulative impact on migratory bird habitat and ecological conditions is substantial.

Gateway West, by itself, would have minor adverse effects to private land uses or to agriculture with the degree of impact varying by alternative. When taken together with many of the factors that constrain and limit agriculture, including availability of irrigation water and development pressure on property values, additional land withdrawals for utility uses can be very important to individual farmers and to agricultural communities. On federal lands, both the Proposed Route and some alternatives would require changes in existing land use plans. In particular, visual resource or scenic management objectives would not be met if some of the proposed or alternative routes were chosen, and existing specifications for allowable levels of visual contrast would have to be altered. Also, several land management plans would require amendments to allow the Project. In some cases, large areas of public lands would be reclassified, possibly allowing for additional projects without additional plan amendments. These impacts to land use planning goals are considerable, particularly when taken together with other transmission lines requesting similar consideration, which if granted along the same route would create a large utility corridor.

Any new water withdrawals in the watersheds of the Platte and Colorado Rivers (Segments 1 to 4 in Wyoming) would require either participation in the recovery programs for those rivers (provided for in programmatic biological opinions for each) or a separate consultation with the USFWS. Gateway West and all new proposed construction projects in those watersheds in Wyoming would require some water during construction and would be subject to concerns regarding withdrawals. BLM would participate in the USFWS recovery program and would require the Proponents to pay the assigned fee for water uses during construction over in either watershed. Any new withdrawals from either river are considered a significant adverse impact on warm-water fisheries and associated endangered fish species as well as riparian-obligate species of plants. However, participation in the recovery program relieves the Project of a jeopardy decision.

Gateway West, by itself, would have significant adverse effects on some cultural resources, particularly on historic properties for which visual setting is important like historic trails. When considered together with other past, present, and foreseeable future projects, including additional transmission lines, the cumulative effect is also significant. Similarly, the visual impact of the Gateway West set of lattice towers in some areas would be a substantial negative effect, and when taken together with the several proposed transmission lines and other developments, would form a cumulatively considerable adverse impact.

2.10.2 No Action

Under the No Action Alternative, the BLM would not issue a ROW grant to the Proponents of the Gateway West Transmission Line Project and the Project would not be constructed across federal lands. No land management plans would be amended to allow for the construction of this Project. Other projects would continue, including wind farms, oil and gas extraction, and coal, trona, phosphate mines. The demand for electricity, especially for renewable energy, would continue to grow in the Proponents' service territories. If the Gateway West Project, or is not permitted, the demand for transmission services to which its purpose and need refers would not be met with this Project and the area would have to turn to other proposals to meet the transmission

demand. According to McBride et al. (2008), the lack of construction of transmission lines could result in substantial adverse impacts on the economic growth, including loss of jobs, in the Pacific Northwest region, which includes Idaho as well as Washington, Oregon, Montana, and several Canadian provinces.

2.11 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

In accordance with NEPA Section 102.C (42 U.S.C. § 4332), this section addresses irreversible and irretrievable commitments of resources that would result from the implementation of the Proposed Action and unavoidable adverse impacts. The relationship between local short-term uses of the environment within the region of influence and the maintenance and enhancement of long-term productivity is discussed in detail for each resource in Chapter 3.

Resources committed to the proposed Project would be material and nonmaterial. Irreversible commitment of resources for the purposes of this section has been interpreted to mean that those resources, once committed to the proposed Project, would continue to be committed throughout the 50-year life of the Project. Irretrievable commitment of resources has been interpreted to mean that those resources used, consumed, destroyed, or degraded during construction, operation, maintenance, and abandonment of the proposed Project could not be retrieved or replaced for the life of the Project or beyond.

Implementation of the Proposed Route would require the consumption of nonrenewable fuel (diesel, gasoline, and jet fuel) resources for construction vehicles, construction equipment, construction operation vehicles, and helicopter use. Construction of the Project would result in the consumption of saleable minerals, including fill material for grade changes, sand and gravel for concrete production, gravel for road beds, and similar uses resulting in an irretrievable commitment of natural resources. Construction would also require the manufacture of new materials, some of which would not be recyclable at the end of the Proposed Route's lifetime, and energy for the production of these materials, which would also result in an irretrievable commitment of natural resources. Table 2.11-1 details the irreversible and irretrievable commitments by resource and indicates in which section of Chapter 3 the resource is discussed.

Table 2.11-1. Irreversible and Irretrievable Commitments of Resources, Gateway West Project

Section	Resource	Irreversible Impacts	Irretrievable Impacts	Explanation
3.2	Visual Resources	No	Yes	Impacts to viewers during the life of the project would be irretrievable. All visual impacts would end with the end of the Project and would not be irreversible.
3.3	Cultural Resources	Yes	Yes	Removal or disturbance of previously unidentified cultural resources would result in irretrievable and irreversible loss of data. Visual impacts would end with the decommissioning of the project but visual setting would be compromised in some cases for the duration of the project.
3.4	Socioeconomic	No	No	Construction impacts to worker availability would be short-term and substitutable with other worker populations
3.5	Environmental Justice	No	No	No impacts from Project would occur.
3.6	Vegetation	Yes	Yes	Removal or disturbance of vegetation could create irreversible and irretrievable impacts.
3.7	Rare Plants	Yes	Yes	Removal or disturbance of habitat could create irreversible and irretrievable impacts. Aquatic habitat could be irreversibly affected.
3.8	Invasive Plant Species	No	Yes	Invasive plant species could be introduced by Project, irretrievably resulting in loss of native vegetation.
3.9	Wetlands	Yes	Yes	Removal or disturbance of habitat could create irreversible and irretrievable impacts. Aquatic habitat could be irreversibly affected.
3.10	Wildlife and Fish	Yes	Yes	
3.11	TES Wildlife and Fish	Yes	Yes	
3.12	Minerals	No	Yes	Construction would result in the consumption of saleable minerals, including fill materials for grade changes, sand and gravel for concrete production, and gravel for road beds.
3.13	Paleontology	Yes	Yes	Some loss of fossil resources may occur during construction of project resulting in irretrievable and irreversible loss of data.
3.14	Geologic Hazards	No	No	No irretrievable or irreversible losses would occur due to geologic hazards.
3.15	Soils	Yes	Yes	Soil lost to increased erosion would be irretrievable. There would be an irreversible commitment of soil resources on land associated with the ROW and aboveground facilities.
3.16	Water Resources	No	Yes	Water quality degradation from increased sedimentation would be irretrievable. Water removed from streams for construction would be irretrievable. There would be no irreversible commitment of water resources.
3.17	Land Use	No	Yes	Land use required for the operation of the transmission line would be irretrievably altered for the life of the Project.
3.18	Agriculture	No	Yes	Irretrievable impacts would include the loss of agricultural crop production for the season during construction in impacted areas. Yearly crop and forage production would decrease due to towers, structures, access roads, etc. on crop land. There would be an irreversible loss to cropland due to tower and structure construction.
3.19	Transportation	No	No	Project impacts would occur only during construction and would be fully mitigated

Table 2.11-1. Irreversible and Irretrievable Commitments of Resources, Gateway West Project (continued)

Section	Resource	Irreversible Impacts	Irretrievable Impacts	Explanation
3.20	Air	No	No	Project emissions would not exceed federal or state air quality standards. Air quality would return to existing conditions after completion of the Project.
3.21	Electrical Environment	No	No	Project electrical and magnetic fields would not exceed federal or state standards. Effects would end with termination of the Project.
3.22	Public Safety	No	No	Temporary impacts to public safety during construction are fully mitigated. No irretrievable or irreversible impacts would occur.
3.23	Noise	No	No	Construction noise is short-term. Project operational noise would not exceed federal or state standards. Effects would end with termination of the Project.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS

3.1 INTRODUCTION

This chapter presents the baseline information needed for the Project area by resource and discloses the predicted effects of the Action Alternatives described in Chapter 2. It is based on the Project description found in Appendix B and includes the EPMs proposed by the Proponents as part of the Project, found in Appendix C. The discussion of each individual resource includes information on what area was evaluated, what the existing conditions are for that resource in that area, what issues were analyzed, and how the analysis was completed. Each resource discussion then describes the effects of the Proposed Action and compares it to its Route Alternatives, if any, by segment. The cumulative effects for each resource analyzed can be found in Chapter 4.

3.1.1 Where to Find Information

Understanding the effects analysis depends on understanding how the Project was developed, what it would entail, what was considered, and where it would be located. Table 3.1-1 provides a quick reference to specific information provided elsewhere in the EIS, including the detailed description of the Project and process.

Table 3.1-1. Quick EIS Information Reference

What	Where
Overall organization of the EIS	Chapter 1, Section 1.11, Reader's Guide
Purpose and Need for the Project	Chapter 1
Decisions to be made	Chapter 1, Section 1.2
Scope of the analysis	Chapter 1, Section 1.7
Issues	Chapter 1, Section 1.9
How the alternatives were developed	Chapter 2, Section 2.2
Route Alternatives (including the Proposed Action) considered in detail	Chapter 2, Section 2.4
Alternatives considered but eliminated from detailed study	Chapter 2, Section 2.4
Proposed federal land management plan amendments	Chapter 2, Section 2.2, Table 2.2-1, Appendix F
Alternative locations for substations	Chapter 2, Section 2.5
No Action Alternative	Chapter 2, Section 2.3
Design Variation	Chapter 2, Section 2.1
Structure Variation	Chapter 2, Section 2.1
Schedule Variation	Chapter 2, Section 2.1
Detailed description of system components	Chapter 2, Section 2.7, Appendix B
Construction	Chapter 2, Section 2.7, Appendix B
Operations and maintenance	Chapter 2, Section 2.7, Appendix B
Abandonment and restoration	Chapter 2, Section 2.7, Appendix B
Environmental Protection Measures (EPMs)	Chapter 2, Section 2.7, Appendix C
Summary comparison of effects of alternatives	Chapter 2, Section 2.8
Summary of cumulative effects	Chapter 2, Section 2.10

Table 3.1-1. Quick EIS Information Reference (continued)

What	Where
EPMs and agency proposed mitigation measures by resource area	Chapter 2, Section 2.7, Table 2.2-1
Cumulative Effects	Chapter 4
Consultation, collaboration, and public involvement	Chapter 5
Glossary of terms and index	Chapter 6
References cited in Draft EIS	Chapter 7
Maps of the Proposed Action and Alternatives	Appendix A
Design details	Appendix B
Detailed EPMs	Appendix C

3.1.2 Proposed Action and Market-driven Variations

The Proponents have indicated that the present economic downturn may alter or delay parts of the Project as proposed. As a result, they have stated that they may need to construct the Project in phases and that those phases may be delayed beyond the initially proposed in-service dates. Therefore, this document analyzes the effects of the Action as proposed, as well as a Design Variation that could occur in Segments 2 through 4 and a Schedule Variation that could occur in Segments 1 through 4.

3.1.2.1 Proposed Action

The Proposed Action is to construct and operate approximately 1,103 miles of new 230-kV and 500-kV electric transmission system consisting of 10 segments between the Windstar Substation at Glenrock, Wyoming, to the Hemingway Substation approximately 30 miles southwest of Boise, Idaho. Segments 1 to 3 and most of 4 would cross Wyoming while the western part of Segment 4 and Segments 5 through 10 would cross Idaho.

Segment 6 is an existing transmission line that was constructed to a 500-kV standard but is currently operated at 345 kV. It would be energized to 500 kV as part of the Proposed Action. The additional ground-disturbing activities associated with this segment are limited to substation and transition structure changes on either end.

3.1.2.2 Route Alternatives

As of the publication of the Draft EIS, route location alternatives were not considered in detail for Segments 1W(c), 3, 6, or 10. Segments 1W(a), 1E, 2, 4, 5, 7, 8, and 9 have at least one Route Alternative, described in Chapter 2 and shown on the maps located in Appendix A. Figure A-1 is an overview of all the Proposed Routes (shown in red), reasonable Route Alternatives considered in detail (shown in green), and those Route Alternatives considered but eliminated from detailed study (shown in purple). More detailed route location maps are found in Figures A-2 through A-12. The configuration and location of the 12 substations are shown in Figures A-13 through A-24.

3.1.2.3 Design Variation

The Proponents may choose a different design for Segments 2 through 4 if market conditions warrant. They would build two lattice single-circuit 500-kV towers in a 350-

foot-wide ROW, constructed simultaneously, with one circuit initially energized at 230 kV in Segments 2 and 3.

3.1.2.4 Structure Variation

The Proponents may choose an alternative single-circuit 500-kV guyed structure for use where terrain, land cover, and land use allow. Guyed 500-kV single-circuit transmission towers, whether of the “delta” or “V” configuration, would have a single foundation in the center to support the mast(s) and four down guys to support the tower.

3.1.2.5 Schedule Variation

If the economic downturn continues, the Proponents may need to extend the construction schedule of the Design Variation. Under this Schedule Variation, one of two 500-kV single-circuit lines proposed for Segments 2 through 4 and the proposed 230-kV transmission lines along Segments 1E and 1W(a) would be built in the 2013 to 2016 time frame. The remaining proposed facilities, including the second 500-kV line between Segments 2 through 4, and the 230-kV line along Segment 1W(c) would be constructed in the 2018 to 2020 time frame. Construction or expansion of the Windstar, Aeolus, Creston, and Bridger Substations would occur for both phases.

3.1.3 Outline

Each resource section follows the same outline described below. In some cases resources often considered together are found in separate sections, as explained in the introduction to such sections.

3.1.3.1 Analysis Area

Each section begins with a characterization of the larger Project area followed by a description of the physical boundaries of the area reviewed for the existing conditions and analyzed in the impacts analysis. In several cases, that area varies depending on the resource element considered. A justification for the Analysis Area is also provided.

3.1.3.2 Issues to be Analyzed

As summarized in Chapter 1, issues were developed through internal and external scoping. Each resource section explains which issues were specifically addressed in that section. Issues included those raised by agencies and the public, and those mandated for review by law, regulation, policy, or land use plan.

3.1.3.3 Regulatory Framework

Regulation, policies, plans, and guidelines that influence the scope of the analysis, assumptions, and measurement criteria are described. In some but not all cases the laws require a particular approach to analysis or require particular consultations, which are detailed.

3.1.3.4 Methods

This section presents the tools and sources of information that were used in the analysis and includes assumptions that were made in order to conduct the analysis and draw comparative conclusions regarding impact.

3.1.3.5 Existing Conditions

In order to understand the effects, a description is provided of the current environmental conditions for each resource. The existing conditions discussion is limited to the Analysis Area and provides site-specific details of the environment that would be affected by the Project.

3.1.3.6 Direct and Indirect Effects

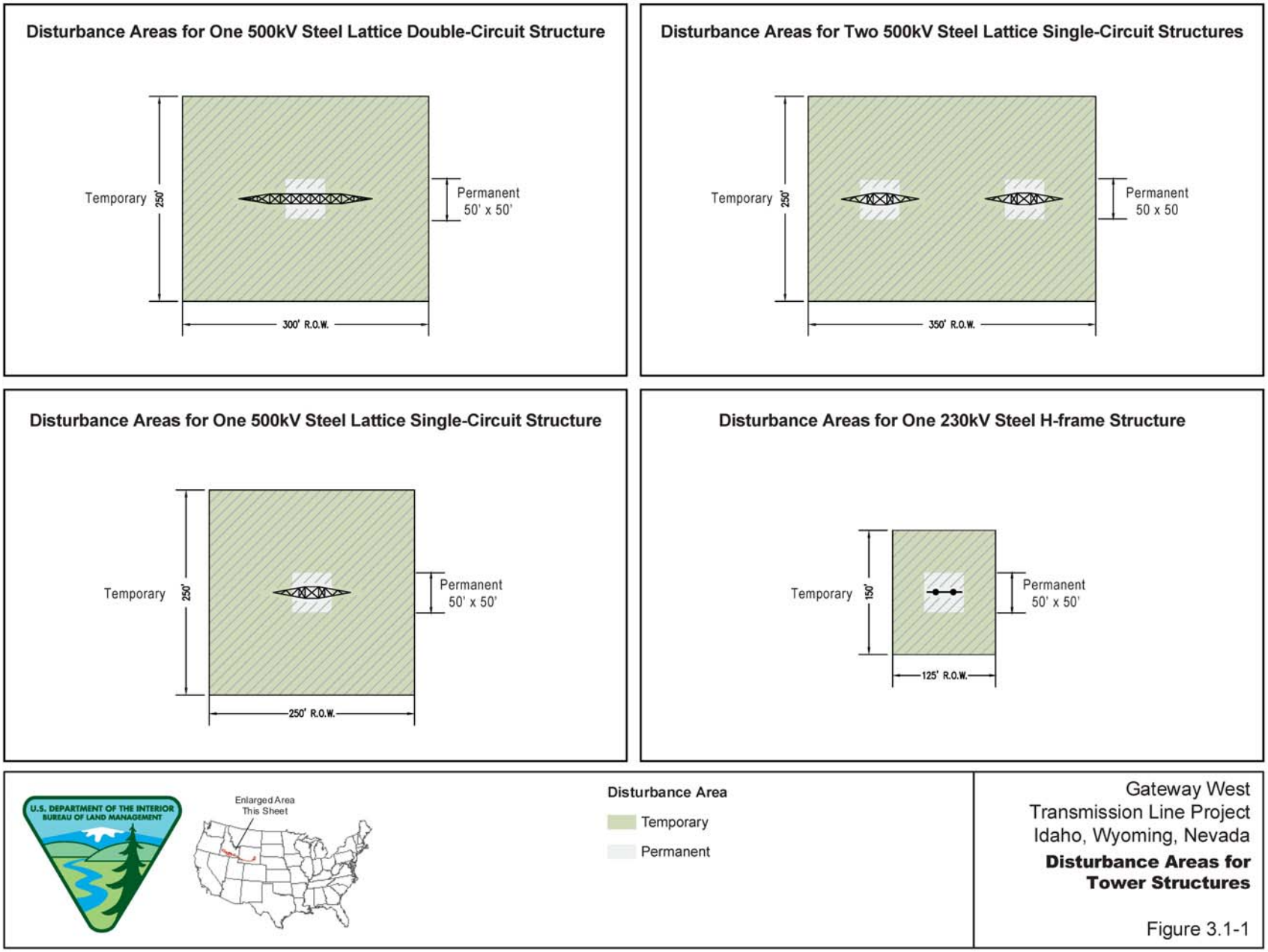
Following the existing conditions discussion, the effects analysis begins with the direct and indirect effects. Direct effects are those caused by the Project, such as soil disturbance. Indirect effects are those effects caused by the Proposed Action but that are later in time or farther removed in distance, such as sedimentation from soil disturbance, yet still reasonably foreseeable. For each resource area, the effects of the No Action Alternative are discussed first. Effects of the Proposed Action that would occur regardless of the route chosen are discussed under Effects Common to All Action Alternatives for construction, operation, and decommissioning. Subsequent discussion focuses on the impacts of the Proposed Route and the comparison portion of the Proposed Route. Chapter 4 presents the cumulative effects discussion for all resources and alternatives.

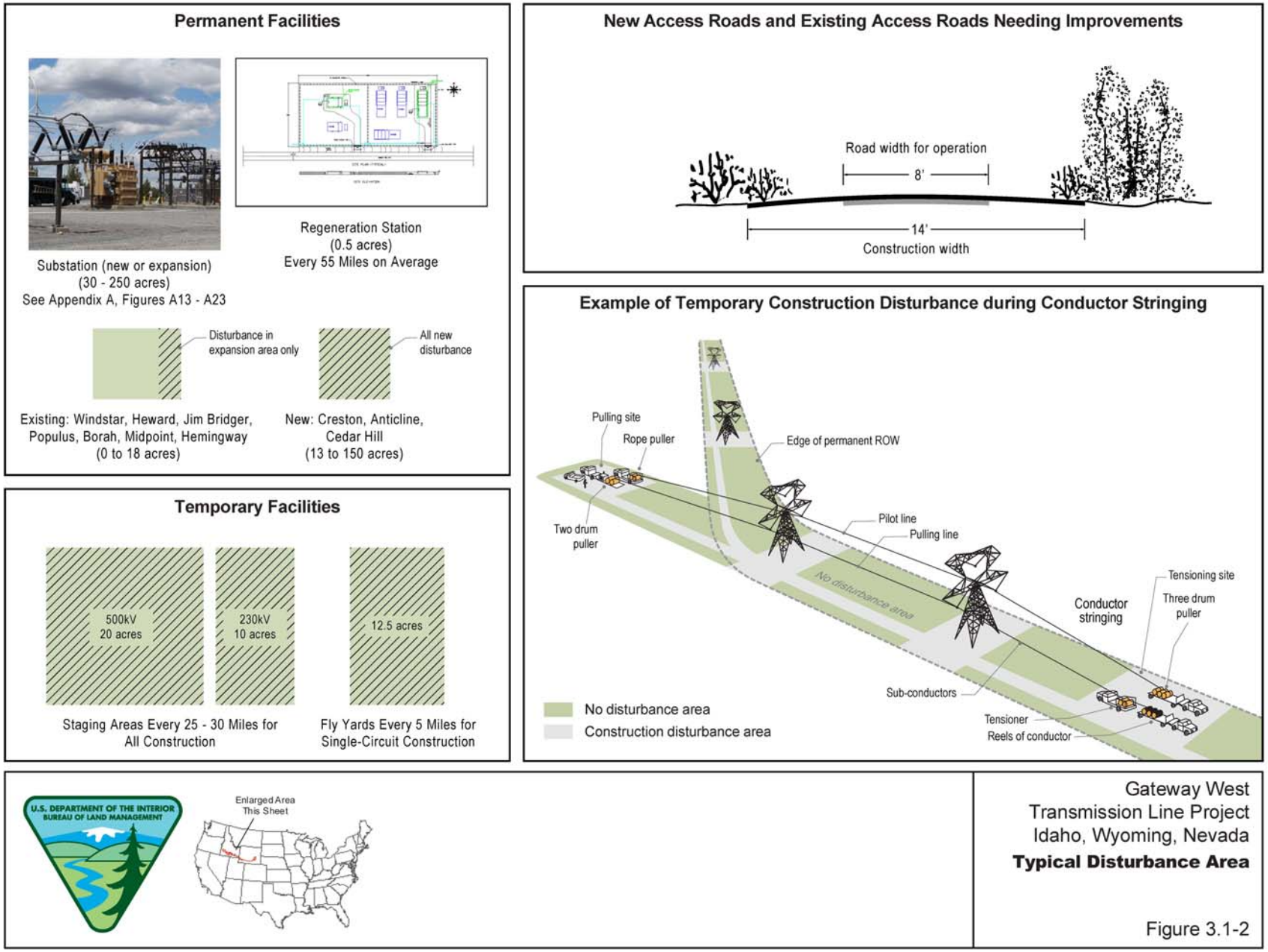
3.1.3.7 Mitigation Measures

The Proponents have supplied a detailed Project description that includes EPMs. The effects analysis was conducted assuming those measures would be in place. Where residual impacts were identified even with EPMs in place, the resource analysis includes additional mitigation measures that should be implemented. Mitigation measures are summarized in Table 2.7-1 in Chapter 2.

3.1.4 Estimation of Ground Disturbance

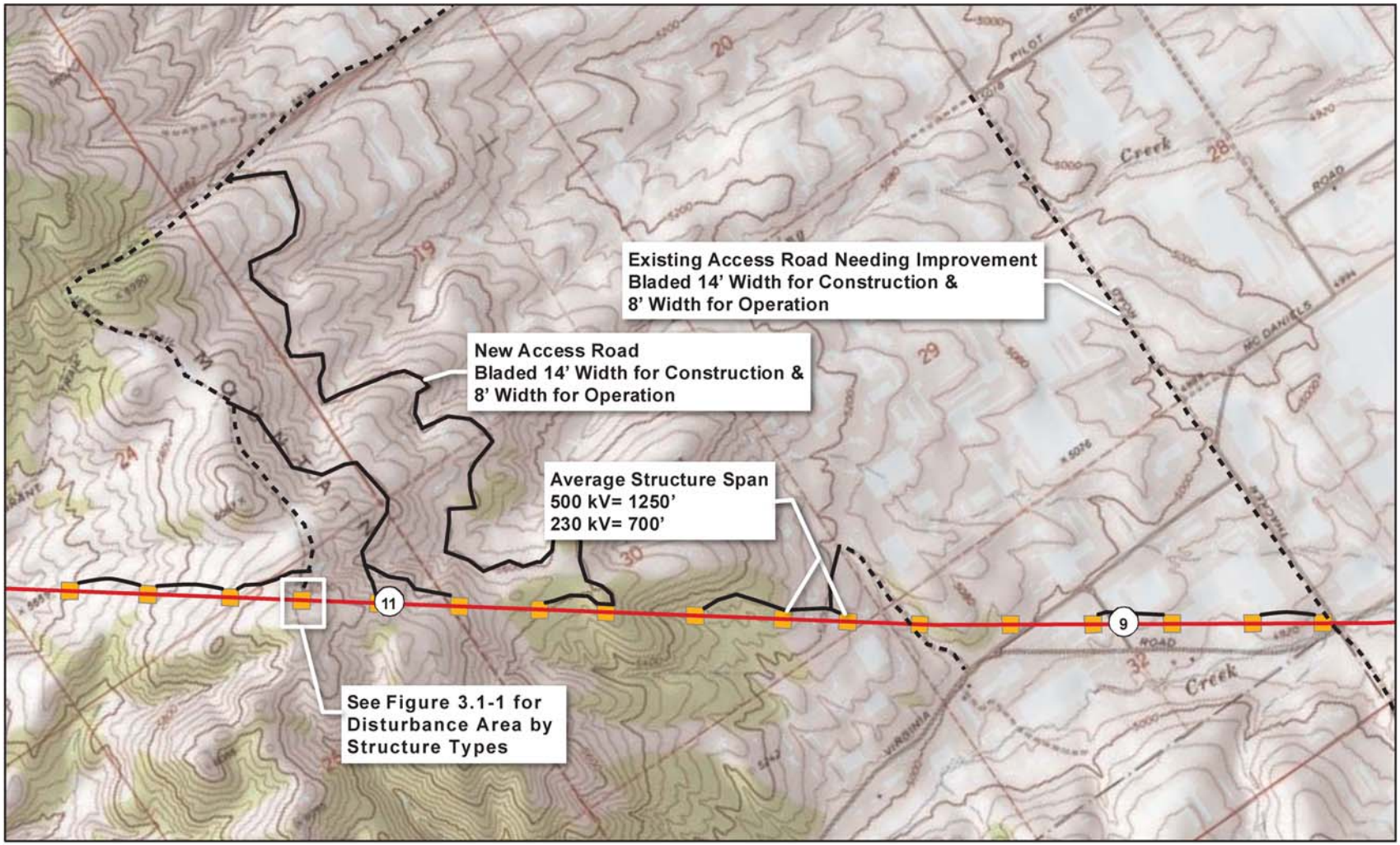
Chapter 2 and Appendix B describe the components of the Project contributing to construction ground disturbance and operations site occupancy and use that would be constructed for any Route Alternative chosen. These components include transmission support structures; their associated construction pads; pulling sites for tensioning conductors; access roads to each structure, regeneration station, and substation; staging areas; fly yards where helicopter construction would be used; regeneration sites; and substations. As part of the conceptual design and to aid quantification of effects, preliminary indicative locations were assigned for all components of the Proposed Action and each Action Alternative. At each location the change in existing conditions was measured based on the size requirements, existing vegetation, and land use. Figures 3.1-1 through 3.1-3 illustrate how disturbance was estimated for each of the components.


Disturbance Areas for One 500kV Steel Lattice Double-Circuit Structure
Temporary
250'
Permanent
50' x 50'
300' R.O.W.
Disturbance Areas for Two 500kV Steel Lattice Single-Circuit Structures
Temporary
250'
Permanent
50 x 50
350' R.O.W.
Disturbance Areas for One 500kV Steel Lattice Single-Circuit Structure
Temporary
250'
Permanent
50' x 50'
250' R.O.W.
Disturbance Areas for One 230kV Steel H-frame Structure
Temporary
150'
Permanent
50' x 50'
125' R.O.W.
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
Enlarged Area
This Sheet
Disturbance Area
Temporary
Permanent
Gateway West
Transmission Line Project
Idaho, Wyoming, Nevada
Disturbance Areas for
Tower Structures
Figure 3.1-1



Gateway West
Transmission Line Project
Idaho, Wyoming, Nevada
Typical Disturbance Area

Figure 3.1-2



Route Features

Proposed Route

Access Road

Needing Improvement

New Access Roads

(7) Mile Marker

Disturbance Feature

Tower Location

Gateway West
Transmission Line Project
Idaho, Wyoming, Nevada

Example Access Roads and Tower Locations

Figure 3.1-3

3.2 VISUAL RESOURCES

This section addresses potential impacts from the Proposed Route and Route Alternatives during construction, operations, and decommissioning. The Proposed Route and Route Alternatives would pass through multiple landscapes and viewing areas. After a discussion of the affected environment, this section analyzes the potential impacts the Proposed Route and Route Alternatives could have on visual resources. Potential visual impacts on historic trails are discussed in Section 3.3 – Cultural Resources.

3.2.1 Affected Environment

This section discusses those aspects of visual resources in the Project area that could be impacted by the Project. It starts with a discussion of the Analysis Area considered, identifies the issues that have driven the analysis, and characterizes the existing conditions within the Analysis Area of the Proposed Route and Route Alternatives in Wyoming, Idaho, and Nevada.

3.2.1.1 Analysis Area

The Analysis Area for visual resources was established through a combination of field reconnaissance and in consideration of the BLM and Forest Service distance zones including foreground, middleground, background, and seldom seen (landscape areas screened by topographic features). These distance zones are described in more detail in the Key Observation Point (KOP) descriptions (Section 3.2.1.4). The visual resources Analysis Area generally is between 5 miles and 15 miles from either side of the centerline of the Proposed Route and Route Alternatives. Five miles was chosen as the minimum extent because it was assumed that beyond that viewing threshold, terrain and atmospheric conditions would absorb the transmission line. The background distance zone used by the BLM is defined as up to 15 miles. This distance was considered for certain sensitive viewing locations; however, due to the nature of lattice structures it was determined that, beyond the 5-mile distance zone (middleground to background), a lattice structure would not be visible in this landscape. In most instances, middleground and background distance zone views are broad open views of valleys and mountainous terrain that would absorb the visual alterations.

The Proposed Route would pass through two major geologic divisions and four physiographic provinces. The regional landscape for Segments 1, 2, 3, and a portion of 4 are within the Wyoming Basin, which is one of four provinces that dominate southern Wyoming (Fenneman 1931). Segment 1 would originate on the border of the Great Plains and the Wyoming Basin Provinces. The Wyoming Basin, which reaches from Evanston to Casper and covers almost the entire length of the Proposed Route and the Route Alternatives in Wyoming, is characterized by elevated plains in various states of erosion and isolated low mountains (Fenneman 1931). Segments 2, 3, and a portion of 4 would be located within the Wyoming Basin Province.

The relatively flat terrain adjacent to the North Platte River is often subordinate to the scenic hills and mountain ranges of Albany, Converse, Carbon, and Natrona Counties,

which contain the focal features in this region. The high-elevation, steep, and rugged mountains commonly found in the Southern Rockies Ecoregion are often covered by a variety of trees such as Douglas-fir, ponderosa pine, aspen, and juniper-oak woodlands (Omernik 1987). The hillside areas are often open grassland interspersed with stands of scrub and trees, creeks, and rock outcroppings. Within the region, the typical views are more commonly identified with the Wyoming Basin, which is relatively open and expansive, allowing the identification of distant features within the landscape. The Wyoming Basin Ecoregion is dominated by arid grasslands and shrublands, interrupted by high hills, and nearly surrounded by forest-covered mountains (Omernik 1987).

Segment 4 would originate within the Wyoming Basin Province and pass through the Middle Rocky Mountain physiographic province before briefly crossing through the most northerly portion of the Great Basin section of the Basin and Range physiographic province south of Pocatello, Idaho. This province is characterized by isolated ranges and dissected mountains separated by broad desert plains (Fenneman 1931). The Middle Rocky Mountain physiographic province is characterized by more complex mountain ranges and intermittent basins. The Idaho portion of Segment 4 and Segments 5 to Segment 10 would be divided between the Basin and Range Province and the Columbia Plateau Province. Almost all of Segment 5 would be located in the Basin and Range Province. The Snake River and associated valley lie within the Snake River Plain section of the Columbia Plateau physiographic province, which is characterized by young lava plateaus.

Segment 7 would be located within the Basin and Range and Columbia Plateau Provinces. The Project would cross the SRBOP and then enter the expanded Hemingway Substation southwest of Boise. The last portion of the alignment would cross the Payette section of the Columbia Plateau physiographic province, which is characterized by young plateaus of prevailingly weak rocks and broad alluvial terraces (Fenneman 1931). Segment 8 would be located entirely within the Columbia Plateau physiographic province and traverse similar landscape types as those described for Segment 7. Segments 9 and 10 are located entirely within the Columbia Plateau physiographic province and traverse similar landscape types as Segments 5 and 8.

3.2.1.2 Issues to be Analyzed

The following visual-related issues were raised during public scoping (Tetra Tech 2009a), scoping by federal and state agencies, or are issues that must be considered as stipulated in law or regulation.

Issues include effects on recreational and scenic resources. Effects on recreation are further discussed in Section 3.17 – Land Use and Recreation. The following is a list of typical aesthetic concerns:

- Conformance with BLM VRM class objectives;
- Consistency with Forest Service Scenery Management System (SMS) or Visual Management System (VMS) as appropriate;
- High impacts to sensitive viewers or from sensitive viewing points, defined as high degree of departure from the existing conditions;

- Sensitive visual resources, such as historic trails or sites, recreation areas, vistas, scenic highways/byways, being degraded and decreased in visual quality; and
- Long-term placement of structures in an undisturbed or otherwise predominantly intact landscape.

3.2.1.3 Regulatory Framework

Public agencies use planning policy to establish visual resource management objectives to protect and enhance visual resources. Goals, objectives, policies, implementation strategies, and guidance are typically contained in RMPs, comprehensive plans, and local specific plans. As described elsewhere in this EIS and in the following summary, federal guidance comes from 1) the BLM's RMPs, and MFPs, for each BLM District or FO throughout the Project area; 2) the Forest Service's Caribou, Medicine Bow, and Sawtooth Forest Plans (Forest Service 2003a, 2003b, and 2003c); 3) the BLM's Oregon and Mormon Pioneers National Historic Trail Management Plan (BLM 1986a) and Oregon/California National Scenic Trail Goals; and 4) the visual resource values of the 1995 City of Rocks Comprehensive Management Plan (CMP; NPS 1995). For information regarding amendments to any of the land use planning documents listed above, please refer to Appendix F. State guidance is found in the Oregon NHT/Bear Lake Scenic Byway, Pioneer Historic Byway, and Snake River Canyon Scenic Byway Goals and Policies. Local guidance is found in plans and policy documents for Sweetwater and Lincoln County, Wyoming, as well as Cassia County, Idaho.

Federal

The BLM is a member of the Federal Interagency Council on Trails, which also includes the NPS, Forest Service, Federal Highway Administration, USFWS, and other federal agencies. The council operates under a Memorandum of Understanding (MOU) focusing on uniform implementation and a seamless interagency approach to trails management. The BLM also maintains partnerships with approximately 16 National Scenic and Historic Trail organizations dedicated to the advocacy, preservation, and day-to-day care of these trails (BLM 2000a).

The National Scenic and Historic Trails Strategy and Work Plan states that "the creation of the National Landscape Conservation System (NLCS) Office for oversight of Congressional and Presidential designations in 2000, resulted in the BLM National Scenic and Historic Trails being managed as one program (BLM, 2000)." The NLCS Office works closely with the BLM recreation, cultural resources, and engineering groups, as well as others, to help ensure a consistent management approach (BLM 2000a). The mission of the NLCS is to protect, conserve, and restore nationally significant landscapes recognized for their outstanding cultural, ecological, and scientific values.[1]

[1] NLCS Web site: http://www.blm.gov/wo/st/en/prog/blm_special_areas/NLCS.html

BLM Visual Resource Management

Public lands crossed by the Project and administered by the BLM have a variety of scenic values. These lands are subject to visual resource management objectives as developed using the BLM VRM System (BLM 1984) and are presented in the RMP or MFP for a given unit. Visual resource management requires the BLM to complete a visual resource inventory of the lands under their management control. The visual resource inventory is a systematic process for determining the visual values on the public lands. The inventory process has three parts: scenic quality evaluation, sensitivity level analysis, and delineation of distance zones. Based on the combinations of the three, BLM-managed lands can then be categorized as Class I (most valued and highest quality of scenery) to Class IV (areas of low scenic quality and sensitivity at most or all distance zones). These inventory classes represent the existing visual resources.

During the resource management planning process, BLM determines how the visual landscape will be managed in the future. The VRM decisions that are made in the planning process result in areas being assigned a VRM management class. These management classes determine how much change should occur in the landscape. VRM Class I areas are managed to preserve the existing character of the landscape and allow for limited management activity. Class II areas allow for low levels of landscape change that do not attract the attention of the casual observer. Class III areas allow for moderate changes to the landscape that may attract attention but are not dominant and Class IV areas allow for high levels of landscape change.

The objectives of each VRM classification, as stated in the BLM VRM Visual Resource Inventory Manual (BLM 1984), are as follows:

- VRM Class I. The objective is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
- VRM Class II. The objective is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
- VRM Class III. The objective is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate or lower. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
- VRM Class IV. The objective is to provide for management activities that require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention.

However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

In most areas, the Project would conform to VRM Class III and IV objectives, especially where there is existing disturbance, and those areas will not be discussed further.

Forest Service Scenery Management System

The Forest Service developed the SMS to provide a mechanism for inventory and analysis of landscape resources and the effects of land management activities on those resources. The SMS was developed to eventually replace the VMS and, in October 1996, *Landscape Aesthetics: A Handbook for Scenery Management* (Forest Service 1995) was released to begin the transition to SMS. This handbook supersedes the National Forest Landscape Management, Volume 2, Chapter 1, The Visual Management System (issued April 1974). The SMS is used in the Medicine Bow Forest Plan (Forest Service 2003b).

The SMS entails identifying landscape character, visual sensitivity, and scenic integrity. The SMS was used to evaluate those portions of the Proposed Route (Segments 1E, 1W[a] and 1W[c]) and an alternative (Alternative 1E-C) that would cross the Medicine Bow-Routt NFs. The SMS provides an overall framework for the orderly inventory, analysis, and management of scenery. It is a tool for integrating the benefits, values, desires, and preferences regarding aesthetics and scenery for all levels of land management planning. The SMS also considers Concern Levels, which are a categorization of the importance of scenic resources to Forest visitors. Three concepts of the SMS are of key importance to the present analysis and include: 1) Scenic Attractiveness, 2) Landscape Character, and 3) Scenic Integrity Objectives (SIOs). These concepts and landscape character are defined below:

1. **Scenic Attractiveness** is the primary indicator of the scenic importance of a landscape based on human perceptions of the intrinsic beauty of landforms, rockforms, waterforms, vegetation patterns, and cultural features. Reflects varying visual perception attributes of variety, unity, vividness, intactness, coherence, mystery, uniqueness, harmony, balance, and pattern. The frame of reference for scenic attractiveness (generally at the section scale) is landscape character. Three levels of scenic attractiveness are identified during the scenery inventory process: (A) Distinctive, (B) Common or Typical, and (C) Undistinguished (FSM 2380 – Landscape Management).

2. **Landscape Character** is a combination of physical, biological, and cultural images that gives an area its visual and cultural identity and helps to define a "sense of place." Landscape character provides a frame of reference from which to determine scenic attractiveness and to measure scenic integrity (FSM 2380 – Landscape Management).

3. **SIOs** define the degrees of deviation from the landscape character that may occur at any given time as established by using the process described in

Agriculture Handbook 701, *Landscape Aesthetics: A Handbook for Scenery Management* (Forest Service 1995).

When discussing SIOs, the degree of alteration is measured in terms of visual contrast with the surrounding natural landscape. The objectives of each SIO classification are included below:

- **Very High SIO** – Management activities, except for very low visual-impact recreation facilities, are prohibited. Allows for ecological changes only. The existing landscape character and sense of place is expressed at the highest possible level.
- **High SIO** – Management activities are not visually evident to the casual observer. The landscape character "appears" intact. Deviations may be present but must repeat the form, line, color, texture, and pattern common to the landscape character so completely and at such scale that they are not evident. Changes in the qualities of size, amount, intensity, direction, pattern, etc., should not be evident.
- **Moderate SIO** – Management activities remain visually subordinate to the characteristic landscape being viewed. Activities may repeat form, line, color, or texture common to the characteristic landscape but may not change in their qualities of size, amount, intensity, direction, pattern, etc.
- **Low SIO** – Management activities begin to visually dominate the original characteristic landscape. However, activities of vegetative and landform alteration must borrow from naturally established form, line, color, or texture so completely and at such a scale that its visual characteristics are those of natural occurrences within the surrounding area or character type. Structures must remain visually subordinate to the proposed composition.
- **Very Low SIO** – Management activities of vegetative and landform alterations may dominate the characteristic landscape. While alterations may not borrow from attributes such as size, shape, edge effect, and pattern of natural openings, vegetative type changes, or architectural styles within or outside the landscape being viewed, they must be shaped and blended with the natural terrain so that elements such as unnatural edges, roads, landings, and structures do not dominate the composition.

The SMS defines four distance zones for project-level planning and to evaluate potential visibility:

- **Immediate Foreground** – At this distance people can distinguish details such as individual leaves, flowers, twigs, bark texture, small animals, and can notice the movement of leaves and grasses in light wind (from 0 to 300 feet).
- **Foreground** – At this distance people can distinguish small boughs of leaf clusters, tree trunks and large branches, individual shrubs, clumps of wildflowers, medium sized animals, and medium-to-large birds. At this distance, people can also distinguish movement of tree boughs and tree tops in moderate winds (from 0 to 0.5 mile). Forms are dominant.

- **Middleground** – This is the predominant distance zone at which NFS landscapes are seen, except for regions of flat lands or tall, dense vegetation. At this distance, people can distinguish individual tree forms, large boulders, flower fields, small openings in the forest, and small rock outcrops. Tree forms typically stand out vividly in silhouetted situations. Form, texture, and color remain dominant, and pattern becomes more visible (from 0.5 to 4 miles).
- **Background** – At a background distance, people can distinguish groves or stands of trees, large openings in a forest, and large rock outcrops. Texture has disappeared and color has flattened, but large patterns of vegetation or rock are still distinguishable, and landform ridgelines and horizon lines are the dominant visual characteristic (from 4 miles to the horizon).

The SMS process uses particular ecosystems as the environmental context for aesthetics. Ecosystem management broadens understanding of environments by its holistic consideration of the physical, biological, and social dimensions of ecosystems. The social dimension has many aspects but one of importance for public lands is recreation. A key attribute of recreation settings is the quality of aesthetics. During the inventory process, the SMS uses interdisciplinary collaborative knowledge to discuss constituent input, landscape character, scenic attractiveness, existing scenic integrity, place attachment, concern levels, distance zones, and scenic classes to develop alternatives and achieve landscape character goals (Forest Service 1995: 5-2).

Forest Service Visual Management System

The VMS is used by NFs that have not yet converted to the SMS, including the Caribou and Sawtooth NFs. The VMS provides a framework for establishing the visual landscape as a basic resource and to treat it as an essential part of the basic quality of the land. VMS identifies a desired level of scenic quality and diversity of natural features based on physical and sociological characteristics of an area, referred to as Visual Quality Objectives (VQOs). A given VQO quantifies the degree of acceptable alterations of the characteristic landscape. VQOs are determined by comparing the variety class with the sensitivity level (Bacon 1974). These terms are described below.

Characteristic Landscape is the naturally established landscape being viewed. It visually represents the basic vegetative patterns landforms, rock formations, and water forms that are in view.

Variety Class designates those landscapes that are most important and those that are of lesser value from the standpoint of scenic quality. The classification is based on the premise that all landscapes have some value, but those with the most variety and diversity have the greatest potential for high scenic quality. There are three variety classes: 1) Class A–Distinctive, 2) Class B–Common, and 3) Class C–Minimal.

Sensitivity Level is a measure of people's concern for the scenic quality of a NF. Sensitivity levels are determined for land areas used by those traveling through the forest on developed roads and trails and those using areas such as campgrounds, visitor centers, and other recreation areas. There are three sensitivity levels: Level I–Highest Sensitivity, Level 2–Average Sensitivity, and Level 3–Lowest Sensitivity.

Distance Zones are divisions of a particular landscape being viewed. The three distance zones are: foreground (the area from 0.25 to 0.5 mile from the observer), middleground (the area from foreground to 3 to 5 miles from the observer), and background (from middleground to infinity).

The VQOs represent the visual resource objectives under the Forest Plan. The objectives of each VQO classification are listed below:

- Preservation – Management activities are generally not allowed in this setting. The landscape is allowed to evolve naturally.
- Retention – Management activities are not evident to the casual Forest visitor.
- Partial Retention – Management activities may be evident, but are subordinate to the characteristic landscape.
- Modification – Management activities may dominate the characteristic landscape but will, at the same time, use naturally established form, line, color, and texture. It should appear as a natural occurrence when viewed as middleground.
- Maximum Modification – Management activities may dominate the characteristic landscape, but should appear as a natural occurrence when viewed as background.

Segment 4 of the Proposed Route crosses areas classified as having Retention and Partial Retention VQOs within the Caribou-Targhee NF. No alternatives to this portion of Segment 4 have been identified. Segment 7 of the Proposed Route does not cross NFS lands; however, Alternatives 7H and 7I both cross areas classified as Modification VQO and Partial Retention VQO within the Sawtooth NF.

Forest Service Recreation Opportunity Spectrum

The Recreation Opportunity Spectrum (ROS) is a continuum of outdoor recreation settings, which is a combination of the existing or desired physical, managerial, and social conditions. It is a planning and management tool used to provide a variety of opportunities for recreationists. The spectrum ranges from highly developed urban parks to backcountry areas without developed trails. User density, remoteness, and size of the area are some of the factors that contribute to experiences along the spectrum. The ROS Classes on NFS and BLM-managed lands typically include Rural, Roaded Natural, Roaded Modified, Semi-primitive Motorized, and Semi-primitive Nonmotorized. These are described in section 3.17 of the DEIS.

City of Rocks National Reserve Visual Quality Objectives

The NPS Organic Act and the enabling legislation for City of Rocks National Reserve (Reserve) call for the conservation and protection of scenic quality. Naturally existing views and vistas of the City of Rocks were the hallmark of the California NHT experience through southern Idaho. Unlike many other places today, these views remain unimpaired, exhibiting integrity and allowing visitors opportunities to experience a landscape similar to those of the emigrants.

Because of the importance of landmarks and vistas to the visitors' understanding and appreciation of the California Trail, the 1996 City of Rocks National Reserve CMP (NPS 1995) encourages the protection of historic views extending beyond the Reserve boundary. Areas of special concern for their historic landscape values include the views to the south and east from Pinnacle Pass and the foreground of the views from the segment of the California NHT west of the Reserve boundary leading to Granite Pass.

The CMP also recommends that portions of the California NHT prism and associated foreground viewshed, between the Reserve boundary and Granite Pass, be considered for potential addition to the designated national historic landmark. To accomplish these protection measures, the CMP suggests that the NPS, the Idaho Department of Parks and Recreation, and Cassia County offer to work in partnership with landowners in these areas to encourage complementary management consistency with design guidelines designed to perpetuate a historic rural setting compatible with the one existing inside the Reserve. It is recommended by NPS that the view from Granite Pass be protected from incompatible development through county zoning.

The NPS is currently preparing a General Management Plan (GMP) for the City of Rocks National Reserve and has expressed interest in the Project due to the abundance of sensitive resources in this general area. As part of the GMP process, the NPS, as required by the National Park and Recreation Act of 1978, has considered extending the boundaries of the Reserve south and incorporating portions of Sparks Basin and areas adjacent to Granite Pass into the Reserve. The NPS must consider boundary changes and other methods to protect important resources, such as historic viewsheds and high potential trail sites and segments along the California NHT. Alternatives 7I and 7J pass approximately 5 miles to the south of the Reserve boundary.

Trails were considered as scenic recreational viewpoints during the field inventory for data collection in this section of the EIS. Many of the trails crossed by the Project are historically important and require an assessment of the setting of each trail for a visual impact survey. The visual impact analysis for historical trails can be reviewed in Section 3.3 – Cultural Resources of this EIS.

Scenic Roadways

Oregon NHT/Bear Lake Scenic Byway

The State of Idaho's management plan for the Oregon NHT/Bear Lake Scenic Byway proposes view corridor protections, discusses the importance and value of scenic quality, and offers guidance for protection. The Proposed Route for Segment 4 is anticipated to cross the scenic byway twice southeast of Montpelier, Idaho. Following is an excerpt from the management plan that discusses the management objectives:

> *The objective is for management activities to remain invisible to visitors. This is especially true for the foreground areas (up to one-half mile from the viewer). Protection of the view corridor also applies to middle-ground and background areas. Road building and infrastructure development should minimize visual impact along the byway. When there are disturbances, incorporate vegetation*

> *screening to camouflage and blend the disturbance with its surrounding landscape. Materials should blend in with the backgrounds from a distance. Billboards harm the visual appeal of the byway and should be restricted by city and county governments. Metal guardrails are recommended rather than concrete jersey barriers. To further ensure high visual quality standards along the byway, interpretive information should encourage the protection and stewardship of the corridor.*

The plan also discusses the development of new infrastructure: "New infrastructures such as roads and overhead power lines along the byway should be carefully monitored. Preferably the power lines should be placed underground" (Planmakers Planning and Taylor Planning 2008).

Pioneer Historic Byway

Like the Oregon NHT/Bear Lake Scenic Byway Management Plan, the Pioneer Historic Byway Management Plan also places emphasis on the visual or scenic quality of the corridor. The Segment 4 Proposed Route would cross the historic byway approximately 0.3 mile south of Thatcher, Idaho. Following is an excerpt from the management plan (Planmakers and J-U-B Engineers 2008) that states the management objectives:

> *The objective is for management activities to remain invisible to the average viewer, especially for the foreground (up to 1/2 mile from the viewer) areas. Protection of the view corridor also applies to middle and background areas. Road building and infrastructure development should minimize visual impact. Future installation of overhead power lines along the corridor should be minimized. In the case of unavoidable disturbances, vegetation screening should be incorporated to camouflage and blend the disturbed space with its surrounding landscape.*

City of Rocks Backcountry Byway

The City of Rocks Backcountry Byway Rural Heritage Stewardship Handbook and Byway Management Plan (City of Rocks 1998) places emphasis on the visual or scenic quality of the corridor especially in relation to preserving the agricultural and ranching character of the areas adjacent to the byway. However, the byway management plan does not have specific goals and objectives to guide development but rather suggestions as to the level of effort needed to achieve preservation of sensitive visual resources and ways to gain protection from the encroachment of new development. Alternatives 7I and 7J would cross the backcountry byway twice, once directly north of Elba, Idaho, and a second time south of Oakley, Idaho. Following is an excerpt from the management plan (City of Rocks 1998) that states the management suggestions for citizen planning to help achieve protection for visual resources:

> *Citizens have made clear that they do not want a government-led Byway. Therefore a citizen-led Byway needs to communicate its goals to the government agencies that own and manage land in the area of the Byway. For example, the BLM is currently managing their land pursuant to a 1984 RMP. Since the BLM Plan pre-dates the Byway, it contains no special protections or prescriptions for*

> *the Byway. When that plan is updated, the Byway should be involved in the process to assure that the plan pays appropriate attention to rural heritage and other Byway issues. This involvement is particularly important in establishing the Visual Resource Management classifications applicable to BLM land along the byway.*

The plan also states that citizens were interested in implementing all three levels of preservation/management effort identified in the management plan incrementally over the course of the next 10 years (City of Rocks 1998: 65). The plan is currently in the process of being fully implemented and restrictions that protect visual resources will be in place in the near future.

Other Byways

The Western Heritage Historic Byway Corridor Management Plan states in Improvement Recommendations-Site Development Actions: "Every effort should be taken to restrict billboards and other visual pollution on SH-69 to meet the spirit of the byway and to be eligible for national recognition, if desired" (Planmakers and J-U-B Engineers 2004: 3-4). Proposed Route Segment 8 would cross the byway, south of Initial Point, and Alternative 8B would cross the byway south of Kuna, Idaho, directly east of Kuna Butte.

The Big Spring Scenic Backway in Lincoln County, Wyoming, does not have a corridor management plan but does have numerous information sources that identify scenic and recreational opportunities along the backway. These areas experience a higher volume of sensitive viewers when compared to secondary roadways in southwestern Wyoming. Some of the opportunities and resources listed along the backway include the Nancy Hill and Alfred Corum Graves, Kemmerer Reservoir, Lake Viva Naughton, and numerous staging areas north of Kemmerer, Wyoming. Proposed Route Segment 4 would cross the backway directly south of the Bridger NF and again north of Cokeville, Wyoming. Alternatives 4A and 4F would cross this backway between the Kemmerer Reservoir and Lake Viva Naughton and Alternative 4F would cross the backway a second time north of Cokeville, Wyoming.

Alternative 8A would also cross the western end of the Thousand Springs Scenic Byway between Hagerman, Idaho, and Lower Salmon Falls. The Thousand Springs Scenic Byway Corridor Management Plan (Planmakers and J-U-B Engineers 2007) does not have language specific for new developments or corridor crossings related to visual resources.

The Snake River Canyon Scenic Byway spans more than 50 miles and the State of Idaho is currently working to complete a management plan. Alternative 8B would cross the proposed scenic byway on Map Rock Road north of Walters Island. Without an existing management plan, few general assumptions can be made about how the scenic corridor would be managed at this time. Scenic byway management plans often include language that refers to the protection of scenic resources and to what level of protection there would be for scenic resources, and reference industrial or infrastructure projects and how they should be properly sited to protect visual resources along the

byway. Until that plan has been completed, the Snake River Canyon Scenic Byway should be considered a sensitive and protected recreational resource.

3.2.1.4 Methods

Visual Inventory Methods

The main components of the visual resource inventory included identifying the existing landscape conditions, potential sensitive viewers, and the representative KOPs based on potential viewers; evaluating visual contrast ratings for each KOP; applying BLM's VRM classes and objectives; and assessing visual contrast for areas not managed by BLM.

Approach

The proposed Project would cross numerous jurisdictions and thus be subject to different methodologies for assessing visual contrast and impacts. The Visual Resources approach was differentiated according to: 1) federal lands administered by the BLM, 2) federal lands administered by the Forest Service, and 3) other federal lands, non-federal public lands, and private lands. The approach for lands subject to administration by the BLM was based on the BLM's VRM system. The approach for lands within the Medicine Bow-Route NFs was based on the Forest Service's SMS, while the VMS was used on the Caribou-Targhee and Sawtooth NFs.

Regardless of whether VRM, SMS, or VMS is used for describing landscapes and analyzing the impacts to the scenic quality of a landscape, the common goal is to apply a level of objectivity and consistency to the process and to reduce the subjectivity associated with assessing landscape visual quality. One concept commonly used by federal land managers in the BLM, NPS, and Forest Service to assess impacts to scenic quality is contrast analysis. Contrast analysis can be summarized as the degree to which a project or activity affects scenic quality or visual resources depending on the visual contrasts created or imposed by a project on the existing landscape. The contrasts can be measured by comparing the project's features with the major features in the existing landscape (BLM 1986b). Each land use agency applies the concept differently (e.g., different terminology, different methodologies for assessing impacts); however, the essential contrast analysis process described below is common to the Forest Service, BLM, and NPS. The appropriate terminology and applicable analysis methods required by each federal agency with jurisdiction crossed by the proposed Project were used in applying the contrast analysis process. The process was used to characterize scenic quality and assess potential scenic quality impacts from new transmission line construction.

Visual contrast analysis compares the existing features and contrasts of the landscape to the contrasts imposed on that landscape by a proposed project. The landscape features used in the comparison are the forms, lines, colors, and textures that comprise the existing and potentially modified landscape. Landscape form refers to the unified masses or shapes of the landscape being analyzed, such as existing structures, topography, and natural objects (e.g., pyramidal peaks, blocky or geometric mesas, undulating grassland). Landscape color refers to the colors of structures, vegetation, soil, water, rock, and sky. Landscape textures are the variations, patterns, density, and

graininess of the landscape surface (e.g., uneven, sparse, and seemingly random-ordered shrubs in an arid landscape; even, orderly, dense rows of trees in a forest; and the smooth surface of a body of water), and the dimensions of those surface variations (e.g., tall trees, short grasses). Linear landscape features are the real or implied paths that the eye follows when perceiving abrupt changes in form, color, or texture. These are often noticeable as the edge effect created at the boundary of two contrasting areas (e.g., a strata line along a rock layer, the abrupt boundary between forest and grassland, a dark ridgeline silhouetted against a bright sky). It should be noted that all of these observable landscape features (form, line, color, and texture) can be affected by environmental factors that include the viewing distance, the angle and orientation of view, atmospheric effects (e.g., haze, fog, dust, smoke), lighting conditions, and time of day.

In general, the project-related landscape changes that repeat the natural features of the landscape are considered to be less contrasting with their surroundings. These changes produce low levels of contrast and are considered to have a low impact on existing scenic quality or on the aesthetic values of the landscape. Landscape modifications that do not repeat the natural features of the landscape are considered to be in contrast with that landscape. The contrasts appear obvious and they can be visually displeasing to viewers because they are not well integrated with the existing natural landscape.

For the proposed Project, visual analysis involves determining the degree of visual change between the existing landscape and the landscape changes that would be produced by the proposed Project. The degree of change to the landscape is determined for areas of “high scenic value” or “high visual sensitivity,” that is, landscapes that are most interesting and appealing. These tend to be the undeveloped, natural landscapes with a diversity of lines, forms, colors, and textures.

The non-federal lands crossed by the Proposed Route and Route Alternatives, which include state, county, and private lands, were analyzed using the BLM VRM methods of inventory, which include scenic quality evaluation, sensitive level analysis, and Project visibility, to determine impacts. Although non-federal lands have no VRM (or SMS/VQO) classes to use as a baseline for visual inventory, the basic design principals of form, line, color, and texture as well as distance can be applied to any KOP.

Key Observation Points

KOPs are viewing locations chosen to be generally representative of visually sensitive areas where it can be assumed that viewers may be affected by a change in the landscape setting from the Project. The inventory of KOPs included three components: 1) identification and photographic documentation of potential KOPs and viewing areas, 2) classification of the visual sensitivity of KOPs, and 3) assessment of the potential visibility of the Project from the KOPs. Residents and recreational users are often considered sensitive viewers due to their heightened awareness to change within their surrounding environment.

During the field inventory, 1,329 potential KOP locations were identified and photographed. Photographs were taken to document existing conditions at each

potential KOP and were used to evaluate visual conditions and potential visibility. These potential KOP locations included a diversity of viewer types, such as residences, residential and recreation areas, scenic resources, NHTs, and other cultural locations. Following the inventory, 232 locations were selected. An additional 147 KOPs were identified to document the visual impact on historical and cultural resources as presented in Section 3.3 – Cultural Resources. All the KOPs described are considered to represent moderate to high sensitivity viewers due to scenic designations, recreational opportunities, cultural sensitivity, or association with residences or residential areas. All KOPs are shown in Appendix E, Figures E.2-1 through E.2-11.

Views from KOPs are described by distance zones and are based on perception thresholds (changes in form, line, color, and texture). Landscape elements become less obvious and less detailed at greater distances, and the elements of form and line become more dominant than color or texture as distance from the observer increases. The BLM VRM system uses the following distance zones to evaluate potential visibility:

- Foreground-Middleground. The limit of a viewed area in which details are perceived and obvious to the zone in which details of foliage and fine textures cease to be perceptible. Vegetation begins to appear as outlines or patterns. Texture and other aesthetic qualities are normally perceived within this zone (from 0 to about 3 to 5 miles).
- Background. Those portions of the landscape where texture and color are subordinate and the landforms become the most dominant elements (from about 3 to 5 miles to 15 miles).
- Seldom Seen Distance Zone: Portions of the landscape that are generally not visible from KOPs or portions that are visible but more than 15 miles distant.

The Forest Service SMS/VMS uses a set of four distance zones as described earlier in this section.

Views from KOPs are described in terms from the VRM Manual 8431(BLM 1986b):

- Form. The mass or shape of an object or objects that appears unified, such as an opening in forest vegetation, a cliff formation, or a water tank.
- Line. The path, real or imagined, that the eye follows when perceiving abrupt differences in form, color, or texture.
- Texture. The visual manifestations of the interplay of light and shadow created by the variations in the surface of an object or landscape.
- Color. The color or colors present in the landscape.

Scenic Quality Rating

KOPs are also described based on the scenic quality in the immediate vicinity. The elements of scenic quality can be summed up with the brief descriptions below.

High

- Landscape elements (landforms, vegetative patterns, water characteristics, and cultural features) have high visual appeal.

- Landscape has high degrees of variety, vividness, intactness, harmony, and uniqueness (attributes).
- Distinctive landscapes that attract people to view.

Moderate-to-High

- Landscape elements have moderate-to-high visual appeal.
- Landscape characteristics have a mix of moderate and high values.
- Landscape may contain built features that neither complement nor detract from overall visual quality.

Moderate

- Landscape elements are moderately appealing.
- Landscape characteristics have common or ordinary values.
- Landscape may contain inharmonious built features, but they are subordinate

Low-to-Moderate

- Landscape elements have low-to-moderate appeal.
- Landscape has weak or missing characteristics and is somewhat common throughout a broad geographic area.
- Landscape may have prominent though not dominant inharmonious built features.

Low

- Landscape elements have low-to-no appeal.
- Landscape is missing character or is common throughout a broad geographic area.
- Landscape is dominated by inharmonious built features.

Project Visibility

Impacts on sensitive viewers are directly attributable to the Proposed Route and Route Alternative's potential visibility or how it would be seen from a particular viewing area. The three components that establish the degree of visibility resulting from the introduction of the proposed facilities into the visual sphere of influence are: 1) viewing distance; 2) screening and backdropping (i.e., adjacent vegetation, terrain, and development); and 3) degree of project contrast.

The noticeable visual change to the landscape resulting from the introduction of the Proposed Route and Route Alternatives would depend largely on the distance of the structures from the viewer. The contrast of the structures within the landscape typically decreases with increased viewing distance because the details and scale/dominance of the structures are reduced. Conversely, when viewed in close proximity, the details and scale/dominance of the structures are prominent. Figure 3.2-1 shows the visibility of existing transmission towers at varying distances.

Figure 3.2-1. Existing Lattice Transmission Structure Visibility at Varying Distances

Available screening and backdropping also were considered in the assignment of impact levels. Three types of screening were identified within the Analysis Area: 1) vegetative screening (e.g., large stands of lodgepole pine, spruce-fir and Douglas-fir, aspen, juniper, and Gambel oak trees as well as the riparian vegetation along the North Platte, Bear, and Snake Rivers); 2) development screening (e.g., adjacent residences and farm, commercial, or industrial structures); and 3) topographic screening, which varies throughout the visual sphere of influence from very dramatic to almost flat and rolling.

The presence of vegetative, structure, or topographic screening can effectively lower levels of impact assigned to views from surrounding areas. Another variable evaluated in the assignment of impact levels is topographic or vegetative backdropping. The proposed structures are visually absorbed to varying degrees when views are backdropped. The extent of visual absorption by the background is determined by the degree or complexity of visual elements and similarity of the Project to the colors and textures that make up the background.

Impact Assessment Methods

The methods used for the visual resources analysis were based on the BLM (1986b) Visual Resource Contrast Rating System Manual (BLM Manual, Section 8431) and the Forest Service SMS (Forest Service 1995) and VMS (Forest Service 1974). The degree of potential impact on viewers is based on the level of viewer sensitivity combined with Project visibility and contrast relative to the existing landscape.

Photographic Simulations

Twenty-two photographic simulations were developed to help in determining the impacts associated with the selected KOPs and are found in Appendix E, Figures E.2-12 through E.2-33. There are an additional 44 photographic simulations located in Appendix G. Computer-aided drafting equipment and GPS were used to create life-sized models of each structure type that translated into real-world coordinates to locate the photos, position facilities, and add other site features. To complete this phase, the sun angle was set, materials and textures were applied, and the composite image was rendered. Additional filters were sometimes required for appropriate atmospheric conditions (such as haze). To verify the scale and accuracy of each simulation, a visual check of the towers and wires is performed to verify that their sizes and locations were modeled correctly.

The impact level was determined by consideration of the following definitions:

- High Impact – will likely cause a substantial (i.e., to a great extent or degree) long-term and adverse effect on scenic quality, an existing viewshed, or KOP due to the visual contrast between the proposed Project and the existing landscape conditions or level of existing scenic quality.
- Moderate Impact – will create a noticeable but not substantial change in scenic quality; or will cause a noticeable, but not substantial change on a sensitive viewer or KOP.

- Low/No Impact – will create negligible or no change in visual contrast or scenic quality, viewer sensitivity, Project visibility, and viewer exposure.

The simulations are included in Appendix E with the KOP location maps for each Project segment. Additional simulations and location maps are located in Appendix G.

3.2.1.5 Existing Conditions

In Wyoming, Segments 1, 2, 3, and 4 of the Project are located predominantly within the Wyoming Basin Physiographic Province and Ecoregion. The Wyoming Basin is one of four provinces that make up the system that dominates southern Wyoming (Fenneman 1931). The Wyoming Basin Ecoregion is a "broad arid intermontane basin interrupted by hills and low mountains and dominated by grasslands and shrublands" (Chapman et al. 2004). The Wyoming Basin, which reaches from Evanston to Casper and covers almost the entire length of the Project in Wyoming, is characterized by elevated plains in various states of erosion and isolated low mountains (Fenneman 1931). Hillside areas are often open grassland interspersed with stands of scrub and trees, creeks, and rock outcroppings. Within the region, the typical views are relatively open and expansive, allowing the identification of distant features within the landscape.

Segment 4 of the Project would pass through the Middle Rocky Mountain physiographic province at the Wyoming border before briefly crossing through the most northerly portion of the Great Basin section of the Basin and Range physiographic province south of Pocatello, Idaho. The Great Basin is characterized by isolated ranges and dissected mountains separated by broad desert plains (Fenneman 1931). Southern Idaho is also defined by the Northern Basin and Range Ecoregion. The physiography of the Northern Basin and Range Ecoregion consists of dissected lava plains, rolling hills, alluvial fans, valleys, and scattered mountains (McGrath et al. 2002). The Middle Rocky Mountain physiographic province is characterized by more complex mountain ranges and intermontane basins. Within the Great Basin region, the typical views are relatively open and expansive, allowing the identification of distant features within the landscape; however, in the Middle Rocky Mountain province, the typical views may be focal or enclosed depending on the surrounding terrain and perspective of the viewer.

In Idaho, the Project would be divided between the Basin and Range Province and the Columbia Plateau Province. The Snake River and associated valley lie within the Snake River Plain section of the Columbia Plateau physiographic province, which is characterized by young lava plateaus. The Owyhee Uplands and Canyons, Semiarid Uplands, and Semiarid Hills and Lowlands Ecoregions, which are scattered throughout the Northern Basin and Range Ecoregion, would display more dramatic, high-relief terrain that may screen views or provide focal points for viewers in southern Idaho. The physiography of the Snake River Plain Ecoregion can be described as plains and low hills where "irrigation water and soil depth are sufficient and agriculture is the predominant use, including low growing crops such as sugar beets, potatoes, alfalfa, small grains, or vegetables. Elsewhere, livestock grazing is widespread as well as cattle feedlots and dairy operations. Potential natural vegetation is mostly sagebrush steppe but barren lava fields and saltbush–greasewood also occur" (McGrath et al. 2002). Within the region, the typical views are relatively open and expansive, allowing the identification of distant features within the landscape.

The following section describes the existing visual environment by segment as viewed from numerous KOPs. The description from each KOP is of the view toward the Proposed Route or Route Alternatives unless noted otherwise. Potential viewers, landscape features, contrast, and scenic quality at each KOP are addressed. Photos and simulations are included in Appendices E or G, as noted below.

Segment 1E – Windstar to Aeolus

Segment 1E would cross approximately 5.0 miles of BLM-administered land with VRM Class II objectives (2.2 miles in Casper FO and 2.8 miles in Rawlins FO). Segment 1E would also cross 64.0 miles of private land and 22.0 miles of land owned by the State of Wyoming, as well as 2.7 miles of NFS land within the Medicine Bow-Routt NFs. Approximately 1.3 miles of Alternative 1E would parallel an existing transmission line (approximately 1,500 feet to the southeast) and the remaining 1.4 miles would be Greenfield. The Medicine Bow Forest Plan states that the SIO for utility corridors will be compatible with the SIO of the adjacent land. The adjacent land has a Moderate SIO. Management activities in an area with an SIO of Moderate must remain visually subordinate to the characteristic landscape being viewed.

Proposed Route

KOP 860 (Figure E.2-1/Appendix G, Figure R-1a). Views from KOP 860 represent the views of residents in the valley between Forty-mile Peak and Smith Mountain. Open panoramic views of the rolling to rugged, rocky terrain are considered to have high scenic quality . The landscape is unique compared to the adjacent views in the region and has landscape elements of visual interest with few human-made alterations to the landscape in the foreground and middleground views. A focal point of the view is a feature named Long Draw. This KOP is adjacent to KOP 988, a resident on Marshall Road.

KOP 1001 (Figure E.2-1). Views from KOP 1001 represent the views of recreational golfers and the surrounding residences at the Glenrock Golf Course's clubhouse looking due south toward the rolling to rugged terrain of Deer Creek and Mormon Canyon. Open panoramic views of the rolling to rugged terrain are considered to have moderate scenic quality. The landscape is fairly common throughout the area and lacks scarce landscape elements of visual interest. There are few human-made alterations to the landscape in the foreground and middleground views. A focal point of the view, which also compromises the aesthetic quality of the landscape, is the highly visible limestone quarry in the background.

KOP 1015 (Figure E.2-1). Views from KOP 1015 represent the views of recreational drivers and historical enthusiasts at the historical marker of the Brigham Young-BYX Mail Station Site on Deer Creek Road, looking northwest across the rolling hills south of I-25. Viewers at this location have open panoramic and subordinate views of the undulating and amorphous terrain. This view is considered to have low to moderate scenic quality due to the lack of distinct landscape features.

KOP 105 (Figure E.2-1/Appendix G-2 Figure 5.1-2). Views from KOP 105 were used to represent scenic views west of the Deer Creek Range and Reno Hill, which are

important to sensitive viewers in this remote area of the Medicine Bow-Routt NFs. There were no KOPs within the Forest due to the remote nature of the area; however, views in the surrounding area range from the undulating valley to more dramatic rocky terrain with numerous mountain silhouettes. KOP 105 is located approximately 2.5 miles south of the Medicine Bow-Routt NFs boundary, but it represents views of the surrounding areas adjacent to the Forest. KOP 105 and other adjacent viewpoints exhibit diversity in form, line, color, and texture with few human-made features. The most visible human-made feature in the surrounding area is an existing 230 kV transmission line.

KOP 983 (Figure E.2-1). Northeast views from KOP 983 represent the views from a residence and travelers on Little Medicine Road, south of Little Medicine Falls. Open panoramic views of the complex undulating terrain with rock outcroppings and dendritic drainage patterns are considered to have moderate to high scenic quality due to the presence of distinct landscape features as well as a lack of human-made intrusions.

KOP 986 (Figure E.2-1). Views from KOP 986 represent the views from a residence on Little Medicine Road looking northeast. Open panoramic views of the undulating terrain with rocky mountainous background terrain are considered to have low to moderate scenic quality. The lack of distinct landscape features, as well as human-made intrusions, distract from the overall landscape composition.

KOP 985 (Figure E.2-1). Views from KOP 985 represent the views from a residence on Balsh Road in Medicine Bow-Routt NFs looking southwest. Open panoramic views of the undulating terrain bordered by large, more dominant vegetation are considered to have moderate to high scenic attractiveness due to the presence of dominant vegetation and few human-made intrusions.

KOP 988 (Figure E.2-1). Views from KOP 988 represent the views from a residence on Marshall Road looking south toward a feature called Long Draw. Open panoramic and focal views of the complex undulating terrain with rugged mountainous silhouettes are considered to have high scenic quality due to the presence of distinct landscape features as well as a lack of human-made intrusions. Most of the human-made features in the view appear as rustic agricultural outbuildings. These structures do not detract from the landscape features and are aesthetically neutral. They do not distract from the overall landscape composition.

KOP 990 (Figure E.2-1). Views from KOP 990 represent the views of a residence next to CR 64, looking south and southwest close to Buck Point and the Greasewood Flats. An open panoramic view of the undulating terrain is considered to have moderate scenic quality due to the presence of some distinct landscape features and lack of human-made intrusions.

KOP 853 (Figure E.2-1). Views from KOP 853 represent the views of a residence next to Sheep Creek, looking southeast close to Buck Point. Open panoramic views of the undulating and contrasting red rock terrain are considered to have moderate scenic quality due to the presence of some distinct landscape features and lack of human-made intrusions.

KOP 107 (Figure E.2-1). KOP 107 represents views of Highway 487 north of Medicine Bow, Wyoming. From this location there are open panoramic views of Pine Butte and Flattop Mountain in the middleground and background. Views also include fencing and overhead transmission lines converging in the middleground. Open panoramic views of the rolling hills and geologic features offer some landscape contrast, but views are considered to be of low scenic quality due to the indistinct landscape features and the presence of human-made features (i.e., fencing, mile markers, and overhead utilities) which detract from the scenic quality.

Alternative 1E-A

Segment 1E has three alternatives. Alternative 1E-A, the first alternative, would parallel I-25 before crossing diagonally and heading south toward Banner Mountain. The Route Alternative would cross approximately 6.6 miles of lands owned by the State of Wyoming and 9.5 miles of privately owned lands.

KOP 38 (Figure E.2-1). Views from KOP 38 represent the views of recreational users at this North Platte River access and recreation area. Open panoramic and focal views of the North Platte River riparian landscape and surrounding rolling hills in the middleground and background are considered to have moderate scenic quality. Numerous existing human-made alterations, including the Dave Johnston Power Plant and adjacent industrial features, create a skyline effect in the background of the view. Open panoramic views of the rolling hills and riparian landscapes in the middleground to background offer some landscape contrast. Views are considered to be of low to moderate scenic quality due to the presence of electric utilities and industrial features in the middleground and background, which detract from the scenic quality.

KOP 37 (Figure E.2-1). Views from KOP 37 represent those of recreational viewers touring by automobile or hiking the Oregon NHT. Open panoramic views of distant mountains and rolling hills add contrast. These views include the presence of large electric generation and transmission facilities along the river, including the Dave Johnston Power Plant. Open panoramic views of the rolling hills and riparian landscape by the North Platte River in the middleground to background offer some landscape and vegetation contrast. Views are considered to be of low to moderate scenic quality due to the presence of large electric facilities in the middleground and background of the view that detract from the scenic quality. This viewpoint is also discussed in Section 3.3 – Cultural Resources.

Alternative 1E-B

The second alternative for Segment 1E, Alternative 1E-B, would cross approximately 2.6 miles of BLM-administered land with VRM Class II objectives and 5.0 miles of lands owned by the State of Wyoming. Alternative 1E-B is a variation of the Proposed Route northeast of Medicine Bow, Wyoming. Alternative 1E-B would also cross approximately 45.6 miles of privately owned lands. The following seven KOP locations were selected to represent the most sensitive or most typical views for Alternative 1E-B.

KOP 62 (Figure E.2-1). Views from KOP 62 represent the views of residences on Rock Creek and Fort Fetterman Road, or CR 61 looking west toward the rugged terrain

of Smith Mountain, as well as Reed Pass beyond the residence in the middleground. Open panoramic views of the rolling to rugged terrain are considered to have moderate to high scenic quality. There are numerous aesthetic landscape elements in the middleground and background views, such as Smith Mountain and the surrounding rocky outcroppings, and very few human-made alterations.

KOP 991 (Figure E.2-1). Views from KOP 991 represent the views from a residence adjacent to Hay Creek Road looking west. Open panoramic views of the complex undulating terrain with rugged mountainous silhouettes are considered to have moderate to high scenic quality. Distinct landscape features add to the scenic quality, while human-made intrusions such as fences, signs, and cattle guards detract from the scenic quality.

KOP 993 (Figure E.2-1). East views from KOP 993 represent the views of recreational visitors at the Toltec Reservoir public fishing area. Open panoramic views of the complex rocky terrain and waterbody are considered to have moderate to high scenic quality. Distinct landscape features add to the scenic quality, while human-made intrusions such as the dams, reservoir retaining walls, parking structures, and bathroom facilities detract from the scenic quality.

KOP 995 (Figure E.2-1). Views from KOP 995 represent the views from a residence on Esterbrook Road looking southwest toward Greasewood Flats. Open panoramic views of the complex undulating terrain and mountainous silhouettes are considered to have moderate to high scenic quality. Distinct landscape features add to the scenic quality, while human-made intrusions such as fences and small power poles detract from the scenic quality.

KOP 999 (Figure E.2-1). Views from KOP 999 represent the views of recreational visitors at the Wheatland Reservoir Number 3 parking area, looking northwest toward Red Hill. Open panoramic views of the complex undulating terrain and reservoir are considered to have moderate to high scenic quality. Distinct landscape features add to the scenic quality, while human-made intrusions such as the dams and reservoir retaining walls detract from the scenic quality.

KOP 840 (Figure E.2-1). Views from KOP 840 represent the views of a residence at Carlin Ranch, looking north toward the Como Bluffs. Open panoramic views of the complex undulating to rugged terrain are considered to have moderate scenic quality due to the presence of distinct landscape features with few human-made intrusions.

KOP 982 (Figure E.2-1). Northeast views from KOP 982 represent the views of residences on the northern boundary for the jurisdiction of the town of Medicine Bow, Wyoming. Open panoramic views of the undulating terrain with distant mountainous silhouettes are considered to have moderate scenic quality. The lack of distinct landscape features as well as the presence of human-made intrusions detract from the scenic quality.

Alternative 1E-C

The third alternative for Segment 1E, Alternative 1E-C, would parallel Segment 1W(a) beginning at point 1Ee and continuing south to the Aeolus Substation. The 48.0-mile

Route Alternative would cross approximately 0.5 mile of BLM-administered land with VRM Class II objectives, 10.2 miles of BLM-administered land with VRM Class III objectives, and 2.1 miles of NFS land with an SIO of Moderate. The following four KOP locations were selected to represent the most sensitive or most typical views for Alternative 1E-C.

KOP 105 (Figure E.2-1/Appendix G-2, Figure 5.1-2). Described above.

KOP 89 (Figure E.2-1). Views from KOP 90 represent those of recreational users at the Bates Creek Reservoir, close to a BLM access road and a historic cabin site. From the top of the main retaining wall of Bates Creek Reservoir, there are open views of the surrounding valley of the Shirley Basin area, which has very little landscape contrast. However, the existing transmission line in the background is scarcely visible due to blending in with the background terrain (backdropping), resulting in low to moderate scenic quality.

KOP 86 (Figure E.2-1). Views from this KOP represent those of recreational drivers along a BLM access road close to the Proposed Route. Open panoramic views from the top of this lookout area are of the surrounding valley of the Shirley Basin in the middleground and background. There is little landscape contrast; however, the existing transmission line in the middleground is scarcely visible due to backdropping. Views would be of low to moderate scenic quality due to low landscape contrast and the presence of existing human-made modifications, which detract from the scenic quality.

KOP 90 (Figure E.2-1). KOP 90 represents the view from a historic cabin site in the Shirley Basin area of Wyoming looking east (it is the same location as KOP C98). Open panoramic views of the surrounding valley, Shirley Basin, offer little landscape contrast. However, the existing transmission line is scarcely visible due to the foreground terrain. Views would be of moderate scenic quality due to low landscape contrast and the presence of a few existing human-made modifications, which detract from the scenic quality.

KOP 46 (Figure E.2-1). Views from this KOP represent those of local commuters and residents traveling north on State Highway 487. Open panoramic views from the top of this hill crest are of the surrounding valley of the Shirley Basin in the middleground and Ice Cave Mountain in the background. There is little landscape contrast, and the existing transmission line in the foreground and middleground is highly visible because it parallels the roadway. Views would be low to moderate scenic quality due to the presence of existing human-made modifications and the lack of scarce scenic landscape elements.

Segment 1W (Segments 1W[a] and 1W[c]) – Windstar to Aeolus

Segment 1W(a) would cross approximately 0.7 mile of BLM-administered land with VRM Class II objectives, 10.6 miles of BLM-administered land with VRM Class III objectives, and 2.3 miles of NFS land (Medicine Bow-Routt NFs) with an SIO of Moderate. Where Segment 1W(a) would cross this NFS land, it is a rebuild of an existing transmission line. Segment 1W(c) would cross approximately 1.3 miles of BLM-administered land with VRM Class II objectives (Casper FO) and 9.1 miles of

BLM-administered land with VRM Class III objectives. Approximately 2.3 miles of Segment 1W(c) would cross NFS land with an SIO of Moderate, approximately 1,500 feet southeast of Segment 1W(a) along the edge of the existing utility corridor. This area is allocated to MA 8.3, Utility Corridors and Electronic Sites.

The Segments 1W(a) and 1W(c) Proposed Routes would cross 18.5 miles and 15.4 miles, respectively, of lands owned by the State of Wyoming. The following 13 KOP locations were selected to represent the most sensitive or most typical views for Segment 1W.

Proposed Route – 1W(a)

KOP C98 (Figure E.2-1). Views from this viewpoint are from a historic cabin. This viewpoint is discussed in Section 3.3 – Cultural Resources.

KOP 1004 (Figure E.2-1). Views from KOP 1004 represent the views of a residence looking southwest across the North Platte River and the town of Glenrock. Open views of the rolling to rugged terrain are considered to have low to moderate scenic quality. The presence of numerous human-made alterations and/or built elements (such as the visible transmission line, railroad, buildings, storage tanks, and a limestone quarry) adjacent to this view and in the visible distance distract from the scenic quality.

KOP 1005 (Figure E.2-1). Views from KOP 1005 represent the views of numerous residences on Cottonwood Lane looking northeast. Open panoramic views of the rolling and patchy rugged terrain are considered to have moderate scenic quality. Human-made alterations adjacent to this view detract from the scenic quality, while somewhat intact natural landscape elements add to the scenic quality.

KOP 1008 (Figure E.2-1). North views from KOP 1008 represent the views of recreational hikers along the Trail at the Rock in the Glen historic site, west of the town of Glenrock. Open panoramic and elevated views of the gently rolling and indistinct terrain are considered to have low to moderate scenic quality. Numerous human-made alterations adjacent to this view are subordinate to the intact natural landscape elements found within the view; however, they detract from the scenic quality.

KOP 1006 (Figure E.2-1). Views from KOP 1006 represent the views of a residence looking west along Highway 87. An open panoramic view of the gently rolling and riparian terrain is considered to have low to moderate scenic quality. Human-made alterations adjacent to this view that are not dominant in this somewhat intact natural landscape with a riparian corridor detract from the scenic quality.

KOP 105 (Figure E.2-1 / Appendix G-2 Figure 5.1-2). Described above.

KOP 89 (Figure E.2-1). Views represent those of recreational users at the Bates Creek Reservoir, close to a BLM access road and historic cabin site. From the top of the main retaining wall of Bates Creek Reservoir, there are open views of the surrounding valley of the Shirley Basin area, which is in the middleground and background. There is little landscape contrast; however, the existing transmission line in the background is scarcely visible because of how it blends in with the background terrain, resulting in low to moderate scenic quality.

KOP 86 (Figure E.2-1). Views from this KOP represent those of recreational drivers along a BLM access road. Open panoramic views from the top of this lookout area are of the surrounding valley of the Shirley Basin in the middleground and background There is little landscape contrast, though the existing transmission line in the middleground is scarcely visible due to backdropping. Views would be of low to moderate scenic quality due to low landscape contrast and the presence of existing human-made modifications, which detract from the scenic quality.

Proposed Route – 1W(c) Alignment

Segment 1W(c) would cross approximately 24.2 miles of BLM-administered land, including 1.3 miles managed with VRM Class II objectives, and 9.1 miles managed with VRM Class III objectives. The route would also cross 14.8 miles of land owned by the State of Wyoming, as well as approximately 30 miles of privately owned land. The route would be a rebuild of an existing line for all but approximately 9 miles of its length. The following four KOP locations were selected to represent the most sensitive or most typical views for Segment 1W(c).

KOP 56 (Figure E.2-1). KOP 56 is directly adjacent to the Oregon NHT and Oregon NHT marker. From this location, there are open panoramic views of the broad floodplains of the North Platte River with the surrounding mountains in the background. Views also include overhead transmission lines and an abundance of industrial electric utilities in the foreground and middleground. Open panoramic views of the rolling hills and riparian landscape by the river in the middleground to background offer some landscape contrast. However, views are considered to be of low to moderate scenic quality due to the presence of electrical transmission lines and the Dave Johnston Power Plant in the middleground and in the distance, which detract from the scenic quality. KOP 56 is also discussed in Section 3.3 – Cultural Resources.

KOP 83 (Figure E.2-1). Views from this KOP represent the views from residences within 3.25 miles of the Dave Johnson Power Plant. Open panoramic views of the rolling hills in the middleground and distant mountain views offer little landscape contrast. Views of the existing electric utilities in the middleground create a skyline effect around the adjacent residences. These views are considered to be of low to moderate scenic quality due to both the presence of existing electric utilities in the middleground and background distance zones lowering contrast levels and detracting from the scenic quality.

KOP 1013 (Figure E.2-1). Views from KOP 1013 represent the views of a residence adjacent to Deer Creek Road looking southwest toward Banner Mountain, directly west of Phillips Spring. Open panoramic and focal views of the rolling to rugged terrain is considered to have moderate to high scenic quality due to the lack of human-made alterations and the presence of distinct landscape features, such as Banner Mountain and Lower Deer Creek Canyon.

KOP 105 (Figure E.2-1/Appendix G-2, Figure 5.1-2). Described above.

Alternative 1W-A (1 to 1Wb)

Segment 1W has one alternative, 1W-A, which crosses approximately 5.5 miles of lands owned by the State of Wyoming and 10.7 miles of private land. The following three KOP locations were selected to represent the most sensitive or most typical views for Alternative 1W-A.

KOP 1010 (Figure E.2-1). Views from KOP 1010 represent the views of residences along Highway 87 looking southeast. Open panoramic views of the indistinct, rolling terrain are considered to have low scenic quality. Numerous vertical and geometric human-made alterations adjacent to this view, including the visually dominant Dave Johnston Power Plant, detract from the scenic quality.

KOP 71 (Figure E.2-1). Views from KOP 71 represent the views of residences along CR 61 adjacent to Banner Draw looking southeast. Open panoramic views of the rolling to rugged terrain are considered to have moderate scenic quality. Distinct landscape elements, as well as human-made alterations adjacent to this view, detract from the scenic quality.

KOP 1011 (Figure E.2-1). Views from KOP 1011 represent the views of a residence adjacent to Deer Creek Road looking southwest toward Banner Mountain, directly west of Banner Draw. Open panoramic and focal views of the rolling terrain and distant rugged terrain of Banner Mountain are considered to have moderate to high scenic quality. The lack of human-made alterations and the presence of distinct landscape features, such as the terrain of Banner Mountain and Lower Deer Creek Canyon, add to the scenic quality of the landscape.

Segment 2 – Aeolus to Creston

Segment 2 would traverse an area of checkerboard land ownership largely to the south of I-80 in Wyoming. This segment would cross approximately 22.9 miles of BLM-administered land managed to conform to VRM Class III objectives and approximately 6.2 miles of Wyoming state land. Most of the land crossed by Segment 2 is private (approximately 53.5 miles).

Proposed Route

The Proposed Route generally follows the base or foot of topographic features including the Hogback providing a backdrop from potential viewing areas except at the crossing of I-80 and the North Platte River. Views range from moderate to high scenic quality. The following nine KOP locations were selected to represent the most sensitive or typical views within this area of the Project.

KOP C4 (Figure E.2-2). Views from this viewpoint on Lincoln Highway are discussed in Section 3.3 – Cultural Resources.

KOP C3 (Figure E.2-2). Views from this viewpoint on Lincoln Highway are discussed in Section 3.3 – Cultural Resources.

KOP C2 (Figure E.2-2). Views from this viewpoint on Lincoln Highway are discussed in Section 3.3 – Cultural Resources.

KOP C1 (Figure E.2-2). Views from this viewpoint on the Rawlins to Baggs Stage Road and are discussed in Section 3.3 – Cultural Resources.

KOP 836-East (Figure E.2-2). Views from KOP 836-East represent the views of a residence looking east through Coyote Canyon and across Highway 30 toward Coal Bank Basin and Elk Mountain. Open views of the rolling terrain are considered to have moderate to high scenic quality. Unique landscape features, such as Elk Mountain, add to the scenic quality, while the presence of numerous human-made alterations and/or built elements (such as the visible transmission line) adjacent to this view detract from the scenic quality.

KOP 94 (Figure E.2-2). Views represent those of recreational drivers along the historic Old Lincoln Highway. Open panoramic views of the surrounding mountains in the background offer some landscape contrast and include transmission and telephone lines, as well as sheds and a substation in the foreground and middleground. Open panoramic views of the rolling to rugged hills in the middleground to background would offer some landscape contrast, but views are of low to moderate scenic quality. The distance and the presence of electric utilities in the middleground of the view detract from the scenic quality.

KOP 822 (**Figure E.2-2).** Views from KOP 822 represent the views of recreational users at the Rochelle public access area adjacent to the North Platte River looking north toward the Hogback geologic formation. Enclosed and focal views of the rolling and rugged terrain bisected by the North Platte River are considered to have high scenic quality due to the lack of human-made alterations and relatively pristine conditions of landscape elements adjacent to this view.

KOP 824 (Figure E.2-2). Views from KOP 824 represent the views of a residence directly adjacent to the North Platte River looking east between the Hogback geologic formation and Whitehorse Canyon. Open panoramic views of the flat to rolling and rugged terrain are considered to have moderate scenic quality. The presence of a variety of natural landscape elements add to the scenic quality, while human-made alterations detract from the scenic quality.

KOP 829 (Figure E.2-2). Views from KOP 829 represent the views of a residence looking north to northeast toward the proposed Project, east of the Coal Mine Draw and north of the Five Mile Ridge. Open panoramic views of the rolling to rugged terrain are considered to have low to moderate scenic quality. The presence of numerous human-made alterations adjacent to this view and throughout the perceptible viewing range detract from the scenic quality; however, the mountainous views in the background add to the interest and complexity of the view.

Alternative 2A

Alternative 2A would traverse an area of checkerboard land ownership of BLM-administered (7.6 miles managed with VRM Class III objectives) and 1.7 miles of Wyoming state lands. BLM-administered land in this area is primarily VRM Class III and IV; therefore, this alternative should conform to VRM objectives. Alternative 2A could be seen from many of the proposed KOPs of Alternative 2B, with the exception of

KOP 94, due to the close proximity of the alternative to the Proposed Route from this particular viewing location. The following four KOP locations were selected to represent the most sensitive or typical views within this area of the Project.

KOP 838 (Figure E.2-2). Views from KOP 838 represent the views of dispersed residences and three churches at the southwestern edge of the town of Hanna, Wyoming. The view to the south is of the Sand Hills, with Elk Mountain visible in the background. Open panoramic views of the flat to rolling and rugged terrain are considered to have moderate scenic quality. The presence of numerous human-made alterations adjacent to this view detract from the scenic quality and the distant scenic landscape elements.

KOP 836-West (Figure E.2-2). Views from KOP 836-West represent the views of a residence looking northwest to west across Coyote Canyon and towards St. Mary's Hill. Partially screened views of the rolling to rugged terrain in Coyote Canyon are considered to have moderate scenic quality. Terrain and the presence of numerous human-made alterations adjacent to this view (e.g., powerlines, pipelines, and fencing) detract from the scenic quality.

KOP 9 (Figure E.2-2). Views from KOP 9 represent the views of recreational users in the Fort Fred Steele cemetery at a historic marker, located at the top of a hill overlooking Whitehorse Canyon and the North Platte River. Open panoramic views of Whitehorse Canyon and surrounding mountains in the background include human-made alterations (transmission structures, houses, barns) in the middleground. Open panoramic views of the rolling to rugged hills in the middleground to background and riparian landscapes adjacent to the North Platte River create landscape contrast; however, scenic quality is considered low to moderate due to the presence of electric utilities in the foreground and middleground.

KOP 5 (Figure E.2-2). From this KOP, an informational kiosk at historic Fort Fred Steele, visitors have views to the north across Whitehorse Canyon and a reach of the North Platte River toward the Project. From this particular viewing area, railings for a cemetery are visible in the immediate foreground marking the viewing area, and two existing transmission lines can be seen in the middleground distance zone. Open panoramic views of the rolling to rugged hills in the middleground to background offer some landscape contrast, but views are of low to moderate scenic quality. The presence of numerous existing electric utilities in the middleground of the view detract from the scenic quality.

Alternative 2B

Alternative 2B traverses an area of checkerboard land ownership of BLM-administered land (2.3 miles managed with VRM Class III objectives) and 3.8 miles of private lands. BLM-administered land in this area is primarily VRM Class III; therefore, Alternative 2B should conform to VRM objectives. The following KOP location was selected to represent the most sensitive or typical views within this area of the Project.

KOP 4 (Figure E.2-2). Views from KOP 4 represent those of residences south of historic Fort Fred Steele, looking north toward the Fort and North Platte River with Mount Steele and the Fort Steele Mountains in the background. Open panoramic

views, with surrounding mountains in the background, are considered to have moderate scenic quality. Existing alterations (transmission structures, houses, barns) in the middleground detract from the scenic quality.

Alternative 2C

Alternative 2C would traverse an area of checkerboard land ownership, west of Hanna Draw Road, which consists of BLM-administered land (11.3 miles managed with VRM Class III objectives) and 12.9 miles of Wyoming state lands. BLM-administered land in this area is primarily VRM Class III (3.7 miles) and IV (7.6 miles); therefore, this alternative should conform to VRM objectives. Alternative 2C could be seen from the KOPs of Alternative 2A and the Proposed Route. There is one KOP location selected to represent the most sensitive or typical views within this area of the Project.

KOP 836-West (Figure E.2-2). Views from KOP 836-West represent the views of a residence looking northwest to west across Coyote Canyon and towards St. Mary's Hill. Partially screened views of the rolling to rugged terrain in Coyote Canyon are considered to have moderate scenic quality. Terrain and the presence of numerous human-made alterations adjacent to this view (e.g., powerlines, pipelines, and fencing) detract from the scenic quality.

Segment 3 – Creston to Anticline

Segment 3 would cross approximately 19 miles of BLM-administered land with VRM Class III objectives (10.4 miles in Rock Springs FO and 8.5 miles in the Rawlins FO) and 10 miles of BLM-administered land with VRM Class IV objectives (6.5 miles in the Rock Springs FO and 3.6 miles in the Rawlins FO). Segment 3 would also cross 1.0 mile of Wyoming State land and 26.5 miles of private land. The following KOP location was selected to represent the most sensitive or most typical viewers within this area of the project.

Proposed Route

KOP 16 (Figure E.2-3). Views from KOP 16 represent those of drivers on I-80 and at a particular rest area close to Bitter Creek Road. Open panoramic views of flat to rolling terrain include human-made alterations (transmission structures, oil and gas structures, sheds) in the middleground. Open panoramic views of the flat to rolling terrain in the middleground to background would offer some landscape contrast, but views are of low scenic quality due to the presence of numerous human-made disturbances. Disturbances include electric utilities in the foreground and middleground of the view, which detract from the scenic quality.

Segment 4 – Anticline to Populus

Segment 4 would cross 9.2 miles of NFS land in the Caribou-Targhee NF, approximately 8 miles of which is managed with a VQO of Partial Retention and 1.3 miles with a VQO of Retention. A VQO of Retention requires that management activities or alterations not be visually apparent and Partial Retention requires that management activities remain visually subordinate to the characteristic landscape. The following KOP locations were selected to represent the most sensitive or most typical

views for Segment 4. Segment 4 has six Route Alternatives, almost entirely within the Kemmerer subsegment in proximity to sensitive landscape elements such as the Cokeville Meadows NWR and Fossil Butte National Monument in Lincoln County, Wyoming. None of the six Route Alternatives would cross NFS land.

Segment 4 would cross 82.1 miles of BLM-administered lands, including 19.9 miles managed with VRM Class II objectives, and 23.0 miles managed with VRM Class III objectives.

Proposed Route

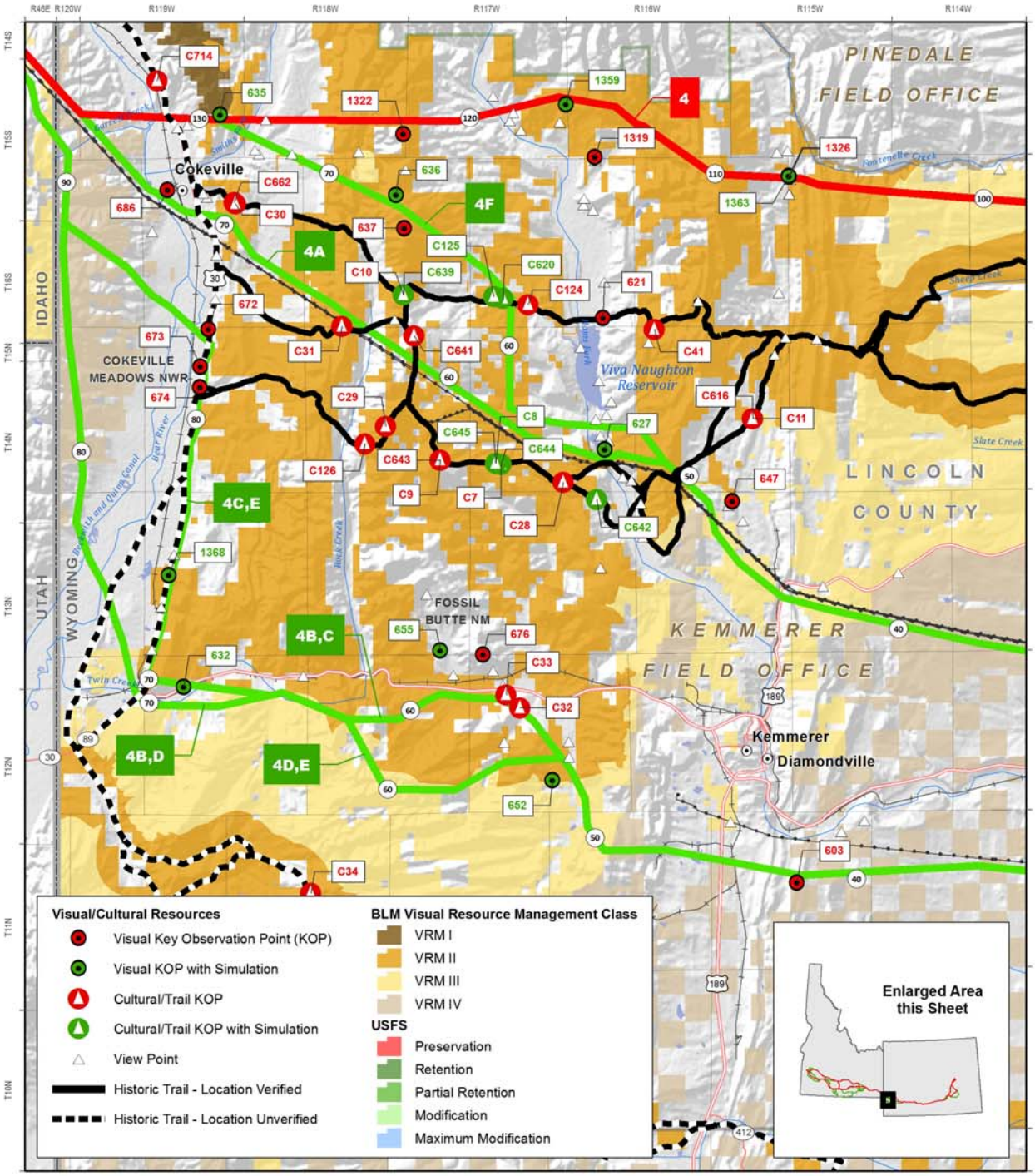
The following 24 KOP locations were selected to represent the most sensitive or most typical views, and were analyzed for potential impacts on visual resources for Segment 4 of the Project. Figure 3.2-2 shows the Kemmerer area in greater detail.

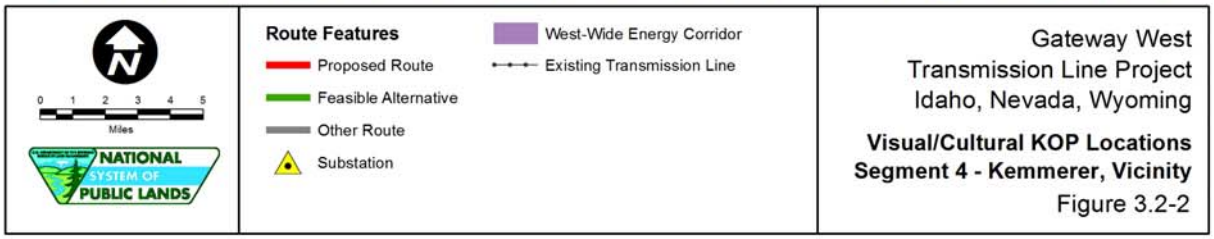
KOP C105 (Figure E.2-4). Views from this point are from the McCauley's Road and Big Hill historic markers along the Oregon NHT. This KOP has cultural as well as visual resource concerns and is described in Section 3.3 – Cultural Resources.

KOP 1346 (Figure E.2-5/Appendix G, Figure CB-1a). Views from KOP 1346 represent the views of recreational users/drivers traveling along the Highline Trail in the Caribou-Targhee NF. Views in this area are enclosed by the surrounding vegetation and topography. Enclosed views of the surrounding landscape are considered to have moderate to high scenic quality. The lack of substantial human-made alterations in the foreground and middleground and the dominant vegetation, which exhibits a variety of forms and textures, increases the scenic quality.

KOP 25 (Figure E.2-4). Views from KOP 25 represent those of recreational users/drivers along U.S. Route 191 looking west toward the Landscapes of Power recreation area. The view is backdropped by mountains and the Sand Knolls, with the Boar's Tusk geological feature in the Seldom-Seen distance zone. This KOP is on BLM-administered lands managed to conform to VRM Class III objectives. Open panoramic views, with surrounding mountains in the background, are considered to have moderate scenic quality. Numerous human-made alterations create a skyline effect in the middleground and detract from the scenic quality.

KOP 23 (Figure E.2-4). Views from KOP 23 represent the views of recreational users along the Wild Horse BLM/NPS Trail, looking west toward the Landscapes of Power recreation area (KOP 25). The view is backdropped by mountains and the Sand Knolls as well as the Boar's Tusk geological feature in the Seldom-Seen distance zone. This KOP is on BLM-administered lands managed to conform to VRM Class III objectives. Open panoramic views of the surrounding mountains in the background views are considered to have moderate scenic quality. Numerous human-made alterations create a skyline effect in the middleground view and detract from the scenic quality.


PINEDALE
FIELD OFFICE
LINCOLN
COUNTY
KEMMERER
FIELD OFFICE
IDAHO
WYOMING
UTAH
Cokeville
COKEVILLE
MEADOWS NWR
FOSSIL
BUTTE NM
Viva Naughton
Reservoir
Kemmerer
Diamondville
4
4A
4F
4C,E
4B,C
4B,D
4D,E
Visual/Cultural Resources
Visual Key Observation Point (KOP)
Visual KOP with Simulation
Cultural/Trail KOP
Cultural/Trail KOP with Simulation
View Point
Historic Trail - Location Verified
Historic Trail - Location Unverified
BLM Visual Resource Management Class
VRM I
VRM II
VRM III
VRM IV
USFS
Preservation
Retention
Partial Retention
Modification
Maximum Modification
Enlarged Area
this Sheet


Miles
NATIONAL
SYSTEM OF
PUBLIC LANDS
Route Features
Proposed Route
Feasible Alternative
Other Route
Substation
West-Wide Energy Corridor
Existing Transmission Line
Gateway West
Transmission Line Project
Idaho, Nevada, Wyoming
Visual/Cultural KOP Locations
Segment 4 - Kemmerer, Vicinity
Figure 3.2-2

KOP 26 (Figure E.2-4). The views from KOP 26 represent those of recreational viewers touring by automobile or hiking the Oregon NHT. Segment 4 would run parallel to SR 372 in the foreground and cross behind this particular view. This KOP is on BLM-administered lands managed to conform to VRM Class III objectives. Open panoramic views of distant mountains in the background add some contrast and include overhead transmission lines. Views are considered to have moderate scenic quality. Numerous human-made alterations create a skyline effect in the middleground and detract from the scenic quality. This viewpoint is also discussed in Section 3.3 – Cultural Resources.

KOP 1315 (Figure E.2-4). Views from KOP 1315 represent those of recreational campers at the BLM's Fontenelle Reservoir campground looking southwest toward Highway 189. Open panoramic views of the surrounding rugged terrain and water feature are considered to have moderate to high scenic quality. Human-made alterations in the middleground detract from the scenic quality, while distinct landscape views with the presence of a waterbody increase the scenic quality.

KOP 1295 (Figure E.2-4). Views from KOP 1295 represent the southeast views of residences in the Pomeroy Draw area adjacent to Dry Hollow. Open panoramic views of the rolling to rugged terrain are considered to have moderate scenic quality. Few aesthetic landscape elements in the middleground and background views, as well as human-made alterations throughout the Pomeroy Draw, detract from the scenic quality.

KOP 1288 (Figure E.2-4/Appendix G-1, Figure K-1c). South views from KOP 1288 represent the views of recreational hikers/drivers on CR 314 at a crossing of the Oregon NHT. Open panoramic views of the rolling to rugged terrain are considered to have moderate scenic quality. Few aesthetic landscape elements in the middleground and background views, as well as human-made alterations throughout the Pomeroy Draw, detract from the scenic quality.

KOP 1292 (Figure E.2-4). Views from KOP 1292 represent the views of a resident off of CR 314 looking southwest toward rolling to rocky terrain. Open panoramic views of the rolling to rugged terrain are considered to have moderate scenic quality. Few aesthetic landscape elements in the middleground and background views, as well as human-made alterations and landscape scarring, detract from the scenic quality.

KOP 1363 (Figure E.2-5/Appendix G, Figure K-2c). Views from KOP 1363 represent the views of travelers on Sublet Pomeroy Road (CR 306) looking south toward rolling to rocky terrain of Oyster Ridge. The open and focal views are considered to have moderate to high scenic quality due to the variety of landforms and vegetation and presence of few human-made alterations.

KOP 1326 (Figure E.2-5). Views from KOP 1326 represent those of residential viewers adjacent to Mammoth Springs on Sublet Pomeroy Road. The KOP is facing south toward mountainous terrain. Open panoramic and focal views, with surrounding mountains in the background, are considered to have moderate to high scenic quality. Human-made alterations in the middleground detract from the scenic quality, while distinct background landscape views add to the scenic quality.

KOP 1319 (Figure E.2-5). Views from KOP 1319 represent those of seasonal residential campers at a temporary dwelling and campers adjacent to Spring Gulch. The KOP is facing a northeastern view toward Fort Hill and Miller Mountain, which are not apparent due to atmospheric seasonal conditions. Open panoramic views, with surrounding mountains in the background , are considered to have moderate scenic quality. Human-made alterations in the middleground detract from the scenic quality, while distinct background views add to the scenic quality.

KOP 1359 (Figure E.2-5/Appendix G, Figure K-2a). Views from KOP 1359 represent those of recreational viewers approximately 2.3 miles east of Hams Fork Road (CR 305) looking north across Commissary Ridge and the East Fork of Pole Creek. The rolling to mountainous views are considered to have moderate to high scenic quality due to the variety of vegetation and presence of several roads.

KOP 1322 (Figure E.2-5). Views from KOP 1322 represent those of recreational drivers and viewers north of Coke Mountain, on Sublet Cuttoff Road looking north toward Buck and Bear Canyon. KOP 1326 is on BLM-administered land managed to conform to VRM Class II objectives. Open superior and high elevation views, with surrounding mountains in the background, are considered to have high scenic quality due to few discernable human-made features and distinct, scenic background landscape views.

KOP 635 (Figure E.2-4). Terrain encloses the views of recreationists and ranchers around this KOP located adjacent to Quealy Reservoir on the south and a WSA immediately north. The BLM road that provides access to the reservoir continues east and eventually turns north providing access to the east side of the WSA. The town of Cokeville, not visible from this point, is located about 2.8 miles to the southeast along Highway 30. Scenic quality is considered moderate to high due the minimal human-made alterations, water, variable landforms, and vegetation.

KOP 697 (Figure E.2-5). Views from KOP 697 represent those of recreational users/drivers along U.S. Highway 30 looking north toward the foothills of the Preuss Range and the Sheep Creek Hills. Open panoramic views, with surrounding mountains in the background, are considered to have moderate scenic quality. Human-made alterations, such as fencing, roads, and existing transmission lines, detract from the scenic quality. KOP 697 also has historical resources (two segments of the Oregon NHT) in the foreground and middleground view.

KOP 705 (Figure E.2-5). Views from KOP 705 represent the views from a residence on Bench Road looking south across the Bear Lake Valley. Open panoramic views, with surrounding hills and mountains in the background, are considered to have low to moderate scenic quality. Numerous human-made alterations, such as fencing, existing transmission lines, roads, a gravel operation, and buildings, detract from the scenic quality.

KOP 758 (Figure E.2-5). Views from KOP 758 represent the views of recreational users/drivers traveling along a Forest Service road and at a trailhead in the Caribou-Targhee NF in Middle North Fork Canyon. Views are enclosed by the surrounding vegetation. The Project would be moderately visible due to dense vegetation. Enclosed views of the surrounding landscape are considered to have moderate to high

scenic quality due to the lack of human-made alterations in the foreground and middleground views.

KOP 757 (Figure E.2-5). Views from KOP 757 represent the views of recreational users/drivers traveling along a Forest Service road in the Caribou-Targhee NF in Grunder Hollow, south of Ant Basin. Views in this area are enclosed by the surrounding vegetation. The Project would have low to moderately visibility due to dense vegetation. Enclosed views of the surrounding landscape are considered to have moderate to high scenic quality due to the lack of human-made alterations in the foreground and middleground views and the dominant vegetation.

KOP 746 (Figure E.2-5). Views from KOP 746 represent the views from the Thatcher Elementary School looking south toward the Gentile/Mound Valley and the Bear River. Open panoramic views, with surrounding mountains in the background, are considered to have moderate scenic quality. Human-made alterations such as fencing, existing transmission lines, roads, and buildings detract from the scenic quality.

KOP 778 (Figure E.2-5). Views from KOP 779 represent those of recreational campers/drivers in Cottonwood Valley. In this area, the existing 345-kV Jim Bridger transmission lines are 1.5 miles distant. Open panoramic views, with surrounding mountains in the background, are considered to have moderate scenic quality due to the presence of human-made alterations in the middleground to background, detracting from the scenic quality.

KOP 691 (Figure E.2-5). Views from KOP 691 represent the views of residents west of Marsh Creek looking south toward Oxford Peak and the Red Rock Pass area. Open panoramic and focal views of the surrounding valley and mountains are considered to have moderate scenic quality. Human-made alterations such as fencing and agricultural lands detract from the scenic quality.

KOP 775 (Figure E.2-5). Views from KOP 775 represent the views of recreational users/drivers along U.S. Highway 91 looking north toward the historic Red Rock Pass Geologic Site. Open panoramic views of the surrounding mountains are considered to have moderate scenic quality. Human-made alterations, directly adjacent to the focal geologic structures in the foreground and middleground views, detract from the scenic quality.

KOP 770 (Figure E.2-5). Views from KOP 770 represent those of recreational users at the Downata Hot springs looking north from the Marsh Creek Valley. Open panoramic views of the surrounding hills are considered to have low to moderate scenic quality. Human-made alterations in the foreground and middleground views detract from the scenic quality. The ridge visible from this KOP could provide partial screening views of the transmission structures.

Alternative 4A

Alternative 4A, the shortest of all the Segment 4 alternatives, would cross approximately 42.9 miles of BLM-administered land, including 13.5 miles managed with VRM Class II objectives in Wyoming and 10.5 managed with VRM Class III objectives in Wyoming and Idaho. Alternative 4A would also cross 4.5 miles of Wyoming state

land and 34.3 miles of private land in Wyoming and Idaho. The following 10 KOP locations were selected to represent the most sensitive or most typical views for Alternative 4A. The first six KOPs exhibit both cultural and visual resource concerns and are described in the Section 3.3 – Cultural Resources.

KOP C5 (Figure 3.2-2). Views from this point are from the Opal Wagon Road.

KOP C6 (Figure 3.2-2). Views from this point are from the Opal Wagon Road.

KOP C110 (Figure 3.2-2). Views from this point are from the White Hill Historic Monument on the Oregon NHT.

KOP C7 (Figure 3.2-2). Views from this point are from the Alfred Corum Grave on the Oregon NHT.

KOP C8 (Figure 3.2-2). Views from this point are from the Nancy Hill Grave on the Oregon NHT.

KOP C9 (Figure 3.2-2). Views from this point are from Emigrant Springs on the Oregon NHT.

KOP 620 (Figure E.2-4). Views from KOP 620 are representative of recreational views along a segment of the Dempsey-Hockaday Cutoff of the Oregon/California NHT looking northeast. This area is located in an open panoramic landscape with undulating topography in the middleground and background with distant views of wooded mountainous terrain. This landscape is considered to have high scenic quality due to the variety of basic landscape elements (i.e., form, line, color, and texture) and the lack of human-caused disturbance in the area.

KOP 604 (Figure E.2-4). Views from KOP 604 are representative of general views from VRM Class IV lands, looking north from an unpaved access road about 0.5 mile north of Highway 30 and about 7.5 miles east of the Opal Cutoff. This area is located in an open panoramic landscape that generally lacks significant topography in the foreground and middleground but provides some views of distant hills in the background. This landscape is considered to have a low scenic quality due to the presence of four existing transmission lines, scattered gas wells, and limited variety in the basic landscape elements (i.e., form, line, color, and texture).

KOP 647 (Figure E.2-4). This KOP represents residential viewers located along Lupine Lane in the Pomeroy Basin. This view is enclosed by hills that provide a backdrop for an existing transmission line. Variation in land form and color exist but is limited in vegetation and texture. Overall scenic quality is moderate due to existing human-made structures which detract from the scenic quality. KOP 647 may have a view of Alternative 4F.

KOP 627 (Figure E.2-4). This KOP represents recreational viewers from a boat launch site on Kemmerer Reservoir, located north of the city of Kemmerer off Highway 233. Overall, the scenic quality is moderate, offering an interesting mix of landscape elements (hills, water, and trees); however existing transmission lines detract from the scenic quality.

KOP 686 (Figure E.2-4). The view from this location is looking south to southwest along Collette Avenue in West Cokeville, Wyoming, from a residential and farming area. The view is focused toward three existing transmission lines that cross the foothills in the middleground, just before crossing the Bear River. This open view toward the Bear River has been impacted by human-made alterations in the foreground/middleground, resulting in a low to moderate scenic quality rating. The Bear River is not apparent in the view.

Alternative 4B

Alternative 4B would cross approximately 50.5 miles of BLM-administered land, including 7.3 miles managed with VRM Class II objectives (Kemmerer FO) in Wyoming and 15.5 miles managed with VRM Class III objectives (5.9 miles in Wyoming and 2.8 miles in Idaho). Alternative 4B would also cross 8.1 miles of Wyoming and Idaho state land and 41.0 miles of private land (35.5 miles in Wyoming and 5.5 miles in Idaho). The following four KOP locations were selected to represent the most sensitive or most typical views for Alternative 4B.

KOP 652 (Figure E.2-4/Appendix G-1, Figure K-6c). This KOP is located on Twin Creek South Fork Road west of Cavanaugh Peak and the Naughton Power Plant. This KOP has open panoramic views of the rolling terrain in all directions. To the east, the Naughton Power Plant, the Kemmerer Coal Mine, and the city of Kemmerer are not visible. Overall scenic quality in this area is moderate to high due to the diversity of color in vegetation and land forms. Landforms also add variety of form, line, and texture with a lack of visible human-made elements.

KOP 603 (Figure E.2-4). This KOP is taken from atop a ridge about 2.5 miles east of Highway 189 and 2.2 miles south of Highway 30 near the Radiant Mine. This KOP has open panoramic views in all directions. To the west, the Naughton Power Plant and Kemmerer Coal Mine are visible. To the northeast, portions of the town of Kemmerer are visible in the background. Overall scenic quality in this area is low. The lack of significant water or vegetation and the presence of large industrial features including the mine and power plant detract from the scenic quality.

KOP 676 (Figure E.2-4). This elevated viewpoint represents views from the Historic Quarry Site located in Fossil Butte National Monument. This open panoramic view overlooks the historic Fossil town site, Highway 30, Nugget Canyon Creek, and Fossil Ridge in the middle and background. Various human-made elements are perceivable. These elements do not dominate the views; however, they detract from the scenic quality. Scenic quality is considered moderate due to the mix of adjacent scenery, variable topography, and expansive views from this location.

KOP 655 (Figure E.2-4). Views from KOP 655 represent the recreational view from the observation deck of the Fossil Butte National Monument Visitors Center. This view is looking to the south across Nugget Canyon Creek toward Fossil Ridge. Views are enclosed by the Fossil Ridge and include human-made alterations such as Highway 30, a railroad, and an existing transmission line, which all detract from the scenic quality. Overall scenic quality is considered moderate.

KOP 673 (Figure E.2-4). This KOP represents a view from a kiosk looking west toward the Cokeville Meadows NWR along Highway 89. The proposed Project would be visible where it crosses Red Knoll and the foothills of Red Mountain on the west side of the Bear River. The open view of Red Mountain is impacted by human-made alterations (railroad, fencing) in the middleground, which detract from the scenic quality, The Bear River is not apparent in the view.

Alternative 4C

Alternative 4C would cross approximately 46.8 miles of BLM-administered land, including 12.5 miles managed with VRM Class II objectives (Kemmerer FO) in Wyoming and 12.6 miles managed with VRM Class III objectives (9.8 in Wyoming and 2.8 miles in Idaho). The Route Alternative would also cross 8.6 miles of Wyoming state land and 44.9 miles of private land in Wyoming and Idaho (39.4 miles of private in Wyoming and 5.5 miles of private land in Idaho). The following seven KOP locations were selected to represent the most sensitive or most typical views for Alternative 4C.

KOP 603 (Figure E.2-4). This KOP is the same as described for Alternative 4B above.

KOP 676 (Figure E.2-4). This KOP is the same as described for Alternative 4B above.

KOP 655 (Figure E.2-4). This KOP is the same as described for Alternative 4B above.

KOP 632 (Figure E.2-4). The view from this location is looking to the northeast along Highway 30 from a wildlife viewing pull out about 1.75 miles east of Highway 60. This enclosed view looking down Nugget Creek Canyon is considered to have a low to moderate scenic quality. Human-made alterations in the foreground and middleground and limited variations in landscape elements detract from the scenic quality.

KOP 1368 (Figure E.2-4/Appendix G-1, Figure K-8a). The view from this location is looking to the east to northeast from Highway 89, which is adjacent to the Cokeville Meadows National Wildlife Area and west of the highway. The Oregon NHT parallels the highway. This enclosed view of Boulder Ridge and Tunp Range in the background is considered to have moderate to high scenic quality due to the rolling topography and random patterns of vegetation.

KOP 674 (Figure E.2-4). The residential view from this location is looking southeast from two residences along Highway 89. The open view is considered to have a low to moderate scenic quality. Human-made alterations (barns, sheds, and fencing) in the foreground and middleground and limited variations in landscape elements detract from the scenic quality.

KOP 672 (Figure E.2-4). The residential view from this location is looking southwest from the Clark Ranch residence along Highway 89. The open view would have some slight screening provided by the vegetation along Highway 89. The view is considered to have a low to moderate scenic quality. Human-made alterations (railroad, fencing) in the foreground and middleground and limited variations in landscape elements detract from the scenic quality. The Bear River is not apparent in the view.

Alternative 4D

Alternative 4D would cross approximately 4.3 miles of BLM-administered land with VRM Class II objectives (Kemmerer FO) in Wyoming and 20.1 miles of BLM-administered land with VRM Class III objectives in Wyoming and Idaho. The Route Alternative would also cross 6.7 miles of Wyoming state land and 41.4 miles of private land (35.9 miles in Wyoming and 5.5 miles in Idaho). The following two KOP locations are shared with Alternative 4B due to shared portions of their route and were selected to represent the most sensitive or most typical views for Alternative 4D.

KOP 603 (Figure E.2-4). This KOP is the same as described for Alternative 4B above.

KOP 673 (Figure E.2-4). This KOP is the same as described for Alternative 4B above.

Alternative 4E

Alternative 4E would cross approximately 9.5 miles of BLM-administered land with VRM Class II objectives (Kemmerer FO) in Wyoming and 17.2 miles of BLM-administered land with VRM Class III objectives (5.9 miles in Wyoming and 2.8 in Idaho). The Route Alternative would also cross 7.2 miles of Wyoming state land and 45.3 miles of private land in Wyoming and Idaho (39.8 miles of private land in Wyoming and 5.5 miles of private land in Idaho). The following five KOP locations, which are shared with Alternatives 4B and 4C due to shared portions of their routes, were selected to represent the most sensitive or most typical views for Alternative 4E.

KOP 603 (Figure E.2-4). This KOP is the same as described for Alternative 4B above.

KOP 632 (Figure E.2-4). This KOP is the same as described for Alternative 4C above.

KOP 1368 (Figure E.2-4). This KOP is the same as described for in Alternative 4C above.

KOP 674 (Figure E.2-4). This KOP is the same as described for Alternative 4C above.

KOP 672 (Figure E.2-4). This KOP is the same as described for Alternative 4C above.

Alternative 4F

Alternative 4F would cross approximately 45 miles of BLM-administered land, including 16.4 miles managed with VRM Class II objectives in Wyoming (Kemmerer FO) and 10.5 miles managed with VRM Class III objectives (18.8 miles in Wyoming and 1.7 miles in Idaho). Alternative 4F crosses 3.5 miles of state land in Wyoming and 35.7 miles of private lands in Wyoming and Idaho (30.9 miles of private land in Wyoming and 4.8 miles of private land in eastern Idaho).

The following 11 KOP locations were selected to represent the most sensitive or most typical views for Alternative 4F. The first 5 KOPs exhibit both cultural and visual resource concerns and are described in the Section 3.3 – Cultural Resources.

KOP C6 (Figure 3.2-2). Views from this point are from the Opal Wagon Road.

KOP C5 (Figure 3.2-2). Views from this point are from the Opal Wagon Road.

KOP C11 (Figure 3.2-2). Views from this point are from the Oregon NHT.

KOP C110 (Figure 3.2-2). Views from this point are from the White Hill Historic Monument on the Oregon NHT.

KOP C10 (Figure E.2-4). Views from this point are from a trail marker at the Dempsey Hockaday Cutoff along the Oregon NHT.

KOP 604 (Figure E.2-4). This KOP is the same as described for Alternative 4A above.

KOP 647 (Figure E.2-4). This KOP is the same as described for Alternative 4A above.

KOP 636 (Figure E.2-4/Appendix G, Figure K-5a). KOP 636, located on Dempsey Ridge, has sweeping views of the Dempsey Basin, Rock Creek Ridge, and Coke Mountain. This area is located in an open panoramic landscape with superior views of undulating terrain, background pyramidal mountainous silhouettes, and contrasting vegetation that exhibits diversity in form, line, color, and texture. There are few human-made features and simple geometric patterns in this open landscape. This landscape is considered to have moderate to high scenic quality. The lack of human-made disturbance as well as a variety in the basic landscape elements (i.e., form, line, color, and texture) increases the scenic quality.

KOP 621 (Figure E.2-4). KOP 621, located at a trailhead immediately east of Highway 233 near the north end of Lake Viva Naughton, represents the views of hikers on Trail 81. This trail provides an off-highway vehicle (OHV) route around the lake and onto Dempsey Ridge. This trail is also used as a snowmobile trail in the winter. The view is generally to the south toward Segment 4, which is located at the boundary of middleground and background distance zones about 5 miles away. This enclosed view, framed by terrain, is considered to have moderate scenic quality. Views of water and topographic variation increases the scenic quality, while the presence of skylined transmission lines in the background detracts from the scenic quality.

KOP 637 (Figure E.2-4). KOP 637 is located near the summit of Coke Mountain, along an existing road running along the top of Dempsey Ridge. This road, providing access for recreational users, including hunters, offers panoramic views west toward Rock Creek Ridge, east toward Wilkinson Creek, and southeast to the Pink Hill. Other than fencing and some roads, there are few human-made alterations noticeable in this landscape. The scenic quality is generally high due to unobstructed panoramic views of dramatic mountainous terrain.

KOP 635 (Figure E.2-4). This KOP is the same as described for the Proposed Route above.

Segment 5 – Populus to Borah

Segment 5 would cross approximately 13.2 miles of BLM-administered land, including 1.6 miles managed with VRM Class II objectives and 3.9 miles managed with VRM Class III objectives (Pocatello FO).

Proposed Route

The Proposed Route would cross 3.5 miles of Idaho state lands including less than 0.1 mile of Idaho Department of Game and Fish (IDFG) designated lands and 37.8 miles of private land. For photos of the Rockland and Arbon Valleys, refer to Appendix E (Figure E.2-34). The following seven KOP locations were selected to represent the most sensitive or most typical views for Segment 5 of the Proposed Route.

KOP C25 (Figure E.2-6). The view from this point is from a portion of the Oregon NHT and is described in the Section 3.3 – Cultural Resources.

KOP 907 (Figure E.2-6/Appendix G, Figure M-1/M-3a). This KOP is located at a scenic lookout in the Deep Creek Mountains, approximately 1,000 feet from KOP 920 (a trailhead on BLM-administered land). The open view to the north includes bold and prominent mountains, valleys, and a variety of vegetation with numerous focal points. The scene is filled with complex landscape elements of form, line, color, and texture. No human alteration is apparent beyond the dirt roads and trails in the view. Scenic quality is high for KOP 907.

KOP 185 (Figure E.2-6). This KOP represents a south view of the Segments 5 and 7 Proposed Routes, from the Arbon Elementary School. This KOP is located south of Pauline on the Arbon Valley Highway. Although an elementary school is often considered a high-sensitivity viewing location, the views to the south from the buildings and playground area are generally heavily screened by trees planted along the southern edge of the school property. Views from the edge of the property, beyond the screening, exhibit open panoramic views of the Arbon Valley between the Deep Creek Mountains to the west and the Bannock Range to the east. The few structures in the view include a pair of residences and an electrical distribution line, which detract from the scenic quality. Generally this KOP exhibits a low overall scenic quality due to numerous human-made alterations and lack of visually appealing elements.

KOP 242 (Figure E.2-6). This KOP represents an eastern view of the Segments 5 and 7 Proposed Routes and Alternative 5D, through the East Fork Canyon. A campground and a sportsmen access to East Fork Rock Creek represent the dominant viewing locations. Views into the canyon in this area, while limited by the topography, provide a dynamic mix of form, line, color, and texture of landscape in both landform and vegetation cover. There are limited human-made modifications in this area, including signs and fencing, resulting in moderate scenic quality.

KOP 1302 (Figure E.2-6). KOP 1302 represents residential viewers on Mayer Road looking north toward American Falls and the American Falls Reservoir. Views of the broad, open terrain, while altered by agricultural production and other human-made modifications, provide a mix of form, line, and color with the dominant background view of American Falls Reservoir. The human-made modifications present in this area include agriculture, road/highways, and numerous high-voltage transmission lines, which detract from the overall moderate scenic quality.

KOP 1304 (Figure E.2-6). KOP 1304 represents residential viewers in the Riverbend Estates looking southeast toward Bannock Peak and White Quartz Mountain. Views of the mountainous terrain, while limited by some human-made modifications, provide a

dynamic mix of form, line, and texture of landform. The human-made modifications present in this area include signs, road and highways, and fencing. These modifications do not detract from the overall moderate to high scenic quality.

KOP 260 (Figure E.2-6). This KOP is located adjacent to the recreation area, park, and boat dock associated with a pipeline on the Snake River, approximately 2.5 miles southwest of American Falls. The views to the west include variations in form, line, and color, as well as features such as the curvilinear shape of the Snake River and the large gas pipeline crossing the river. About 1.5 miles to the northwest, a large substation with numerous transmission lines detracts from the scenic quality. Scenic quality is moderate due to the dominant nature of the industrial features which detract from the scenic Snake River in the foreground.

Alternative 5A

Alternative 5A would arc south of Segment 5 close to Hawkins Reservoir in the Arbon Valley and cross the Deep Creek Mountains south of existing BLM-administered land managed to conform to VRM Class II objectives. Alternative 5A rejoins the Proposed Route in the Rockland Valley east of the town of Rockland. Alternative 5A would cross approximately 10.1 miles of BLM-administered land, including 6.2 miles managed with VRM Class III objectives (Pocatello FO). Alternative 5A would also cross 0.3 mile of Idaho state lands, and 23.4 miles of private land. The following four KOP locations were selected to represent the most sensitive or most typical views for Alternative 5A of the Project.

KOP 305 (Figure E.2-6). This KOP is located adjacent to the Hawkins Reservoir, an existing BLM recreation site. The views to the south include variations in form, line, and color, as well as features such as Rattlesnake Peak in the Caribou-Targhee NF. To the south, a gravel road marks the only noticeable human-made modification of the landscape. The view to the north is dominated by multiple transmission lines approximately 1,000 feet from the KOP which detract from the scenic quality. Scenic quality is considered moderate due to the dominant nature of the transmission lines located immediately to the north.

KOP 903 (Figure E.2-6). This KOP is located at a church along Church Road. The views to the north extend to mountains in the distant background and are enclosed on the east and west by mountains in the middleground. Foreground views include agricultural fields offering little vegetation or landform variety. Few human-made modifications are noticeable. Few scattered residences, fences, and agricultural fields detract from the scenic quality. Scenic quality is considered moderate due to the influence of the mountains and their varied textures, colors, and forms in an otherwise generally flat agricultural valley.

KOP 920 (Figure E.2-6). This KOP is located at a trail head on BLM-administered land in the Deep Creek Mountains. The enclosed view to the south includes bold and prominent mountains, valleys, and a variety of vegetation. The scene is filled with complex landscape elements of form, line, and color. No human alteration is apparent beyond the dirt roads and trails in the view. Scenic quality is high for KOP 920.

KOP 242 (Figure E.2-6). This KOP is the same as described for the Segment 5 Proposed Route above.

Alternative 5B

Alternative 5B would be located farther south than Alternative 5A at Dairy Creek and travel north of the Curlew National Grasslands before turning east at the town of Roy and rejoining Alternative 5A west of the Deep Creek Mountains in the Rockland Valley. Alternative 5B would cross approximately 10.3 miles of BLM-administered land, including 3.9 miles managed with VRM Class III objectives (Pocatello FO). Alternative 5B would also cross 0.3 mile of Idaho state lands and 33.8 miles of private land. The following five KOP locations were selected to represent the most sensitive or most typical views for Alternative 5B of the Proposed Route.

KOP 305 (Figure E.2-6). This KOP is the same as described for Alternative 5A above.

KOP 912 (Figure E.2-6). This KOP is located at a locked gate along Daniels Road, approximately 0.75 mile north of Dairy Creek Road. A residence is located approximately 0.3 mile north of this location in an agricultural setting. Views to the north are semi-panoramic with some limitations in viewing distance provided by the low hills in the middle to background. The foreground presents rolling terrain with a mix of vegetation from grass fields to trees and agricultural lands. Human-made features of this landscape include a residence, agricultural buildings, and fences which detract from the scenic quality. Scenic quality is considered moderate.

KOP 916 (Figure E.2-6). This KOP is adjacent to a residence on 10800 West Road north of Little Malad Spring. Views to the north are focal with numerous mountain silhouettes and complex form, line, color, and texture variations. The immediate foreground is predominantly flat with some rolling agricultural fields and scattered residences, agricultural out buildings, and electrical distribution lines, detracting from the scenic quality. Overall scenic quality is considered moderate to high in this setting.

KOP 898 (Figure E.2-6). This KOP is adjacent to a residence on the Arbon Highway west of Mount Elkhorn. Views to the north are broad and focal with numerous mountain silhouettes to the south end of the Deep Creek Mountains with complex form, line, color, and texture variations. The immediate foreground is predominantly flat, with some rolling agricultural fields and scattered residences and agricultural outbuildings. These features detract from the scenic quality. Overall scenic quality is considered moderate to high in this setting.

KOP 887 (Figure E.2-6). This KOP is adjacent to a residence on Groom Road. Views to the east are short and enclosed by mountains with complex form, line, and color variations. The immediate foreground is predominantly flat with some rolling agricultural fields and scattered residences, agricultural outbuildings, and electrical distribution lines, detracting from the scenic quality. Overall scenic quality is considered moderately high in this setting.

Alternative 5C

Alternative 5C would deviate from the Segment 5 Proposed Route north of Bradley Mountain and the Caribou-Targhee NF and travel northwest across the Fort Hall Indian Reservation. Alternative 5C rejoins the Proposed Route south of American Falls, which travels west and terminates at the Borah Substation. Alternative 5C would cross approximately 0.7 mile of Idaho state land, 13.0 miles of private land, and approximately 12.4 miles of the Fort Hall Indian Reservation (federal land held in trust for the Tribe by the BIA). The majority of this alternative would parallel numerous existing high-voltage transmission lines. The following seven KOP locations were selected to represent the most sensitive or most typical views for Alternative 5C of the Project.

KOP 1298 (Figure E.2-6). KOP 1298 represents the views of a residence within the Fort Hall Indian Reservation on the Arbon Valley Highway viewing north. Views to the north are semi-panoramic and focal with dramatic mountainous terrain in the middle to background. The foreground presents a broad open valley with grass fields, natural riparian vegetation and larger dominant trees. The visible human-made features of this landscape include the residences, fences, and numerous high-voltage transmission structures which clutter the view and detract from the scenic quality. The scenic quality of this view is considered moderate.

KOP 1308 (Figure E.2-6). KOP 1308 represents the views of two residences within the Fort Hall Indian Reservation on the Arbon Valley Highway viewing southwest. Views to the south and southwest are semi-panoramic with dramatic mountainous terrain in the middle to background offering diversity in form, line, and texture. The foreground presents a broad open valley with grass fields, natural riparian vegetation, and larger dominant trees. The visible human-made features of this landscape include the residences, fences, and numerous high-voltage transmission structures that clutter the view, detracting from the scenic quality. The scenic quality of this focal view is considered moderate to high.

KOP 1309 (Figure E.2-6). KOP 1309 represents the southwest views of three residences within the Fort Hall Indian Reservation on the Arbon Valley Highway. This KOP is approximately 1.8 miles north of KOP 1308. Views to the south and southwest are semi-panoramic with dramatic and rolling mountainous terrain in the middle to background offering diversity in form, line, and texture. The foreground presents a broad open valley with a mix of vegetation including grass fields, natural riparian vegetation, and larger dominant trees. The visible human-made features of this landscape include the residences, fences, and numerous high-voltage transmission structures that clutter the view and skyline the dramatic terrain in the middleground, detracting from the scenic quality. The scenic quality of this focal view is considered moderate.

KOP 1311 (Figure E.2-6). KOP 1311 represents the views from Moonshine Road, which leads to a sacred sundance location within the Fort Hall Indian Reservation. Views to the northeast toward Study Spring and Flatiron Hill are somewhat panoramic, though partially screened, with mountainous silhouettes in the foreground, middleground, and background.

The foreground presents partially screened rolling hills with natural vegetation and clusters of larger vegetation which offer variety in form, line, color, and texture. The visible human-made features of this landscape include distant high-voltage transmission structures which detract from the scenic quality. The scenic quality of this focal view is considered moderate.

KOP 1313 (Figure E.2-6). KOP 1313 represents the views from the existing transmission line access road at a traditional use area within the Fort Hall Indian Reservation. The traditional use area is a known location where tribal members harvest Chokecherry and is located at the western boundary of the reservation grounds. Views to the west and northwest are partially screened by the rolling terrain in the foreground and middleground. The foreground and middleground presents rolling hills with natural grassland vegetation, distant agricultural land, and clusters of larger vegetation which offer variety in form, line, color, and texture. The visible human-made features of this landscape include the dominant high-voltage transmission structures overhead, detracting from the scenic quality. The scenic quality of this focal view is considered low to moderate.

KOP 1314 (Figure E.2-6). KOP 1314 represents the views of a residence on Sunbeam Road directly west of the Fort Hall Indian Reservation. Views to the north are semi-panoramic with some limitations in viewing distance, provided by the low hills in the middle to background. The foreground presents rolling terrain with a mix of vegetation from grass fields and natural riparian vegetation to agricultural lands. The visible human-made features of this landscape include two residences, agricultural buildings, and fences, detracting from the scenic quality. The scenic quality of this focal view is considered moderate.

KOP 1299 (Figure E.2-6). KOP 1299 represents the views from a sacred sundance location within the Fort Hall Indian Reservation, south of I-86 viewing southwest. Views to the south are panoramic with mountainous silhouettes in the middle to background. The foreground presents a broad open valley dominated by agricultural development. The visible human-made features of this landscape include residences, agricultural equipment, and numerous high-voltage transmission structures, detracting from the scenic quality. The scenic quality of this focal view towards Alternative 5C is considered moderate.

Alternative 5D

Alternative 5D would diverge from the Proposed Route east of Rockland and travel north through the Rockland Valley paralleling the alignment of the Proposed Route to the west. South of American Falls, Alternative 5D would turn northwest, crossing I-84 and the Snake River before terminating at the Borah Substation. Alternative 5D would cross approximately 0.8 mile of Idaho state land and 16.4 miles of private land. The following five KOP locations were selected to represent the most sensitive or most typical views for Alternative 5D of the Project.

KOP 242 (Figure E.2-6). This KOP is the same as described for the Segment 5 Proposed Route above.

KOP 241 (Figure E.2-6). This KOP, like KOP 242, is located in the East Fork Rock Creek area. This view is toward a low hillside immediately to the south that may partially or totally screen Segment 5, which would be approximately 900 feet south. Views in this area provide some variation in form, line, color, and texture of landscape in both landform and vegetation cover. Limited human-made modifications are present in this area and include signs and fencing, which somewhat detract from the scenic quality. Overall scenic quality is considered moderate.

KOP 257 (Figure E.2-6). This KOP represents southeastern views from a residence on Windmill Road in the Rockland Valley toward Howard Mountain and Cold Creek Canyon. The views from this area are generally open with mountain ranges framing each side of the valley. Scenic quality is considered to be moderate to high due to scenic landscape elements and a variety of form, line, color, and texture.

KOP 263 (Figure E.2-6). This KOP represents views from the Snake River Vista, a recreational area on the north side of the Snake River southwest of American Falls. The views from this area are generally open with some vegetation screening views of the river. Rural elements of American Falls are discernable to the northeast, and electrical transmission lines are noticeable in this view to the north and northeast, slightly detracting from the scenic quality. Scenic quality is considered to be moderate to high due to scenic landscape along the Snake River and the Snake River itself.

KOP 260 (Figure E.2-6). This KOP is located adjacent to the recreation area, park, and boat dock associated with a pipeline on the Snake River (approximately 2.5 miles southwest of American Falls). The views to the west include variations in form, line, and color as well as features such as the curvilinear shape of the Snake River and the large gas pipeline crossing the river. About 1.5 miles to the northwest, a large substation, with numerous transmission lines ,detract from the scenic quality. Scenic quality is moderate due to the dominant nature of the industrial features that detract from the scenic Snake River in the foreground.

Alternative 5E

Alternative 5E would diverge from the Proposed Route south of American Falls at point 5m and parallel the existing transmission lines to the west across I-86 and the Snake River before terminating at the Borah Substation. Alternative 5E would cross mostly private land (approximately 5.0 miles) south of American Falls. The following KOP location was selected to represent the most sensitive or most typical view for Alternative 5E of the Project.

KOP 1302 (Figure E.2-6). KOP 1302 represents residential viewers on Mayer Road looking north toward American Falls and the American Falls Reservoir. Views of the broad, open terrain, while altered by agricultural production and other human-made modifications, provide a mix of form, line, and color with the dominant background view of American Falls Reservoir. The human-made modifications present in this area include agriculture, roads and highways, and numerous high-voltage transmission lines. which all detract from the overall moderate scenic quality.

Segment 6 – Borah to Midpoint

The Proposed Action under the Proposed Route is an increase in voltage carried by structures and conductors of an existing transmission line. The use of an existing transmission line would not produce noticeable changes to the existing visual conditions and thus no KOPs were required for the analysis.

Segment 7 – Populus to Cedar Hill

Segment 7 would cross approximately 28.1 miles of BLM-administered land, including 1.4 miles managed with VRM Class II objectives (Pocatello FO) and 6.4 miles managed with VRM Class III objectives (Pocatello FO and Twin Falls FO).

Proposed Route

The Proposed Route would cross 4.3 miles of Idaho state lands as well as 85.7 miles of private land. The following 13 KOP locations were selected to represent the most sensitive and typical views for Segment 7.

KOP C25 (Figure E.2-8). Views from this point are from the "Parting of the Ways" site along the Oregon NHT. This viewpoint is discussed in Section 3.3 – Cultural Resources.

KOP C63 (Figure E.2-8). Views from this point are from the "Parting of the Ways" site along the Oregon NHT. This viewpoint is discussed in Section 3.3 – Cultural Resources.

KOP 305 (Figure E.2-8). This KOP is the same as described for Alternative 5A above.

KOP 185 (Figure E.2-8). This KOP is the same as described for the Segment 5 Proposed Route above.

KOP 907 (Figure E.2-8/Appendix G, Figure M-1/M-3c). This KOP is located at a scenic lookout in the Deep Creek Mountains approximately 1,000 feet from KOP 920(a trailhead on BLM-administered land). The open view to the north includes bold and prominent mountains, valleys, and a variety of vegetation with numerous focal points. The scene is filled with complex landscape elements of form, line, color, and texture. No human alteration is apparent beyond the dirt roads and trails in the view. Scenic quality is high for KOP 907.

KOP 247 (Figure E.2-8). This KOP, on East Shoshone Street in the town of Rockland, represents the view from residences at an LDS Church looking south toward Molly's Nipple and the Sublette Mountains. Views are open and panoramic across an area of largely agricultural land and beyond to the mountainous terrain and silhouettes. The foreground views offer little variation in landform or vegetation; however, middleground and background views include the dominant hills offering more visual diversity. Overall scenic quality is moderate in this landscape.

KOP 301 (Figure E.2-8). This KOP, on 950 Road East, represents the view from a residence west of East Hills on private land looking southeast along Segment 7. Views are open and panoramic across an area of largely agricultural land with hills in the

background. The foreground views offer little variation in landform or vegetation; however, middleground views include the dominant hills offering more visual diversity. Overall scenic quality is low to moderate in this landscape.

KOP 303 (Figure E.2-8). This KOP, at 500 Water Canyon Road, represents a southern view from a residence south of Water Canyon. Views are focal, meaning they have landscape features which either create a focal point or frame a certain view, and are screened by the dominant hills in the foreground and middleground. The foreground views offer little variation in landform from an inferior (low-elevation) vantage point. Overall scenic quality is low to moderate in this landscape.

KOP 310(Figure E.2-8). This KOP represents views from residences in the mountainous landscape located north of Pine Knob. Views are partially screened and inferior (low-elevation). In the foreground, most structures are residential though agricultural settings can be seen further west. Overall scenic quality is low. Human-made modifications within the view and the lack of diverse form, line, color, and texture detract from the scenic quality.

KOP 315 (Figure E.2-8). This KOP was taken from a residence on East 700 South Road. Open and panoramic views of the surrounding agricultural fields offer little visual variety but the rugged mountains in the background offer some landscape contrast and variety. Views are considered to be of moderate scenic quality due to the presence of electric utilities and other human-made modifications in the foreground and middleground that detract from the scenic quality.

KOP 131 (Figure E.2-8). This KOP represents views from residences in a largely flat agricultural landscape organized into square blocks by largely north-south and east-west roads. Views are open and panoramic. In the foreground, agricultural lands limit landform and vegetation variety, while structural elements include electrical distribution lines, residences, elevated irrigation equipment, and agricultural “out structures” such as sheds or storage buildings. The middleground and background views include the mountains, which provide more dynamic visual elements. Low scenic quality is due to the amount of visible human-made modification which detracts from the scenic quality.

KOP 140 (Figure E.2-8). This KOP is an area cooperatively managed by BLM and the Idaho Fish and Game Department located just south of Big Cottonwood Creek and 1 mile east of the Cassia County line designated as VRM Class III. Views are generally open and panoramic and include the Sawtooth NF to the south in the middleground and to the east in the background. Foreground views include a stockyard/feedlot operation and agricultural fields offering little vegetation or landform variety. Overall scenic quality is considered low. The limited variety in vegetation or topography as well as the adjacent stockyard buildings and activities detract from the scenic quality.

KOP 221 (Figure E.2-8). This KOP includes a residence and agricultural operations east of the Cedar Hill Substation. The views to the south are open and panoramic with distant mountains creating a backdrop to the flat to rolling valley terrain. Irrigational farming equipment is visible along with dispersed residences, fences, and agriculture-related structures. Vegetation adds some limited variation in color and texture with strong lines created between differing crops. The resultant scenic quality is considered

moderate due to mountainous terrain and visible human-made alterations, which detract from the scenic quality.

Alternative 7A

Alternative 7A would arc southwest of Segment 7 close to Hawkins Reservoir in the Arbon Valley and cross the Deep Creek Mountains south of existing BLM-administered land managed to conform to VRM Class III objectives before rejoining the Proposed Route north of Cedar Ridge. Alternative 7A would cross 5.9 miles of BLM-administered land with VRM Class III objectives and 30.7 miles of private land. The following five KOP locations were selected to represent the most sensitive or most typical views for Alternative 7A of the Project.

KOP 305 (Figure E.2-8). This KOP is the same as described for Alternative 5A.

KOP 903 (Figure E.2-8). This KOP is the same as described for Alternative 5A.

KOP 920 (Figure E.2-8). This KOP is the same as described for Alternative 5A.

KOP 887 (Figure E.2-8). This KOP is the same as described for Alternative 5B.

KOP 917 (Figure E.2-8). This KOP represents views from recreational users at a seasonal recreational vehicle (RV) camping area adjacent to Smith Canyon. Views are open and panoramic with numerous mountain silhouettes and rugged landforms visible in the middleground. Moderate to high scenic quality is due to the presence of some visible human-made modifications that do not necessarily detract from the variety in form, line, color, or texture.

Alternative 7B

Alternative 7B would arc farther south than Alternative 7A at Dairy Creek and travel north of the Curlew National Grasslands and the town of Buist before crossing the foothills of the Deep Creek Mountains. The route turns northeast of the town of Roy to rejoin Alternative 7A west of the Deep Creek Mountains in the Rockland Valley. Alternative 7B would cross approximately 3.8 miles of BLM-administered land with VRM Class III objectives and 38.7 miles of private lands. The following six KOP locations were selected to represent the most sensitive or most typical views for Alternative 7B of the Project.

KOP 305 (Figure E.2-8). This KOP is the same as described for Alternative 5A.

KOP 912 (Figure E.2-8). This KOP is the same as described for Alternative 5B.

KOP 916 (Figure E.2-8). This KOP is the same as described for Alternative 5B.

KOP 898 (Figure E.2-8). This KOP is the same as described for Alternative 5B.

KOP 917 (Figure E.2-8). This KOP is the same as described for Alternative 5B.

KOP 893 (Figure E.2-8). Views from this KOP represent those of residents north of Buck Peak in the Rockland Valley. Panoramic and focal views of rolling to rugged terrain in the middleground and background offer some landscape contrast in terms of

form, line, color, and texture. Views are considered to be of moderate to high scenic quality. Human-made features in the foreground and middleground detract from the overall scenic quality.

Alternative 7C

Alternative 7C would diverge from the Segment 7 Proposed Route at Heglar Canyon and cross the Raft River to the south before rejoining the Proposed Route close to where it crosses I-84. Alternative 7C would cross approximately 7.2 miles of BLM-administered land with VRM Class IV objectives as well as 1.0 mile of Idaho state land and 12.0 miles of private lands. The following KOP location was selected to represent the most sensitive and typical views for Alternative 7C.

KOP 282 (Figure E.2-8). This KOP represents views from residences in a largely flat agricultural landscape along North Yale Road. Views are open and panoramic with limited landform and vegetation variety. Structural elements present on the landscape include fencing, electric distribution lines, and cellular communication towers, which are visible in the foreground and middleground. Low to moderate scenic quality is due to the amount of visible human-made modifications and the lack of variety in form, line, color, or texture, detracting from the scenic quality.

Alternative 7D

Alternative 7D would diverge from the Segment 7 Proposed Route after crossing I-84 and rejoin the Proposed Route east of the town of Declo. Alternative 7D would cross less than 0.1 mile of BLM-administered land with VRM Class IV objectives as well as 1.0 mile of Idaho state land and 5.7 miles of private lands. The following KOP location was selected to represent the most sensitive and typical views for Alternative 7D.

KOP 296 (Figure E.2-8). Views from this KOP represent those of residents and drivers traveling along Skaggs Ranch Road. Open panoramic views of the relatively flat valley, currently used for agriculture, and more rugged distant hills in the middleground and background offer some landscape contrast in terms of form, line, and color. Views are considered to be of moderate scenic quality. Human-made features and landscape alterations detract from the scenic quality in the foreground and middleground.

Alternative 7E

Alternative 7E would be one of the potential variations in the area of the Albion Mountains south of the town of Springdale. Alternative 7E would cross approximately 0.3 mile of BLM-administered land with VRM Class II objectives, 1.6 miles of BLM-administered land with VRM Class IV objectives, and 2.6 miles of private lands. The following two KOP locations were selected to represent the most sensitive and typical views for Alternative 7E.

KOP 304 (Figure E.2-8). This KOP is the same as described for Alternative 7F.

KOP 311 (Figure E.2-8). This KOP includes a residential area located along the foothills of the Albion Mountains. The views to the southwest are open and framed on one side by the mountains, creating a partially backdropped view with the contrasting

flat rolling valley terrain. Irrigational farming equipment is visible along with dispersed residences, fences, and agriculture-related structures. Vegetation adds some limited variation in color and texture with strong lines created between differing crops and irrigated land. The resultant scenic quality considered low to moderate. Mountainous terrain and visible human-made alterations detract from the scenic quality.

Alternative 7F

Alternative 7F would be one of the potential variations in the area of the Albion Mountains south of the town of Springdale. Alternative 7F would cross approximately 4.4 miles of BLM-administered land with VRM Class IV objectives and 6.4 miles of private lands. The following KOP location was selected to represent the most sensitive and typical views for Alternative 7F.

KOP 304 (Figure E.2-8). Views from this KOP represent the views of recreational drivers along SR 77 on lands managed by the BLM to meet VRM Class II objectives. Alternative 7E would be visible in a gap to the east but may not be fully visible. Views are considered to be of moderate scenic quality in the foreground and middleground. Open and panoramic views of the surrounding mottled and rolling terrain offer little visual variety; however, there are a few visible human-made modifications detracting from the scenic quality.

Alternative 7G

Alternative 7G would deviate from the Segment 7 Proposed Route directly west of the Cedar Hill Substation and travel north of the Proposed Route to avoid sensitive BLM-administered lands. Alternative 7G would cross approximately 1.8 miles of BLM-administered land with VRM class III objectives as well as 1.4 miles of private land. The following KOP location was selected to represent the most sensitive and typical views for Alternative 7G.

KOP 221 (Figure E.2-8). This KOP is the same as described for the Segment 7 Proposed Route.

Alternative 7H

Alternative 7H would deviate from the Segment 7 Proposed Route east of Bradley Mountain and travel southeast along Alternative 7B, diverging from Alternative 7B north of Buist, Idaho. The alternative would travel west across the Sawtooth NF and Raft River Valley before crossing the Albion Mountains and rejoining the Proposed Route east of the Cedar hill Substation. Alternative 7H would cross approximately 1.0 mile of BLM-administered land with VRM Class II objectives and 13.3 miles of BLM-administered land with VRM Class III objectives. The alternative would cross 64.5 miles of private land, 4.7 miles of Idaho state land, and 0.3 mile of IDFG-administered lands.

Alternative 7H would cross two divisions of the Sawtooth NF—the Sublett and Albion Divisions—for a total distance of 11.4 miles. The roads associated with this alternative would cross the northwestern edge of the Black Pine Division. This alternative would cross 7.2 miles of NFS lands allocated to MA 6.1, Restoration and Maintenance Emphasis within Shrubland and Grassland Landscapes; 2.7 miles of land allocated to

MA 4.2, Roaded Recreation Emphasis; and 1.5 miles allocated to MA 5.1, Restoration and Maintenance Emphasis within Forested Landscapes. Alternative 7H would cross 2.9 miles of NFS lands managed with Partial Retention VQOs, which would be more restrictive and require management activities to remain visually subordinate to the characteristic landscape. Alternative 7H would cross 5.5 miles of NFS lands managed with Modification VQOs, which allows management activities to visually dominate the original characteristic landscape. Approximately 2.9 miles of Alternative 7H would cross NFS lands managed with Maximum Modification VQOs. This would allow management activities of vegetative and landform alterations to dominate the characteristic landscape and be out of scale or contain detail that is incongruent with natural occurrences as seen in foreground or middleground. Siting opportunities in the Albion Division are limited due to Alternative 7H being located within a canyon access area bordered on the north and south by Inventoried Roadless Areas (IRAs), Mount Harrison and Cache Peak (see Figure 3.2-3). The ROS for this area is listed as Roaded Natural (RN), except for 0.2 mile of the route in the westernmost portion of its crossing of the Albion Division, which is listed as Semi-Primitive Motorized (SPM).

The following 28 KOP locations were selected to represent the most sensitive and typical views for Alternative 7H. Figure 3.2-3 shows an area of Sawtooth NF in more detail.

KOP 305 (Figure E.2-8). This KOP is the same as described for Alternative 5A.

KOP 912 (Figure E.2-8). This KOP is the same as described for Alternative 7B.

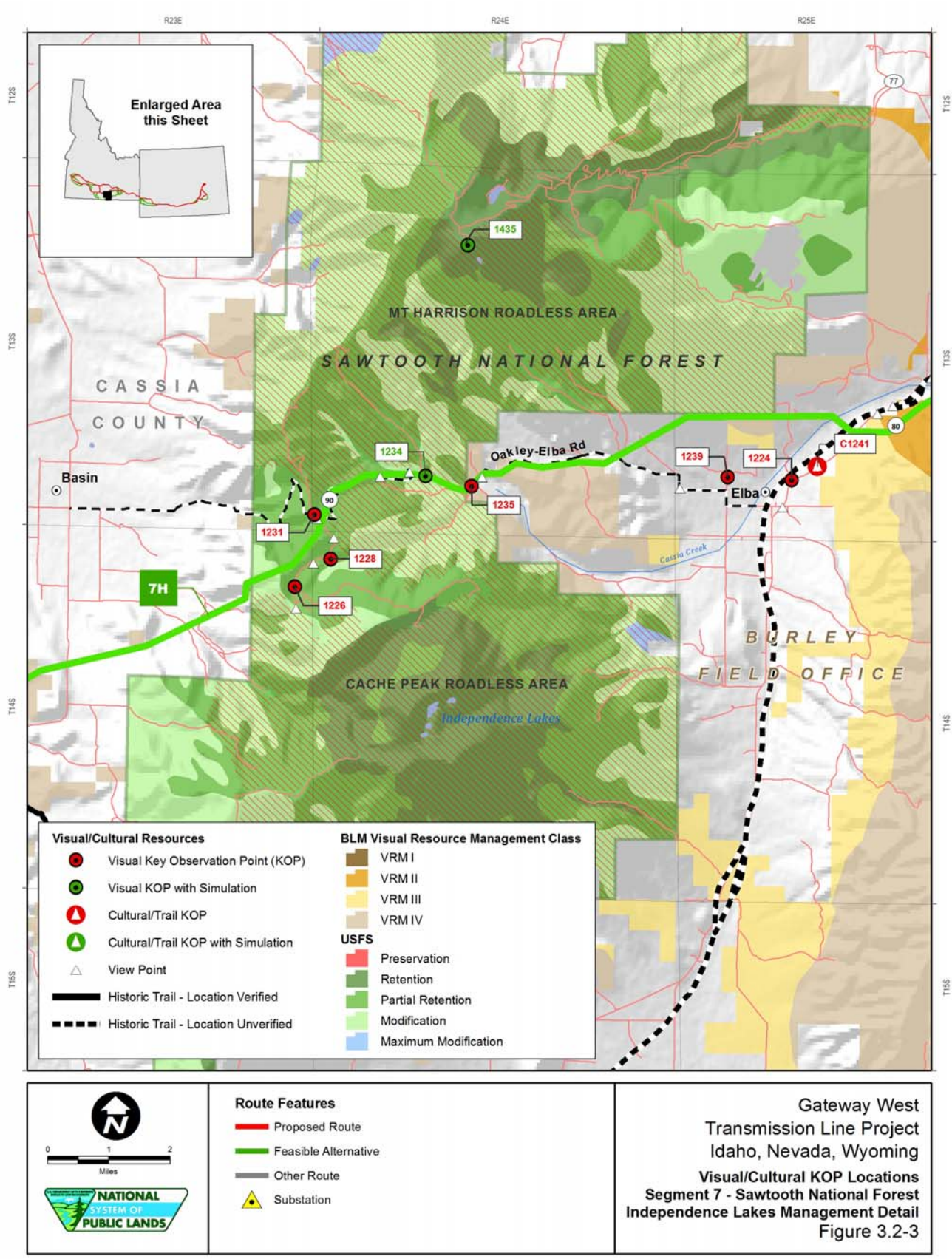
KOP 916 (Figure E.2-8). This KOP is the same as described for Alternative 7B.

KOP 898 (Figure E.2-8). This KOP is the same as described for Alternative 7B.

KOP 1282 (Figure E.2-8). Views from KOP 1282 represent the views of a residence and farm on Bull Canyon Road looking north toward the Deep Creek Mountains. Open, panoramic, and focal views of the rolling to rugged terrain are considered to have high scenic quality. Numerous aesthetic landscape elements present in the middleground and background views with variations of form, line, color, and texture increase the scenic quality.

KOP 1278 (Figure E.2-8). Views from KOP 1278 represent the views of a residence on the Rockland Highway looking north toward Buck Peak. Open, panoramic views of the rolling to rugged terrain are considered to have moderate scenic quality. The aesthetic landscape elements present in the middleground and background increases the scenic quality, while numerous human-made alterations detract from the scenic quality.

KOP 1273 (Figure E.2-8). Views from KOP 1273 represent the views of recreational users looking south on Heydlauff Canyon Road in the Sawtooth NF. Open, panoramic views of the rolling to rugged terrain are considered to have high scenic quality due to the numerous aesthetic landscape elements present in the middleground and background with variations of form, line, color, and texture. The view is considered a natural characteristic landscape with a landscape variety class A, or distinctive.


R23E
R24E
R25E
T12S
T13S
T14S
T15S
Enlarged Area this Sheet
1435
MT HARRISON ROADLESS AREA
SAWTOOTH NATIONAL FOREST
CASSIA COUNTY
Basin
1234
Oakley-Elba Rd
1239
1224
C1241
Elba
1235
1231
1228
1226
7H
Cassia Creek
BURLEY FIELD OFFICE
CACHE PEAK ROADLESS AREA
Independence Lakes
Visual/Cultural Resources
Visual Key Observation Point (KOP)
Visual KOP with Simulation
Cultural/Trail KOP
Cultural/Trail KOP with Simulation
View Point
Historic Trail - Location Verified
Historic Trail - Location Unverified
BLM Visual Resource Management Class
VRM I
VRM II
VRM III
VRM IV
USFS
Preservation
Retention
Partial Retention
Modification
Maximum Modification
Route Features
Proposed Route
Feasible Alternative
Other Route
Substation
0 1 2
Miles
NATIONAL SYSTEM OF PUBLIC LANDS
Gateway West
Transmission Line Project
Idaho, Nevada, Wyoming
Visual/Cultural KOP Locations
Segment 7 - Sawtooth National Forest
Independence Lakes Management Detail
Figure 3.2-3

Viewers traveling on this roadway would have a level 2 (average) sensitivity to changes in the characteristic landscape.

KOP 1270 (Figure E.2-8). Views from KOP 1270 represent the views of recreational users on the Hudspeth Cutoff portion of the Oregon NHT in the Sawtooth NF looking southeast in Kossman Canyon. The view is considered a natural characteristic landscape with a landscape variety class of A, or distinctive. Viewers traveling on this roadway would have a level 1 (highest) sensitivity to changes in the characteristic landscape. Enclosed and focal views of the rolling to rugged terrain are considered to have moderate to high scenic quality due to the aesthetic landscape elements present in the middleground and background with few human-made alterations.

KOP 1267 (Figure E.2-8). Views from KOP 1267 represent the views of recreational users entering the Sawtooth NF looking east across the Cold Spring Canyon area. The view is considered a natural characteristic landscape with a landscape variety class of B, or common, when compared to views in the surrounding region. Viewers traveling on this roadway would have a level 2 (average) sensitivity to changes in the characteristic landscape. Enclosed and focal views of the rolling to rugged terrain are considered to have moderate to high scenic quality due to the aesthetic landscape elements present in the middleground and background with few human-made alterations.

KOP 1207 (Figure E.2-8). Views from KOP 1207 represent the views from a resident on Clover Lane looking north across the vast Sun Valley toward North and South Chapin Mountains. Open panoramic views of the flat to rolling terrain with mountainous silhouettes are considered to have low to moderate scenic quality. Few aesthetic landscape elements in the middleground and background and monotonous visible human-made alterations (i.e., planted agricultural fields) detract from the scenic quality.

KOP 1252 (Figure E.2-8). Views from KOP 1252 represent the views of a resident on Cottle Lane looking south toward Red Rock Mountain and Red Rock Spring. Open, panoramic views of the rolling to rugged terrain with mountainous silhouettes are considered to have moderate to high scenic quality due to the aesthetic landscape elements in the middleground and background with few visible human-made alterations.

KOP 1255 (Figure E.2-8). Views from KOP 1255 represent the views of recreational visitors of the Raft River Valley Trails Marker looking south toward Red Rock Mountain. Open, panoramic views of the rolling to rugged terrain with mountainous silhouettes are considered to have moderate scenic quality. The aesthetic landscape elements in the middleground and background and numerous visible human-made alterations detract from the scenic quality.

KOP 1246 (Figure E.2-8). Views from KOP 1246 represent the views of two residences adjacent to the Elba-Almo Road (City of Rocks Back Country Byway) directly south of Conner, Idaho, looking south toward Red Rock Mountain. Focal views of the rolling to rugged terrain with mountainous silhouettes and rocky valleys are considered to have moderate scenic quality. The aesthetic landscape elements in the middleground and background and numerous visible human-made alterations detract from the scenic quality.

KOP 1241 (Figure E.2-8). Views from KOP 1241 represent the views of recreational travelers on Elba-Almo Road (City of Rocks Back Country Byway) at a crossing of the historic California NHT looking north across the Elba Basin to Kemp Hollow. Open panoramic views of the rolling to rugged terrain with mountainous silhouettes and rocky outcroppings are considered to have moderate to high scenic quality. The aesthetic landscape elements in the middleground and background views and few visible human-made alterations increase the scenic quality.

KOP 1224 (Figure E.2-8). Views from KOP 1224 represent the views from a resident on Anderson Lane looking north across the Elba Basin to Kemp Hollow. Open panoramic views of the rolling to rugged terrain with mountainous silhouettes are considered to have moderate to high scenic quality due to the aesthetic landscape elements in the middleground and background views and few visible human-made alterations.

KOP 1239 (Figure E.2-8). Views from KOP 1239 represent the views from a residence on 1125 East in Elba, Idaho, looking north towards Rocky Hollow. Open, panoramic views of the rolling to rugged terrain with rocky outcrops are considered to have moderate to high scenic quality due to the aesthetic landscape elements in the middleground and background views as well as numerous human-made alterations which detract from the scenic quality.

KOP 1235 (Figure E.2-8). Views from KOP 1235 represent the views from a recreational hiker at the marked Stinson Trail in the Sawtooth NF looking northeast towards Clyde Flat. The view is considered a natural characteristic landscape with a landscape variety class of A, or distinctive, when compared to views in the surrounding region. Viewers traveling on this roadway would have a level 1 (highest) sensitivity to changes in the characteristic landscape. Focal and partially screened views of the rolling to rugged terrain with mountainous silhouettes are considered to have moderate scenic quality. While much of the terrain is screened, aesthetic landscape elements in the middleground and background increase scenic quality. .

KOP 1234 (Figure E.2-8). Views from KOP 1234 represent the views from a recreational hiker at the marked New Canyon Trail in the Sawtooth NF looking east towards Clyde Flat. The view is considered a natural characteristic landscape with a landscape variety class of A, or distinctive, when compared to views in the surrounding region. Viewers traveling on this roadway would have a level 1 (highest) sensitivity to changes in the characteristic landscape. Open panoramic views of the rolling to rugged terrain with mountainous silhouettes and snow-capped peaks are considered to have high scenic quality. Numerous aesthetic landscape elements in the middleground and background and few visible human-made alterations increase the scenic quality.

KOP 1435 (Figure E.2-8). Views from KOP 1435 represent the views of recreationalists at the Mt. Harrison Lookout Tower looking south toward Mount Independence. Open, expansive, and superior (high-elevation) views of the broad valley with rolling to rugged terrain and pyramidal mountainous silhouettes are considered to have high scenic quality. Numerous aesthetic landscape elements

present in the middleground and background with variations of form, line, color, and texture increase the scenic quality.

KOP 1231 (Figure E.2-8). Views from KOP 1231 represent the views from a recreational hiker at the marked Skyline trailhead (#513) in the Sawtooth NF looking southeast towards Mount Independence and Cache Peak. The view is considered a natural characteristic landscape with a landscape variety class of A, or distinctive, when compared to views in the surrounding region. Viewers traveling on this roadway would have a level 1 (highest) sensitivity to changes in the characteristic landscape. Open panoramic views of the rolling to rugged terrain with mountainous silhouettes and snow-capped peaks are considered to have high scenic quality. Numerous aesthetic landscape elements in the middleground and background views and few visible human-made alterations increase the scenic quality.

KOP 1228 (Figure E.2-8). Views north toward Myers Canyon from KOP 1228 represent the views of recreational hikers at the Stinson Creek trailhead in the Sawtooth N F. The view is considered a natural characteristic landscape with a landscape variety class of A, or distinctive, when compared to views in the surrounding region. Viewers traveling on this roadway would have a level 1 (highest) sensitivity to changes in the characteristic landscape. Open panoramic views of the rolling to rugged terrain with mountainous silhouettes have a moderate to high scenic quality. Aesthetic landscape elements in the middleground and background and few visible human-made alterations increase the scenic quality.

KOP 1226 (Figure E.2-8). Views from KOP 1226 represent the views from a recreational hiker at a marked trailhead in the Sawtooth NF looking north towards Myers Canyon. The view is considered a natural characteristic landscape with a landscape variety class of A, or distinctive, when compared to views in the surrounding region. Viewers traveling on this roadway would have a level 1 (highest) sensitivity to changes in the characteristic landscape. Open panoramic views of the rolling to rugged terrain with mountainous silhouettes are considered to have moderate to high scenic quality. Aesthetic landscape elements in the middleground and background and few visible human-made alterations increase the scenic quality.

KOP 1184 (Figure E.2-8). Views from KOP 1184 represent the views of a residential area on 2400 South Road looking north toward Oakley, Idaho. Open panoramic and partially screened views of the rolling terrain are considered to have low to moderate scenic quality due to the few aesthetic landscape elements in the middleground and background views with few visible human-made alterations.

KOP 1180 (Figure E.2-8). Views from KOP 1180 represent the views of a resident on 2200 South Road looking south toward Walker Hallow and the Lower Goose Creek Reservoir. Open panoramic and partially screened views of the rolling to rugged terrain are considered to have moderate to high scenic quality due to the aesthetic landscape elements in the middleground and background with few visible human-made alterations.

KOP 1175 (Figure E.2-8). Views from KOP 1175 represent the views of a resident on Mullen Ranch Road looking south toward Cowboy Spring and the Lower Goose Creek Reservoir. Open panoramic views of the rolling to rugged terrain are impacted by

numerous human-made alterations associated with heavy agricultural uses and cattle operations around Oakley. Views from this KOP have moderate scenic quality.

KOP 1173 (Figure E.2-8). Views from KOP 1173 represent the views of recreational users in Cedar Canyon, which is managed by the BLM to conform to VRM Class III objectives. Motorists traveling northeast along Little Cedar Canyon Road have panoramic views of the flat to rugged terrain that has been impacted by numerous human-made alterations associated with heavy agricultural uses and industrial uses around Oakley. Views from this KOP have moderate scenic quality.

KOP 1171 (Figure E.2-8). From KOP 1171, residents at Warm Creek Ranch have views south toward the rugged terrain of Cedar Canyon. Open panoramic views of the flat to rugged terrain are impacted by numerous human-made alterations associated with heavy agricultural uses, resulting in a moderate scenic quality.

KOP 221 (Figure E.2-8). This KOP is the same as described for the Segment 7 Proposed Route.

Alternative 7I

Alternative 7I would deviate from the Segment 7 Proposed Route east of Bradley Mountain and travel southeast along the Alternative 7B route, diverging from it north of Buist, Idaho. The alternative would travel west across the Sawtooth NF and Raft River Valley following the Alternative 7H route before diverging farther to the south, east of the Jim Sage Mountains. The Route Alternative would travel south of the City of Rocks National Reserve along the Nevada state line before turning northwest toward Amsterdam, Idaho, where it would follow an existing transmission alignment and WWE corridor to the Cedar Hill Substation from the west.

Alternative Route 7I would cross approximately 0.6 mile of BLM-administered land with VRM Class II objectives (Burley FO) and 24.1 miles of BLM-administered land with VRM Class III objectives (Burley and Pocatello FO) as well as 65.3 miles of private land in the states of Idaho and Nevada.

Alternative 7I would also cross 8 miles of Idaho state land. The portion of the alignment in Wells, Nevada, crosses land with both VRM Class II objectives (0.3 mile) and Class III objectives (8.4 miles) managed by the Wells FO of the Elko District.

Alternative 7I would cross two divisions of the Sawtooth NF—the Sublett and Cassia Divisions—for a total distance of 27.7 miles. Roads associated with this alternative would cross the northwestern edge of the Black Pine Division. Alternatives 7H, 7I, and 7J would share the same alignment where they cross the Sublett Division and pass within 0.5 mile of the Black Pine Division. Alternative 7I would cross 25 miles of NFS lands allocated to MA 6.1, Restoration and Maintenance Emphasis within Shrubland and Grassland Landscapes, and 2.7 miles allocated to MA 4.2, Roaded Recreation Emphasis.

Most of the NFS land that would be crossed by Alternative 7I is managed to conform to Maximum Modification VQO (17.6 miles), which allows management activities of vegetative and landform alterations to dominate the characteristic landscape and be out

of scale or contain detail that is incongruent with natural occurrences as seen in foreground or middleground. Two other portions of the alternative would cross Modification VQO (9.2 miles), which allows management activities to visually dominate the original characteristic landscape. Partial Retention VQO-Moderate SIO (0.8 mile) would be more restrictive and require management activities to remain visually subordinate to the characteristic landscape.

Although Alternative 7I would be south of the City of Rocks National Reserve, the NPS must consider boundary changes and other methods to protect important resources, such as historic viewsheds and high potential trail sites and segments along the California NHT. Specific KOPs regarding this area of visual concern, where there is a heightened awareness to visual change, have been provided in the KOP description below (see Figure 3.2-4).

The following 25 KOP locations were selected to represent the most sensitive and typical views for Alternative 7I.

KOP 305 (Figure E.2-8). This KOP is the same as described for Alternative 5A.

KOP 912 (Figure E.2-8). This KOP is the same as described for Alternative 7B.

KOP 916 (Figure E.2-8). This KOP is the same as described for Alternative 7B.

KOP 898 (Figure E.2-8). This KOP is the same as described for Alternative 7B.

KOP 1282 (Figure E.2-8). This KOP is the same as described for Alternative 7H.

KOP 1278 (Figure E.2-8). This KOP is the same as described for Alternative 7H.

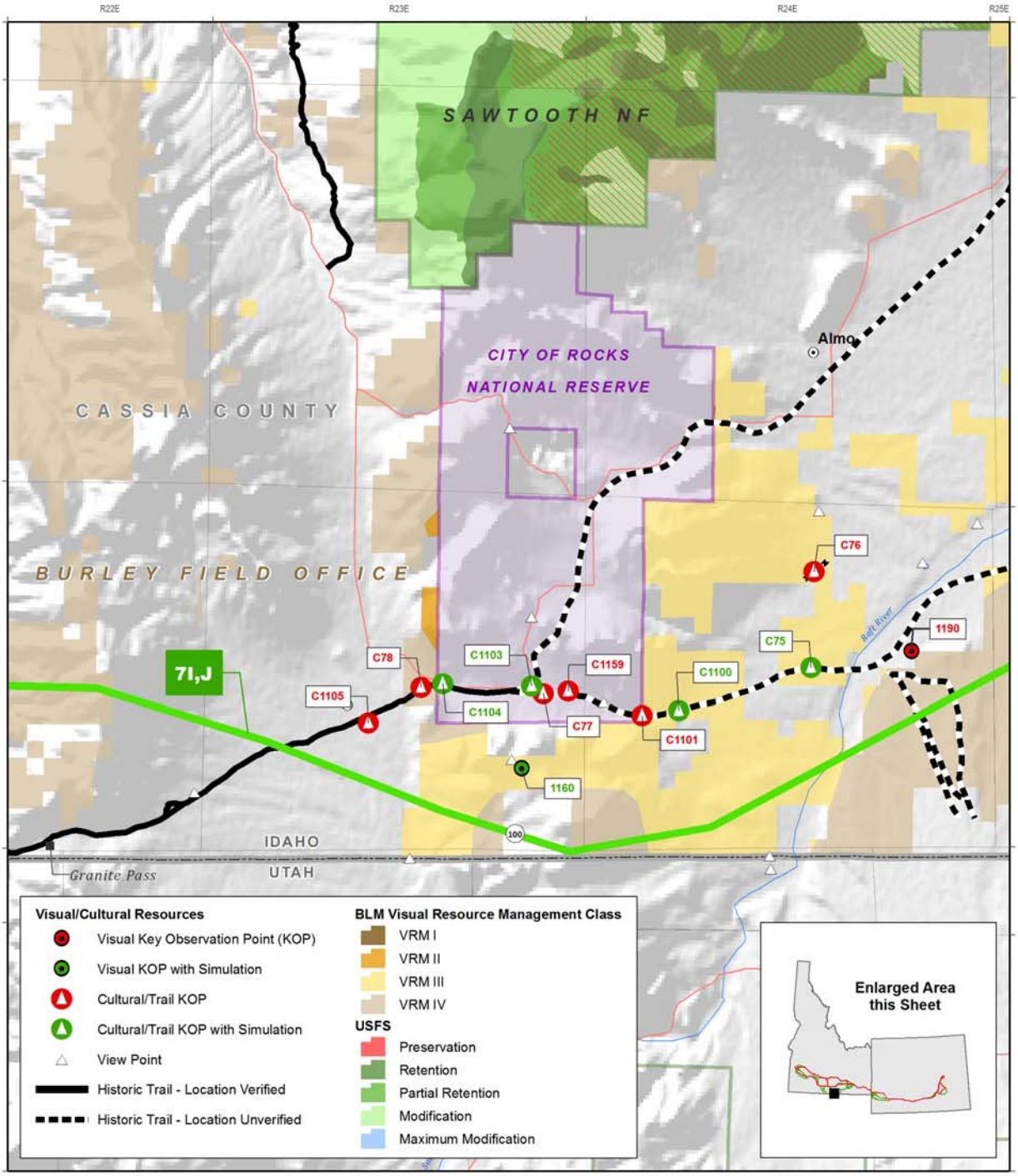
KOP 1273 (Figure E.2-8). This KOP is the same as described for Alternative 7H.

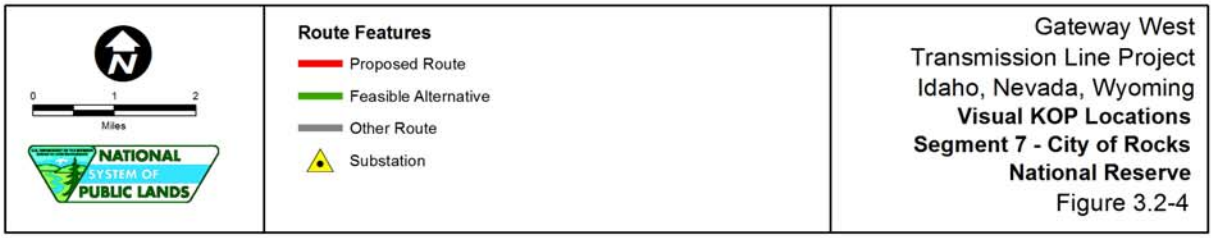
KOP 1270 (Figure E.2-8). This KOP is the same as described for Alternative 7H.

KOP 1267 (Figure E.2-8). This KOP is the same as described for Alternative 7H.

KOP 1079 (Figure E.2-8/Appendix G, Figure ST-3a). Views from KOP 1079 represent the views of recreational users of the Sawtooth NF driving along Hoppers Gulch Road looking west toward the rolling terrain of Flatiron Butte, adjacent to the Sawtooth NF. The view is considered a natural characteristic landscape with a landscape variety class of B, or common, when compared to views in the surrounding region. Viewers traveling on this roadway would have a level 2 (average) sensitivity to changes in the characteristic landscape due to the distance from campgrounds and viewpoints. Open panoramic views of the rolling terrain are considered to have moderate scenic quality. due to the lack of unique aesthetic landscape elements in the middleground and background with few human-made alterations.

KOP 1081 (Figure E.2-8/Appendix G, Figure ST-3c). Views from KOP 1081 represent the views of recreational users of the Sawtooth NF driving along Hoppers Gulch Road looking southwest toward the rolling terrain adjacent to Hopper Gulch Spring in the Sawtooth NF. The view is considered a natural characteristic landscape with a landscape variety class of B, or common, when compared to views in the


R22E
R23E
R24E
R25E
T14S
T15S
T16S
T15N
T14N
SAWTOOTH NF
CITY OF ROCKS
NATIONAL RESERVE
Almo
CASSIA COUNTY
BURLEY FIELD OFFICE
7I,J
C76
C75
1190
C78
C1103
C1159
C1100
C1105
C1104
C77
C1101
1160
Raft River
100
IDAHO
UTAH
Granite Pass
Visual/Cultural Resources
Visual Key Observation Point (KOP)
Visual KOP with Simulation
Cultural/Trail KOP
Cultural/Trail KOP with Simulation
View Point
Historic Trail - Location Verified
Historic Trail - Location Unverified
BLM Visual Resource Management Class
VRM I
VRM II
VRM III
VRM IV
USFS
Preservation
Retention
Partial Retention
Modification
Maximum Modification
Enlarged Area
this Sheet


0
1
2
Miles
NATIONAL
SYSTEM OF
PUBLIC LANDS
Route Features
Proposed Route
Feasible Alternative
Other Route
Substation
Gateway West
Transmission Line Project
Idaho, Nevada, Wyoming
Visual KOP Locations
Segment 7 - City of Rocks
National Reserve
Figure 3.2-4

surrounding region. Viewers traveling on this roadway would have a level 2 (average) sensitivity to changes in the characteristic landscape due to the distance from campgrounds and viewpoints. Open panoramic views of the rolling terrain are considered to have moderate scenic quality due to the lack of unique aesthetic landscape elements in the middleground and background views as well as few human-made alterations.

KOP 1204 (Figure E.2-8). Views from KOP 1204 represent the views of residences adjacent to Clover Lane looking southeast across Sandrock Canyon toward the rugged terrain of the Black Pine Range. Open panoramic views of the rolling to rugged terrain are considered to have moderate to high scenic quality. Numerous alterations associated with agricultural detract from the scenic quality.

KOP 1190 (Figure E.2-8). Views from KOP 1190 represent the views of residences at Reed Springs looking southeast toward the rugged terrain of George Peak in the Sawtooth NF and Dry Hallow. Open panoramic views of the rolling to rugged terrain are considered to have moderate to high scenic quality. Numerous alterations associated with intensive agricultural activity detract from the scenic quality.

KOP 1097 (Figure E.2-8). Views from KOP 1097 represent the views of recreational users on a marked portion of the California NHT on Lynn Road. This KOP is adjacent to Reed Springs and looks south toward the rugged terrain of Mahogany Peak and the Nut Pine Hills. Focal views of the rolling to rugged terrain are considered to have moderate to high scenic quality. Aesthetic landscape elements in the middleground and background and few human-made alterations increase the scenic quality.

KOP 1101 (Figure E.2-8). Views from KOP 1101 represent the views of recreational users at the boundary of the Reserve and State Park traveling on City of Rocks Road in Emigrant Canyon. The eastern view focuses on the rolling to rugged terrain of Round Mountain and the snaking Raft River Canyon. Open panoramic views of the rolling to rugged terrain are considered to have moderate to high scenic quality. Aesthetic landscape elements in the middleground and background add to the scenic quality, while human-made alterations associated with agricultural uses detract from the scenic quality.

KOP 1159 (Figure E.2-8). Views from KOP 1159 represent the views of recreational users on the City of Rocks Road, east of the Twin Sisters interpretive site in the Reserve and State Park. The south-facing views focus on the rolling terrain of the area adjacent to Sparks Spring. Partially screened views of the undulating and rocky terrain are considered to have moderate scenic quality. Aesthetic landscape elements in the middleground and background increase the scenic quality, while a few human-made alterations, associated with park uses, slightly detract from the overall scenic quality.

KOP 1103 (Figure E.2-8). Views from KOP 1103 represent the views of recreational users at the Twin Sisters interpretive site in the Reserve and State Park at the intersection of the City of Rocks Road. The south-facing views focus on the rolling terrain of the area adjacent to Sparks Spring. Partially screened views of the undulating terrain are considered to have moderate scenic quality. Aesthetic landscape elements

in the background increase the scenic quality, while human-made alterations associated with park interpretive uses detract from the scenic quality.

KOP 1160 (Figure E.2-8). Views from KOP 1160 represent the views of recreational users within the Reserve and State Park looking south toward the rugged bold terrain of the area adjacent to Sparks Spring. Partially screened views of the rugged terrain are considered to have high scenic quality. Numerous aesthetic landscape elements in the foreground, middleground, and background, along with few human-made alterations associated with park uses, increase the scenic quality.

KOP 1104 (Figure E.2-8). Views from KOP 1104 represent the views of recreational users at the Junction Valley entrance to the City of Rocks Natural Reserve. The southwest view is focused toward the rugged bold terrain of Twin Peaks and the Junction Valley. Open superior (high elevation) views of the rugged terrain are considered to have moderate to high scenic quality. Numerous aesthetic landscape elements in the foreground, middleground, and background increase the scenic quality, while visible human-made alterations, such as the visible powerline, detract from the scenic quality.

KOP 1105 (Figure E.2-8). Views from KOP 1105 represent the views of recreational users on the California National Historic Trail west of the City of Rocks and adjacent to a historic homesite and school. The southwest view is focused toward the rugged and prominent terrain around Worthington Spring. Open panoramic and somewhat focal views of the rugged terrain are considered to have moderate scenic quality. Aesthetic landscape elements in the middleground and background increase the scenic quality, while visible human-made alterations, such as the visible powerline in the foreground, detract from the scenic quality.

KOP 1091 (Figure E.2-8). Views from KOP 1091 represent the views of residences at a ranch along Lower Goose Creek looking north toward the rugged terrain surrounding Blue Hill. Focal views of the rugged terrain are considered to have moderate to high scenic quality. Aesthetic landscape elements in the middleground and background increase the scenic quality, while human-made alterations associated with ranching uses, slightly detract from the scenic quality.

KOP 1086 (Figure E.2-8). Views from KOP 1086 represent the views of recreational users adjacent to the Sawtooth NF driving along Shoshone Basin Road and looking east toward the rolling to rugged terrain of Timber Butte and Monument Peak in the Sawtooth NF. The view is considered a natural characteristic landscape with a landscape variety class of B, or common, when compared to views in the surrounding region. Viewers traveling on this roadway would have a level 2 (average) sensitivity to changes in the characteristic landscape due to distance from the Sawtooth NF. Open panoramic views of the rolling to rugged terrain are considered to have moderate to high scenic quality. Aesthetic landscape elements in the middleground and background increase the scenic quality, while human-made alterations associated with grazing land uses, detract from the scenic quality.

KOP 1078 (Figure E.2-8). Views from KOP 1078 represent the views of recreational users adjacent to the Sawtooth NF driving along Magic Mountain Road. The northeast

view is focused toward the rolling to rugged terrain of Black Mountain and Bald Hill in the Sawtooth NF. The view is considered a natural characteristic landscape with a landscape variety class of A, or distinctive, when compared to views in the surrounding region. Viewers traveling on this roadway would have a level 1 (highest) sensitivity to changes in the characteristic landscape adjacent to the Sawtooth NF. Open panoramic views of the rolling to rugged terrain are considered to have moderate to high scenic quality. Aesthetic landscape elements in the middleground and background increase the scenic quality, while human-made alterations associated with Forest Service uses, slightly detract from the scenic quality.

KOP 1052 (Figure E.2-8). Views from KOP 1052 represent the views of adjacent residences along North 2475 East Road looking east toward the rolling to rugged terrain of Sugarloaf Mountain in the Sawtooth NF. Open panoramic views of the rolling to rugged terrain are considered to have low to moderate scenic quality. Aesthetic landscape elements in the middleground and background increase the scenic quality, while human-made alterations associated with adjacent agricultural uses, detract from the scenic quality.

KOP 1047 (Figure E.2-8). Views from KOP 1047 represent the views of adjacent recreational users at Nat-Soo-Pah Warm Springs looking east toward the rolling terrain of foothills adjacent to Sugarloaf Mountain and Squaw Joe Canyon. Partially screened views of the rolling to rugged terrain are considered to have low scenic quality. Few aesthetic landscape elements in the middleground and background along with human-made alterations associated with the warm springs partially block the view and detract from the scenic quality.

Alternative 7J

Alternative 7J would incorporate all of Alternative 7I from the Populus Substation to point 7r.3, where Alternative 7J would replace the remainder of Alternative 7I. At MP 137.2, Alternative 7J would turn west then northwest for approximately 16.6 miles across Shoshone Basin. Local landowners proposed that the Cedar Hill Substation be moved to this junction, a move of about 24 miles southwest from its current proposed location at point 9; Twin Falls County sent a letter supporting this proposal (Twin Falls County 2010). From point 13, Alternative 7J would branch in two directions: one line would continue northwest for approximately 8 miles, then turn north within a WWE corridor to meet Proposed Segment 9 at point 9a.6. The second line would proceed for approximately 10 miles back to the WWE corridor at point 9a.1, continuing to the east along the Alternative 7I alignment, into the current location of the proposed Cedar Hill Substation.

Alternative 7J would cross approximately 0.6 mile of BLM-administered land with VRM Class II objectives (Burley FO) and 25.2 miles of BLM-administered land with VRM Class III objectives (Burley and Pocatello FO) as well as 92.3 miles of private land in the states of Idaho and Nevada.

Alternative 7J would also cross 8.9 miles of Idaho state land. The first portion of the alignment would be shared with Alternative 7I, crossing the same portion of VRM Class

II objectives (0.3 mile) and Class III objectives (8.4 miles) in Nevada, managed by the Wells FO of the Elko District.

The portion of NFS land crossed by Alternative 7J and not by 7I is managed to conform to Maximum Modification VQO (0.1 mile), which allows management activities of vegetative and landform alterations to dominate the characteristic landscape and be out of scale or contain detail that is incongruent with natural occurrences as seen in foreground or middleground. Approximately 13 miles of portion of the route that Alternative 7J shares with Alternative 7I would cross the Sawtooth NF. Of these, 6.8 miles would cross NFS land managed to conform to Maximum Modification VQO, and 6.2 miles would cross NFS land managed to conform to Modification VQO.

Alternative 7J shares the same portion of the Alternative 7I alignment south of the City of Rocks National Reserve. Specific KOPs regarding this area of visual concern, where there is a heightened awareness to visual change, have been provided in the KOP description for Alternative 7I.

The following 23 KOP locations were selected to represent the most sensitive and typical views for Alternative 7J.

KOP 305 (Figure E.2-8). This KOP is the same as described for Alternative 5A.

KOP 912 (Figure E.2-8). This KOP is the same as described for Alternative 7B.

KOP 916 (Figure E.2-8). This KOP is the same as described for Alternative 7B.

KOP 898 (Figure E.2-8). This KOP is the same as described for Alternative 7B.

KOP 1282 (Figure E.2-8). This KOP is the same as described for Alternative 7H.

KOP 1278 (Figure E.2-8). This KOP is the same as described for Alternative 7H.

KOP 1273 (Figure E.2-8). This KOP is the same as described for Alternative 7H.

KOP 1270 (Figure E.2-8). This KOP is the same as described for Alternative 7H.

KOP 1267 (Figure E.2-8). This KOP is the same as described for Alternative 7H.

KOP 1204 (Figure E.2-8). This KOP is the same as described for Alternative 7I.

KOP 1190 (Figure E.2-8). This KOP is the same as described for Alternative 7I.

KOP 1097 (Figure E.2-8). This KOP is the same as described for Alternative 7I

KOP 1101 (Figure E.2-8). This KOP is the same as described for Alternative 7I.

KOP 1159 (Figure E.2-8). This KOP is the same as described for Alternative 7I.

KOP 1103 (Figure E.2-8). This KOP is the same as described for Alternative 7I.

KOP 1160 (Figure E.2-8). This KOP is the same as described for Alternative 7I.

KOP 1104 (Figure E.2-8). This KOP is the same as described for Alternative 7I.

KOP 1105 (Figure E.2-8). This KOP is the same as described for Alternative 7I.

KOP 1091 (Figure E.2-8). This KOP is the same as described for Alternative 7I.

KOP 1086 (Figure E.2-8). This KOP is the same as described for Alternative 7I.

KOP 1410 (Figure E.2-8). Views from KOP 1410 represent the views of adjacent residences on Three Creek Road west of Rogerson looking northeast toward the rolling terrain of foothills adjacent to the Deep Creek Reservoir and South Hills of the Sawtooth NF. Open, panoramic views of the undulating terrain are considered to have low scenic quality. Few aesthetic landscape elements in the middleground and background, along with numerous human-made alterations associated with agricultural land use, detract from the scenic quality.

KOP 1401 (Figure E.2-8). Views from KOP 1401 represent the views of adjacent recreational users at the Salmon Falls Dam west of Rogerson looking northeast across the jagged and focal terrain of Salmon Falls Canyon. Focal views of the canyon with contrasting undulating terrain across the top of the plain are considered to have moderate to high scenic quality. Diverse aesthetic landscape elements of form, line, and texture in the foreground and middleground increase the scenic quality, while human-made alterations associated with the dam and picnic/camping area detract from the scenic quality.

KOP 1409 (Figure E.2-8). Views from KOP 1409 represent the views of adjacent residences on 2700 East south of the Nat Soo Pah Hotsprings approximately 2.0 miles west of the NF boundary. The south-facing view is focused toward the undulating terrain of North Cottonwood Ridge in the NF. Open, panoramic views of the undulating terrain with numerous vertical man-made elements are considered to have low to moderate scenic quality due to the scenic aesthetic landscape elements in the foreground and middleground views. Numerous human-made alterations associated with the high-voltage transmission lines and smaller distribution lines that alter the natural appearing landscape detract from the scenic quality.

Segment 8 – Midpoint to Hemingway

Proposed Route

The Segment 8 Proposed Route would cross approximately 3.2 miles of BLM-administered land with VRM Class I objectives (Four Rivers FO), 12.3 miles of BLM-administered land with VRM Class II objectives (Shoshone FO), and 40.3 miles of BLM-administered land with VRM Class III objectives (Four Rivers FO, Shoshone FO). The route would also cross 9.3 miles of Idaho state lands and 33.4 miles of private land.

The following 14 KOPs were identified to represent the most sensitive or most typical views for Segment 8 of the Project. The first 3 KOPs have cultural as well as visual resource concerns and are described in Section 3.3 – Cultural Resources and summarized in Table 3.3-5.

KOP C100 (Figure E.2-9). Views from this point are the from Canyon Creek Stage Station historic site.

KOP C101 (Figure E.2-9, Simulation Figure E.2-24). Views from this point from the Pioneer Reservoir on the Oregon NHT.

KOP C102 (Figure E.2-9). Views from this point are from the Rattlesnake Station historic site on the Oregon NHT.

KOP 561 (Figure E.2-9/Figure BOP-3a in Appendix G-1). From this KOP, located at a BLM trailhead directly adjacent to Marsing Murphy Road, there are views toward an existing residences and the Striker Basin. The view is open with variation in topography from the foreground to the horizon. Scenic views in the Striker Basin of Guffey Butte and the surrounding mountainous terrain are important to sensitive viewers such as hikers at the BLM trailhead and the adjacent residences in the view. The pristine mountain views exhibit diversity in form, line, color, and texture. The views include residences and other structures, which detract from the scenic quality; however, the overall scenic quality is considered moderate to high.

KOP 1222 (Figure E.2-9). Views from KOP 1222 represent the views of two residences looking south across both agricultural and natural re-growth lands surrounding Jerome, Idaho. Open panoramic views of the broad, rolling terrain are considered to have low scenic quality. Few aesthetic landscape elements in the middleground and background and numerous dominant human-made alterations detract from the scenic quality.

KOP 356 (Figure E.2-9). From this KOP, located approximately 3 miles south of Gooding on State Highway 46, there are views toward an existing electrical transmission line. The view is open with little variation in topography from the foreground to the horizon. The landscape includes relatively homogenous sagebrush and agricultural areas. The views include electrical distribution lines, residences, and other structures, which detract from the scenic quality. The overall scenic quality is considered low.

KOP 353 (Figure E.2-9). This KOP, which represents travelers along U.S. Route 26, is located approximately 3.5 miles east of I-84 on U.S. Route 26, just south of a railroad. An electrical transmission line is present in this view, along with dispersed residences, fences, and agriculture-related structures, which detract from the scenic quality. Topography in this view is flat to gently rolling and extends from the foreground to the horizon. Vegetation adds some limited variation in color and texture, but the resultant scenic quality is considered low.

KOP 1350 (Figure E.2-9/Appendix G-1, Figure J-5a). Views from this KOP represent recreational viewers along the Bennett Mountain Road looking south. Open panoramic views of this nearly horizontal landscape are considered to have low scenic quality due to the few aesthetic landscape elements and relatively homogenous sagebrush. The views include three existing electrical transmission lines and the straight paved road, which detract from scenic quality.

KOP 1208 (Figure E.2-9). Views from KOP 1208 represent the views of residences on Bennett Road looking southwest toward the broad Snake River Valley Plain. Open panoramic views of the broad, rolling terrain are considered to have low to moderate

scenic quality due to the few aesthetic landscape elements in the middleground and background. Dominant human-made alterations associated with wind energy infrastructure detract from the scenic quality.

KOP 1126 (Figure E.2-9). Views from KOP 1126 represent the views of residents and travelers on I-84 looking north toward the rolling terrain of Smith's Draw and mountainous silhouette of Lucky Peak in the background. Open panoramic views of the flat to rolling terrain in the foreground to middleground are considered to have low scenic quality due to the few scarce aesthetic landscape elements. Numerous human-made alterations within the view detract from the scenic quality.

KOP 1118 (Figure E.2-9). Views from KOP 1118 represent the views of residents traveling on Pleasant Valley Road looking directly south toward rolling terrain and mountainous silhouettes. Open panoramic views of the flat to rolling terrain are considered to have low scenic quality due to the few scarce aesthetic landscape elements. Numerous human-made alterations within the view detract from the scenic quality.

KOP 1142 (Figure E.2-9). Views from KOP 1142 represent the views of recreational hikers at Initial Point Butte looking south across the flat to rolling terrain with the mountainous silhouette of Coyote Butte in the background. Open panoramic views of the flat to rolling terrain have been impacted by subordinate human-made alterations to the landscape, which draw the attention of the casual observer and result in a moderate to high scenic quality rating.

KOP 563 (Figure E.2-9). Views from this KOP represent those of recreational drivers and hikers at Celebration Archeological Park. Open panoramic views of the surrounding mountains in the background offer some landscape contrast along with the presence of aesthetically interesting elements in the foreground, middleground, and background of the view. Overall scenic quality is considered moderate to high for this KOP.

KOP 1145 (Figure E.2-9). Views from KOP 1145 represent the views of recreational OHV users at the Hemingway Butte OHV use area, looking southwest toward rocky and angular terrain that constitutes Hemingway Butte and the surrounding area. The visible overhead transmission line in the view is approximately 0.6 mile from the KOP. Open panoramic views of the rugged terrain with heavy OHV scarring are considered to have moderate scenic quality due to the aesthetic landscape elements in the middleground and background. Human-made alterations across the landscape detract from the scenic quality.

Alternative 8A

Alternative 8A would deviate from the Proposed Route at the Midpoint Substation and travel directly west crossing I-84 and the Thousand Springs Scenic Byway, which does not have specific visual requirements at this time, and parallel an existing 138-kV line northwest across the Snake River and I-84 before rejoining the Proposed Route north of Glenn's Ferry. Alternative 8A would cross approximately 6.8 miles of BLM-administered land with VRM Class I objectives (1.0 mile in the Four Rivers FO and 5.8

miles in the Jarbidge FO) and 2.1 miles of BLM-administered land with VRM Class III objectives (Shoshone FO). The alternative would also cross 6.2 miles of Idaho state land including 0.1 mile of IDFG land at the Billingsley Creek Wildlife Management Area and 22.1 miles of private land. Alternative 8A would cross the Snake River north of the Hagerman Fossilbeds, which is discussed in Section 3.3 – Cultural Resources (see KOP C62). The following two KOPs have cultural as well as visual resource concerns and are described in the Section 3.3 – Cultural Resources and summarized in Table 3.3-5.

KOP C107 (Figure E.2-9). Views from this point are from a portion of the Oregon NHT.

KOP C108 (Figure E.2-9). Views from this point are from a portion of the Oregon NHT.

The following nine KOP locations were selected to represent the most sensitive or most typical views for Alternative 8A of the Project.

KOP 810 (Figure E.2-9/Appendix G, Figure J-4c). This KOP is located southeast of Black Mesa and represents the view of recreational viewers on the Oregon NHT. Views north toward the Snake River are open and panoramic and include a limited variation in vegetation but do exhibit topographic variation as the mesa slopes down toward the river. Numerous transmission lines are readily visible in the middleground and background. Overall scenic quality is low to moderate due to a lack of diversity in form, line, color, and texture as well as the visible human-made disturbance.

KOP 358 (Figure E.2-9). This KOP is located on the west side of U.S. Highway 93 south of Shoshone and about 1 mile southwest of the Midpoint Substation; this KOP represents residential viewers. Views are open and panoramic and include a limited variation in vegetation due to agricultural uses and minimal topographic variation. The existing transmission line is readily visible as are smaller distribution lines. To the northeast, the existing Midpoint Substation is visible, which detracts from the overall scenic quality. Overall scenic quality is low.

KOP 1220 (Figure E.2-9). Views from KOP 1220 represent the views of a residence looking north across agricultural lands approximately 0.5 mile from Alternative 8A. This KOP represents a foreground, uninterrupted view of the Project alignment. Open panoramic views of the broad, rolling terrain are considered to have low scenic quality. Few aesthetic landscape elements in the middleground and background views as well as numerous dominant human-made alterations and landscape scarring from agriculture detract from the scenic quality.

KOP 1213 (Figure E.2-9). Views from KOP 1213 represent the views from a residence adjacent to Idaho Highway 46 looking north toward Gooding and Turkey Head Butte. Viewers at this location would be approximately 1.5 miles from Alternative 8A. This KOP represents a foreground, partially screened view of the alternative route. Open panoramic views of the broad, rolling terrain are considered to have low to moderate scenic quality. Few aesthetic landscape elements in the middleground and background views as well as industrial/infrastructure human-made alterations, such as the high-voltage transmission lines in the middleground, detract from the scenic quality.

KOP 1211 (Figure E.2-9). Views from KOP 1211 represent the views from a residence on Shoe String Road looking south toward the town of Wendell and I-84. Open panoramic views of the broad, rolling terrain are considered to have low to moderate scenic quality. Few aesthetic landscape elements in the middleground and background views as well as industrial/infrastructure human-made alterations, such as the high-voltage transmission lines in the middleground, detract from the scenic quality.

KOP 791 (Figure E.2-9). Views from KOP 791 represent the views of recreational drivers along the Thousand Springs Scenic Byway north of Hagerman, Idaho, looking north toward the Lower Salmon Falls and the Devil's Washbasin along the Snake River. A framed, superior view of the rolling to rugged terrain and diverse vegetative patterns is considered to have high scenic quality due to the few visible human-made alterations, and the scenic status of the roadway.

KOP 803 (Figure E.2-9). Views from KOP 803 represent the views of recreational users of the Salmon Reserve boat launch and recreational dock on the Snake River just south of Lower Salmon Falls, looking southwest across the Snake River at a highly visible transmission line. Open panoramic and inferior views of the rolling to rough terrain and more dramatic background views are considered to have moderate to high scenic quality due to the presence of the dominant water feature in the immediate foreground. A few human-made alterations adjacent to this view detracts from the scenic quality.

KOP 783 (Figure E.2-9). Views from KOP 783 represent the views of residences on Black Mesa Road looking slightly northeast toward the flat to rolling terrain of Black Mesa and the Pasadena Valley. There are visible existing transmission lines crossing the middleground that have a high contrast with the existing viewing conditions. Open panoramic views of the rolling terrain are considered to have low to moderate scenic quality. Numerous human-made alterations to the landscape in the foreground and middleground detract from the scenic quality.

KOP 1339 (Figure E.2-9). Views from KOP 1339 represent those of recreational viewers at the Three Island Crossing State Park south of Glenns Ferry, Idaho, looking east toward Black Mesa across the Snake River. Open panoramic views of the surrounding rolling to rugged terrain and meandering water feature are considered to have moderate to high scenic quality. Human-made alterations adjacent to the view and in the background detract from the scenic quality.

Alternative 8B (8q, 8r, 8s, 8g, 8h, 8j, 8k, 8l, 8m, 8n, 8p, 11)

Alternative 8B would be one of the variations in the route near the town of Melba. Alternative 8B would cross approximately 7.4 miles of BLM-administered land with VRM Class III objectives (Four Rivers FO), 2.8 miles of Idaho state land, and 27.3 miles of private land. The following nine KOP locations were selected to represent the most sensitive and typical views for Alternative 8B.

KOP C88 (Figure E.2-9). Views from this point are from Walter's Ferry historic site. This viewpoint is discussed in Section 3.3 – Cultural Resources.

KOP 1126 (Figure E.2-9). This KOP is the same as described for the Segment 8 Proposed Route.

KOP 329 (Figure E.2-9). From this KOP located in southern Kuna, north of Indian Creek, there are views toward the south with Kuna Butte evident in the middleground at a distance of approximately 3.5 miles. This KOP, adjacent to the Kuna's athletic fields, offers a partially screened view to the south of Segment 8. A variety of structures are present in this view, including residences, cellular towers, fences, and the baseball field, which all detract from the scenic quality. Vegetation includes trees of different species, sizes, and shapes. Overall scenic quality is considered low for this KOP.

KOP 362 (Figure E.2-9). Views from this KOP represent those of recreational drivers traveling along Highway 45 and stopped at this lookout point. Framed views of the surrounding valley and mountainous terrain in the background offer some landscape contrast, but views include the presence of human-made features in the middleground, detracting from the scenic quality. Overall scenic quality is considered moderate for this KOP.

KOP 591 (Figure E.2-9). Views from this KOP represent those of travelers on the Snake River Canyon Scenic Byway (Map Rock Road) east of the Snake River. The view looking to the south includes rolling topography, water, and prominent hills in the background. From this location there would be views of a diverse variety of vegetation, ground cover, structures, and terrain. Overall scenic quality is considered moderate.

KOP 338 (Figure E.2-9). Views from this KOP represent those of residents on State Highway 78 looking northwest. Open views of the flat agricultural land with mesas and mountainous terrain in the middleground and background offer some landscape contrast. Views include the presence of numerous human-made features in the foreground and middleground, detracting from the scenic quality. Overall scenic quality is considered low to moderate for this KOP.

KOP 328 (Figure E.2-9). Views represent those of residential visitors to Wilson Cemetery looking south to southeast. Open views of the rolling hills and mountainous terrain in the background offer some landscape contrast. Views include the presence of human-made features in the foreground and middleground, which detract from the scenic quality. Overall scenic quality is considered low to moderate for this KOP.

KOP 1333 (Figure E.2-9). Views from KOP 1333 represent those of residential viewers adjacent to Kuna Butte looking south across the top of the butte. Open panoramic views of the undulating terrain are considered to have low to moderate scenic quality due to the lack of variety in form, line, color, and texture when compared to other views in the surrounding region.

KOP 1334 (Figure E.2-9). Views from KOP 1334 represent those of residential viewers on Swan Falls Road east of Kuna Butte looking south. Open panoramic views of the flat to undulating terrain are considered to have low scenic quality due to the lack of variety in form, line, color, and texture when compared to other views in the surrounding region.

Alternative 8C

Alternative 8C would be one of the variations in the route near the town of Melba (directly west). Alternative 8C would cross approximately 2.3 miles of BLM-administered land managed to conform to VRM Class III objectives and 3.9 miles of private land. The following three KOP locations were selected to represent the most sensitive or most typical view for Alternative 8C.

KOP 1126 (Figure E.2-9). This KOP is the same as described for the Segment 8 Proposed Route.

KOP 336 (Figure E.2-9). This KOP, which represents travelers on I-84, is located near Indian Creek Reservoir. The terrain is gently rolling with views of the reservoir in the middleground. The vegetation lacks variety in color and texture and is generally made up of low shrubs and grass. Noticeable structures include an existing electric transmission line and an overpass to the southeast with visible retail signs, all of which detract from the scenic quality. Overall scenic quality is considered low.

KOP 337 (Figure E.2-9) This KOP, which represents travelers stopping at the Sinclair gas station on I-84 or local residents on Mayfield Road, is located southeast of Indian Creek Reservoir. The terrain is gently rolling with views of distant mountainous silhouettes in the middleground. The vegetation is typical of the Columbia Plateau physiographic province and lacks variety in color and texture and is generally made up of low shrubs and grass. Noticeable structures include an existing high-voltage electric transmission line. Overall scenic quality is considered low.

Alternative 8D

Alternative 8D would be one of the variations in the route in the SRBOP. Alternative 8D would cross approximately 4.2 miles of private land, 2.5 miles of BLM-administered land managed to conform to VRM class III objectives, and 1.0 mile of Idaho state land. The following KOP location was selected to represent the most sensitive or most typical views for Alternative 8D.

KOP 331 (Figure E.2-9). Views from this KOP represent those of local residences traveling along South Pleasant Valley Road. Open and panoramic views of the rolling terrain in the middleground and background as well as the relatively flat agricultural land in the background offer little landscape contrast. Views are considered to be of low to moderate scenic quality. Electric utilities and high-voltage transmission lines in the middleground, as well as other human-made elements in the foreground and middleground, detract from the scenic quality.

Alternative 8E

Alternative 8E has been proposed to avoid the Halverson Bar non-motorized area in the Guffey Butte-Black Butte Archaeological District. The portion of the Proposed Route that would cross the north end of the Guffey Butte-Black Butte Archaeological District and the Snake River would be located within an area designated by the BLM as Non-Motorized (i.e., no vehicle travel allowed). Alternative 8E would avoid this Non-Motorized land designation.

Alternative 8E would leave the Proposed Route at point 8r.4 (between MPs 113 and 114), proceeding south, following an existing 138-kV transmission line for approximately 8.2 miles. The route would turn to the west-southwest, following an existing transmission line, through the Guffey Butte-Black Butte Archaeological District and crossing the Snake River south of Sinker Butte and Swan Falls. On the west side of the river, the route would turn to the northwest then west before rejoining the Proposed Route at point 8r.5. The portion of Alternative 8E located west of the Snake River would follow the same route as Alternatives 9D and 9F. Alternative 8E on the east side of the river would cross approximately 9.8 miles of BLM-administered land managed to conform to VRM class III objectives and the western alignment would cross approximately 5.9 miles of BLM-administered land managed to conform to VRM class III objectives. Alternative 8E would also cross 2.4 miles of BLM-administered land managed to conform to VRM Class II objectives, and 0.3 mile of private land.

The following KOP location was selected to represent the most sensitive or most typical views for Alternative 8E of the Project west of the Snake River.

KOP 1423 (Figure E.2-9). Views from this KOP represent those of recreational users at Celebration Park adjacent to the Snake River looking south across the river toward Guffey Butte and Con Shea Basin. Open yet focal views of the placid river and more dramatic terrain in the middleground and background offer diverse landscape contrast in form, color, texture, and line. Views are considered to be of moderate to high scenic quality. The presence of human-made changes in the foreground, which do not necessarily detract from the scenic quality, often exist harmoniously with the natural landscape.

The following two KOP locations were selected to represent the most sensitive or most typical views for Alternative 8E of the Project east of the Snake River.

KOP 1425 (Figure E.2-9). Views from this KOP represent those of recreational users at the Dedication Point Overlook on the Snake River looking south to southeast toward Big Foot Butte and the SRBOP. Open, panoramic views of the undulating terrain in the middleground and background offer little landscape contrast in form, color, texture, and line. Views are considered to be of moderate scenic quality. The presence of a few horizontal and vertical human-made changes in the foreground detract from the scenic quality of the natural landscape.

KOP 1428 (Figure E.2-9). Views from this KOP represent those of recreational drivers on the Western Heritage Historic Byway looking east toward Coyote Butte and the SRBOP. Open, panoramic views of the undulating to flat terrain in the middleground and background offer little landscape contrast in form, color, texture, and line. Views are considered to be of moderate scenic quality due to the presence of man-made changes in the middleground (transmission line), which detract from the scenic quality of the natural landscape.

Segment 9 – Cedar Hill to Hemingway

Proposed Route

The Segment 9 Proposed Route would cross 0.15 mile of BLM-administered land with VRM Class I objectives (Burley FO), 5.6 miles of BLM-administered land with VRM Class II objectives (Bruneau FO and Jarbidge FO), and 29.2 miles of BLM-administered land with VRM Class III objectives (Bruneau FO, Burley FO, Jarbidge FO, and Owyhee FO). Approximately 15.0 miles of the Proposed Route would cross the SRBOP in two locations. This route would cross an eligible Wild and Scenic River (WSR; Salmon Falls Creek). Scenery is one of the outstandingly remarkable values identified for this WSR.

Approximately 10.0 miles of the Proposed Route would be in the eastern end of the SRBOP between Bruneau Dunes State Park and the Saylor Creek Air Force Range (a military withdrawn area). Approximately 5.0 miles would be located in Owyhee County, southeast of Murphy, Idaho. Approximately 11.1 miles of the SRBOP land crossed by the Proposed Route is managed by the BLM with VRM Class III objectives. This portion of the Proposed Route would be in the designated WWE corridor. The route would also cross 4.5 miles of Idaho state lands and 28.4 miles of private land.

The following 17 KOP locations were selected to represent the most sensitive or most typical views for Segment 9.

KOP C101 (Figure E.2-10). Views from this point are from the historic Hollister School. This viewpoint is discussed in Section 3.3 – Cultural Resources.

KOP C109 (Figure E.2-10). Views from this point are from the Owyhee County Courthouse. This viewpoint is discussed in Section 3.3 – Cultural Resources.

KOP 372 (Figure E.2-10/Appendix G, Figure J-2a). Views from this KOP represent those of residences along the Snake River Plain. Open and panoramic views of the rolling hills in the middleground and background as well as relatively flat adjacent agricultural land offer some landscape contrast. Views are considered to be of moderate scenic quality due to the monotonous landscape features. This KOP is also discussed in further detail in Appendix G.

KOP 410 (Figure E.2-10). Views from this KOP represent those of recreational drivers and hikers traveling along this BLM access road. Superior (elevated) open and panoramic views of the rolling hills in the middleground and relatively flat agricultural land in the background offer some landscape contrast. Views are considered to be of moderate scenic quality. The presence of electric utilities in the middleground and other human-made elements and altered landscapes detract from the scenic quality.

KOP 452 (Figure E.2-10). Views from KOP 452 represent the views of a residence on North 3100 East Road east of Hub Butte looking southwest toward Black and Sugarloaf Mountains in the Sawtooth NF. Panoramic and focal views of the flat, rolling, and bold terrain are considered to have moderate scenic quality. The resulting scenic quality is due to the presence of human-made alterations adjacent to this view, which detracts

from the scenic quality, and the monotone vegetation as well as some distinct forms within the natural landscape elements in the background.

KOP 407 (Figure E.2-10). Views from KOP 407 represent the views of a residence on East 2900 North Road west of Hub Butte looking south toward the town of Hollister and Flatiron Mountain. Open panoramic views of the flat, rolling, and bold terrain with monotone vegetation are considered to have moderate scenic quality due to the presence of some human-made alterations adjacent to this view, detracting from the scenic quality.

KOP 1067 (Figure E.2-10). Views from this KOP represent those of recreational drivers traveling along Lily Grade Road crossing the Lower Salmon Falls Creek. Low elevation framed views of the vertical rugged terrain in the foreground and middleground offer a variety of landscape elements with form and texture. Views are considered to be of moderate to high scenic quality due to the lack of human-made elements and the seemingly unaltered landscape.

KOP 1068 (Figure E.2-10). Views from this KOP represent those of recreational drivers and local residents traveling along Lily Grade Road after crossing the Lower Salmon Falls Creek. Open panoramic views of the flat to rolling terrain in the foreground, middleground, and background offer little variety of landscape elements. Views are considered to be of low to moderate scenic quality due to the presence of human-made elements, detracting from the scenic quality.

KOP 1069 (Figure E.2-10). Views from KOP 1069 represent the views of a residence adjacent to Balanced Rock Road looking southwest toward Castleford Butte. The natural landscape elements within the view are monotone in form. Focal views of the rolling and bold terrain are considered to have moderate scenic quality due to the presence of human-made alterations adjacent to this view, detracting from the scenic quality.

KOP 387 (Figure E.2-10). Views from this KOP represent those of recreational drivers and hikers on the Centennial Trail. KOP 387 is located on BLM-administered lands managed to conform to VRM Class III objectives. Open panoramic views of rolling hills and distant mountains in the middleground and background offer some landscape contrast. However, the wind turbines that appear in the background detract from the view, resulting in a moderate to high scenic quality.

KOP 401 (Figure E.2-10). Views from this KOP represent those of recreational drivers and hikers traveling along Bruneau Dunes Road in the Bruneau Dunes State Park. Open panoramic views of the rolling sand dunes and distant mountains (ranging up to 3,000 feet in elevation) in the middleground and background offer some landscape contrast. Views are considered to be of moderate to high scenic quality due to human-made elements in the middleground around Dunes Lake, which slightly detract from the scenic quality.

KOP 599 (Figure E.2-10). Views from this KOP represent those of local residents and drivers traveling along Mud Flat Road. Open panoramic views of relatively flat landscapes to distant rolling hills in the middleground and background and relatively flat

agricultural land dominating foreground views offer little landscape contrast. Views are considered to be of low to moderate scenic quality due to the presence of electric utilities, numerous human-made features, and human-made landscape alterations in the foreground and middleground, detracting from the scenic quality.

KOP 602 (Figure E.2-10). Views from this KOP represent those of residents and attendees of a school on Mud Flat Road. Open panoramic views of distant hills and plateaus in the background and relatively flat to rolling agricultural land dominating foreground and middleground views offer little landscape contrast. Views are considered to be of low to moderate scenic quality. The presence of electric utilities, numerous human-made features, and human-made landscape alterations in the foreground and middleground detract from the scenic quality.

KOP 592 (Figure E.2-10). Views from KOP 592 represent the views of recreational drivers at the Utter Disaster Historic Site. Open panoramic views of the surrounding mountains in the background offer some landscape contrast; however, electric utilities and other human-made elements in the foreground and middleground modify the setting. Views are considered to be of low to moderate scenic quality due to human-made alterations in the foreground and middleground, detracting from the scenic quality.

KOP 566 (Figure E.2-10). Views from this KOP represent those of recreational viewers visiting the historic Our Lady Queen of Heaven Catholic Church. Open panoramic views of the surrounding agricultural lands and rolling hills in the middleground and background offer some landscape contrast but include human-made features in the foreground and middleground. Views are considered to be of moderate scenic quality due to numerous human-made alterations in the foreground and middleground, detracting from the scenic quality.

KOP 1114 (Figure E.2-10). Views from KOP 1114 represent the views of recreational OHV users at the Fossil Creek Trailhead looking southwest toward rolling to rugged terrain commonly found in the Underwood Alkaline Foothills Ecoregion of the Snake River Plain. This KOP represents a foreground to middleground, uninterrupted view of the project alignment and alternative. Open panoramic and elevated views of the rolling to rugged terrain are considered to have high scenic quality due to the numerous aesthetic landscape elements in the middleground and background views and a lack of human-made alterations.

KOP 572 (Figure E.2-10). Views from this KOP represent those of recreational hikers at the BLM Rabbit Creek Trailhead. Open panoramic views of the rolling hills in the middleground and background offer some landscape contrast. Modest human-made alterations in the foreground and middleground detract from the view and result in moderate to high scenic quality for views from this KOP.

Alternative 9A

South of Magic Valley there is one proposed Route Alternative, which is Alternative 9A. Alternative 9A is generally an 8-mile reconfiguration of the Segment 9 Proposed Route, south of Hub Butte (south of the Twin Falls Airport and the Saylor Creek Air Force

Range. Alternative 9A would cross approximately 2.1 miles of private land and 5.6 miles of BLM-administered land managed to conform to VRM Class IV objectives.

The following three KOP locations were selected to represent the most sensitive or most typical views for Alternative 9A.

KOP 454 (Figure E.2-10). Views from KOP 454 represent the views of a residence adjacent to North 2800 East Road looking south toward Alternative 9A northeast of Hollister, Idaho. Focal views of the prominent terrain are considered to have moderate scenic quality. The presence of highly visible human-made alterations adjacent to this view detracts from the scenic quality, while the natural landscape elements add a variety of form, line, color, and texture within the view, increasing the scenic quality.

KOP 414 (Figure E.2-10). Views from KOP 414 represent the views of a residence on North 3000 East Road looking south toward Alternative 9A south of Hub Butte. Open panoramic views of the flat to rolling terrain with rugged background silhouettes are considered to have moderate to high scenic quality. The presence of some small-scale human-made alterations adjacent to this view detract from the scenic quality, while the presence of natural landscape elements with distinguishable form, line, color, and texture adds variety within the view.

KOP 440 (Figure E.2-10). Views from KOP 440 represent the views of a residence on North 2800 East Road looking north toward Alternative 9A northeast of Hollister, Idaho. Open panoramic views of the flat to rolling terrain are considered to have low scenic quality. The presence of numerous human-made alterations adjacent to this view and the lack of natural landscape elements detract from the scenic quality.

Alternative 9B

Alternative 9B, south of Hagerman, Idaho, and Glenns Ferry, would follow an existing 138-kV transmission line and WWE corridor for much of its alignment before turning west at Dead Mans Flat. Alternative 9B would cross approximately 1.6 miles of BLM-administered land with VRM Class I objectives (Jarbidge FO), 31.5 miles of BLM-administered land with VRM Class IV objectives, 1.0 mile of Idaho state land, and 19.1 miles of private land.

The following six KOP locations were selected to represent the most sensitive or most typical views for Alternative 9B.

KOP C106 (Figure E.2-10). Views from this point are from a portion of the Oregon NHT. This viewpoint is discussed in Section 3.3 – Cultural Resources.

KOP 810 (Figure E.2-9/Appendix G, Figure J-4c). This KOP is located southeast of Black Mesa and represents recreational viewers on the Oregon NHT. Views south toward Twenty-Mile Butte are open and panoramic and include a limited variation in vegetation with little human-made development. The only apparent human-made development in the view is a gravel road cutting through the middleground. Overall scenic quality is moderate due to a lack of diversity in form, line, color, and texture as well as the lack of visible human-made disturbance.

KOP 419 (Figure E.2-10). Views from KOP 419 represent the views of a residence looking northwest toward the location of Alternative 9B directly east of the Salmon Falls Creek Canyon. Open panoramic views of the flat to rolling terrain are considered to have low to moderate scenic quality. The presence of numerous human-made alterations associated with heavy agricultural use adjacent to this view and the lack of natural landscape elements detract from the scenic quality.

KOP 793 (Figure E.2-10). Views from KOP 793 represent the views of a residence looking east toward Alternative 9B directly east of the Snake River. Open panoramic views of the flat to rolling to rugged terrain are considered to have low scenic quality. The presence of numerous human-made alterations and the lack of natural landscape elements detract from the scenic quality.

KOP 798 (Figure E.2-10). Views from KOP 798 represent the views of a residence looking east directly west of the Snake River and Sinking Canyon. Open panoramic views of the flat to rolling terrain are considered to have low scenic quality. Numerous human-made alterations and/or built elements (such as a transmission in the foreground) and the lack of unique natural landscape elements, detract from the scenic quality.

KOP 801 (Figure E.2-10). Views from KOP 801 represent the views of a residence looking southwest, east of the Twenty-Mile Butte, and directly west of the Snake River. Viewers at this location would have open panoramic views of the flat to rolling and rugged terrain that are considered to have moderate scenic quality due to the presence of somewhat intact natural landscape elements. Human-made alterations adjacent to this view, detract from the scenic quality.

Alternative 9C

Alternative 9C would parallel Salmon Falls Creek (avoiding the Proposed Route WSR crossing) for a portion of its route before turning west and crossing west of Castleford, Idaho. Alternative 9C would cross approximately 7.0 miles of private land, 0.1 mile of BLM-administered land managed to conform to VRM Class II management objectives, and 8.2 miles of BLM-administered land managed to conform to VRM Class IV objectives.

The following three KOP locations were selected to represent the most sensitive or most typical views for Alternative 9C.

KOP 419 (Figure E.2-10). This KOP is the same as described for Alternative 9B.

KOP 369 (Figure E.2-10). Views from this KOP represent those of recreational drivers and hikers in Balanced Rock County Park at the bottom of the canyon created by Salmon Falls Creek. Enclosed and inferior views of the rugged canyon walls that dominate the middleground offer some landscape contrast. Views are considered to be of moderate scenic quality due to the presence of electric utilities in the middleground, detracting from the scenic quality.

KOP 793 (Figure E.2-10). This KOP is the same as described for Alternative 9B.

Alternative 9D

Alternative 9D would turn north of the Proposed Route south of the Bruneau Dunes State Park travel northwest directly north of the Snake River before turning west and crossing the Snake River south of Swan Falls, then rejoining the Proposed Route north of Murphy, Idaho. The alternative would cross approximately 11.5 miles of BLM-administered land with VRM Class II objectives (Four Rivers FO), 36.1 miles of BLM-administered land with VRM Class III objectives, 3.4 miles of BLM-administered land with VRM Class IV objectives, 3.9 miles of Idaho state land, and 3.3 miles of private land. Alternative 9D is proposed to parallel an existing 138-kV line across the SRBOP.

The following 11 KOP locations were selected to represent the most sensitive or most typical views for Alternative 9D.

KOP 1129 (Figure E.2-10). Views from KOP 1129 represent the views of recreational hikers and campers at Broken Wheel campground looking southwest toward the complex terrain surrounding the Bruneau Dunes State Park. Open panoramic views of the undulating and rugged terrain in the middleground are considered to have high scenic quality due to the scarce aesthetic landscape elements and few human-made alterations within the view. Landscape modifications have been designed to conform to surrounding aesthetic elements, ensuring change is minimally noticeable.

KOP 1128 (Figure E.2-10). Views from KOP 1128 represent the views of recreational hikers and OHV users looking south toward the complex terrain of the Bruneau Dunes State Park. Open panoramic views of the undulating and rugged terrain in the middleground are considered to have high scenic quality due to the scarce aesthetic landscape elements and few human-made alterations within the view.

KOP 1133 (Figure E.2-10). Views from KOP 1133 represent the views of recreational drivers on Crane Falls Road north of the Oregon NHT looking southwest toward rolling to rugged terrain surrounding Wilkins Gulch and the Bruneau Arm of the C.J. Strike Reservoir. Open panoramic and elevated views of the rolling to rugged terrain are considered to have moderate to high scenic quality. Various aesthetic landscape elements in the middleground and background increase the scenic quality, while highly visible human-made alterations detract from the scenic quality.

KOP 1156 (Figure E.2-10). Views from KOP 1156 represent the views of recreational campers in the BLM's Cove Recreation Site at the C.J. Strike Reservoir looking south across rolling to rocky terrain and curvilinear water features. Open and partially screened views of the surrounding rugged terrain and water features are considered to have moderate scenic quality due to the aesthetic landscape elements in the surrounding views; however, the view is typical of this region. Human-made disturbance is very apparent and detracts from the scenic quality.

KOP 1154 (Figure E.2-10). Views from KOP 1154 represent the views of recreational campers in the Idaho Power Campground at the C.J. Strike Reservoir. The view is focused to the west across agricultural and dominant vegetation along the water retention and control structures associated with the C.J. Strike Reservoir and Snake River canyon. Screened and enclosed views of the surrounding rugged and engineered terrain are considered to have low to moderate scenic quality. There are

few aesthetic landscape elements in the surrounding views and the diverse variations of form, line, color, and texture are screened by the numerous human-made alterations and structures in the foreground. Many elements within the view have an industrial nature to them and detract from the overall scenic quality.

KOP 1158 (Figure E.2-10). Views from KOP 1158 represent the views of recreational drivers traveling along Strike Dam Road adjacent to the C.J. Strike Reservoir looking southwest to west across undulating terrain and meandering water features. Open and panoramic views of the surrounding rolling terrain and water features are considered to have moderate scenic quality due to the aesthetic landscape elements in the surrounding views; however, the view is typical of this region. Human-made disturbance is very apparent and detracts from the scenic quality.

KOP 1143 (Figure E.2-10). Views from KOP 1143 represent the views of recreational users at Dedication Point, a BLM-developed day use area with scenic overlooks of the Snake River and Swan Falls. The southwest view is focused toward rocky and angular terrain that comprises the edges of the Snake River Canyon. Open panoramic views of the rugged terrain and background agricultural fields are considered to have moderate to high scenic quality. Numerous aesthetic landscape elements in the middleground and background increases the scenic quality, while human-made alterations, though partially screened, detract from the scenic quality.

KOP 1115 (Figure E.2-10). Views from KOP 1115 represent the views of residents traveling on Warrick Road looking directly north toward rolling terrain and the Snake River Valley (at a distance of 3.25 miles). Open panoramic views of the flat to rolling terrain are considered to have low to moderate scenic quality. The few scarce aesthetic landscape elements and numerous human-made alterations detract from the scenic quality.

KOP 1352 (Figure E.2-10/Appendix G, Figure BOP-2a). Views from this KOP represent local residents on Warrick Road looking southeast towards the SRBOP approximately 0.8 mile away. Open panoramic views of this landscape along with agricultural crops in the foreground is considered to have low to moderate scenic quality due to the landscape elements such as Sinker Butte. Farm buildings, stockpiles, utility lines, and irrigation equipment detract from the limited views beyond the agricultural area.

KOP 572 (Figure E.2-10). This KOP is the same as described for the Segment 9 Proposed Route.

KOP 1337 (Figure E.2-10). Views from KOP 1337 represent those of recreational viewers at a scenic lookout adjacent to Swan Falls Dam looking southeast toward Sinker Butte across the Snake River. Open panoramic views of the rugged canyon terrain and meandering water feature are considered to have high scenic quality due to the variety in form, line, color, and texture as well as the scarcity of such views in the surrounding region.

Alternative 9E

Alternative 9E would diverge directly south of the Proposed Route south of where the Bruneau Dunes State Park is located traveling east of the Hot Spring Area before turning in a northwestern direction and rejoining the Proposed Route northwest of Murphy, Idaho. Alternative 9E would cross approximately 24.5 miles of BLM-administered land with VRM Class III objectives (Bruneau FO, Jarbidge FO, and Owyhee FO) as well as 2.3 miles of Idaho state land and 1.3 miles of private land.

The following eight KOP locations were selected to represent the most sensitive or most typical views for Alternative 9E.

KOP 1137 (Figure E.2-10). Views from KOP 1137 represent the views of residences and visitors to the Hot Springs Cemetery on Hot Springs Road looking east toward the flat to undulating terrain north of Bruneau Canyon. Open panoramic views of the rolling to rugged terrain are considered to have moderate scenic quality. Numerous human-made alterations (i.e., crop cultivation) to the landscape are not dominant in this view but detract from the overall scenic quality.

KOP 1138 (Figure E.2-10). Views from KOP 1138 represent the views of residences in Hot Spring on the corner of Blackstone Grasmere and Hot Springs Road looking east toward the undulating to mountainous terrain adjacent to Seventy-one Gulch and north of Bruneau Canyon. Open panoramic views of the rolling to rugged terrain are considered to have moderate to high scenic quality due to scarce visual resources of interest (i.e., dramatic topography). The juxtaposition of human-made alterations (i.e., crop cultivation) to the landscape is not dominant in this view but slightly detracts from the scenic quality.

KOP 1140 (Figure E.2-10). Views from KOP 1140 represent the views of recreational travelers on Highway 51 adjacent to BLM-managed public lands looking north toward the undulating terrain and scattered mesa silhouettes north of Dead Man Gulch. Open panoramic views of the rolling to rugged terrain are considered to have low to moderate scenic quality due to the lack of scarce visual resources of interest (i.e., dramatic topography. Numerous human-made alterations to the landscape, dominate the middleground and background view and detract from the scenic quality.

KOP 1141 (Figure E.2-10). Views from KOP 1141 represent the views of recreational drivers along the Owyhee Uplands Backcountry Byway directly north of Rock House Ranch looking northeast across the flat to rolling terrain. Open panoramic views of the flat to rolling terrain are considered to have moderate to high scenic quality. The juxtaposition of human-made alterations (i.e., crop cultivation) to the landscape are not dominant in this view but detract from the scenic quality.

KOP 1152 (Figure E.2-10). Views from KOP 1152 represent the views of residential and recreational visitors of Our Lady Queen of Heaven Catholic Church. The view is focused to the southwest toward the rocky and angular terrain of Lead and Cinnabar Mountains, Hayden Peak, and Cavaney Hill. Open panoramic views of the rugged terrain are considered to have moderate scenic quality due to the aesthetic landscape elements in the background views; however, views of the diverse variations of form,

line, color, and texture are screened by the numerous human-made alterations and structures in the foreground, detracting from the scenic quality.

KOP 1149 (Figure E.2-10). Views from KOP 1149 represent the views of recreational travelers on Silver City Road looking southwest toward the rocky and angular terrain surrounding Cavaney and Gerdie Hills and farther to New York Summit close to Silver City. Open panoramic views of the rugged terrain are considered to have high scenic quality. Numerous aesthetic landscape elements in the middleground and background views, diverse variations of form, line, color, and texture, and few visible human-made alterations increase the scenic quality.

KOP 1148 (Figure E.2-10). Views from KOP 1148 represent the views of residences adjacent to public lands south of Murphy, Idaho, looking southwest toward rocky and angular terrain surrounding Sand Canyon. Open panoramic views of the rugged terrain and scattered residences are considered to have moderate to high scenic quality. Numerous aesthetic landscape elements in the middleground and background views, diverse variations of form, line, color, and texture add to the scenic quality, while visible human-made alterations that are subordinate and partially screened slightly detract from the scenic quality.

KOP 572 (Figure E.2-10). This KOP is the same as described for the Segment 9 Proposed Route.

Alternative 9F[2]

This alternative was proposed to avoid the Cove Non-motorized Area near the C.J. Strike Reservoir crossed by Alternative 9D.

From reference point 9n, Alternative 9F would proceed to the west, following the Proposed Route and the WWE corridor for approximately 18 miles. At reference point 9m.1, just south and west of C.J. Strike Reservoir dam, the route turns to the northeast then north for approximately 3 miles to rejoin Alternative 9D. The remainder of Alternative 9F is coincident to Alternative 9D.

Alternative 9F would cross approximately 51.0 miles of BLM-administered land, 5.2 miles managed with VRM Class II objectives, and 35.3 miles managed with VRM Class III objectives. The route would also cross 3.9 miles of Idaho State land and 12.3 miles of private land.

The following two KOP locations were selected to represent the most sensitive or most typical views for Alternative 9F.

KOP 1417 (Figure E.2-10). Views from KOP 1417 represent the views of residences and Rimrock Junior and Senior High School approximately 1.0 mile southwest of the C.J. Strike Reservoir. The view is focused to the west and northwest toward middle line canal and Rim Road. Open, panoramic views of the undulating terrain and irrigated agricultural land are considered to have moderate scenic quality. Rugged terrain

[2] Alternatives 8E and 9D/9F are the same between reference points 9r.4 and 9r.5 – only one of the Route Alternatives will follow this alignment.

associated with the C.J. Strike Reservoir and distant mountainous elements add variations in form, line, color and texture, increase the scenic quality. Visible human-made alterations are subordinate but slightly detracting from the scenic quality.

KOP 1413 (Figure E.2-10). Views from KOP 1413 represent the views of recreational users at an informational kiosk at the C.J. Strike Dam, looking southwest to west toward rocky and angular terrain surrounding the Snake River. Partially screened views of the rocky terrain rising up from the Snake River Plain and scattered industrial human-made development are considered to have moderate scenic quality. Aesthetic landscape elements in the middleground views with variations of form, line, color, and texture increase the scenic quality, while visible human-made alterations detract from the scenic quality.

Alternative 9G

Alternative 9G was developed to provide a separate alignment from Alternative 8E, which shares the same alignment as Alternatives 9D and 9F where it crosses the Snake River. The primary difference between Alternative 9G and Alternatives 9D and 9F is the alignment of the last 15 miles of the route. Alternatives 9D and 9F would take a more northerly path than Alternative 9G. Alternative 9G would not avoid the Cove Non-motorized Area, and instead would share the same alignment as Alternative 9D for that part of its route.

Alternative 9G would follow Alternative 9F for the first 41 miles, proceeding west from reference point 9n along the Proposed Route and WWE corridor. At point 9n.1, just south and west of C.J. Strike Reservoir Dam, the route would turn to the northeast then north for approximately 3 miles to rejoin Alternatives 9D and 9F. Alternatives 9D, 9F, and 9G would then follow the same path, proceeding to the northwest and following an existing 138-kV transmission line. At point 9r.1, Alternative 9G would turn to the west, crossing the Guffey Butte-Black Butte Archaeological District and the Snake River approximately 4 miles south of Sinker Butte. The route continues to the north and west to point 9p.

Alternative 9G would cross 17.9 miles of BLM-administered land with VRM Class II objectives, 27.6 miles of BLM-administered land with VRM Class III objectives, 3.9 miles of Idaho State land, and 2.9 miles of private land. The following two KOP locations were selected to represent the most sensitive or most typical views for Alternative 9G.

KOP 1419 (Figure E.2-10). Views from KOP 1419 represent the views of recreational users at the BLM-administered Rabbit Creek OHV trailhead, looking southeast to southwest toward Striker Basin and Sinker Creek Butte. Open, panoramic views of the rocky terrain of buttes rising up from the Snake River Plain, with little human-made development, are considered to have moderate to high scenic quality. Aesthetic landscape elements in the middleground views have variations of form, line, color, and texture, which increase the scenic quality. Few visible human-made alterations across the landscape detract from the scenic quality.

KOP 1420 (Figure E.2-10). Views from KOP 1420 represent the views of residents at the courthouse in Murphy, Idaho, looking northwest toward the Con Shea Basin and Guffey Butte. Open, panoramic views of the undulating terrain with rising, contrasting buttes and scattered human-made development are considered to have moderate scenic quality. Aesthetic landscape elements in the middleground and background views with variations of form, line, color, and texture add to the scenic quality, while visible human-made alterations in the foreground detract from the scenic quality.

Alternative 9H

Alternative 9H would avoid the Cove Non-Motorized Area as well as provide an alternate alignment for the portion of Alternative 9D/9F that is shared with Alternative 8E. The reasons for the evaluation of Alternative 9G are the same as those discussed for those section of Alternatives 9F and 9G. Alternative 9H would share the same alignment as 9F near C.J. Strike Reservoir, thus avoiding the Cove Non-motorized Area, but would take a more southern alignment for the last 15 miles of the route, following the same alignment as Alternative 9G in that area.

From point 9n, Alternative 9H would follow the same alignment as Alternative 9D, also crossing the nonmotorized area, and then continuing northwest following an existing 138-kV transmission line to point 9r.1. Alternative 9H would then turn west and cross the Guffey Butte-Black Butte Archaeological District and the Snake River approximately 4 miles south of Sinker Butte. The route would continue north and west to point 9p following the same path as Alternative 9G.

Alternative 9H would cross approximately 11.7 miles of BLM-administered land with VRM Class II objectives, 26.8 miles of BLM-administered land with VRM Class III objectives, 3.9 miles of Idaho State land, and 12.0 miles of private land. The previous KOP locations (KOP 1419 and 1420) selected to represent the most sensitive or most typical views for Alternative 9H are the same as Alternative 9G.

Segment 10 – Midpoint to Cedar Hill

Segment 10 would cross approximately 13.2 miles of BLM-administered land managed with VRM Class IV objectives and 20.4 miles of private land. Segment 10 has no Route Alternatives.

Proposed Route

Three KOP locations were selected to represent the most sensitive or most typical views for Segment 10. The first KOP was identified as a cultural KOP and is listed below.

KOP C99 (Figure E.2-11). Views from this point are from the Minidoka National Historic Site. This viewpoint is discussed in Section 3.3 – Cultural Resources.

KOP 162 (Figure E.2-11). This KOP is located on the west side of U.S. Highway 93 south of Shoshone and about 1 mile southwest of the Midpoint Substation. It represents residential viewers. The terrain is generally flat, providing open panoramic views in all directions. The landscape offers little variety in form, line, or color due to

the mono-culture nature of the agricultural use. Existing transmission lines are present to the north and east, along with a view of the existing substation, detracting from the scenic quality. Overall scenic quality is considered low.

KOP 193 (Figure E.2-11). This KOP represents the view from the Hansen Bridge Scenic Overlook viewing east along the Snake River Canyon. The KOP is in an area identified as VRM Class II by the BLM. This view offers some variety in landform due to the canyon and some limited variation in vegetation. Human-made structures include the Hansen Bridge, scattered residences, and distant transmission lines, which detract from the scenic quality. Overall scenic quality is considered low outside the canyon to moderate inside the canyon.

3.2.2 Direct and Indirect Effects

This section is organized to present first construction, then operations, followed by decommissioning effects from the Proposed Route or Route Alternatives. Route Alternatives are analyzed in detail below in Section 3.2.2.3. There is a Design Variation involving use of two single-circuit structures proposed by the Proponent for Segments 2, 3, and 4 (see Section 2.2 for details), which is analyzed below in Section 3.2.2.4. The Proponents have also proposed a Schedule Variation, analyzed in Section 3.2.2.5, in which one of the two single circuits to be constructed in Segments 2, 3, and 4 and a portion of Segment 1W would be built on an extended schedule with construction beginning approximately 2.5 years after completion of the initial construction.

3.2.2.1 No Action Alternative

Under the No Action Alternative, the Proposed Route or Route Alternatives would not be constructed or operated. No direct or indirect impacts to visual resources would occur from this Project.

3.2.2.2 Effects Common to Action Alternatives

<u>Construction</u>

Construction would result in the visual intrusion of construction vehicles, equipment, materials, and a work force in staging areas, along access roads, and along the new transmission line ROW. Vehicles, heavy equipment, tower components, and workers would be visible during substation construction and modification, access and spur road clearing and grading, structure erection, conductor stringing, and cleanup and restoration. However, disturbance from construction activities would be transient and of short duration as activities progress along the transmission line route. Affected viewers would be aware of the temporary nature of Project construction impacts, which would decrease their sensitivity to the impact. The towers and cables (transmission lines) would cause the major long-term change in scenery. In addition, there would be the alteration of topography, grading for access roads and work areas, dust generation, and clearing of vegetation along the ROW that could be long-lasting in semi-arid and forested, mountain environments and would introduce potentially adverse visual change and contrast.

Operations

Towers and transmission lines, as well as existing and new permanent access roads, would be used by maintenance crews and vehicles for inspection and maintenance activities. Visual impacts would result from inspection and maintenance activities producing traffic and dust on access roads; however, these impacts would be temporary.

Increased visual contrast from the clearing and grading of staging areas and construction yards, construction of new access and spur roads, and activities adjacent to construction sites and along the ROW could be long-lasting in semi-arid and forested, mountain environments where vegetation establishment and growth are slow. Views along linear land scars or newly constructed roads would introduce visual change and contrast by causing unnatural vegetative lines and soil color contrast. Vegetation clearing would occur during construction and in some instances would remain substantially cleared for the life of the Project while other areas would be allowed to revegetate or may be planted with native plant materials. The greatest impact would occur from the long-term presence and operations of the transmission line in sensitive visual resource areas due to the cleared ROW, large vertical structures, and multiple overhead conductors.

The Proponents have incorporated two Project-wide EPMs into the project design that would help mitigate the visual contrast of the transmission line in the landscape:

VR-1 The 500-kV transmission line lattice steel towers would be specified to have a dull galvanized finish. The proposed surface finish is a galvanized finish, treated after the initial galvanizing process to produce a dulled finish to reduce surface reflectivity. This process results in an installed tower with more visual absorption and thus allows the towers to blend in better with the landscape.

VR-2 The three subconductor (500-kV) and two subconductor (230-kV) that make up the conductor bundles would be specified to have a non–specular finish. Similar to the dulled finish of the transmission structures, the conductors reduce surface reflectivity. This process results in eliminating the shiny ribbon effect often seen in older untreated transmission lines and thus allows the conductors to blend in better with the landscape.

The Proponents have identified an additional structure type that would be used to help blend the proposed transmission lines with existing transmission lines.

VR-3 The proposed 230-kV transmission lines between Windstar and Aeolus would use a steel H-frame structure configuration similar to the existing 230-kV in the same general location. The steel pole H-frame would utilize self-weathering steel. Weathering steel is manufactured from a group of steel alloys that were developed to eliminate the need for painting. This type of steel alloy forms a stable rust-like appearance if exposed to the weather for several years.

VR-4 The single-circuit 500-kV steel pole H-frame structure is more expensive than the lattice tower alternative. Table 2.6-3 compares the single-circuit lattice steel tower and single-circuit steel pole H-frame ROW configurations for several factors. The Proponents do not wish to propose this alternative as a Project-wide option, but propose that, where needed for mitigation, the H-frame tangent configuration for single-circuit 500-kV is feasible. The Proponents are unwilling to propose that H-frames be used for angle or dead-end structures, but are willing to propose them for tangent use only.

The Agencies have reviewed the Proponents' proposed action and EPMs and have identified additional mitigation measures that would be required on federal lands (and recommended on non-federal lands) to reduce adverse effects on visual resources. The following 15 mitigation measures apply on federal lands project-wide. Additional measures are site-specific or management unit-specific and are identified under the route segment where they apply.

VIS-1 No paint or permanent discoloring agents would be applied to rocks or vegetation to indicate limits of survey or construction activity.

VIS-2 To minimize ground disturbance and/or reduce scarring (visual contrast) of the landscape, the alignment of any new access roads or cross-country routes will follow the landform contours in designated areas where practicable, providing that such alignment does not impact resource values additionally.

VIS-3 To minimize sensitive feature disturbance and/or visual contrast, in designated areas structures will be placed so as to avoid sensitive features such as, but not limited to, riparian areas, water courses and cultural sites and/or to allow conductors to clearly span the features, within the limits of standard tower design.

VIS-4 To reduce visual impacts on federal land, including potential impacts on recreation values and safety, towers are to be placed at the maximum feasible distance from the highway, canyon and trail crossings within limits of standard design and to the extent practical.

VIS-5 Crossings of rivers shall be at approximately right angles where practical. Strategic placement of structures shall be done both as a means to screen views of the transmission line and rights-of-way and to minimize the need for vegetative clearing.

VIS-6 All insulators shall be made of materials that have reduced potential to reflect and refract light. Glass insulators shall be avoided when there is an alternative insulator type available with lower refractive characteristics

VIS-7 For segments of the line 1) within the 0- to 0.5-mile zone of Interstate highways where existing lines of the same voltage are paralleled and 2) within the 0- to 0.5-mile zone of residences where existing lines of the same voltage are paralleled, locate new towers to be adjacent to existing

towers, within the limits of standard transmission line design and considering the ruling span length of adjacent proposed and existing lines.

VIS-8 Site-specific "micro-siting" will be required near certain sensitive areas, as identified by the agencies, where proposed transmission facilities would be present and could impact visual quality; these situations include:

- Crossings over major highways
- Crossings of high quality historic trails
- Crossings over the North Platte Snake Rivers
- Crossing the Albion Mountains in the Sawtooth NF
- Sensitive travelways, use areas, residential areas, recreational facilities as identified by the agencies (including national recreation and scenic trails, campgrounds, recreation areas, and trailheads), and other areas identified by management plans
- Along Forest Service roads in forested areas

VIS-9 In specific areas identified by the applicable federal land manager (such as VRM Class II, erosive soils, steep slopes, areas near NHT Trails) the access road used for construction will be restored and an alternative access route for operations will be designated.

VIS-10 In areas in proximity to existing residential developments with an urban or suburban character, such as in the Kuna area, steel pole H frames or tubular steel poles may be specified to provide tower structures that are visually more appealing. Lattice steel towers will need to be specified at turning tower locations and at long spans because tubular steel poles do not have the strength to withstand the forces exerted by the conductors at these locations.

VIS-11 The lighting specified for the marshaling yards shall be the minimum required to meet safety and security standards. All light fixtures within 1,000 feet of a residence shall be hooded to eliminate any potential for glare and to prevent light from spilling off the site or up into the sky. Additionally, the fixtures shall have sensors and switches to permit the lighting to be turned off at times when it is not required.

VIS-12 Where the route would be visible on timbered slopes, limit tree removal to areas required for safety rather than from the entire ROW in order to prevent a linear feature on the landscape from clear-cutting trees. Vegetation removal requirements will consider Appendix A, "Standards and Practices for Electric System Reliability."

VIS-13 To reduce visual contrast in areas where overstory vegetation is removed for access, tower pads, or conductor clearance, specific sections of the clearing edges on federal land will be feathered to give a natural

appearance, where not in conflict with regulatory requirements (e.g., NERC, WECC, and Occupational Safety and Health Administration requirements).

VIS-14 Crossing federal land along a transmission corridor shall require the preparation of a vegetation management plan for the utility corridor to minimize scenic impacts and plan for rehabilitation of existing impacts. This plan will be approved by the land-management agency prior to vegetation clearing.

VIS-15 To mitigate potential visual impacts on federal land, the construction and maintenance plan to be developed by the Proponents shall include measures to reduce ROW scarring and enhance restoration. The plan will be approved by the land management agency prior to ground clearing and construction.

Decommissioning

Project facilities would be removed at the end of the operational life of the transmission line. Conductors, structures, and related facilities would be removed. Foundations would be removed to below the ground surface level. There would be residual visual impacts for many years after the Project has been decommissioned and structures removed such as vegetative cutbacks, cut and fill scars from construction activities, and access roads, which all add to the visual impact, though these impacts would be at ground level. These areas would be apparent after the removal of structures but are expected to diminish over time.

3.2.2.3 Proposed Route and Alternatives by Segment

This section describes the impacts for the Proposed Route and Route Alternatives for each of the segments of Gateway West. The analysis discusses the relative impacts to visual resources of the alternatives. In all cases, after analysis of impacts was complete and where impacts were identified, measures were proposed to reduce impacts.

Assessment of potential impacts on KOPs assumed all sensitive viewers would have views toward the Proposed Route and Route Alternatives on a high-visibility day (defined as visibility of 5 miles and beyond) and that those KOPs would represent the disparate viewing conditions and viewing opportunities of the characteristic landscapes described in Section 3.2.1.5 – Existing Conditions. Based on the field inventory, more than 1,300 locations were identified and photographed. KOP locations were suggested by the BLM, Forest Service, and NPS and located through literature review within the Project area or identified in the field. Photographs were taken to document existing conditions at each KOP and were used to evaluate visual conditions and potential visibility as well as to assess the level of contrast and impacts that would result from the introduction of the Project elements. Following the inventory, 232 locations were selected as KOPs in this section. Appendix E, Figures E.2-1 through E.2-11 show the location of all points inventoried as well as the locations of chosen KOPs (both visual and cultural). An additional 147 KOPs were to document the visual impact on historical

and cultural resources as presented in Section 3.3 – Cultural Resources. All the KOPs described herein are considered to represent the most sensitive viewers or are the most representative of typical views and viewing conditions along this alignment.

Visual Resource Management Class Assessment

Where the Proposed Route and Route Alternatives would cross BLM-managed lands or NFS lands, the following assumptions were made to determine whether change resulting from the Project would conform with management plans or whether an amendment would be required. Visual resources–related impacts that would lead to potential plan amendments are identified in Table 2.2-1 of Chapter 2 and discussed in detail in Appendix G:

- High-voltage transmission lines do not conform to management objectives of BLM VRM Classes I and II and Forest Service Very High, High, and Moderate (SMS) and Preservation, Retention, Partial Retention, and, in some cases, Modification (VMS) areas.
- The location of the Proposed Route or Route Alternatives across VRM Class III areas conforms with the class objectives if consideration was given to alternative alignments that would avoid the area and feasible mitigation was applied. However, in some special circumstances, crossing VRM Class III areas would not conform with the visual characteristics of the management class. Those areas received visual analysis, as described in Appendix G.
- Direction for considering visual resource values stated in RMPs, MFPs, and Forest Plans was taken into consideration. On BLM-managed land where guidelines were absent or general in nature, the management direction provide in BLM Handbook H-1601-1, *Land Use Planning,* was considered (BLM 2005a).
- Evaluating the effects of a proposed plan amendment on other resources is difficult due to the small areas of land where specific information regarding resources may not be available. Therefore, effects are discussed qualitatively.

Details regarding conformance with VRM objectives as well as plan amendments are provided in Appendix G-1. Details regarding conformance with Forest Service visual resource management are found in Appendix G-2.

The Visual Impact Assessments tables (Tables 3.2-1 through 3.2-51) listed below for each segment have abbreviated terms to represent potential viewers from each particular KOP. The abbreviated terms are listed below with appropriate definitions for each type of viewer. The viewers from each KOP can be defined as:

- RES – A single residential viewer or group of residential viewers.
- REC – A recreational viewer in broad context; more specific details would be provided in the KOP description, but recreational viewers for this analysis included Forest Service campsites and trails, NHT users, historic and scenic highway/byway users, BLM trailheads, NPS lands, and general recreational areas (e.g., RV parks, city parks, ball fields, state parks, and recreation sites).

- COMM – A commuter traveling on major highways or secondary roads not identified as having scenic protection. Often these views were considered residential if they were adjacent to an identified residence or community.
- HIST – A site identified as having historic value, often a recreational site (i.e., Oregon or California NHT users)
- CULT – A site identified as a sensitive viewing location for cultural resources yet not discussed in the Cultural Resources section. These viewers were identified on the Fort Hall Indian Reservation.
- SCHOOL – A community school usually not identified as historic.
- CEM – A community cemetery usually not identified as historic.

Segment 1E – Windstar to Aeolus

Segment 1E, as proposed, would link the Windstar and Aeolus Substations in south-central Wyoming with a 100.6-mile 230-kV single-circuit transmission line. Twenty acres of the expansion of Windstar and Aeolus Substations and 0.5 acre for one regeneration site are attributed to Segment 1E. Alternative 1E-A is a 16.1-mile alternative along the north end of Segment 1E, which was the Proponents' initial proposal before moving the Proposed Route at the suggestion of local landowners to avoid the more settled area around Glenrock. Alternative 1E-B is 21.4 miles longer than the Proposed Route but is being considered by the Proponents because it would avoid a Wyoming-designated sage-grouse core area to the east. The BLM has required the consideration of Alternative 1E-C, which parallels the proposed and rebuilt Segment 1W 230-kV lines into the Aeolus Substation (see Appendix A, Figure A-2).

Table 3.2-1 summarizes the potential visual impact for each KOP along the Segment 1E Proposed Route.

Table 3.2-1. Visual Impact Assessment for Each KOP in the Segment 1E Proposed Route

KOP	Viewers[1/]	Land Ownership	Viewer Rating[2/]	Scenic Quality[2/]	Distance (miles)	Visibility[2/]	Contrast[2/]	Impact[2/]
860	RES	Private	H	H	1.0	M-H	H	H
1001	REC	Private	H	M	0.75	H	H	M-H
1015	REC	State of WY	H	L-M	0.75	M-H	M-H	L-M
105	REC	State of WY	H	L-M	0.3-0.60	M-H	L-M	L-M
983	RES	BLM VRM II	H	M-H	0.80	H	H	H
986	RES	Private	H	L-M	2.00	M	L-M	L-M
985	RES	Private	H	M-H	3.30	L-M	L-M	L-M
988	RES	Private	H	H	1.20	M-H	H	H
990	RES	State of WY	H	M	0.80	H	M-H	M-H
853	RES	Private	H	M	0.75	M-H	H	M-H
107	REC/HIST	Private	M	L	2.25	M	M	L-M
38	REC/HIST	State of WY	H	L-M	0.30	H	L-M	M
37	REC/HIST	Private	H	L-M	0.40	H	L	M
1010	RES	Private	H	L	0.50	H	M	M

1/ RES – A single resident. REC – A recreational viewer. HIST – A site identified as having historic value.
2/ H High, M – Medium, L – Low

KOP 860 (Figure E.2-1 /Appendix G-1, Figure 5.2-1). The Project would be moderately to highly visible to high-sensitivity residential viewers at KOP 860 (at a distance of 1.0 mile from the Proposed Route). The viewers would have an open view that is focused toward the Proposed Route where it crosses Long Draw with few opportunities for screening until it reaches the mountainous terrain, resulting in contrast levels that are anticipated to be high for the Proposed Route. Impacts on residential viewers from this KOP and in the general vicinity are expected to be high for the Segment 1E Proposed Route due to the high scenic quality of the view and high contrast.

KOP 1001 (Figure E.2-1). The Project would be highly visible to high-sensitivity recreational and residential viewers at KOP 1001 (at a distance of 0.75 mile from the Proposed Route). This section of the Proposed Route would not parallel any existing transmission lines or linear features, resulting in high contrast levels. Impacts on recreational and residential viewers from this KOP and in the general vicinity are anticipated to be moderate to high due to the development of a new linear feature in a relatively undisturbed landscape.

KOP 1015 (Figure E.2-1). The Project would be moderately to highly visible to high-sensitivity recreational viewers at KOP 1015 (at a distance of 0.75 mile from the Proposed Route). Few opportunities for screening result in moderate to high contrast levels. Impacts on recreational viewers from this KOP and in the general vicinity are expected to be low to moderate for the Proposed Route due to the viewing distance and moderate scenic quality with vertical and horizontal human-made disturbance in the immediate vicinity.

KOP 105 (Figure E.2-1/Appendix G-2, Figure 5.1-2). KOP 105 is located approximately 2.5 miles south of the Medicine Bow-Routt NFs boundary, but this KOP represents views of the surrounding areas adjacent to the NF. KOP 105 and other adjacent viewpoints exhibit diversity in form, line, color, and texture with few human-made features. The most visible human-made feature in the surrounding area is an existing 230-kV transmission line. Segment 1E of the proposed Project would be moderately visible and screening and other mitigation efforts would not be successful at lowering impacts to scenic resources in the surrounding area. With little existing development in the area other than the existing transmission line approximately 1,500 feet to the northwest, the structures would be moderately to highly contrasting with the landscape due to backdropping effects offered by the high relief terrain. Many of the views in the surrounding area exhibit a high level of variety in form line, color, and texture, which would contrast with the addition of new human-made structures and access roads. This would not meet the Moderate SIO.

KOP 983 (Figure E.2-1). The Project would be highly visible to high-sensitivity residential viewers and travelers at KOP 983 (at a distance of 0.8 mile from Proposed Route), which could skyline the view. An open view toward the Proposed Route, across the middleground ridgeline, would provide few screening opportunities and high contrast levels. Impacts on residential viewers from this KOP and in the general vicinity are expected to be high due to the high visibility and high visual contrast.

KOP 986 (Figure E.2-1). The Project would be moderately visible to high-sensitivity residential viewers at KOP 986 (at a distance of 2.0 miles from the Proposed Route). The viewer would have a partially screened view of the Proposed Route, resulting in low to moderate contrast levels. Impacts on residential viewers from this KOP and in the general vicinity are expected to be low to moderate due to the low to moderate contrast and scenic quality of the view

KOP 985 (Figure E.2-1). The Project would be low to moderately visible to high-sensitivity residential viewers at KOP 985 (at a distance of 3.3 miles from the Proposed Route). The viewer would have a partially screened view of the Proposed Route, resulting in low to moderate contrast levels. Impacts on residential viewers from this KOP and in the general vicinity are expected to be low to moderate due to the low to moderate contrast and visibility.

KOP 988 (Figure E.2-1). The Project would be moderately to highly visible to high-sensitivity residential viewers at KOP 988 (at a distance of 1.2 miles from the Proposed Route). An open view focused toward the Proposed Route, across the Long Draw, would provide few screening opportunities and high contrast levels. Impacts on residential viewers from this KOP and in the general vicinity are expected to be high due to the high scenic quality of the view and high contrast.

KOP 990 (Figure E.2-1). The Project would be highly visible to high-sensitivity residential viewers at KOP 990 (at a distance of 0.8 mile from the Proposed Route). An open view toward the Proposed Route with few screening opportunities and a skylined view would result in moderate to high contrast levels. Impacts on residential viewers from this KOP and in the general vicinity are expected to be moderate to high due to the moderate to high contrast and the possibility of skylined views or views where the Proposed Route would be visible as a silhouette above the horizon with no backdropping.

KOP 853 (Figure E.2-1). The Project would be moderately to highly visible to high-sensitivity residential viewers at KOP 853 (at a distance of 0.75 miles from the Proposed Route). An expansive view toward the Proposed Route would provide few screening opportunities and high contrast levels. Impacts on residential viewers from this KOP and in the general vicinity are expected to be moderate to high due to the viewing distance and moderate scenic quality with little human-made disturbance in the immediate vicinity.

KOP 107 (Figure E.2-1). The Project would be moderately visible to moderate-sensitivity motorists and commuters traveling south along Highway 487 at KOP 107 (at a distance of 2.5 miles from where the Proposed Route would cross the highway). At KOP 107, moderate-sensitivity viewers along Highway 487 would have a moderate level of Project visibility due to middleground distances. Visual contrast levels would be moderate due to the lack of screening and visible human-made alterations. Visual impacts on viewers at KOP 107 would be low to moderate due to distance and the moderate sensitivity of viewers on the highway.

Alternative 1E-A

Table 3.2-2 summarizes the potential visual impact for each KOP in Alternative 1E-A.

Table 3.2-2. Visual Impact Assessment for Each KOP in Alternative 1E-A

KOP	Viewers[2/]	Land Ownership	Viewer Rating[3/]	Scenic Quality[3/]	Distance (miles)	Visibility[3/]	Contrast[3/]	Impact[3/]
38[1/]	REC/HIST	State of WY	H	L-M	0.30	H	L-M	M
37[1/1]	REC/HIST	Private	H	L-M	0.40	H	L	M
71	RES	State of WY	H	M	300 feet	H	H	M-H
1011	RES	Private	H	M-H	1.65	M-H	L-M	M
1013	RES	Private	H	M-H	1.00	M-H	M	M

1/ Viewers at KOP would have views of Segment 1E Proposed Route and Alternative 1E-A with lower anticipated visual impacts.
2/ RES – A single resident. REC – A recreational viewer. HIST – A site identified as having historic value. CULT – A site identified as a sensitive viewing location for cultural resources yet not discussed in the Cultural Resources section.
3/ H – High, M – Medium, L – Low

KOP 38 (Figures E.2-1 and E.2-1). The Project would be highly visible to high-sensitivity recreational viewers at this KOP 38. Foreground views of the Project have limited screening except for the vegetation along the North Platte River. Viewers at this location would be approximately 0.3 mile from Alternative 1E-A, representing a foreground view of the Project. Visual contrast levels would be low to moderate due to numerous human-made alterations within the landscape; however, the introduction of new structures within these views could draw the attention of a casual observer. Impacts to recreational viewers from KOP 38 would be moderate due to adjacent human-made alterations in the landscape.

KOP 37 (Figure E.2-1). The Project would be highly visible from KOP 37 to high-sensitivity recreational viewers traveling along the Oregon NHT or visiting the historic marker erected at the site (at a distance of 0.4 mile from the proposed Alternative1E-A). The Project would be highly visible to the recreational viewers along the Oregon NHT. Numerous industrial structures in the immediate vicinity, such as the Dave Johnston Power Plant and associated transmission structures, would provide low visual contrast levels. Visual impacts on recreational viewers would be moderate due to the close distance of the view.

KOP 41 (Figure E.2-1). Discussed under Segment 1W.

KOP 1011 (Figure E.2-1). Discussed under Segment 1W.

KOP 1013 (Figure E.2-1). Discussed under Segment 1W.

Alternative 1E-B

Table 3.2-3 summarizes the potential visual impact for each KOP of Alternative 1E-B.

Table 3.2-3. Visual Impact Assessment for Each KOP in Alternative 1E-B

KOP	Viewers[1/]	Land Ownership	Viewer Rating[2/]	Scenic Quality[2/]	Distance (miles)	Visibility[2/]	Contrast[2/]	Impact[2/]
62	RES	Private	H	M-H	0.45	H	H	M-H
991	RES	Private	H	M-H	0.25	H	M-H	M-H
993	REC	Private	H	M-H	0.75	H	H	H
995	RES	Private	H	M-H	0.60	H	M-H	M-H
999	REC	BLM VRM III	H	M-H	3.65	L-M	M	M
840	RES	Private	H	M	368 feet	H	H	H
982	RES	Private	H	M	2.75	M	M-H	M

1/ RES – A single resident. REC – A recreational viewer.
2/ H – High, M – Medium, L – Low

KOP 62 (Figure E.2-1). The Project would be highly visible to high-sensitivity residential viewers at KOP 62 (at a distance of 0.45 mile from Alternative 1E-B). The viewer would have an expansive view toward Alternative 1E-B that would not parallel any existing alignments or linear features. The view may skyline the rocky terrain of the middleground, resulting in high contrast levels. Potential visual impacts on residences from this KOP and in the general vicinity are expected to be moderate to high due to the development of a new linear feature in an undisturbed landscape with moderate to high scenic quality.

KOP 991 (Figure E.2-1). The Project would be highly visible to high-sensitivity residential viewers at KOP 991 (at a distance of 0.25 miles from Alternative 1E-B). An open view toward the Route Alternative, backdropped by mountainous terrain, would provide few screening opportunities, resulting in moderate to high contrast levels . Impacts on residential viewers from this KOP and in the general vicinity are expected to be moderate to high due to the moderate to high contrast and scenic quality of the view.

KOP 993 (Figure E.2-1). The Project would be highly visible to high-sensitivity recreational viewers at KOP 993 (at a distance of 0.75 mile from Alternative 1E-B, which would cross the scenic foreground landscape). The viewer would have an expansive and focal view toward the Route Alternative. The landscape provides few screening opportunities, resulting in broad, open, skylined views with high contrast levels. Impacts on recreational viewers from this KOP and in the general vicinity are expected to be high due to the moderate to high scenic quality of the view and high contrast. BLM has identified an alignment change, moving Alternative 1E-B to follow the rugged terrain along the foothills of Smith Mountain. This could effectively absorb the structure in many of the surrounding views.

VIS-16 Realignment of a portion of Alternative 1E-B, adjacent to the Rock Creek and Fort Fetterman Road (KOP 993), to follow the rugged terrain and foothills of Smith Mountain should be evaluated to determine absorption effectiveness.

KOP 995 (Figure E.2-1). The Project would be highly visible to high-sensitivity residential viewers at KOP 995 (at a distance of 0.6 mile from Alternative 1E-B). The viewer would have an expansive view toward the Route Alternative. The landscape provides few screening opportunities in the north, resulting in moderate to high contrast

levels. Impacts on residential viewers from this KOP and in the general vicinity are expected to be moderate to high due to the moderate to high contrast and scenic quality of the view.

KOP 999 (Figure E.2-1). The Project would be low to moderately visible to high-sensitivity recreational viewers at KOP 999 (at a distance of 3.65 miles from Alternative 1E-B). The viewer would have an expansive view toward the Route Alternative with no opportunities for screening due to the broad open view and superior vantage point, resulting in contrast levels that are anticipated to be moderate. Impacts on recreational viewers from this KOP and in the general vicinity are expected to be moderate for the proposed realignment due to the low to moderate scenic quality of the view and moderate contrast.

KOP 840 (Figure E.2-1). The Project would be highly visible to high-sensitivity residential viewers at KOP 840 (at a distance of 368 feet from Alternative 1E-B). The viewer would have an expansive view toward the Route Alternative. The landscape provides few screening opportunities and the close viewing distance results in high contrast levels. Impacts on residential viewers from this KOP and in the general vicinity are expected to be high due to the close distance of the view and high contrast.

KOP 982 (Figure E.2-1). The Project would be moderately visible to high-sensitivity residential viewers at KOP 982 (at a distance of 2.75 miles from Alternative 1E-B, which possibly skylines the view). The viewer would have an open view toward the Alternative crossing the middleground. The view may be screened by the ridgeline in the middleground, resulting in moderate to high contrast levels. Impacts on residential viewers from this KOP and in the general vicinity are expected to be moderate due to the moderate scenic quality and moderate visibility.

Alternative 1E-C

Table 3.2-4 summarizes the potential visual impact for each KOP of Alternative 1E-C.

Table 3.2-4. Visual Impact Assessment for Each KOP in Alternative 1E-C

KOP	Viewers[3/]	Land Ownership	Viewer Rating[4/]	Scenic Quality[4/]	Distance (miles)	Visibility[4/]	Contrast[4/]	Impact[4/]
89 [1/]	REC	Private	H	L-M	1.86	L-M	M	L-M
86 [1/]	REC	BLM VRM III	H	L-M	0.75	M	M	M
90 [2/]	REC/CULT	State of WY	H	M	1.75	L-M	M	L-M
46	COMM	BLM VRM IV	M	L-M	0.50	H	M	M-H

1/ Viewers at KOP would have views of Segments 1W(a) and 1W(c) with lower anticipated visual impacts.
2/ KOP 90 is assessed in Section 3.3 – Cultural Resources (KOP C98) because it is deemed a historic structure; however, due to its location adjacent to a BLM access road, it is also being assessed here as a recreation site.
3/ REC – A recreational viewer. COMM – A commuter traveling on major highways or secondary roads. CULT – A site identified as a sensitive viewing location for cultural resources yet not discussed in the Cultural Resources section.
4/ H – High, M – Medium, L – Low

KOP 89 (Figure E.2-1). The Project would be moderately to highly visible to high-sensitivity recreational viewers accessing the Bates Creek Reservoir at KOP 89 (at a distance of 1.86 miles from the Proposed Route). Alternative 1E-C would run parallel to the existing 230-kV line (Segment 1W[a] proposed to be rebuilt until approximately 0.5 mile south of Bates Creek; south of this area, Segment 1W[c] would become the

rebuild). Segment 1W(c) would be approximately 3.0 miles from the viewpoint. Middleground distances and backdropping effects lower the visual contrast levels. Visual contrast levels would be moderate due to the distance from the viewer to human-made alterations, which can mask changes to form, line, color, and texture. Backdropping helps to blend the Project into the surrounding landscape. Visual impacts on recreational viewers would be low to moderate due to the middleground viewing distance and backdropping.

KOP 86 (Figure E.2-1). The Project would be moderately visible for the recreational viewers at KOP 86 (at a distance of 0.75 miles from Alternative 1E-C. In this area, Alternative 1E-C would parallel an existing 230-kV transmission line (Segment 1W[c]) and the proposed 230-kV Segment 1W(a). Middleground distances and backdropping would lower visual contrast to moderate levels. Backdropping is the effect of blending in with background terrain, vegetation, and scenery. Visual impacts on recreational viewers would be moderate due to the Alternative 1E-C paralleling another transmission line and moderate visibility.

KOP 90 (Figure E.2-1). KOP 90 represents recreational views from a historic cabin site (same location as KOP C98) in the Shirley Basin area of Wyoming looking east toward Alternative 1E-C. The Project would be low to moderately visible to high-sensitivity recreational viewers (at a distance of 1.75 miles away). The viewers would have a broad, expansive view toward Alternative 1E-C with topographic screening in the foreground, resulting in moderate contrast levels. Potential visual impacts are expected to be low to moderate due to the distance of the transmission line and visibility.

KOP 46 (Figure E.2-1). The Project would be highly visible to viewers from KOP 46 traveling along State Highway 487 (at a distance of 0.5 mile of Alternative 1E-C). Alternative 1E-C would parallel and be partially screened by the proposed Segment 1W(a) route along the left shoulder of the highway as well as the existing 230-kV transmission line (Segment 1W[c]) on the right. Foreground distances and partial screening would lower visual contrast to moderate levels. Visual impacts on recreational viewers would be moderate to high due to the tunneling effect, or framing of both sides of the roadway, that the high-voltage transmission lines would create along this portion of the roadway.

Medicine Bow National Forest

The Medicine Bow Forest Plan includes standards for utility corridors to minimize scenic impacts and plan for rehabilitation of existing impacts. It includes:

> *Scenery Management, Standard 1 (LRMP 1-56): Apply Management System (SMS) to all NFS lands. Travel routes, use areas, and water bodies determined to be of primary importance are a concern Level 1 and appropriate Scenic Integrity Objectives (SIOs) are established according to the SMS.*

The Forest Plan also includes this guideline:

> *Locate and design utility corridors and electronic sites to blend with the landscape and be compatible with scenic integrity objectives in adjacent management areas.*

The Forest has recommended measures to reduce contrast, such as preparing a site-specific vegetation management plan, feathering the ROW edges, using towers similar to the existing structures, and using material for the towers that, over time, becomes non-reflective.

Conformance with BLM VRM Classes and Forest Service VQOs

Portions of Segment 1E and its alternative routes would cross public lands managed under the Casper and Rawlins RMPs and Medicine Bow Forest Plan. The construction and operations of a transmission line along Segment 1E would conform with BLM VRM Class IV objectives where the level of change to the characteristic landscape resulting from the project can be considered high and may dominate views or be the major focus of viewer's attention. Overall, the construction and operations of a transmission line along the Segment 1E Proposed Route or Route Alternatives would conform to BLM VRM Class III objectives, which require that a project partially retain the existing character of the landscape and only result in moderate levels of change to the characteristic landscape (see KOPs 90 and 986). Portions of the Proposed and Alternative routes that cross VRM Class II lands would not conform to management objectives and amendments would be needed (see Appendices F-1 and G-1).

The construction and operations of a transmission line along Segment 1E would not be consistent with the Medicine Bow Forest Plan management objectives in all areas of the Forest crossed. Segment 1E would cross NFS lands designated as MA 3.31, Backcountry Recreation, Year-round Motorized. MA 3.31 has an SIO of Moderate. Impacts would be moderate due to screening offered by vegetation and landforms, distance of viewers, and lack of densely populated areas in this intact landscape. The area is not visible from any developed recreation area or travel way. Existing roads are closed to the public. Any new roads would also be closed. The borders of the cleared ROW would be feathered to create a more natural-appearing line, as required by the Forest Plan. Also, the towers would be made of material that, over time, becomes non-reflective. New towers would be similar to the existing towers to reduce contrast. A plan amendment would be needed (see Appendices F-2 and G-2).

Segment 1E Proposed Route – The Proposed Route would cross over 2.6 miles of BLM-administered VRM Class II lands in the Casper FO generally between MPs 21 and 43.8, and 2.4 miles in the Rawlins FO generally between MPs 48 and 56, creating a new ROW. Crossing VRM Class II areas without paralleling an existing transmission facility would result in a noticeable change to the landscape from the increased contrast because the new facilities would represent a level of change to the landscape and basic elements that would attract the attention of the casual observer. Four such areas occur along the Segment 1E Proposed Route (see KOPs 991, 993, and 995). Amendments would likely be needed for both the Casper RMP and Rawlins RMP either changing the VRM class or allowing a one-time visually-altering action without changing the VRM classification (see Appendix G-1, Sections 5.1.2 and 5.2.1).

The effects discussed above for the following KOPs would only occur if the corresponding amendments were approved. KOPs 105 and 988 include views of BLM

Class II land that would require an amendment to the visual management direction in the RMPs in order for the project to be built. The effects discussed for additional KOPs

Alternative 1E-A – Alternative 1E-A would not cross BLM-administered or NFS lands.

Alternative 1E-B – Alternative 1E-B would cross over 2.6 miles of BLM-administered VRM Class II lands in the Rawlins FO generally between MPs 2.4 and 14.3, resulting in a degree of change that would attract the attention of a casual observer and therefore would conform to the RMP. An amendment would be needed if this route is selected. The proposed amendment would change VRM class designation to VRM Class III for three of the parcels that would be more visible to recreational users and retain the remaining parcels that are not easily viewed as VRM Class II. No NFS land would be crossed.

The effects analysis for KOPs 105, 986, and 988 includes areas of VRM Class II lands and thus these effects would only occur if the amendment were approved.

Alternative 1E-C – Route Alternative 1E-C would cross over 23 miles of BLM-administered VRM Class II, III, and IV lands in the Casper FO and Rawlins FO. Alternative 1E-C, however, would parallel an existing line and is anticipated to conform to VRM Class II, III, and IV objectives (see KOPs 86, 89, and 105) in most areas. Where the VRM requirements would not be met (i.e., within in scattered isolated VRM Class II parcels), a one-time visually-altering action without changing the VRM classification is recommended. It is also recommended that the 630-acre VRM Class II parcel crossed by 1E, 1E-C, 1W(a), and 1W(c), north of Medicine Bow NF would be reclassified as VRM Class III (see Appendix G-1, Section 5.1.2).

Alternative 1E-C would also cross Medicine Bow-Routt NFs–managed lands designated as MA 8.3 and managed with an SIO of Moderate. The Route Alternative would neither be consistent with MA 3.31 designation nor an SIO of Moderate, thus an amendment would be needed. It is recommended that the plan be amended to change the prescription to MA 8.3 and to allow the Project without changing the SIO (see Appendix G-2 5.1.1.3). Alternative 1E-C would affect less NFS land than Segment 1E of the Proposed Route

The effects analysis for KOPs 89 and 96 may include views where the project is on BLM Class II land, thus these effects, in part, would only occur if an amendment were approved.

Segment 1E Conclusion

There are three alternatives to the Proposed Route: Alternatives 1E-A, 1E-B, and 1E-C. The comparison portion of the Proposed Route would have more evenly distributed visual impacts than Alternative 1E-A due to the Proposed Route being located 2.0 miles closer to Glenrock, creating a new visible disturbance from the many views of the residents within the town, and Alternative 1E-A being located closer to sensitive viewers mainly along Deer Creek. Impacts would be higher for the Proposed Route along this comparative segment. Overall impacts for Alternative 1E-B would be higher than for the comparison portion of the Proposed Route due to the alternative being immediately adjacent (less than 0.25 mile) to sensitive viewers along the Rock Creek and Fort

Fetterman Road. Overall, visual impacts resulting from Alternative 1E-C would be lower than the comparison segment of the Proposed Route due to the lack of sensitive viewing locations, crossing less BLM-administered land managed to conform to VRM Class II and III objectives, and paralleling existing and proposed transmission lines.

Segment 1W (Segments 1W[a] and 1W[c]) – Windstar to Aeolus

Segment 1W is composed of two parts, Segment 1W(a) and 1W(c), both of which would consist of a new 230-kV line for part of their length and a reconstruction of an existing 230-kV line for the remaining part. Segment 1W(a) would be about 76.5 miles long, and would extend from the Windstar Substation to the Aeolus Substation. Segment 1W(c) would be about 70.6 miles long, and would extend from the Dave Johnson Power Plant to the Aeolus Substation. Alternative 1W-A is a 16.2-mile alternative located near the town of Glenrock, which was the Proponents' initial proposal before moving the Proposed Route at the suggestion of local landowners in order to avoid the more settled area around Glenrock. Twenty acres of the proposed expansion at the Windstar and Aeolus Substations are attributed to Segment 1W(a) and 3 acres of the expansion at the Heward Substation and 17 acres of the expansion at the Windstar and Aeolus Substations are attributed to Segment 1W(c). There are no Route Alternatives proposed south of that point (see Appendix A, Figure A-2).

Proposed Route – Segment 1W(a)

Table 3.2-5 summarizes the potential visual impact for each KOP in Segment 1W(a).

Table 3.2-5. Visual Impact Assessment for Each KOP in the Segment 1W(a) Proposed Route

KOP	Viewers[2/]	Land Ownership	Viewer Rating[3/]	Scenic Quality[3/]	Distance (miles)	Visibility[3/]	Contrast[3/]	Impact[3/]
1004	RES	Private	H	L-M	650 feet	H	H	M-H
1005	RES	Private	H	M	0.80	H	L-M	M
1008	REC	Private	H	L-M	1.50	M-H	M	M
1006	RES	Private	H	L-M	0.25	H	M-H	M-H
89[1/]	REC	Private	H	L-M	2.25	L-M	L-M	L-M
86[1/]	REC	BLM VRM III	H	L-M	0.5-1.25	M	M	M
105	REC	State of WY	H	L-M	0.3-0.60	M-H	L-M	L-M

1/ Viewers at KOP would have views of Segment 1W(c) with lower anticipated visual impacts and Alternative 1E-C with higher impacts.
2/ RES – A single resident. REC – A recreational viewer.
3/ H – High, M – Medium, L – Low

KOP C98 (Figure E.2-1). Discussed in Section 3.2.1.4, this view is looking toward Segment 1W from a historic cabin. This viewpoint is discussed in Section 3.3 – Cultural Resources.

KOP 1004 (Figure E.2-1). High-sensitivity residential viewers at KOP 1004 would have a high level of Project visibility at 650 feet from the Proposed Route. There are few opportunities for screening with the surrounding terrain, resulting in high contrast levels due to the possibility of skylining. Impacts on residential viewers from this KOP and in

the general vicinity are expected to be moderate to high due to the close distance of the view and low to moderate scenic quality.

KOP 1005 (Figure E.2-1). High-sensitivity residential viewers at KOP 1005 would have a high level of Project visibility (approximately 0.8 mile from the Proposed Route). The viewer would have an expansive and panoramic view toward the Proposed Route with some opportunities for screening with large vegetation in the middleground and visible human-made structures (i.e., transmission line, communication tower, and numerous buildings). Contrast levels are anticipated to be low to moderate. Impacts on residential viewers from this KOP and in the general vicinity are expected to be moderate. The close distance of the view and moderate contrast level, as well as presence of visible human-made alterations adjacent to the view, lower scenic quality.

KOP 1008 (Figure E.2-1). High-sensitivity recreational viewers at KOP 1008 would have a moderate to high level of Project visibility (approximately 1.5 miles away). The viewer would have an expansive and panoramic, superior view toward the Proposed Route with some opportunities for screening. Contrast levels are anticipated to be moderate. Impacts on recreational viewers from this KOP and in the general vicinity are expected to be moderate. The relatively close distance of the viewer and moderate contrast level, as well as presence of visible human-made alterations adjacent to the view, lower scenic quality.

KOP 1006 (Figure E.2-1). High-sensitivity residential viewers at KOP 1006 would have a high level of Project visibility (approximately 0.25 mile from the Proposed Route). The viewer would have an expansive and panoramic view toward the Proposed Route with few opportunities for screening. Contrast levels are anticipated to be moderate to high. Impacts on residential viewers from this KOP and in the general vicinity are expected to be moderate to high. The close distance of the view and moderate to high contrast level, as well as presence of visible human-made alterations adjacent to the view, lower scenic quality.

KOP 89 (Figure E.2-1. This KOP is discussed under Segment 1E.

KOP 86 (Figure E.2-1). This KOP is discussed under Segment 1E.

KOP 105 (Figure E.2-1). This KOP is discussed under Segment 1E.

Proposed Route – Segment 1W(c)

Table 3.2-6 summarizes the potential visual impact for each KOP in Segment 1W(c).

Table 3.2-6. Visual Impact Assessment for Each KOP in the Segment 1W(c) Proposed Route

KOP	Viewers[4/]	Land Ownership	Viewer Rating[5/]	Scenic Quality[5/]	Distance (miles)	Visibility[5/]	Contrast[5/]	Impact[5/]
56	REC/HIST	Private	H	L-M	2.25	M	L	L-M
83[1/]	RES	Private	H	L-M	0.75	H	L-M	L-M
1013[2/]	RES	Private	H	M-H	500 feet	H	M-H	M-H
105[3/]	REC	State of WY	H	L-M	0.25	M-H	M	M
71	RES	State of WY	H	M	0.80	M-H	M	M
1011	RES	Private	H	M-H	Not in view	H	L-M	L-M

1/ Viewers at KOP 83 would have views of Alternative 1W-A with lower anticipated visual impacts.
2/ Viewers at KOP 1013 would have views of Alternative 1E-A with lower anticipated visual impacts.
3/ Viewers at KOP 105 would have views of the Proposed Route with lower anticipated visual impacts.
4/ RES – A single resident. REC – A recreational viewer. HIST – A site identified as having historic value.
5/ H – High, M – Medium, L – Low

KOP 56 (Figure E.2-1). Viewers from KOP 56 would be high-sensitivity recreational viewers traveling along the Oregon NHT (approximately 2.25 miles from the Segment 1W(c) Proposed Route). At KOP 56, high-sensitivity recreational viewers along the Oregon NHT would have a moderate level of Project visibility due to middleground distances and existing industrial features (i.e., transmission structures, Dave Johnston Power Plant). Visual contrast levels would be low, while impacts on recreational viewers would be low to moderate due to distance and the visible industrial features within the view.

KOP 83 (Figure E.2-1). Viewers at KOP 83 would be high-sensitivity residential viewers (approximately 0.75 mile within the Proposed Route. At KOP 83, the Project would be highly visible to high-sensitivity residential viewers due to foreground distances and skyline effects created by the existing and proposed structures. Visual contrast levels would be low to moderate. Numerous human-made alterations within the middleground view would create low to moderate visual impacts on residential viewers.

KOP 1013 (Figure E.2-1). High-sensitivity residential viewers at KOP 1013 would have a high level of project visibility 500 feet from the Proposed Route. The viewer would have an expansive and focal view toward the Proposed Route with few opportunities for backdropping and/or screening. Contrast levels are anticipated to be moderate to high. Impacts on residential viewers from this KOP and in the general vicinity are expected to be moderate to high due to the close distance of the view and the dominating existing transmission line.

KOP 105 (Figure E.2-1). Viewers from KOP 105 are high-sensitivity recreational viewers traveling along the BLM access road south of Medicine Bow-Routt NFs (approximately 0.25 mile from the Segment 1W(c) Proposed Route and 0.5 mile from the Segment 1W(a) Proposed Route, which would parallel the existing transmission line corridor). At KOP 105, the viewers would have a moderate to high level of Project visibility due to foreground and middleground distances and a lack of vegetative or topographic screening. Visual contrast levels would be moderate. Human-made alterations within the vicinity and backdropping effects created by the surrounding landscape help blend the proposed facilities into the landscape. Visual impacts on the

recreational viewers would be moderate due to contrast levels and existing transmission lines.

Alternative 1W-A

Table 3.2-7 summarizes the potential visual impact for each KOP in Alternative 1W-A.

Table 3.2-7. Visual Impact Assessment for Each KOP in Alternative 1W-A

KOP	Viewers[3/]	Land Ownership	Viewer Rating[4/]	Scenic Quality[4/]	Distance (miles)	Visibility[4/]	Contrast[4/]	Impact[4/]
1010[1/]	RES	Private	H	L	0.50	H	M	M
71[2/]	RES	State of WY	H	M	300 feet	H	H	M-H
1011[2/]	RES	Private	H	M-H	1.65	M-H	L-M	M
38	REC/HIST	State of WY	H	L-M	2.75	L-M	L-M	L-M
37	REC/HIST	Private	H	L-M	2.90	L	L	L
83	RES	Private	H	L-M	5.00	L-none	L-none	L-none
1013	RES	Private	H	M-H	1.60	M-H	L-M	M

1/ Viewers at KOP 1010 would have views of Segment 1E with lower anticipated visual impacts.
2/ Viewers at KOP would have views of Segment 1W(c) and Alternative 1E-A with lower anticipated visual impacts.
3/ RES – A single resident. REC – A recreational viewer. HIST – A site identified as having historic value.
4/ H – High, M – Medium, L – Low

KOP 1010 (Figure E.2-1). High-sensitivity residential viewers at KOP 1010 would have a high level of Project visibility (approximately 0.5 mile from Alternative 1W-A). The viewer would have an expansive and panoramic view toward the proposed realignment with few opportunities for screening in a landscape cluttered with highly visible geometric and vertical human-made alterations. Contrast levels are anticipated to be moderate. Impacts on residential viewers from this KOP and in the general vicinity are expected to be moderate for Proposed Route 1W-A due to the close distance of the view and moderate contrast level.

KOP 71 (Figure E.2-1). High-sensitivity residential viewers at KOP 71 would have a high level of Project visibility (approximately 300 feet from Alternative 1W-A of the Project). The viewer would have an expansive and panoramic view toward Alternative 1W-A with some opportunities for backdropping offered by the background terrain. Contrast levels are anticipated to be high. Impacts on residential viewers from this KOP and in the general vicinity are expected to be moderate to high due to the distance of the view and high contrast level.

KOP 1011 (Figure E.2-1). High-sensitivity residential viewers at KOP 1011 would have a moderate to high level of Project visibility (approximately 1.65 miles from Alternative 1W-A and 2.5 miles from where Segments 1W[a], 1E, and 1W[c] all converge). The viewer would have an expansive but focal view toward Alternative 1W-A with opportunities for both backdropping and screening. Contrast levels are anticipated to be low to moderate. Impacts on residential viewers from this KOP and in the general vicinity are expected to be moderate due to the distance of the view and low to moderate contrast level.

KOP 38 (Figure E.2-1). This KOP is discussed under Segment 1E.

KOP 37 (Figure E.2-1). This KOP is discussed under Segment 1E.

KOP 83 (Figure E.2-1). This KOP is discussed under Segment 1E.

KOP 1013 (Figure E.2-1). This KOP is discussed under Segment 1E.

Medicine Bow National Forest

The Medicine Bow Forest Plan includes standards for utility corridors to minimize scenic impacts and plan for rehabilitation of existing impacts. Mitigation requirements are discussed under Segment 1E.

Conformance with BLM VRM Classes and Forest Service VQOs

Overall, the construction and operations of the Segment 1W Proposed Route or Route Alternative conform to BLM VRM Class III and IV objectives. Impacts would be moderate with areas of lower to moderate impacts and isolated incidents of moderate to high impacts due to screening offered by vegetation and landforms, distance of viewers, and lack of densely populated areas in this landscape.

Segment 1W(a) Proposed Route – The Proposed Route would cross less than 0.7 mile of VRM Class II lands primarily between MPs 32.1 and 33.0 and with other small instances between MPs 39.1 and 39.8 and between MPs 42.1 and 42.2 near KOPs 89 and 105. Segment 1W(a) would parallel an existing transmission line and would be a reconstruction of an existing line between approximately MP 30 and MP 39. It is anticipated that Segment 1W(a) may conform to VRM Class II objectives because it would repeat the basic elements (form, line, color, texture) present in the landscape when considered in context with the existing transmission lines. It might, therefore, not draw the attention of the casual observer. However, because the transmission line is not part of the natural landscape, and increasing the transmission line presence through this area could cumulatively draw more attention from the casual observer, amendments to the Casper RMP have been proposed for those locations where the route crosses VRM Class II lands. Where Segments 1W(a), 1W(c), and 1E would cross a VRM Class II parcel in parallel, it is proposed that the 630-acre parcel be reclassified to VRM Class III such that the designation is more reflective of the multiple-transmission line land use (see Appendix G-1, Section 5.1.1). Proposed Route 1W(a) would also cross numerous smaller parcels where it is proposed an amendment to the Casper RMP be made to allow a one-time visually altering action without changing the VRM classification.

Segment 1W(a) would cross Medicine Bow-Routt NF-managed lands designated as MA 8.3, Utility Corridors and Electronic Sites. The corridor is managed to meet the adjacent SOI, which is Moderate. Segment 1W(a) would be a rebuild of the existing line within the Medicine Bow-Routt NFs; therefore, it would be consistent with the Forest Plan even though it would not meet the SIO of Moderate.

Effects analyses for KOPs for 1W(c) do not likely contain views including BLM-managed land; thus, an assessment of the amendment effect on KOPs for 1W(a) was not included.

Segment 1W(c) Proposed Route – This route would cross BLM-managed VRM Class II lands located in the Sensebaugh Canyon area between MPs 26.0 and 27.2.

Segment 1W(c), which would be a reconstruction of an existing transmission line to MP 23.7 and would parallel an existing transmission line from that point to MP 34, from which point it continues as a reconstruction of an existing line for the remainder of its length. It is anticipated that Segment 1W(c) would conform to VRM Class II objectives because it would repeat the basic elements (form, line, color, texture) present in the landscape when considered in context with the existing transmission lines; therefore, Segment 1W(c) would not draw the attention of a casual observer. However, it is recommended that the 630-acre parcel of VRM Class II (Area of Inconsistency [AOI] C-1, Appendix G-1, Section 5.1.1) be reclassified to VRM Class III. Where Segment 1W(c) crosses numerous small parcels south of this parcel, it is recommended that the Project be allowed as a one-time visually altering action, without changing the VRM classification.

Segment 1W(c) would be a new transmission line where it crosses the Medicine Bow-Routt NFs. It would be placed along the edge of the WWE corridor. The adjacent lands are designated as MA 3.31, Backcountry Recreation, Year-round Motorized. New developments within the utility corridor must meet the SIO of the adjacent management area. MA 3.31 has an SIO of Moderate. Segment 1W(c) would not be consistent with the SIO of Moderate and thus an amendment would be needed (see Appendices F-2 and G-2, Section 5.1.1.3).

The effects analysis for KOP 105 includes land that is currently managed as VRM Class II, thus the impacts of the project discussed for this KOP would only occur in an amendment were approved.

Alternative 1W-A – Alternative 1W-A would not cross BLM-managed or NFS lands and therefore is not subject to BLM or Forest Service visual resource management.

Segment 1W and Alternative 1W-A Conclusion

Impacts to public, private, and state lands are anticipated to be moderate with areas of low to moderate impacts. Alternative 1W-A would have less visual impact associated with views in Glenrock, Wyoming, than the comparison portion of the Proposed Route due to fewer viewers and the fact it would parallel an existing transmission line.

Segment 2 – Aeolus to Creston

Segment 2, as proposed, would link the Aeolus and Creston Substations in southeast Wyoming with two 500-kV circuits on one structure. One circuit would be operated at 230 kV during the initial phase of the Project. Its total proposed length is 96.7 miles, 36.9 miles of which are on BLM-administered land (22.9 miles VRM Class III and 14.0 miles VRM Class IV). Fifty-two acres of the expansion of the Aeolus Substation and the construction of the Creston Substation and 0.5 acre for one regeneration site are attributed to Segment 2. There are three Route Alternatives, two of which are near the community of Fort Fred Steele. Alternative 2A at 28.4 miles long is being considered by the BLM because it remains in the WWE corridor nearer the town and the state historic site. Alternative 2B, at 6.2 miles, is closer to the community than the comparison portion

of the Proposed Route[3] and was the initially proposed route before the Proponents responded to local suggestions and relocated the Proposed Route farther to the south. Alternative 2C is a 24.4-mile alternative located north of Hanna, Wyoming. It is being evaluated at the recommendation of the Wyoming Governor's office to follow a utility corridor approved by that office for minimizing effects to sage-grouse (see Appendix A, Figure A-3).

Table 3.2-8 summarizes the potential visual impact for each KOP in Segment 2.

Table 3.2-8. Visual Impact Assessment for Each KOP in the Segment 2 Proposed Route

KOP	Viewers[1/]	Land Ownership	Viewer Rating[2/]	Scenic Quality[2/]	Distance (miles)	Visibility[2/]	Contrast[2/]	Impact[2/]
836 (east)	RES	Private	H	M-H	1.00	M-H	M-H	M-H
94	REC	Private	M	L-M	1.20	M-H	M	M
822	REC	Private	H	H	0.45	H	M-H	M-H
824	RES	Private	H	M	0.7	H	M-H	M-H
829	RES	Private	H	L-M	0.03	H	H	M-H
838	RES	Private	H	M	0.83	L-M	L	L-M

1/ RES – A single resident. REC – A recreational viewer.
2/ H – High, M – Medium, L – Low

KOP C4 (Figure E.2-2). Views from this viewpoint on Lincoln Highway are discussed in Section 3.3 – Cultural Resources.

KOP C3 (Figure E.2-2). Views from this viewpoint on Lincoln Highway are discussed in Section 3.3 – Cultural Resources.

KOP C2 (Figure E.2-2). Views from this viewpoint on Lincoln Highway are discussed in Section 3.3 – Cultural Resources.

KOP C1 (Figure E.2-2). Views from this viewpoint on the Rawlins to Baggs Stage Road and are discussed in Section 3.3 – Cultural Resources.

KOP 836-East (Figure E.2-2). Viewers within this area include high-sensitivity residential viewers on Highway 30 looking east. Viewers at KOP 836 would be approximately 1.0 mile from the Segment 2 Proposed Route, representing a foreground view. Residential viewers at this location would have a moderate to high level of Project visibility due to the surrounding terrain. The viewer would have an expansive view toward the Proposed Route with opportunities for screening and backdropping provided by the surrounding rolling to rugged terrain Contrast levels are anticipated to be moderate to high due to the possibility of skylining in certain portions of the view. Impacts on residential viewers from this KOP and in the general vicinity are expected to be moderate to high due to the distance of the view and moderate to high contrast level.

[3] The portion of the Proposed Route that starts and ends at the same nodes as the Route Alternative.

KOP 94 (Figure E.2-2). Viewers from KOP 94 would be moderate sensitivity recreational viewers traveling along the Old Lincoln Highway (approximately 1.2 miles from the Segment 2 crossing). The Project would be moderately to highly visible due to middleground distances. These views, however, would be brief when travel speeds are in excess of 55 miles per hour (mph). Visual contrast levels would be moderate due to the numerous human-made alterations within the vicinity, which include a substation, transmission lines, and other structures. Visual impacts on viewers would be moderate due to visual contrast levels and the short duration of views.

KOP 822 (Figure E.2-2). High-sensitivity recreational viewers at KOP 822 would have a high level of Project visibility (approximately 0.45 mile from the Proposed Route). The view would span the Hogback across the North Platte River in the foreground, possibly even skylining the rugged terrain. The viewer would have an enclosed and focal view toward the Proposed Route with some opportunities for screening once the route crosses the river. Contrast levels are anticipated to be moderate to high. Impacts on recreational viewers from this KOP and in the general vicinity are expected to be moderate to high due to the distance of the view and the possibility of skylining the terrain as well as the high scenic quality. An amendment of the Rawlins RMP would be needed to allow the Project in this area (see Appendix G-1, Section 5.2.3).

KOP 824 (Figure E.2-2). High-sensitivity residential viewers at KOP 824 would have a high level of Project visibility (approximately 0.7 mile from the Proposed Route), and a moderate level of Project visibility for Alternative 2B (approximately 1.25 miles away). The viewer would have an expansive and panoramic view toward the Proposed Route and Route Alternatives with some opportunities for screening provided by the terrain and large vegetation adjacent to the North Platte River. Contrast levels are anticipated to be moderate to high for the Proposed Route and low to moderate for Alternative 2B due to numerous visible human-made alterations. Proposed Route impacts on residential viewers from this KOP and in the general vicinity are expected to be moderate to high due to the distance of the view and moderate to high contrast level, as well as presence of visible human-made alterations adjacent to the view. Alternative 2B impacts on residential viewers from this KOP and in the general vicinity are expected to be low to moderate. The distance of the view and opportunities for screening, provided by vegetation and terrain, as well as presence of visible human-made alterations adjacent to the view detract from the scenic quality.

KOP 829 (Figure E.2-2). Viewers within this area include high-sensitivity residential viewers on Sage Creek Road Southwest of Rawlins, Wyoming. Residential viewers at KOP 829 would have a high level of Project visibility at 150 feet (0.03 mile) from the Proposed Route, representing an immediate foreground view. The viewers would have an expansive and panoramic view toward the Proposed Route with few opportunities for screening. Contrast levels are anticipated to be high for views of the Proposed Route. Impacts on residential viewers from this KOP and in the general vicinity are expected to be moderate to high. The distance of the viewer from the Project, high contrast levels, and the presence of visible human-made alterations adjacent to the view lower scenic quality.

KOP 838 (Figure E.2-2). See discussion under Alternative 2A.

Alternative 2A

Table 3.2-9 summarizes the potential visual impact for each KOP in Alternative 2A.

Table 3.2-9. Visual Impact Assessment for Each KOP in Alternative 2A

KOP	Viewers[4/]	Land Ownership	Viewer Rating[5/]	Scenic Quality[5/]	Distance (miles)	Visibility[5/]	Contrast[5/]	Impact[5/]
838[1/]	RES	Private	H	M	0.30	H	L-M	M
836 (west)	RES	Private	H	M	1.80	L-M	M	M
9[2/]	REC	Private	H	L-M	0.50	M	M-H	M
5[3/]	REC	Private	H	L-M	0.25	M	M	M

1/ Viewers at KOP 838 would have views of the Proposed Route with lower anticipated visual impacts.
2/ Viewers at KOP 9 would have views of Alternative 2B with lower anticipated visual impacts.
3/ Viewers at KOP 5 would have views of Alternative 2B with lower anticipated visual impacts.
4/ RES – A single resident. REC – A recreational viewer.
5/ H – High, M – Medium, L – Low

KOP 838 (Figure E.2-2). Viewers within this area included high-sensitivity residential viewers in the town of Hanna, Wyoming. Viewers at KOP 838 would have a high level of Project visibility (approximately 0.3 mile from Alternative 2A), representing a foreground view. The viewer would also have an expansive and panoramic view toward the Proposed Route (approximately 0.7 mile away) that would be screened by the Alternative 2A and two other transmission lines. Contrast levels are anticipated to be low to moderate. Impacts on residential viewers from this KOP and in the general vicinity are expected to be moderate for Alternative 2A. The distance of the view, low to moderate contrast levels, and visible human-made alterations adjacent to the view lower scenic quality.

KOP 836-West (Figure E.2-2). Viewers within this area include high-sensitivity residential viewers on Highway 30 looking west-northwest. The viewer looking west (KOP-West) would have a low to moderate level of Project visibility with partially screened foreground views of Alternative 2A. The viewer looking east (KOP-East) would have an expansive though partially screened view toward the Proposed Route with opportunities for terrain screening. Contrast levels are anticipated to be moderate to high. Impacts on residential viewers from this KOP looking west-northwest to Alternative 2A are expected to be moderate due to the distance of the view, contrast levels, scenic quality, and the presence of visible human-made alterations, lowering scenic quality.

KOP 9 (Figure E.2-2). Viewers within this area include high-sensitivity recreational viewers visiting the cemetery at Fort Fred Steele. Viewers at this location would be less than 0.5 mile from Alternative 2A, representing a foreground to middleground view. From KOP 9, a moderate to high level of contrast is anticipated due to the lack of screening and the presence of two existing transmission lines. Views of the new lines would not draw the attention of a casual observer. Visual impacts on recreational viewers would be moderate due to the foreground to middleground distance and existing structures. The least visual impact would occur with Alternative 2B, which would be 1.5 miles farther from Fort Fred Steele.

KOP 5 (Figure E.2-2 and Photo Simulation E.2-14). High-sensitivity recreational viewers at the Fort Fred Steele informational kiosk would have a moderate level of

Project visibility. The Project would be visible in middleground views, along with two existing transmission lines. KOP 5 is approximately 0.25 mile from Alternative 2A representing a foreground to middleground view. Visual contrast levels would be moderate for Alternative 2A but these views are not anticipated to draw the attention of a casual observer. Two existing transmission lines and other human-made features are the focal points in the view. Impacts on recreational viewers would be moderate. Use of steel pole H-frame structures similar in form to the existing transmission lines at Fort Fred Steele could reduce impacts by matching existing structures in the area. The following mitigation measure has been identified by the Agencies:

VIS-17 Single-circuit H-frame structures shall be used to reduce visual impact to Fort Fred Steele between MP 38.0 to MP 43.0 for Alternative 2B and MP 18.0 to MP 24.0 for Alternative 2A to match the existing structures.

Alternative 2B

Alternative 2B would be 6.2 miles long and would cross a checkerboard of land ownership. Approximately 2.3 miles of BLM-managed land would be crossed, all of which is managed with VRM Class III objectives. The transmission line should conform to VRM objectives. The following KOPs represent anticipated areas of visual impacts from this Alternative. KOPs 9 and 5 are discussed in the discussion on Alternative 2A. Table 3.2-10 summarizes the potential visual impact for each KOP in Alternative 2B.

Table 3.2-10. Visual Impact Assessment for Each KOP in Alternative 2B

KOP	Viewers[2/]	Land Ownership	Viewer Rating[3/]	Scenic Quality[3/]	Distance (mile)	Visibility[3/]	Contrast[3/]	Impact[3/]
4[1/]	RES	Private	H	M	0.25	H	M	M-H
9	REC	Private	H	L-M	0.60	M	M	L-M
5	REC	Private	H	L-M	0.71	L-M	L-M	L-M

1/ Viewers at KOP 4 would have views of Alternative 2A with lower anticipated visual impacts.
2/ RES – A single resident. REC – A recreational viewer.
3/ H – High, M – Medium, L – Low

KOP C4 (Figure E.2-2). High-sensitivity residential viewers at KOP 4, south of Fort Fred Steele, would have a high level of Project visibility in the foreground and middleground. Viewers at this location would be less than 0.25 mile from the Route Alternative, representing a foreground view. Visual contrast levels would be moderate. Views would not draw the attention of a casual observer due to the backdropping effect created by the mountainous terrain in the and the presence of two existing transmission lines. Visual impacts on residential viewers would be moderate to high due to the distance and contrast level of Alternative 2B. Use of steel pole H-frame structures would reduce visual impact (see mitigation measure above).

Alternative 2C

Alternative 2C would traverse an area of checkerboard land ownership, west of Hanna Bar Road, which consists of 11.4 miles of BLM-administered land and 12.9 miles of Wyoming state lands. BLM-administered land in this area is primarily VRM Class III (3.7 miles) and IV (7.6 miles); therefore, this alternative should conform to VRM objectives. Alternative 2C could be seen from the KOPs of Alternative 2A and the

Proposed Route due to the close proximity of the alternative to the Proposed Route from the town of Hanna, Wyoming. There is one KOP location selected to represent the most sensitive or typical views within this area of the Project.

Table 3.2-11 summarizes the potential visual impact for each KOP in Alternative 2C.

Table 3.2-11. Visual Impact Assessment for Each KOP in Alternative 2C

KOP	Viewers[2/]	Land Ownership	Viewer Rating[3/]	Scenic Quality[3/]	Distance (mile)	Visibility[3/]	Contrast[3/]	Impact[3/]
836 (west)[1/]	RES	Private	H	M	1.0	M	M-H	M-H

1/ Viewers at KOP 836 (west) would have views of Alternative 2A with higher anticipated visual impacts.
2/ RES – A single resident.
3/ H – High, M – Medium, L – Low

KOP 836-West (Figure E.2-2). Viewers within this area include high-sensitivity residential viewers on Highway 30. The viewer looking west (KOP West) would have a moderate level of Project visibility with partially screened foreground views of Alternative 2C. The viewer would have an expansive though partially screened view toward Alternative 2C with opportunities for terrain screening. Contrast levels are anticipated to be moderate to high. Impacts on residential viewers from this KOP and in the general vicinity are expected to be moderate to high. The distance of the view, contrast levels, and visible human-made alterations lower scenic quality.

Conformance with BLM VRM Classes

Overall, the construction and operations of the Segment 2 Proposed Route or Route Alternatives would conform to BLM VRM Class III and IV objectives. Impacts would be moderate with isolated areas of lower and higher impacts for private and state lands crossed by Segment 2 due to screening offered by vegetation and landforms, distance of viewers, and lack of densely populated areas in this landscape.

Segment 2 Proposed Route – The Proposed Route would cross VRM Class III lands in a checkerboard pattern between MPs 26.5 and 79.9 near KOPs 822 and 829. It is anticipated that because the Proposed Route does not dominate views and most impacts are moderate, it would conform to VRM Class III objectives in most areas. One area of inconsistency analyzed for this Project is a 951 acre VRM Class III parcel adjacent to the North Platte River and within the North Platte River SRMA. Crossing this parcel would likely conform to the Rawlins RMP and an amendment allowing a one-time visually altering action without changing the VRM classification may be needed if this route is selected (see Appendix G-1, Section 5.2.3).

Effects described for KOP 822 include land that is managed as VRM Class III in the North Platte River SRMA. An amendment would be needed for crossing this VRM parcel and thus the effect described would apply only if an amendment were approved.

Alternative 2A – Alternative 2A would cross BLM-managed VRM Class III lands located in a checkerboard pattern between MPs 9.4 and 27.4. It is anticipated that because Alternative 2A would not dominate any views and most impacts would be moderate, it would conform to VRM Class III objectives.

Alternative 2B – Alternative 2B would cross BLM-managed VRM Class III lands located in a checkerboard pattern along its entire length. It is anticipated that since Alternative 2B would not dominate any views and most impacts would be moderate, it would conform to VRM Class III objectives.

Alternative 2C – Alternative 2C would cross approximately 3.7 miles of BLM-managed VRM Class III and 6.5 miles of Class IV lands located in a checkerboard pattern along its entire length. It is anticipated that because Alternative 2C would not dominate any views and most impacts would be moderate, it would conform to VRM Class III and Class IV objectives.

Segment 2 – Conclusion

There are three Route Alternatives for a portion of the Proposed Route: Alternatives 2A, 2B, and 2C. Alternative 2A shares many of the same KOPs that have been described above for Alternative 2B. The shared KOPs are all within close proximity to Fort Fred Steele. Alternative 2B is approximately 1.5 miles farther from Fort Fred Steele and closer to local residences than Alternative 2A. Overall, the Proposed Route would have less visual impact than Alternatives 2A or 2B due to the increased viewing distance between Fort Fred Steele and residences located to the north of I-80. With increased view distance the facilities lack scale and spatial dominance and in some views are partially to totally screened by the foothills of the Hogback, resulting in overall low visual impacts, with a few isolated incidences of moderate to high impacts resulting from the residence and recreational access area located south of I-80. If Alternatives 2A or 2B were selected, steel pole H-frame structures would be used where noted due to the adjacent H-frame structures in the area of impact.

Alternative 2C shares KOP 836-West with Alternative 2A. At this location Alternative 2C would be closer and the visual impact would be moderate to high compared to the moderate impact from Alternative 2A. However, farther east Alternative 2A would be close to KOPs 838, C2, C3, and C4, as well as the community of Hanna. The overall visual impacts would be much greater from Alternative 2A compared to Alternative 2C.

Segment 3 – Creston to Anticline

Segment 3, as proposed, would link the Creston and Anticline Substations in southeast Wyoming with two 500-kV circuits on one structure. One circuit would be operated at 230 kV during the initial phase of the Project. Its total proposed length between those two substations is 46.7 miles. Sixty-nine acres of the construction of the Anticline and Creston Substations are attributed to Segment 3. Segment 3 would also link the Anticline and Jim Bridger Substations with a 4.3-mile 230-kV line and a 5.5-mile 345-kV line and includes the 10-acre expansion of the Jim Bridger 345-kV Substation. There are no alternatives proposed along this segment (see Appendix A, Figure A-4).

Proposed Route

Table 3.2-12 summarizes the potential visual impact for each KOP in Segment 3.

Table 3.2-12. Visual Impact Assessment for Each KOP in the Segment 3 Proposed Route

KOP	Viewers[1/]	Land Ownership	Viewer Rating[2/]	Scenic Quality[2/]	Distance (mile)	Visibility[2/]	Contrast[2/]	Impact[2/]
16	COMM	Private	M	L	0.75	H	M	L-M

1/ COMM – A commuter traveling on major highways or secondary roads.
2/ H – High, M – Medium, L – Low

KOP 16 (Figure E.2-3). Moderate-sensitivity viewers traveling on I-80 or at the rest stop adjacent to this KOP would have a high level of Project visibility, considering the open middleground views of the Project. Viewers at this location would be less than 0.75 mile from the Project, representing a middleground view of the Project. Visual contrast levels would be moderate, and the proposed transmission line is not anticipated to dominate the view from this VRM Class III area due to the existing transmission lines and oil and gas developments. Impacts on viewers would be low to moderate due to the lower quality of the landscape resulting from the human-made alteration and the lack of variation in form, color, line, or texture.

Conformance with BLM VRM

The Proposed Route would conform to BLM VRM Class IV objectives. Visual impacts to public, private, and state lands are anticipated to be mostly low because the area is used primarily for oil, gas, and pipeline development with few residents.

Segment 3 – Conclusion

There are no proposed Route Alternatives for Segment 3 and impacts to visual resources are anticipated to be low to moderate.

Segment 4 – Anticline to Populus

Segment 4, as proposed, would link the Anticline Substation near the Jim Bridger Power Plant in southwestern Wyoming with the Populus Substation in Idaho with two 500-kV circuits on one structure. Its total proposed length is 203 miles. Eighty-nine acres of the construction of the Anticline Substation and the expansion of the Populus Substation and 1.5 acres for three regeneration sites are attributed to Segment 4. It has six Route Alternatives in the middle portion of its route but the first 52 miles to the east and the last 61 miles to the west (in Idaho) do not have any Route Alternatives. The middle section of the Proposed Route is 90.2 miles long, and its Route Alternatives vary from 85 to 102 miles long. These alternatives were proposed by the Wyoming Governor's office (4A, paralleling the existing 345-kV lines throughout); by the BLM Kemmerer FO (4B through 4E, including edits from various cooperating agencies), with the intent to avoid impacts to cultural resources to the extent practical; and by the Proponents (4F, attempting to avoid impacts to cultural resources while still remaining north of the existing lines) (see Appendix A, Figures A-5 and A-6).

Table 3.2-13 summarizes the potential visual impacts for each KOP in Segment 4.

Table 3.2-13. Visual Impact Assessment for Each KOP in the Segment 4 Proposed Route

KOP	Viewers[2/]	Land Ownership[3/]	Viewer Rating[4/]	Scenic Quality[4/]	Distance (miles)	Visibility[4/]	Contrast[4/]	Impact[4/]
25	REC	BLM VRM III	H	M	0.7-1.0	H	L	L-M
23	REC	BLM VRM III	H	M	0.50	H	L	L-M
26	REC	BLM VRM III	H	M	0.25	H	H	M-H
1315	REC	BLM VRM II	H	M-H	1.90	L-M	L	L-M
1295	RES	BLM VRM IV	H	M	0.85	H	H	M-H
1288	REC	BLM VRM IV	H	M	300 feet	H	H	M-H
1292	RES	Private	H	M	0.83	H	H	M-H
1363	REC	Private	LH	M-H	<0.1	H	M-H	M-H
1326	RES	Private	H	M-H	260 ft	H	H	H
1319	REC	BLM VRM II	H	M	2.00	L-M	L-M	L-M
1359	REC	BLM VRM II	H	M-H	<0.1	H	M-H	M-H
1322	REC	BLM VRM II	H	H	0.50	M-H	M	M
635[1/]	REC	BLM VRM II	M-H	M-H	0.30	H	H	H
697	REC/ COMM	Private	H	M	1.50	M	L-M	M
705	RES	Private	H	L-M	0.50	H	L	L-M
758	REC	Forest Service MM VQO	H	M-H	0.30	M	M-H	M
757	REC	Forest Service MM VQO	H	M-H	0.50	L-M	M	L-M
746	RES/ SCHOOL	Private	H	M	0.50	H	L-M	M
778	REC	Private	H	M	0.50	H	M	M-H
691	RES	Private	H	M	0.50	H	H	H
775	REC/COMM	Private	H	L-M	2.20	M	L-M	M
770	REC	Private	H	M	0.75	H	M-H	M-H
1346	REC	Forest Service PR VQO	H	M-H	0.5	L-M	M	M-H

1/ Impacts to KOP 635 (Segment 4) would also apply to Alternative 4F because they share a portion of their alignment at this particular KOP. Most of the Alternative 4F alignment is farther away than the Proposed Route, resulting in lower impacts.
2/ RES – A single resident. REC – A recreational viewer. COMM – A commuter traveling on major highways or secondary roads. SCHOOL – A community school usually not identified as historic.
3/ PR – Partial Retention; MM – Maximum Modification
4/ H – High, M – Medium, L – Low

KOP C105 (Figure E.2-4). This view is looking toward Segment 4 from the McCauley's Road and Big Hill historic markers along the Oregon NHT. This viewpoint is discussed in Section 3.3 – Cultural Resources.

KOP 25 (Figures E.2-4 and E.2-16). High-sensitivity recreational viewers driving on U.S. Highway 191 would have a high level of Project visibility, considering the foreground views of the Project. Viewers at this location would be approximately 0.75 to 1.0 mile from the proposed 500/250-kV line. This KOP is representing a middleground view of the Project, which would parallel three existing transmission lines visible in the middleground. Visual contrast levels would be low, and these views would not draw the attention of a casual observer due to the three existing transmission lines

and backdropping effects created by the surrounding terrain. Visual impacts on recreational viewers would be low to moderate for either the Proposed Route or Route Alternative 4A. The existing transmission lines, lower the contrast levels of the Proposed Route and Route Alternatives.

KOP 23 (Figures E.2-4 and E.2-15). The Project would be highly visible to high-sensitivity recreational viewers, considering the middleground views of the Project and the lack of vegetative or topographic screening. Viewers at this location would be approximately 0.5 mile from the Project, representing a middleground view of the Project, which would parallel three existing transmission lines clearly visible in the middleground. Visual contrast levels would be low and these views are not anticipated to draw the attention of a casual observer due to the presence of the three existing transmission lines. Visual impacts on recreational viewers would be low to moderate for the Proposed Route and Alternative 4A. Two single-circuit steel-lattice structures with matching spans would replace the proposed single double-circuit lattice structures between MP 26.0 and MP 32.0 to reduce potential visual impacts by making structures match the existing transmission lines more closely.

KOP 26 (Figures E.2-4). Highly sensitive viewers at KOP 26 would be approximately 0.25 mile from the point where the Project would cross SR 372 and the Oregon NHT with trail markers in the foreground distance zone. The Project would be 0.25 mile from and highly visible to high-sensitivity recreational viewers along the Oregon NHT or accessing the North Platte River at KOP 26. The viewers would have broad, expansive views toward this segment. There would be high contrast due to few screening opportunities offered by vegetation or topography. Visual impacts on recreational viewers would be moderate to high due to close views and contrast levels.

KOP 1315 (Figure E.2-4). High-sensitivity recreational viewers in the BLM's Fontenelle Reservoir campground at KOP 1315 would have a low to moderate level of Project visibility (approximately 1.9 miles away) looking southwest toward State Highway 89 in the foreground and middleground. Topography in the view toward Segment 4 would result in partial, if not full, screening of Project elements, resulting in low contrast levels. Visual impacts on recreational viewers would be low to moderate due to distance and contrast levels.

KOP 1295 (Figure E.2-4). High-sensitivity residential viewers at KOP 1295 would have a high level of Project visibility (approximately 0.85 mile from Alternative 4F). The viewer would have an expansive view toward the alignment, which would not parallel any existing alignments or linear features and may skyline the rolling to rugged terrain of the middleground. This would result in high contrast levels. Potential visual impacts on residences from this KOP and in the general vicinity are expected to be moderate to high. The transmission line creating a new linear feature in a disturbed landscape will detract from the scenic quality.

KOP 1288 (Figure E.2-4/Appendix G-1, Figure K-1d). High-sensitivity recreational viewers at KOP 1288 would have a high level of Project visibility 300 feet from the Proposed Route. The viewer would have an expansive view toward the alignment, which would not parallel any existing alignments or linear features and may skyline the

rolling terrain of the middleground. Contrast levels are anticipated to be high. Potential visual impacts on recreationalists from this KOP and in the general vicinity are expected to be moderate to high due to the transmission line creating a new linear feature in a disturbed landscape with moderate scenic quality.

KOP 1292 (Figure E.2-4). High-sensitivity residential viewers at KOP 1292 would have a high level of Project visibility (approximately 0.83 mile from Alternative 4F). The viewer would have an expansive view toward the alignment, which would not parallel any existing alignments or linear features and may skyline and/or span the rolling to rugged terrain of the middleground. Contrast levels are anticipated to be high. Potential visual impacts on residences from this KOP and in the general vicinity are expected to be moderate to high due to the transmission line creating a new linear feature in a disturbed landscape with moderate scenic quality.

KOP 1363 (Figure E.2-4/Appendix G, Figure K-2d). High-sensitivity recreational viewers at KOP 1363 would have a high level of Project visibility (less than 0.1 mile from the Proposed Route) until they passed under the transmission lines. The viewing threshold would be of a short duration due to viewers traveling at speeds up to 35 mph. The viewer would have an expansive view of the Proposed Route, which would be perpendicular to the surrounding ridges. Several of the towers would be above the skyline and vegetation clearing would be obvious, resulting in moderate to high contrast levels. Visual impacts are expected to be moderate to high on this varied landscape with moderate to high scenic quality.

KOP 1326 (Figure E.2-5). High-sensitivity residential viewers at KOP 1326 would have a high level of Project visibility from 260 feet away looking southeast toward Round Mountain, a foreground view. Topography in the view toward the Proposed Route would not provide screening of Project elements. Contrast levels would be high. Visual impacts on recreational and seasonal viewers would be high due to the Proposed Route being in the immediate vicinity and the resulting contrast levels.

KOP 1319 (Figure E.2-5). High-sensitivity recreational viewers at KOP 1319 would have a low to moderate level of Project visibility (approximately 2.0 miles away) looking northeast. Topography in the view toward Segment 4 would result in partial if not full screening of Project elements, resulting in contrast levels that would be low to moderate. Visual impacts on recreational and seasonal viewers (hunters) would be low to moderate due to distance and contrast levels.

KOP 1359 (Figure E.2-5/Appendix G, Figure K-2b). High-sensitivity recreational viewers at KOP 1359 would have a high level of Project visibility in the foreground (less than 0.1 mile away) looking north across Commissary Ridge and the East Fork of Pole Creek. Topography and vegetation would provide some partial screening, resulting in contrast levels that would be moderate to high. Visual impacts would be moderate to high due to the distance to the Project and the moderate to high scenic quality.

KOP 1322 (Figure E.2-5). High-sensitivity recreational viewers at KOP 1322 would have a moderate to high level of Project visibility in the foreground (approximately 0.5 mile away) looking north toward Bear Canyon. Topography in the view toward the Proposed Route would provide some screening of Project elements, resulting in

contrast levels that would be moderate. Visual impacts on recreational viewers would be moderate due to partial screening and contrast levels.

KOP 635 (Figure E.2-5 and Photo Simulation E.2-18). From this KOP, located on the southern edge of Raymond Mountain WSA and adjacent to Quealy Reservoir, moderate to high sensitivity viewers would have a high level of Project visibility (approximately 0.3 mile away). The Proposed Route would be located in the foreground at approximately 0.3 mile from the potential viewers. Viewers would have a limited viewing distance within the surrounding terrain that includes the Project approaching from the southeast before turning west on a slope opposite the WSA in the middleground. Contrast levels would be high as a result of the near absence of existing structures and the skylined transmission towers. Visual impacts on viewers in the vicinity of this KOP would be high due to foreground distances and contrast level.

KOP 697 (Figure E.2-5). The Project would be highly visible to high-sensitivity recreational viewers along U.S. Highway 30 (approximately 1.5 miles from the Project). Viewers at this location would be approximately 1.5 miles from the Proposed Route, representing a foreground to middleground view of the Project. The viewers would have a broad, expansive view toward this segment, which generally parallels an existing transmission corridor. Contrast levels would be low to moderate. Visual impacts on recreational viewers would be moderate due to high visibility, which is offset by low to moderate contrast levels.

KOP 705 (Figure E.2-5). The Project would be highly visible to high-sensitivity residential viewers along a Bench Road at KOP 705 (approximately 0.5 mile away). Viewers at this location would be approximately 0.5 mile from the Proposed Route, representing a foreground view of the Project, which would parallel two existing transmission lines to the south that are highly visible due to skylining. The viewers would have an immediate foreground view toward this segment, which parallels two existing transmission lines. Contrast levels would be low. Impacts on residential viewers would be low to moderate due to contrast levels and existing transmission lines.

KOP 758 (Figure E.2-5). The Project would be moderately visible to high-sensitivity recreational viewers along North Canyon Road and at the campground in the Caribou-Targhee NF (approximately 0.3 mile away). Viewers at this location would be approximately 0.3 mile from the Proposed Route representing a middleground view of the Project, which would cross the North Canyon Road. Contrast levels would be moderate to high due to dense forest vegetation and possible forest clearing for the proposed ROW. The removal of vegetation would increase contrast and draw the attention of observers. The Forest Service has identified the following mitigation measures:

KOP 757 (Figure E.2-5). The Project would be low to moderately visible from 0.5 mile away to high-sensitivity recreational viewers along a Forest Service road in the Caribou-Targhee NF. Viewers at this location would be approximately 0.5 mile from Segment 4, which would generally parallel the existing Forest Service road to the south. The viewers would have a middleground view toward this segment, which would parallel a

Forest Service road, resulting in contrast levels that would be moderated by the dense forest vegetation.

KOP 746 (Figure E.2-5). From Thatcher Elementary School, the Project (approximately 0.5 mile away) would be highly visible to the educational viewers. Viewers at this location would be approximately 0.5 mile from the Proposed Route, representing a foreground view of the Project. The Project would parallel two existing transmission lines to the south and would be highly visible due to skylining of the existing terrain. The viewers would have an expansive view toward this segment, which would parallel two existing transmission lines and would be skylined. Contrast levels would be moderate. Visual impacts on viewers would be moderate to high due to distance and contrast levels.

KOP 778 (Figure E.2-5). High-sensitivity recreational viewers in Cottonwood Valley would have a high level of Project visibility (approximately 0.5 mile away). Viewers would be looking south toward the Proposed Route, a foreground view. Topography in the view toward the Proposed Route would result in partial screening and some backdropping of Project elements in this enclosed view. Contrast levels would be moderate. Visual impacts on recreational viewers would be moderate to high.

KOP 691 (Figure E.2-5). The Project would be highly visible to high-sensitivity residential viewers along South Pratt Road (approximately 0.5 mile away). Viewers at this location would be approximately 0.5 mile from Segment 4, representing a foreground view of the Project, which would not parallel existing transmission lines and would be highly visible due to flat valley terrain. The viewers would have a broad, expansive view toward the Proposed Route, resulting in high contrast levels. Impacts on residential viewers would be high.

KOP 775 (Figures E.2-5 and E.2-19). The Project would be moderately visible to high-sensitivity viewers along U.S. Highway 91 (approximately 2.2 miles away). Viewers at this location would be approximately 2.2 miles from the Project on a new ROW, representing a middleground view. Three transmission lines are visible from this view. The viewer would have a broad, expansive view toward the Proposed Route. The view would be screened by two existing transmission lines and the geologic landscape features except for skylining opportunities along the adjacent ridgeline. Contrast levels would be low to moderate. Visual impacts on recreational viewers would be moderate.

KOP 770 (Figure E.2-5). High-sensitivity recreational viewers from Downata Hotsprings would have a high level of Project visibility (approximately 0.75 mile from the Proposed Route), representing a foreground view of the Project. The viewers would have broad, expansive views toward the Proposed Route, resulting in contrast levels that would be moderate to high. Visual impacts on recreational viewers would be moderate to high.

KOP 1346 (Figure E.2-5/Appendix G, Figure CB-1b). The Project would be low to moderately visible to high-sensitivity recreational viewers (approximately 0.5-mile along a Forest Service road [Highline Trail] in the Caribou-Targhee NF represented by KOP 1346). The viewers would have a middleground view toward the Proposed Route. Contrast levels would be moderated by the forest vegetation, which screens the

structures except for some open views. This area is also managed to meet a VQO of Partial Retention, which requires management activities remain visually subordinate to the characteristic landscape. Activities may repeat form, line, color, or texture common to the characteristic landscape but not change their qualities of size, amount, intensity, direction, and pattern. Potential visual impacts on recreational viewers from this KOP and in the general vicinity are expected to be moderate to high. The Proposed Route would create a new linear feature in an undisturbed landscape approximately 1.0 mile north from an existing ROW with moderate to high scenic quality and moderate contrast. The Proposed Route would not conform to the Forest Service Partial Retention classification.

Alternative 4A

Table 3.2-14 summarizes the potential visual impact for each KOP in Alternative 4A.

Table 3.2-14. Visual Impact Assessment for Each KOP in Alternative 4A

KOP	Viewers[2/]	Land Ownership	Viewer Rating[3/]	Scenic Quality[3/]	Distance (miles)	Visibility[3/]	Contrast[3/]	Impact[3/]
620	REC	BLM VRM II	H	H	1.8	H	H	H
604	COMM	BLM VRM III	L-M	L	1.50	L-M	L	L
647[1/]	RES	BLM VRM IV	H	M	1.00	M	L	L-M
627	REC	Private	H	M	0.50	H	M	M
686	RES	Private	H	L-M	0.32	H	M	M

1/ Impacts to KOP 647 (4A) would also apply to Alternative 4F because they share a portion of their alignment at this particular KOP.
2/ RES – A single resident. REC – A recreational viewer. COMM – A commuter traveling on major highways or secondary roads.
3/ H – High, M – Medium, L – Low

KOP C5 (Figure E.2-4, 3.2-1). Views from this point are from the Opal Wagon Road toward Alternative 4A. This viewpoint is discussed in Section 3.3 – Cultural Resources.

KOP C6 (Figure E.2-4). Views from this point are from the Opal Wagon Road toward Alternative 4A. This viewpoint is discussed in Section 3.3 – Cultural Resources.

KOP C110 (Figure E.2-4). This view is looking toward Alternative 4A from the White Hill Historic Monument on the Oregon NHT. This viewpoint is discussed in Section 3.3 – Cultural Resources.

KOP C7 (Figure E.2-4). This view is looking toward Alternative 4A from the Alfred Corum Grave on the Oregon NHT. This viewpoint is discussed in Section 3.3 – Cultural Resources.

KOP C8 (Figure E.2-4). This view is looking toward Alternative 4A from the Nancy Hill Grave on the Oregon NHT. This viewpoint is discussed in Section 3.3 – Cultural Resources.

KOP C9 (Figure E.2-4). This view is looking toward Alternative 4A from Emigrant Springs on the Oregon NHT. This viewpoint is discussed in Section 3.3 – Cultural Resources.

KOP 620 (Figure E.2-4). Discussed under Alternative 4F.

KOP 604 (Figure E.2-4). Low to moderate sensitivity viewers at KOP 604 would have a low level of Project visibility. Alternative 4A would be located about 1.5 miles north of this viewing location, focused toward Highway 30 and generally paralleling an existing transmission line. Views of the Project to the north look through one existing transmission line and three other existing transmission lines about 1,500 feet farther north. Visual contrast levels would be low due the parallel existing transmission lines and the low overall scenic quality. Visual impact on viewers from this KOP would be low.

KOP 647 (Figure E.2-4). The Project would be moderately visible from this residential KOP. This view is a foreground view to the southwest toward Alternative 4A (approximately 1 mile away). This view is enclosed by hills in the background that would provide a backdrop for the existing and proposed alternative facilities. The level of contrast in this view is low due to the existing transmission lines and the backdrop of the hills. Impacts on viewers would be low to moderate.

KOP 627 (Figures E.2-4 and E.2-17). The Project would be approximately 0.5 mile from KOP 627 and would be highly visible to high-sensitivity recreation viewers on Kemmerer Reservoir. This is a foreground view looking south towards Alternative 4A, from a boat launch approximately 0.5 mile north of the Project. This view is enclosed by hills surrounding the reservoir and views of three existing transmission lines that are located approximately 0.6 mile to the south. The enclosed view to the south would frame the existing transmission lines and the proposed double-circuit structures. The anticipated contrast levels would be reduced by the presence of three existing transmission lines; however, the Project is expected to be noticeable in this landscape and would be located closer to the viewers than the existing lines. This would result in moderate visual contrast and a moderate visual impact.

KOP 686 (Figure E.2-4). The view from this location is looking south to southwest along Collette Avenue in West Cokeville, Wyoming, from a residential and farming area. This KOP is approximately 0.32 mile from Alternative 4A and represents a foreground view of the Project, which would parallel the three existing transmission lines that cross the foothills in the middleground of the view just before crossing the Bear River. The Project would be highly visible from 0.32 mile away to high-sensitivity residential viewers along Collette Avenue. Impacts to viewers from KOP 686 would be moderate. The transmission line would have a skylining effect as it crosses the foothills in the middleground; however, it would be paralleling existing transmission lines and would have some structural screening from irrigation structures.

Alternative 4B

Table 3.2-15 summarizes the potential visual impact for each KOP in Alternative 4B.

Table 3.2-15. Visual Impact Assessment for Each KOP in Alternative 4B

KOP	Viewers[2/]	Land Ownership	Viewer Rating[3/]	Scenic Quality[3/]	Distance (miles)	Visibility[3/]	Contrast[3/]	Impact[3/]
652	REC	BLM VRM II	H	M-H	0.7	M-H	M-H	M-H
603	REC	Private	H	L	0.25	H	M	L-M
676[1/]	REC/HIST	NPS	H	M	1.6	M	M	M
655[1/]	REC	NPS	H	M	1.5	M	M	M
673	REC	USFWS	H	M	4.7	L-M	L-M	L-M

1/ Impacts to KOP (4B) would also apply to Alternative 4C because they share a portion of their alignment at this particular KOP.
2/ REC – A recreational viewer. HIST – A site identified as having historic value.
3/ H – High, M – Medium, L – Low

KOP 652 (Figure E.2-4/Appendix G, Figure K-6d). Alternative 4B would be moderate to highly visible to high-sensitivity recreational viewers at this location looking to the east about 3.5 miles east of Cavanaugh Peak and south of Fossil Ridge. The KOP would have a foreground view of the moderate to highly visible Route Alternative (approximately 0.7 mile to the east). Alternative 4B would not parallel any existing transmission lines but would be backdropped by the surrounding terrain. This view does not include any apparent human-made modifications. Impacts on viewers from this KOP and in the surrounding area are moderate to high due to distance, backdropping, and contrast.

KOP 603 (Figure E.2-4). Alternative 4B would be highly visible to high-sensitivity recreational viewers at this location looking to the north atop a ridge (approximately 2.5 miles east of Highway 189 and 2.2 miles south of Highway 30 near the Radiant Mine). The KOP would have a foreground view of the highly visible Project alternative approximately 0.25 mile south. The alternative alignment would not parallel any existing transmission lines though the northeast portions of the town of Kemmerer are visible in the background. This view includes fencing and the highway, which would result in moderate visual contrast. Impacts on viewers from this KOP and in the surrounding area would be low to moderate.

KOP 676 (Figure E.2-4). The Project would be moderately visible to high-sensitivity recreational viewers at the Fossil Butte National Monument Historic Quarry Site. The view is to the south and Alternative 4B would be in the foreground/middleground at approximately 1.6 miles south. This enclosed view, high above the valley floor, would provide expansive views with a variety of landscape elements, including Fossil Ridge in the background, and human-made alterations, including a mine, a railroad, a highway, and an existing transmission line. The view would have moderate contrast and visual impacts on viewers would be moderate.

KOP 655 (Figures E.2-4 and E.2-20). The Project would be moderately visible to high-sensitivity recreational viewers at the Fossil Butte National Monument visitor center (approximately 1.5 miles away). This alternative is located approximately 1.5 miles to the south along the base of Fossil Ridge. The enclosed view includes U.S. Highway 30, a railroad, and an existing transmission line at the base of Fossil Ridge, which provides a backdrop that tends to absorb the human-made alterations. The view would have a moderate level of contrast and visual impacts to the viewer would be moderate.

KOP 673 (Figure E.2-4). This high-sensitivity KOP is representative of recreational views from the Cokeville Meadows NWR at an informational kiosk, looking west along U.S. Highway 89 at Alternative 4B as it crosses the view (approximately 4.7 miles to the west). This represents a middleground to background view of the Project. The Project would not parallel any existing transmission lines as it crosses Red Knoll and the foothills of Red Mountain on the west side of the Bear River. This intersection is just east of the Utah and Idaho state line. This alternative would have low to moderate visibility and would not parallel existing transmission lines. Overall, contrast would be low to moderate in this moderate quality landscape with distances far enough from the viewer that it is anticipated the alternative would be absorbed into the background terrain. Impacts on viewers from KOP 673 would be low to moderate.

Alternative 4C

Table 3.2-16 summarizes the potential visual impact for each KOP in Alternative 4C.

Table 3.2-16. Visual Impact Assessment for Each KOP in Alternative 4C

KOP	Viewers[3/]	Land Ownership	Viewer Rating[4/]	Scenic Quality[4/]	Distance (miles	Visibility[4/]	Contrast[4/]	Impact[4/]
603	REC	Private	H	L	0.25	H	M	L-M
676	REC/HIST	NPS	H	M	1.60	M	M	M
655	REC	NPS	H	M	1.50	M	M	M
632[1/]	REC/COMM	Private	M-H	L-M	0.25	H	M	L-M
1368[2/]	REC	BLM	H	M-H	<0.1	H	H	H
674	RES	USFWS	H	L-M	0.10	H	M-H	M-H
672[1/]	RES	Private	H	L-M	0.37	H	M	L-M

1/ Impacts to KOP (4C) would also apply to Alternative 4E because they share a portion of their alignment at this particular KOP.
2/ Impacts to KOP 1368 (4C) would also apply to Alternative 4E since they share a portion of their alignment at this particular KOP.3
3/ RES – A single resident. REC – A recreational viewer. COMM – A commuter traveling on major highways or secondary roads. HIST – A site identified as having historic value.
4/ H – High, M – Medium, L – Low

KOP 603 (Figure E.2-4). Alternative 4C shares the same alignment as Alternative 4B for this portion of its route. See description under 4B.

KOP 632 (Figure E.2-4). Alternative 4C would be highly visible to moderate-sensitivity viewers traveling along this wildlife auto tour route. A pull-out site located approximately 0.25 mile west of where the alternative alignment crosses U.S. Highway 30 would be the primary viewing location. Viewers at this location would be approximately 0.25 mile from Alternative 4C, representing a foreground view of the Project, which would depart from paralleling existing transmission lines as it crosses U.S. Highway 30 from the south to the north. This enclosed view includes deer fencing, a railroad, an electric distribution line, a communication tower on the hill to the east, and the highway that results in an overall moderate visual contrast. Considering the speed of travel (55 mph), the view duration would be brief; thus, the impacts on viewers traveling along this road would be low to moderate.

KOP 1368 (Figure E.2-4/Appendix G-1, Figure K-8b). Alternative 4C would be highly visible to high-sensitivity recreational viewers traveling to the numerous recreation areas in the region. Viewers at this location would be less than 0.1 mile away from the proposed alignment. Alternative 4C parallels the Oregon NHT and U.S. 30. All of the towers would be visible above the skyline of the Boulder Ridge and Tunp Range in the background. The visual contrast would be high, although the horizontal powerlines are similar to the horizontal lines of the road, fence, and topography. Impacts to viewers along this highway would be high due to the close parallel views of Alternative 4C.

KOP 672 (Figure E.2-4). Alternative 4C would be highly visible to high-sensitivity residential viewers (approximately 0.37 mile from the alternative). Views would be focused to the southwest along U.S. Highway 89, representing a foreground view of the Project. The alternative would not parallel any existing transmission lines before crossing the Bear River in the middleground to the west of this view. This partially screened view includes fencing, a railroad, an electric distribution line, and the highway that would result in an overall moderate visual contrast. Impacts on viewers from this residence and traveling along the highway would be low to moderate.

Alternative 4D

Table 3.2-17 summarizes the potential visual impact for each KOP in Alternative 4D.

Table 3.2-17. Visual Impact Assessment for Each KOP in Alternative 4D

KOP	Viewers[2/]	Land Ownership	Viewer Rating[3/]	Scenic Quality[3/]	Distance (miles)	Visibility[3/]	Contrast[3/]	Impact[3/]
603 [1/]	REC	Private	L	L	0.25	H	M-H	M
673 [1/]	REC	USFWS	H	M	4.7	L-M	L-M	L-M

1/ Impacts to KOP would also apply to Alternatives 4B, 4C, and 4E since they share a portion of their alignment at this particular KOP.
2/ REC – A recreational viewer.
3/ H – High, M – Medium, L – Low

KOP 603 (Figure E.2-4) Alternative 4D shares the same alignment as 4B, 4C, and 4E at this location. This KOP is described in the discussion of Alternative 4B.

KOP 673 (Figure E.2-4) Alternative 4D shares the same alignment as Alternative 4B at this location. This KOP is described in the discussion of Alternative 4B.

Alternative 4E

Table 3.2-18 summarizes the potential visual impact for each KOP in Alternative 4E.

KOP 603 (Figure E.2-4) Alternative 4E shares the same alignment as 4B, 4C, and 4D at this location. This KOP is described in the discussion of Alternative 4B.

Table 3.2-18. Visual Impact Assessment for Each KOP in Alternative 4E

KOP	Viewers[3/]	Land Ownership	Viewer Rating[4/]	Scenic Quality[4/]	Distance (miles)	Visibility[4/]	Contrast[4/]	Impact[4/]
603[1/]	REC	Private	H	L	0.25	H	M	L-M
632[2/]	REC/COMM	Private	M-H	L-M	0.25	H	M	L-M
1368[2/]	REC	BLM VRM II	H	M-H	<0.1	H	H	H
674[2/]	RES	USFWS	H	L-M	0.10	H	M-H	M-H
672[2/]	RES	Private	H	L-M	0.37	H	M	L-M

1/ Visual impacts to KOP would be the same as those described for Alternative 4B since they share a portion of their alignment at this particular KOP.
2/ Impacts to KOP would also apply to Alternative 4C since they share a portion of their alignment at this KOP.
3/ RES – A single resident. REC – A recreational viewer. COMM – A commuter traveling on major highways or secondary roads.
4/ H – High, M – Medium, L – Low

KOP 674 (Figure E.2-4) Alternative 4E would be highly visible to high-sensitivity residential viewers (approximately 0.1 mile from the alternative). The view would be focused to the southwest along U.S. Highway 89, representing a foreground view of the Project. The alternative would not parallel any existing transmission lines. This open view includes human-made alterations (barns, sheds, fencing) in the foreground and middleground and limited variations in the landscape elements, resulting in moderate to high visual contrast. Visual impacts on travelers and residents would be moderate to high though impacts to travelers on the highway would be temporary with a brief duration.

Alternative 4F

Table 3.2-19 summarizes the potential visual impact for each KOP in Alternative 4F.

Table 3.2-19. Visual Impact Assessment for Each KOP in Alternative 4F

KOP	Viewers[2/]	Land Ownership	Viewer Rating[3/]	Scenic Quality[3/]	Distance (miles)	Visibility[3/]	Contrast[3/]	Impact[3/]
636	REC	BLM VRM Class II	H	M-H	0.3	H	H	H
604[1/]	REC	BLM VRM III	L-M	L	1.5	H	L	L
647	RES	BLM VRM IV	H	M	1.0	M	L	L-M
621	REC	Private	H	M	5.0	H	L	L
620	REC	BLM VRM II	H	H	1.8	H	H	H
637	REC	BLM VRM III	H	H	0.6	H	M-H	M-H
635	REC	BLM VRM II	M-H	M-H	0.25	M-H	H	M-H

1/ KOP 604 would view a shared portion of the Alternative 4A alignment; thus, impacts would be the same.
2/ RES – A single resident. REC – A recreational viewer.
3/ H – High, M – Medium, L – Low

KOP C6 (Figure 3.2-2). Views from this point are from the Opal Wagon Road toward Alternative 4F. This viewpoint is discussed in Section 3.3 – Cultural Resources.

KOP C5 (Figure 3.2-2). Views from this point are from the Opal Wagon Road toward Alternative 4F. This viewpoint is discussed in Section 3.3 – Cultural Resources.

KOP C11 (Figure 3.2-2). Views from this point are from the Oregon NHT. This viewpoint is discussed in Section 3.3 – Cultural Resources.

KOP C110 (Figure E.2-4). This view is looking toward the Segment 4 from the White Hill Historic Monument on the Oregon NHT. This viewpoint is discussed in Section 3.3 – Cultural Resources.

KOP C10 (Figure E.2-4). This view is looking toward the Segment 4 from a trail marker at the Dempsey Hockaday Cutoff along the Oregon NHT. This viewpoint is discussed in Section 3.3 – Cultural Resources.

KOP 636 (Figure E.2-4/Appendix G-1, Figure K-5d). This view from Coke Mountain is representative of high-sensitivity recreational viewers at KOP 636. The KOP is located 0.3 mile north of Alternative 4F. Alternative 4A would be over 5.0 miles south of the KOP. Photographic simulations depicting potential visual impacts to the resource have been generated for this KOP (Appendix G, Figure K-5d). The simulation illustrates that the alternative would not parallel any existing transmission lines, which would result in high contrast levels at close viewing distances. Visual impact on viewers from this KOP would be high due to the high contrast level and skylined views.

KOP 604 (Figure E.2-4). This view, from a dirt access road north of U.S. Highway 30, is representative of the views available to low to moderate sensitivity viewers at KOP 64. The Project would be located about 1.5 miles north of this viewing location, generally paralleling an existing transmission line. Views of the Project to the north look through one existing transmission line and three other existing transmission lines about 1,500 feet farther north. Visual contrast levels would be low due the parallel existing transmission lines and the low overall scenic quality. Visual impact on viewers from this KOP would be low due to the numerous transmission lines present within the view.

KOP 621 (Figure E.2-4). High-sensitivity recreational viewers at the trailhead of Trail 81 would have a distant (5 miles) skylined view of the Project set against three existing transmission lines. Contrast levels would be low due to the viewing distance and the presence of existing transmission lines. Visual impacts on recreational viewers and the immediate area would be low.

KOP 620 (Figure E.2-4/Appendix G, Figure K-5b). This view from the Dempsey-Hockaday Cutoff of the Oregon/California NHT is representative of those available to high-sensitivity viewers at KOP 620. The KOP is located 4.0 miles north of Alternative 4A. Alternative 4F would be 0.2 mile east of the KOP. Photographic simulations depicting potential visual impacts to the resource have been generated for this KOP (see Appendix G, Figure K-5b). The simulation illustrates that the alternative alignment would not parallel any existing transmission lines, which would result in high contrast levels with no other visible human-made disturbance in the view. Visual impact on viewers from this KOP would be high due to high contrast levels and high scenic quality.

KOP 637 (Figure E.2-4). High-sensitivity viewers traveling on a BLM road along Dempsey ridge would pass directly under Segment 4 (approximately 0.6 mile north of this KOP). Viewers have generally open panoramic views from this ridge line. Alternative 4C is located approximately 4 miles to the southwest. Visual contrast levels would be

moderate to high in this landscape. Visual impacts on viewers would be moderate to high. There are limited options such as micrositing of structures to reduce visual impacts in this area.

Conformance with BLM VRM Classes and Forest Service VQOs

Generally the construction and operations of the Segment 4 Proposed Route or Route Alternatives would conform to BLM VRM Class III and IV objectives. In some cases the transmission facility may not conform to the RMP's VRM Class II objectives where there is no paralleling existing transmission facility or VRM Class III objectives where the level of change is considered high.

Segment 4 Proposed Route – The Proposed Route would cross over 19.1 miles of BLM-administered VRM Class II lands in the Kemmerer FO between MPs 94.0 and 128.8, creating a new ROW. VRM Class II classification requires levels of change to be low and not attract the attention of a casual observer. The proposed transmission line would not conform to the RMP because the new facilities would represent a level of change to the landscape and basic elements that would attract the attention of the casual observer. Three such areas occur along the Proposed Route (see KOPs 635, 620, and 627). Amendments to the Kemmerer RMP would be needed, if this route is selected, to allow one-time visually altering action without changing the VRM classification (see Appendix G-1, Sections 5.4.1 to 5.4.3).

Effects discussed for KOPs 1288, 1292, 1359, 635, 1346, 1322, and 1359 include assessment of BLM Class II land and there for the Project and its associated effects described for these areas could only occur if the plan amendments were approved.

Segment 4 of the Proposed Route would also cross 0.8 mile of a 410-acre parcel of VRM Class II land managed by the Rock Springs FO between MPs 51.1 and 51.9. Crossing this parcel would require an amendment to the Green River RMP to permit a one-time allowance without changing the VRM class (see Appendix G-1, Section 5.3.1).

Effects for KOP 1353 are discussed in Appendix G-1 and would only apply if the amendment were approved.

The Segment 4 Proposed Route would cross the Caribou-Targhee NF in areas classified as having Retention and Partial Retention VQOs, which require that project elements not be visually evident and preferably be visually subordinate in the landscape and that they repeat the form, line, color, or texture common to the characteristics of the landscape. Regardless of whether one double-circuit 500-kV system or two single-circuit 500-kV lines are built, the Project would not conform to the VQOs. Two existing transmission lines cross this section of the Caribou-Targhee NF approximately 1 to 2 miles to the south of the Proposed Route. A Project-level plan amendment would be required to allow another transmission corridor and to change the land classification for the ROW to MA 8.1, Utility Corridor (see Appendix G-2, Section 5.2.1.3).

Effects described for KOPs 1346, 757, and 758 would only apply if the amendment were approved as this alignment would require an amendment to the Forest Plan.

Alternative 4A – Alternative 4A would cross 13.5 miles of BLM-administered VRM Class II lands in the Kemmerer FO. The route parallels an existing transmission lines for much of its length. The resulting level of change is low to moderate and therefore may conform to the RMP. In areas that do not parallel an existing ROW, as is the case between MPs 50.8 and 53.3, Alternative 4A would not conform to the RMP and would require a plan amendment if Alternative 4A is selected. The proposed amendment would allow a one-time visually altering action without changing the VRM classification (see Appendix G-1, Section 5.4.4).

Effects described for KOPs 627 and 620 are dependent upon approval of the amendment as the project could not otherwise occur in this alignment.

Alternative 4B – Alternative 4B would cross 7.3 miles of BLM-administered VRM Class II lands in the Kemmerer FO between MPs 52.3 and 63.3, creating a new ROW. This ROW occurs where the route would cross south of Fossil Butte National Monument. VRM Class II designation requires levels of change to be low and not attract the attention of a casual observer. Crossing VRM Class II areas without paralleling an existing transmission facility may not conform to the RMP because the new facilities would represent a level of change to the landscape and basic elements that would attract the attention of the casual observer. If this route is selected, it is recommended that the RMP be amended to reclassify the area around the route to VRM Class III (see Appendix G-1, Section 5.4.6).

Effects described for KOPs 676 and 655 are dependent upon approval of the amendment as the project could not otherwise occur in this alignment.

Alternative 4C – Alternative 4C would cross 12.5 miles of BLM-administered VRM Class II lands in the Kemmerer FO between MPs 52.3 and 63.3 and MPs 66.2 to 75, creating a new ROW. VRM II designations require levels of change to be low and not attract the attention of a casual observer. Crossing VRM Class II areas without paralleling an existing transmission facility may not conform to the RMP because the new facilities would represent a level of change to the landscape and basic elements that would attract the attention of the casual observer. If this route were selected, an amendment to change the VRM Class II area south of highway 30 crossed by the joint 4B/4C alternative would be required be reclassified to VRM Class III as shown in Appendix G-1 5.4.6 may be needed. An amendment may be needed to allow a one-time visually altering action without changing the VRM classification for the parcels of VRM Class II land crossed by the joint alternative route 4C/4E west of the area recommended for reclassification (see Appendix G-1, Sections 5.4.6 to 5.4.8).

Effects described for KOPs 676, 655, 1368, and 632 are dependent upon approval of the amendment as the project could not otherwise occur in this alignment.

Alternative 4D – Alternative 4D would cross approximately 4.3 miles of BLM-administered VRM Class II lands in the Kemmerer FO between MPs 52.3 and 55.7, and 63 to 63.3, creating a new ROW. VRM Class II designation requires levels of change to be low and not attract the attention of a casual observer. Crossing VRM Class II areas without paralleling an existing transmission facility may not conform to the RMP because the new facilities would represent a level of change to the landscape and basic

elements that would attract the attention of the casual observer. If this route is selected, it is recommended that the RMP be amended to reclassify the VRM Class II area crossed from MP 52.3 to MP 54.8 and from MP 63 to MP 63.3 to VRM Class III and to permit a one-time allowance from MP 54.8 to MP 55.7 without changing the VRM classification (see Appendix G-1, Sections 5.4.6 and 5.4.9).

Effects described for KOP 603 is dependent upon approval of the amendment as the project could not otherwise occur in this alignment.

Alternative 4E – Alternative 4E would cross approximately 9.5 miles of BLM-administered VRM Class II lands in the Kemmerer FO between MPs 52.3 and 63.3 as well as between MPs 66.2 and 75. Part of this route would result in creating a new ROW through these VRM Class II areas that would require levels of change to be low and not attract the attention of a casual observer. Crossing VRM Class II areas without paralleling an existing transmission facility may not conform to the RMP because the new facilities would represent a level of change to the landscape and basic elements that would attract the attention of the casual observer. If Alternative 4E is selected, it is recommended that the RMP be amended to reclassify the VRM Class II area crossed from MP 52.3 to MP 54.8 and from MP 63 to MP 63.3 to VRM Class III and allow a one-time visually altering action without changing the VRM classification between MPs 66.2 and 75 (see Appendix G-1, Sections 5.4.6 to 5.4.8).

No effects were specifically described for KOPs that were dependent upon an amendment for this alignment.

Alternative 4F – Alternative 4F would cross approximately 16.4 miles of BLM-administered VRM Class II lands in the Kemmerer FO in multiple locations between MPs 49.5 and 74.2. A new ROW would be created through these VRM Class II areas, which would require levels of change to be moderate and not attract the attention of a casual observer. Crossing VRM Class II areas without paralleling an existing transmission facility may not conform to the RMP because the new facilities would represent a level of change to the landscape and basic elements that would attract the attention of the casual observer. If this alternative is selected, an amendment allowing a one-time visually altering action without changing the VRM classification may be needed (see Appendix G-1, Sections 5.4.3 and 5.4.5).

Effects described for KOPs 636, 637, 620, and 621 are dependent upon approval of the amendment as the project could not otherwise occur in this alignment.

Segment 4 – Conclusion

Segment 4 Proposed Route – It is anticipated that visual impacts to public, private, and state lands would be moderate to moderate-high. There would be several potential high visual impact areas including the area of the Sheep Creek Hills close to U.S. Highway 30. The Proposed Route would cross the Oregon NHT/Bear Lake Scenic Byway approximately 2.5 miles west of Montpelier, Idaho, and the Pioneer Historic Byway south of Thatcher in the Gentile Valley. Where historic or scenic byways would be crossed, it is encouraged to cross perpendicular to roads and, where practicable, use vegetative screening and other mitigation to help blend the power lines with the

surrounding landscape. This segment would also cross the Big Springs Scenic Byway twice (once adjacent to Kemmerer Reservoir and a second time north of Cokeville).

Alternative 4A – The impacts to public, private, and state lands resulting from Alternative 4A would be moderate.

Alternative 4B – The visual impacts to public, private, and state lands resulting from construction and operation of Alternative 4B would be moderate. Additionally, Alternative 4B would cross the south end of the Cokeville Meadows NWR, although not lands managed by the USFWS, and would result in moderate to high visual impacts in the refuge due to the impact on pristine refuge land with little human-made elements apparent from most views.

Alternative 4C – Impacts to public, private, and state lands, including the areas along Highway 30 where there are numerous residences in the Boulder Ridge Area, resulting from Alternative 4C would be moderate. Additionally, this alternative parallels Highway 89 for approximately 13 miles, representing moderate-high visual impacts. The alternative crosses the north end of the Cokeville Meadows NWR boundary, but not lands managed by the USFWS, about 1.75 miles south of the Cokeville Airport. The crossing of the Cokeville Meadows NWR would represent moderate to high visual impacts to the landscape in the refuge due to the impact on refuge land, with little human-made elements apparent from most views.

Alternative 4D – The construction of Alternative 4D would result in moderate visual impacts due to its close proximity to Highway 30 where there are numerous residences in the Boulder Ridge area. Additionally, Alternative 4D would cross the south end of the Cokeville Meadows NWR, although not lands managed by the USFWS, which would result in moderate to high visual impacts in the refuge due to the impact on pristine refuge land with little human-made elements apparent from most views.

Alternative 4E – The construction of Alternative 4E would result in low to moderate visual impacts due to its close proximity to U.S. Highway 30/89 where there are residences in the Boulder Ridge area. Additionally, this alternative parallels U.S. Highway 89 for approximately 13 miles representing moderate visual impacts. The alternative crosses the north end of the Cokeville Meadows NWR boundary, but not lands managed by the USFWS, about 1.75 miles south of the Cokeville Airport. The crossing of the Cokeville Meadows NWR would represent moderate visual impacts to the landscape in the refuge due to the impact on refuge land with little human-made elements apparent from most views.

Alternative 4F – The construction of Alternative 4F would result in low to moderate visual impacts due to its close proximity to dispersed residences in the Dempsey Basin area.

Alternatives Comparison

Overall, Alternative 4D would provide the lowest anticipated visual impacts over the comparison portion of the Proposed Route. Alternatives 4D and 4E would avoid more VRM Class II lands than the other alternatives with the exception of 4A, which although shorter would use more of Segment 4 in an area where cultural landscape setting concerns exist. Alternative 4D would impact fewer recreational or culturally sensitive

viewers than the other routes. There are no specific viewing areas on the south end of the refuge and it is currently closed to public access, lowering the potential for visual impacts. Overall, the Proposed Route would have the highest impacts to visual resources of all the alternatives proposed due to crossing over 12.0 miles of VRM Class II land, which would represent a development that would not conform to class objectives.

Segment 5 –Populus to Borah

Segment 5, as proposed, would link the Populus and Borah Substations with a 54.6-mile single-circuit 500-kV line. Forty-four acres of the expansion of the Populus and Borah Substations are attributed to Segment 5. There are five Route Alternatives including two proposed by the BLM to avoid the Deep Creek Mountains (5A and 5B; 8 miles and 19 miles longer than the comparison portion of the Proposed Route), one preferred by Power County that crosses the Fort Hall Indian Reservation (5C; 6 miles shorter than the comparison portion of the Proposed Route), one originally proposed by the Proponents (5D; 2 miles shorter than the comparison portion of the Proposed Route but located within more agricultural lands), and one proposed by Power County as an alternative approach to the Borah Substation (5E) (see Appendix A, Figure A-7).

Proposed Route

Table 3.2-20 summarizes the potential visual impact for each KOP in Segment 5.

Table 3.2-20. Visual Impact Assessment for Each KOP in the Segment 5 Proposed Route

KOP	Viewers[4/]	Land Ownership	Viewer Rating[5/]	Scenic Quality[5/]	Distance (miles)	Visibility[5/]	Contrast[5/]	Impact[5/]
907	REC	BLM VRM II	H	H	1.5	L	M-H	M-H
185[1/]	SCHOOL	Private	H	L	0.10	L	L-M	L-M
242[2/]	REC	State of ID	H	M-H	0.35	H	M-H	M-H
1302[3/]	RES	Private	H	M	0.50	H	L-M	M
1304	REC	Private	H	H	0.15	H	M-H	H
260	REC	BLM VRM II	H	M	0.15	H	M	M

1/ KOP 185 would view portions of Segment 7 Proposed Route but it is anticipated to have the same impacts as Segment 5 Proposed Route.
2/ KOP 242 would view portions of the Segment 5 Proposed Route but is anticipated to have lower impacts compared to Alternative 5D.
3/ KOP 1302 would view portions of Alternative 5E, which is anticipated to have lower impacts compared to the Proposed Route.
4/ RES – A single resident. REC – A recreational viewer. SCHOOL – A community school usually not identified as historic.
5/ H – High, M – Medium, L – Low

KOP C25 (Figure E.2-6). This view is looking toward the Segment 5 Proposed Route from a portion of the Oregon NHT. This viewpoint is discussed in Section 3.3 – Cultural Resources.

KOP 907 (Figure E.2-6/Appendix G, Figure M-1/M-3b). This KOP represents high-sensitivity recreational viewers at a lookout point on a BLM trail in the Deep Creek Mountains. Viewers would have a low-visibility, partially screened view of the alignment as it crosses the Deep Creek Mountains. Viewers would be approximately 1.5 miles

from Segment 5. Contrast levels would be moderate to high due to the partial screening and visibility. Visual impacts on recreational viewers and the immediate area would be moderate to high due to the very high scenic quality and moderate to high contrasts.

KOP 185 (Figure E.2-6). This KOP, representing high-sensitivity viewers from the Arbon Elementary School, has a partially screened view of the Segment 5 Proposed Route (approximately 0.1 mile to the south), and the Segment 7 Proposed Route (approximately 0.4 mile also to the south). Visibility and contrast levels from close to the school building and the playground area would be low and low to moderate, respectively, due to the screening from trees along the south property line of the school. Visual impacts on viewers would be low to moderate due to the partial screening and the low scenic quality landscape.

KOP 1302 (Figure E.2-6). KOP 1302 represents high-sensitivity residential viewers on Mayer Road looking north toward American Falls and the American Falls Reservoir. This KOP has open panoramic views of the Proposed Route (approximately 0.5 mile to the south) resulting in high visibility. Contrast levels would be low to moderate due to the numerous transmission lines which cross the middleground. Visual impacts on viewers would be moderate due to the low to moderate contrast levels in the moderate scenic quality landscape.

KOP 1304 (Figure E.2-6). KOP 1304 represents high-sensitivity residential viewers in the Riverbend Estates looking southeast toward Bannock Peak and White Quartz Mountain. This KOP has open yet focal views of the Proposed Route about 0.15 mile to the south resulting in high visibility. Contrast levels would be moderate to high due to the distance of the Proposed Route and the few human-made features present within the view. Visual impacts on viewers would be moderate to high due to moderate to high contrast levels and high scenic quality.

KOP 260 (Figure E.2-8). The Segment 5 Proposed Route would be highly visible to recreational viewers in the pipeline crossing park on the Snake River 0.15 mile to the west. The viewers would have an open but framed view of the Proposed Route in a modified landscape. The combination of human-made alterations and scenic landscape elements would result in a moderate contrast level. Adjacent industrial elements detract from the natural scenery of the scenic Snake River Canyon. Impacts on viewers from this KOP and in the surrounding area would be moderate.

Alternative 5A

Table 3.2-21 summarizes the potential visual impact for each KOP in Alternative 5A.

Table 3.2-21. Visual Impact Assessment for Each KOP in Alternative 5A

KOP	Viewers[2/]	Land Ownership	Viewer Rating[3/]	Scenic Quality[3/]	Distance (miles)	Visibility[3/]	Contrast[3/]	Impact[3/]
305	REC	BLM VRM IV	H	M	1.5	H	M	M-H
903	RES	Private	H	M	0.6	H	M-H	M-H
920	REC	BLM VRM II	H	H	1.5	H	H	H
242[1/]	REC	State of ID	H	M-H	0.2	M-H	M-H	M-H

1/ KOP 242 would view portions of the Segment 5 Proposed Route but is anticipated to have lower impacts compared to 5D.
2/ RES – A single resident. REC – A recreational viewer.
3/ H – High, M – Medium, L – Low

KOP 305 (Figures E.2-8 and E.2-23). Alternative 5A would be highly visible to recreational viewers in the Hawkins Reservoir area (approximately 1.5 miles south of the alternative). The viewers would have an open but somewhat enclosed view of Alternative 5A in a mostly unmodified landscape; however, immediately to the north, opposite this view, an existing transmission line crosses the landscape. This situation results in a moderate contrast level due to the adjacent scenery. Impacts on viewers would be moderate to high.

KOP 903 (Figure E.2-6). High-sensitivity residential viewers at a church along Church Road would have a high-visibility open view of the alternative as it crosses agricultural lands in the Arbon Valley. Viewers would be approximately 0.6 mile from Alternative 5A. Contrast levels would be moderate to high due to the viewing distance and lack of human-made modifications. Visual impacts on residential viewers and the immediate area would be moderate to high.

KOP 920 (Figure E.2-6). High-sensitivity recreational viewers at a trailhead on BLM-administered land in the Deep Creek Mountains would have a high-visibility open view of the alternative as it crosses Warner Flat. Viewers would be approximately 1.5 miles from Alternative 5A. Contrast levels would be high due to the viewing distance and lack of human-made modifications. Visual impacts on residential viewers and the immediate area would be high due to the very high scenic quality.

Alternative 5B

Table 3.2-22 summarizes the potential visual impact for each KOP in Alternative 5B.

Table 3.2-22. Visual Impact Assessment for Each KOP in Alternative 5B

KOP	Viewers[1/]	Land Ownership	Viewer Rating[2/]	Scenic Quality[2/]	Distance (miles)	Visibility[2/]	Contrast[2/]	Impact[2/]
305	REC	BLM VRM IV	H	M	1.50	H	M	M-H
912	RES	Private	H	M	0.60	H	M	M
916	RES	Private	H	M-H	2.40	M	M	L-M
898	RES	Private	H	M-H	0.75	H	M-H	M-H
887	RES	Private	H	M-H	0.40	H	M	M

1/ RES – A single resident. REC – A recreational viewer.
2/ H – High, M – Medium, L – Low

KOP 305 (Figures E.2-8 and E.2-23). Alternatives 5A and 5B share the same alignment at this location. This KOP is described in 5A.

KOP 912 (Figure E.2-6). Alternative 5B would be highly visible to residential viewers along Daniels Road viewing the alternative from 0.6 mile to the southeast. The viewers would have an open semi-panoramic view of Alternative 5B in a modified landscape with moderate scenic quality. This situation would result in a moderate contrast level due to the adjacent scenery. Impacts on viewers would be moderate.

KOP 916 (Figure E.2-6). High-sensitivity residential viewers on 10800 West Road would have a moderate-visibility open view of the alternative as it crosses agricultural lands and mountainous terrain in the Arbon Valley. Viewers would be approximately 2.4 miles from Alternative 5B. Contrast levels would be moderate due to the viewing

distance and presence of human-made modifications. Visual impacts on residential viewers and the immediate area would be moderate due to the distance of the viewer.

KOP 898 (Figure E.2-6). High-sensitivity residential viewers on the Arbon Valley Highway would have a high-visibility open view of Alternative 5B as it crosses agricultural lands backdropped by the mountainous terrain of the Deep Creek Range. Viewers would be approximately 0.75 mile from the alternative. Contrast levels would be moderate to high due to the viewing distance and scenic quality. Visual impacts on residential viewers and the immediate area would be moderate to high due to the distance of the viewer, scenic quality, and contrast levels.

KOP 887 (Figure E.2-6). High-sensitivity residential viewers on Groom Road would have a high-visibility open view of Alternative 5B as it crosses agricultural lands in the Rockland Valley. Viewers would be approximately 0.4 mile from the alternative. Contrast levels would be moderate due to the viewing distance and presence of human-made modifications. Visual impacts on residential viewers and the immediate area would be moderate.

Alternative 5C

Table 3.2-23 summarizes the potential visual impact for each KOP in Alternative 5C.

Table 3.2-23. Visual Impact Assessment for Each KOP in Alternative 5C

KOP	Viewers[1/]	Land Ownership	Viewer Rating[2/]	Scenic Quality[2/]	Distance (miles)	Visibility[2/]	Contrast[2/]	Impact[2/]
1298	RES	BIA - Reservation	H	M	0.40	H	L	L-M
1304	REC	Private	H	M-H	0.15	H	M-H	M-H
1308	RES	BIA - Reservation	H	M-H	0.30	H	L-M	M-H
1309	RES	BIA - Reservation	H	M	1.40	M	L	L-M
1311	CULT	BIA - Reservation	H	M	1.60	M	L	L-M
1313	CULT	BIA - Reservation	H	L-M	0.35	H	M	M
1314	RES	Private	H	M	1.00	M-H	L-M	M
1299	CULT	BIA - Reservation	H	M	12.0	L	L	L

1/ RES – A single resident. REC – A recreational viewer. CULT – A site identified as a sensitive viewing location for cultural resources yet not discussed in the Cultural Resources section.
2/ H – High, M – Medium, L – Low

KOP 1298 (Figure E.2-6). Viewers at KOP 1298 include residents of the Fort Hall Indian Reservation on the Arbon Valley Highway. Viewers would see Alternative 5C to the south from approximately 0.4 mile away. At KOP 1298, the viewers would have a high level of Project visibility due to near-distance and open views of the valley terrain in the middleground. Visual contrast levels would be low due to numerous human-made alterations, including four high-voltage transmission lines, visible in the foreground and middleground of this KOP. Visual impacts on viewers would be low to moderate due to lack of contrast, distance, and moderate scenic quality.

KOP 1308 (Figure E.2-6). Viewers at KOP 1308 include residents of the Fort Hall Indian Reservation on the Arbon Valley Highway. Viewers would see Alternative 5C to the southwest, approximately 0.3 mile away. At KOP 1308, the viewers would have a high level of Project visibility due to near distances and open views of the valley terrain in the middleground. Visual contrast levels would be low to moderate due to numerous

human-made alterations, including four high-voltage transmission lines, visible in the foreground and middleground of this KOP (some are directly behind the viewer at this location). Visual impacts on viewers would be moderate to high due to the distance, moderate to high scenic quality, and due to the fact that the viewer would be surrounded by transmission structures.

KOP 1309 (Figure E.2-6). Viewers at KOP 1309 include residents of the Fort Hall Indian Reservation on the Arbon Valley Highway. Viewers would see Alternative 5C, approximately 1.4 miles to the south. At KOP 1309, the viewers would have a moderate level of Project visibility due to distances and open views of the valley terrain in the middleground where transmission structures are scattered around in numerous directions. Visual contrast levels would be low due to numerous human-made alterations, including numerous high-voltage transmission lines, visible in the middleground of this KOP. Visual impacts on viewers would be low to moderate due to lack of contrast, distance, and moderate scenic quality.

KOP 1311 (Figure E.2-6). Viewers from KOP 1311 include residents of the Fort Hall Indian Reservation on Moonshine Road, which leads to a traditional use area. Viewers would see Alternative 5C approximately 1.6 miles to the northeast. At KOP 1311, the viewers would have a moderate level of Project visibility due to distance and partially screened views. Visual contrast levels would be low due to numerous human-made alterations, including three high-voltage transmission lines, visible in the foreground and middleground. Visual impacts on viewers would be low to moderate due to lack of contrast, distance, and moderate scenic quality.

KOP 1313 (Figure E.2-6). Viewers from KOP 1313 are high-sensitivity residential viewers on an existing transmission line access road at a traditional use area within the Fort Hall Indian Reservation. West views focus on Alternative 5C, approximately 0.35 mile away. At KOP 1313, the viewers would have a high level of Project visibility due to close-distances and the possibility of skylining. Visual contrast levels would be moderate due to numerous human-made alterations, including four high-voltage transmission lines, above the viewer from this KOP. Visual impacts on viewers would be moderate due to moderate contrast and low to moderate scenic quality.

KOP 1314 (Figure E.2-6). Viewers from KOP 1314 are high-sensitivity residential viewers on Sunbeam Rd directly west of the Fort Hall Indian Reservation. North views focus on Alternative 5C, approximately 1.0 mile away. At KOP 1314, the viewers would have a moderate to high level of Project visibility due to near-distances and partial screening offered by the rolling terrain in the middleground. Visual contrast levels would be low to moderate due to numerous human-made alterations, including high-voltage transmission lines, visible in the foreground and background of this KOP. Visual impacts on viewers would be moderate due to lack of contrast and moderate scenic quality.

KOP 1299 (Figure E.2-6). Viewers from KOP 1299 are high-sensitivity viewers within the Fort Hall Indian Reservation at a traditional cultural location, looking southwest, approximately 12.0 miles from Alternative 5C. At KOP 1299, the viewers would have a low level of Project visibility due to the far distance of the view. Visual contrast levels

would be low because the Project would not be visible from this location. Visual impacts on viewers would be low due to lack of contrast and distance of view.

Alternative 5D

Table 3.2-24 summarizes the potential visual impact for each KOP in Alternative 5D.

KOP 242 (Figures E.2-6 and E.2-21). High-sensitivity viewers at this KOP would have enclosed views to the east that focus on Alternative 5D, which would head directly toward the KOP (less than 185 feet north) and nearly pass over a recreation area (a sportsmen's access). The expected contrast levels would be high due to the co-dominant to dominant nature of the Project in an area lacking existing transmission lines. Impacts on recreational viewers would be high.

Table 3.2-24. Visual Impact Assessment for Each KOP in Alternative 5D

KOP	Viewers[2/]	Land Ownership	Viewer Rating[3/]	Scenic Quality[3/]	Distance (miles)	Visibility[3/]	Contrast[3/]	Impact[3/]
242[1/]	REC	State of ID	H	M-H	<0.10	H	H	H
241	REC	State of ID	H	M	0.25	H	H	H
257	RES	Private	H	M-H	0.70	H	H	H
263	REC	Private	H	M-H	0.10	H	H	H
260	REC	BLM VRM II	H	M	1.0	L-M	L-M	L-M

1/ KOP 242 would view portions of the Segment 5 Proposed Route as well as Alternatives 5A and 5B, which all have lower impacts compared to 5D.
2/ RES – A single resident. REC – A recreational viewer.
3/ H – High, M – Medium, L – Low

KOP 241 (Figures E.2-6). High-sensitivity recreational viewers would have moderate visibility from this sportsmen's access area and would have an enclosed, upslope view of Alternative 5D from less than 0.25 mile away. Contrast levels would be high because the proposed transmission towers would be skylined and no existing transmission lines are visible in this view. Impacts on viewers would be high.

KOP 257 (Figures E.2-6). High-sensitivity residential viewers would have high visibility of the Alternative Route, including open, focal views of the dramatic terrain from less than 0.7 mile away. Contrast levels would be high because the proposed transmission towers could possibly be skylined and there are no existing transmission lines or other human-made features visible in this view. Impacts on viewers would be high.

KOP 263 (Figures E.2-6 and E.2-22). This segment would be highly visible to high-sensitivity viewers at the Snake River Vista, a BLM recreation area 500 feet away. Segment 5 would be located about 800 feet to the east of this KOP. The generally open panoramic view has skylined existing transmission lines, and a partially screened residential area that would result in a moderate visual contrast level. Visual impacts on recreational viewers at this KOP would be moderate to high due to the close viewing distance and open views.

KOP 260 (Figure E.2-8). Alternative 5D would be low to moderately visible to recreational viewers in the pipeline crossing park on the Snake River, approximately 1.0

mile to the west of the alternative. The viewers would have a partially screened view of Alternative 5D in a modified landscape. The combination of human-made alterations and scenic landscape elements would result in a low to moderate contrast level due to the adjacent industrial elements, detracting from the natural scenery of the scenic Snake River. Impacts on viewers from this KOP and in the surrounding area would be low to moderate.

Alternative 5E

Table 3.2-25 summarizes the potential visual impact for each KOP in Alternative 5E.

Table 3.2-25. Visual Impact Assessment for Each KOP in Alternative 5E

KOP	Viewers[2/]	Land Ownership	Viewer Rating[3/]	Scenic Quality[3/]	Distance (miles)	Visibility[3/]	Contrast[3/]	Impact[3/]
1302 [1/]	RES	Private	H	M	0.75	M	L	L-M

1/ KOP 1302 would view the Segment 5 Proposed Route and would be a KOP for that alignment as impacts are anticipated to be higher compared to Alternative 5E.
2/ RES – A single resident. REC – A recreational viewer.
3/ H – High, M – Medium, L – Low

KOP 1302 (Figure E.2-6). KOP 1302 represents high-sensitivity residential viewers on Mayer Road looking north toward American Falls and the American Falls Reservoir. This KOP has partially screened views of Alternative 5E, about 0.75 mile to the north, resulting in moderate visibility. Contrast levels would be low due to the numerous transmission lines that partially screen the alternative in the foreground and middleground. Visual impacts on viewers would be low to moderate due to the low contrast levels in the moderate scenic quality landscape.

Conformance with VRM Classes and Forest Service VQOs

Generally the construction and operations of the Segment 5 Proposed Route or Route Alternatives would conform to BLM VRM Class III and IV objectives. In some cases the transmission facility may be inconsistent with the RMP's VRM Class II objectives where there is no paralleling existing transmission facility or VRM Class III objectives where the level of change is considered high.

Proposed Route Segment 5 – The Proposed Route would cross over 1.6 miles of BLM-administered VRM Class II lands designated by the Malad MFP between MPs 30.8 and 32.3 and MPs 52.7 to 52.8 creating a new ROW. VRM Class II areas require levels of change to be low and not attract the attention of a casual observer. Crossing VRM Class II areas without paralleling an existing transmission facility would conform to the Malad MFP because the new facilities would represent a level of change to the landscape and basic elements that would attract the attention of the casual observer (see KOP 920). Amendments would be needed if this route is selected. One amendment would be needed allowing a one-time visually altering action without changing the VRM classification for the Deep Creek area. The crossing of the Pipeline recreation area was originally included as an area needing an amendment, the Pocatello FO determined am amendment was not necessary because the area that would be crossed by the Project is inundated. See Appendix F-1 for proposed amendment language and Appendix G-1 for visual analyses.

Effects for KOP 907 would only apply if an amendment to the VRM requirements were approved because the Project would not otherwise be permitted with the current alignment.

Where Segment 5 would create a new ROW in areas managed under the Malad MFP, an amendment of the current land use plan allowing an new ROW outside designated corridors is needed. While this amendment is required to be consistent with the current MFP, the new land use plan being developed for this area does not contain the ROW requirement. Effects for all KOPs discussed for the Proposed Route and its alternatives would be dependent upon approval of the amendment to the ROW requirements or approval of a new plan that does not carry the ROW restriction forward.

Alternative 5A – Alternative 5A would cross over 6 miles of BLM-administered VRM Class III lands designated by the Malad MFP between MPs 19.2 and 25.5, creating a new ROW that requires a project partially retain the existing character of the landscape and only result in moderate levels of change to the characteristic landscape. Most areas can conform to VRM Class III and IV objectives (see KOPs 912 and 305). The creation of a new ROW require an amendment to the current MFP allowing a new ROW outside designated corridors. All effects for KOPs viewing BLM-managed land outside the designated ROW would be dependent upon approval of an amendment to the existing plan or approval of a new plan that does not carry the ROW restriction forward.

Alternative 5B – Alternative 5B would cross approximately 2.9 miles of BLM-administered VRM Class III lands designated by the Malad MFP between MPs 25.1 and 31.5, creating a new ROW that requires a project partially retain the existing character of the landscape and only result in moderate levels of change to the characteristic landscape. Most areas can conform to VRM Class III and IV objectives (see KOPs 898 and 1282). The creation of a new ROW require an amendment to the current MFP allowing a new ROW outside designated corridors. All effects for KOPs viewing BLM-managed land outside the designated ROW would be dependent upon approval of an amendment to the existing plan or approval of a new plan that does not carry the ROW restriction forward.

Alternative 5C – Alternative 5C would not cross any BLM-administered land. Alternative 5C would cross the Fort Hall Indian Reservation parallel to an existing 345-kV transmission line.

Alternative 5D – Alternative 5D would not cross any BLM-administered land. Alternative 5D would cross mostly private agricultural land, which has the highest concentration of viewers and thus the highest impacts when compared to the other alternatives.

Alternative 5E – Alternative 5E would not cross any BLM-administered land with a designated VRM management class. Alternative 5E would cross mostly private agricultural land and is an alternative crossing of the Snake River south of American Falls. This alternative would have lower visual impacts when compared to the other alternatives.

Segment 5 – Conclusion

Proposed Route – Visual impact to public, private, and state lands resulting from the construction and operations of the Proposed Route is anticipated to be mostly moderate, with some areas of high impact in the Arbon Valley area and the Indian Springs area where residences occur. The majority of the area that would be crossed by the Proposed Route is an agricultural setting with dispersed residences, which is where higher impacts would occur.

The Proposed Route is shorter than Alternatives 5A and 5B, contributing to more impact in a generally high-quality landscape. However, the Proposed Route would cross a large, intact VRM Class II portion of the Deep Creek Mountains. On balance, the Proposed Route would have an overall higher visual impact than Alternatives 5A and 5B.

Alternative 5A – Visual impact to public, private, and state lands resulting from the construction and operations of Alternative 5A is anticipated to be mostly moderate to high especially in the Arbon Valley area where residential areas occur in this segment. The majority of the area that would be crossed by Alternative 5A is the mountainous terrain of the Deep Creek Mountains with agriculture and dispersed residential areas in the Arbon and Rockland Valleys, where higher impacts would occur.

Alternative 5B – Visual impact to public, private, and state lands resulting from the construction and operations of Alternative 5B is anticipated to be mostly moderate with some areas of high impact in the Arbon Valley area and from the Rockland Highway where residential areas occur in this segment. The majority of the area that would be crossed by Alternative 5B is the foothills of the Deep Creek Mountains with agriculture and dispersed residential areas in the Arbon and Rockland Valleys, which is where higher impacts would occur.

Alternative 5C – Visual impact to public, private, Native American, and state lands resulting from the construction and operations of Alternative 5C is anticipated to be mostly low to moderate, with some areas of high impact on the Fort Hall Indian Reservation where residential areas occur in this segment. The majority of the area that would be crossed by Alternative 5C is the foothills of the Cedar Mountain and Bannock Peak with dispersed residential areas in the Arbon Valley around Pauline, Idaho, which is where higher impacts would occur. This alternative was sited because it follows more of a direct route to the Borah Substation, traverses more gentle terrain, and avoids public lands that are managed as VRM Class II areas by following a series of existing high-voltage transmission lines.

Alternative 5D – Visual impact to public, private, and state lands resulting from the construction and operations of Alternative 5D is anticipated to be mostly high due to open views from numerous residences in the Rockland Valley and closer to American Falls. The majority of the area crossed by Alternative 5D is the foothills of the Deep Creek Mountains with dispersed residential areas in the Rockland Valley. Photos in Figure 3.2-5 looking toward this alternative show existing conditions at KOPs in Power County.

KOP 252

KOP 243

KOP 249

KOP 253

Figure 3.2-5. Existing Conditions at Power County KOPs

Alternative 5E – Visual impact to public, private, and state lands resulting from the construction and operations of Alternative 5E is anticipated to be mostly low to moderate due to the numerous areas of human-made disturbance south of American Falls, Idaho.

Alternatives Comparison

Alternative 5C, the Fort Hall crossing, is anticipated to offer the lowest overall visual impact when compared to the other alternatives in Segment 5. Alternative 5B would avoid more VRM Class II lands as well as the recreation areas associated with the Deep Creek Mountains while impacting a similar number of scattered residences in the Arbon and Rockland Valleys. The Proposed Route and Alternative 5D would both cross VRM Class II lands. When comparing the Proposed Route and Route Alternatives for Segment 5, Alternative 5C would have the least viewers, lowest viewer impacts, and least impact to sensitive VRM classes.

Segment 6 – Borah to Midpoint

Segment 6 is an existing transmission line linking the Borah and Midpoint Substations; it is now operated at 345 kV but would be changed to operate at 500 kV. This segment has no Route Alternatives. Existing support structures would be used and impacts

would be limited to within approximately one-quarter mile from each substation to allow for moving the entry point into the substation to the new 500-kV bay. Thirty-one acres of the expansion of the Borah and Midpoint Substations are attributed to Segment 6. Changes in the two substations would allow it to be operated at 500 kV (see Appendix A, Figure A-8).

The use of an existing transmission line would not produce noticeable changes to the existing visual conditions and thus no KOPs were required for the analysis.

Segment 7 – Populus to Cedar Hill

Segment 7, as proposed, would link the Populus and Cedar Hill Substations with a 118.1-mile single-circuit 500-kV line. Forty-two acres of the expansion of the Populus and the construction of the Cedar Hill Substations and 1 acre for two regeneration sites are attributed to Segment 7. In addition to the Proposed Route, which is principally on private lands, Route Alternatives have been proposed by the BLM to avoid the Deep Creek Mountains (7A and 7B; which are 5 miles and 11 miles longer than the comparison portion of the Proposed Route), by local landowners (7C, 7D, 7E, 7F, and 7G, which all represent minor adjustments proposed to address local issues), by local landowners to avoid private agricultural lands (7I or the State Line Route, which is 55 miles longer than the Proposed Route and would require 0.5 acre for an additional regeneration site), and by the Proponents to avoid the State Line Route (7H, which is 10 miles longer than the Proposed Route). Alternative 7J, which is a variant of the State Line Route also proposed by local landowners, would not terminate at the Cedar Hill Substation. This alternative, referred to as the Rogerson Alternative, would require a different substation be constructed near a 345-kV existing transmission line (approximately 24 miles southwest of the Cedar Hill Substation; see Appendix A, Figure A-9). The tables and discussion in this document comparing 7J (202 miles) with the corresponding portion of Segment 7/9 (168.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

Proposed Route

Table 3.2-26 summarizes the potential visual impact for each KOP along the Proposed Route.

Table 3.2-26. Visual Impact Assessment for Each KOP in the Segment 7 Proposed Route

KOP	Viewers[3/]	Land Ownership	Viewer Rating[4/]	Scenic Quality[4/]	Distance (miles)	Visibility[4/]	Contrast[4/]	Impact[4/]
907	REC	BLM VRM II	H	H	1.0	H	H	H
305 [1/]	REC	BLM VRM IV	H	M	0.15	H	M	M-H
185 [2/]	SCHOOL	Private	H	L	0.43	L	L-M	L-M
247	RES	Private	H	M	0.5	H	M	M
301	RES	Private	H	L-M	1.3	M-H	L-M	L-M
303	RES	Private	H	L-M	0.25	M-H	M	M
310	RES	Private	H	L	0.1	H	M	M
131	RES	Private	H	L	0.75	H	L-M	M

Table 3.2-26. Visual Impact Assessment for Each KOP in the Segment 7 Proposed Route (continued)

KOP	Viewers[3/]	Land Ownership	Viewer Rating[4/]	Scenic Quality[4/]	Distance (miles)	Visibility[4/]	Contrast[4/]	Impact[4/]
140	REC	State of ID	L	L	1.5	M	L	L
315	RES	Private	H	M	0.9	H	M	M-H
221	RES	Private	H	M	0.75	M-H	M	M

1/ KOP 305 would view portions of Alternatives 7A, 7B, 7H, and 7I, which all have lower impacts compared to the Segment 7 Proposed Route resulting from shared corridors or distance from viewer.
2/ KOP 185 would view portions of Segment 5 Proposed Route but it is anticipated to have the same impacts as the Segment 7 Proposed Route.
3/ RES – A single resident. REC – A recreational viewer. SCHOOL – A community school usually not identified as historic.
4/ H – High, M – Medium, L – Low

KOP C25 (Figure E.2-6). Views from this point are from a portion of the Oregon NHT and are described in Section 3.3 – Cultural Resources.

KOP C63 (Figure E.2-8, Photo Simulation Figure E.3-29). This view is looking toward Segment 7 from the "Parting Of The Ways" site along the Oregon NHT. This viewpoint is discussed in Section 3.3 – Cultural Resources.

KOP 907 (Figure E.2-8/Appendix G, Figure M-1/M-3d). The Proposed Route would be highly visible to high-sensitivity recreational viewers at KOP 907, a lookout point on a BLM trail in the Deep Creek Mountains. Viewers would have a high-visibility, open view of the alignment as it crosses the Deep Creek Mountains. Viewers would be approximately 1.0 mile from the Proposed Route. Contrast levels would be high due to the lack of other human-made disturbance within the view with high scenic quality. Visual impacts on recreational viewers and the immediate area would be high due to the high scenic quality, visibility, contrast, and close distance to the Project.

KOP 305 (Figures E.2-8 and E.2-23). The Proposed Route would be highly visible to recreational viewers in the Hawkins Reservoir area viewing the Project from 0.15 mile to the south. The viewers would have an open but somewhat enclosed view of the Proposed Route in an unmodified landscape; however, immediately to the north, opposite this view, an existing transmission line crosses the landscape. This situation results in a moderate contrast level due to the adjacent scenery. Impacts on viewers would be moderate to high.

KOP 185 (Figure E.2-8). The Proposed Route as viewed is consistent with the description provided for the Segment 5 Proposed Route. Viewing distance would increase from 0.10 to 0.43 mile but the visual impact would still be low to moderate.

KOP 247 (Figure E.2-8). High-sensitivity residential viewers would have high Project visibility from KOP 247 (approximately 0.5 mile away from the Project). The viewers would have a panoramic view of Segment 7 crossing the Rockland Valley. In this agricultural setting there are many structures and pivot irrigation equipment, resulting in moderate contrast in this moderate scenic quality area. Visual impacts would be moderate.

KOP 301 (Figure E.2-8). High-sensitivity residential viewers would have moderate to high Project visibility from just over 1 mile away. The viewers would have a panoramic view of the Proposed Route at the base of the hills. In this agricultural setting there are many structures and pivot irrigation equipment, resulting in low to moderate contrast in this low to moderate scenic quality area. Visual impacts would be low to moderate.

KOP 303 (Figure E.2-8). High-sensitivity residential viewers would have moderate to high Project visibility from 0.25 mile away. The viewers would have a partially screened and inferior (low-elevation) view of the Proposed Route crossing the dominant hills in the foreground. In this rural residential setting there are many scattered residential structures resulting in moderate contrast in this low to moderate scenic quality area. Visual impacts would be moderate due to the distance of the viewer.

KOP 310 (Figure E.2-8). High-sensitivity residential viewers at this KOP would have high Project visibility from a distance of 0.1 mile to the southeast. The view is partially screened and inferior (low-elevation) and scenic quality is low, resulting in a moderate overall contrast level. Visual impacts would be moderate due to the distance of the view which may skyline or be screened by the terrain.

KOP 315 (Figure E.2-8). At KOP 315 high-sensitivity residential viewers would view the Proposed Route approximately 0.9 mile to the southeast and Alternative 7F approximately 1.8 miles also to the southeast. At KOP 315, the viewers would have a high level of Project visibility due to the open landscape with little screening in the middleground. Visual contrast levels would be moderate due to human-made alterations visible in the foreground and background of this KOP. Impacts on viewers would be moderate to high due to the close viewing proximity and moderate contrast levels.

KOP 131 (Figure E.2-8). High-sensitivity residential viewers at this KOP would have high Project visibility from a distance of 0.75 mile to the south. One residence, on 400 West just north of 900 South, would view the Sawtooth NF to the east and the Proposed Route approximately 0.75 mile to the south. The view is open and panoramic and scenic quality is low with some vertical structures, resulting in low to moderate contrast. Visual impacts on would be moderate.

KOP 140 (Figure E.2-8). Low-sensitivity viewers, at this BLM/IDFG–managed wildlife area located in a low scenic quality VRM Class III area, would have generally open and panoramic views. The Proposed Route would be moderately visible from a distance of about 1.5 miles. The combination of this viewing distance, low scenic quality, and the presence of existing structures results in generally low visual contrast. Visual impacts would be low.

Alternative 7A

Table 3.2-27 summarizes the potential visual impact for each KOP in Alternative 7A.

Table 3.2-27. Visual Impact Assessment for Each KOP in Alternative 7A

KOP	Viewers[2/]	Land Ownership	Viewer Rating[3/]	Scenic Quality[3/]	Distance (miles)	Visibility[3/]	Contrast[3/]	Impact[3/]
903	RES	Private	H	M	0.35	H	M-H	M-H
920	REC	BLM VRM II	H	H	6.3	L	L	L
887	RES	Private	H	M-H	0.3	H	M	M
917 [1/]	REC	Private	H	M-H	0.5	H	H	H

1/ KOP 917 would view a shared portion of Alternatives 7A and 7B; thus, impacts would be the same.
2/ RES – A single resident. REC – A recreational viewer.
3/ H – High, M – Medium, L – Low

KOP 903 (Figure E.2-8). High-sensitivity residential viewers at a church along Church Road would have a high-visibility, open view of the Alternative as it crosses agricultural lands in the Arbon Valley. Viewers would be approximately 0.35 mile from Alternative 7A. Contrast levels would be moderate to high due to the viewing distance and lack of human-made modifications. Visual impacts on residential viewers and the immediate area would be moderate to high.

KOP 920 (Figure E.2-8). High-sensitivity recreational viewers, at a trailhead on BLM-managed land in the Deep Creek Mountains, would have a low-visibility open view of the alternative approximately 6.3 miles from Alternative 7A. Contrast levels would be low due to the viewing distance of the viewer, and visual impacts on recreational viewers and the immediate area would also be low due to the viewing distance.

KOP 887 (Figure E.2-8). High-sensitivity residential viewers on Groom Road would have a high-visibility, open view of the alternative as it crosses agricultural lands in the Rockland Valley. Viewers would be approximately 0.3 mile from Alternative 7A. Contrast levels would be moderate due to the viewing distance and presence of human-made modifications. Visual impacts on residential viewers and the immediate area would be moderate.

KOP 917 (Figure E.2-8). High-sensitivity recreational viewers at a seasonal RV campground would have a high-visibility, open view of the alternative as it crosses rugged mountainous terrain and the foothills of the Sublette Range outside of the Sawtooth NF. Viewers would be approximately 0.5 mile from Alternative 7A. Contrast levels would be high due to the viewing distance and lack of human-made modifications. Visual impacts on residential viewers and the immediate area would be high.

Alternative 7B

Table 3.2-28 summarizes the potential visual impact for each KOP in Alternative 7B.

Table 3.2-28. Visual Impact Assessment for Each KOP in Alternative 7B

KOP	Viewers[1/]	Land Ownership	Viewer Rating[2/]	Scenic Quality[2/]	Distance (miles)	Visibility[2/]	Contrast[2/]	Impact[2/]
912	RES	Private	H	M	0.35	H	M	M
916	RES	Private	H	M-H	2.10	M	M	M
898	RES	Private	H	M-H	0.43	H	H	H
917	REC	Private	H	M-H	0.50	H	H	H
893	RES	Private	H	M-H	1.30	M-H	L-M	L-M

1/ RES – A single resident. REC – A recreational viewer.
2/ H – High, M – Medium, L – Low

KOP 912 (Figure E.2-8). Alternative 7B would be highly visible to residential viewers, along Daniels Road, viewing it from KOP 912 (approximately 0.36 mile to the southeast). The viewers would have an open semi-panoramic view of Alternative 7B in a modified landscape with moderate scenic quality. This situation would result in a moderate contrast level due to the adjacent scenery. Impacts on viewers would be moderate.

KOP 916 (Figure E.2-8). High-sensitivity residential viewers on 10800 West Road would have a moderate-visibility, open view of the alternative as it crosses agricultural lands and mountainous terrain in the Arbon Valley. Viewers would be approximately 2.1 miles from Alternative 7B. Contrast levels would be moderate due to the viewing distance and presence of human-made modifications. Visual impacts on residential viewers and the immediate area would be moderate due to the distance of the viewer.

KOP 898 (Figure E.2-8). High-sensitivity residential viewers on the Arbon Valley Highway would have a high-visibility, open view of the alternative as it crosses agricultural lands, backdropped by the mountainous terrain of the Deep Creek Range. Viewers would be approximately 0.43 mile from Alternative 7B. Contrast levels would be high due to the viewing distance and scenic quality. Visual impacts on residential viewers and the immediate area would be high due to the distance of the viewer and contrast levels.

KOP 893 (Figure E.2-6). Alternative 7B would be moderately to highly visible to residential viewers adjacent to Colson Canyon (approximately 1.3 miles to the west). The viewers would have a semi-panoramic and focal view of Alternative 7B in a modified landscape with moderate to high scenic quality. This situation would result in a low to moderate contrast level due to the adjacent scenery and the distance of the viewer. Impacts on viewers would be low to moderate since views of the transmission line may be partially screened by the rugged terrain in the middleground.

Alternative 7C

Table 3.2-29 summarizes the potential visual impact for each KOP in Alternative 7C.

Table 3.2-29. Visual Impact Assessment for Each KOP in Alternative 7C

KOP	Viewers[1/]	Land Ownership	Viewer Rating[2/]	Scenic Quality[2/]	Distance (mile)	Visibility[2/]	Contrast[2/]	Impact[2/]
282	RES	Private	H	L-M	0.75	H	M-H	M-H

1/ RES – A single resident.
2/ H – High, M – Medium, L – Low

KOP 282 (Figure E.2-8). Viewers from KOP 282 would be high-sensitivity residents on North Yale Road looking north 0.75 mile to where Alternative 7C would span the valley. At KOP 282, high-sensitivity viewers would have a high level of Project visibility due to the open landscape views with little screening in the middleground. Visual contrast levels would be moderate to high due to the human-made alterations visible in the foreground and background of this KOP. Visual impacts on viewers would be moderate to high. KOP 275 and KOP 289 were also selected as sensitive viewpoints but are related to historic trails as discussed in Section 3.3 – Cultural Resources.

Alternative 7D

Table 3.2-30 summarizes the potential visual impact for each KOP in Alternative 7D.

Table 3.2-30. Visual Impact Assessment for Each KOP in Alternative 7D

KOP	Viewers[1/]	Land Ownership	Viewer Rating[2/]	Scenic Quality[2/]	Distance (mile)	Visibility[2/]	Contrast[2/]	Impact[2/]
296	RES	Private	H	M	0.7	H	M	M

1/ RES – A single resident.
2/ H – High, M – Medium, L – Low

KOP 296 (Figure E.2-8). Viewers from KOP 296 are high-sensitivity residential viewers along Skaggs Ranch Road looking southeast approximately 0.70 mile from the Proposed Route and 0.5 mile from Alternative 7E. At KOP 296, viewers would have a high level of Project visibility due to near distances and lack of screening in the middleground. Visual contrast levels would be moderate due to numerous human-made alterations visible in the foreground and background of this KOP. Visual impacts on viewers would be moderate due to lack of contrast and moderate scenic quality.

Alternative 7E

Table 3.2-31 summarizes the potential visual impact for each KOP in Alternative 7E.

Table 3.2-31. Visual Impact Assessment for Each KOP in Alternative 7E

KOP	Viewers[1/]	Land Ownership	Viewer Rating[2/]	Scenic Quality[2/]	Distance (miles)	Visibility[2/]	Contrast[2/]	Impact[2/]
304	REC	Private	H	M	0.9	M	M-H	M-H
311	RES	Private	H	L-M	0.1	H	H	M-H

1/ RES – A single resident. REC – A recreational viewer.
2/ H – High, M – Medium, L – Low

KOP 304 (Figure E.2-8). This KOP is the same as described for Alternative 7F.

KOP 311 (Figure E.2-8). Viewers from KOP 311 would be high-sensitivity residences looking southeast approximately 0.1 mile from where Alternative 7E would cross the linear perspective of the view. At KOP 311, high-sensitivity viewers would have a high level of Project visibility due to skylined topography in the foreground (approximately 0.1 mile from the viewer). Visual contrast levels would be high due to the lack of human-made alterations visible in the foreground and mountainous terrain in the background. Visual impacts would be moderate to high due to skylined views and low to moderate scenic quality. It should also be noted that from this KOP parts of the Proposed Route would be visible, approximately 100 feet behind the viewer.

Alternative 7F

Table 3.2-32 summarizes the potential visual impact for each KOP in Alternative 7F.

Table 3.2-32. Visual Impact Assessment for Each KOP in Alternative 7F

KOP	Viewers[2/]	Land Ownership	Viewer Rating[3/]	Scenic Quality[3/]	Distance (mile)	Visibility[3/]	Contrast[3/]	Impact[3/]
304[1/]	REC	Private	H	M	0.9	M	M-H	M-H

1/ KOP 304 would view a shared portion of Alternative 7E; thus, impacts would be the same.
2/ REC – A recreational viewer.
3/ H – High, M – Medium, L – Low

KOP 304 (Figure E.2-8). Viewers from KOP 304 would be high-sensitivity recreational drivers looking northwest (approximately 0.9 mile from where Alternative 7F would cross the view). This KOP is located on lands managed by the BLM to meet VRM Class II objectives. At KOP 304, high-sensitivity viewers would have a moderate level of Project visibility due to partially screening by topography in the middleground. Visual contrast levels would be moderate to high due to the lack of human-made alterations visible in the foreground and background. Visual impacts would be moderate to high due to partial screening and moderate scenic quality. Moderate to high impacts resulting from elevated visibility and contrast levels on public lands would not conform to VRM Class II objectives.

Alternative 7G

Table 3.2-33 summarizes the potential visual impact for each KOP in Alternative 7G.

Table 3.2-33. Visual Impact Assessment for Each KOP in Alternative 7G

KOP	Viewers[2/]	Land Ownership	Viewer Rating[3/]	Scenic Quality[3/]	Distance (mile)	Visibility[3/]	Contrast[3/]	Impact[3/]
221[1/]	RES	Private	H	M	0.5	H	M-H	M-H

1/ Viewers at KOP 221 would have views of the Proposed Route and Alternative 7H alignments with lower anticipated visual impacts.
2/ REC – A recreational viewer.
3/ H – High, M – Medium, L – Low

KOP 221 (Figure E.2-8). At KOP 221 there would be high-sensitivity residential viewers looking south (approximately 0.5 mile to where Alternative 7G would cross the view 0.75 mile from the Proposed Route). At KOP 221, high-sensitivity viewers would have a high level of Project visibility due to the open landscape views with little screening in the middleground. Visual contrast levels would be moderate to high due to the human-made alterations visible in the foreground and background. Impacts on viewers would be moderate to high due to the close viewing proximity and moderate contrast levels.

Alternative 7H

Table 3.2-34 summarizes the potential visual impact for each KOP in Alternative 7H.

Table 3.2-34. Visual Impact Assessment for Each KOP in Alternative 7H

KOP	Viewers[2/]	Land Ownership[3/]	Viewer Rating[4/]	Scenic Quality[4/]	Distance (miles)	Visibility[4/]	Contrast[4/]	Impact[4/]
305 [1/]	REC	BLM VRM IV	H	M	0.50	H	M	M-H
912[1/]	RES	Private	H	M	0.35	H	M	M
916[1/]	RES	Private	H	M-H	2.10	M	M	M
898[1/]	RES	Private	H	M-H	0.43	H	H	H
1282[1/]	RES	Private	H	H	0.25	H	H	H
1278[1/]	RES	Private	H	M	1.25	M	M-H	M
1273[1/]	REC	Forest Service M VQO	H	H	0.30	H	H	H
1270[1/]	REC	Forest Service M VQO	H	M-H	0.65	H	H	H
1267[1/]	REC	Forest Service MM VQO	H	M-H	100 ft	H	H	H

Table 3.2-34. Visual Impact Assessment for Each KOP in Alternative 7H (continued)

KOP	Viewers[2/]	Land Ownership[3/]	Viewer Rating[4/]	Scenic Quality[4/]	Distance (miles)	Visibility[4/]	Contrast[4/]	Impact[4/]
1207	RES	Private	H	L-M	0.25	H	H	M-H
1252	RES	BLM VRM III	H	M-H	0.30	H	M-H	M-H
1255	REC	BLM VRM III	H	M	1.30	M	M	M
1246	RES	Private	H	M	0.35	H	M-H	M-H
1241	REC	Private	H	M-H	0.95	H	M-H	M-H
1224	RES	Private	H	M-H	1.00	H	M	M-H
1239	RES	Private	H	M-H	1.00	H	M-H	M-H
1235	REC	BLM VRM IV	H	H	83 ft	H	H	H
1234	REC	Forest Service M VQO	H	H	73 ft	H	H	H
1231	REC	Forest Service PR VQO	H	H	0.15	H	H	H
1228	REC	Forest Service PR VQO	H	M-H	0.43	H	H	H
1226	REC	Forest Service PR VQO	H	M-H	0.3	H	H	H
1184	RES	Private	H	L-M	0.75	H	M-H	M
1180	RES	Private	H	M-H	0.25	H	H	H
1175	RES	Private	H	M	0.6	H	H	M-H
1173	REC	BLM VRM IV	H	M	1.1	H	M-H	M-H
1171	RES	Private	H	M	0.5	H	M-H	M
1435	REC	Forest Service PR VQO	H	H	3.8	L	M	M
221	RES	Private	H	M	0.5	H	M-H	M-H

1/ Viewers at KOP would have views of Alternative 7I with equal anticipated visual impacts due to a shared corridor between both alternatives.
2/ KOP would also be used in the discussion of Alternative 7I because this is a shared portion of the corridor.
3/ PR – Partial Retention; M – Modification; MM – Maximum Modification
4/ REC – A recreational viewer. RES – A single resident.
5/ H – High, M – Medium, L – Low

KOP 305 (Figure E.2-8). See discussion under Segment 5.

KOP 912 (Figure E,2-8). See discussion under Alternative 7B.

KOP 898 (Figure E.2-8). See discussion under Alternative 7B.

KOP 916 (Figure E.2-8). See discussion under Alternative 7B.

KOP 221 (Figure E.2-8). See discussion under Proposed Route.

KOP 1282 (Figure E.2-8). High-sensitivity residential viewers at KOP 1282 would have a high level of Project visibility 0.25 mile from Alternative 7H. The viewer would have an open and panoramic view toward the alignment that would not parallel any existing alignments or linear features and may screen views of the scenic terrain of the Deep Creek Mountains. Contrast levels are anticipated to be high. Potential visual impacts on residential users from this KOP and in the general vicinity are expected to be high due to high contrast and the creation of a new linear feature in a landscape with few visible human-made disturbances.

KOP 1278 (Figure E.2-8). High-sensitivity residential viewers at KOP 1278 would have a moderate level of Project visibility (approximately 1.25 miles from Alternative 7H). The viewer would have an open and panoramic view toward the alignment, which would not parallel any existing alignments or linear features and may skyline the terrain of Buck Peak in the middleground. Contrast levels are anticipated to be moderate to high. Potential visual impacts on residential users from this KOP and in the general vicinity are expected to be moderate. The alternative would create a new linear feature in a landscape with numerous visible human-made disturbances and moderate to high contrast.

KOP 1207 (Figure E.2-8). High-sensitivity residential viewers at KOP 1207 would have a high level of Project visibility (approximately 0.25 mile from Alternative 7H). The viewer would have an expansive panoramic view toward the alignment, which would not parallel any existing alignments or linear features and would likely skyline the views toward the Chapin Mountains. Contrast levels are anticipated to be high. Potential visual impacts on residential viewers from this KOP and in the general vicinity are expected to be moderate to high due to high contrast and the creation of a new linear feature in a disturbed landscape with low to moderate scenic quality.

KOP 1252 (Figure E.2-8). High-sensitivity residential viewers at KOP 1252 would have a high level of Project visibility (approximately 0.3 mile from Alternative 7H). The viewer would have an open view toward the alignment, which would not parallel any existing alignments or linear features. The scene would be backdropped by the mountainous terrain, resulting in contrast levels that are anticipated to be moderate to high. Potential visual impacts on residential viewers from this KOP and in the general vicinity are expected to be moderate to high due to the closeness of the view. The alternative would create a new linear feature in an undisturbed landscape with moderate to high contrast, detracting from the scenic quality.

KOP 1255 (Figure E.2-8). High-sensitivity recreational viewers at KOP 1255 would have a moderate level of Project visibility (approximately 1.3 mile from Alternative 7H). The viewer would have a broad open view toward the alignment, which would not parallel any existing alignments or linear features but would be backdropped by the mountainous terrain. Contrast levels are anticipated to be moderate. Potential visual impacts on recreational viewers from this KOP and in the general vicinity are expected to be moderate because the alternative would create a new linear feature in a disturbed landscape with moderate contrast.

KOP 1246 (Figure E.2-8). High-sensitivity residential viewers at KOP 1246 would have a high level of Project visibility (approximately 0.35 mile from Alternative 7H). The viewer would have a focal view toward the alignment, which would not parallel any existing alignments or linear features but would be backdropped by the mountainous terrain. Contrast levels are anticipated to be moderate to high. Potential visual impacts on residential viewers from this KOP and in the general vicinity are expected to be moderate to high because the alternative would create a new linear feature in an undisturbed landscape with moderate to high contrast.

KOP 1241 (Figure E.2-8). High-sensitivity recreational viewers at KOP 1241 would have a high level of Project visibility (approximately 0.95 mile from Alternative 7H). The viewer would have an open and panoramic view toward the alignment, which would not parallel any existing alignments or linear features but would be backdropped by the mountainous terrain. Contrast levels are anticipated to be moderate to high. Potential visual impacts on residential viewers from this KOP and in the general vicinity are expected to be moderate to high because the alternative would create a new linear feature in an undisturbed landscape with moderate to high contrast.

KOP 1224 (Figure E.2-8). High-sensitivity residential viewers at KOP 1224 would have a high level of Project visibility (approximately 1.0 mile from Alternative 7H). The viewer would have an expansive panoramic view toward the alignment, which would not parallel any existing alignments or linear features but may be backdropped by the Pomerelle Mountains. Contrast levels are anticipated to be moderate. Potential visual impacts on residential viewers from this KOP and in the general vicinity are expected to be moderate to high due to moderate contrast and the development of a new linear feature in a disturbed landscape with moderate to high scenic quality.

KOP 1239 (Figure E.2-8). High-sensitivity residential viewers at KOP 1239 would have a high level of Project visibility (approximately 1.0 mile from Alternative 7H). The viewer would have an open and panoramic view toward the alignment, which would not parallel any existing alignments or linear features but would be backdropped by the mountainous terrain. Contrast levels are anticipated to be moderate to high. Potential visual impacts on residential viewers from this KOP and in the general vicinity are expected to be moderate to high because due to the development of a new linear feature in an undisturbed landscape with moderate to high contrast.

KOP 1235 (Figure E.2-8). High-sensitivity recreational viewers at KOP 1235 would have a high level of Project visibility (approximately 85 feet from Alternative 7H, an immediate foreground view). The viewer would have a focal and enclosed view toward the alignment, which would not parallel any existing alignments or linear features and may cause vegetation removal and landscape scarring. Contrast levels are anticipated to be high. The area is directly adjacent to lands managed for Modification by the Sawtooth NF, which allows for activities that may visually dominate the original characteristic landscape. Activities that alter vegetation and landforms must borrow from naturally established form, line, color, or texture, and structures must remain visually subordinate to the proposed composition. The ROS for this area directly adjacent to this KOP is listed as RN. Potential visual impacts on recreational viewers from this KOP and in the general vicinity are expected to be high because the alternative would create a new linear feature in an undisturbed landscape with high contrast. Alternative 7H would conform to the Forest Service Modification classification as well as the ROS of RN even though this particular KOP is directly adjacent to lands managed by the Sawtooth NF.

KOP 1234 (Figure E.2-8). High-sensitivity recreational viewers at KOP 1234 would have a high level of Project visibility (approximately 73 feet from Alternative 7H, an immediate foreground view). The viewer would have an expansive, panoramic, and superior (high-elevation) view toward the alignment, which would not parallel any

existing alignments or linear features and may skyline the mountainous terrain. Contrast levels are anticipated to be high. The area is managed for Modification by the Sawtooth NF, which allows for activities that may visually dominate the characteristic landscape. Activities which alter vegetation and landforms must borrow from naturally established form, line, color, or texture, and structures must remain visually subordinate to the proposed composition. The ROS for this area is listed as RN. Potential visual impacts on recreational viewers from this KOP and in the general vicinity are expected to be high due to high contrast and the development of a new linear feature in an undisturbed landscape with high scenic quality. Alternative 7H would conform to the Forest Service Modification classification as well as the ROS of RN.

KOP 1231 (Figure E.2-8). High-sensitivity recreational viewers at KOP 1231 would have a high level of Project visibility (approximately 0.15 mile from Alternative 7H, an immediate foreground view). The viewer would have an expansive, panoramic, and inferior (low-elevation) view toward the alignment, which would not parallel any existing alignments or linear features and may skyline the mountainous terrain. The Project may cause landscape scarring through clearing activities, resulting in contrast levels that are anticipated to be high. The area is managed for Partial Retention by the Sawtooth NF, which requires management activities remain visually subordinate to the characteristic landscape. Activities may repeat form, line, color, or texture common to the characteristic landscape but not change qualities such as size, amount, intensity, direction, and pattern. The ROS for this area is listed as RN. Potential visual impacts on recreational viewers from this KOP and in the general vicinity are expected to be high because the alternative would create a new linear feature in an undisturbed landscape with high scenic quality and high contrast. Alternative 7H would not conform to the Forest Service Partial Retention classification but would conform to the ROS of RN.

KOP 1228 (Figure E.2-8). High-sensitivity recreational viewers at KOP 1228 would have a high level of Project visibility (approximately 0.43 mile from Alternative 7H). The viewer would have an expansive, panoramic, and inferior (low-elevation) view toward the alignment, which would not parallel any existing alignments or linear features and may skyline the mountainous terrain. Contrast levels are anticipated to be high. The area is managed for Partial Retention by the Sawtooth NF, which requires management activities remain visually subordinate to the characteristic landscape. Activities may repeat form, line, color, or texture common to the characteristic landscape but not change qualities such as size, amount, intensity, direction, and pattern. Potential visual impacts on recreational viewers from this KOP and in the general vicinity are expected to be high because the alternative would create a new linear feature in an undisturbed landscape with moderate to high scenic quality and high contrast. Alternative 7H would not conform to the Forest Service Partial Retention classification.

KOP 1226 (Figure E.2-8). High-sensitivity recreational viewers at KOP 1226 would have a high level of Project visibility (approximately 0.3 mile from Alternative 7H). The viewer would have an expansive, panoramic, and inferior (low-elevation) view toward the alignment, which would not parallel any existing alignments or linear features and may skyline the mountainous terrain. Contrast levels are anticipated to be high. The area is managed for Maximum Modification by the Sawtooth NF, which allows for

vegetative and landform alterations that may dominate the characteristic landscape. When viewed in the foreground, the Project may not appear to completely borrow from naturally established form, color, line, or texture. Alterations could be out of scale or contain detail that is incongruent with natural occurrences as seen in the foreground. The ROS for this area is listed as RN. Potential visual impacts on recreational viewers from this KOP and in the general vicinity are expected to be high due to high contrast and the development a new linear feature in an undisturbed landscape with moderate to high scenic quality. Alternative 7H would conform to the Forest Service Maximum Modification classification as well as the ROS of RN.

KOP 1184 (Figure E.2-8). High-sensitivity residential viewers at KOP 1184 would have a high level of Project visibility (approximately 0.75 mile from Alternative 7H). The viewer would have an expansive panoramic, though partially screened, view toward the alignment, which would not parallel any existing alignments or linear features and would likely skyline the views toward Oakley, Idaho, and across the Magic Valley. Contrast levels are anticipated to be moderate to high. Potential visual impacts on residential viewers from this KOP and in the general vicinity are expected to be moderate due to the development of a new linear feature in a disturbed landscape with low to moderate scenic quality and partial screening.

KOP 1180 (Figure E.2-8). High-sensitivity residential viewers at KOP 1180 would have a high level of Project visibility (approximately 0.25 mile from Alternative 7H). The viewer would have an expansive panoramic view toward the alignment, which would not parallel any existing alignments or linear features and would likely skyline a portion of the views of Walker Hollow and the Lower Goose Creek Reservoir. Contrast levels are anticipated to be high. Potential visual impacts on residential viewers from this KOP and in the general vicinity are expected to be high. The development of a new linear feature in a disturbed landscape with moderate to high scenic quality and the high contrast levels would detract from the scenic quality.

KOP 1175 (Figures E.2-8 and E.2-24). High-sensitivity residential viewers at KOP 1175 would have a high level of Project visibility (approximately 0.6 mile from Alternative 7H). The viewer would have an expansive panoramic view toward the alignment, which would not parallel any existing alignments or linear features and would likely skyline the views of Walker Hollow. Contrast levels are anticipated to be high. Potential visual impacts on residential viewers from this KOP and in the general vicinity are expected to be moderate to high. The development of a new linear feature in a disturbed landscape, with moderate scenic quality and high contrast, would detract from the scenic quality.

KOP 1173 (Figure E.2-8). High-sensitivity recreational viewers at KOP 1173 would have a high level of Project visibility (approximately 1.1 miles from Alternative 7H). The viewer would have an expansive panoramic view toward the alignment, which would not parallel any existing alignments or linear features and would skyline the views of the valley. Contrast levels are anticipated to be moderate to high. Potential visual impacts on recreational viewers from this KOP and in the general vicinity are expected to be moderate to high due to moderate to high contrast and the development of a new linear feature in a disturbed landscape with moderate scenic quality.

KOP 1171 (Figure E.2-8). High-sensitivity residential viewers at KOP 1171 would have a high level of Project visibility (approximately 0.5 mile from Alternative 7H). The viewer would have an expansive and focal view toward the alignment, which would not parallel any existing alignments or linear features but would be backdropped by the rocky terrain. Contrast levels are anticipated to be moderate to high. Potential visual impacts on residences from this KOP and in the general vicinity are expected to be moderate due to the development of a new linear feature in a disturbed landscape, with moderate scenic quality.

KOP 1435 (Figure E.2-8). High-sensitivity recreational viewers at KOP 1435 would have a low level of Project visibility 3.8 miles from Alternative 7H. The viewer would have an expansive, panoramic, and superior (high-elevation) view toward the alignment, which would not parallel any existing alignments or linear features but would be backdropped by the mountainous terrain. The resulting contrast levels are anticipated to be moderate. The area is managed for Partial Retention by the Sawtooth NF, which requires management activities remain visually subordinate to the characteristic landscape. Activities may repeat form, line, color, or texture common to the characteristic landscape but not changes in their qualities of size, amount, intensity, direction, and pattern. Potential visual impacts on recreational viewers from this KOP and in the general vicinity are expected to be moderate because the alternative would create a new linear feature in an undisturbed landscape with high scenic quality and moderate contrast at a far distance. Alternative 7H would conform to the Forest Service Partial Retention classification due to it being visually subordinate in the characteristic landscape from this particular viewpoint.

Alternative 7I

Table 3.2-35 summarizes the potential visual impact for each KOP in Alternative 7I.

Table 3.2-35. Visual Impact Assessment for Each KOP in Alternative 7I

KOP	Viewers[3/]	Land Ownership[4/]	Viewer Rating[5/]	Scenic Quality[5/]	Distance (miles)	Visibility[5/]	Contrast[5/]	Impact[5/]
1079	REC	Forest Service M VQO	M	M	0.1	H	H	H
1081	REC	Forest Service MM VQO	M	M	0.1	H	H	H
305	REC	BLM VRM IV	H	M	0.50	H	M	M-H
912	RES	Private	H	M	0.35	H	M	M
916	RES	Private	H	M-H	2.10	M	M	M
898	RES	Private	H	M-H	0.43	H	H	H
1282	RES	Private	H	H	0.25	H	H	H
1278	RES	Private	H	M	1.25	M	M-H	M
1273 [1/]	REC	Forest Service MM VQO	H	H	0.30	H	H	H
1270 [1/]	REC	Forest Service MM VQO	H	M-H	0.65	H	H	H
1267 [1/]	REC	Forest Service MM VQO	H	M-H	100 feet	H	H	H
1204	RES	Private	H	M-H	2.00	M	M	M
1190	RES	Private	H	M-H	1.00	H	M	M

Table 3.2-35. Visual Impact Assessment for Each KOP in Alternative 7I (continued)

KOP	Viewers[3/]	Land Ownership[4/]	Viewer Rating[5/]	Scenic Quality[5/]	Distance (miles)	Visibility[5/]	Contrast[5/]	Impact[5/]
1097	REC	BLM VRM III	H	M-H	3.80	L-M	L-M	L-M
1101	REC	BLM VRM III	H	M-H	3.75	L	L-M	L
1159	REC	NPS	H	M	2.30	L	L	L
1103	REC	NPS	H	M	2.50	L	L-M	L
1160	REC	BLM VRM III	H	H	1.00	M-H	M-H	M-H
1104	REC	NPS	H	M-H	2.00	M	M	M
1105	REC	Private	H	M	0.85	H	M	M-H
1091[2/]	RES	Private	H	M-H	1.10	M	M-H	M-H
1086[2/]	REC	Private	H	M-H	2.00	L-M	M	M
1078	REC	Forest Service MM VQO	H	M-H	0.20	H	H	H
1052	RES	BLM VRM IV	H	L-M	2.30	L-M	M	M
1047	REC	Private	H	L	1.10	L	L-M	L-M

1/ Viewers at KOP would have views of Alternative 7H with equal anticipated visual impacts due to a shared corridor between both alternatives.
2/ Viewers at KOP would have views of Alternative 7J with equal anticipated visual impacts due to a shared corridor.
3/ REC – A recreational viewer. RES – A single resident.
4/ PR – Partial Retention, M – Modification, MM – Maximum Modification
5/ H – High, M – Medium, L – Low

KOP 305 (Figure E.2-8). See discussion under Segment 5.

KOP 912 (Figure E,2-8). See discussion under Alternative 7B.

KOP 898 (Figure E.2-8). See discussion under Alternative 7B.

KOP 916 (Figure E.2-8). See discussion under Alternative 7B.

KOP 1282 (Figure E.2-8). See discussion under Alternative 7H.

KOP 1278 (Figure E.2-8). See discussion under Alternative 7H.

KOP 1079 (Figure E.2-8/Appendix G, Figure ST-3b). The visibility of Alternative 7I would be high for recreational viewers at KOP 1079 (approximately 900 feet from this alignment). The viewers would have an open view toward the alignment, which would not parallel any existing linear features and may skyline when crossing the rolling terrain in the middleground and background, resulting in high contrast levels. The area is managed for Modification by the Sawtooth NF, which allows activities that may dominate the characteristic landscape but will, at the same time, use naturally established form, line, color, and texture. It should appear as a natural occurrence when viewed as middleground, which the Project would not conform to from this viewpoint. Potential visual impacts on recreational users from this KOP and in the general vicinity are expected to be high due to the development of a new linear feature in a landscape with little visible disturbance, high contrast, and a close view. Alternative 7I would not conform to the Forest Service Modification objectives.

KOP 1081 (Figure E.2-8/Appendix G, Figure ST-3d). The visibility of Alternative 7I would be high for recreational viewers at KOP 1081 (approximately 0.1 mile from the alignment). The viewers would have an open view toward the alignment, which would not parallel any existing linear features and would skyline when crossing the rolling

terrain in the middleground and background, resulting in high contrast levels. The area is managed for Maximum Modification by the Sawtooth NF, which allows for vegetative and landform alterations that may dominate the characteristic landscape. When viewed as foreground, the Project may not appear to completely borrow from naturally established form, color, line, or texture. Alterations may also be out of scale or contain detail that is incongruent with natural occurrences as seen in the foreground, which the Project would conform to from this viewpoint. Potential visual impacts on recreational users from this KOP and in the general vicinity are expected to be high due to the development of a new linear feature in a landscape with little visible disturbance, high contrast, and a close view. Alternative 7I would conform to the Forest Service Maximum Modification objectives.

KOP 1273 (Figure E.2-8). High-sensitivity recreational viewers at KOP 1273 would have a high level of Project visibility (approximately 0.3 mile from Alternative 7I). The viewer would have an open and elevated view toward the alignment, which would not parallel any existing alignments or linear features and may span the rugged terrain in the middleground and background. Contrast levels are anticipated to be high. The area is managed for Maximum Modification by the Sawtooth NF, which allows for vegetative and landform alterations that may dominate the characteristic landscape. When viewed as foreground, the Project may not appear to completely borrow from naturally established form, color, line, or texture. Alterations may also be out of scale or contain detail that is incongruent with natural occurrences as seen in the foreground. The ROS for this area is listed as both RN and SPM. Potential visual impacts on recreational users from this KOP and in the general vicinity are expected to be high due to the development of a new linear feature in a landscape with little existing visible disturbance, high contrast, and high scenic quality. Alternative 7I would conform to the Forest Service Maximum Modification classification as well as the ROS of RN, but not SPM where structures are supposed to be rare and isolated.

KOP 1270 (Figure E.2-8). High-sensitivity recreational viewers at KOP 1270 would have a high level of Project visibility (approximately 0.65 mile from Alternative 7I). The viewer would have an enclosed view toward the alignment, which would not parallel any existing linear features and may span the rugged terrain in the middleground and background, resulting in high contrast levels. The area is managed for Maximum Modification by the Sawtooth NF, which allows for vegetative and landform alterations that may dominate the characteristic landscape. When viewed as foreground, the Project may not appear to completely borrow from naturally established form, color, line, or texture. Alterations could be out of scale or contain detail that is incongruent with natural occurrences as seen in the foreground. The ROS for this area is listed as both RN and SPM. Potential visual impacts on recreational users from this KOP and in the general vicinity are expected to be high due to the development of a new linear feature in a landscape with little visible disturbance, high contrast, and a close view. Alternative 7I would conform to the Forest Service Maximum Modification classification as well as the ROS of RN, but not SPM.

KOP 1267 (Figure E.2-8). Visibility of Alternative 7I would be high for recreational viewers at KOP 1267 (approximately 100 feet from this alignment). The viewers would have an enclosed view toward the alignment, which would not parallel any existing

linear features and may skyline when crossing the rolling and rugged terrain in the middleground and background, resulting in high contrast levels. The area is managed for Maximum Modification by the Sawtooth NF, which allows for vegetative and landform alterations that could dominate the characteristic landscape. When viewed as foreground, the Project may not appear to completely borrow from naturally established form, color, line, or texture. Alterations may also be out of scale or contain detail that is incongruent with natural occurrences as seen in the foreground. The ROS for this area is listed as both RN and SPM. Potential visual impacts on recreational users from this KOP and in the general vicinity are expected to be high because the alternative would create a new linear feature in a landscape with little visible disturbance, high contrast, and the closeness of the view. Alternative 7I would conform to the Forest Service Maximum Modification classification but would not conform to the ROS of RN due to the high visibility of the alternative from the roadway.

KOP 1204 (Figure E.2-8). High-sensitivity residential viewers at KOP 1204 would have a moderate level of Project visibility (approximately 2.0 miles from Alternative 7I). The viewer would have an expansive view toward the alignment, which would not parallel any existing alignments or linear features but would be backdropped by the rocky terrain in the middleground and background. Contrast levels are anticipated to be moderate. Potential visual impacts on residences from this KOP and in the general vicinity are expected to be moderate because the alternative would create a new linear feature in a landscape with visible disturbance and moderate contrast.

KOP 1190 (Figure E.2-8). High-sensitivity residential viewers at KOP 1190 would have a high level of Project visibility (approximately 1.0 mile from Alternative 7I). The viewer would have an expansive view toward the alignment, which would not parallel any existing alignments or linear features but would be backdropped by the rocky terrain in the background. Contrast levels are anticipated to be moderate. Potential visual impacts on residences from this KOP and in the general vicinity are expected to be moderate because the alternative would create a new linear feature in a disturbed landscape with moderate contrast.

KOP 1097 (Figure E.2-8). High-sensitivity recreational viewers at KOP 1097 would have a low to moderate level of Project visibility (approximately 2.8 miles from Alternative 7I). The viewer would have an expansive and focal view toward the alignment, which would not parallel any existing alignments or linear features but would be backdropped by the rocky terrain. Contrast levels are anticipated to be low to moderate. Potential visual impacts on recreational viewers from this KOP and in the general vicinity are expected to be low to moderate. Opportunities for backdropping and low to moderate contrast levels would detract from views focused on the Alternative 7I, while the development of a new linear feature in a relatively undisturbed landscape would detract from the scenic quality.

KOP 1101 (Figure E.2-8). High-sensitivity recreational viewers at KOP 1101 would have a low level of Project visibility (approximately 3.75 miles from Alternative 7I). The viewer would have an open view toward the alignment, which would not parallel any existing alignments or linear features but would be backdropped by the rolling and rugged terrain in the middleground and background. Contrast levels are anticipated to

be low to moderate. Potential visual impacts on recreational users from this KOP and in the general vicinity are expected to be low due to the development of a new linear feature in a landscape with visible disturbance and the distance of the view.

KOP 1159 (Figure E.2-8). High-sensitivity recreational viewers at KOP 1159 would have a low level of Project visibility (approximately 2.3 miles from Alternative 7I). The viewer would have a partially to fully screened view toward the alignment, which would not parallel any existing alignments or linear features but would be screened by the rolling terrain in the middleground. Contrast levels are anticipated to be low. Potential visual impacts on recreational users from this KOP and in the general vicinity are expected to be low due to the distance of the view and screening opportunities offered by the terrain.

KOP 1103 (Figure E.2-8). High-sensitivity recreational viewers at KOP 1103 would have a low level of Project visibility (approximately 2.5 miles from Alternative 7I). The viewer would have a partially screened view toward the alignment, which would not parallel any existing alignments or linear features but would be partially screened by the rolling terrain in the middleground. Contrast levels are anticipated to be low to moderate. Potential visual impacts on recreational users from this KOP and in the general vicinity are expected to be low due to the distance of the view and screening opportunities offered by the terrain.

KOP 1160 (Figures E.2-8 and E.2-25). High-sensitivity recreational viewers at KOP 1160 would have a moderate to high level of Project visibility (approximately 1.0 mile from Alternative 7I). The viewer would have a partially screened view toward the alignment, which would not parallel any existing alignments or linear features but would be partially screened by the rolling and rugged terrain in the foreground, middleground, and background. Contrast levels are anticipated to be moderate to high. Potential visual impacts on recreational users from this KOP and in the general vicinity are expected to be moderate to high due to the distance of the view and screening opportunities offered by the terrain.

KOP 1104 (Figures E.2-8 and E.2-26). High-sensitivity recreational viewers at KOP 1104 would have a moderate level of Project visibility (approximately 2.0 miles from Alternative 7I). The viewer would have an open panoramic view toward the alignment, which would not parallel any existing alignments or linear features but would be located beyond the visible transmission line. Contrast levels are anticipated to be moderate. Potential visual impacts on recreational users from this KOP and in the general vicinity are expected to be moderate due to the distance of the view and existing human-made alterations.

KOP 1105 (Figure E.2-8). High-sensitivity recreational viewers at KOP 1105 would have a high level of Project visibility (approximately 0.85 mile from Alternative 7I). The viewer would have an open panoramic and somewhat focal view toward the alignment, which would not parallel any existing alignments or linear features but would be located adjacent to the visible transmission line. Contrast levels are anticipated to be moderate. Potential visual impacts on recreational users from this KOP and in the

general vicinity are expected to be moderate to high due to the distance of the view and existing human-made alterations.

KOP 1091 (Figure E.2-8). High-sensitivity residential viewers at KOP 1091 would have a moderate level of Project visibility (approximately 1.1 mile from Alternative 7I). The viewer would have a focal and somewhat enclosed view toward the alignment, which would not parallel any existing alignments or linear features but would be either screened or back dropped by the rocky terrain in the middleground and background. Contrast levels are anticipated to be moderate to high. Potential visual impacts on residences from this KOP and in the general vicinity are expected to be moderate to high because the alternative would create a new linear feature in a relatively undisturbed landscape with moderate to high contrast.

KOP 1086 (Figure E.2-8). High-sensitivity recreational viewers at KOP 1086 would have a low to moderate level of Project visibility (approximately 2.0 miles from Alternative 7I). The viewer would have an open panoramic view toward the alignment, which would not parallel any existing transmission alignments. Contrast levels are anticipated to be moderate. Potential visual impacts on recreational viewers from this KOP and in the general vicinity are expected to be moderate due to the development of a new industrial linear feature in a relatively undisturbed landscape with moderate to high scenic quality.

KOP 1078 (Figure E.2-8). High-sensitivity recreational viewers at KOP 1078 would have a high level of Project visibility (approximately 0.2 mile from Alternative 7I). The viewer would have an open panoramic view toward the alignment, which would not parallel any existing transmission alignments. Contrast levels are anticipated to be high. The area is managed for Maximum Modification by the Sawtooth NF, which allows for vegetative and landform alterations which may dominate the characteristic landscape. When viewed as foreground, the project may not appear to completely borrow from naturally established form, color, line, or texture. Alterations may also be out of scale or contain detail that is incongruent with natural occurrences, as seen in the foreground. The ROS for this area is listed as both RN and SPM. Potential visual impacts on recreational viewers from this KOP and in the general vicinity are expected to be high due to the development of a new industrial linear feature in a relatively undisturbed landscape with moderate to high scenic quality. Alternative 7I would conform to the Forest Service Maximum Modification classification but would not conform to the ROS of RN due to the high visibility of the alternative from the roadway.

KOP 1052 (Figure E.2-8). High-sensitivity residential viewers at KOP 1052 would have a low to moderate level of Project visibility (approximately 2.3 miles from Alternative 7I). The viewer would have an expansive and inferior (low elevation) view toward the alignment, which would not parallel any existing transmission alignments. Contrast levels are anticipated to be moderate. Potential visual impacts on residences from this KOP and in the general vicinity are expected to be moderate due to the development of a new industrial linear feature in an undisturbed landscape with low to moderate scenic quality and low to moderate visibility. Alternative 7I has the possibility to skyline the foothills of the background terrain but at a distance great enough that atmospheric conditions may absorb the form of the structures.

KOP 1047 (Figure E.2-8). High-sensitivity recreational viewers at KOP 1047 would have a low level of Project visibility (approximately 1.1 miles from Alternative 7I). The viewer would have a partially screened view toward the alignment, which would not parallel any existing transmission alignments. Contrast levels are anticipated to be low to moderate. Potential visual impacts on recreational viewers from this KOP and in the general vicinity are expected to be low to moderate due to the development of a new industrial linear feature in a disturbed landscape with low scenic quality and partially screened views.

Alternative 7J

Table 3.2-36 summarizes the potential visual impact for each of the KOPs in Alternative 7J.

Table 3.2-36. Visual Impact Assessment for Each KOP in Alternative 7J[1/]

KOP	Viewers[3/]	Land Ownership[4/]	Viewer Rating[5/]	Scenic Quality[5/]	Distance (mile)	Visibility[5/]	Contrast[5/]	Impact[5/]
305	REC	BLM VRM IV	H	M	0.50	H	M	M-H
912	RES	Private	H	M	0.35	H	M	M
916	RES	Private	H	M-H	2.10	M	M	M
898	RES	Private	H	M-H	0.43	H	H	H
1282	RES	Private	H	H	0.25	H	H	H
1278	RES	Private	H	M	1.25	M	M-H	M
1273[2/]	REC	Forest Service MM VQO	H	H	0.30	H	H	H
1270[2/]	REC	Forest Service MM VQO	H	M-H	0.65	H	H	H
1267	REC	Forest Service MM VQO	H	M-H	100 Feet	H	H	H
1204	RES	Private	H	M-H	2.00	M	M	M
1190	RES	Private	H	M-H	1.00	H	M	M
1097	REC	BLM VRM III	H	M-H	3.80	L-M	L-M	L-M
1101	REC	BLM VRM III	H	M-H	3.75	L	L-M	L
1159	REC	NPS	H	M	2.30	L	L	L
1103	REC	NPS	H	M	2.50	L	L-M	L
1160	REC	BLM VRM III	H	H	1.00	M-H	M-H	M-H
1104	REC	NPS	H	M-H	2.00	M	M	M
1105	REC	Private	H	M	0.85	H	M	M-H
1091	RES	Private	H	M-H	1.10	M	M-H	M-H
1086	REC	Private	H	M-H	2.00	L-M	M	M
1410	RES	Private	H	L	0.9	M-H	M	L-M
1401	REC	BLM	H	M-H	5.0	L	L	L
1409	RES	Private	H	L-M	1.6	M	M	M

1/ Alternative 7J connects with Segment 9 approximately 25.8 miles west of the proposed Cedar Hill Substation, which is the western terminus of Segment 7 and the beginning point for Segment 9. This table compares 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.
2/ Viewers at KOPs would have views of Alternatives 7H and 7I with equal anticipated visual impacts due to a shared corridor between both alternatives.
3/ REC – A recreational viewer. RES – A single resident.
4/ M – Modification, MM – Maximum Modification
5/ H – High, M – Medium, L – Low

KOP 305 (Figure E.2-8). See discussion under Segment 5.

KOP 912 (Figure E.2-8). See discussion under Alternative 7B.

KOP 898 (Figure E.2-8). See discussion under Alternative 7B.

KOP 916 (Figure E.2-8). See discussion under Alternative 7B.

KOP 1079 (Figure E.2-8). See discussion under Alternative 7I.

KOP 1273 (Figure E.2-8). See discussion under Alternative 7I.

KOP 1267 (Figure E.2-8). See discussion under Alternative 7I.

KOP 1270 (Figure E.2-8). See discussion under Alternative 7I.

KOP 1267 (Figure E.2-8). See discussion under Alternative 7I.

KOP 1204 (Figure E.2-8). See discussion under Alternative 7I.

KOP 1190 (Figure E.2-8). See discussion under Alternative 7I.

KOP 1197 (Figure E.2-8). See discussion under Alternative 7I.

KOP 1101 (Figure E.2-8). See discussion under Alternative 7I.

KOP 1159 (Figure E.2-8). See discussion under Alternative 7I.

KOP 1103 (Figure E.2-8). See discussion under Alternative 7I.

KOP 1160 (Figure E.2-8). See discussion under Alternative 7I.

KOP 1104 (Figure E.2-8). See discussion under Alternative 7I.

KOP 1105 (Figure E.2-8). See discussion under Alternative 7I.

KOP 1091 (Figure E.2-8). See discussion under Alternative 7I.

KOP 1086 (Figure E.2-8). See discussion under Alternative 7I.

KOP 1052 (Figure E.2-8). See discussion under Alternative 7I.

KOP 1047 (Figure E.2-8). See discussion under Alternative 7I.

KOP 1410 (Figure E.2-8). KOP 1410 represents high-sensitivity residential viewers looking northeast (approximately 0.9 mile from where Alternative 7J would cross the view). At KOP 1410, high-sensitivity residential viewers would have a moderate to high level of Project visibility due to the close distance of the Project alternative. Visual contrast levels would be moderate due to the presence of human-made alterations visible in the foreground and middleground of this KOP. Visual impacts would be low to moderate due to low scenic quality and moderate contrast.

KOP 1401 (Figure E.2-8). KOP 1401 represents high-sensitivity recreational viewers looking northeast (approximately 5.0 miles from where Alternative 7J would cross the view). At KOP 1401, high-sensitivity recreational viewers would have a low level of

Project visibility due to the distance of the Project alternative. Visual contrast levels and visual impacts would be low due to the distance and visibility, low scenic quality, and low contrast.

KOP 1409 (Figure E.2-8). KOP 1409 represents high-sensitivity residential viewers looking south (approximately 1.6 miles from where Alternative 7J would cross the view). At KOP 1409, high-sensitivity residential viewers would have a moderate level of Project visibility due to the distance of the Project alternative and partial screening by the topography. Visual contrast levels and visual impacts would be moderate due to surrounding structures, low to moderate scenic quality, and moderate contrast.

Segment-Specific Mitigation

The Agencies have identified the following mitigation measures in addition to those recommended for all federal land (see Section 3.2.2.2).

VIS-18 If Alternative 7I were to be constructed, H-frame single-circuit structures would be required in the Nevada portion of the alternative as requested by the Wells FO.

VIS-19 If any of Alternatives 7H, 7I, or 7I were to be constructed, H-frame single-circuit structures would be required in the Sawtooth NF.

Conformance with BLM VRM Classes and Forest Service VQOs

Proposed Route – The Proposed Route would cross over 1.3 miles of BLM-administered VRM Class II lands designated by the Malad MFP between MPs 31.2 and 32.5 and MPs 83.0 to 83.1, creating a new ROW that requires levels of change to be low and not attract the attention of a casual observer. It is assumed that crossing VRM Class II areas without paralleling an existing transmission facility may be inconsistent with the Malad MFP because the new facilities would represent a level of change to the landscape and basic elements that would attract the attention of the casual observer (see KOP 920). The Proposed Route would also cross over 2.7 miles of BLM-administered VRM Class III lands designated by the Malad MFP between MPs 28.2 and 35.5 as well as from MPs 113.5 to 117.7, creating a new ROW that requires that a project partially retain the existing character of the landscape and only result in moderate levels of change to the characteristic landscape. It is assumed that crossing VRM Class III areas without paralleling an existing transmission facility may be inconsistent with the Malad MFP in the Deep Creek Mountains (see KOP 920) due to the level of change anticipated. Most areas can conform to VRM Class IV objectives (see KOP 279). An amendment would be needed, if this route is selected, to allow a one-time visually altering action without changing the VRM classification in the Deep Creek area. See Appendix F-1 for proposed amendment language and Appendix G-1 for visual analyses.

The effects analysis for KOP 907 would only apply if an amendment permitting the project were approved. See Appendix G-1 for effects analyses of additional KOPs related to this amendment.

An amendment to the Malad MFP would be needed to allow construction of a new ROW outside of existing utility corridors for the Proposed Route and its Alternatives within the Malad MFP planning area. It is worth noting, however, that a new RMP is currently being developed for this area that does not carry over the ROW restriction.

All effects for KOPs viewing BLM-managed land outside the designated ROW would be dependent upon approval of an amendment to the existing plan or approval of a new plan that does not carry the ROW restriction forward.

Alternative 7A – Alternative 7A would cross land managed by the Malad MFP without paralleling an existing transmission facility, which may be inconsistent with the Malad MFP. Alternative 7A would cross approximately 6.0 miles of BLM-administered VRM Class III lands designated by the Malad MFP in three separate areas between MPs 19.0 and 26.0, creating a new ROW that requires a project partially retain the existing character of the landscape and only result in moderate levels of change to the characteristic landscape (see KOP 917). Most areas can conform to VRM Class III and IV objectives, and no AOIs were identified.

All effects for KOPs viewing BLM-managed land outside the designated ROW would be dependent upon approval of an amendment to the existing plan or approval of a new plan that does not carry the ROW restriction forward.

Alternative 7B – Alternative 7B would cross approximately 3.8 miles of BLM-administered VRM Class III lands designated by the Malad MFP between MPs 25.1 and 32.1, creating a new ROW that requires a project partially retain the existing character of the landscape and result in moderate levels of change to the characteristic landscape. The majority of areas can conform to VRM Class III and IV objectives (see KOPs 898 and 893), and no AOIs were identified.

All effects for KOPs viewing BLM-managed land outside the designated ROW would be dependent upon approval of an amendment to the existing plan or approval of a new plan that does not carry the ROW restriction forward.

Alternative 7C – Alternative 7C would cross approximately 7.2 miles of BLM-administered VRM Class IV lands between MPs 10.0 and 47.0. Most areas can conform to VRM Class IV objectives (see KOPs 282 and 289). There are no BLM-administered lands managed to conform with VRM Class I, II, or III objectives along Alternative 7C.

Alternative 7D – Alternative 7D would cross approximately 0.1 mile of BLM-administered VRM Class IV lands between MP 0.0 and 0.1. Most areas can conform to VRM Class IV objectives (see KOP 296). There are no BLM-administered lands managed to conform with VRM Class I, II, or III objectives along Alternative 7D.

Alternative 7E – Alternative 7E would cross over 0.3 mile of BLM-administered VRM Class II lands designated by the Cassia RMP between MPs 3.6 and 3.9 without paralleling an existing transmission facility, which may be inconsistent with the Cassia RMP because the new facilities would represent a level of change to the landscape and basic elements that would attract the attention of the casual observer (see KOPs 304 and 311). An amendment would be needed, reclassifying this area to VRM Class IV, if

this route is selected. See Appendix F-1 for proposed amendment wording and Appendix G-1 for visual analyses. Alternative 7E would also cross approximately 1.6 miles of BLM-administered VRM Class IV lands between MPs 0.6 and 2.4. Most areas can conform to VRM Class IV objectives.

Effects described in this section for KOP 311 would only apply if an amendment were approved. Additional KOPs are discussed in Appendix G-1. All effects for KOPs viewing BLM-managed land outside the designated ROW would be dependent upon approval of an amendment to the existing plan or approval of a new plan that does not carry the ROW restriction forward.

Alternative 7F – Alternative 7F would cross approximately 4.4 miles of BLM-administered VRM Class IV lands in three different areas between MPs 0.7 and 10.3. Most areas can conform to VRM Class IV objectives (see KOP 304). There are no BLM-administered lands managed to conform to VRM Class I, II, or III objectives along Alternative 7F.

Alternative 7G – Alternative 7G would cross approximately 1.8 miles of BLM-administered VRM Class III lands designated by the Cassia RMP between MPs 0.3 and 3.2 creating a new ROW, which requires a project partially retain the existing character of the landscape and only result in moderate levels of change to the characteristic landscape (see KOP 221). It is anticipated due to backdropping that Alternative 7G would conform to VRM Class III objectives and no AOIs are anticipated. All effects for KOPs viewing BLM-managed land outside the designated ROW would be dependent upon approval of an amendment to the existing plan or approval of a new plan that does not carry the ROW restriction forward.

Alternative 7H – Alternative 7H would cross over 0.9 mile of BLM-administered VRM Class II lands designated by the Cassia RMP between MPs 78.3 and 80.2 without paralleling an existing transmission facility, which may be inconsistent with the Cassia RMP because the new facilities would represent a level of change to the landscape and basic elements that would attract the attention of the casual observer (see KOP 1246). An amendment would be needed, reclassifying this area to VRM Class III, if this route is selected. See Appendix F-1 for proposed amendment wording and Appendix G-1 for visual analyses. Alternative 7H would also cross over 2.9 miles of BLM-administered VRM Class III lands designated by the Cassia RMP in numerous areas between MPs 33.8 and 127.2, creating a new ROW that requires a project partially retain the existing character of the landscape and only result in moderate levels of change to the characteristic landscape (see KOPs 1171, 1173, and 1252). Most areas can conform to VRM Class III and IV objectives.

Additionally, Alternative 7H would cross over 11.35 miles of NFS lands in the Sawtooth NF. Most of the NFS land crossed is managed as Modification VQO and Maximum Modification VQO. Much of the NFS land between the communities of Oakley and Elba is managed to conform to Partial Retention VQO. This management classification would require the proposed alternative to remain visually subordinate to the characteristic landscape and repeat the form, line, color, or texture common to the characteristic landscape. This portion of Alternative 7H is further restricted in location

due to being bordered by a roadless area to both the north and south, which effectively limits many mitigation strategies (such as micrositing) from taking advantage of vegetative or topographic screening. The Proposed Route would be visible from the Mt. Harrison lookout.

Visual impacts identified for areas classified as Partial Retention would also be a concern in areas classified as Modification and, in some cases, even Maximum Modification. KOPs 1228, 1231, 1234, 1226, 1273, 1270, and 1267 were all identified in areas managed as Maximum Modification by the Sawtooth NF, which allows for vegetative and landform alterations to dominate the characteristic landscape. The area is also managed under MA 6.1, Restoration and Maintenance Emphasis, with shrubland and grassland landscapes. When viewed within a foreground distance zone, the Project would not appear to borrow from naturally established form, color, line, or texture. Alterations would be out of scale and contain detail that is incongruent with natural occurrences as seen in the foreground. Alternative 7H would be congruent with the ROS of RN and RM including the areas adjacent to KOPs 1228, 1231, 1234, 1226, 1273, 1270, and 1267; however, it would not be consistent for the portion of the route in the Albion Division that crosses SPM-designated land.

Effects discussed for KOPs 1273, 1270, 1226, 1228, 1231, 1243, and 1435 would only apply if corresponding amendments that would permit the Project were approved. Discussion of additional KOPs can be found in Appendices G-1 and G-2. All effects for KOPs viewing BLM-managed land outside the designated ROW would be dependent upon approval of an amendment to the existing plan or approval of a new plan that does not carry the ROW restriction forward.

Alternative 7I – Alternative 7I would cross 0.6 mile of BLM-administered VRM Class II lands designated by the Cassia RMP and Twin Falls MFP between MPs 115.1 and 115.2 (Cassia RMP) and MPs 169.6 and 169.9 (Twin Falls MFP) without paralleling an existing transmission facility. These crossings would not conform with the Cassia RMP and Twin Falls MFP because the new facilities would represent a level of change to the landscape and basic elements that would attract the attention of the casual observer (see KOP 410). Amendments would be needed for the Cassia RMP and Twin Falls MFP, reclassifying this area to VRM Class III, if this route is selected. See Appendix F-1 for proposed amendment wording and Appendix G-1 for visual analyses.

Alternative 7I would also cross over 8.7 miles of BLM-administered VRM Class III lands designated by the Cassia RMP and 6.7 miles of BLM-administered VRM Class III lands designated by Twin Falls MFP in numerous areas between MPs 33.8 and 173.1, creating a new ROW that requires a project partially retain the existing character of the landscape and only result in moderate levels of change to the characteristic landscape (see KOPs 1100, 1101, and 1159). Most areas can conform to VRM Class III and IV objectives.

Alternative 7I would cross 8.7 miles of BLM-managed land in the Wells FO. Of the 8.7 miles, 0.3 mile is managed with VRM Class II objectives and 8.4 miles are managed with VRM Class III objectives. These lands are designated VRM Class II and III, respectively, by the 1985 Wells RMP. As with other alternatives, lands managed by the BLM to conform to VRM Class II objectives should be avoided if possible through

realignment or micrositing. An amendment would be needed to either allow a one-time exception or reclassify the area to VRM Class III if this route is selected. See Appendix F-1 for proposed amendment wording and Appendix G-1 for visual analyses.

Additionally, Alternative 7I would cross 27.7 miles of NFS land in the Sawtooth NF. This NFS land is managed to conform to Maximum Modification VQO (17.6 miles) and Modification VQO (9.2 miles), which allows management activities of vegetative and landform alterations to dominate the characteristic landscape. The alternative would also cross an area managed as Partial Retention VQO (0.84 mile), which would be more restrictive and require management activities to remain visually subordinate to the characteristic landscape. KOPs 1078, 1273, 1270, and 1267 were all identified in areas managed as Maximum Modification by the Sawtooth NF, which allows for vegetative and landform alterations to dominate the characteristic landscape. When viewed as foreground, the Project may not appear to completely borrow from naturally established form, color, line, or texture. Alterations may also be out of scale or contain detail that is incongruent with natural occurrences as seen in the foreground. The ROS for this area includes RN and SPM, which is more restrictive than RN because structures are supposed to be rare and isolated. Alternative 7I would be consistent with the ROS of RN but not SPM because of the distances to sensitive viewers at KOPs 1273, 1270, 1261, and 1078.

Effects discussed for KOPs 1079, 1091, 1273, and 1270 would only apply if amendments to the visual and scenic resources in the BLM and Forest Service land use plans were approved. Discussion of additional KOPs is provided in Appendices G-1 and G-2. All effects for KOPs viewing BLM-managed land outside the designated ROW would be dependent upon approval of an amendment to the existing plan or approval of a new plan that does not carry the ROW restriction forward.

Alternative 7J – Alternative 7J would cross approximately 25.2 miles of BLM-administered VRM Class III lands creating a new ROW, which requires a project partially retain the existing character of the landscape and only result in moderate levels of change to the characteristic landscape (see KOPs 1401 and 1410). It is anticipated that Alternative 7J would conform to VRM Class III objectives due to backdropping.

Where Alternative 7J has the same alignment as Alternative 7I, it would cross 0.6 mile of BLM-administered VRM Class II land managed under the Cassia RMP and Twin Falls MFP. Amendments to reclassify these areas to VRM Class III would be needed.

Alternative 7J would cross the Sawtooth NF for 12.9 miles. Impacts would be the same as under Alternative 7I for the Sublett Division. For the Cassia Division, Alternative 7J would cross approximately 2.2 miles of Modification VQO and around 6 miles of Maximum Modification VQO. Visual impacts identified for Partial Retention would also be a concern in areas classified as Modification and, in some cases, even Maximum Modification. The Project would not be consistent with the Sawtooth NF Forest Plan and a forest plan amendment would be needed.

Effects discussed for KOPs 1091, 1273, and 1270 would only apply if amendments to BLM land use plans were approved to permit the Project. Additional KOPs are discussed for this route in Appendices G-1 and G-2. All effects for KOPs viewing BLM-

managed land outside the designated ROW would be dependent upon approval of an amendment to the existing plan or approval of a new plan that does not carry the ROW restriction forward.

Segment 7 – Conclusion

Proposed Route – Visual impacts resulting from the construction of the Proposed Route would be mostly moderate with some areas of moderate-high impact in the East Fork Canyon Sportsman's Access area, in dispersed residential areas outside of Rockland, Idaho, and interspersed throughout the immediate area of, and in close proximity to, trail-related cultural resources. However, the Proposed Route would cross a large intact VRM Class II portion (approximately 3.0 miles) of the Deep Creek Mountains.

Alternative 7A – Visual impacts resulting from the construction of Alternative 7A would be mostly moderate to high due to areas being nearer trail-related cultural resources and dispersed residences.

Alternative 7B – Visual impacts resulting from the construction of Segment 7B would be mostly moderate to high.

Alternative 7C – Visual impacts resulting from the construction of Alternative 7C would be mostly moderate to high with a section of high impact located at the southwest end of this alternative in close proximity to residences.

Alternative 7D – Visual impacts resulting from the construction of Alternative 7D would be mostly moderate with some areas of moderate-high impact associated with adjacent residences.

Alternative 7E – Visual impacts from the construction of Alternative 7E would be moderate because the majority of the area is primarily characterized as an agricultural setting resulting in moderate visual impacts. Some areas with dispersed residences would experience higher visual impacts.

Alternative 7F – Visual impacts resulting from the construction of Alternative 7F would be mostly moderate to high due to the short length of the alternative and isolated terrain crossed by the alignment. The majority of the area crossed by Alternative 7F is in a mountainous setting with agriculture in the surrounding valleys and dispersed residences that would experience higher visual impacts than some of the more remote areas crossed by other alternatives.

Alternative 7G – Visual impacts resulting from the construction of Alternative 7G would be mostly moderate to high. The majority of the area crossed by Alternative 7G is in an agricultural setting with numerous dispersed residences that would experience higher visual impacts than some of the more remote areas crossed by other alternatives.

Alternative 7H – Visual impacts resulting from the construction of Alternative 7H would be mostly high. The majority of the area crossed by Alternative 7H is in a rural agricultural setting with numerous dispersed residences and recreational areas that would experience higher visual impacts than some of the more remote areas crossed

by other alternatives. Alternative 7H would cross the Sawtooth NF on land managed to meet the VQOs of Partial Retention, Modification, and Maximum Modification. The alternative would meet the objectives for Maximum Modification and some Modification; however, the alternative would not meet the objectives of Partial Retention and many of those for Modification. Alternative 7H would not be consistent with the Sawtooth NF Forest Plan and a forest plan amendment would be required.

Alternative 7I – Visual impacts resulting from the construction of Alternative 7I would be mostly moderate to high with areas of higher impacts where residences are located close to the alternative. The majority of the area crossed by Alternative 7I is in a rural agricultural setting with numerous dispersed residences and recreation areas that would experience higher visual impacts than some of the more remote areas crossed by other Alternatives. Alternative 7I would be the only alignment that has the potential to impact viewers in the City of Rocks National Reserve as well as from local sensitive viewing areas such as Sparks Basin, Granite Pass, or along the California NHT. Impacts would be considered moderately high to high for this alternative.

Alternative 7I would cross the Sawtooth NF on land managed to meet the VQOs of Partial Retention, Modification, and Maximum Modification. The alternative would meet the objectives for Maximum Modification and some of those for Modification; however, the alternative would not meet the objectives of Partial Retention and many of those for Modification. Alternative 7I would not be consistent with the Sawtooth NF Forest Plan and a forest plan amendment would be required.

Alternative 7J – Visual impacts resulting from the construction of Alternative 7J would be similar to those for Alternative 7I. The increased length of Alternative 7J through primarily flat agricultural land would be offset by the location of Alternative 7I within the hilly terrain crossed in the Sawtooth NF.

Alternative Comparisons

In the eastern portion of Segment 7, the routes generally connect route reference points 7a.0 to 7d (see Figure E.2-8). In this area, Alternative 7A is anticipated to offer the lowest overall visual impact when compared to the comparison portion of the Proposed Route or Alternative 7B due to distance of viewers from the alignment and avoidable VRM Class II crossings. Alternative 7B would avoid more VRM Class II lands than the comparison portion of the Proposed Route and Alternative 7A as well as avoiding the recreation areas east of Rockland while impacting a similar number of scattered residences in the Arbon and Rockland Valleys; however, with the alignment being longer than the comparison portion of the Proposed Route and Alternative 7A, it can be assumed that it would impact more viewers overall.

For the area around Heglar Canyon, generally the connection of route reference points 7e to 7g, the routes for consideration are the Proposed Route and Alternative 7C. Overall in this area, Alternative 7C would offer lower visual impacts than the comparison portion of the Proposed Route due largely to fewer residential viewers and increased distance from “The Parting of the Ways,” a visually sensitive cultural and recreational resource.

For the area south of I-86 and west of I-84, generally the connection of route reference points 7g and 7h, the routes to compare are the Proposed Route and Alternative 7D (see Figure E.2-8). In this area, Alternative 7D offers a reduction in visual impact by keeping the transmission line off of topographic features and preventing the skylining of transmission towers. This alternative would also bring the Project closer to the few residential viewers in the area; however, because the alternative would provide the opportunity for topographic backdropping, this reduced view distance is not anticipated to raise visual impact levels.

In the area generally represented by the connection of route reference points 7h and 7m, the range of alternatives includes the Proposed Route, Alternative 7E, and Alternative 7F. The comparison portion of the Proposed Route and Alternative 7E would be in very close proximity, in some cases less than 0.15 mile, to residential viewers, an issue not completely addressed by either the Proposed Route or Route Alternative. Overall, Alternative 7F would be potentially viewed by fewer residential viewers than the other two options. Although it would cross 0.3 mile of VRM Class II land and a scenic backcountry byway (City of Rocks), Alternative 7F would ultimately be the farthest from viewers by following the foothills of the eastern side of the Albion Mountains and Pine Knob. The result would be lower impacts for Alternative 7F than the comparison portion of the Proposed Route or Alternative 7E in this area by lowering impacts to the town of Albion and the valley south of Burley, Idaho.

The three southern alternatives, 7H, 7I, and 7J, would connect the alignment reference point 7a2, from Alternative 7B, to the Cedar Hill Substation. These three alternatives would share a portion of their alignment south of the Sublette Range until crossing I-84. Alternative 7H would travel north of Elba, through the Albion District of the Sawtooth NF, and south of Oakley, Idaho, before rejoining the Proposed Route south of Artesian City. Alternatives 7I and 7J would continue on a shared alignment farther south of the Jim Sage Mountains as well as south of Almo and the City of Rocks National Reserve while following the Nevada state line before turning north around the western boundary of the Sawtooth NF. Where Alternative 7I would turn northwest, to continue a route through the Cassia Division of the Sawtooth NF, 7J would turn west through mostly private lands. Alternative 7I would continue northwest and then turn east back to the Cedar Hill Substation. Alternative 7J would continue northwest through private land for approximately 16 miles to a point where, if this alternative were selected, the Rogerson Substation (as an alternative to the Cedar Hill Substation) would be located. From this point, the alternative would split into two routes; one would head northeast to join with the Proposed Route Segment 7, while the other would head northeast to join with Proposed Route Segment 9. It is anticipated that Alternatives 7H, 7I, and 7J would be located in more pristine viewing conditions and closer to numerous sensitive viewing areas where contrast and impacts to viewers would be higher than comparison portions of the Proposed Route.

Finally, at the western end of Segment 7 near the Cedar Hill Substation, the area of route reference point connection 7s.1 to 7z is the comparison portion of the Proposed Route and Alternative 7G. It is anticipated that Alternative 7G, located parallel but north of the comparison portion of the Proposed Route, would be closer to sensitive viewers within the Pleasant Valley, thus resulting in higher impacts to visual resources.

Segment 8 – Midpoint to Hemingway

Segment 8, as proposed, would link the Midpoint and Hemingway Substations. This 131-mile single-circuit 500-kV transmission line would stay north of the Snake River until crossing through the SRBOP parallel to an existing 500-kV transmission line before ending at the Hemingway Substation. Thirteen acres of the expansion of the Midpoint Substation and 0.5 acre for a regeneration site are attributed to Segment 8. There are five Route Alternatives: 8A, which follows the WWE corridor but crosses the Snake River and I-84 twice (while the Proposed Route would stay north of this area); 8B and 8C, which represent the old routes originally proposed by the Proponents but that have now been changed to avoid the cities of Kuna and Mayfield, respectively; 8D, which represents a small revision involving a rebuild of the existing transmission line to move both away from the National Guard Maneuver Area; and 8E, which was proposed by the BLM in order to avoid crossing the Halverson Bar non-motorized portion of the Guffey Butte-Black Butte Historical Area (see Appendix A, Figure A-10).

Proposed Route

Table 3.2-37 summarizes the potential visual impact for each KOP in the Segment 8 Proposed Route.

Table 3.2-37. Visual Impact Assessment for Each KOP in the Segment 8 Proposed Route

KOP	Viewers[2/]	Land Ownership	Viewer Rating[3/]	Scenic Quality[3/]	Distance (miles)	Visibility[3/]	Contrast[3/]	Impact[3/]
1222	RES	Private	H	L	0.60	H	L	L-M
356	COMM	Private	H & M	L	0.75	M	L	L
353	COMM	Private	H	L	0.75	M	L	L
1350	REC	State of ID	L	L	0.1	H	M	L
1208	RES	Private	H	L-M	1.20	H	M	M
1126[1/]	RES/COMM	Private	M	L	0.23	M	M-H	M
1118	RES	Private	H	L	0.50	H	M	L-M
1142	REC	BLM VRM III	H	M-H	2.00	M	L-M	M
563	REC	BOR VRM II	H	M-H	2.50	L-M	L-M	L
561	RES/REC	BLM VRM III	H	M-H	0.5	H	M-H	M-H
1145	REC	BOR VRM IV	H	M	550 ft	H	M-H	M

1/ Viewers at KOP 1126 would have views of Alternatives 8B and 8C with equal anticipated visual impacts due to a shared corridor between both Alternatives and the Proposed Route.
2/ REC – A recreational viewer. RES – A single resident. COMM – A commuter traveling on major highways or secondary roads.
3/ H – High, M – Medium, L – Low

KOP C100 (Figure E.2-9). Views from this point are the looking toward the Segment 8 Proposed Route from Canyon Creek Stage Station historic site. This viewpoint is discussed in Section 3.3 – Cultural Resources.

KOP C101 (Figure E.2-9, Simulation Figure E.2-32). Views from this point are the looking toward the Segment 8 Proposed Route from the Pioneer Reservoir on the Oregon NHT. This viewpoint is discussed in Section 3.3 – Cultural Resources.

KOP C102 (Figure E.2-9). Views from this point are the looking toward the Segment 8 Proposed Route from the Rattlesnake Station historic site on the Oregon NHT. This viewpoint is discussed in Section 3.3 – Cultural Resources.

KOP 1222 (Figure E.2-9). High-sensitivity residential viewers at KOP 1222 would have a high level of Project visibility (approximately 0.6 mile from the Proposed Route). The viewer would have an expansive and elevated view toward the alignment, which would parallel two existing transmission alignments and be considered co-dominant with the existing structures. Contrast levels are anticipated to be low. The addition of a new industrial linear feature in a disturbed landscape with low scenic quality would create a "forested" visual effect and result in low to moderate visual impacts.

KOP 356 (Figures E.2-9). High-sensitivity residential viewers and moderate sensitivity motorists traveling south on South 1900E Road would have an open panoramic view of the Proposed Route as it parallels a smaller transmission line. The Proposed Route would be located approximately 0.75 mile to the south and Alternative 9A approximately 3.25 miles to the south. Project visibility from this area is generally moderate at a viewing distance of about 0.75 mile. Travel speeds of 55 mph would result in short viewing durations for travelers making impacts temporary in nature. Visual contrast levels would be low due to the viewing distance, travel speed, and the existing transmission lines in a low scenic quality area. Impacts on viewers would be low.

KOP 353 (Figures E.2-9). The Proposed Route would be moderately visible to high-sensitivity residential viewers located along Highway 26 (approximately 0.75 mile away). Views would be considered short in duration at speeds in excess of 45 miles per hour. The views to the west and south are open and panoramic and would include the Proposed Route. Alternative 9A would be located approximately 6 miles south of this KOP. This segment parallels an existing but smaller transmission line in a low scenic quality landscape resulting in generally low contrast. Impacts on viewers would be low due to the low contrast levels and the temporary nature of the views.

KOP 1350 (Figure E.2-9/Appendix G, Figure J-5b). Low-sensitivity recreational viewers traveling south on Bennett Mountain Road would have a high level of Project visibility (approximately 0.1 mile away from this KOP). The viewer would have an expansive view of the proposed towers and lines until passing beneath them. The Proposed Route is at various angles to the three existing transmission lines and would be considered co-dominant with them. Contrast levels are anticipated to be moderate. Potential visual impacts on recreational viewers are expected to be low due to a horizontal landscape with low scenic quality and the presence of other transmission lines.

KOP 1208 (Figure E.2-9). High-sensitivity residential viewers at KOP 1208 would have a high level of Project visibility (approximately 1.2 miles from the Proposed Route). The viewer would have an expansive view toward the alignment, which would not parallel any existing alignments or linear features but would be considered co-dominant with the existing wind generation towers. Contrast levels are anticipated to be moderate. Potential visual impacts on residences from this KOP and in the general vicinity are expected to be moderate due to the development of a new linear feature in a disturbed landscape with moderate contrast and low to moderate scenic quality.

KOP 1126 (Figure E.2-9). High- and moderate-sensitivity residential viewers and drivers at KOP 1126 would have a high level of Project visibility (approximately 0.23 mile from the proposed Project alignment). The viewer would have an expansive view

toward the alignment, which would parallel the existing transmission alignment visible in the middleground view. Contrast levels are anticipated to be moderate to high. Potential visual impacts on viewers from this KOP and in the general vicinity are expected to be moderate due to the Project paralleling an existing linear feature and the low scenic quality of the landscape.

KOP 1118 (Figure E.2-9). High-sensitivity residential viewers at KOP 1118 would have a high level of Project visibility (approximately 0.5 mile from the Proposed Route). The viewer would have an expansive view toward the alignment, which would parallel the existing transmission alignment visible in the foreground view. The existing transmission line may screen the Proposed Route, resulting in moderate contrast levels. Potential visual impacts on viewers from this KOP and in the general vicinity are expected to be low to moderate due to the Project paralleling an existing linear feature and the low scenic quality of the landscape.

KOP 1142 (Figure E.2-9). High-sensitivity recreational viewers at KOP 1142 would have a moderate level of Project visibility (approximately 2.0 miles from the Proposed Route). The viewer would have an expansive, high elevation view toward the Project, which parallels an existing transmission alignment and could be absorbed through backdropping. Contrast levels are anticipated to be low to moderate. Potential visual impacts on recreational viewers from this KOP and in the general vicinity are expected to be moderate due to partial screening by a linear feature in a previously disturbed landscape, which exhibits moderate to high scenic quality.

KOP 563 (Figure E.2-9). Viewers from KOP 563 would be high-sensitivity recreational viewers visiting the Celebration Archeological Park and, more particularly, examining a lookout point at the entrance to the park (approximately 2.5 miles from the Proposed Route across the Snake River). At KOP 563, high-sensitivity viewers would have a low to moderate level of Project visibility due to distance from this KOP, as well as screening provided by adjacent landscape elements. Visual contrast levels would be low to moderate due to human-made alterations and screening elements within the surrounding area of this KOP. These elements include large natural geologic elements and mountainous terrain as well as houses and other human-made structures. Impacts on viewers would be low.

KOP 561 (Figures E.2-9/ Appendix G, Figures BOP-3b and BOP-3c). The Segment 8 Proposed Route would be highly visible to high-sensitivity recreational hikers and residential viewers located adjacent to Marsing Murphy Road (approximately 0.5 mile away). The views are open and panoramic with strong horizon lines and mountainous silhouettes, as well as uninterrupted views of the Proposed Route. Alternative 9D, which is visible from this KOP, would be located over 2.5 miles south of this KOP. The Proposed Route would not parallel an existing transmission line in a moderate to high scenic quality landscape. Contrast levels are expected to be moderate to high. The Proposed Route would interrupt the viewshed of this scenic landscape. Screening or other mitigation efforts would be less successful at lowering impacts to scenic resources in the surrounding area. Impacts on viewers would be moderate to high due to the contrast levels and the scenic quality of the landscape within the view. KOP 561

would not conform to BLM VRM Class II objectives, which is discussed further in Appendix G-1.

KOP 1145 (Figure E.2-9). High-sensitivity recreational viewers at KOP 1145 would have a high level of Project visibility (approximately 550 feet from the Proposed Route). The viewer would have an expansive view toward the alignment, which would parallel an existing alignment that it screens, and has a high potential to skyline the view. Contrast levels are anticipated to be moderate to high. Potential visual impacts on recreational users from this KOP and in the general vicinity are expected to be moderate due to the Project creating a dominant linear feature in a landscape with existing human-made disturbance.

Alternative 8A

Table 3.2-38 summarizes the potential visual impact for each KOP in Alternative 8A.

Table 3.2-38. Visual Impact Assessment for Each KOP in Alternative 8A

KOP	Viewers[1/]	Land Ownership	Viewer Rating[2/]	Scenic Quality[2/]	Distance (miles)	Visibility[2/]	Contrast[2/]	Impact[2/]
358	RES	Private	H	L	0.60	M-H	L	L-M
1220	RES	Private	H	L	0.50	H	L	L-M
1213	RES	Private	H	L-M	1.50	M-H	M-H	M-H
1211	RES	Private	H	L-M	2.10	M	L-M	L-M
791	REC	Private	H	H	0.27	H	M-H	M-H
803	RES	Private	H	H	0.27	H	M-H	M-H
810	REC	BLM VRM Class I	H	L-M	1.2	M-H	M	M
783	RES	Private	H	L-M	0.83	H	L-M	L-M
1339	REC	State	H	M-H	2.5	L-M	L	L-M

1/ REC – A recreational viewer. RES – A single resident. COMM – A commuter traveling on major highways or secondary roads.
2/ H – High, M – Medium, L – Low

The following two KOPs have cultural as well as visual resource impacts and are analyzed in the Section 3.3 – Cultural Resources.

KOP C107 (Figure E.2-9). Views from this point are the looking toward Alternative 8A from a portion of the Oregon NHT.

KOP C108 (Figure E.2-9). Views from this point are the looking toward Alternative 8A from a portion of the Oregon NHT.

The following nine KOP locations were selected to represent the most sensitive or most typical views and were analyzed for potential impacts on visual resources for Alternative 8A.

KOP 358 (Figure E.2-9). High-sensitivity residential viewers on the west side of U.S. 93 near the existing Midpoint Substation have an open panoramic view to the north that includes an existing transmission line. Views to the north include an existing transmission line near Alternative 8A (approximately 0.6 mile away). Viewing distance to Alternative 8A would be approximately 0.6 mile, resulting in moderate to high Project visibility. Visual contrast levels would be low due to the existing transmission lines and overall low scenic quality. Visual impacts on viewers at this location would be low to moderate.

KOP 1220 (Figure E.2-9). High-sensitivity residential viewers at KOP 1220 would have a high level of Project visibility (approximately 0.5 mile from Alternative 8A. The viewer would have an expansive view toward the alignment, which would parallel two existing transmission alignments and would be considered co-dominant with the existing structures. Contrast levels are anticipated to be low. Potential visual impacts on residences from this KOP and in the general vicinity are expected to be low to moderate due to the alternative creating a co-dominant linear feature in a disturbed landscape from a close distance to the viewer.

KOP 1213 (Figure E.2-9). High-sensitivity residential viewers at KOP 1213 would have a moderate to high level of Project visibility (approximately 1.5 miles from Alternative 8A). The viewer would have an expansive view toward the alignment, which would parallel an existing co-dominant transmission line. Contrast levels are anticipated to be moderate to high. Potential visual impacts on residences from this KOP and in the general vicinity are expected to be moderate to high due to the alternative creating a co-dominant linear feature in a disturbed landscape with moderate to high contrast and low to moderate scenic quality.

KOP 1211 (Figure E.2-9). High-sensitivity residential viewers at KOP 1211 would have a moderate level of Project visibility (approximately 2.1 miles from Alternative 8A). The viewer would have an expansive view toward the alignment, which would parallel an existing, co-dominant transmission line and be partially screened by the structures. Contrast levels are anticipated to be low to moderate. Potential visual impacts on residences from this KOP and in the general vicinity are expected to be low to moderate due to the alternative creating a co-dominant linear feature in a disturbed landscape with low to moderate contrast and low to moderate scenic quality.

KOP 791 (Figure E.2-9). High-sensitivity recreational viewers at KOP 791 would have a high level of Project visibility (approximately 0.27 mile from Alternative 8A). The view would cross the Thousand Springs Scenic Highway, representing a foreground to middleground view of the Project. The viewer would have a framed, superior view toward the alternative alignment, which would be partially screened by the adjacent vegetation. Contrast levels would be moderate to high. Visual impacts on recreational viewers from this KOP and in the general vicinity are expected to be moderate to high for Alternative 8A due to the distance of view and high scenic quality. Siting considerations for scenic highway crossings would include crossing the road at a perpendicular angle. There are no specified mitigation guidelines for the Thousand Springs Scenic Highway. KOP 791 would also represent viewers in the adjacent Billingsley Creek Wildlife Management Area.

KOP 803 (Figure E.2-9). High-sensitivity recreational viewers at KOP 803 would have a high level of Project visibility (approximately 0.27 mile from Alternative 8A). The Project would not parallel the highly visible existing transmission line and the viewer would have a foreground view of the Project. The viewer would have an expansive but inferior view toward the Proposed Route that would be partially screened by topography. Contrast levels would be moderate for Alternative 8A due to the numerous visible transmission lines in the area adjacent to the view. Visual impacts on recreational viewers from this KOP and in the general vicinity would be moderate due to

the distance of the view, numerous human-made alterations in the view, and the moderate to high scenic quality.

KOP 810 (Figure E.2-9/Appendix G, Figure J-4d). High-sensitivity recreational viewers on Black Mesa have an open panoramic view to the north that includes numerous existing transmission lines and the Snake River Canyon, though the river itself is not apparent. Viewing distance to Alternative 8A would be approximately 1.2 miles and thus would result in moderate to high Project visibility. Visual contrast levels would be moderate due to the numerous existing transmission lines and overall low to moderate scenic quality. Visual impacts on viewers at this location would be moderate.

KOP 783 (Figure E.2-9). High-sensitivity residential viewers along Black Mesa Road at KOP 783 would have a high level of Project visibility (approximately 0.83 mile from Alternative 8A in the middleground). The Project would parallel two existing transmission lines. The viewer would have an expansive view toward the alternative alignment, which would parallel two existing transmission lines, resulting in contrast levels that are anticipated to be low to moderate. Visual impacts on residential viewers from this KOP and in the general vicinity are expected to be low to moderate for the alternative due to it paralleling the two existing alignments.

KOP 1339 (Figures E.2-9 and E.2-28). High-sensitivity recreational viewers visiting the Three Island Crossing State Park at KOP 1339 would have a low to moderate level of Project visibility (approximately 2.5 miles away looking east toward Alternative 8A, a middleground view). The presence of the existing transmission line in the view toward Alternative 8A would result in co-dominant Project elements. Contrast levels would be low. Visual impacts on recreational viewers would be low to moderate due to distance and contrast levels.

Alternative 8B

Table 3.2-39 summarizes the potential visual impact for each KOP in Alternative 8B.

Table 3.2-39. Visual Impact Assessment for Each KOP in Alternative 8B

KOP	Viewers[1/]	Land Ownership	Viewer Rating[2/]	Scenic Quality[2/]	Distance (miles)	Visibility[2/]	Contrast[2/]	Impact[2/]
1126	RES/COMM	Private	M	L	0.2	M	M-H	M
329	REC	Private	H	L	3.0	L-M	L	L-M
362	REC	Private	H	M	0.2	H	H	H
591	REC	Private	H	M	0.5	H	M	M-H
338	RES	Private	H	L-M	100 ft	H	M	M-H
328	RES/CEM	Private	H	L-M	0.4	H	H	H
1333	RES	Private	H	L-M	1.0	H	H	M-H
1334	RES	Private	H	L	1.0	H	M-H	M-H

1/ REC – A recreational viewer. RES – A single resident. COMM – A commuter traveling on major highways or secondary roads. CEM – A community cemetery usually not identified as historic.
2/ H – High, M – Medium, L – Low

KOP C88 (Figure E.2-9). As discussed in Section 3.2.1.4, views from this point are the views looking toward Alternative 8C from Walter's Ferry historic site. This viewpoint is further discussed in Section 3.3 – Cultural Resources.

KOP 1126 (Figure E.2-9). This KOP is discussed under Segment 8, Proposed Route.

KOP 329 (Figures E.2-9). Viewers from KOP 329 would be high-sensitivity recreationists at Kuna's athletic fields(approximately 3 miles from Alternative 8B). At KOP 329, high-sensitivity viewers would have a low to moderate level of Project visibility due to the numerous human-made alterations in the view. Visual contrast levels would be low due to human-made alterations, which include houses, cell phone towers, and other structures. Impacts on viewers would be low to moderate.

KOP 362 (Figure E.2-9). Viewers from KOP 362 would be high-sensitivity recreational viewers traveling along Highway 45 or stopped at the lookout point (approximately 0.2 mile from Alternative 8B). At KOP 362, the viewers would have a high level of Project visibility because of its proximity to this KOP. Visual contrast levels would be high due to the openness of the area and the lack of human-made alterations within the vicinity. Visual impacts on viewers would be high due to the close proximity from this KOP.

KOP 591 (Figures E.2-9 and E.2-27). Viewers from KOP 591 would be high-sensitivity recreational drivers and residents along the Snake River Canyon Scenic Byway. KOP 591 would be about 0.5 mile from Alternative 8B. At KOP 591, high-sensitivity viewers would have a high level of Project visibility due to the close proximity to the Project. Visual contrast levels would be moderate due to the presence of human-made alterations, including houses, transmission poles, and other structures. Visual impacts on viewers would be moderate to high.

KOP 338 (Figure E.2-9). Viewers from KOP 338 would be high-sensitivity residents located along the Owyhee Highway viewing across agricultural land 100 feet from Alternative 8B. At KOP 338, the viewers would have a high level of Project visibility due to open foreground views. Visual contrast levels would be moderate due to the presence of human-made alterations within the vicinity of this KOP and the close proximity of the viewer. Visual impacts would be moderate to high due to distance and numerous human-made alterations in the immediate vicinity of the view.

KOP 328 (Figure E.2-9). Viewers from KOP 328 would be high-sensitivity residential viewers visiting Wilson Cemetery (approximately 0.4 mile from Alternative 8B). Due to foreground distances from this particular KOP, lack of screening, and skylining, Alternative 8B would be highly visible from this KOP. Visual contrast levels would be high due to the lack of human-made alterations within the vicinity of this KOP and the close proximity of the viewer. Visual impacts on viewers would be high.

KOP 1333 (Figures E.2-9 and E.2-30). High-sensitivity residential viewers on Kuna Butte at KOP 1333 would have a high level of Project visibility (approximately 1.0 mile from Alternative 8B in the foreground looking south. The lack of human-made modifications and the possibility of the alignment to skyline the foreground views would result in high contrast levels. Visual impacts on residential viewers would be moderate to high due to distance, contrast levels, and scenic quality.

KOP 1334 (Figures E.2-9 and E.2-31). High-sensitivity residential viewers east of Kuna Butte at KOP 1334 would have a high level of Project visibility (approximately

1.0 mile from Alternative 8B in the foreground looking south. The alternative would be partially screened by the human-made modifications, such as the transmission line and sewage disposal ponds located in the southwestern viewing direction, but would skyline the foreground views resulting in moderate to high contrast levels. Visual impacts on residential viewers would be moderate to high due to distance, contrast levels, and scenic quality.

Alternative 8C

Table 3.2-40 summarizes the potential visual impact for each KOP in Alternative 8C.

Table 3.2-40. Visual Impact Assessment for Each KOP in Alternative 8C

KOP	Viewers[1/]	Land Ownership	Viewer Rating[2/]	Scenic Quality[2/]	Distance (miles)	Visibility[2/]	Contrast[2/]	Impact[2/]
1126	RES/COMM	Private	M	L	0.23	M	M-H	M
336	RES/COMM	BLM VRM III	M	L	1.25	M	L-M	L-M
337	RES/COMM	Private	M	L	0.30	H	M	M

1/ RES – A single resident. COMM – A commuter traveling on major highways or secondary roads.
2/ H – High, M – Medium, L – Low

KOP 1126 (Figure E.2-9). This KOP is discussed under the Segment 8 Proposed Route.

KOP 336 (Figure E.2-9). Moderate-sensitivity residences and commuters traveling on I-84 and stopping at the Sinclair gas station near the Indian Creek Reservoir would have a high level of Project visibility (approximately 0.3 mile from Alternative 8C). The viewer would have an expansive view toward the alignment, which would parallel the existing transmission alignment visible within the view. Contrast levels are anticipated to be moderate. Potential visual impacts on viewers from this KOP and in the general vicinity are expected to be moderate due to the alternative paralleling an existing linear feature and the landscape being of low scenic quality.

KOP 337 (Figure E.2-9). Moderate-sensitivity residences and commuters traveling on I-84 near the Indian Creek Reservoir would have a moderate level of Project visibility (approximately 1.5 miles from Alternative 8C). The viewer would have an expansive view toward the alignment, which would parallel the existing transmission alignment visible within the view, which is interrupted by numerous retail signs. contrast levels are anticipated to be low to moderate. Potential visual impacts on viewers from this KOP and in the general vicinity are expected to be low to moderate due to the alternative paralleling an existing linear feature and the landscape being of low scenic quality.

Alternative 8D

Table 3.2-41 summarizes the potential visual impact for each KOP in Alternative 8D.

Table 3.2-41. Visual Impact Assessment for Each KOP in Alternative 8D

KOP	Viewers[1/]	Land Ownership	Viewer Rating[2/]	Scenic Quality[2/]	Distance (miles)	Visibility[2/]	Contrast[2/]	Impact[2/]
331	RES	BLM VRM IV	H	L-M	1.3	M	L-M	L-M

1/ RES – A single resident.
2/ H – High, M – Medium, L – Low

KOP 331 (Figure E.2-9). Viewers from KOP 331 would be high-sensitivity residential viewers traveling south on Pleasant Valley Road (approximately 1.3 miles from Alternative 8D). Due to foreground distances from this particular KOP, lack of screening, and existing disturbance, Alternative 8D would be moderately visible from this KOP. Visual contrast levels would be low to moderate due to the highly visible existing transmission line, which skylines the view and adjacent human-made alterations. Visual impacts on viewers would be low to moderate due to low to moderate scenic quality and contrast.

Alternative 8E

Table 3.2-42 summarizes the potential visual impact for each of the KOPs in Alternative 8E.

Table 3.2-42. Visual Impact Assessment for Each KOP in Alternative 8E

KOP	Viewers[1/]	Land Ownership	Viewer Rating[2/]	Scenic Quality[2/]	Distance (miles)	Visibility[2/]	Contrast[2/]	Impact[2/]
1423	REC	BLM VRM II	H	M-H	2.8	L-M	M	L-M
1425	REC	BLM VRM III	H	M	0.8	M-H	H	M-H
1428	REC	BLM VRM III	H	M	0.5	H	M	M

1/ REC – A recreational viewer.
2/ H – High, M – Medium, L – Low

The following KOP location was selected to represent the most sensitive or most typical views for Alternative 8E of the Project west of the Snake River.

KOP 1423 (Figure E.2-9). Viewers from KOP 1423 would be high-sensitivity recreational viewers at Celebration Park (approximately 2.8 miles from Alternative 8E). Due to middleground distances from this particular KOP, partial screening, and pristine landscape conditions, Alternative 8E would be low to moderately visible from this KOP. Visual contrast levels would be moderate due to the lack of adjacent human-made alterations within the vicinity of this KOP and the distance of view. Visual impacts on viewers would be low to moderate due to visibility and contrast.

The following KOP locations were selected to represent the most sensitive or most typical views for Alternative 8E of the Project east of the Snake River.

KOP 1425 (Figure E.2-9). Viewers from KOP 1425 would be high-sensitivity recreational viewers at Dedication Point Overlook at the Snake River (approximately 0.8 mile from Alternative 8E). Due to foreground distances from this particular KOP, lack of screening, and pristine landscape conditions, Alternative 8E would be moderately to highly visible from this KOP. Visual contrast levels would be high due to the lack of adjacent human-made alterations within the vicinity of this KOP and distance of the view. Visual impacts on viewers would be moderate to high due to visibility and contrast.

KOP 1428 (Figure E.2-9). Viewers from KOP 1428 would be high-sensitivity recreational viewers on the Western Heritage Historic Byway looking east (approximately 0.5 mile from Alternative 8E). Due to foreground distances from this particular KOP, lack of screening, and existing human-made development, Alternative 8E would be highly visible from this KOP though contrast levels would be moderate due

to these same factors and the distance of the view. Visual impacts on viewers would be moderate due to scenic quality and contrast resulting from the co-dominant nature of the Route Alternative and the existing high-voltage transmission line.

Conformance with BLM VRM Classes and Forest Service VQOs

Proposed Route – The Proposed Route would cross 3.2 miles of BLM-administered VRM Class I lands designated by the Jarbidge RMP between MPs 45.3 and 50.7. All but 0.7 mile of the 3.1 miles is parallel to an existing 138-kV transmission line. This segment of the Proposed Route would not conform to the Jarbidge RMP because the objective of VRM Class I is to preserve the existing character of the landscape. Only natural ecological changes can occur on lands managed as VRM Class I and the level of change to the characteristic landscape must not attract attention. An amendment would be needed, if this route is selected, to reclassify areas impacted by the Project to VRM Class III. See Appendix F-1, Section 3.8 for amendment language and Appendix G-1, Section 5.8 for visual analyses.

Effects discussed in this chapter for KOPs 1350, 563, and 561 would only apply if amendments to the visual resource management requirements for the Jarbidge and SRBOP RMPs were approved to permit the Project. Project effects for additional KOPs are discussed in Appendix G-1.

The Proposed Route would also cross 12.3 miles of BLM-administered VRM Class II lands designated by the Bennett Hills/Timmerman Hills MFP and the SRBOP RMP between MPs 30.6 and 44.8 and another between MPs 119.2 and 123.3 partially paralleling an existing 138-kV transmission line. It may be not in conformance with, and thus require an amendment to, the Bennett Hills/Timmerman Hills MFP and the SRBOP RMP because new facilities would represent a level of change to the landscape and basic elements that would attract the attention of the casual observer (see KOP 347 and Appendix G-1). Most areas can conform to VRM Class III and IV objectives due to paralleling existing transmission lines.

Effects for KOP 347 are discussed in Appendix G-1 and would only apply if an amendment were approved to permit the Project.

Alternative 8A – Alternative 8A would cross approximately 6.8 miles of BLM-administered VRM Class I lands designated by the Jarbidge RMP in numerous areas between MPs 24.6 and 53.0 partially paralleling an existing 138-kV transmission line. This same area is also designated a WWE corridor. Alternative 8A would not conform with the Jarbidge RMP. Only natural ecological changes can occur on lands managed as VRM Class I and the level of change to the characteristic landscape must not attract attention (see KOP 815). An amendment would be needed to reclassify the VRM Class I areas associated with the Oregon NHT to VRM Class III where the Project crosses. If this route were selected, areas where the Project crosses within the WWE corridor as well as those areas adjacent to existing ROWs would be reclassified to VRM Class III. See Appendix F-1, Section 3.8 for amendment language and Appendix G-1, Section 5.8.4 for visual analyses.

Effects discussed in this section for KOPs 810 and 1339 would be directly related to approval of land us plan amendments because the Project could not cross areas viewed from these KOPs without an amendment to the land use plan's visual resource management classification.

Alternative 8A would also cross over 2.1 miles of BLM-administered VRM Class III lands designated by the Monument RMP in four separate areas between MPs 0.3 and 15.3, paralleling an existing ROW, which require that a project partially retain the existing character of the landscape and only result in moderate levels of change to the characteristic landscape (see KOP 812). Impact areas along Alternative 8A are anticipated to conform to VRM Class III and IV objectives.

Alternative 8B – Alternative Route 8B would cross over 7.3 miles of BLM-administered VRM Class III lands designated by the SRBOP RMP in several separate areas between MPs 0.0 and 27.0, creating a new ROW, which requires a project partially retain the existing character of the landscape and only result in moderate levels of change to the characteristic landscape (see KOP 591). Alternative 8B is anticipated to conform to VRM Class III objectives where those lands are crossed by the route.

All effects for KOPs viewing BLM-managed land outside the designated ROW would be dependent upon approval of an amendment to the existing plan or approval of a new plan that does not carry the ROW restriction forward.

Alternative 8C – Alternative 8C would also cross over 2.3 miles of BLM-administered VRM Class III lands designated by the Kuna MFP in several separate areas between MPs 0.0 and 6.4, paralleling an existing 138-kV transmission line ROW. VRM Class III management requires that a project partially retain the existing character of the landscape and only result in moderate levels of change to the characteristic landscape (see KOP 337). Alternative 8C is anticipated to conform to VRM Class III objectives where those lands are crossed.

Alternative 8D – Alternative Route 8D would cross over 2.5 miles of BLM-administered VRM Class III lands designated by the SRBOP RMP in four separate areas between MPs 0.4 and 8.0, paralleling an existing transmission line ROW. VRM Class III management requires that a project partially retain the existing character of the landscape and only result in moderate levels of change to the characteristic landscape (see KOP 331). Alternative 8D would conform to VRM Class III objectives where those lands are crossed on the SRBOP.

All effects for KOPs viewing BLM-managed land outside the designated ROW would be dependent upon approval of an amendment to the existing plan or approval of a new plan that does not carry the ROW restriction forward.

Alternative 8E – Alternative 8E would cross 2.4 miles of BLM-administered VRM Class II lands, and 15.6 miles of BLM-administered VRM Class III lands. Approximately 9.8 miles of the route that crosses VRM Class III would parallel an existing transmission line ROW. VRM Class III management requires that a project partially retain the existing character of the landscape and only result in moderate levels of change to the characteristic landscape (see KOP 1428). Alternative 8E would conform to VRM Class III objectives where those lands are crossed on the SRBOP. If this route

is selected, an amendment would be needed to change the VRM Class II to VRM Class III where the route crosses the Sinker Butte AOI.

Effects of the Project for additional KOPs are provided in Appendix G-1.

Segment 8 – Conclusion

Proposed Route – The Proposed Route would be located in a generally agricultural area, and would parallel an existing transmission line for most of the alignment with numerous other transmission lines, radio towers, and other vertical elements in its vicinity. The route is sited to cross the north and western portions of the SRBOP in the western portion of the Treasure Valley as well as the Snake River south of Guffey Butte and Celebration Park, which is used by recreational viewers and is where many of the more moderate visual impacts are concentrated. Visual impacts to public, private, and state lands resulting from the construction of the Proposed Route would be mostly low to moderate with areas of moderate visual impact concentrated toward the western end where there are dispersed residences that would be in close proximity and where scenic byways would be crossed close to the Snake River (Western Heritage, Snake River Canyon).

Alternative 8A – The majority of the area crossed by Alternative 8A is used for agricultural production with numerous dispersed residences that would experience higher visual impacts. Alternative 8A would cross Thousand Springs Scenic Byway, which does not have specific visual requirements at this time, but would be considered a scenic roadway with highly sensitive viewers. Many management plans for scenic roadways require a perpendicular crossing for utilities to minimize visual impacts. Alternative 8A would cross the Thousand Springs Scenic Byway at a perpendicular angle to conform to this standard. Alternative 8A would be located directly north of the Billingsley Creek Wildlife Management Area, which is open year-round to recreational viewers; however, there are no current visual management objectives identified by the IDFG. Visual impacts to public, private, and state lands resulting from the construction of Alternative 8A would be mostly low to moderate.

Alternative 8B – Visual impact to public, private, and state lands resulting from the construction and operations of Alternative 8B is anticipated to be mostly moderate to high with some areas of high impact due to the alternative being close to dispersed residential areas and the towns of Kuna and Melba, Idaho, where concentrated residential and visual nonconformance areas occur. Alternative 8B would not conform to the Kuna Comprehensive Land Use Plan where it crosses Kuna Butte and would be visible to the residents of Kuna, Idaho. Kuna Butte is identified in the Kuna Comprehensive Land Use Plan as an important visual attribute (City of Kuna 2009b). The City's Plan identifies the need to protect this land feature from visually intruding obstacles because its presence helps define the community's sense of place.

Alternative 8C – Visual impact to public, private, and state lands resulting from the construction and operations of Alternative 8C is anticipated to be mostly moderate with some areas of lower impact. This is due to the alternative following a WWE corridor and paralleling an existing 500-kV transmission line before crossing I-84 at a more perpendicular angle than the comparison portion of the Proposed Route.

Alternative 8D – Visual impact to public, private, and state lands resulting from the construction and operations of Alternative 8D is anticipated to be mostly low with some areas of moderate impact due to the variation being closer to residences within and north of the SRBOP.

Alternative 8E – Alternative 8E would follow an existing transmission line for much of its route. Higher visual impacts would occur where it crosses VRM Class II lands, west of the Snake River and the Guffey Butte-Black Butte Archaeological District where it would follow the same alignment as Alternative 9D and then the Proposed Route.

Alternatives Comparison

On the eastern end of Segment 8, in the area bounded by route points 8 and 8c.1, there would be two possible connections, the Proposed Route or Alternative 8A (see Figure E.2-9). In this area, the comparison portion of the Proposed Route would have proportionally less of a visual impact than Alternative 8A due largely to lower overall visual impacts and crossing less VRM Class I area. Alternative 8A would be in close proximity to the communities of Hagerman, at the eastern crossing of the Snake River, and Glenns Ferry, at the western crossing of the Snake River in this area. Additionally, Alternative 8A would be located 0.25 mile from the northern boundary of the Hagerman Fossil Beds and the Billingsley Creek Wildlife Management Area. Alternative 8A would need a perpendicular crossing for the Thousand Springs Scenic Highway in the area of KOP 791. Also, micrositing of structures to take advantage of screening offered by the surrounding terrain would be required in the area of KOP 803 under Alternative 8A.

At the western end of Segment 8, there are several Route Alternatives: Alternative 8B, Alternative 8C, Alternative 8D, and Alternative 8E. These alternatives are in the area bounded by route reference points 8j and 11 (see Figure E.2-9). This area is largely open, with undeveloped lands within the SRBOP and adjacent agricultural areas that have a number of dispersed residential units resulting in each alternative being within general proximity of residences. Alternatives 8A and, especially, 8B would have a greater effect on residential viewers than the comparison portion of the Proposed Route or the other alternatives.

Segment 9 – Cedar Hill to Hemingway

Segment 9, as proposed, would link the Cedar Hill and Hemingway Substations with a 161.7 mile single-circuit 500-kV transmission line which skirts the Jarbidge and Owyhee Military Operating Areas to the north, then follows the WWE corridor just north of the Saylor Creek Air Force Range, passing through Owyhee County before entering into the Hemingway Substation. Fifteen acres of the construction of the Cedar Hill Substation and 1 acre for two regeneration sites are attributed to Segment 9. There are eight Route Alternatives proposed, including 9A, which was the Proponents' Proposed Route until moving to avoid the Hollister area; 9B, which is being considered by the BLM because it follows the WWE corridor and parallels existing utility corridors; 9C, which was the Proponents' Proposed Route until moving to avoid the Castleford area; and 9D and 9E, proposed by the Owyhee County Task Force, that cross more public lands north and south of the Proposed Route, respectively, than the Proposed Route. Most of Alternative 9D would be within the SRBOP. Alternatives 9F, 9G, and 9H were proposed by BLM to avoid an area designated for nonmotorized access in the Guffey

Butte/Black Butte Archaeological District. Alternatives 9F, 9G, and 9H were proposed to avoid crossing the nonmotorized area south of C.J. Strike Reservoir. Alternatives 9G and 9H provide an alternate route location south of Alternative 8E (see Appendix A, Figure A-11).

Proposed Route

Table 3.2-43 summarizes the potential visual impact for each KOP in Segment 9.

Table 3.2-43. Visual Impact Assessment for Each KOP in the Segment 9 Proposed Route

KOP	Viewers[2/]	Land Ownership	Viewer Rating[3/]	Scenic Quality[3/]	Distance (miles)	Visibility[3/]	Contrast[3/]	Impact[3/]
372	RES	Private	H	M	0.6	M-H	M-H	M-H
410	REC	Private	H	M	0.5	L	M	L-M
452	RES	Private	H	M	1.0	M	L-M	H
407	RES	BLM VRM IV	H	M	0.9	M-H	M-H	M-H
1067	REC	BLM VRM II	H	M-H	400 feet	H	H	H
1068	REC/RES	BLM VRM II	H	M-H	0.75	M-H	M-H	M-H
1069	RES	Private	H	M-H	0.30	H	M-H	M-H
387	REC	BLM VRM III	H	M-H	1.00	H	M-H	M
401	REC	Private	H	M-H	4.00	L	M	L-M
599	RES	Private	H	L-M	0.25	M	M	M
602	RES	Private	H	L-M	0.50	M-H	M	L-M
592	REC	BLM VRM IV	M-H	L-M	2.25	L	L	L
566	HIST	Private	H	M	1.00	M	L-M	L-M
1114	REC	BLM VRM IV	H	H	2.50	M-H	H	H
572[1/]	REC	BLM VRM III	H	M-H	0.50	H	M-H	M-H

1/ Viewers at KOP 572 would have views of Alternatives 9D and 9E with less anticipated visual impacts due to the distance of both alternatives and the Proposed Route.
2/ REC – A recreational viewer. RES – A single resident. HIST – A site identified as having historic value.
3/ H – High, M – Medium, L – Low

KOP C101 (Figure E.2-10). Views from this point are from the historic Hollister School. This viewpoint is discussed in Section 3.3 – Cultural Resources.

KOP C109 (Figure E.2-10). Views from this point are from the Owyhee County Courthouse. This viewpoint is discussed in Section 3.3 – Cultural Resources.

KOP 372 (Figure E.2-10/ Appendix G, Figure J-2b). Viewers from KOP 372 would be high-sensitivity residential viewers south of the Snake River, Sparlin Island, and the town of Hammett, Idaho. Viewers would be approximately 0.6 mile from where the Proposed Route would cross the ridge top in the middleground. At KOP 372, visibility of the Proposed Route would be moderate to high due to the partial screening effect of the closest rolling ridge top in the middleground of the view and the fact that the Proposed Route would skyline the terrain in the background. Visual contrast levels would be moderate to high due to the lack of apparent human-made alterations in the middleground and background. Impacts on viewers would be moderate to high.

KOP 410 (Figure E.2-10). Viewers from KOP 410 would be high-sensitivity recreational viewers traveling along the BLM access road (approximately 0.5 mile from

where the Proposed Route would cross the ridge top in the middleground). KOP 410 is located over 6 miles from where Alternative 9A rejoins the Proposed Route. At KOP 410, visibility of the Proposed Route would be low due to the screening effect of the closest ridge top in the middleground of the view. Visual contrast levels would be moderate due to the human-made alterations in the middleground and background. Impacts on viewers would be low to moderate.

KOP 452 (Figure E.2-10). Viewers from KOP 452 would be high-sensitivity residential viewers on North 3100 East Road (approximately 1.0 mile from where the Proposed Route would cross the foreground blocking views of the rugged terrain). From KOP 452, the Proposed Route would be moderately to highly visible to the viewers. For a comparison, the existing monopole transmission line visible within the view is approximately 2.6 miles from this KOP (1.6 miles farther than the Proposed Route). Existing human-made alterations such as linear structures impact the viewers from KOP 452 and would reduce the contrast of the Proposed Route with the existing landscape to a rating of moderate to high. Impacts on viewers would be moderate to high due to contrast and the close proximity of the viewer.

KOP 407 (Figure E.2-10). Viewers from KOP 407 would be high-sensitivity residential viewers on East 2900 North Road (approximately 0.9 mile from where the Proposed Route would cross the foreground, blocking views of the rugged terrain and skylining views where backdropping terrain is not present). From KOP 407, the Proposed Route would be highly visible to the viewers due to skylining the middleground terrain. Existing human-made alterations would not screen views of the Proposed Route and visual contrast levels are anticipated to be high due to the lack of linear human-made alterations within the foreground and middleground of the view. Impacts on viewers would be high due to the contrast level of skylined views and the distance of the viewer.

KOP 1067 (Figure E.2-10). High-sensitivity recreational viewers at KOP 1067 would be traveling across the Lower Salmon Creek Falls Canyon on Lily Grade Road (approximately 400 feet from where the Proposed Route would span the canyon ridge top in the foreground). At KOP 1067, visibility of the Proposed Route would be high due to the distance of where the alignment would span the canyon. Visual contrast levels would be high due to the few human-made alterations in the foreground and middleground. Impacts on viewers would be high.

KOP 1068 (Figure E.2-10). Moderate and high-sensitivity residential and recreational viewers at KOP 1068 would be traveling on Lily Grade Road (approximately 0.75 mile from where the Proposed Route would span the canyon ridge top and cross the foreground). Lily Grade is the transition between the WSA to the south and the eligible wild and scenic river segment to the north. North of Lily Grade is also an ACEC (see Section 3.17.2). At KOP 1068, visibility of the Proposed Route would be moderate to high due to the distance to the alignment. Visual contrast levels would be moderate to high due to the human-made alterations visible in the foreground, middleground, and background. Impacts on viewers from KOP 1068 and in the surrounding area would be moderate to high due to contrast levels and distance of the Project from the viewer.

KOP 1069 (Figure E.2-10). Viewers from KOP 1069 would be high-sensitivity residential viewers on Balanced Rock Road (approximately 0.3 mile from where the Proposed Route would cross the foreground blocking views of the rugged terrain). From KOP 1069, the Proposed Route would be highly visible to the viewers. Existing human-made alterations would not partially screen views of the Proposed Route but visual contrast levels are anticipated to be moderate to high due to the human-made alterations within the foreground and middleground. Impacts on viewers would be moderate to high due to contrast and distance of the viewer.

KOP 387 (Figures E.2-10). Viewers from KOP 387 would be hikers traveling along the Centennial Trail approximately (approximately 1.0 mile from where the Proposed Route would cross the trail in the middleground). KOP 387 is located on BLM-administered lands managed to conform to VRM Class III objectives and is approximately 1.5 miles from Alternative 9A. Due to the open landscape with little screening, the proposed transmission facilities would be highly visible from KOP 387. Visual contrast levels would be moderate to high due to the man-made alterations visible in the background. Impacts on viewers would be moderate.

KOP 401 (Figure E.2-10). Viewers from KOP 401 would be high-sensitivity recreational viewers traveling along the Bruneau Dunes Road(4.0 miles from where the Proposed Route would cross the middleground). At KOP 401, high-sensitivity viewers would have a low level of Project visibility due to the screening effects of the dominant sand dunes in the middleground of the view. Visual contrast levels would be moderate due to the human-made alterations in the middleground. Impacts on viewers would be low to moderate.

KOP 599 (Figure E.2-10). Viewers from KOP 599 would be high-sensitivity residential viewers living and traveling along Mud Flat Road (approximately 0.25 mile from where the Proposed Route would cross the road in the middleground). At KOP 599, high-sensitivity viewers would have a moderate level of Project visibility due to partial screening of existing human-made alterations and distance from this KOP. Visual contrast levels would be moderate due to the human-made alterations in the middleground distance. Impacts on viewers would be moderate.

KOP 602 (Figures E.2-10). Viewers from KOP 602 would be high-sensitivity residential and moderate-sensitivity motorists along Mud Flat Road (approximately 0.5 mile from where the Proposed Route would cross the road and valley in the middleground). From KOP 602, the Proposed Route would be moderately to highly visible to the viewers. Existing human-made alterations would partially screen views of the Proposed Route from this KOP. Visual contrast levels would be moderate due to the human-made alterations within the foreground and middleground. Impacts on viewers would be low to moderate.

KOP 592 (Figures E.2-10). Viewers from KOP 592 would be high- and moderate-sensitivity recreational viewers traveling along Highway 78 (Murphy Grandview Road) (2.25 miles from the Proposed Route). At KOP 592, viewers traveling on the highway or at the historic marker would have a low level of Project visibility due to middleground distances and existing vegetation screening. Also these views would be brief due to

travel speeds in excess of 55 mph. Visual contrast levels would be low due to screening and the numerous human-made alterations in the vicinity of this KOP, which include transmission lines, houses, and other structures as well as screening from vegetation. Visual impacts on viewers would be low.

KOP 566 (Figures E.2-10). Viewers from KOP 566 would be high-sensitivity viewers visiting the historic Our Lady Queen of Heaven Catholic Church (approximately 1.0 mile south from the Proposed Route). At KOP 566, high-sensitivity viewers would have a moderate level of Project visibility due to distance from this particular KOP, as well as screening provided by adjacent landscape elements. Visual contrast levels would be low to moderate due to the human-made alterations and screening elements in the surrounding area of this KOP, which include a school, transmission lines, and other structures. Visual impacts on viewers would be low to moderate.

KOP 1114 (Figure E.2-10). High-sensitivity recreational viewers at KOP 1114 would have a high level of Project visibility (approximately 0.25 mile from the Proposed Route). The viewer would have an expansive view toward the alignment, which would not parallel any existing alignments or linear features and could skyline in the case of the Proposed Route. Contrast levels that are anticipated to be high. Potential visual impacts on recreational viewers from this KOP and in the general vicinity are expected to be high due to it creating a new linear feature in an undisturbed landscape with high scenic quality.

KOP 572 (Figure E.2-10). Viewers from KOP 572 are high-sensitivity recreational viewers traveling along the BLM Rabbit Creek Trail (less than 0.5 mile from where the Proposed Route would cross the trail and hills in the foreground and middleground). At KOP 572, high-sensitivity viewers would have a high level of Project visibility, and visual contrast levels would be moderate to high due to the few human-made alterations within the view. The rolling topography in the vicinity may offer opportunities for backdropping, which could absorb the lattice structures and lower contrast levels. Visual impacts on viewers would be moderate to high.

Alternative 9A

Table 3.2-44 summarizes the potential visual impact for each KOP in Alternative 9A.

Table 3.2-44. Visual Impact Assessment for Each KOP in Alternative 9A

KOP	Viewers[1/]	Land Ownership	Viewer Rating[2/]	Scenic Quality[2/]	Distance (mile)	Visibility[2/]	Contrast[2/]	Impact[2/]
454	RES	Private	H	M	0.1	H	L-M	M
414	RES	Private	H	M-H	0.2	H	H	M-H
440	RES	BLM VRM IV	H	L	0.9	M	M-H	M

1/ RES – A single resident.
2/ H – High, M – Medium, L – Low

KOP 454 (Figure E.2-10). High-sensitivity residential viewers at KOP 454 would have a high level of Project visibility (approximately 570 feet from Alternative 9A, representing a foreground view of the Alternative). Views from KOP 454 represent the views of a residence looking south toward Alternative 9A and a highly visible existing

monopole transmission line that skylines the view. The visible transmission line is located approximately 1,500 feet from Alternative 9A. Viewers would have a focal view toward the proposed alternative with few opportunities for screening, resulting in contrast levels that would be low to moderate due to the existing transmission line. Visual impacts on residential viewers from this KOP and in the general vicinity are expected to be moderate for Alternative 9A due to the distance of the view as well as the presence of visible human-made alterations adjacent to the view, which lower scenic quality.

KOP 414 (Figure E.2-10). High-sensitivity residential viewers at KOP 414 would have a high level of Project visibility (approximately 0.2 mile from Alternative 9A, representing a foreground view of the alternative). Views from KOP 414 represent the views of a residence on North 3000 Road looking south toward Alternative 9A south of Hub Butte. Viewers would have an expansive and panoramic view toward the alternative with few opportunities for screening, resulting in contrast levels that would be high. Visual impacts on residential viewers from this KOP and in the general vicinity are expected to be moderate to high for Alternative 9A due to the distance of the view, as well as the presence of visible human-made alterations adjacent to the view, which lower scenic quality.

KOP 440 (Figure E.2-10). High-sensitivity residential viewers at KOP 440 would have a moderate level of Project visibility (approximately 0.9 mile from Alternative 9A, representing a foreground view of the alternative). Views from KOP 440 represent the views of a residence looking north toward Alternative 9A, south of Hub Butte. Viewers would have an expansive and panoramic view toward the Alternative with few opportunities for screening. Contrast levels would be moderate to high. Visual impacts on residential viewers from this KOP and in the general vicinity are expected to be moderate for Alternative 9A due to the distance of the view, as well as the presence of visible human-made alterations adjacent to the view, which lower scenic quality.

Alternative 9B

Table 3.2-45 summarizes the potential visual impact for each KOP in Alternative 9B.

Table 3.2-45. Visual Impact Assessment for Each KOP in Alternative 9B

KOP	Viewers[2/]	Land Ownership	Viewer Rating[3/]	Scenic Quality[3/]	Distance (mile)	Visibility[3/]	Contrast[3/]	Impact[3/]
810	REC	BLM VRM Class I	H	M	0.7	M	M	M
419 [1/]	RES	Private	H	L-M	0.50	H	M-H	M-H
793	RES	Private	H	L	0.10	H	H	H
798	RES	Private	H	L	0.45	H	M	M
801	RES	Private	H	M	0.21	H	H	M-H

1/ Viewers at KOP 419 would have views of Alternative 9C with equal anticipated visual impacts due to a shared corridor between both alternatives.
2/ REC – A recreational viewer. RES – A single resident.
3/ H – High, M – Medium, L – Low

KOP C106 (Figure E.2-10). Views from this point are the looking toward Alternative 9A as well as 8A from a portion of the Oregon NHT. This viewpoint is discussed in Section 3.3 – Cultural Resources.

KOP 810 (Figure E.2-10/Appendix G, Figure J-4d). High-sensitivity recreational viewers on Black Mesa have an open panoramic view to the south with little human-made development. Viewing distance to Alternative 9B would be approximately 0.7 mile and would be partially screened by the terrain, which would result in moderate Project visibility. Visual contrast levels would be moderate due to the partial screening by the terrain and overall moderate scenic quality. Visual impacts on viewers at this location would be moderate.

KOP 419 (Figure E.2-10). Views from KOP 419 represent the views of a residence looking northwest toward the Alternative 9A alignment directly east of the Salmon Falls Creek Canyon, which is not visible from this KOP. Viewers at this location would be approximately 0.5 mile from Alternative 9B, representing a foreground view of the Alternative. High-sensitivity residential viewers at KOP 419 would have a high level of Project visibility located 0.5 mile from Alternative 9B. The viewers would have a panoramic view toward Alternative 9B with few opportunities for screening and the opportunity to skyline the view. Contrast levels would be moderate to high. Impacts on residential viewers from this KOP and in the general vicinity are expected to be moderate to high due to the distance of the view and the low to moderate scenic quality.

KOP 798 (Figure E.2-10). Views from KOP 798 represent the views of a residence looking east toward Alternative 9A directly west of the Snake River and Sinking Canyon. Viewers at this location would be approximately 0.45 mile from Alternative 9B, representing a foreground view of the alternative. High-sensitivity residential viewers at KOP 798 would have a high level of Project visibility located 0.45 mile from Alternative 9B. The viewers would have a panoramic view toward Alternative 9B with few opportunities for screening but parallel to an existing transmission alignment, resulting in moderate contrast levels. Impacts on residential viewers from this KOP and in the general vicinity are expected to be moderate for Alternative 9B due to the distance of the view and moderate contrast level.

KOP 801 (Figure E.2-10). High-sensitivity residential viewers at KOP 801 would have a high level of Project visibility (approximately 0.21 mile from Alternative 9B, representing a foreground view of the alternative). Views from KOP 801 represent the views of a residence looking southwest toward Alternative 9B, east of the Twenty-Mile Butte and directly west of the Snake River Canyon. Viewers would have an expansive and panoramic view toward Alternative 9B with few opportunities for screening, resulting in high contrast levels. Visual impacts on residential viewers from this KOP and in the general vicinity are expected to be moderate to high for Alternative 9B due to the distance of the view and high contrast level as well as the presence of visible human-made alterations adjacent to the view, which lower scenic quality.

Alternative 9C

Table 3.2-46 summarizes the potential visual impact for each KOP in Alternative 9C.

Table 3.2-46. Visual Impact Assessment for Each KOP in Alternative 9C

KOP	Viewers[1/]	Land Ownership	Viewer Rating[2/]	Scenic Quality[2/]	Distance (mile)	Visibility[2/]	Contrast[2/]	Impact[2/]
419	RES	Private	H	L-M	0.5	H	M-H	M-H
369	REC	Private	H	M	0.75	L	M	L-M
793	RES	Private	H	L	0.1	H	H	H

1/ REC – A recreational viewer. RES – A single resident.
2/ H – High, M – Medium, L – Low

KOP 369 (Figures E.2-10 and E.2-28). Viewers from KOP 369 are high-sensitivity recreational viewers traveling along Balanced Rock Road or hiking in Balanced Rock County Park (approximately 0.75 mile from where Alternative 9C would span the canyon parallel to an existing transmission line and 1.25 miles from where Alternative 9B would span the same canyon). Views from KOP 369 would be screened by dominant geologic features along the canyon walls in the middleground. Visual contrast levels would be moderate due to the human-made alterations within the immediate vicinity of this KOP and the middleground distance. Impacts on viewers would be low to moderate, due to the line being sited parallel to an existing 138-kV transmission line. This crossing of the Salmon Creek Canyon was sited in conjunction with the existing transmission line and crosses the canyon as far north as possible to avoid sensitive BLM VRM Class II and III lands and lower visual impacts.

KOP 793 (Figure E.2-10). High-sensitivity residential viewers at KOP 793 would have a high level of Project visibility (approximately 0.1 mile from Alternative 9C). Viewers at this location would have a foreground view of the alternative. The viewer would have an expansive and panoramic view toward Alternative 9C with few opportunities for screening. Contrast levels are anticipated to be high. Impacts on residential viewers from this KOP and in the general vicinity would be moderate to high for Alternative 9C due to the distance of the view and high contrast level as well as presence of highly visible human-made alterations which lower scenic quality.

Alternative 9D

Table 3.2-47 summarizes the potential visual impact for each KOP in Alternative 9D.

Table 3.2-47. Visual Impact Assessment for Each KOP in Alternative 9D

KOP	Viewers[1/]	Land Ownership	Viewer Rating[2/]	Scenic Quality[2/]	Distance (miles)	Visibility[2/]	Contrast[2/]	Impact[2/]
1129	REC	State of Idaho	H	H	3.20	L	L-M	M
1128	REC	State of Idaho	H	H	2.50	L-M	M	M-H
1133	REC	BLM VRM I	H	M-H	0.15	H	H	M-H
1156	REC	BLM VRM II	H	M	0.40	M	L-M	M
1154	REC	Private	H	L-M	0.25	L-M	L-M	L-M
1158	REC	State of Idaho	H	M	0.35	M-H	L-M	M
1143	REC	BLM VRM III	H	M-H	2.20	M-H	M-H	M-H
1115	RES	Private	H	H	1.00	H	H	H
1352	RES	Private	L	L-M	1.3	L-M	L	L
572	REC	BLM VRM III	H	M-H	0.50	H	M-H	M-H
1337	REC	State	H	H	2.0	M	M	M

1/ REC – A recreational viewer. RES – A single resident.
2/ H – High, M – Medium, L – Low

KOP 1129 (Figure E.2-10). High-sensitivity recreational viewers at KOP 1129 would have low Project visibility (approximately 3.2 miles from Alternative 9D). The viewer would have a partially to fully screened, low elevation view toward the alignment. Contrast levels anticipated to be low to moderate. Potential visual impacts on viewers from this KOP and in the general vicinity are expected to be moderate due to the landscape being of high scenic quality, low to moderate contrast levels, and the anticipated screening of the view.

KOP 1128 (Figure E.2-10). High-sensitivity recreational viewers at KOP 1128 would have low to moderate Project visibility (approximately 2.75 miles from Alternative 9D of the Project). The viewer would have a partially screened, low elevation view toward the alignment, resulting in contrast levels anticipated to be moderate. Potential visual impacts on viewers from this KOP and in the general vicinity are expected to be moderate to high due to the landscape being of high scenic quality and the partial screening of the view.

KOP 1133 (Figure E.2-10). High-sensitivity recreational viewers at KOP 1133 would have a high level of Project visibility (approximately 0.15 mile from Alternative 9D). The viewer would have an expansive view toward the alignment, which would not parallel any existing alignments or linear features and has the potential to skyline the view, Contrast levels are anticipated to be high. Potential visual impacts on recreational drivers from this KOP and in the general vicinity are expected to be moderate to high due to the alternative creating a new highly visible linear feature of high contrast in a landscape with moderate to high scenic quality.

KOP 1156 (Figure E.2-10). High-sensitivity recreational viewers at KOP 1156 would have a moderate level of Project visibility (approximately 0.4 mile from Alternative 9D of the Project). The viewer would have a partially screened view toward the alignment, which would parallel an existing alignment. Contrast levels are anticipated to be low to moderate. Potential visual impacts on recreational viewers from this KOP and in the general vicinity are expected to be moderate due to existing disturbance, partial screening, and moderate scenic quality.

KOP 1154 (Figure E.2-10). High-sensitivity recreational viewers at KOP 1154 would have a low to moderate level of Project visibility (approximately 0.25 mile from Alternative 9D). The viewer would have a partially to fully screened view toward the alignment, which would parallel an existing alignment, resulting in contrast levels that are anticipated to be low to moderate. Potential visual impacts on recreational viewers from this KOP and in the general vicinity are expected to be low to moderate due to existing disturbance, screening, and low to moderate scenic quality.

KOP 1158 (Figure E.2-10). High-sensitivity recreational viewers at KOP 1158 would have a moderate to high level of Project visibility (approximately 0.35 mile from Alternative 9D). The viewer would have an open, panoramic view toward the alignment, which would parallel an existing alignment, resulting in contrast levels that are anticipated to be low to moderate. Potential visual impacts on recreational viewers from this KOP and in the general vicinity are expected to be moderate due to existing

disturbance and highly visible human-made elements as well as moderate scenic quality.

KOP 1143 (Figure E.2-10). High-sensitivity recreational viewers at KOP 1143 would have a moderate to high level of Project visibility (approximately 2.2 miles from Alternative 9D of the Project). The viewer would have an expansive view toward the alignment, which would not parallel any existing alignments or linear features and could skyline the view, resulting in contrast levels that is anticipated to be moderate to high. Potential visual impacts on recreational users from this KOP and in the general vicinity are expected to be moderate to high due to the alternative creating a new linear feature in a landscape with minor disturbance and a focal viewing location toward the alignment.

KOP 1115 (Figure E.2-10). High-sensitivity residential viewers at KOP 1115 would have a high level of Project visibility (approximately 1.0 mile from Alternative 9D of the Project). The viewer would have an expansive view toward the alignment, which would not parallel any existing alignments or linear features and may skyline the middleground view. Contrast levels are anticipated to be high. Potential visual impacts on viewers from this KOP and in the general vicinity are expected to be high due to the alternative creating a new linear feature and skylining a view within a landscape with high scenic quality.

KOP 1352 (Figure E.2-10/Appendix G, Figure BOP-2b). Low-sensitivity agricultural workers and commuters at KOP 1352 would have a low to moderate level of Project visibility (approximately 1.3 miles away from Alternative 9D on the SRBOP). The towers would be partially seen above the skyline, except where they cross in front of Sinker Butte. The presence of existing utility lines, irrigation equipment, stockpiles, and agricultural fields dominate the view, resulting in low contrast levels. Potential visual impacts are expected to be low within this landscape of low to moderate scenic quality.

KOP 572 (Figure E.2-10). Discussed under Segment 9 Proposed Route.

KOP 1337 (Figures E.2-10 and E.2-29). High-sensitivity recreational viewers visiting Swan Falls Dam at KOP 1337 would have a moderate level of Project visibility from approximately 2.0 miles away, looking southeast toward Alternative 9D, which represents a middleground view. The presence of the existing transmission lines and Sinker Butte in the view toward Alternative 9D would result in co-dominant Project elements and partial screening, resulting in contrast levels that would be moderate. Visual impacts on recreational viewers would be moderate due to distance and contrast levels.

Alternative 9E

Table 3.2-48 summarizes the potential visual impact for each KOP in Alternative 9E.

Table 3.2-48. Visual Impact Assessment for Each KOP in Alternative 9E

KOP	Viewers[1/]	Land Ownership	Viewer Rating[2/]	Scenic Quality[2/]	Distance (miles)	Visibility[2/]	Contrast[2/]	Impact[2/]
1137	RES	Private	H	M	1.0	M-H	M-H	M-H
1138	RES	Private	H	M-H	0.5	H	M-H	M-H
1140	REC	BLM VRM III	M	L-M	0.3	H	M	M-H
1141	REC	Private	H	M-H	0.23	H	H	M-H
1152	RES	Private	H	M	1.8	L-M	L-M	M
1149	REC	BLM VRM III	H	H	0.6	H	M-H	H
1148	RES	BLM VRM IV	H	M-H	0.3	H	M-H	M-H
572	REC	BLM VRM III	H	M-H	0.5	H	M-H	M-H

1/ REC – A recreational viewer. RES – A single resident.
2/ H – High, M – Medium, L – Low

KOP 1137 (Figure E.2-10). High-sensitivity residential viewers at KOP 1137 would have a moderate to high level of Project visibility (approximately 1.0 mile from Alternative 9E). The viewer would have an expansive view toward the alternative alignments, which would not parallel any existing alignments or linear features and could skyline the view. Contrast levels are anticipated to be moderate to high. Potential visual impacts on residential viewers from this KOP and in the general vicinity are expected to be moderate to high due to the alternative creating a new linear feature in a previously disturbed landscape that exhibits moderate scenic quality.

KOP 1138 (Figure E.2-10). High-sensitivity residential viewers at KOP 1138 would have a high level of Project visibility (approximately 0.5 mile from Alternative 9E). The viewer would have an expansive view toward the alternative alignment, which would not parallel any existing alignments or linear features and could skyline the view. Contrast levels are anticipated to be moderate to high. Potential visual impacts on residential viewers from this KOP and in the general vicinity are expected to be moderate to high due to the alternative creating a new linear feature with moderate to high contrast in a previously disturbed landscape that exhibits moderate to high scenic quality.

KOP 1140 (Figure E.2-10). Moderate-sensitivity traveling recreational viewers at KOP 1140 would have a high level of Project visibility (approximately 0.3 mile from Alternative 9E). The viewer would have an expansive view toward the alternative alignment, which would not parallel any existing alignments or linear features and skylines the view. Contrast levels are anticipated to be moderate. Potential visual impacts on traveling recreational viewers from this KOP and in the general vicinity are expected to be moderate to high due to the alternative creating a new linear feature in a previously disturbed landscape at a close viewing distance.

KOP 1141 (Figure E.2-10). High-sensitivity recreational viewers at KOP 1141 would have a high level of project visibility (approximately 0.23 mile from Alternative 9E). The viewer would have an expansive view toward the alternative alignment, which would not parallel any existing alignments or linear features and could skyline the view. Contrast levels are anticipated to be high. Potential visual impacts on recreational viewers from this KOP and in the general vicinity are expected to be moderate to high due to the

alternative creating a new linear feature with high contrast in a previously disturbed landscape which exhibits moderate to high scenic quality.

KOP 1152 (Figure E.2-10). High-sensitivity residential and recreational viewers at KOP 1152 would have a low to moderate level of Project visibility (approximately1.8 miles from Alternative 9E). The viewer would have a partially screened view toward the alignment, which would not parallel any existing alignments or linear features but could be backdropped by the surrounding terrain Contrast levels are anticipated to be low to moderate. Potential visual impacts on residences from this KOP and in the general vicinity are expected to be moderate due to it creating a new partially screened linear feature in a landscape with existing disturbance and moderate scenic quality.

KOP 1149 (Figure E.2-10). High-sensitivity recreational viewers at KOP 1149 would have a high level of Project visibility (approximately 0.66 mile from Alternative 9E). The viewer would have an expansive view toward the alignment, which would not parallel any existing alignments or linear features but could be backdropped by the surrounding terrain, resulting in contrast levels that are anticipated to be moderate to high. Potential visual impacts on residences from this KOP and in the general vicinity are expected to be high due to the alternative creating a new highly visible linear feature in a landscape with minor disturbance and high scenic quality.

KOP 1148 (Figure E.2-10). High-sensitivity residential viewers at KOP 1148 would have a high level of Project visibility (approximately 0.3 mile from Alternative 9E). The viewer would have an expansive view toward the alignment, which would not parallel any existing alignments or linear features and could skyline the view. Contrast levels are anticipated to be moderate to high. Potential visual impacts on residences from this KOP and in the general vicinity are expected to be moderate to high due to the Alternative creating a new highly visible linear feature in a landscape with minor disturbance and moderate to high scenic quality.

KOP 572 (Figure E.2-10). Discussed under Segment 9 Proposed Route.

Alternative 9F

Table 3.2-49 summarizes the potential visual impact for each of the KOPs in Alternative 9F.

Table 3.2-49. Visual Impact Assessment for Each KOP in Alternative 9F

KOP	Viewers[1/]	Land Ownership	Viewer Rating[2/]	Scenic Quality[2/]	Distance (miles)	Visibility[2/]	Contrast[2/]	Impact[2/]
1417	RES	Private	H	M	1.0	M-H	M-H	M-H
1413	RES	Private	H	M-H	0.5	M-H	M	M

1/ RES – A single resident.
2/ H – High, M – Medium, L – Low

The following two KOP locations were selected to represent the most sensitive or most typical views for Alternative 9F. Alternative 9F would follow the same alignment as 9D after KOP 1154. Refer to Alternative 9D above for discussions regarding KOPs for Alternative 9F north of C.J. Strike Reservoir.

KOP 1417 (Figure E.2-10). High-sensitivity residential viewers at KOP 1417 would have a moderate to high level of Project visibility (approximately 1.0 mile from Alternative 9F). The viewer would have an expansive view toward the alternative alignment, which would not parallel any existing alignments or linear features and could skyline the view. Contrast levels are anticipated to be moderate to high. Potential visual impacts on residential viewers from this KOP and in the general vicinity are expected to be moderate to high due to the alternative creating a new linear feature in a previously disturbed landscape that exhibits moderate scenic quality.

KOP 1413 (Figure E.2-10). High-sensitivity recreational viewers at KOP 1413 would have a high level of Project visibility (approximately 0.5 mile from Alternative 9F). The viewer would have a partially screened view toward the alternative alignments, which would parallel an existing transmission alignment but could skyline the view. Contrast levels are anticipated to be moderate. Potential visual impacts on residential viewers from this KOP and in the general vicinity are expected to be moderate due to the alternative adding industrial clutter to a previously disturbed landscape that exhibits moderate to high scenic quality.

Alternative 9G

Table 3.2-50 summarizes the potential visual impact for each of the KOPs in Alternative 9G.

Table 3.2-50. Visual Impact Assessment for Each KOP in Alternative 9G

KOP	Viewers[1/]	Land Ownership	Viewer Rating[2/]	Scenic Quality[2/]	Distance (miles)	Visibility[2/]	Contrast[2/]	Impact[2/]
1419	REC	BLM VRM III	H	M-H	<0.1	H	H	H
1420	RES	Private	H	M	0.9	M-H	M-H	M-H

1/ REC – A recreational viewer. RES – A single resident.
2/ H – High, M – Medium, L – Low

The following two KOP locations were selected to represent the most sensitive or most typical views for Alternative 9G. Alternative 9G would share the same alignment as 9D until approximately 4 miles south of Sinker Butte.

KOP 1419 (Figure E.2-10). High-sensitivity recreational viewers at KOP 1419 would have a high level of Project visibility (approximately 400 feet from Alternative 9G). The viewer would have an expansive, open view toward the alternative alignment, which would not parallel any existing alignments or linear features and could skyline the view. Contrast levels are anticipated to be high. Potential visual impacts on recreational viewers from this KOP and in the general vicinity are expected to be high due to the alternative creating a new linear feature in a previously undisturbed landscape that exhibits moderate to high scenic quality.

KOP 1420 (Figure E.2-10). High-sensitivity residential viewers at KOP 1420 would have a moderate to high level of Project visibility (approximately 0.9 mile from Alternative 9G). The viewer would have an expansive, open view toward the alternative alignment, which would not parallel any existing alignments or linear features but would be partially backdropped by terrain. Contrast levels are anticipated to be moderate to high. Potential visual impacts on recreational viewers from this KOP and in the general

vicinity are expected to be moderate to high due to the alternative creating a new linear feature in a disturbed landscape that exhibits moderate scenic quality.

Alternative 9H

Alternative 9H would cross approximately 11.7 miles of BLM-administered land with VRM Class II objectives. The eastern portion of the route shares the same alignment as Alternative 9F (see associated KOPs for Alternative 9F), while the eastern portion shares the same alignment as 9G. The previous KOP locations (KOP 1419 and 1420) selected to represent the most sensitive or most typical views for Alternative 9H are the same as Alternative 9G.

Conformance with BLM VRM Classes and Forest Service VQOs

Generally, the construction and operations of the Segment 9 Proposed Route or Route Alternatives would conform with BLM VRM Class III and IV objectives. In some cases the transmission facility may not conform with an RMP's VRM Class II objectives where there is no paralleling existing transmission facility or VRM Class III objectives where the level of change is considered high.

Proposed Route – The Proposed Route would cross over 0.1 mile of BLM-administered VRM Class I lands designated by the Twin Falls MFP between MPs 32.4 and 32.5, which would not conform with the Twin Falls MFP as the objective of VRM Class I is to preserve the existing character of the landscape. Only natural ecological changes can occur on lands managed as VRM Class I and the level of change to the characteristic landscape must not attract attention (see KOP 572). This area is also a crossing of Salmon Falls Creek where it is an eligible Wild and Scenic River segment. This designation does not permit a crossing and thus the Project would not be allowed and an amendment could not be considered unless the river segment were determined to be unsuitable for Wild and Scenic River designation. See Appendices F-1 and G-1 for further discussion.

The Proposed Route would also cross 5.5 miles of BLM-administered VRM Class II lands designated by the Bruneau MFP, Twin Falls MFP, and Jarbidge RMP in three separate areas between MPs 32.5 and 37.3, MPs 81.8 and 83.4, and MPs 130.9 and 131.0 partially paralleling an existing 138-kV transmission line. The route may be inconsistent with the associated MFPs and RMP because new facilities would represent a level of change to the landscape and basic elements that would attract the attention of the casual observer (see KOPs 419 and 369). Amendments would be needed to reclassify areas that do not meet VRM II objectives to VRM Class III within the respective plans if this route is selected. See Appendix F-1 for proposed amendment language and Appendix G-1 for visual analyses.

Effects discussed in this chapter for KOPs 410 and 372 would be dependent upon LUP amendments to visual requirements. Effects to KOPs 1067 and 1068 would only occur with the current alignment if the Salmon Falls Creek segment that would be crossed by the Proposed route were determined to be unsuitable for WSR designation.

The Proposed Route would cross approximately 1.0 mile of BLM-administered VRM Class III lands designated by the SRBOP RMP in two separate areas between MPs

150.9 and 152.1 in the vicinity of KOP 572, where the level of change is anticipated to be moderate to high.

Alternative 9A – Alternative 9A would cross 5.5 miles of BLM-administered VRM Class IV land designated by the Jarbidge RMP. Alternative 9A is anticipated to conform with VRM Class IV objectives (see KOP 440).

Alternative 9B – Alternative 9B would cross over 1.6 miles of BLM-administered VRM Class I lands designated by the Jarbidge RMP between MPs 36.8 and 38.4 partially paralleling an existing 138-kV transmission line. It would not conform with the Jarbidge RMP because the objective of VRM Class I is to preserve the existing character of the landscape. Only natural ecological changes can occur on lands managed as VRM Class I and the level of change to the characteristic landscape must not attract attention (see KOPs 801 and 810). If this route were selected, amendments would be needed to change the VRM Class to VRM Class III where it would no longer conform with VRM Class II objectives. See Appendix F-1 for proposed amendment language and Appendix G-1 for visual analyses. Alternative 9B would also cross BLM-administered VRM Class IV lands designated by the Jarbidge RMP in numerous separate areas between MPs 0.0 and 53.2, paralleling an existing ROW, which allows for change in the landscape setting (see KOP 798). Impact areas along Alternative 9B are anticipated to conform to VRM Class IV objectives.

Effects discussed in this chapter for KOP 810 would be dependent upon land use plan amendments to visual requirements.

Alternative 9C – Alternative 9C would cross over 0.1 mile of BLM-administered VRM Class II lands designated by the Jarbidge RMP between MPs 9.9 and 10.0. This crossing would be at the very northern edge of the VRM Class II lands, just south of the property line of a CAFO. East of the Salmon Falls Creek Crossing, this route would partially parallel an existing transmission line. This alignment would concentrate the disturbance near existing development along the property line with the CAFO (see KOPs 419 and 369).

Alternative 9D – Alternative 9D would cross over 11.5 miles of BLM-administered VRM Class II lands designated by the Jarbidge RMP and SRBOP RMP in four separate areas between MPs 5.9 and 6.6, MPs 9.1 and 15.8, MPs 17.0 and 17.4, and MPs 53.2 and 56.9, partially paralleling an existing transmission line. It may be inconsistent with the Jarbidge and SRBOP RMPs because the new facilities would represent a level of change to the landscape and basic elements that would attract the attention of the casual observer unless close enough to the existing transmission line to lower contrast levels (see KOPs 1156 and 1158). It is anticipated that Alternative 9D represents a level of change to the basic elements of the landscape that would attract the attention of the casual observer, thus making the transmission facility inconsistent with the RMP's VRM Class II objectives. Amendments would be needed to the both RMPs, if this route is selected, changing the VRM classification to VRM Class III. See Appendices F-1 and G-1 for proposed amendment language and visual analyses.

Effects discussed in this chapter for KOPs 1156, 1154, and 575 would be dependent upon, in part, the approval of amendments to the Jarbidge and SRBOP RMPs. Additional KOP effects are discussed in Appendix G-1.

Alternative 9D would also cross over 36.1 miles of BLM-administered VRM Class III lands designated by the SRBOP RMP in numerous separate areas between MPs 47.0 and 53.2 and MPs 56.9 and 58.1 (see KOP 1115).

Alternative 9E – Alternative 9E would cross over 24.5 miles of BLM-administered VRM Class III lands designated by the Bruneau MFP, and a small amount in the Jarbidge and SRBOP RMP-managed areas in numerous separate areas between MPs 0.0 and 68.5, not paralleling an existing transmission line ROW. VRM Class III objectives require that a project partially retain the existing character of the landscape and only result in moderate levels of change to the characteristic landscape (see KOPs 1138 and 1141).

Alternative 9F – Alternative 9F would cross over 5.2 miles of BLM-administered VRM Class II lands designated by the SRBOP RMP, and 35.3 miles of BLM-administered VRM Class III lands designated by the SRBOP RMP and a small amount in the Bruneau MFP-managed area. It is anticipated that the Project would not conform with VRM Class II objectives, and amendments for these areas would be needed.

Effects discussed in this chapter for KOPs 1156, 1154, and 575 would be dependent upon, in part, the approval of amendments to the Jarbidge and SRBOP RMPs. Additional KOP effects are discussed in Appendix G-1.

Alternative 9G – Alternative 9G would cross 17.9 miles of BLM-administered VRM Class II lands and 27.6 miles of VRM Class III lands designated by the SRBOP and a small portion designated under both the SRBOP RMP and the Jarbidge RMP. It is anticipated that the Project would not conform with the VRM Class III objectives and that amendments to cross these areas would be needed.

Effects discussed in this chapter for KOPs 1156, 1154, 575, 1352, and 1419 would be dependent upon, in part, the approval of amendments to the Jarbidge and SRBOP RMPs. Additional KOP effects are discussed in Appendix G-1.

Alternative 9H – Alternative 9H would cross 11.7 miles of BLM-administered VRM Class II lands and 26.8 miles of VRM Class III lands managed under the SRBOP RMP and a small portion managed by the Bruneau MFP. It is anticipated that the Project would not conform with the VRM Class II objectives and that an amendment would be needed to cross these areas.

Effects discussed in this chapter for KOPs 575, 1352, and 1419 would be dependent upon, in part, the approval of amendments to the Jarbidge and SRBOP RMPs. Additional KOP effects are discussed in Appendix G-1.

Segment 9 – Conclusion

Proposed Route – Impacts to public, private, and state lands would be moderate to high overall due to the barren landscapes with evenly distributed viewers. There would be several areas of high visual impacts where dispersed residential, recreation, and

historic areas are located adjacent to the Project and where the Proposed Route would cross the Owyhee Uplands Backcountry Byway and Salmon Creek Falls ACEC.

Alternative 9A – Visual impacts to public and private lands resulting from the construction of Alternative 9A would be mostly moderate with areas of moderate to high impacts associated with residences.

Alternative 9B – The majority of the area that would be crossed by Alternative 9B is open undeveloped land with dispersed agricultural production lands. There are numerous dispersed residences that would experience higher visual impacts and some remote areas, which would have little visual disturbance. The highest concentrations of residences are located east of Salmon Falls Creek.

Alternative 9C – The majority of the area that would be crossed by Alternative 9C is used for agricultural production. There are numerous dispersed residences that would experience higher visual impacts.

Alternative 9D – The majority of the area that would be crossed by Alternative 9D is used for recreation, especially the portion that crosses the SRBOP. Near the eastern origination point, the route crosses more land in agricultural production and near numerous dispersed residences that would experience higher visual impacts. The route would also cross remote areas, which would have little visual disturbance.

Alternative 9E – Visual impacts to public, private, and state lands resulting from the construction of Alternative 9E would be mostly moderate to high with an area of high impact associated with the crossing of the Owyhee Uplands Backcountry Byway. The majority of the area that would be crossed by Alternative 9E is the open undeveloped foothills of the Chalk and Toy Mountains, which would experience little visual disturbance compared to some dispersed residences and the scenic byway that would experience higher visual impacts due to the crossing of the byway.

Alternative 9F – Alternative 9F would follow the same alignment as 9D except for the eastern 21 miles of the alternative, the majority of which follows the Proposed route before crossing north to follow the 9D alignment west of C.J. Strike Reservoir. The route would follow the same alignment as 9D through the SRBOP management area.

Alternative 9G – Alternative 9G would follow the 9D alignment until 4 miles south of the Sinker Butte Snake River crossing. The alternative route south of 9D would cross extensive VRM Class II lands adjacent to the California-Oregon NHT.

Alternative 9H – Alternative 9H would follow the 9F alignment until 4 miles south of the Sinker Butte Snake River crossing and then follows the 9G alignment. This route would cross through VRM Class II land in the C.J. Strike SRMA as well as the SRBOP.

Alternatives Comparison

The comparison of the Segment 9 Proposed Route to Alternatives 9A, 9B, and 9C is in the area east of Saylor Creek Air Force Range and both west and south of the Snake River. In this area, most potential viewers would be concentrated on the eastern side of Lower Salmon Falls Creek. The comparison portion of the Proposed Route is anticipated to represent lower visual impacts than Alternative 9A due in large part to the proximity of the alternative to a number of visually sensitive residences. The

comparison portion of the Proposed Route would have lower visual impacts than Alternative 9B due to the close proximity to viewers, historic trail resources, and VRM Class I lands. The comparison portion of the Proposed Route would have lower visual impacts than Alternative 9C as well, due to that alternative's impacts to sensitive viewers adjacent to and within Balanced Rock County Park.

Alternatives 9D through 9H are located west of Saylor Creek Air Force Range and generally represent higher visual impacts than the comparison portion of the Proposed Route. Alternatives 9D, 9F, 9G, and 9H, which travel north of the Snake River, would parallel an existing 138-kV line, cross VRM Class II lands, and travel closer to the town of Burley, which has a higher concentration of surrounding sensitive viewers and resources. Alternatives 9G and 9H would follow the same alignment through the SRBOP and parallel historic trails for the majority of the western portion of the route. The comparison portion of the Proposed Route would cross more land managed for VRM Class II objectives (5.4 miles) than Alternative 9E (1.9 miles) but would have lower overall visual impacts.

Segment 10 – Midpoint to Cedar Hill

Segment 10, as proposed, would link the Cedar Hill and Midpoint Substations with a 33.6-mile single-circuit 500-kV line, following a WWE corridor for most of its distance. Twenty-eight acres of the expansion of the Midpoint Substation and of the construction of the Cedar Hill Substation are attributed to Segment 10. There are no Route Alternatives proposed along this segment (see Appendix A, Figure A-12).

Proposed Route

Table 3.2-51 summarizes the potential visual impact for each KOP in the Segment 10 Proposed Route.

Table 3.2-51. Visual Impact Assessment for Each KOP in the Segment 10 Proposed Route

KOP	Viewers[1/]	Land Ownership	Viewer Rating[2/]	Scenic Quality[2/]	Distance (miles)	Visibility	Contrast	Impact
162	RES	Private	H	L	1.0>	M	L-M	M
193	REC	BLM VRM II	H	L-M	3	L	L	L

1/ REC – A recreational viewer. RES – A single resident.
2/ H – High, M – Medium, L – Low

KOP C99 (Figure E.2-11). Views from this point are looking toward the Segment 10 Proposed Route from the Minidoka National Historic Site. This viewpoint is discussed in Section 3.3 – Cultural Resources.

KOP 162 (Figure E.2-11). This KOP represents the view of high-sensitivity residential viewers on west side of U.S. 93 southwest of the Midpoint Substation. The Proposed Route would be located to the northeast and east approximately 1 mile or greater away resulting in a moderate Project visibility. Views are open and panoramic with multiple existing transmission lines to the northwest and northeast as well as an existing substation. Overall visual contrast would be low to moderate with moderate visual impacts on viewers.

KOP 193 (Figure E.2-11). Visibility for high-sensitivity viewers at this scenic overlook of the Snake River Canyon and the Hanson Bridge would be low due to the 3-mile viewing distance. The Proposed Route would be just over 3 miles to the east, paralleling an existing electrical transmission line. Views are open and panoramic with the Project paralleling an existing transmission line that results in a low Project contrast. Given the view distance and low contrast level, visual impacts would be low. KOP 193 is anticipated to conform with VRM Class II objectives due to the fact that the route parallels an existing transmission line and, due to distance, the Project would not draw the attention of a casual observer.

Conformance with BLM VRM Classes and Forest Service VQOs

Proposed Route – The Proposed Route would cross BLM-administered VRM Class IV land and is anticipated to conform to VRM Class IV objectives (see KOP 162).

Segment 10 – Conclusion

Impacts on public, private, and state lands from the construction of the Segment 10 Proposed Route would be moderate due to the close proximity of residential areas west and southwest of Eden, Idaho and west of Hunt and Minidoka, Idaho. There would be a few areas of moderate to high visual impact south of the Snake River and north of Eden close to the Midpoint Substation. These moderate to high instances of visual resource impacts includes approximately 25 residential viewers (houses) less than 0.5 mile from the route, of which 3 are located in close proximity to the proposed centerline of the alignment, and the Minidoka National Historic Site, which is located approximately 1.0 mile from Segment 10.

3.2.2.4 Design Variation

A Design Variation is being considered that would consist of constructing two single-circuit lines in Segments 2 through 4 instead of a single double-circuit line (which is the design assessed above). The disturbance footprint of the two single-circuit towers is greater than that of the double-circuit tower, in part because the requested ROW would be wider, but also because helicopter-assisted construction could be implemented in these areas due to the lighter weight of the towers, which would require additional fly yards. The additional ROW space and the fly yards would cause additional temporary disturbance during construction. Across Segments 2, 3, and 4, the additional disturbance of the single-circuit tower alternative ranges from 25 to 30 percent greater than the comparable portions of the double-circuit tower disturbance under the proposed design. The two single circuits require more ground disturbance, but would be designed and constructed to the same standards as the Proposed Action.

The primary potential benefit of this Design Variation would be reduced structure height (average height of 156 feet vs. 170 feet). Other benefits would include reduced structure contrast in areas that the proposed segments would parallel existing structures of a similar type. Conversely, this Design Variation would introduce more towers in the landscape than the double-circuit option.

The anticipated visual impacts and conformance with RMP planning objectives are largely similar between the Proposed Action double-circuit 500-kV configuration and the two single-circuit Design Variation. In many cases, the number of existing lines reaches three; two additional lines would begin to present a “forest” of transmission towers, adding a high level of modification to the landscape. Table 3.2-52 compares the proposed double-circuit to the two single-circuit Design Variations. Simulations from KOPs 822, C40, and C53 (Figures 3.2-6, 3.2-7, and 3.2-8) have been prepared to illustrate the visible differences for comparison of each design variation. The simulations demonstrate that visual impacts would not be significantly lowered by constructing the two single-circuit towers and in some cases may increase visual impacts.

Table 3.2-52. Comparison of Proposed Action and Design Variation

Segment/KOP	Scenic Quality	Proposed Action Visual Impact	Design Variation Visual Impact
Segment 2 and Alternatives 2A/2B			
94	L-M	M	M
4 (Alt. 2B)	M	M-H	M-H
4 (Alt. 2A)	M	M	M
5 (Alt. 2A)	L-M	M	M
5 (Alt. 2B)	L-M	L-M	L-M
9 (Alt. 2A)	L-M	M	M
9 (Alt. 2B)	L-M	L-M	L-M
836 (east)	M	M-H	M-H
836 (west)	M	M	L-M
824	M	M-H	M-H
824(Alt 2B)	M	L-M	L-M
829	L-M	M-H	M-H
838	M	L-M	M
838 (Alt. 2A)	M	M	M-H
822	H	M-H	H
Segment 3			
16	L	L-M	L-M
Segment 4			
1346	M-H	M-H	M-H
23	M	L-M	L
25	M	L-M	L-M
26	M	M-H	M-H
1315	M-H	L-M	L-M
1295	M	M-H	H
1288	M	M-H	H
1292	M	M-H	H
1363	M-H	M-H	H
1326	M-H	H	H
1319	M	L-M	L
1359	M-H	M-H	M-H
1322	H	M	M-H
635	M-H	H	H
691	M	H	M-H

Table 3.2-52. Comparison of Proposed Action and Design Variation (continued)

Segment/KOP	Scenic Quality	Proposed Action Visual Impact	Design Variation Visual Impact
697	M	M	M
705	L-M	L-M	L
746	M	M	L
757	M-H	L-M	L-M
758	M-H	M	M
770	M	M-H	M-H
775	L-M	M	M
778	M	M-H	M
Alternative 4A			
604	L	L	L
647	M	L-M	L-M
627	M	M	M
686	L-M	M	M-H
Alternative 4B			
652	M-H	M-H	M-H
603	L	M	M
655	M	M	M
676	M	M	M
673	M	L-M	L
Alternative 4C			
603	L	M	M
655	M	M	M
676	M	M	M
632	L-M	L-M	M
1368	M-H	H	H
674	L-M	M-H	H
672	L-M	L-M	M
Alternative 4D			
603	L	M	M
673	M	L-M	L
Alternative 4E			
603	L	L-M	M
632	L-M	L-M	M
674	L-M	M-H	H
672	L-M	L-M	M
Alternative 4F			
636	M-H	H	H
604	L	L	L
621	M	L	L
637	H	M-H	M-H
647	M	L-M	L-M
635	M-H	M-H	H

Photo simulation double-circuit single tower

Photo simulation single-circuit double towers

Figure 3.2-6. Photo Simulation Comparing Design Variation Structures from KOP 822

Photo simulation double-circuit single tower

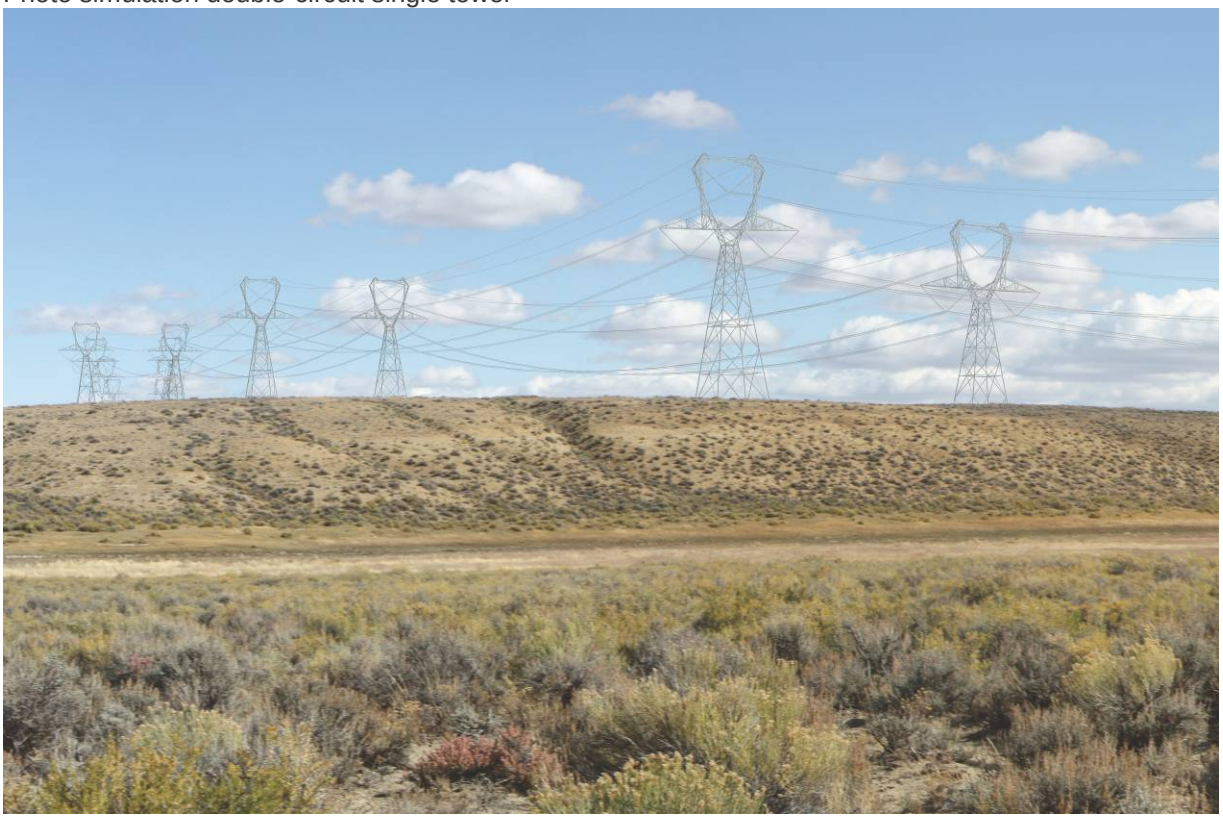


Photo simulation single-circuit double towers

Figure 3.2-7. Photo Simulation Comparing Design Variation Structures from KOP C40

Photo simulation double-circuit single tower

Photo simulation single-circuit double towers

Figure 3.2-8. Photo Simulation Comparing Design Variation Structures from KOP C53

Conclusion

Overall, the Design Variation would offer similar impacts to those from the single structure double-circuit Proposed Action. In some instances, this variation offers incremental benefits over the single double-circuit line and in a couple of other circumstances potentially increases impacts.

3.2.2.5 Structure Variation

The proposed guyed structure variation would add four guy wires about 140 feet long from a point about 100 feet up in each tower to four guy anchors spaced in a square around the tower (Appendix B, Figure B-6). There would be no appreciable difference in impact on visual resources from the use of this Structure Variation when compared to the use of self-supporting lattice towers, as the guyed towers would be around the same height and breadth at the top of the structure as the proposed self-supporting lattice towers.

3.2.2.6 Schedule Variation

The Schedule Variation uses the two single-circuit structure variation described above but extends construction over a longer timeframe. Initially only one of the eventual two single circuit lines would be constructed with the second to be constructed at a later date which increases the amount of time construction equipment and workers are present and would affect the schedule for reclamation and mitigation in those particular areas. The Schedule Variation proposes that the first single-circuit transmission line in Segments 2, 3, and 4 would be built as soon as a ROW grant is issued, but that the second line would not begin construction until late 2018. This would mean nearly 2 years between the end of construction for the first line and beginning of construction for the second line. Any staging areas and fly yards that had been used for the first stage would have been revegetated after construction was complete and would have to be cleared again. There would be two sets of temporary visual impacts resulting from construction disturbances adding movement, noise, and dust to the area of construction in two instances in any given area.

With construction of the first single-circuit 500-kV transmission line, the overall impacts on visual resources would be less than the Proposed Action due to the use of smaller towers. However, in the future any short-term reduction in visual impacts would be lost with construction of the second single-circuit transmission line.

Conclusion

For visual resources the Schedule Variation would have similar operations impacts as the Design Variation. Overall visual impacts would be greater with the Schedule Variation due to the increase in offset construction activities when compared to constructing the Design Variation (two single circuits at the same time). This would only delay the temporary direct impacts, creating two visual impact occurrences as compared to one for the Design Variation.

3.2.3 Mitigation Measures

To minimize or avoid impacts on visual resources, the Proponents have committed to EPMs that would be implemented Project-wide as outlined in this section and in Appendix C.

The following mitigation measures identified by the Agencies are required on federally managed lands. The Agencies recommend that the Proponents incorporate those measures that are not specific to a particular area into their EPMs and apply them Project-wide as appropriate.

VIS-1 No paint or permanent discoloring agents would be applied to rocks or vegetation to indicate limits of survey or construction activity.

VIS-2 To minimize ground disturbance and/or reduce scarring (visual contrast) of the landscape, the alignment of any new access roads or cross-country routes will follow the landform contours in designated areas where practicable, providing that such alignment does not impact resource values additionally.

VIS-3 To minimize sensitive feature disturbance and/or visual contrast, in designated areas structures will be placed so as to avoid sensitive features such as, but not limited to, riparian areas, water courses and cultural sites and/or to allow conductors to clearly span the features, within the limits of standard tower design.

VIS-4 To reduce visual impacts on federal land, including potential impacts on recreation values and safety, towers are to be placed at the maximum feasible distance from the highway, canyon and trail crossings within limits of standard design and to the extent practical.

VIS-5 Crossings of rivers shall be at approximately right angles where practical. Strategic placement of structures shall be done both as a means to screen views of the transmission line and rights-of-way and to minimize the need for vegetative clearing.

VIS-6 All insulators shall be made of materials that have reduced potential to reflect and refract light. Glass insulators shall be avoided when there is an alternative insulator type available with lower refractive characteristics

VIS-7 For segments of the line 1) within the 0- to 0.5-mile zone of Interstate highways where existing lines of the same voltage are paralleled and 2) within the 0- to 0.5-mile zone of residences where existing lines of the same voltage are paralleled, locate new towers to be adjacent to existing towers, within the limits of standard transmission line design and considering the ruling span length of adjacent proposed and existing lines.

VIS-8 Site-specific "micrositing" will be required near certain sensitive areas, as identified by the agencies, where proposed transmission facilities would be present and could impact visual quality; these situations include:

- Crossings over major highways
- Crossings of high quality historic trails
- Crossings over the North Platte Snake Rivers
- Crossing the Albion Mountains in the Sawtooth NF
- Sensitive travelways, use areas, residential areas, recreational facilities as identified by the agencies (including national recreation and scenic trails, campgrounds, recreation areas, and trailheads), and other areas identified by management plans
- Along Forest Service roads in forested areas

VIS-9 In specific areas identified by the applicable federal land manager (such as VRM Class II, erosive soils, steep slopes, areas near NHT Trails) the access road used for construction will be restored and an alternative access route for operations will be designated.

VIS-10 In areas in proximity to existing residential developments with an urban or suburban character, such as in the Kuna area, steel pole H frames or tubular steel poles may be specified to provide tower structures that are visually more appealing. Lattice steel towers will need to be specified at turning tower locations and at long spans because tubular steel poles do not have the strength to withstand the forces exerted by the conductors at these locations.

VIS-11 The lighting specified for the marshaling yards shall be the minimum required to meet safety and security standards. All light fixtures within 1,000 feet of a residence shall be hooded to eliminate any potential for glare and to prevent light from spilling off the site or up into the sky. Additionally, the fixtures shall have sensors and switches to permit the lighting to be turned off at times when it is not required.

VIS-12 Where the route would be visible on timbered slopes, limit tree removal to areas required for safety rather than from the entire ROW in order to prevent a linear feature on the landscape from clear-cutting trees. Vegetation removal requirements will consider Appendix A, "Standards and Practices for Electric System Reliability."

VIS-13 To reduce visual contrast in areas where overstory vegetation is removed for access, tower pads, or conductor clearance, specific sections of the clearing edges on federal land will be feathered to give a natural appearance, where not in conflict with regulatory requirements (e.g., NERC, WECC, and Occupational Safety and Health Administration requirements).

VIS-14 Crossing federal land along a transmission corridor shall require the preparation of a vegetation management plan for the utility corridor to minimize scenic impacts and plan for rehabilitation of existing impacts. This plan will be approved by the land-management agency prior to vegetation clearing.

VIS-15 To mitigate potential visual impacts on federal land, the construction and maintenance plan to be developed by the Proponents shall include measures to reduce ROW scarring and enhance restoration. The plan will be approved by the land management agency prior to ground clearing and construction.

VIS-16 Realignment of a portion of Alternative 1E-B, adjacent to the Rock Creek and Fort Fetterman Road (KOP 993), to follow the rugged terrain and foothills of Smith Mountain should be evaluated to determine absorption effectiveness.

VIS-17 Single-circuit H-frame structures shall be used to reduce visual impact to Fort Fred Steele between MP 38.0 to MP 43.0 for Alternative 2B and MP 18.0 to MP 24.0 for Alternative 2A to match the existing structures.

VIS-18 If Alternative 7I were to be constructed, H-frame single-circuit structures would be required in the Nevada portion of the alternative as requested by the Wells FO.

VIS-19 If any of Alternatives 7H, 7I, or 7J were to be constructed, H-frame single-circuit structures would be required in the Sawtooth NF.

3.3 CULTURAL RESOURCES

This section of the EIS discusses cultural resources in the Project area and the impact that the Proposed Route and its alternatives would have on those resources. Cultural resources encompass "historic properties," non-historic properties, and sites of "traditional religious and cultural importance" (36 CFR Part 800.2). Historic properties are defined at 36 CFR Part 800.16(l)(1) as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior." For non-historic properties, BLM Manual 8100.03.F (BLM 2004a) states that "[c]ultural resources need not be determined eligible for the National Register of Historic Places (as in the National Historic Preservation Act) to receive consideration under the National Environmental Policy Act." Cultural resources that are of traditional religious and cultural importance, or TCPs, are places that "are valued by the human community" and play an important role in that community's "historically rooted beliefs, customs, and practices" (Parker and King 1992). Walker (2009) indicates that TCPs should be defined so as not to limit the identification of tribal "traditions, beliefs, practices, lifeways, arts, crafts, and social institutions." TCPs could also embrace a "rural community whose organization, buildings, and structures, or patterns of land use reflect the cultural traditions valued by its long-term residents" (Parker and King 1992). This section also presents a suite of mitigation measures to be considered where impacts are unavoidable. As described in this document, mitigation under NEPA does not limit or prescribe the outcome of consultation required under Section 106 of the NHPA and implementing regulations found at 36 CFR Part 800.

3.3.1 Introduction

3.3.1.1 Purpose of the NEPA Analysis

The purpose of this section is to present the impacts of the Proposed Route and to compare and contrast the impacts of a range of reasonable alternatives on cultural resources. It also serves as part of a disclosure document to the public and to the decision makers, which discusses the impacts to all resources, including but not limited to cultural resources. This section describes the resources and the extent to which each Route Alternative avoids or minimizes impacts to cultural resources. Where such avoidance or minimization is insufficient, mitigation measures that could be employed to mitigate the impact are discussed.

3.3.1.2 Organization of the NEPA Analysis

This section of the Draft EIS presents the affected environment, the methods of analysis, and the direct and indirect impacts of the Proposed Action. For each of these categories, in each state, prehistoric resources are discussed first, followed by an overview of the protohistoric period and historic resources. "Prehistoric (pre-contact)" refers to artifacts and features created and used by the aboriginal inhabitants of the region prior to "contact with Europeans and resulting in written records" (NPS 2000); "historic (post-contact)" includes artifacts and features" dating to periods since significant contact between Native Americans and Europeans" (NPS 2000). The protohistoric period refers to a brief period, at the time of contact with Europeans, when

cultural materials and ideas were exchanged between cultural groups, but prior to written records. TCPs are discussed under the Consultation heading in Section 3.3.2.3. A TCP is a "property, a place, that is eligible for inclusion on the National Register of Historic Places because of its association with cultural practices and beliefs that are (1) rooted in the history of a community and (2) are important to maintaining the continuing cultural identity of the community" (Parker and King 1992).

Prehistoric resources are divided into site categories that reflect the purpose and intensity of aboriginal occupation at specific locations: lithic (chipped stone) scatters, landscapes, and quarries; open and sheltered camps, with or without evidence of specialized activities; rock art (petroglyphs and pictographs); and mortuary sites that might include human burials. The protohistoric overviews provide a general description of the types of resources known in the region and reflect changes observed in cultural resource types and assemblages that occur between pre- and post-European contact. Historic resources are segregated into broad socioeconomic themes, such as transportation routes, including trails (further subdivided into trails that have been congressionally designated as NHT and other trails and routes), railroads, roads, and bridges; settlements including homesteads, ranches, and camps; irrigation works, including canals and ditches; and electric transmission lines. Other sites that are associated with trails, such as important emigrant graves, are treated with those trails.

Impacts that are common to all Route Alternatives are presented first, followed by a comparative analysis of impacts by alternative. Finally, a comparative analysis of the proposed design, ROW, and Structure Variation is presented. Cumulative effects are discussed in Chapter 4.

3.3.1.3 Scope of the NEPA Analysis

This 1,103-mile-long Project would cross hundreds of private land parcels for which access is not currently available. The BLM and the SHPOs in Idaho, Nevada, and Wyoming have determined that a PA will be prepared to govern compliance with the requirements of Section 106 of the NHPA for this Project, using the phased approach for identification, evaluation, and mitigation of historic properties that is described at 36 CFR Part 800.4(b)(2).

The BLM sent out a Work Statement for the documentation and evaluation of cultural resources, which specified that the EIS would be augmented by a literature review and a sample survey on public lands across all alternatives. This procedure allows for the recognition and disclosure of impacts on known cultural resources, as well as a comparison of alternatives, based on a method that endeavors to assess those alternatives with a uniform and consistent approach. The final determination of impacts and resolution of adverse effects, through the Section 106 consultation process, will not be complete until surveys of all lands crossed by the Project have been completed. Only then can the BLM and other federal agencies complete their obligations under Section 106 and the PA.

Therefore, this section of the EIS presents results of a literature review for Idaho, Nevada, and Wyoming. Sample surveys were conducted for most of the Idaho and Wyoming alternatives, including the newly identified Alternatives 7J, 8E, 9F, 9G and 9H

in Idaho. Adverse weather conditions precluded completion of the sample surveys for the Nevada portion of Alternative 7I/7J, survey of which is planned for the 2011 field season. At the request of the BLM Kemmerer FO, no sample surveys of Segment 4 alternatives were conducted. Instead, known site data were used in place of sample surveys to assess site likelihood along the alternatives (see Section 3.3.2.4).

The BLM's third-party consultants provide their professional opinions regarding the likely NRHP eligibility of newly identified prehistoric and historic sites, and provide professional opinions regarding the likely suite of mitigation measures that may be applied and agreed upon through the Section 106 process. This should NOT be mistaken for an NRHP eligibility determination under the Section 106 consultation process. The impacts disclosed in this document have neither been carried through the Section 106 process nor have the proposed mitigation measures been part of a resolution of potentially adverse impacts among interested parties and the SHPOs. The Section 106 process would be concluded when the BLM has determined the Preferred Alternative, a 100 percent survey of that Alternative and associated facilities has been completed, and the appropriate agencies make determinations of NRHP eligibility and impacts. The PA stipulations would guide this public involvement process.

3.3.1.4 Note on Vocabulary

NEPA and NHPA use terms with specific meanings given by the regulations, yet the regulatory meaning from each of these acts may be slightly different for the same term. Table 3.3-1 compares NEPA terms, with similar terms used under the NHPA. The NEPA terms are used in this EIS, recognizing their use would not be appropriate in the NHPA realm.

Table 3.3-1. NEPA and NHPA Terminology (Note: Terms are not interchangeable)

NEPA	NHPA
Federal Action – any action taken directly by a federal agency.	Federal Undertaking – a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a federal agency
Analysis Area – geographical area in which impacts are likely to occur.	Area of Potential Effects (APE) – the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties.
Impacts – the result of actions affecting the quality of the environment; divided into *direct*, *indirect*, and *cumulative impact.* Impacts can be *adverse* or *beneficial.*	Effects – alteration to the characteristics of a historic property qualifying it for inclusion in or eligible for the National Register of Historic Places. Effects can be *adverse* or *not adverse*.
Adverse Impact – in the professional opinion of the EIS preparers, it is likely that the consequence of the action is adverse.	Adverse Effect – through the NHPA consultation process a determination has been made that an adverse effect would occur (effects that alter, directly or indirectly, any of the characteristics of a historic property that qualify it for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association). Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance, or be cumulative.

Table 3.3-1. NEPA and NHPA Terminology (Note: Terms are not interchangeable) (continued)

NEPA	NHPA
Eligible – includes resources that are Listed, determined or recommended eligible, and unevaluated. In the professional opinion of the EIS preparers, unevaluated resources may be eligible for inclusion in the NRHP.	Eligible – through the NHPA consultation process a determination has been made that a prehistoric or historic district, site, building, structure, or object would be eligible for inclusion in the NRHP.
Public Involvement – the effort required to engage stakeholders and general public.	Consultation – the process of seeking, discussing, and considering the views of other participants, and, where feasible, seeking agreement with them regarding matters arising in the Section 106 process. The views of the public are also essential to informed federal decision-making in the Section 106 process.
Council on Environmental Quality (CEQ) – oversees implementation of the NEPA process.	Advisory Council on Historic Preservation (ACHP) – an independent agency mandated to advise the President, Congress, and federal agencies in matters relating to historic preservation, and to review how the agencies' decision affects historic properties.
Mitigation – any action that avoids, minimizes, rectifies, reduces, or compensates for an impact on the environment.	Resolution of Adverse Effects – alternatives or modifications to an undertaking that avoid, minimize, or mitigate adverse effects on historic properties.
Significance – describes the severity (long-term alteration of a resource) and context (relationship of project impacts compared to the project area spatial and temporal scale) of project impacts.	Historical Significance – those districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and that are (a) associated with important historic events; (b) associated with important historic persons; (c) embody distinctive architectural characteristics; or (d) have yielded, or are likely to yield, information important in prehistory or history (36 CFR Part 63).
Cultural Resources – encompass archaeological, traditional, and built environment resources, including but not necessarily limited to buildings, structures, objects, districts, and sites.	Historic Properties – any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP.

3.3.2 Affected Environment

3.3.2.1 Definition of Analysis Area

For the purposes of this EIS, the Analysis Area has been defined as the following:

- Literature Review: The Analysis Area includes those cadastral sections crossed by a 1-mile buffer on Proposed Route and Route Alternatives for a file search in each state, and the ecoregions crossed by the Project for published and unpublished literature on the area.
- Class III Pedestrian Survey: The Analysis Area includes a 500-foot-wide buffer centered on the centerlines of the Proposed and Alternative Routes. It also includes a 200-foot-wide buffer centered on the centerline of proposed new or

rebuilt access roads and a 200-foot buffer encompassing ancillary facilities, such as substations, regeneration stations, fly yards, and staging areas.

- Cultural Resources Visual Impact Study: The Analysis Area includes the viewable area from KOPs (see Section 3.2 of this EIS) on or along important cultural resources for which, in consultation with the BLM and the Forest Service, visual setting is considered important. That portion of the viewable area crossed by the Proposed or Alternative Routes is included for analysis. The BLM has recommended that cultural resources, for which setting is an important factor for NRHP eligibility, located within 5 miles of Proposed or Alternative Routes, should be considered to be within the Project's viewshed and would be evaluated for visual impacts.

These buffered areas were selected to capture all potential direct and indirect impacts on cultural resources associated with construction and operation of the Project. These areas were also established to aid route siting efforts, accommodate shifts in the Proposed Route, and to cover areas where access roads and ancillary facilities may be necessary. A description of the regional context in which the cultural resources within the Analysis Area occur is provided in Section 3.3.2.5.

3.3.2.2 Issues to be Addressed

Project-specific issues have been identified through the public scoping process, which began in 2008 and continued through 2009 (Tetra Tech 2009a). The issues raised by the public in regard to cultural resources can be summarized as follows:

- What values do the area's Native American communities ascribe to places of historic and traditional significance?
- Would all impacted Native American Tribes be consulted?
- What would be the impact on Native American Tribes and would their treaty rights and privileges be addressed?
- Would a complete inventory of potentially impacted cultural sites be carried out?
- Would the design of structures such as towers and substations minimize their visual impact to the setting of historic properties?
- What are the impacts on eligible prehistoric resources?
- What are the impacts on eligible historic resources?
- What would be the visual and recreational impacts on historic trails?
- Would TCPs be impacted?
- Would the setting of a property for which setting is an important aspect of integrity be affected?

These questions can be distilled down to the following general issues.

- Native American Consultation. The BLM, as an agency of the federal government, is obliged under the NHPA (36 CFR Part 800.2c) and other laws and mandates to consult with every affected Indian Tribe. Such consultation

under NHPA does not preclude, or absolve, the government from compliance with treaties or other statutes and regulations that address either tribal privileges or TCPs and other cultural resources, such as NAGPRA, AIRFA, ARPA, and agency-specific legislation. Impacted Tribes have expressed their concerns through formal tribal consultations and the public involvement process, and those concerns are identified in Table 3.3-2.

- Inventory of Cultural Sites. Once the BLM has selected a Preferred Route, a Class III (intensive pedestrian) inventory of that route will be completed, so that cultural resources that may be directly or indirectly impacted can be identified. This will occur after comments on the Draft EIS have been received, before issuance of the Final EIS.
- Determinations of Eligibility. All cultural resources identified during the Class III inventory will be evaluated for NRHP eligibility. Through the Section 106 process, the BLM, in consultation with the SHPO in each state, will determine NRHP eligibility of all cultural resources within the APE and determine Project effects (direct and indirect) upon those resources. Where those effects are determined to be adverse, appropriate mitigation measures would be implemented to avoid, minimize, or treat those effects. The nature and extent of such mitigation would be guided by a PA, executed among the BLM; the Idaho, Nevada, and Wyoming SHPOs; the Proponents; and (possibly) the ACHP. Specific Indian Tribes may be included as Consulting Parties to the PA.
- Visual Impacts on Historic Trails. As directed by the National Trails Systems Act of 1968 (P.L. 90-543), as amended 1978, Congress designates NHTs. The Project would impact four NHTs (California, Mormon-Pioneer, Oregon, and Pony Express), as well as several significant non-NHTs. Extensive analyses of indirect (visual) impacts on the NHTs and non-NHTs in the Analysis Area have been completed and form a key portion of the EIS. A summary of these impacts is provided in Section 3.3.3.3, Table 3.3-6.

3.3.2.3 Regulatory Framework

Relationship to NHPA and the Section 106 Process

In addition to the disclosure requirements under NEPA, Section 106 of the NHPA requires that the federal agency permitting the undertaking must “take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register.” Effect is defined at 36 CFR Part 800.16(i) as “alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register.” With execution of the PA, the Section 106 process will be completed before the responsible official signs the ROD. The appropriate measures, timing of the processes, and the responsible parties will be developed in the PA.

The Section 106 process stipulates that the federal agency (in this case, the BLM) establish the undertaking (permitting of the Gateway West Transmission Line), identify other consulting parties, identify historic properties, and assess adverse effects upon those properties. The BLM, in consultation with the Idaho, Nevada, and Wyoming

SHPOs and other consulting parties, develops appropriate measures to resolve adverse effects to those cultural resources, including determination of final mitigation measures. The NHPA process, when completed, will provide the final mitigation measures applicable to the route and associated facilities, such as access roads and staging areas.

Other Cultural Resources Laws and Regulations

In addition to, and parallel with, the NHPA and 36 CFR Part 800 is a suite of laws and regulations that protect cultural resources, especially those of concern to Native Americans. Some of the most recent legislation is listed below.

- AIRFA, enacted in 1978, requires federal agencies to protect and preserve the customs, ceremonies, and traditions of Native American religions.
- ARPA, enacted in 1979, provides felony-level penalties for the unauthorized excavation, removal, damage, alteration, or defacement, or the attempt to do so, to any archaeological resource more than 100 years old on public lands or Indian lands (not restricted to NRHP-eligible resources). It prohibits the sale, purchase, exchange, transportation, receipt, or offering of any archaeological resource obtained from public lands or Indian lands in violation of any provision, rule, regulation, ordinance, or permit under the act or under any federal, state or local law (BLM 2004a). It establishes permit requirements and civil and criminal penalties and increases the penalty for stealing or vandalizing to $100,000 and up to 5 years in prison.
- NAGPRA, enacted in 1990, establishes additional requirements for ownership and control of Native American cultural items, human remains, and associated funerary objects to Native Americans. It also establishes requirements for the treatment of Native American human remains and cultural objects found on Federal land. This act further provides for the protection, inventory, and repatriation of Native American human remains, objects of cultural patrimony, sacred objects, unassociated funerary objects, and associated funerary objects.
- EO 13007, signed by President Clinton in 1996, directs federal land-managing agencies to accommodate access to, and ceremonial use of, Indian sacred sites by Indian religious practitioners and to avoid adversely affecting the physical integrity of such sacred sites.
- EO 13175, signed by President Clinton in 2000, reiterated the requirement for regular and meaningful consultation and collaboration between the federal government and tribal officials.

Consultation

TCPs are frequently associated with places of significance to Native Americans, but they may also be associated with other cultural groups. These groups, such as the Japanese-American groups and constituents of the Minidoka National Historic Site, will be identified and consulted through the NEPA process.

The BLM is in consultation with Native American Tribes on issues relating to Tribal concerns including traditional cultural properties and values. The BLM, as a governmental agency, will maintain special government-to-government relationships with federally-recognized Indian Tribes. Native American treaty rights such as fishing, hunting large and small game, and gathering natural resources for subsistence, medicinal, and cultural purposes are not anticipated to be impacted by the Project. Consultations with traditional communities/groups undertaken by the BLM for other projects have identified types of properties that are generally considered Native American-sensitive sites that could be TCPs. These sensitive sites include, but are not limited to, medicine wheels, tipi rings, low cairns and other rock alignments, burial places, rock art, fire pits, and plant-gathering areas. Potential TCPs identified by this Project will be assessed by the BLM FOs in consultation with the Tribes. Based on the traditional Native American territories, as shown on the "Indian Land Areas Judicially Established 1978" map (NPS 1978), the following Tribes have been contacted, and their comments sought about the Project:

- Northern Arapaho
- Northern Cheyenne
- Eastern Shoshone
- Shoshone-Bannock
- Northern Ute
- Shoshone-Paiute
- Northwest Shoshone Band
- Southern Arapaho
- Southern Cheyenne
- Oglala Sioux

Ethnographic studies requested by the Shoshone-Paiute, Eastern Shoshone, and Northern Ute Tribes are in progress, and the results of these studies will be used to refine the discussions between the BLM and the Tribes concerning TCPs. Thus far, these studies have not formally identified TCPs or sacred landscapes in the Analysis Area. Previous ethnographic studies by Hultkrantz (1987), Miller (1983), Walker (1991), Steward (1942), Jorgensen (1972), Janetski (1983), Salzmann (1983), Dorsey and Kroeber (1903), and Mooney (1907) describe several types of sacred places including mountains, foothills, buttes, springs, lakes, rivers, caves, burial places, petroglyph and pictograph sites, battle sites, rock alignments, and stone piles, as well as most sites identified by archaeologists as being sites of previous occupation by Shoshone-Paiute and Shoshone-Bannock peoples (Walker 2009).

Of special note are the treaty rights granted to the Shoshone-Bannock Tribes in the 1868 Fort Bridger Treaty and the rights the Shoshone-Bannock may exercise on lands within the Fort Hall Reservation that were ceded to the United States government (Fort Bridger Treaty 1868; Pocatello Cession Agreement 1900). Relevant portions of the Fort

Bridger Treaty stipulate that: the Shoshone-Bannock Tribes have the right to hunt on unoccupied lands of the United States so long as there is game found on these lands; heads of households may select a tract of land up to 320 acres in size for farming; any person over 18 years of age not being a head of a household may select a tract of land up to 80 acres in size for farming (Fort Bridger Treaty 1868). The agreement concerning the cessation of lands within the Fort Hall Reservation provided that members of the Shoshone-Bannock Tribes residing on the reservation shall have rights to cut timber for their own use, pasture cattle, and hunt and fish from the streams from any of these lands as long as they remained in the public domain (Pocatello Cession Agreement 1900).

Previous projects have identified potential TCPs in the Rock Springs FO, but the boundaries of these TCPs and sacred landscapes have not yet been defined. Regarding consultation with Native American Tribes in the Rock Springs area, BLM Rock Springs FO archaeologists noted (Miller 2010):

> *In consultation with the affected Native American Tribes, the Rock Springs Field Office has commenced the study of a cultural landscape. The Tribes involved have communicated that the large numbers of traditional cultural properties in the environs surrounding White Mountain are reflective of the presence of a landscape which is of great cultural importance to the Tribes. This "landscape" incorporates more than just a broad surface of land. It also includes sites, atmospheric elements, plants, animals, sounds, and light. The Tribes maintain that they would prefer the BLM consider management of this cultural landscape as a single entity rather than segmenting the resource into a series of disjointed traditional cultural properties.*
>
> *Within this cultural landscape Native Americans practiced their ceremonies, interacted with natural/supernatural forces, and maintained their roles as part of the everlasting cycles. The landscape has seen extensive and dedicated use for vision quests, healing ceremonies, birth rituals, death rituals, and other ceremonies critical to the communal lifestyles of the modern Tribes and their ancestors.*

The affected Tribes, as the most qualified of experts in these matters, are participating in a study at this time to further define the components of the cultural landscape and its conformation. That study is ongoing. Of the 23 Tribes consulted for this Project, comments have been received to date from the following nine Tribes, as summarized in Table 3.3-2.

Table 3.3-2. Status of Native American Consultation

Name of Tribe	Date of Initial Contact	Follow-up Letters	Additional Follow-up			Summary of Issues Raised during Consultation
			Date	**To/By/From**	**Method**	
Shoshone-Bannock Tribes	April 9, 2008	September 15, 2008 December 8, 2008 August 11, 2009	April 10, 2008	Presentation by Walt George (BLM) in Fort Hall, ID	In-person	BLM continued to send ROW routing updates. The Tribes have expressed concern over the transmission line alignment, which is not in the proposed WWE Corridor. They indicated they would like this Project to follow it or other existing corridors. The Idaho Falls District and Pocatello FOs continue to provide the Tribal council and staff information on the Project status as part of other meetings and consultations
			December 2, 2008	To: Joe Kraayenbrink	Email	
			February 5, 2009	To: Yvette Trell and Travis Stone	In-person	
			March 18, 2009	Presentation by Walt George (BLM) in Fort Hall, ID	In-person	
Northern Arapaho Business Council	April 9, 2008	June 11, 2009 August 11, 2009	**Date**	**To/By/From**	**Method**	BLM continued to send ROW routing updates. The Tribe requested a meeting. Tribal Historic Preservation Officer (THPO) changed before a meeting could be arranged. New THPO asks for project updates, which have been sent to her as updates occur. Business council requested participation in the PA and to be included in site visits with the Elders when they occur.
			April 29, 2008	From: JoAnn White (THPO to May 2008))	E-mail	
			May 12, 2008	No response	Phone	
			July 29, 2009	From: Darlene Conrad (THPO)	E-mail	
			November 4, 2009	PA kickoff invitation	E-mail	
			April 1, 2010	To: Darlene Conrad (THPO)	E-mail	
			April 5, 2010	To: Darlene Conrad (THPO)	E-mail	
			August 16, 2010	To: Darlene Conrad (THPO)	E-mail	
			August 19, 2010	To: Darlene Conrad (THPO)	E-mail	
			August 30, 2010	To: Darlene Conrad (THPO)	E-mail	
			September 1, 2010	To: Darlene Conrad (THPO)	E-mail	
			January 27, 2011	To: Darlene Conrad	E-mail	E-mailed PA meeting invitation

Table 3.3-2 Status of Native American Consultation (continued)

Name of Tribe	Date of Initial Contact	Follow-up Letters	Additional Follow-up			Summary of Issues Raised during Consultation
Ute Tribe of the Uintah and Ouray Reservation	April 9, 2008	June 11, 2009 August 11, 2009	**Date**	**To/By/From**	**Method**	BLM continued to send ROW routing updates. The Tribe has expressed interest in the Project and informally requested ethnographic studies and a copy of the literature review. The Tribe has noted a cultural landscape between Pilot Butte, White Mountain Petroglyphs, Cedar Canyon Petroglyphs and Boars Tusk for the Teton Wind Project. Sent Statement of Work for the requested Ethnography (2/17/2010) – no response Sent Draft PA (2/19/2010) – no response
			May 15, 2008	No response	Phone	
			June 16, 2009	By: Penny Daniels, RSFO Archaeologist	In-person	
			November 4, 2009	PA kickoff invitation	E-mail	
			December 8, 2009	By: Penny Daniels, RSFO Archaeologist	In-person	
			December 9, 2009	To: Betsy Chapoose	Phone	
			December 15, 2009	From: Betsy Chapoose	Phone	
			February 17, 2010	To: Betsy Chapoose	Phone / E-mail	
			February 19, 2010	From: Betsy Chapoose	E-mail	
			August 30, 2010	To: Betsy Chapoose	Phone / E-mail	
			December 2, 2010	To: Betsy Chapoose	Phone	No response
			January 5, 2011	To: Betsy Chapoose	Phone	No response
			January 27, 2011	To: Betsy Chapoose and Curtis Cesspoch	E-mail	E-mailed PA meeting invitation
Northwest Shoshone Band	April 9, 2008	June 11, 2008 August 11, 2008	**Date**	**To/By/From**	**Method**	BLM continued to send ROW routing updates, but have not received comments/concerns.
			November 4, 2009	PA kickoff invitation	E-mail	
Eastern Shoshone Business Council Eastern Shoshone Business Council	April 9, 2008	June 11, 2009 August 11, 2009	**Date**	**To/By/From**	**Method**	BLM continued to send ROW routing updates. The Tribe has expressed concern about the remains of "Deer Butte Man" and the related
			May 12, 2008	To: Ivan Posey	Phone	
			May 31, 2008	From: Reed Tizump (THPO)	E-mail	
			June 19, 2009	To: Ivan Posey	Phone	

Table 3.3-2 Status of Native American Consultation (continued)

Name of Tribe	Date of Initial Contact	Follow-up Letters	Additional Follow-up			Summary of Issues Raised during Consultation
(Cont.)			August 31, 2009	To: Ivan Posey	E-mail	ethnographic studies. Business council requested PA participation, copy of the WY literature review and an ethnography.
			November 4, 2009	PA kickoff invitation	E-mail	
			November 9, 2009	To: Ivan Posey	Phone	
			December 18, 2009	By: Judge Richard Ferris	In-person	
			December 18, 2009	By: Terry Del Bene, RSFO Archaeologist	In-person	
			February 22, 2010	To: Judge Richard Ferris	E-mail	
			March 3, 2010	From: Judge Richard Ferris	Phone	
			August 30, 2010	To: Judge Richard Ferris	E-mail	
			January 12, 2011	To: Judge Richard Ferris	Phone/E-mail	PA participation
			January 27, 2011	To: Judge Richard Ferris	E-mail	
Northern Cheyenne Tribal Council	April 9, 2008	June 11, 2009 August 11, 2009	**Date**	**To/By/From**	**Method**	Have continued to send ROW routing updates. The Tribe has expressed interest in the Project.
			May 15, 2008	From: Eugene Littlecoyote	Phone	
			June 19, 2009	To: Conrad Fisher (THPO)	Phone / Fax	
			August 31, 2009	From: Clara Caufield	E-mail	
			November 4, 2009	PA kickoff invitation	E-mail	
			February 22, 2010	To: Linwood Tallbull (THPO)	Phone	
			August 30, 2010	To: Cultural Resources Staff	Phone	
			December 3, 2010	To: THPO office	Phone	No response
			January 27, 2011	To: Conrad Fisher	E-mail	
Shoshone-Paiute Tribes	April 24, 2008	August 11, 2009	Date	To/By/From	Method	The Project Manager continues to provide project updates to the tribe via monthly meetings The Tribes have expressed concern over the transmission line alignment which is not
			April 24, 2008	Presentation by Walt George (BLM) in Mountain Home, ID	In-person	
			May 22, 2008	Joint Meeting: BLM and Tribal representatives	In person (Bill Baker Twin Falls District Manager)	

Table 3.3-2 Status of Native American Consultation (continued)

Name of Tribe	Date of Initial Contact	Follow-up Letters	Additional Follow-up			Summary of Issues Raised during Consultation
Shoshone-Paiute Tribes (Cont.)			July 24, 2008	Joint Meeting: BLM and tribal representatives	Tele-conference (Walt George)	in the proposed WWE Corridor. They indicated they would like this Project to follow it or other existing corridors.
			August 28, 2008	Joint Meeting: BLM and tribal representatives	Tele-conference (Walt George)	
			September 25, 2008	Joint Meeting: BLM and tribal representatives	Tele-conference (Walt George)	
			October 23, 2008	Joint Meeting: BLM and tribal representatives	Tele-conference (Walt George)	
			January 22, 2009	Joint Meeting: BLM and tribal representatives	Tele-conference (Walt George)	
			January 28, 2009	Joint meeting: BLM, tribal, and Owyhee County representatives	In-person	
			February 25, 2009	Joint Meeting: BLM and tribal representatives	Tele-conference (Walt George)	
			March 26, 2009	Joint Meeting: BLM and tribal representatives	Tele-conference (Walt George)	
			May 25, 2009	Joint Meeting: BLM and tribal	Tele-conference	
			June 25, 2009	Joint Meeting: BLM and tribal representatives	Tele-conference (Walt George)	
			July 23, 2009	Joint Meeting: BLM and tribal representatives	Tele-conference (Walt George)	
			September 24, 2009	Joint Meeting: BLM and tribal representatives	Tele-conference (Walt George)	
			October 22, 2009	Joint Meeting: BLM and tribal representatives	Tele-conference (Walt George)	

Table 3.3-2 Status of Native American Consultation (continued)

Name of Tribe	Date of Initial Contact	Follow-up Letters	Additional Follow-up			Summary of Issues Raised during Consultation
Shoshone-Paiute Tribes (Cont.)			November 4, 2009	PA kickoff invite	E-mail	
			November 25, 2009	Joint Meeting: BLM and tribal representatives	Tele-conference (Walt George)	
			January 28, 2010	Joint Meeting: BLM and tribal representatives	In-person (Bill Baker, Twin Falls District Manager)	
			February 25, 2010	Joint Meeting: BLM and tribal representatives	Tele-conference (Walt George)	
			May 25, 2010	Joint Meeting: BLM and tribal representatives	Tele-conference (Walt George)	
			June 24, 2010	Joint Meeting: BLM and tribal representatives	Tele-conference (Walt George)	
			July 22, 2010	Joint Meeting: BLM and tribal representatives	Tele-conference (Walt George)	
			August 26, 2010	Joint Meeting: BLM and tribal representatives	Tele-conference (Walt George)	
			January 27, 2011	To: Ted Howard and Robert Bear	E-mail	E-mailed PA meeting invitation
Southern Cheyenne and Southern Arapaho	May 29, 2010		**Date**	**To/By/From**	**Method**	No response
Oglala Sioux	July 30, 2010		**Date**	**To/By/From**	**Method**	No response
			November 23, 2010	From: Joyce Whiting	Phone	
			December 9, 2010	To: Joyce Whiting	E-mail	
			January 3, 2011	To: Joyce Whiting	E-mail	
			January 27, 2011	To: Joyce Whiting	E-mail	

Visual Impacts on Resources, Including Cultural Landscapes

This analysis considers impacts upon visual resources from three perspectives. These are:

1. The BLM's VRM system, which uses a specific inventory system to determine visual impact and to determine whether that impact is consistent with visual land management objectives assigned in the area's RMP;
2. The BLM's cultural resource evaluation of project impact on cultural resources for which setting may be a contributing component of the site's eligibility for the NRHP, which includes both inventory and interpretation of simulation photography, and
3. The BLM's understanding of the importance that Tribes place on cultural landscapes and the possible impacts the Project could have on those landscapes and on the Tribal uses of those landscapes.

The first method of visual analysis is found in Section 3.2 and discusses impacts to visual resources on Public Lands using the VRM system. The second method is found in Section 3.3 and specifically analyzes the impacts of the Project on the setting of historic properties where appropriate.

The BLM has the following understanding of Tribal perspective of cultural landscapes. Local tribes in the area of the Gateway West Project have used and viewed, and will continue to use and view, certain landscapes as integral wholes rather than as a collection of artifacts, views, or natural resources. Some of these landscapes are considered sacred landscapes, which, as sacred sites, "function to create a conceptual and emotional parallelism between the objective order of the universe, the realm of the spirits, and the intellectual constructs of American Indian cultures. They are portals between the world of humans and the world of spirits through which sacred power can be attained and spirits contacted" (Walker 2005). These landscapes cannot be parsed into separate resources, and the rocks, soil, water, air, plants, animals, and also any human artifacts are all considered together as inseparable parts of the whole. For the purposes of this NEPA analysis, sacred landscapes will be considered in the section on cultural resources but are explicitly recognized as including all elements of the landscape and not just those resources that may be eligible for inclusion on the NRHP.

To the extent that Tribes are willing to share the location and importance of specific sacred sites, Project impact to those sites will be considered in the analysis of impacts on cultural resources. To date, specific information has not been shared with the BLM, and some Tribes have indicated that they will wait to identify locations until the BLM identifies a preferred alternative. BLM anticipates including any information Tribes share as part of the cultural resources analysis in Section 3.3 in the Final EIS. Landscapes thus analyzed will be considered regardless of their eligibility for the NRHP.

3.3.2.4 Methods

To identify cultural resources and TCPs within the Analysis Area, the Project Proponents conducted a literature review, Class III (intensive) cultural resources

investigations, and ethnographic studies of the Proposed Route and Alternatives. The methods used for each of these objectives are explained below.

Literature Review

As set forth in the BLM Manual 8110 (BLM 2004b), a literature review consists of a reasonable compilation of existing information about known cultural resources, which is assembled from a review of previously recorded sites in the SHPO databases and from the available literature. The study area for the literature review included a 0.5-mile area on either side of the Project route centerline, along the Proposed and Alternative Routes. This area was established to aid route siting efforts, to accommodate shifts in the route alignment, and to cover areas where access roads, substations, and other construction or operation facilities may occur outside the 500-foot-wide intensive survey corridor (URS 2009a). Data were gathered by official file records requests to each SHPO for sites and inventories located in any township, range, and section intersected by the 1-mile-wide transmission line corridor. This resulted in a sample slightly larger than the 1-mile-wide corridor, because the corridor might cross an extreme corner of the section. The records search focused on collecting information regarding previously recorded cultural resources within the study area, as well as identifying areas previously surveyed. Additional data sources for the literature review included current published and unpublished literature, chronologies, cultural and historical contexts, and information provided by the BLM, Forest Service, and the NPS Trails Office. The full analysis is filed as a confidential document in the BLM FOs that the Proposed Route crosses (Henderson et al. 2009; Nilsson et al. 2009).

Class III Cultural Resources Inventory

Class III investigations involve pedestrian field surveys that may locate new sites and provide additional knowledge of site types, densities, and precise locations of sites within the area of analysis (BLM 2004b). The Class III cultural resources inventory for the Project is being conducted in two phases. Phase I includes 15 percent sample surveys and a visual impact survey, while Phase II encompasses an intensive survey of the route to be constructed (preferred route on public lands).

Phase I

Fifteen Percent Sample Surveys

Field surveys of a 15 percent sample of the Proposed Route and Route Alternatives (URS 2009b) were completed in 2008, 2009, and 2010. The purpose of Phase I is to provide sufficient information for a comparison of alternatives by identifying additional cultural resources sites in the area, helping to predict relative site densities for Route Alternatives, and providing additional information regarding cultural resources within the Analysis Area. The 15 percent sample area consists of 500-foot-wide by 1-mile-long segments located on public lands along the length of the route (URS 2009b). These segments were randomly chosen from a geographic information system analysis of public lands filtered to exclude areas in which cultural resources inventories have occurred in the last 5 years. Areas greater than 25 percent slope or exhibiting recent disturbance were excluded from the survey. Third-party consultant archaeologists used a 30-meter interval pedestrian linear survey to cover each sample segment. The high

frequency of existing cultural resources data in the BLM Kemmerer FO provided sufficient information to meet the objectives of Phase I. The BLM Kemmerer FO provided data on percentages of previously inventoried portions of the Segment 4 Proposed Route and Route Alternatives within that jurisdiction, and known cultural resources within a 500-foot-wide zone equivalent to the Phase I sampling. The percentages of previous inventories on the seven routes analyzed in the BLM Kemmerer FO varied from 11 to 19 percent, with an overall average of 16 percent, which is approximately analogous to the Phase I 15 percent sampling. Therefore, the existing cultural resources data in the BLM Kemmerer FO were used to meet the Phase I objectives in this document.

As noted earlier, the onset of inclement weather precluded the completion in 2010 of the 15 percent sample surveys along Alternative 7I in Nevada, as well as the recently added Alternatives 7J, 8E, 9F, 9G, and 9H in Idaho. These surveys were completed in spring 2011, with the exception of Alternative 7I, due to snow the roads have been impassable until as late as June 2011.

Visual Impact Survey of Historic Trails and Other Properties

Phase I also included an analysis of visual impacts on the settings of all known historic trails and other known cultural resources, such as Hagerman Fossil Beds National Monument and Minidoka National Historic Site, along the Project route. Field visits were completed in June, July, August, and December 2008; September to December 2009; and August 2010. The elements of the visual assessment included (1) identification of historic sites and trail segments, (2) inventory and assessment of existing visual conditions and viewshed analysis, (3) identification of representative KOPs, (4) completion of visual contrast rating (VCR) worksheets, and (5) determination of impacts. The methods for visual resource analysis were based on the BLM (1986b) Visual Resource Contrast Rating System Manual (BLM Manual, Section 8431).

BLM FO archaeologists in the Analysis Area suggested possible KOP locations and identified cultural resources, such as NHTs, and these were given priority when choosing KOPs. The NPS also provided additional information on sites within 5 miles of the study area, many of which were included in the inventory. In Wyoming and Nevada, shapefiles obtained from the SHPO and BLM contained verified trails data. In Idaho, however, *Emigrant Trails of Southern Idaho* (Hutchison and Jones 1993) was used to identify trails that are known to have intact physical remnants. Those trails were identified as “verified” and those segments that are known to be destroyed or are currently unknown were identified as “unverified” trails. Those that were listed as “unverified” were not visited. The maps produced by the viewshed analysis distinguished verified and unverified trail segments. In general, where KOPs were not established by the BLM or NPS, the viewshed analysis (described in the following paragraphs) was used to establish KOPs within a 3- to 5-mile distance along the trails that parallel the Project and within a mile of either side of the Project (where access was available) where the Project crosses the trails.

One area in southwestern Wyoming, near Monell, was omitted from analysis of visual impacts. According to an MOA executed in 2007 among the BLM, Wyoming SHPO,

and Oregon-California Trails Association (OCTA), the settings of the Overland Trail and Point of Rocks to South Pass Stage Road located within the MOA boundary have degraded sufficiently so that they are no longer an important aspect of eligibility for these properties.

Although the study was conducted for all trail segments within the Analysis Area, high-potential sites and trail segments were also identified and given priority for analysis. The National Trails System Act identifies *high-potential historic sites* as "those historic sites related to the route, or sites in close proximity thereto, which provide opportunity to interpret the historic significance of the trail during the period of its major use. Criteria for consideration as high-potential sites include historic significance, presence of visible historic remnants, scenic quality, and relative freedom from intrusion." The National Trails System Act identifies *high-potential route segments* as "those segments of a trail which would afford a high-quality recreation experience in a portion of the route having greater than average scenic values or affording an opportunity to vicariously share the experience of the original users of a historic route."

The viewshed analysis used GIS to evaluate whether transmission line towers might be visible by viewers along historic trails and generated two types of viewsheds: a multiple viewshed and an individual viewshed. A multiple viewshed analysis combines the viewable areas from several observation points into a single visibility surface. The fieldwork analysis used transmission towers, spaced at 300 feet or 100 meters, as viewpoints. This method created a visibility surface 5 miles on either side of the transmission line where the towers would most likely be visible. Historic trails/routes were overlaid in GIS on the visibility surface to identify any intersecting trail sections or portions of the trail that needed to be visited in the field. In contrast to multiple viewshed analysis, individual viewshed analysis results in a visibility surface that relates to a single observation point. Several KOPs along historic trails were established in the field and an individual viewshed was created for each KOP. The individual viewsheds identified the Project segments and alternatives that were visible from each KOP. Both viewshed analysis methods assume an average observer eye level of 5.5 feet. Tower height was assumed to be 190 feet for the field viewshed analysis and 180 feet for the KOP analysis. In addition to identifying each visible Project segment and alternative, the shortest distance from a KOP to the Project segment and alternative was calculated in GIS using a straight line, or perpendicular, distance. If a Project segment or alternative did not intersect the viewshed at the shortest distance, then the distance was calculated at an angle from the KOP to the nearest point of Project/viewshed intersection.

Photographs were taken to document existing conditions at each KOP and were used to evaluate visual conditions and Project visibility. Throughout the process of inventory and impact assessment, additional KOPs were chosen for photographic simulations. Specific criteria for the selection of a KOP for simulation vary but generally included requests from various federal or state agencies and the following characteristics: typical impacts in a particular geographic area, areas of visual concern, sensitive historic resources, or potentially high levels of visual impact (maps of the KOP locations are included in Appendix E, Figures E.3-1 through E.3-11).

Assessment of impacts on cultural resources within the Project's viewshed assumed a worst-case scenario, in which all viewers would have views toward the proposed Project on a high-visibility day (recommended to be up to 5 miles and beyond) and the KOP chosen for that resource would best represent the disparate viewing conditions and viewing opportunities. In September 2009, Idaho and Wyoming BLM authorized use of the following procedure for visual analysis of cultural resources within the Project area.

The *Guidelines for Determination of Visual Effects of an Undertaking on the Integrity of a Historic Setting*, Appendix C of the State Protocol, executed between the Wyoming BLM and Wyoming SHPO (BLM 2006), provides guidance on assessment of visual impacts for known cultural resources. Appendix C summarizes the procedures as follows:

1. Identify cultural resources for which setting is an important aspect of integrity.
2. Identify KOPs, those locations where view of the proposed undertaking is most revealing.
3. Assess VCR for each KOP.
4. Determine visual impacts.

Once the VCR for each KOP has been evaluated, then Appendix C stipulates the following impacts:

- **No Contrast** – If the proposed Project elements will not be seen, there is no contrast between the undertaking and the setting. The agency determination should be "**No Historic Properties Affected.**"
- **Weak Contrast** – If the proposed Project elements, or portions of the elements, can be seen but will not dominate the setting or attract the attention of the casual observer because the basic elements of form, line, color, and texture found in the setting are repeated in the Project's physical elements, there is a weak contrast between the undertaking and the setting. The agency determination should be "**No Historic Properties Adversely Affected.**"
- **Moderate or Strong Contrast** – If the proposed Project elements tend to dominate the setting, there is a moderate or strong contrast between the undertaking and the setting. The agency determination should be "**Historic Properties Adversely Affected.**"

Phase II

Fieldwork for Phase II of the Class III inventory began in 2009 on public lands along portions of the route without alternatives and will continue once the BLM has selected the Preferred Route. The Phase II survey covered a 500-foot-wide corridor, 250 feet on either side of the Proposed Route centerline. The Phase II survey also covered ancillary developments, such as substations, access roads, staging areas, pull sites, helicopter fly yards, and any other areas related to the proposed action. Third-party consultant archaeologists used a 30-meter interval pedestrian linear survey to cover the corridor. If design changes or selection of alternatives result in the selection of Project areas that were not fully surveyed in the 2009-2010 field efforts, supplemental Class III

surveys will be conducted to provide complete coverage of the Analysis Area. The results of the Phase II cultural resources inventory will be summarized in a stand-alone Class III cultural resources inventory report. A full analysis of visual impacts on the settings of NHTs, other trails, and related cultural resources has been summarized in a stand-alone historic trails document that will complement the Class III inventory report (Henderson et al. 2010). While the rest of the Class III report is confidential to protect sensitive resources, the historic trails report is in the Administrative Record for this project. Section 3.3.3.3 of the EIS draws from the trails report.

Ethnographic Studies

The Shoshone-Paiute, Shoshone-Bannock, Eastern Shoshone, and Northern Ute Indian Tribes have requested ethnographic studies to protect Tribal interests and to assist the BLM in meeting its obligations under NEPA, NHPA, EO 13175, AIRFA, ARPA, and numerous other laws and EOs. The BLM will treat all information gathered during the development of the ethnographic research as confidential. The method for conducting the ethnographic studies includes background research and literature review, ethnographic interviews to determine contemporary and ongoing uses of culturally significant areas or sites, and a resulting final report for inclusion in the Section 106 process and development of the Final EIS. The qualified professional to conduct the study will be chosen through consultation with the designated Tribal official. Tribes requesting the ethnographic studies will control the distribution of their respective report.

3.3.2.5 Existing Conditions

The 1,103-mile-long Gateway West Transmission Line can be considered an environmental transect, inasmuch as it crosses several environmental zones from its beginning in east-central Wyoming to its terminus in southwestern Idaho, with one alternative crossing through a portion of northern Nevada. For discussion purposes, it is useful to distinguish the project environmental setting by *ecoregion*. Ecoregions are defined as “areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources” (USEPA 2007). This is relevant to an understanding of human settlement and subsistence in the Project area, because each ecoregion is characterized to by a distinctive landscape that, to a greater or lesser extent, influenced human settlement and by a complement of essential resources (e.g., potable water, plants, animals, and useful raw materials) upon which the prehistoric and historic inhabitants relied for subsistence. Therefore, modern environmental parameters are used to interpret past patterns of human settlement and subsistence. The regional climate has fluctuated dramatically in the 12,000-plus years that humans have occupied these areas of Idaho and Wyoming. A general description of these ecoregions serves as a natural baseline against which the representative cultural resources are compared, with the ultimate purpose of deciding which Project segments (proposed or alternative) are least likely to impact significant cultural resources.

Wyoming Ecoregions

Descriptions of the Wyoming ecoregions are derived from Chapman et al. (2004) and Knight (1994).

The Gateway West Transmission line begins in the Powder River Basin Ecoregion, which is described as rolling prairie and dissected river breaks along the North Platte River. The natural vegetation community is short and mixed grass prairie with stands of cottonwood trees along drainages. This ecoregion encompasses the extreme northern end of Segment 1. The rest of Segment 1 crosses four ecoregions: the Laramie Mountains, which is defined by shrublands, alpine, and subalpine mountains, with high plains prairie, mid-elevation forests, and shrublands; Laramie Basin, with rolling hills, rolling alluvial fans, and nearly level to flat floodplains and terraces, covered by shrublands and mixed grass prairies; and Shirley Basin and Shirley Mountains, defined by high elevation valleys, hills, ridges, footslopes, and nearly flat floodplains and low terraces, with shrubland and mid-elevation forests. The vast majority of the prehistoric sites in these five ecoregions are limited activity and open camps (see below for definition of these site types) in approximately equal frequencies, except for the Shirley Basin, where open camps greatly outnumber limited activity sites. These resources represent a pattern of regional settlement consisting of base camps surrounded by task activity localities where desired natural resources, such as food (plants and animals) and raw materials for tools, were obtained. The historic era is represented by sites related to settlement (principally agricultural/animal husbandry and energy exploration/mining), transportation (emigrant trails, roads, and railroads), and waterworks. Many of these early Euro-American visitors traveled through this area, on their way to more appealing places, but others stayed to settle, building irrigation ditches and laterals to bring water to the crops they had planted. Eventually, the railroads replaced the emigrant trails as the primary routes of travel through the region. Modern impacts in these ecoregions include uranium and coal mining, oil and gas extraction, wind energy farms, livestock grazing, and wildlife habitat, which may impact local cultural resources.

Segment 2 crosses the Hanna-Carbon Basin Ecoregion, which consists of hills, rolling alluvial fans, sand dunes, dissected ridges, and level floodplains and terraces, with shrubland, short grass prairie, and aeolian sand dunes. Open camps are more numerous here than limited activity sites, which may be due to the abundance of natural resources found in and around sand dunes. The documented historic resources mirror those observed in Segment 2, signifying the pervasiveness of the pattern of emigration, settlement, and subsequent growth and development. Modern uses of the ecoregion include coal mining, natural gas extraction, wind energy farms, livestock grazing, and wildlife habitat, which may impact local cultural resources.

Segment 3 principally traverses the Washakie Basin Ecoregion and Great Divide Basin Ecoregion, ending on the edge of the Rock Springs Uplift Ecoregion. The two basins encompass rolling plains, flat floodplains and terraces, aeolian sand dunes, and internal drainage, characterized by salt desert shrubs and rolling sagebrush steppe. The Rock Springs Uplift marks a portion of the eastern extent of the Great Basin region that extends west into Idaho, Nevada, and Utah. It includes plains, rolling hills, high plateaus, dissected ridges, valleys, level floodplains and terraces, and aeolian dune fields, vegetated by shrubland, sagebrush and grassland steppe, and high elevation forests. Twice as many open camps as limited activity sites occur in these three ecoregions, an outcome probably attributable to the plentiful sand dunes in this area.

Historic settlements are predominant, with a few transportation sites representing a later pattern of settlement spreading out from the original transportation routes (trails and railroads). The greatest potential impacts are due to mining; timber, oil, gas, and coal production; livestock grazing; and wildlife habitat, which may impact local cultural resources.

Segment 4 displays perhaps the most environmental diversity, crossing four large ecoregions. It begins in the Rock Springs Uplift, crosses the broad expanses of the Green River Basin and Bridger Basin, and then crosses the hills and valleys of the Overthrust Belt. The Green River Basin and Bridger Basin together comprise the largest ecoregion in southwestern Wyoming. The Green River is one of the largest drainages in the region and joins the Colorado River in southeastern Utah. The greater ecoregion is defined by flat floodplains and terraces, rolling alluvial fans, aeolian dunes, steep-sloped dissected ridges, and valleys. The natural vegetation communities include shrublands, short mixed-grass prairies, and sagebrush steppe. Riparian areas along drainages, near springs, snow traps, and perennial rivers support groves of aspen, willow, cottonwood, greasewood, and mountain mahogany. The Overthrust Belt is located along the western boundary of the Green River Basin and is defined by moderately glaciated, steep mountains, unglaciated footslopes, alluvial fans, rolling hills, ridges, plains, level flood plains, and terraces. The natural vegetation communities include shrublands, sand dunes, sagebrush steppe, high elevation forest, and mountain meadows. Segment 4 has, by far, the greatest number of prehistoric sites and most of these are open camps. As is the case with the Washakie and Great Divide basins in Segment 3, these frequencies are most likely attributable to the profusion of sand dunes, which support beneficial natural resources. Historic sites again are dominated by settlements and transportation-related localities. The latter are particularly abundant in these areas, perhaps a result of poor soil conditions for agriculture and similar economic pursuits. Modern land uses include dryland and flood irrigation farming, coal mining, timber production, oil and gas production, recreation, livestock grazing, and wildlife habitat.

Idaho and Nevada Ecoregions

Descriptions of the Idaho and Nevada ecoregions are derived from McGrath et al. (2002).

Segment 4 of the Gateway West Transmission Line enters Idaho in the extreme southeastern corner of the state, at the western edge of the Wyoming Basin. It crosses the Wet Valley Ecoregion and Semiarid Bear Hills Ecoregion. The Wet Valley is characterized by wetlands, lakes, canals, rivers, swamps, and marsh lands of the many tributaries originating within the Uinta Mountains. Landforms consist primarily of flat floodplains, low terraces, foothills, and well-drained alluvial fans. The Semiarid Bear Hills consists primarily of sagebrush steppes along the Bear Lake Plateau, which lies within the rain shadow of the nearby Wasatch and Uinta Mountains and is defined by footslopes, alluvial fans, hills, ridges, and valleys. This ecoregion is dominated by sagebrush and various grasses, with occasional aspen groves. The landscape quickly transitions to the Wasatch Montane Zone Ecoregion and the Semiarid Foothills Ecoregion. The Wasatch Montane Zone is defined by partially glaciated mountains and

plateaus. Deep winter snowpack feeds perennial streams leading to the lower arid regions below. Vegetation consists mainly of Douglas-fir and western spruce-fir forests, while south-facing slopes support more arid-adapted plant species. The Semiarid Foothills Ecoregion flanks the eastern and western slopes of the Bear River Range crest. It is partially glaciated and elevations range between 5,500 and 8,500 feet. The natural plant community is sagebrush steppe with various grasses and occasional Utah juniper. As noted above for Wyoming, more than twice as many open camps as limited activity sites occur along Segment 4, and this pattern holds for Idaho. Historic settlements and transportation-related sites are also predominant. Modern uses of the ecoregion include livestock grazing, wildlife habitat, and limited grain and alfalfa farming, which may impact local cultural resources.

Segment 5 occurs entirely within the Northern Basin and Range, but crosses five distinct ecoregions. The Dissected High Lava Plateau Ecoregion dominates much of southwestern Idaho and is defined by unglaciated alluvial fans, rolling plains, hills, and shear-walled canyons cut into extrusive igneous (rhyolite, basalt, and tuffaceous) rocks. It is externally drained by larger tributaries of the Snake River. The natural vegetation community is sagebrush steppe with various arid grasses; Utah juniper is supported on the rocky uplands. The Semiarid Hill and Low Mountains Ecoregion occurs in a broad, discontinuous band across south-central and southeastern Idaho. It is defined by unglaciated mountain slopes, hills, and alluvial fans, with elevations ranging from 4,600 to 7,000 feet. Natural vegetation is sagebrush steppe, with numerous grasses, snowberry, serviceberry, and Utah juniper. Drainages and alluvial fans support stands of aspen, lodgepole pine, and Douglas-fir. The High Elevation Forests and Shrublands Ecoregion is found in discrete pockets across a broad area of southeastern Idaho. It is defined by partially glaciated, steep mountain slopes and peaks along the Bannock Range, Portneuf Range, Albion Mountains, Deep Creek Mountains, and areas of the Sawtooth and Caribou-Targhee National Forests. Modern vegetation communities include western spruce-fir forests along north-facing slopes and sagebrush-dominated grassland along south-facing slopes. The Saltbush-dominated Valleys is the smallest ecoregion in the proposed Project area, located in south-central Idaho. It is defined by unglaciated, gently sloping valleys that drain to the Snake River. The Raft River provides the principal drainage for this ecoregion, and the natural vegetation community consists of saltbush-greasewood. The Sagebrush Steppe Valleys Ecoregion is located primarily in southeastern Idaho, between the Snake River and the Utah state line. The ecoregion is defined by unglaciated, gently sloping terraces, valley bottoms, basin rims, and alluvial fans. It is drained by numerous rivers, principally the Bear River, Portneuf River, Bannock River, Rock Creek River, and Marsh Creek. The natural vegetation community is sagebrush steppe. Segment 5 has few prehistoric resources, and all of them are limited activity sites, probably due to the relative scarcity of natural resources in this area. Historic resources are also sparse and consist almost entirely of a few settlements and emigrant trail segments, suggesting that most visitors were moving through this area, but few stayed to settle. Modern uses include livestock grazing, wildlife habitat, recreation, and timber production, which may impact local cultural resources.

Segment 7 covers large parts of the Northern Basin and Range and Snake River Plain. In the Northern Basin and Range, the segment crosses most of the same ecoregions that Segment 5 crosses. The exception is the Semiarid Uplands Ecoregion, which encompasses mid-elevation zones in the Owyhee and Jarbidge mountains and hills, volcanic cones, buttes, and rocky outcrops. Vegetation consists of mountain sagebrush, western juniper, mountain brush, and grasses. The Treasure Valley Ecoregion encompasses the eastern portion of Treasure Valley, where the Payette, Boise, Weiser, Malheur, and Owyhee Rivers converge at the Snake River. The valley is mainly lowland with elevations ranging between 2,100 and 2,800 feet. The natural vegetation community is sagebrush steppe with saline areas dominated by shadscale and greasewood. The Eastern Snake River Basalt Plains Ecoregion is formed by the deposition of basaltic lava extruded from numerous volcanic vents across the plain. These flows have eroded and are often overlain or interbedded with aeolian and alluvial deposits. The Snake River itself forms the southern margin of the ecoregion and drains the various tributaries that form in the mountains east and south of the large plain. The ecoregion is relatively dry, with a natural vegetation community of sagebrush steppe. The Magic Valley Ecoregion is located within the Snake River Plain. The modern surface of the ecoregion has been significantly altered by the development of historic and modern irrigation and canal systems that supply water to the numerous developments. The natural vegetation community is sagebrush steppe, with shadscale and greasewood present on lower drainage terraces. The Mountain Home Uplands Ecoregion is defined by unglaciated plains, hills, and basalt-capped buttes. The natural vegetation community is sagebrush steppe with small areas of saltbush and greasewood. The Snake River and many of its tributaries crosscut the ecoregion. Segment 7, with the exception of one alternative, has relatively few prehistoric resources and nearly all of them are limited activity sites. The exception is Alternative 7I, which dips south to run along the Utah and Nevada border, through the Brown's Bench obsidian source area, and has many more limited activity sites than do the other segment alternatives. It also has several open camps and sheltered camps, as well as at least one ritual site. It presumably presented optimal areas for aboriginal settlement. Historic resources are also generally sparse in the segment, with the exception of Alternative 7I, which runs along Idaho's border with Utah and Nevada and Alternative 7H, which runs a little farther north. Both areas have more historic settlements and emigrant trails, suggesting that many of those who traveled through this area eventually stayed (or returned) to settle. The rich agricultural potential of the ecoregions in Segment 7 has allowed for historic and modern increases in population density that has led to these ecoregions having large areas of urban and suburban housing and industrial development, which may impact local cultural resources.

Segment 8 crosses the Snake River Plain and the same ecoregions as Segment 7. A modest number of prehistoric resources, most of which are limited activity sites with a handful of open camps are found in Segment 8, a pattern that probably reflects the localization of essential natural resources. A relatively large number of historic settlements, transportation-related sites (emigrant trails, roads, and railroads), and irrigation waterworks are found here. The fertile volcanic soils, once watered, attracted many settlers to this area.

Segment 9 also crosses the Snake River Plain and the same ecoregions as Segments 7 and 8, with one exception. One of the segment alternatives passes through the Unwooded Alkaline Foothills Ecoregion, which is located in the southwestern corner of the Snake River Plain, between the Snake River and a portion of the Owyhee Mountains. The ecoregion contains rolling foothills, hills, benches, alluvial fans, and badlands. Perennial streams are rare in this ecoregion, but numerous intermittent and ephemeral drainages are present. The natural vegetation community is shadscale and greasewood with areas of sagebrush steppe. Segment 9 includes many prehistoric limited activity sites, a sizable number of sheltered camps, and a handful of open camps, demonstrating an abundance of natural resources that drew aboriginal inhabitants to the area. Historic settlements are particularly numerous in Segment 9, while transportation-related sites are relatively sparse. Irrigation waterworks are also present, demonstrating the attractiveness of the area to historic settlement once water was brought to the fertile soils. Current land use is mainly rangeland and wildlife habitat. Irrigated farmland is present along the Snake River and near reservoirs.

Segment 10 crosses the Snake River Plain. It has no prehistoric resources, indicating that its natural resources were sparse. It did, however, support several historic settlements, emigrant trails and railroads, and irrigation waterworks, reflecting again the historic growth of settlement in the area. Irrigated farmland is present along the Snake River and near reservoirs.

Ethnohistoric Overview

Native American culture including trade, warfare, and inter-tribal relations has always involved the dynamic interaction of multiple groups. The influx of European Americans into their homeland brought about many sudden changes to Native American culture, including population decimation due to disease and warfare, loss of traditional territories and resources, and forced assimilation into Euro-American culture. Ethnographic and ethnohistoric studies have attempted to record the pre-contact customs, languages, religion, and social structures of tribes.

The Shoshone, Paiute, and Bannock occupied portions of southern Idaho, western Wyoming, and northern Utah. As mentioned above, an ethnographic study requested by the Shoshone-Paiute and Shoshone-Bannock Tribes is currently underway. In addition to his own reassessment of the Shoshone-Bannock, Walker (1993) cites Lowie (1924), Stewart (1939), and Fowler and Liljeblad (1986) as the principal ethnographic sources for the Northern Paiute (Walker 2009). Traditional ethnographies of the Northern Shoshone and Bannock Tribes are Lowie (1909), Steward (1938), Murphy and Murphy (1960, 1986), and Walker (1973, 1978, 1993).

The Eastern Shoshone have occupied western Wyoming and, periodically, adjoining areas since A.D. 1500 or earlier. Their migration from the Great Basin area (Nevada and Utah) into Wyoming, and then farther out into the northern Plains by ca. A.D. 1800, is supported by tribal history, early historic accounts, and archaeological data. A transitory tribe, the Eastern Shoshone moved frequently from place to place to search for food, as well as to avoid harsh winters and hostile tribes, such as the Blackfeet and,

later, the Arapaho and Sioux (Bevill et al. 2008; Shimkin 1986). Key ethnographies for the Eastern Shoshone are Lowie (1915), Hamilton (1905), and Shimkin (1942).

In general, the Ute are understood to have occupied areas primarily in western Colorado and central and eastern Utah (Callaway et al. 1986). A more recent review of historic accounts written by Spanish explorer Father Silvestre Velez de Escalante in 1776, the 1765 Juan Rivera diary, and various letters to the U.S. Office of Indian Affairs indicate that a northern shift in Ute territory may have occurred during the protohistoric stage (Baker 2007). According to Baker (2007), these sources vaguely suggest that the Ute were present near the southern edge of Wyoming, particularly in the area of the Green River. Identified Ute bands that are known to be closest to southwestern Wyoming during this time period are the Uintah, the Yamparika, and the Cumumba Bands (BLM 2004c). Previous ethnographic studies for the Northern Ute Tribe include Steward (1942), Jorgensen (1972), and Janetski (1983).

The Tribal group known as the Arapaho historically lived on the eastern plains of Wyoming and Colorado. Scholars have been unable to say definitively when and how the Arapaho began roaming the northern Plains, although many think that their ancestors were most likely from present-day Minnesota and North Dakota. Before the period of Euro-American expansion, the Arapaho were living in Wyoming, Colorado, South Dakota, Nebraska, and Kansas (Fowler 2001). The principal ethnographic studies for the Northern Arapaho are Salzmann (1983), Dorsey and Kroeber (1903), and Mooney (1907).

Wyoming Cultural Resources Inventory Summary

Previous Inventories

More than 1,200 cultural resources inventories have been conducted within the Project area between 1974 and 2007, with 20 percent having been conducted in the last 5 years. The majority of these studies are small block inventories or linear surveys related to well pad sites, access roads, seismic lines, and pipeline development on public lands. The number of inventories by Project segment is relatively similar with the exception of the Proposed Route in Segments 1E and 1W, where fewer surveys have been conducted. These differences may be attributable to the greater amounts of private land or fewer development projects in those segments, resulting in fewer federal undertakings.

Previously Recorded Cultural Resources

The search of the Wyoming SHPO cultural records for the Wyoming portion of the Project area identified more than 3,000 cultural resources locations in the Analysis Area. The majority (95 percent) of prehistoric site types include lithic scatters and open camps, while only a few of the sites are identified as ritual sites or sheltered camps. The majority of historic site types include stock herding camps, building foundations, canals, cairns, ranching and mining facilities, and transportation features or routes (e.g., NHTs and other emigrant routes, highway segments, historic freight roads, and railroad facilities). The multi-component sites usually consist of lithic scatters with historic debris.

Idaho Cultural Resources Inventory Summary

Previous Inventories

The search of the Idaho SHPO cultural records for the Idaho portion of the Project area (part of Segment 4 and Segments 5 through 10) identified nearly 1,550 previous cultural resources inventories in the Analysis Area. These studies collectively examined approximately 520,000 acres dispersed within the Analysis Area, a 1-mile-wide corridor along all Project segments and alternatives. Most inventories are related to developments, construction, and fiber optic projects.

Previously Recorded Cultural Resources

The records search identified a diverse range of previously recorded cultural resources across the Project area in Idaho. A total of nearly 600 cultural resources locations have been identified. Most (80 percent) of the prehistoric resources are limited activity sites (e.g., lithic scatters). A few sites have cultural features that include fire-affected rock, cairns, housepits, and rock shelters. The majority of historic sites include emigrant trail segments, railroad segments, historic roads, modern roads, transmission lines, and canal segments.

Nevada Cultural Resources Inventory Summary

Previous Inventories

The record search conducted at the BLM Elko District Office indicates that two cultural resource inventories have been conducted along those portions of Alternatives 7I and 7J located in Nevada, examining 1,940 acres, of which approximately 500 acres occur within the Analysis Area. One inventory was conducted by BLM prior to construction of a fenceline, while the other was a reseeding effort. Both projects were conducted in 1989.

Previously Recorded Cultural Resources

The inventories resulted in the identification of over 200 cultural resources located within the Analysis Area (extending 0.5 mile south from the Idaho-Nevada border). Identified sites are all prehistoric in origin and consist of lithic scatters and quarrying areas, many with stone tools, related to locally occurring obsidian and ignimbrite sources.

Prehistoric Resources by Segment and Alternative

Table 3.3-3 summarizes, by segment/alternative and resource type, the prehistoric resources that are listed in the NRHP, officially determined eligible for the NRHP, or unevaluated (and assumed NRHP-eligible for the purposes of this analysis) within the 1-mile-wide Analysis Area. The Proposed Routes are listed first by segment, followed by the Route Alternatives. It should be noted that the Proposed Route in Segment 4 and Alternative 4A overlap both Wyoming and Idaho. To simplify the discussion, the literature review results for Segments 1 through 4 are included in Wyoming, while Segments 5 through 10 are included in Idaho, and a small portion of Alternative 7I/7J crosses into Nevada. As a way of achieving consistency in descriptive site types for all

Table 3.3-3. Summary of Prehistoric Resources by Segment and Type[1/]

Segment	Proposed Route and Alternatives	State	Open Camp	Ritual	Sheltered Camp	Mortuary	Rock Art	Limited Activity	Totals
1E	Proposed Route	WY	13	–	–	1	1	21	36
	Alternative 1E-A	WY	3	–	1	–	–	14	18
	Alternative 1E-B	WY	12	–	–	–	–	9	21
	Alternative 1E-C	WY	9	–	–	–	–	8	17
1W(a)	Proposed Route	WY	12	–	–	–	–	21	33
	Alternative 1W-A	WY	3	–	1	–	–	10	14
1W(c)	Proposed Route	WY	11	–	1	–	–	32	44
2	Proposed Route	WY	219	1	–	–	–	137	357
	Alternative 2A	WY	55	–	–	1	–	26	82
	Alternative 2B	WY	9	–	–	–	–	11	20
	Alternative 2C	WY	50	2	–	1	–	14	67
3	Proposed Route	WY	166	–	1	–	–	126	293
4	Proposed Route	WY/ID	445	3	1	–	–	125	574
	Alternative 4A	WY/ID	115	–	–	–	–	100	215
	Alternative 4B	WY/ID	287	2	–	–	–	91	380
	Alternative 4C	WY/ID	176	–	–	–	–	52	228
	Alternative 4D	WY/ID	169	–	–	–	–	48	217
	Alternative 4E	WY/ID	171	–	–	–	–	45	216
	Alternative 4F	WY/ID	170	–	–	–	–	45	215
5	Proposed Route	ID	–	–	–	–	–	21	21
	Alternative 5A	ID	–	–	–	–	–	7	7
	Alternative 5B	ID	–	–	–	–	–	3	3
	Alternative 5C	ID	–	–	–	–	–	–	–
	Alternative 5D	ID	–	–	–	–	–	17	17
	Alternative 5E	ID	–	–	–	–	–	11	11
7	Proposed Route	ID	1	–	–	–	–	16	17
	Alternative 7A	ID	–	–	–	–	–	5	5
	Alternative 7B	ID	–	–	–	–	–	2	2
	Alternative 7C	ID	–	–	–	–	–	1	1
	Alternative 7D	ID	–	–	–	–	–	–	–

Table 3.3-3. Summary of Prehistoric Resources by Segment and Type[1/] (continued)

Segment	Proposed Route and Alternatives	State	Open Camp	Ritual	Sheltered Camp	Mortuary	Rock Art	Limited Activity	Totals
7	Alternative 7E	ID	–	–	–	–	–	–	–
	Alternative 7F	ID	–	–	–	–	–	1	1
	Alternative 7G	ID	–	–	–	–	–	2	2
	Alternative 7H	ID	1	–	1	–	–	36	38
	Alternative 7I	ID/NV[2/]	3	–	3	–	–	95	101
	Alternative 7J	ID/NV	3	–	4	–	–	94	101
8	Proposed Route	ID	9	–	–	–	–	39	48
	Alternative 8A	ID	1	–	5	1	–	45	52
	Alternative 8B	ID	3	–	–	1	–	5	9
	Alternative 8C	ID	–	–	–	–	–	–	–
	Alternative 8D	ID	1	–	–	–	–	1	2
	Alternative 8E	ID	–	–	5	–	–	6	11
9	Proposed Route	ID	5	–	9	–	–	61	75
	Alternative 9A	ID	–	–	–	–	–	2	2
	Alternative 9B	ID	–	–	7	–	–	23	30
	Alternative 9C	ID	–	–	8	–	–	23	31
	Alternative 9D	ID	1	–	6	–	–	42	49
	Alternative 9E	ID	1	–	3	–	–	21	25
	Alternative 9F	ID	1	–	6	–	–	9	16
	Alternative 9G	ID	1	–	9	–	–	49	59
	Alternative 9H	ID	1	–	9	–	–	16	26
10	Proposed Route	ID	–	–	–	–	–	1	1

1/ The Proposed Routes and Route Alternatives are not mutually exclusive, and totals for resource types are not included in this table to avoid error produced by the presence of a resource in more than one alternative.

2/ The Nevada portion of Alternatives 7I and 7J have not been surveyed. According to the BLM staff at the Wells FO, this area has a high potential for cultural resources.

states, the following descriptive schema of resource types was developed. It consolidates the numerous site types listed in the Wyoming, Idaho, and Nevada SHPO databases (see Henderson et al. 2009 for additional discussion of these resource types):

Open Camps are minimally defined by the presence of one or more hearth features. The resource type includes open camps, stone circle sites, ceramic sites, and bone beds/kill sites:

- Stone Circle Sites – Although the evidence suggests that many of these sites are habitation sites, the function of stone circles cannot often be inferred from the available archaeological data and is often determined through Native American consultation.
- Ceramic Sites are open camps that are further distinguished by the presence of prehistoric pottery. Such temporally diagnostic artifacts are useful in determining not only the age of an occupation, but the cultural affiliation of the occupants.
- Bone Beds/Kill Sites are locations where large and medium-sized game animals were killed and butchered. Sites are usually recognized by large scatters of bones.

Ritual Sites are places where formalized ceremonies took place or are natural features on the landscape that have religious significance. In the Project area, *stone alignments and cairns* are the most visible remnants of ritual localities. The most dramatic example of such sites is the "medicine wheel," which consists of concentric circles of stones, radiating lines or spokes, and an altar stone or cairn in the center (BLM 2004c).

Sheltered Camps generally consist of a rock overhang or cave, with evidence of human occupancy such as smoke-stained ceilings, artifact scatters, or other features. In this area, rock shelters are most representative of this resource type

Rock Art Sites include pictographs or petroglyphs, which are respectively drawn or inscribed on rock faces. The images often depict events such as battles, spiritual visions, environmental observations, hunting activities, deaths and burials, or simply the visitation of an individual or group at that location.

Mortuary Sites are locations where a body has been interred or is related to burial practices.

Limited Activity Sites are short-term camps where a specialized activity took place. They include lithic scatters, lithic landscapes, quarry sites, and vegetal processing sites.

- Lithic scatters consist of stone materials that remain from lithic procurement activities or stone tool manufacture, and may include bifaces, unifaces, and flaking debris.
- Lithic landscapes cover many miles and are areas or regions where aboriginal peoples habitually tested and procured tool stone and lithic materials. The result

is a cultural landscape created by thousands of years of repeated use (Berrigan 1992; Stainbrook 1994; Harrell 1996).

- Quarry sites are lithic procurement locations where prehistoric peoples extracted lithic materials from primary or secondary geological contexts.
- Vegetal Processing Sites are locations where diagnostic artifacts indicate the collection of processing of floral remains without evidence of occupation (Tate et al. 1989). They are often separated from other sites because they identify a specific type of resource extraction activity.

Archaeological District is defined as "a grouping of sites, buildings, structures, or objects that are linked historically by function, theme, or physical development or aesthetically by plan" (NPS 2000). Districts are not included in the site count summaries as a whole; however, individual sites that are within the districts, within the Analysis Area, are included in the site number totals by segment in Table 3.3-3.

Some categorizations represent compromises (e.g., should a ritual function be categorically applied to stone alignments). Some bone beds and kill sites exhibit hearth features and thereby can legitimately be categorized as open camps, while others lack such features and might better be considered a separate category, but that would defeat the purpose of the consolidated approach.

Following Table 3.3-3 is a general overview of prehistoric resources by state. Specific examples of important sites were identified during agency and public scoping, and are included as examples to demonstrate the breadth and complexity of the prehistoric resources across the Project area.

Wyoming Prehistoric Resource Overview

The Project crosses that portion of Wyoming that falls within the Northwestern Plains and Great Basin culture areas. Due to the overall size of the Project and the number of different geographic zones, a comprehensive culture history of the Project is not included in this EIS. The reader is directed to the *Handbook of North American Indians, Volume 13, Plains* (DeMallie 2001) and *Prehistoric Hunter-Gatherers of the High Plains and Rockies* (Kornfeld et al. 2010) for comprehensive and in-depth summaries of the various prehistoric and ethnographic cultures and cultural developments within the region.

Previously recorded prehistoric resources in the Wyoming portion of the Project area (Segments 1 through 4) are represented by at least one of each defined site type. Together, open camps and limited activity sites comprise over 90 percent of the resource types.

Wyoming Open Camps

- *The Deadman Wash Site* (48SW1455), an open camp, is located less than 0.25 mile north of the Proposed Route in Segment 4 and is one of the most important prehistoric sites within the study area. The site was repeatedly occupied for nearly 8,000 years, from the Paleoindian stage through the Late Prehistoric period (Armitage et al. 1982). Radiocarbon age estimates from various levels

and features, including hearths and semi-permanent structures, provided a well-stratified chronology of occupation periods, lithic tool technology, and mobility and habitation practices of the various cultures. The Deadman Wash site exemplifies long-term occupation and subsistence practices of prehistoric people in southern Wyoming and is the type site for the Deadman Wash Phase (2800 to 1800 Before Present [BP]). Although the site itself was occupied repeatedly, recent research indicates that this phase marks a decrease in the overall population of the Wyoming Basin (Thompson and Pastor 1995).

Other important open camps near the area include Ten Mile Draw, Maxon Ranch, Taliaferro, Blue Point, Hogsback, Willow Spring Bison Pond, Hell Gap, and Pine Springs, all of which have contributed important information about prehistoric occupation in the area.

Idaho Prehistoric Resource Overview

The Project crosses the Great Basin culture area of Idaho, a region that extends beyond the physiographic Great Basin to include portions of the Columbia Plateau and Rocky Mountains. Cultural overviews presented by Butler (1978, 1986), Franzen (1981), Holmer (1986), Meatte (1990), Simms (2008), and Swanson (1974), as well as the literature review prepared for this Project (Nilsson et al. 2009), discuss settlement and subsistence, technology, and cultural interaction of indigenous groups in the study area over time. The reader is referred these overviews for detailed information regarding the cultural continuity and variability presented in Idaho's archaeological record.

Previously recorded prehistoric resources in the Idaho portion of the Analysis Area (Segments 5 through 10) include all defined resource types except for Rock Art; however, Rock Art sites are well-documented in the Project area, particularly in the Guffey Butte-Black Butte Archaeological District. The majority (approximately 75 percent) of these sites are defined as lithic scatters. Two archaeological districts were also identified in the Idaho Project area. These resources are described further below.

<u>Idaho Archaeological District</u>

The Project crosses three archaeological districts in Idaho.

- The proposed *Tunnel Hill Archaeological District* consists of a dense distribution of obsidian (ignimbrite) quarries and open air habitation sites located along a bluff overlooking Shoshone Basin. Diagnostic artifacts suggest the area has been used for the last 9,000 years (Guisto 2010). Evaluation of the district is scheduled for completion in December 2013. The district is crossed by Alternative 7H, 7I, and 7J.
- *Guffey Butte-Black Butte Archaeological District* occupies an area extending along the course of the Snake River for over 24 miles and across four counties. This archaeological district contains over 114 prehistoric and historic archaeological sites (Green and Torgeson 1977). The district was nominated to the NRHP in 1977 (Green and Torgeson) and listed in 1978 (NPS 2010a). The district is significant primarily for its dense abundance of prehistoric sites, including 77 open campsites—numerous villages possessing pithouse features

among them—and 33 rock shelter sites. The district also contains some of the most impressive prehistoric rock art found in the state of Idaho, and over 68 boulders bearing petroglyphs have been recorded there (Green and Torgeson 1977). Historic resources are also present within the district, including several associated with early placer mining activity in the area. Historic sites within the district boundaries include the Guffey Railroad Bridge, the old town site of Guffey, the Swan Falls Dam and Power Plant, and the associated wagon road leading to Swan Falls Ferry. The Swan Falls Dam and Power Plant dates to 1901 and was listed on the NRHP in 1976 (NPS 2010a). The associated wagon road was recommended as NRHP eligible in 2006 (Root et al. 2006). The wagon road serviced an electrically powered ferry located 0.5 mile downriver from the Swan Falls Dam and Power Plant. The western end of the historic wagon road would be crossed by Alternative 9D.

Generally following the boundaries of the SRBOP, the archaeological district extends from its southeastern boundary, approximately 3 miles south of Black Butte, downriver to its northwestern boundary, just northeast of Guffey Butte. The Proposed Route in Segment 8 would cross the district near its northern boundary, south and east of Guffey Butte. Alternative 9D would cross the district in the vicinity of Sinker Butte.

- *Celebration Archaeological Park* is located 2.5 miles north of the Proposed Route in Segment 9 and within the Guffy Butte-Black Butte Archaeological District boundary. It was established in 1989 to allow visitors to explore the area's unique natural and cultural resources in southwestern Idaho. The park is located on the Snake River, south of Melba, near the western edge of the SRBOP. The park is open year-round and is part of the Western Heritage Historic Byway. The park contains historic and prehistoric architecture as well as "thousands" of petroglyphs that represent over 10,000 years of occupation (Canyon County Parks, Recreation and Waterways 2008). It is also the site of the historic Guffey Bridge, a 500-foot-long, two-span bridge, which was built in 1897 to support the rail line connecting Silver City and Nampa. The bridge is the only surviving structure of its kind in Idaho (ISHS 1993).

<u>Idaho Sheltered Camps</u>

Wilson Butte Cave was identified by the BLM to be within the Idaho Analysis Area for visual impact study.

- *Wilson Butte Cave* is a volcanic, basalt lava blister located on the Snake River Plain in the vicinity of Twin Falls. The cave contains stratified deposits that have provided important radiocarbon dates associated with the human occupation of North America, beginning as early as 15,000 years ago and extending through as late as 425 years ago (Gruhn 1961). While the association of human occupation with the earliest dates obtained from Wilson Butte Cave has been questioned due to the paucity of artifacts found in the lowest strata and the possible disturbance of these strata (BLM 2009b), the site has nonetheless yielded a wealth of information that has aided scientists in modeling the region's ecological and cultural past (Butler 1968; Swanson 1972). With dates firmly associated with

human activity beginning at least 10,000 years ago, the cave provides evidence for the earliest occupation of the Snake River Plain and, in conjunction with data from other sites, the earliest occupation of North America. Separate excavations led by Ruth Gruhn in 1958, 1959, and 1988 have uncovered evidence suggesting that the cave was utilized periodically by numerous cultural groups over thousands of years. In addition to Pleistocene big-game hunters, the cave has provided evidence of occupation by subsequent Great Basin and Desert Culture groups (BLM 2009b; Butler 1968), supplying archaeologists with substantial data contributing to the study of prehistory. The resource has been listed in the NRHP since 1974.

Nevada Prehistoric Overview

The Project (Alternative 7I) would cross the Great Basin cultural area of Nevada, in the northeastern corner of the state, at the Idaho-Nevada state boundary. This area is geographically linked to cultural histories of the Snake River Valley and Rocky Mountains (Butler 1986). Cultural overviews for this portion of Nevada are synonymous with those already listed for the Idaho Project area.

Nevada Limited Activity Sites

Lithic scatters and quarry sites are the most common site type identified within the Nevada Project area. Many of the sites identified in the Analysis Area for Alternative 7I include stone tools that are related to the locally occurring obsidian and ignimbrite sources.

- *Browns Bench* is a 50-mile-long, northeast-to-southwest trending geologic formation containing ash-flow obsidian (Hughes and Smith 1993) located southwest of Twin Falls, west of present-day Salmon Falls Creek Reservoir, and into portions of northern Nevada. It is a well-documented source of culturally utilized obsidian. Toolstone specimens – in archaeological and secondary geological contexts – possessing the locality's specific geochemical signature have been recovered from localities as far away as 62 miles to 124 miles from the primary source (Jackson et al. 2009:87; Jones el al. 2003:20). Archaeological sites on Browns Bench, particularly the Dean site at the headwaters of Cedar Creek, have been extensively studied since the late 1950s. Initially believed to possess Paleoindian components dating back as far as 10,000 BP (Bowers and Savage 1962:10), more recent investigations suggest that occupation of Browns Bench sites occurred somewhat later in time, during the Early Archaic to Late Archaic Periods (Plew 2000:54). As a primary source of valued toolstone, the area holds high potential for the presence of cultural resources.

  Browns Bench Obsidian Source Area (through which Alternative 7I passes) is an extensive cultural resource that is being considered for nomination as an archaeological district eligible for the NRHP. Although a file search identified seven sites along the 9-mile Nevada portion of the route, BLM staff at the Wells FO have indicated that this portion of the route may contain numerous archaeological sites, many of which may be eligible for NRHP. A survey of the

Nevada portion of the route has not yet been completed and is planned for the 2011 field season.

Protohistoric Resources

The Protohistoric stage begins between 300 and 400 years BP with the appearance of European trade goods and continues to the early 1800s with the first European contact. Wyoming was protohistorically and historically occupied by the Eastern Shoshone Tribe. as well as the Ute, Cheyenne, and Arapaho Tribes. The Crow occupied the area northwest of the Project area, including the Big Horn and Wind River Mountains, Yellowstone, and Big Horn Basin, during Protohistoric times. At the time of initial European contact, Northern Shoshone and Bannock groups occupied much of Idaho, and the Western Shoshone were present in portions of the Analysis Area in northern Nevada. Other Tribes, such as the Comanche, Gros Ventre, and Blackfoot, are known to have moved through the area as well. The Eastern Shoshone are thought to be one of the earliest Tribes to obtain European goods and the horse in southern Wyoming due mainly to their close ties with their southern relatives, the Comanche, who extensively traded with and raided the early Spanish settlements throughout the southern Plains and into Texas, New Mexico, and Northern Mexico (Shimkin 1986).

Wyoming Protohistoric Overview

The Protohistoric stage is a relatively little known episode in Wyoming culture history. Assigning an accurate age range has been difficult, because its identifying components are often scarce in the archaeological record. Most identified Protohistoric sites contain individual components that are associated with the period, within a larger multi-component site that may also incorporate Late Prehistoric and Historic components. The Natural Corrals (48SW336) site contained Late Prehistoric Desert Side-notched projectile points, European ceramic fragments worked into gaming pieces, glass trade seed beads, a thimble, black powder percussion caps, and a musket ball (Gardner and Creasman 1986). Site 48SW2472 is a predominantly Late Prehistoric site with a small Protohistoric component consisting of a single blue glass seed bead (Pastor 1980). Both of these sites illustrate the integration of European items and trade goods into Late Prehistoric patterns of mobility and resource procurement, a theme common to Protohistoric sites.

Idaho Protohistoric Overview

The Protohistoric stage in Idaho begins between 300 and 220 years BP with the appearance of the horse in the region, even though many Tribes did not adopt the animal (Plew 2000). The stage is defined by increased mobility among the differing cultural groups; the adoption of new material cultures, such as new house types (Meatte 1990); and the use of new resources, such as bison (Plew 2000). As in Wyoming, sites recorded in Idaho dating to this period are few and are often associated with earlier components (Meatte 1990; Plew 2000). The stage is thought to be a “continuation of the Late Archaic Lifeway” (Plew 2000). Sites near the Project area dating to this stage with documented material evidence, such as metal artifacts and seed beads, include the Three Island Crossing and Bliss sites (Plew 2000).

Nevada Protohistoric Overview

As in Idaho, Wyoming, and throughout the Great Basin, the Protohistoric stage is often difficult to identify archaeologically in Nevada. Characterized by the introduction of the horse, Old World diseases, and western textiles to indigenous groups, its archaeological hallmarks include iron utensils and glass trade beads (Arkush 1990). Historically, the Western Shoshone were the primary occupants of the part of Nevada within the current Analysis Area (Thomas et al. 1986). Notably, the Western Shoshone resisted adoption of the horse until at least the 1830s (Thomas et al. 1986: 263) because maintaining herds did not suit their environmental habitat or traditional means of subsistence (Malouf and Findlay 1986: 500). In this regard, the area provides a poignant illustration of how contact with European settlers was differentially manifested among native populations.

Historic Resources by Segment and Alternative

Historic resources in the Project area are categorized as general socioeconomic themes that are identified as historic trails, agricultural/animal husbandry, energy exploration/resource extraction (subsuming mining, lumbering, and power transmission subtypes), transportation (subsuming historic roads, bridges, and railroad subtypes), waterworks (subsuming canals, pipelines, and ditches subtypes), and historic sites (subsuming inscriptions, military, rural, and urban subtypes). These resource types and their subtypes are listed in Table 3.3-4 followed by a general overview of historic resources by state. Specific examples of important sites were identified during agency and public scoping, and are included as examples to demonstrate the breadth and complexity of the prehistoric resources across the Project area.

Historic Trails – Historic Trails, Stage, and Freight Roads

Indian Trails

Before Euro-American westward immigration, Native Americans had established networks of trails and trade relationships. Commodities such as marine shells, obsidian, and turquoise were carried many miles from their origins. Interregional exchange of goods bearing common social and ceremonial value was well organized throughout the continent (Swagerty 1986). Indian trails had a pronounced impact on the early European American history of the Plains. Native guides led explorers along them, traders built their posts beside them, and battles were fought near them. Some emigrant trails developed from Indian trails, although wagon traffic sometimes necessitated modifications to the routes (Blakeslee 1988). The route that became the Oregon NHT was made up, in part, of Native American hunting and migration paths. Early explorers devised routes that incorporated ancient trails accessible by wagon. In 1812, fur traders made an arduous 10-month journey from Fort Astoria, Oregon, to St. Louis, Missouri, covering much of what would become the Oregon NHT (Dary 2005). Later groups of traders and trappers found an alternative route through South Pass that made it possible for wagons to travel the trail (BLM 1986a).

Table 3.3-4. Summary of Historic Resources by Segment and Type[1/]

Segment	Proposed Route and Alternatives	State	Historic Trails	Agriculture/ Animal Husbandry	Energy Development/ Resource Extraction	Transportation	Water Works	Historic Sites	Totals
1E	Proposed Route	WY	5	4	6	9	4	10	38
	Alternative 1E-A	WY	5	1	2	7	3	1	19
	Alternative 1E-B	WY	–	4	–	2	–	1	7
	Alternative 1E-C	WY	–	1	–	1	–	4	6
1W(a)	Proposed Route	WY	5	3	13	5	2	8	36
	Alternative 1W-A	WY	5	1	1	6	3	1	17
1W(c)	Proposed Route	WY	2	1	2	12	2	6	25
2	Proposed Route	WY	17	12	7	25	–	48	109
	Alternative 2A	WY	2	3	7	18	–	11	41
	Alternative 2B	WY	2	–	1	6	–	5	14
	Alternative 2C	WY	1	2	–	4	–	8	15
3	Proposed Route	WY	11	13	–	7	–	18	49
4	Proposed Route	WY/ID	27	9	4	9	4	29	82
	Alternative 4A	WY/ID	19	24	9	4	3	26	85
	Alternative 4B	WY/ID	15	19	13	7	9	27	90
	Alternative 4C	WY/ID	1	12	10	7	3	1	34
	Alternative 4D	WY/ID	1	8	7	4	6	1	27
	Alternative 4E	WY/ID	1	9	7	5	3	1	26
	Alternative 4F	WY/ID	1	9	7	3	1	2	23
5	Proposed Route	ID	3	–	–	–	–	5	8
	Alternative 5A	ID	1	–	1	–	–	–	2
	Alternative 5B	ID	1	–	–	–	–	–	1
	Alternative 5C	ID	–	–	–	–	–	–	–
	Alternative 5D	ID	2	–	–	–	–	6	6
	Alternative 5E	ID	2	–	–	–	–	4	6
7	Proposed Route	ID	5	–	–	3	–	6	14
	Alternative 7A	ID	2	–	1	–	–	1	4
	Alternative 7B	ID	2	–	1	–	–	1	4
	Alternative 7C	ID	2	–	–	–	–	–	2
	Alternative 7D	ID	1	–	–	1	–	–	2

Table 3.3-4. Summary of Historic Resources by Segment and Type[1/] (continued)

Segment	Proposed Route and Alternatives	State	Historic Trails	Agriculture/ Animal Husbandry	Energy Development/ Resource Extraction	Transportation	Water Works	Historic Sites	Totals
7	Alternative 7E	ID	–	–	–	2	–	–	2
	Alternative 7F	ID	–	–	–	1	–	1	2
	Alternative 7G	ID	1	–	–	–	–	–	1
	Alternative 7H	ID	6	4	1	3	–	8	22
	Alternative 7I	ID/NV[2/]	4	4	–	1	–	9	18
	Alternative 7J	ID/NV	4	4	–	3	1	10	22
8	Proposed Route	ID	5	4	2	14	3	40	68
	Alternative 8A	ID	3	3	1	3	2	38	50
	Alternative 8B	ID	3	1	–	6	–	15	25
	Alternative 8C	ID	–	–	–	1	–	1	2
	Alternative 8D	ID	–	1	–	–	–	4	5
	Alternative 8E	ID	–	3	–	2	–	4	9
9	Proposed Route	ID	1	4	–	2	5	29	41
	Alternative 9A	ID	–	–	–	–	–	–	–
	Alternative 9B	ID	2	1	–	–	1	6	10
	Alternative 9C	ID	1	–	–	–	1	4	6
	Alternative 9D	ID	1	9	–	21	–	16	47
	Alternative 9E	ID	–	–	–	–	–	7	7
	Alternative 9F	ID	1	3	–	12	1	13	30
	Alternative 9G	ID	1	7	–	20	1	15	44
	Alternative 9H	ID	1	1	–	11	2	12	27
10	Proposed Route	ID	3	–	–	3	2	14	22

1/ The Proposed Routes and Route Alternatives are not mutually exclusive, and totals for resource types are not included in this table to avoid error produced by the presence of a resource in more than one alternative.

2/ The Nevada portion of Alternatives 7I and 7J have not been surveyed. According to the BLM staff at the Wells FO, this area has a high potential for cultural resources.

Emigrant Trails

The web of pathways that became variously known as the Oregon, Mormon Pioneer, California, or Pony Express Trails was actually a network of trail segments, river crossings, and landmarks that stretched across 1,800 miles of territory and linked the western frontier to the settled lands of the east. Most components of these four historic trails have been congressionally designated as NHTs and are part of the National Trails System. The Oregon, Mormon Pioneer, California, and Pony Express NHTs coincide and share a common corridor across many, but not all, portions of the Project area.

In addition, some nineteenth century wagon trail segments (known to have been used by emigrants bound for Oregon, Utah, or California) were not included in the original national trails feasibility studies, have not been designated as components of a NHT, and therefore are not part of the National Trails System. These are addressed in this document as individual historic trails.

Interconnecting with these transcontinental trails are regional and local historic stage and freight roads, which likewise are not part of the National Trails System. They, too, are addressed in this document as individual trails.

National Historic Trails

In accordance with the National Historic Trails System Act of 1968 (as amended 2009), the BLM and NPS have developed management plans to identify and protect the NHTs and their associated sites and resources (BLM 1986a; NPS 1998). It is the responsibility of the BLM to protect and interpret trail resources that are under their jurisdiction (BLM 1986a). Implementing those responsibilities includes, but is not limited to, the following tasks: regular monitoring of the resource, keeping the NPS informed, defining boundaries, erecting and maintaining trail markers, providing and maintaining facilities, issuing and enforcing regulations, maintaining the scenic/historic integrity, avoiding destruction of segments, and mitigating the unavoidable impacts (BLM 1986a).

Agricultural/Animal Husbandry Sites are locations, features, or structures associated with cultivating land; raising crops; feeding, breeding, or tending domestic animals; and raising livestock.

Energy Exploration/Resource Extraction – As the explorers and trappers of the late eighteenth century and early nineteenth century were replaced by the growing number of emigrants traveling to or through the Project area, mineral and natural resources began to be actively explored, prospected, and widely exploited. Resource types within this category include lumbering sites, mining sites, and power transmission sites:

- Lumbering sites are buildings, structures, objects, sites, or districts associated with cutting or preparing lumber.
- Mining sites include any buildings, structures, objects, sites, or districts associated with natural resources extraction, such as oil, gas, coal, or other mineral. Mining sites are identified by single and multi-family houses (made out of milled wood, brick, stone, or logs), bunk and boarding houses, concrete and stone foundations, commercial buildings (saloons, stores, and warehouses),

industrial buildings (machine shops and warehouses), mining-related buildings (pump and fan houses, elevator and hoist houses, changing rooms, tool storage houses), cisterns, wells, privies, and railroad features (trestles, spurs, switching equipment, lights, and yards). Mining-related features include adits, shafts, air shafts, hoist frames, and trestles. Artifacts include domestic materials (glass, clothing items, ceramics, food and beverage containers, and tools), machinery (pumps, fans, hoist and elevator equipment), and miscellaneous items such as head lamps, lunch pails, pipes, and other personal items.

- Power Transmission sites are locations, features, or structures involved with the movement of energy from one place to another. Until recently, transmission lines have not been widely recorded as historic sites. The historic context statement written for the Bonneville Power Administration (BPA) (Kramer 2009), and a report prepared for the Western Area Power Administration that was submitted to the Colorado and Wyoming SHPOs (Schweigert 1998), will be used to help guide resource evaluation during the Phase II survey. Both documents contain a detailed historic context on the design and construction of electrical transmission systems in the western U.S.

Transportation sites include buildings, structures, objects, sites, or districts that are associated with the movement of people and their belongings from one place to another. These sites can be related to air, rail, water, road, or pedestrian travel (NPS 2000). Resources within this category include historic roads, bridges, and railroads.

Waterworks sites consist of buildings, structures, objects, sites, or districts that are man-made features that supply water.

Historic Sites – This category comprises the remaining resource types that do not share a related socioeconomic theme. These resource types include inscriptions, military sites, and urban and rural sites:

- Inscriptions are sites where historical, religious, or other records are cut, impressed, painted, or written on stone, brick, metal, or other hard surface.
- Military sites can include buildings, structures, objects, sites, or districts that are associated with any activity that occurred to support military action or where military activities have taken place. Sites can include, but are not limited to, arms storage, fortification, facilities, battle sites, and roads (NPS 2000).
- Urban sites are locations, features, or structures associated with human settlement in a town or city.
- Rural sites include buildings, structures, objects, sites, or districts associated with human settlement in the non-urban setting.

Wyoming Historic Resource Overview

Previously recorded historic resources in the Wyoming portion of the Project area (Segments 1 through 4) are represented by at least one of each defined historic site type. The different resource types are relatively evenly represented throughout the study area with the Waterworks site type representing the fewest in number

(approximately 4 percent). Approximately 20 percent of the historic resources in Wyoming are related to Historic Trails, with the majority of them located in Segments 3 and 4.

Wyoming National Historic Trail Resource Overview

Oregon NHT. The route that became the Oregon NHT was made up, in part, of ancient hunting and migration paths. Early explorers devised a route that incorporated these ancient trails that were accessible by wagon. In 1812, fur traders made an arduous 10-month journey from Fort Astoria, Oregon, to St. Louis, Missouri, covering much of what would become the Oregon NHT (Dary 2005). In 1836, a group of missionaries made the first recorded wagon trip from Missouri to Oregon (Massey 1992a), and they were soon followed by tens of thousands of emigrants (Dary 2005). By 1843, the trail had seen many groups moving west, lured by tales of fertile land, and in that year, one party of more than one thousand people followed the route. A series of forts, constructed to trade with local Native American Tribes, had been established along the route, and these sites also served as way stations for travelers.

The designated trail for the primary route comprises the 1841-1848 wagon route before the gold rush to California (NPS 1998). In Wyoming, the length of the trail is 491 miles, beginning at the point where the emigrants entered the eastern part of the state near Torrington; to Fort Laramie, through the rangeland and to the North Platte River and present-day Casper; on to Independence Rock; through South Pass; to the Green River; and finally stopping at Fort Bridger before crossing the Bear River into Idaho (NPS 1998). The Oregon NHT follows the eastern shore of the Bear River north between the Tunp Range to the east and Boundary Ridge and Boundary Hills to the west. This area is called the Bear River Divide. The Oregon NHT through the divide is considered to be a high-potential segment (NPS 1998). The route would be crossed by the Proposed Route in Segments 1E, 1W, and 4, and Alternatives 4A, 4B, 4C, and 4D.

California NHT. The California NHT, like the Oregon NHT, was initially used by immigrants in the early 1840s to traverse the western expanses of the United States and settle on the west coast. The first covered wagon pioneers to head overland to California were the 69 members of the Western Emigration Society, guided west in 1841 by mountain man Thomas Fitzpatrick. At Soda Springs in present-day Idaho, where Fitzpatrick left them, the emigrants split, with about half proceeding to Oregon and the other 34, known to history as the Bidwell-Bartleson Party, continuing to California on their own without guide or maps (Gillis and Magliari 2004).

Between 1842 and 1848, only some 2,700 emigrants went overland to California, but after the start of the 1849 gold rush, thousands of treasure hunters hit the trails. More than 200,000 people emigrated to California between 1849 and 1860 (Unruh 1979), developing many trail variants as they sought the fastest, easiest, or safest ways west. In the years after the Civil War, a massive effort was undertaken to build the transcontinental rail line, linking the two halves of the country. The completion of that line in 1869 signaled the end of the era when the trail served as the primary route for emigrants traveling to the west (NPS 1998).

The designated California NHT overlaps the Oregon NHT from Independence, Missouri, to the Raft River Crossing in Idaho. The trail comprised numerous routes and cutoffs used by emigrants and gold-seekers in 1844 and thereafter. In Wyoming, the total length of the California NHT is 1,088 miles, including several variants and associated cultural resources:

- *Unthank Grave* – Alvah H. Unthank was part of a group of several men traveling on the California NHT. He died of cholera in 1850, at the age of 19, near present-day Glenrock. His grave is marked by an inscribed headstone, footstone, and metal fence. Howard Jackson of Glenrock installed the fence around the grave in 1924. The Unthank Grave (48CO187) has been designated as a high-potential NHT site by the NPS (1998). The site has since been recommended as eligible under Criterion A for nomination to the NRHP by Abraska Cultural Resource Consultants, Inc. (O'Dell 2000), but SHPO concurrence of NRHP eligibility has not been completed, leaving the resource's NRHP eligibility officially unevaluated. The resource is located within 2.5 miles or less of the Proposed Route in Segments 1W(c), 1E, and 1W(a) and Alternatives 1E-A and 1W-A.
- *Child's Route* – This trail (also known as Child's Cutoff) ran along the north bank of the North Platte River from Fort Laramie to Fort Casper. Prior to 1850, travelers commonly crossed to the south side of the river at an established ferry crossing near Fort Laramie. In 1850 two different companies of travelers successfully continued on the north shore beyond the fort and showed that the route could be safely used by wagons. This route, named for Andrew Child, who wrote a guidebook documenting the route in 1852, helped emigrants avoid two hazardous crossings of the Platte River (Wyoming SHPO 2008). The resource as a whole has been determined NRHP eligible with SHPO concurrence. The Proposed Route in Segments 1E and 1W would cross the route.
- *Sublette Cutoff* – The Sublette Cutoff (also known as Sublette Trail or Sublette's Cutoff) of the Oregon/California NHT exemplifies how explorer and emigrant parties modified the original trail routes in an effort to reduce travel time and avoid hazards. The Sublette Cutoff cut straight across the Green River Desert and eliminated as much as 2 days of travel from the journey (Wyoming SHPO 2008).

  The Sublette Cutoff begins at the Parting of the Ways in Sweetwater County and branches to the right, following a nearly straight western course across the area between the Big Sandy and Green Rivers. The trail then angles southwest, over Holden Hill, up Fontenelle Creek, around the south end of Oyster Ridge, across Pomeroy Basin and Commissary Ridge and to the Hams Fork River. From here, the route turns northwest, crossing Dempsey Ridge, and descends into the valley of the Bear River (Larson et al. 2004). Here, the trail rejoins the primary route of the Oregon/California NHT coming from Fort Bridger. The resource as a whole has been evaluated as eligible for the NRHP. The Proposed Route in Segment 4 and Alternatives 4A and 4F would cross the route.

- Holden Hill – Following the crossing of the Green River, the trip over Holden Hill posed yet another formidable obstacle to emigrants utilizing the Sublette Cutoff. Today, multiple variants of the trail itself remain here as do other signs of emigrant travel. Included among such indicators of emigrant presence are numerous inscriptions bearing their names and several marked, and unmarked, graves (Gardner 1985; Gardner and Johnson 1987; Rosenberg 1984). At two discrete localities in the area, 108 historic inscriptions have been recorded (Gardner and Johnson 1987). This complex of cultural resources occupies 1.25 square miles (Gardner and Johnson 1987) of land on the top and southeastern slope of Holden Hill, approximately 3.2 miles north of the Proposed Route in Segment 4.
- Johnny Williams Grave – The probable gravesite of 10-year-old emigrant Johnny Williams is located along the Sublette Cutoff, south of Holden Hill, approximately 2.4 miles north of the Proposed Route in Segment 4. The boy reputedly died after being run over by a wagon near this location in 1851. The gravesite is currently fenced and marked by a commemorative plaque placed by OCTA in 1987.
- White Hill – The emigrants who used the California NHT faced numerous geographical obstacles on their trip. One constant challenge was the hills that had to be climbed and descended. For modern drivers, this presents little difficulty, but for a tired group of travelers, walking next to a heavily laden wagon pulled by oxen, these hills could potentially bring the journey to a disastrous end. One such obstacle was the “white hill,” named so because of the high content of lime in the rocks. Wagons would first have to climb up the steep eastern face of the hill. When they reached the top, they would be presented with a stunning vista, including the Wind River Range, Uinta Mountains, and Ham’s Plateau. The site is located 1.5 miles south of Alternative 4A and 2.73 miles south of Alternative 4F. The property is a well-known trail resource that has been interpreted and the public visits regularly.
- Alfred Corum Grave – The Alfred Corum grave is one of a few marked graves situated along the Sublette Cutoff trail near Kemmerer. It is located approximately 2 miles south of Alternative 4A. Corum was part of a group that left Missouri in April 1849 hoping to reach the goldfields of California. By July 1849, the party had reached Hams Fork Plateau, where they stopped because Alfred had grown ill. They waited there for a day, reportedly watching almost 200 wagons pass them by. On July 4, the party decided to push on, but left half a dozen members behind to care for Alfred. Unfortunately, his condition worsened and later that day he died and was buried in a shallow grave on the south side of the trail. The gravesite has been protected by fencing and interpretive signs have been installed. The property is a well-known trail resource that the public visits regularly.
- Nancy Hill Grave – In 1852, a party of more than 60 people set out for California. The Hill family, four brothers—Wesley, Samuel, James, and Steven—along with their respective families and their sister Nancy, left their home in Missouri. In July 1852, somewhere near Hams Fork Plateau, Nancy

died of cholera. Only 20 years old, and one of six children of Wesley and Elizabeth Hill, she was buried 65 feet north of the Sublette Cutoff. Her grave is located approximately 2 miles south of Alternative 4A. The gravesite has been protected by fencing and interpretive signs have been installed. The property is a well-known trail resource that the public visits regularly.

  - Emigrant Spring – Emigrant Spring is an important historic emigrant campsite, identified in the Project area 3.5 miles south of Alternative 4A, near the summit of Dempsey Ridge. The site has been recorded as one of the largest and most reliable sources of water and firewood that emigrants would have encountered as they traveled westward along the Sublette Cutoff between 1843 and 1867 (Jensen 1975; Larsen 2003). Emigrant graves are located near the spring and intact trail ruts connect to the spring's eastern boundary (BLM 1986a). Today, the site consists of a developed spring, livestock troughs, and a grove of aspen and Douglas-fir trees. The property is a well-known trail resource that has been interpreted and the public visits regularly.

- *Slate Creek Cutoff* – The Slate Creek Cutoff was developed ca. 1852 in response to the need for a route that would avoid the dry and dangerous Sublette Cutoff. The Slate Creek Cutoff diverges from the main route of the California NHT west of the Big Bend on the Big Sandy River. The cutoff crosses the Green River at a point downstream from modern Fontenelle Dam and heads west toward Emigrant Spring. The trail then traverses Slate Creek Ridge and meets the Sublette Cutoff near Rocky Gap. Spatial data provided by NPS and BLM Kemmerer FO depict the resource as forking and following two discrete, northern and southern, physical paths that parallel Slate Creek south of Green River. The northern and southern routes of the resource would both be crossed by the Proposed Route in Segment 4. This resource as a whole has been determined, with SHPO concurrence, as eligible for the NRHP.

- *Dempsey-Hockaday Cutoff* – Established by indigenous groups long before the nineteenth century westward migration, the Dempsey-Hockaday Trail (also referred to as the Dempsey Cutoff or Dempsey-Hockaday Trail) is a 17-mile-long shortcut on the Sublette Cutoff portion of the California NHT between Rocky Gap and Dempsey Ridge. John Hockaday was a mountaineer and government surveyor, and Robert Dempsey was a trader and fur trapper. In 1854, Dempsey and Hockaday attempted to divert a portion of the overland migration from the Sublette Cutoff across this segment of the trail, which crosses Commissary Ridge, Hams Fork Plateau, and Dempsey Ridge. Although it was reportedly a more difficult passage than the Sublette Cutoff to the south, the trail was in use up until the early twentieth century. Today, many portions of the Dempsey-Hockaday Trail retain their historical character and physical integrity and are an important component of the greater California NHT system across the Trans-Mississippi West. The resource in its entirety has been determined NRHP eligible as of 1981 (Rosenberg 1981). Alternative 4F would cross the trail.

Pony Express NHT. The Pony Express was a short-lived (April 1860 to October 1861) mail delivery service that followed the Oregon and California NHTs and was advertised as a quick way to send a letter from St. Joseph, Missouri, to Sacramento, California. A

series of relay stations were built along the route that allowed riders to change horses approximately every 10 miles (Bradley 2003).

No relay stations were identified in the Project area through a cultural records search of Wyoming SHPO data. The same Project segments and alternatives identified for the Oregon NHT (Proposed Route in Segments 1E, 1W, and 4, and Alternatives 4A, 4B, 4C, and 4D) would cross the route.

Mormon Pioneer NHT. In 1846, members of the Church of Jesus Christ of Latter-day Saints ("The Mormons") were driven from Nauvoo, Illinois, by anti-Mormon vigilantes. The first party of pioneers set out across the Iowa prairie in February of that year under the leadership of Brigham Young and arrived at the Missouri River, in the vicinity of present-day Council Bluffs, Iowa, in mid-June. There they settled into their "Winter Quarters" and began planning their migration to the Great Basin, where they could live apart and establish their own government (NPS 1998). In April 1847, a select vanguard of pioneers, again led by Brigham Young, set out along the north side of the Platte River (avoiding conflict with travelers on the south side Oregon NHT) and entered present-day Wyoming on June 1 (NPS 1998). The vanguard group reached the Salt Lake Valley on July 24, 1847. Thousands more Mormon pioneers followed their trail, adding handcart segments and other variants, over the next two decades (Kimball 1991).

The Mormon Pioneer NHT consists only of the route followed by Brigham Young's 1846-47 pioneer vanguard contingent (NPS 1998). In Wyoming, the total length of the trail is 511 miles and overlaps the Oregon NHT from Fort Laramie to Fort Bridger, where they cross the Bear River and depart the state near the area of the Needles (NPS 1998). The same Project segments and alternatives identified for the Oregon NHT (Proposed Route in Segments 1E, 1W, and 4, and Alternatives 4A, 4B, 4C, and 4D) would cross the route.

<u>Wyoming Non-National Historic Trails/Stage/Freight Roads Overview</u>

The following resources are discussed in the order they occur from east to west across the Project area.

- *Rock Creek and Fort Fetterman Stage Road* – The Rock Creek and Fort Fetterman Stage Road was an early transportation route that connected the Rock Creek Station on the UPRR in Albany County with Fort Fetterman, just west of present-day Douglas, Converse County (Rosenberg and Rosenberg 1998). The U.S. Army opened the stage road in 1877, to replace an older route from Medicine Bow Station to the Rock Creek Road junction, 14 miles south of Fort Fetterman. The Rock Creek and Fort Fetterman Stage Road was slightly shorter (83.5 miles vs. 85.4 miles), built on gentler and firmer soil, and crossed fewer streams than did its predecessor. Mail service was established along the Rock Creek and Fort Fetterman Stage Road in 1878, and freighters associated with the Bozeman Trail also used the road. Stage stations were established at 20-mile intervals along the road, intermingled with lesser stations and ranches. As the railroads expanded across Wyoming during the late nineteenth century, the need for stage and mail service along Rock Creek and Fort Fetterman Stage Road lessened. The U.S. government ended contracting for mail service and

suspended the Rock Creek Stage Line in the late 1880s. Fort Fetterman was abandoned in 1882 as the Indian Wars diminished, and the Rock Creek Station was abandoned in 1900 when the UPRR rerouted its mainline and moved 10 miles south.

Many segments of the stage road have been impacted by Road 61 in Albany County and Road 11 in Converse County, as well by extensive irrigation of hay meadows in the La Prele Creek area between Douglas and Casper (Rosenberg and Rosenberg 1998). Ten segments of the road were recorded in 1998 (Rosenberg and Rosenberg 1998). Only two of those have been recommended eligible to the NRHP. The remainder of the road has yet to be fully evaluated. The Proposed Route in Segment 1E would be located approximately 3 miles northwest of this resource, and Alternative 1E-B would be located approximately 2.5 miles east of the resource.

- *Bozeman Trail* – The route known as the Bozeman Trail was used by gold seekers traveling to the Montana strikes. Gold was discovered near present-day Virginia City in 1863, and the area was soon filled with would-be miners. Within a year, Virginia City had more than 10,000 inhabitants, and the Montana Territory was carved out of the larger Idaho Territory (Lindmeir 2002). The Bozeman Trail came about as gold seekers and settlers sought a quicker route to the newly established territory. The trail followed paths that had long been used by migratory animals and Native American hunting parties. Travelers who used these routes followed the Oregon Trail to a point east of Casper, where the two roads diverged (Chapman 2004). The Bozeman Trail (named for John Bozeman, one of the guides who laid out the route) proceeded on a northwestern axis towards Virginia City. While the route was much quicker and provided good water and forage for pack animals, it also crossed lands occupied by the Shoshone, Arapahoe, and Lakota Sioux. The U.S. Army quickly built a series of posts (Reno, Phil Kearny, and C.F. Smith) to help protect travelers along the trail, which caused further tension with Indian groups (Limerick 1987). The end of the American Civil War in 1865 brought increasing numbers of travelers to the area and led to several clashes, including the 1867 Fetterman Fight (when Captain William J. Fetterman and the 81 men under his command were killed by the Lakota) and attempts to overrun Forts C.F. Smith and Phil Kearny. The fighting continued until the 1868 Treaty of Fort Laramie that ceded the Powder River basin, the Black Hills, and other parts of Montana, South Dakota, and Wyoming to the Native Americans. The treaty also led to the closing of the Bozeman Trail and the forts that lay along it (Limerick 1987). The 1863 route of the Bozeman Trail crosses the Proposed Route in Segment 1W(a) of the Project.
- *Rawlins to Fort Washakie Stage and Freight Road* – The Rawlins to Fort Washakie Stage and Freight Road (also known as the Rawlins to Fort Washakie Trail, the Fort Washakie Military Road, and the Rawlins to Lander Stage Road) was a military and commercial stage road that originated from Rawlins, Wyoming, and provided stage and freight services to Fort Washakie and the town of Lander. In the summer of 1869, Camp Auger (renamed Camp Brown in March of 1870) was established at the present-day town of Lander. This camp

was a military fort, supply post, and the Indian Agency location for the adjacent Wind River Indian Reservation, which housed Chief Washakie and the Shoshone tribe. In 1871, the camp was moved 16 miles northwest and renamed Fort Washakie. The road was built by the U.S. military from Rawlins to Camp Auger in late 1869 or early 1870. It was extended to the newly established Fort Washakie in 1871. Originally this road was used exclusively by the military, but after the town of Lander was platted in 1884 there was a need for civilian stage services, and by 1885 the first commercial stage line was in operation. The early 1880s also brought a federal mail contract for this stage route and a telegraph line paralleled the road by 1882. This road was used as a major freight, passenger, and mail service route until about 1910. The stage line ended its services at the end of 1906. The approaching railroad into Lander from the east devalued the stage road and the final abandonment of Fort Washakie in 1909 made this specific route obsolete. The road was still utilized by local ranchers until the late 1930s, when U.S. Highway 287 was built (Moore et al. 1987). The resource, as a whole, has been determined eligible to the NRHP by the BLM with SHPO concurrence. The trail is located 4.4 miles north of the Proposed Route in Segment 2.

- *Rawlins to Baggs Stage Road* – The origin of the Rawlins to Baggs Stage Road is associated with two significant historical events of the 1860s: the construction of the first transcontinental railroad, which passed through southern Wyoming Territory, and the establishment of the White River Agency for the Ute Indians in northwestern Colorado. Heading southward from Rawlins, the road proceeded along the western base of the Sierra Madre Range crossing the Overland Trail at Sulfur Springs. The road continued southward along Muddy Creek to the Snake River Valley, then crossed into Colorado. Stage service ended on the road in 1909 (Frizell 1998).

  As of December 2003, the resource as a whole has been determined NRHP eligible by the BLM with SHPO concurrence. The Proposed Route in Segment 2 would cross the road southwest of Rawlins.

- *Overland Trail* – This trail was developed in response to the Indian troubles that broke out in the early 1860s. The battles and raids that took place along the North Platte River led stagecoach king, Ben Holladay, to seek an alternative route for his stagecoaches. Eventually, the trail cut across the Colorado plains, north of Denver, entered Wyoming at Virginia Dale, and followed the old Cherokee Trail to Fort Bridger (Boyd 1946; Massey 1992a). Stage stations were built every 10 to 12 miles along the route to help maintain stock and horses, and to provide meals, and other services to travelers (Johnson et al. 2005). The Point of Rocks (also known as Rock Point or Almond) Stage Station is located south of the modern Jim Bridger Power Plant and is the only station located within the Project area. The station was listed on the NRHP in 1970 and has since been restored and interpreted for the public. The Proposed Route in Segments 3 and 4 would cross the trail and is approximately 2.4 miles north of the stage station.

- *Rock Springs to Superior Road* – The Rock Springs to Superior Road was built to link the coal-mining town of Superior with Rock Springs as part of the development and expansion of coal resources in southern Wyoming in the early twentieth century. Many new coal-mining sites were opened to serve growing western U.S. rail and industrial needs. The UPRR operated coal mines in several towns and locations around Rock Springs. Many of these mines were classic "company towns" with company-supplied housing, schools, and stores (Gardner 1991:1). Early prospecting in the Superior area was undertaken in the early 1900s and was supplied by wagons during this period.

  The road that appears on historic maps (such as the 1906 and 1908 General Land Office maps) is labeled the Rock Springs to Reliance Road, but it does not lead to the modern-day town of Reliance, which is located approximately 8 miles southwest of the road segment. Other General Land Office maps show this road extending south to eventually tie into roads that paralleled the UPRR, and extending north and east, eventually leading to the town of Superior. The Proposed Route in Segment 4, west of Superior, would cross this road.

- *Point of Rocks to South Pass Stage Road* – This was one of several roads connecting the mining communities at South Pass to the UPRR. It was the shortest and most direct route, but covered rough terrain (Darlington 2006). This made it a less favorable route compared to others, in particular the Bryan (and later Green River) to South Pass stage line. Still, the Point of Rocks to South Pass Stage Road was instrumental in establishing the communities in South Pass after the initial mining boom and it also serviced communities in the Wind River Valley (Darlington 2006). The Proposed Route in Segment 3 would cross the road near the Bridger Power Plant.

- *Rock Springs to Lander Stage Road* – The Rock Springs to Lander Stage Road (also known as the Rock Springs to Lander Stageline or Lewiston Stageline) was formally established in the 1880s as a military transport road from Rock Springs to the Wind River Reservation. The first commercial use of the route began in 1894 when the Rock Springs to Lander Stage Line was established by Rock Springs investors. The route connected the booming Sweetwater Mining District at South Pass to the UPRR in Rock Springs (Gardner 1982). The completion of the Chicago and Northwestern Railway to Lander in 1906 brought the stage coach service on this line to an end, although portions of it were and are still used by local traffic. The Proposed Route in Segment 4, north of Rock Springs on U.S. Highway 191, crosses the Stage Road. The entire resource is eligible for nomination to the NRHP.

- *New Fork Wagon Road* – The New Fork Wagon Road (also known as the Rock Springs to New Fork Wagon Road) was utilized during the late 1800s through the early 1900s. The road provided access from ranches and rural areas in Northern Sweetwater and eastern Sublette counties, to the UPRR railhead and trade center in Rock Springs (Vlcek 2008). The road was used to haul freight, mail, and passengers approximately 80 miles from Rock Springs to New Fork. Sublette County ranchers made annual supply runs to Rock Springs on the New

Fork Wagon Road to prepare for the winter. The trip crossed through sagebrush upland environments, which were generally devoid of water. Several stage stops were located along the wagon road (Vlcek 2008). The first stop was Fourteen Mile Hill at the base of White Mountain. In 1910, the road veered north from Rock Springs to Reliance and then onto the Wells, where the road split. One branch followed Washington Draw, the other branch continued to John Hay's Ranch (Vlcek 2008). The road re-converged and continued north to Eden and Farson, following the Big Sandy River, past the old Francis Place (a stage stop near the Sublette Cutoff). Approximately 15 miles north, a major wagon road junction was located at Ten Trees along the Big Sandy River. From there the road continued to Long Draw, the Mud Holes, and Sand Springs. North of Sand Springs, the road continued onto Two Elk Springs (48SU1407) and Grouse Springs (48SU1406) (Vlcek 2008). The New Fork Wagon Road represents a variety of important historic themes including transportation, colonization, homesteading, early commerce, and communication.

As of 2001, Wyoming SHPO has concurred that the entire resource is eligible for nomination to the NRHP. The resource would be crossed by the Proposed Route in Segment 4 of the Project.

- *Old Bryan Stage Road* – The Old Bryan Stage Road once connected two important travel and freight routes: the Rock Springs to Lander Stage Road and the Green River/Bryan to South Pass City Stage Road. The Bryan Stage Road (which is approximately 11 miles long) was named for Lieutenant Francis T. Bryan of the U.S. Army Corps of Topographical Engineers. Bryan, a prominent surveyor and explorer, served in the Mexican War, and later helped map new routes in Texas, Kansas, and Wyoming (Jackson 1952). The route split off from the Rock Springs to Lander Stage Road near Fourteenmile Gap and then followed a west-trending path to its junction with the Green River to South Pass City Stage Road. It is not known when the road was first used, and it does not appear as a named road until 1908, when it is shown on the General Land Office map for Township 21 North, Range 106 West.

  The arrival of the railroad brought about the creation of the Old Bryan Stage Road. The completion of the UPRR's line across southern Wyoming led to the establishment of railroad towns such as Bryan (also named for Lieutenant Francis Bryan), which quickly became important regional supply points (Larson 1978; Urbanek 1988). The road would be crossed by the Proposed Route in Segment 4.

- *Green River to South Pass Stage Road* – The Green River to South Pass Stage Road was a passenger and freight road that came into use in the early 1870s when the UPRR moved operations from Bryan to Green River City, both stops along the UPRR Main Line (Johnson 1998). Because large portions of the route are shared with the Bryan to South Pass Stage Road, the resource is alternately referred to as the Green River/Bryan to South Pass Road, Green River-South Pass City Stage Road, or Bryan-South Pass City Stage Road (Johnson 1998). The two stage roads share a common route throughout the study area. The

route was frequently used until 1906 when the Chicago and Northwestern Railway completed a line to Lander at South Pass, thus eliminating nearly all but local traffic on the road. The resource in its entirety has been determined NRHP eligible with SHPO concurrence. Segment 4 would cross the road approximately 0.4 mile northwest of the reported location of the Alkali Spring Stage Station, 10.4 miles north of where the Bryan to South Pass and Green River to South Pass stage roads merge.

- *Bryan to South Pass Stage Road* – The Bryan to South Pass Stage Road was a passenger and freight road beginning in the historic town of Bryan, which was a stop along the UPRR Main Line. It was developed in 1868 in response to the success of the Sweetwater Mining District at South Pass. The line was in direct competition with other roads and eventually faded out of popularity in the 1870s after the UPRR moved operations from Bryan to Green River (Johnson 1998). The Bryan to South Pass Stage Road meets the Green River to South Pass Stage Road near Alkali Creek, and it is here the two stage roads combine into a single road, historically continuing north to South Pass. The resource in its entirety has been determined NRHP eligible with SHPO concurrence. The Proposed Route in Segment 4 would cross the road just north of where the roads merge.
- *The 1849 Evans Cherokee Trail* – The 1849 Evans Cherokee Trail is a good example of a trail that evolved into a transcontinental route as a result of trapper, trader, and then emigrant use (Gardner et al. 2006). Although trappers and traders established early on some of the routes later incorporated into the larger trail, the 1849 Evans Cherokee Trail is best known for the numerous groups of Cherokees and others who took the trail west to reach the gold fields of California (Whiteley 2001). The trail was built north past the stage station at Virginia Dale, CO, to the Laramie Plains in southeastern Wyoming. The trail then proceeded westward/northward around the Medicine Bow Range crossing the North Platte River then turning north to present-day Rawlins. The Evans Route (North Route) went near present-day Rawlins and down into the Bitter Creek Valley in 1849 (Gardner et al. 2006:11-13, 16). This route in particular was continually used until the turn of the century by westward-bound stock drivers, emigrants, and travelers. The trail proceeded west along the route of present day I-80 finally joining the Oregon, California, and Mormon Pioneer NHTs near Granger, Wyoming. In 1850, an additional route (South Route) was made on the west side of the South Platte River, crossing the Cache la Poudre River, and then to the Laramie Plains. There the trail turned west near present-day Tie Siding and proceeded along the Colorado/Wyoming border to Green River and Fort Bridger, where it merged with the other emigrant trails (Fletcher et al. 1999).

  The Evans 1849 Cherokee Trail in its entirety is eligible for the NRHP but individual segments within the Project area have not been previously evaluated. The Proposed Route in Segment 4 would cross the trail approximately 4 miles east of Alkali Creek.

- *Opal Wagon Road* – The Opal Wagon Road (48LN949) is a regionally significant Expansion Era stage and freight road that served as a major transportation route in the Green River Valley. The road came into use around 1882 when the town of Opal became a rail stop on the Oregon Shortline (Rosenberg 1990). With the construction of the Oregon Shortline, Opal became a commercial and shipping center. The wagon road provided the shortest link with the upper Green River area (Rosenberg 1990). It was the predominant mail route in the late-nineteenth century until settlements with post offices grew along the New Fork Wagon Road (Vlcek 2008). The growing prominence of automobiles and concurrent decline in cattle drives eventually reduced Opal's importance as a commercial and shipping center.

  The route followed the Sublette Cutoff northward, diverging north of Names Hill to closely parallel the current route of U.S. 189 through La Barge, west of the Green River, through Midway, and onward to Big Piney. Today's Opal Cutoff (State Highway 230) roughly approximates the course of the historic Opal Wagon Road (Rosenberg 1990). By the 1940s, the road was mainly abandoned, although some modern streets incorporated sections of the old route (Murray 2002). The resource as a whole has been determined NRHP eligible by the BLM with SHPO concurrence as of 1988 (Currit 2009). This resource would be crossed by the Proposed Route in 4 and Alternative 4F.

Additional Historic Trail Resources

Additional trail resources that were established as freight or stage roads to serve as connectors between train towns and ranching or farming communities or military outposts were identified within the study area. Westward migration was not the primary purpose for many of these trails and several do not retain good physical integrity and are therefore not summarized herein. These trails include the Shirley-Medicine Bow Road (Proposed Route in Segment 1W), Baggs to Wamsutter Stage Road (Proposed Route in Segment 2), Desert Ranch Stage Road, Bitter Creek Stage Road (Proposed Route in Segment 3), Sublette Cutoff Trail-Westfall Hollow Stage Road (Proposed Route in Segment 4), and the Medicine Bow to Fort Fetterman Road.

Wyoming Agricultural/Animal Husbandry Sites

Homesteads, Ranches, and Sheepherding Camps

These cultural resources represent important parts of Wyoming's economic history. Cattle ranching started first in the area as early as the 1850s when Captain William Sublette and Jim Bridger began to supply cattle to emigrants and freighters at nearby military forts (Massey 1992b). The sheep industry began in 1865 when sheep drives started east from California (Rosenberg 1982). Both of these industries were highly competitive for ample range land, thus stimulating the sheep and cattle wars of the 1890s and early 1900s (Rosenberg 1982). Homesteaders came to the state in the late nineteenth century, struggled with farming practices, and therefore often opted to combine farming and ranching practices (Massey 1992c). The homestead era ended in 1934 when the Taylor Grazing Act reclassified the land and, by the 1930s, many of the original homesteads were abandoned or sold back to the government (Massey 1992c).

The farming and ranching industries still play a large part in Wyoming's economy and define the communities in the area today.

The majority of these resources are distributed between the Proposed Route in Segments 3 and 4. Besides two homesteads (described below), this category includes ranch houses, concrete and stone foundations, log cabins, dugouts, barns, sheds, smokehouses, cisterns, root cellars, corrals, cairns, stock pens, loading facilities, and watering facilities. Artifacts include domestic materials (glass, clothing items, ceramics, utensils, and food and beverage containers), farm and ranch equipment, wood piles, and fencing materials.

- *Rawlings Homestead* – The Rawlings Homestead site is the 1880s homestead of Frederick S. Rawlings, one of the earliest settlers of the Fossil area. Rawlings was a railroad worker, rancher, and one of two individuals responsible for laying out the town site of Fossil. In 1930 the homestead was sold to F.N. Steinhour, a shopkeeper in Fossil. Around 1944 the property was transferred to Melvin and Caroline Winter. By 1946 the homestead was abandoned, and today is owned by the Lewis family, whose ancestors were another pioneering family in the area.

  This site was previously recorded by L. McNees and B. McClelland (1991a) of Mariah Associates as MA597-41A for the Northwest Pipeline System Expansion Project. When the site was surveyed in 1991, it contained historic ranching and domestic debris and several collapsed and intact structures. Among these is the foundation of the original Rawlings house which burned ca. 1900-1902. Several standing structures remain on the property, including a later house and several sheds made of railroad ties. The resource as a whole has been determined NRHP eligible with Wyoming SHPO concurrence. This resource is located less than 0.25 mile from Alternatives 4B and 4C.

- *Lewis Homestead* – The Lewis Homestead is the 1885 home of Susanna and Richard Lewis, some of the first permanent settlers to the Fossil Butte area. They raised cattle and horses on the property up until ca. 1923. In 1902, they donated land for the Fossil town site, helping to foster community development in the area. The site consists of a log house, coal shed, animal shed and corral, an outbuilding of unknown function, and historic debris. All structures, except for the log house, are collapsed or partially dismantled. In 1941, the homestead was deeded to other Lewis family members and has remained in the family to the present day (McNees and McLelland 1991b). The site has been determined NRHP eligible with SHPO concurrence. This resource is located less than 0.25 mile from Alternatives 4B and 4C.

<u>Wyoming Energy Exploration/Resource Extraction</u>

Lumbering sites

In Wyoming, this category includes site types associated with the railroad tie industry that was active in the Project area in the Medicine Bow Range and the upper Green River area from 1867 through the 1940s and 1950s (Rosenberg 1999).

Wyoming Transportation

Historic Roads

- **Yellowstone Highway** – The Yellowstone Highway was one of the earliest automobile routes in the state. Connecting Denver to Yellowstone National Park, it opened in 1915 to help promote tourist travel to the park and help development of individual communities along the way (Francis 2004). In 1920, the Yellowstone Highway became the first highway to be dedicated as a National Park to Park Highway. The National Park to Park Highway system was designed as an auto road that would connect all of the national parks in the western U.S. (Rosenberg 2003). The Yellowstone Highway was designated U.S. 20 in 1926, and it was reconstructed as a modern highway as part of a national highway system during the middle to late 1920s (Rosenberg 2003).

  The Yellowstone Highway is eligible to the NRHP. The portion of the road in the Analysis Area was used until 1940 when U.S. 87 was constructed along a similar alignment (Francis 2004). Known features that are associated with the site include culverts, cattle guards, powerlines, buried pipes, fences, gates, berms, and a small bridge (Rosenberg 2003). The portion of the highway identified by the records search in the Analysis Area follows the Chicago, Burlington and Quincy Railroad grade and would be crossed by the Proposed Route in Segments 1E, 1W(a), and 1W(c).

- ***Lincoln Highway*** – The Lincoln Highway was established in 1913 as one of the first transcontinental automobile roads and extended from New York City to San Francisco. By 1925, the U.S. had many named highways. Each highway was marked with a specific color combination along the side of the road. However, this system proved to be confusing to many travelers because several highways often shared portions of the same route, making it difficult to identify individual highway routes (Longfellow 2008). As a result of this confusion, the federal government realized the necessity of having a uniform system to designate highways. The new system used even numbers to mark east-west running highways and odd numbers to mark north-south running highways, and was included in the Federal Highway Aid Act of 1925 (Rosenberg 2003). In 1926, the highway was renamed U.S. 30 but held its period of significance until 1956 when the development of the modern interstate system reduced its well-known identity to the average traveler (NPS 2004). In Wyoming, the road was developed through four different construction generations (1913, 1920, 1930, and 1940) that began near Pine Bluffs, stretched across the southern half of the state, very close to the modern I-80, then to Evanston, and continuing into Utah. Today, modern roads have been constructed over several of the Lincoln Highway segments in Wyoming.

  As a whole, the Lincoln Highway within Wyoming is eligible for NRHP nomination. The Proposed Route and Alternatives would cross the highway at 24 locations. Many of these potential crossings are located in the Proposed Route in Segments 2, 3, and Alternative 2A, in close proximity to I-80.

- **Kemmerer-Cumberland Road** – The Kemmerer-Cumberland Road was developed in the early 1920s and provided a service and transportation corridor for the Oyster Ridge Coal Mines and as a link between the Kemmerer-Diamondville center and surrounding communities (McNees 1993). By 1940, the Cumberland and Oyster Ridge mines were closed and the road became an occasional route for recreation and ranching use (McNees 1993).

  The Kemmerer-Cumberland Road is eligible to the NRHP. Many segments of the road that have been evaluated during other cultural resource inventories have been determined to be non-contributing. The segment that is identified in Alternatives 4B, 4C, 4D, and 4E has not yet been evaluated but is adjacent to another segment that supports the NRHP eligibility of the road (Stubbs et al. 2004).

Railroads

The construction of a transcontinental railroad during 1867 and 1868 helped to establish many of the largest cities in the state, such as Laramie, Rawlins, Rock Springs, and Evanston (Houston 1998). These cities grew from small railroad camps to large commerce centers. Feeder lines from other railroad companies contributed to urban development in other areas of the state by connecting products, supplies and people. Between 1881 and 1890, 70,000 miles of railroad were constructed nationwide (Gardner and Flores 1989). The cattle, sheep, and coal industries developed contemporaneously with this expansion and benefited greatly from the shipping services offered by the railroad.

The records search identified several railroad resources within the Project area, including the Burlington Northern railroad (Proposed Route in Segment 1W), Hanna town site (Proposed Route in Segment 2 and Alternative 2A), the UPRR (Proposed Route in Segment 3), and two segments of the Oregon Shortline Railroad (Proposed Route in Segment 4).

<u>Wyoming Waterworks</u>

The majority of the waterworks within the Wyoming Project area are small projects developed by private farmers to divert and store runoff for use during the dry season. Larger and more complex waterworks projects, such as the North Platte Project (originally the Sweetwater Project), were developed in the Project area as early as 1905 by the Bureau of Reclamation (BOR 2009a). This project was built to help store spring runoff and to control the release of water that now supports approximately 335,000 acres (from Wyoming to Nebraska) of productive farmland today (BOR 2009a). The Seedskadee Project, completed in 1964, is the most prominent waterworks project in the Project area (BOR 2009b). The project, largely consisting of the Fontenelle Dam, power plant, and reservoir, stores and regulates water from the Green River. Although the project was initially designed to address irrigation concerns, its goals were redirected prior to construction in 1964 to provide water for municipal and industrial water and for fish and wildlife (BOR 2009b).

Canals

In the late 1880s, large irrigation systems were built in Wyoming to supply water to large tracts of land allowing for the production of crops such as sugar beets, seed potatoes, alfalfa, and wheat (Reiss 2000). These irrigations systems often consisted of several large canals that not only contributed to increased agriculture but also encouraged additional settlement and development of many of the small towns that exist today in Wyoming (Thibodeau 1994).

- **Rawlins Wood Pipeline** – The Rawlins Wood Pipeline is a 35-mile-long gravity flow water line built in 1927 (Gardner 1982). It originated in the Sage Creek Basin, where it collected water from 25 different fresh water springs and then flowed north to Rawlins through a series of siphons. The engineering of the pipeline is representative of a distinctive type of construction considered that of a master craftsman (Gardner 1982). It also provides an excellent example of how water systems can function without the aid of fossil fuel energy (Gardner 1982). The pipeline was replaced in 1982 with a new pipeline, while leaving the original in place. Subsequent evaluations have discovered that some segments have been destroyed or completely removed (Hoefer 1999; Sanders 2007). The pipeline was believed to be intact in the Sage Creek Basin in 1996 (Rosenberg 1996).

Wyoming Historic Sites

Military Sites

The records search identified two military sites: Fort Fred Steele and a military stage trail, the Hay Reservation Road. Fort Fred Steele is listed in the NRHP, and the Hay Reservation Road is considered not eligible for listing in the NRHP.

- **Fort Fred Steele** – Fort Fred Steele was built in 1868 to help protect the workers from Indian attack while building the first transcontinental rail line and, later, to protect the railroad bridge over the North Platte River, which lay just east of the post. The fort was named for a minor Civil War figure, brevet Major General Frederick Steele. In 1886, the Army decommissioned the post and, by 1893, the land had been sold to private owners. A small community had developed around the fort during its years of operation and a network of roads led from the fort (and its railroad stop) to surrounding farms, ranches, and settlements. In 1895, the land on which the fort had stood was sold to the Cosgriff Brothers, for use in their sheep operations (Coutant 1899; Larson 1978). Even though many of the old fort buildings were destroyed in a fire sometime after the post was closed, some of the buildings and foundations survived and still exist today. The site was listed in the NRHP in April 1969 and is currently managed by the Division of State Parks, Historic Sites, and Trails as a Wyoming State Historic Site. The division is currently working closely with public interest groups to improve site preservation through stabilization, restoration, and improved interpretation. It is a marked tourism stop along I-80, approximately 12 miles east of Rawlins, and self-guided tours are allowed year-round. The resource is located 2.1 miles from the Proposed Route in Segment 2, 506 feet from Alternative 2A, and 0.4 mile from Alternative 2B.

Rural Sites
In Wyoming, a group of historic cabins were identified for the visual impact study conducted in 2008.

- **Historic Cabins** – These cabins are located approximately 2.25 miles west of the Proposed Route in Segments 1W(a) and 1W(c), north of Bates Creek Reservoir. No site records exist for this location at this time. These structures have not been previously recorded. These cabins were not formally evaluated during Phase I because they were located outside of the Project Class III Analysis Area; however, they have been included as part of the visual impact study for the Project. The location of the cabins and photographic documentation was forwarded to the Wyoming SHPO.

Idaho Historic Resource Overview

Previously recorded historic resources in the Idaho portion of the Project area (Segments 5 through 10) include all defined resource types except for Energy Development/Resource Extraction sites. Close to half of the historic resources identified are within the Historic Site type and almost 30 percent of the remaining sites are related to historic trails. Most of the historic trails are located in Segments 8 and 9.

Idaho National Historic Trail Resource Overview

Oregon NHT
The Oregon NHT enters Idaho from Wyoming, passing near present-day Montpelier and Soda Springs before reaching the Snake River near Fort Hall. The trail extends west along the south side of the river, passing the areas of Burley and Twin Falls before crossing the river at Glenn's Ferry. The Oregon NHT then continues northwest to Boise and west through the areas of Middleton and Parma before crossing the Snake River again into Oregon. As planned, the Proposed Route in Segment 4 would closely parallel and cross the Oregon NHT near Montpelier. The Proposed Route in Segments 7 and 9 would again approach and cross the Oregon NHT near the Raft River, while the Proposed Route in Segment 5 would cross the trail near Indian Springs. The Proposed Route in Segment 10 would cross the Oregon NHT near Hansen, while the Proposed Route in Segment 8 would cross the trail just east of Mountain Home and closely parallel the trail north of Mountain Home. South and west of Glenn's Ferry, just north of Upper Salmon Falls, the trail passes west of the Hagerman Fossil Beds National Monument. The trail at this location is considered to be a high-potential segment of the Oregon NHT (NPS 1998).

Alternative routes of the Oregon NHT followed the north side of the Snake River from a point north of American Falls to a junction just west of Mountain Home. These routes, known as the North Alternate and Northside Alternate Oregon Trail, are not part of the designated NHT and are described in the non-NHT trail section.

- **Thomas Fork and Big Hill** – Running through southeast Idaho, the Bear River presented a barrier to the emigrants traveling along the Oregon NHT. After crossing into Idaho, travelers were confronted with two obstacles. The first, Thomas Fork, was a low spot on the Bear River, where under the right conditions, wagons could cross. By the early 1850s, an entrepreneur had built

two bridges and was charging one dollar per wagon. Those who could not afford the fee had to travel downstream to find another low spot.

After crossing the river, emigrants ascended the Sheep Creek Hills. Wagons would first have to climb up the east face of the Big Hill, and then make an arduous dangerous descent down a steep rocky slope. Travelers wrapped ropes around trees in an effort to belay their heavy wagons, and furrows are still visible where wagons skidded and slid down the hill. Big Hill has been designated as a high-potential NHT site by the NPS (1998). This site is located 3.5 miles north of the Proposed Route in Segment 4.

- **Massacre Rocks** – The Massacre Rocks Site is named for two rock outcrops situated to the south of the Oregon NHT that leave just enough room for wagon passage (NPS 1998). The area was perceived as an ideal place for an Indian ambush and reputedly inspired fear among travelers. As emigrant traffic on the trail increased, there was a corresponding decrease in the report of skirmishes (Michno and Michno 2009). One of the last documented hostile encounters between immigrants and Indians in this part of Idaho occurred in the Massacre Rocks vicinity in 1862 (NPS 1998). The Oregon NHT adjacent to Massacre Rocks is currently listed in the NRHP and the property is currently maintained and managed as Massacre Rocks State Park. The Massacre Rocks Site has been designated as a high-potential NHT site by the NPS (1998). This resource is located approximately 4 miles southwest of Alternative 5D.
- **Parting of the Ways / Raft River Crossing –** This location along the Oregon NHT in Idaho is immediately west of the Raft River Crossing and consists of one of a few original wagon trails in the state. Here, emigrants bound for California would head south towards the Cassia Valley and the City of Rocks (NPS 1998). Those bound for Oregon would continue west over the rangelands to follow the Snake River. This resource is located approximately 0.5 mile south of where the Proposed Route in Segment 7 would cross the trail.
- **Rock Creek Station and Stricker Ranch** – Though this spot is best known first as a point on the Oregon NHT, and later as a stop along the Kelton Road, it had been frequented by Native Americans, fur trappers, and early western explorers (Wright 1972). In 1864, Ben Holladay won a contract to operate a mail and stage line from Salt Lake City to Walla Walla, Washington (Wright 1972). His company built a series of stations along the route, including one at Rock Creek (Planmakers 2001:5). In the following year, a store/trading post opened at the site, followed by a post office in 1871. In 1876, Herman Stricker and his business partner John Botzet bought the station, store, and other buildings at the site. Stricker had emigrated to the U.S. from Germany, served with Union forces during the Civil War, and then operated a commissary for railroad workers. In 1877, he became the postmaster at Rock Creek (Planmakers 2001:5). In 1884 he filed for the water and mineral rights for the site, and later homesteaded multiple parcels. Eventually he assembled an agricultural complex of more than 900 acres. In 1984, the Stricker family donated a 5-acre parcel containing the historic stage station to the State of Idaho (Planmakers 2001:5). The structures

located on this property have been listed in the NRHP since 1979. The resource has been designated as a high-potential NHT site by the NPS (1998). This resource is located approximately 3.2 miles north of the Proposed Route in Segment 9, 3.9 miles west of the Proposed Route in Segment 10, and 3.7 miles north of Alternative 7I.

- **Three Island Crossing** – This site is named for the presence of three islands extending across the Snake River that allowed travelers on the Oregon NHT to make smaller fords across the river at this location. Travelers commonly used the crossing until the 1869 construction of Glenns Ferry, located approximately 2 miles upriver. Although the crossing largely fell out of use at this time, some who could not afford the ferry fee continued to use Three Island Crossing (Fanselow 2001). The resource is currently maintained and managed as an Idaho State Park and has been designated a high-potential NHT site by the NPS (1998). Three Island Crossing is located approximately 2.7 miles northeast of the Proposed Route in Segment 9.
- **Canyon Creek Stage Station** – The Canyon Creek Stage Station is located 2 miles northeast of Segment 8 at Canyon Creek, 6 miles north of Mountain Home in Elmore County. This stage station was built in 1880 and was one of many stops later established along the Oregon NHT. A fire in 1970 destroyed part of the roof and wooden addition; however, much of the brick foundation still remains today (Mauser 2005). The resource has been designated as a high-potential NHT site by the NPS (1998). Canyon Creek Stage Station is located approximately 2.1 miles north of the Proposed Route in Segment 8.
- **Rattlesnake Station** – The self-described stagecoach king, Ben Holladay, built this stage stop in August 1864 to serve his Overland Stage Line. Passengers traveling between Salt Lake City, Utah, and Walla Walla, Washington, would stay at the station. As such, it became an important transfer stop for several lines that ran through it (ISHS 1984). Rattlesnake Station has been designated as a high-potential NHT site by the NPS (1998). This site is located 3.5 miles north of the Proposed Route in Segment 8.
- **Bonneville Point** – Bonneville Point is located approximately 10 miles east of the city of Boise, situated upon a high promontory overlooking the Boise River Valley. The point was named for Captain Benjamin Bonneville, whose fur-trading party first reached the area in May of 1833 (NPS 1998). Anecdote has it that the initial arrival of Bonneville's expedition here is when the name Boise was first derived, as members of his party (or, by some accounts, Bonneville himself) exclaimed, "…*les bois, voyes les bois*!" ("…the trees, look at the trees!"), upon first reaching the summit and looking down upon the Boise River Valley. The point represented the western terminus of the arid terrain of the Snake River Plain for westward travelers, and diary accounts suggest that the view from Bonneville Point was a welcome sight to emigrants for the duration of overland travel across the Oregon Trail (ISHS 2001). The resource is located 8.7 miles north of the Proposed Route in Segment 8, 7.7 miles north of Alternative 8B, and 8 miles north of Alternative 8C.

- **Oregon NHT, South Alternate** – At Three Island Crossing, some emigrants remained on the south side of the Snake River and followed the South Alternate Oregon NHT or Dry Route that continued west to the Oregon Territory. The trail rejoins the Oregon NHT beyond Fort Boise (Kreutzer 2008). Many chose this route if the water was too high at Three Island Crossing. In 1843, Overton Johnson and William H. Winter were among the first emigrants to travel on the South Alternate. They noted that the trail passed through the most "rugged, desert, and dreary country" (Hutchison and Jones 1993).

  Many portions of the route have been mapped from Three Island Crossing to the Idaho/Oregon border (Hutchison and Jones 1993). The trail passes by several locations and landmarks recorded by emigrants, including the Narrows, the Bruneau Sand Dunes, Castle Butte, Henderson Creek, and the site of the Utter Massacre. Several ferries crossed the Snake River from the South Alternate, including Walter's Ferry and Glenn's Ferry. The Sinker Creek segment of this trail, extending from 2 miles west of Castle Butte to 4 miles north of Murphy, Idaho, has been identified as a high-potential NHT trail segment by the NPS (1998). The resource is crossed by the Proposed Route in Segment 8 and Alternative 9D.

California NHT

The California NHT, like the Oregon NHT, was used by emigrants in the early 1840s to traverse the western expanses of the U.S. and settle on the west coast. The California NHT diverged from the Oregon NHT at Raft River, south of the Snake River. A portion of the trail overlaps with the Oregon NHT at American Falls. American Falls was one of the great natural wonders of the California/Oregon NHT became a favorite camping and resting spot for emigrants. This location is designated as a high-potential site for the California NHT (NPS 1998). The trail extended southwest, passing along the west side of the Jim Sage Mountains before entering the northwestern corner of Utah. The first wagons crossed this route in 1841 when a small group of travelers, led by mountain man Thomas Fitzpatrick, made the journey. At Soda Springs, Idaho, the group split into two parties, one continuing to Oregon and the other choosing a more southerly route. The discovery of gold in 1848 caused a mass migration along this trail and established it as a major transportation route to the southwestern coast (NPS 1998). More than 30,000 gold seekers traveled along the trail towards California, followed by 55,000 in 1850 (End of the Oregon Trail Interpretive Center 2008). Between 1849 and 1869, over 200,000 people used the trail (Unruh 1979). The Proposed Route in Segment 9 would cross the California NHT at Raft River, and the Proposed Route in Segment 7 would pass near the junction of the Oregon and California NHT.

- **Bartleson-Bidwell Route** – The Bartleson-Bidwell route was blazed by the first organized wagon train to travel overland from Missouri to California. Made up of 69 people, the group left Missouri in the spring of 1841, enticed by glowing accounts of life in California. The party elected John Bartleson captain, and picked John Bidwell, a 22-year-old school teacher, as secretary (Dary 2005:72). Bidwell, who kept a detailed journal of the trip, later became a prominent California farmer, soldier, and politician.

The Bidwell journal makes clear that none of the members of the party (including their captain) knew the route to California (Gillis and Magliari 2004: 41). The Bartleson-Bidwell party was fortunate in being able to join a group of Catholic missionaries (traveling to Oregon) led by Thomas Fitzpatrick, an experienced guide. The combined parties left Missouri on the path long used by fur-trappers and mountain men that became known as the Oregon NHT. At Soda Springs, Idaho, many members of the Bartleson-Bidwell group decided to follow Fitzpatrick on to Oregon. A group of 34 people, however, ignored Fitzpatrick's warnings against blazing a new route to California and struck out on their own (Dary 2005:74). The party faced many difficulties as it made its way across Utah and Nevada and across the Sierra Nevada Mountains. The travelers eventually abandoned their wagons, and packed their belongings onto the backs of the surviving oxen. On November 4, 1841, the tattered and nearly starving group arrived at John Marsh's Rancho Los Medano's, some 40 miles east of San Francisco (Driggs 1942:207). The Bartleson-Bidwell route is crossed by the Proposed Route in Segment 4.

- **Hudspeth's Cutoff** – Established in 1849, the Hudspeth Cutoff was a 110-mile-long trail that originated on the California/Oregon NHT, before the Parting of the Ways, and connected to the California NHT. The variant extends from Soda Springs west and southwestward to a point on the California NHT near present-day Malta in the Raft River Valley. This cutoff was originally used by a group of 250 people with 70 wagons from Missouri, led by Benoni Hudspeth and John J. Meyers. Instead of continuing on the main route, at Soda Springs the group headed west, determined to find a shorter route to the Humboldt River via this little known hunter's trail. The trail cut 25 miles from the trip but several long stretches lacked adequate water supplies and the route transverses four north-south ridge lines. Despite higher elevation and rougher terrain, this cutoff was used by most of the travelers on the northern California NHT and even some of the people on the southern Oregon NHT (ISHS 1964). The resource, as a whole, has been unevaluated for NRHP eligibility. Hudspeth's Cutoff is crossed by the Proposed Route in Segment 7 and Alternatives 7H and 7I.
- **Salt Lake Alternate** – Samuel Hensley pioneered this route in 1848. The route begins at the base of the Wasatch Mountains, "heading north, swinging through Ogden, crossing the Ogden River, and heading north to Utah Hot Springs and Brigham City. The Salt Lake Cutoff then turned northwest over Rattlesnake Pass and headed west across Curlew Valley. Passing Pilot Springs, Emigrant Spring, and Cedar Spring, the trail proceeded northwest into Idaho and the Raft River" (NPS 1998). The trail continued west through the Raft River Narrows, crossing the Upper Raft River Valley, into the Emigrant Canyon, and "intersected the main California NHT coming from the south at the western end of City of Rocks" (NPS 1998). The City of Rocks Complex is one of the great scenic and historic landmarks along the California NHT. This area of weathered granite formations was a major point of interest for emigrants. The reserve was established to "preserve and protect through cooperative efforts the scenic qualities and attributes of the California Trail landscape, historic rural setting, and granite

features" (NPS 2006). The Salt Lake Alternate at the City of Rocks Complex is considered to be a high-potential segment (NPS 1998). Members of the returning Mormon Battalion, who had just opened the Carson route of the California NHT, took their wagons over this route to Salt Lake City, thereby adapting the cutoff to wagon use. During the gold rush period, Hensley's Salt Lake Cutoff received heavy emigrant traffic (NPS 1998). The resource is crossed by Alternative 7I.

Idaho Non-National Historic Trails/Stage/Freight Roads Overview

- **Northside Alternate Oregon Trail** – Travelers leaving Fort Hall could elect to stay on the north side of the Snake River and follow a pathway frequented by Hudson Bay Company fur trappers. Before 1852, emigrants had to follow the south side of the Snake River, but the discovery and development of fords and ferries made it easier to cross the river (NPS 1998:71). This route became even more popular and easier when a wagon road was built from the ferry crossing at Thousand Spring in 1852. The Northside Alternate was shorter and more direct, and connected to other roads such as Marcus Whitman's Oregon Trail wagon road near Teapot Dome (Planmakers 1992:7). Little information has been located about this route. The NPS notes that few relevant diary entries exist and this has greatly hampered the process of researching and understanding this resource (NPS 1998:71). The route is crossed by Alternative 8A and the Proposed Route in Segment 8 and 10.
- *North Alternate Oregon Trail* – This variant of the Oregon NHT came into use after 1852 following the construction of a ferry above Salmon Falls on the Snake River (Hutchison and Jones 1993). It is estimated that over 15,000 emigrants utilized this trail between 1852 and 1854, during which time it became the most hazardous route through the state of Idaho. Over 50 people died and hundreds of cattle were lost due to inadequate and poisoned water sources. The remains of many of these unfortunate travelers are reputedly in several mass gravesites that line the route (Eichhorst 2010a). Between 1869 and 1879, the Kelton freight and stage line utilized portions of the route (Hutchison and Jones 1993), and much of the trail between modern day Pioneer Reservoir and the point where it rejoins the main route of the Oregon NHT coincides with the historic Kelton Road. The route has recently been delineated by Idaho OCTA members, who are also involved in the process of ascertaining NHT status for the resource (Eichhorst 2010a). Segments observed within the Analysis Area are in good to excellent condition and are assessed as contributing to the overall NRHP eligibility of the resource. The route is crossed by Alternative 5D and the Proposed Route in Segment 5 and 8.
- *Kelton Road* – Kelton Road measured 232 miles long with 19 waystations (Jones 1972). It extended from the railroad at Kelton, Utah, approximately 20 miles from Promontory, to Boise. This route was used to haul supplies to the mines in Idaho in the 1860s, and it followed portions of the older Oregon NHT and the North Alternate Route once it reached the Snake River area. The Proposed Route in Segments 7 and 10 would cross Kelton Road where it approaches the Snake

River. The Proposed Route in Segment 8 would cross Kelton Road where it followed the Oregon NHT east of Mountain Home.

- Pilgrim Stage Station – Pilgrim Stage Station sat along the Kelton Road, a route that linked Kelton, Utah and Boise, Idaho. The route partially followed the Salt Lake Alternate, a branch of the Oregon and Overland Trails (HRA 1996). The first stage company to use the road was the Holladay Overland Mail and Express Company, owned by Ben Holladay. The 240-mile route, which followed a path laid out by John Hailey in 1869, typically required a 40-hour trip to complete (HRA 1996). A series of stations were set up at 10 to 15 mile intervals where horses could be fed and watered. There were "home" stations built at 50- to 60-mile intervals that had sleeping and eating facilities (HRA 1996).

  The Pilgrim station was named for nearby Pilgrim Gulch, which offered Oregon NHT emigrants an area to rest their animals and obtain water from the Snake River, accessible via a steep slope 0.5 mile away. The stage station was built sometime in the early 1870s to serve the stages and freighters that used Kelton Road (Planmakers 1992). The remains of Pilgrim Station were surveyed in 1980 and it was reported that the remnants of a stone foundation were still in place (Martin 1980). The resource is located approximately 0.7 mile northeast of Alternative 8A and 1.4 miles north of Alternative 9B.

- *Toana Freight Wagon Road* – The Toana (also spelled Toano) Freight Wagon Road was used in the early 1870s to haul freight from Nevada to Boise and Idaho mining camps. This road runs north-south along the west side of Salmon Falls Creek in Twin Falls County, passing along the west side of Hagerman Fossil Beds National Monument. The Toana Road linked the town of Toano, Nevada, with southwestern Idaho. The route was first laid out in 1870, when surveyors mapped out a road that was 50 miles shorter than the existing road. The construction of the road is reported to have been managed by John W. Moffat, and the road was opened for traffic by the summer of 1870 (Gray 2005). The road had two branches: a western section that merged with the Oregon NHT at Glenn's Ferry near Tuano Gulch, and an eastern section that connected with the Kelton Road near the mouth of Salmon Falls Creek (Gray 2005). After the road was built, a series of stations were set up at 8- to 12-mile intervals where horses could be fed and watered. "Home" stations, which had sleeping and eating facilities, were also built at 50- to 60-mile intervals. The road was listed in the NRHP in November of 2006. The Proposed Route in Segment 9 parallels the road for approximately 3 miles and would cross the road just west of Salmon Falls Creek and Balanced Rock.

  - Coyote Spring Stage Station – The Coyote Spring Stage Station was located on the Toano (also spelled Toana) Road, a route that linked the town of Toano, Nevada with southwestern Idaho. The station was built sometime in the early 1870s to serve the stages and freighters that used Toano Road (Gray 2005). The site was located near Coyote Springs (sometimes referred

to as Yahoo Springs) which provided water. Little has been found about the facilities at the station, and it is not known if it was a "home station" (with sleeping and eating facilities) or a simpler stop for watering and feeding animals. The site of the station was surveyed in 1999, and the only remains that were found were two trash scatters (Dalmer 1999a, 1999b). The resource is located 1.1 miles south of Alternative 9B.

- *Dorsey's Road* – Dorsey's Road, also known as Grand View to Boise Road, ran from Dorsey's Ferry on the Snake River north past the present location of Indian Creek Reservoir. This road was apparently named for Dave Dorsey, a man who acquired a ranch on the Snake River in the 1870s, located just north of Grand View. Dorsey built a ferry at this location and the road leading from Boise to his ferry gave Boise businessmen a direct route to the railroad and mining camps in northern Nevada (Jones 1982a). The Proposed Route in Segment 8 would cross this road on the southeast side of Indian Creek Reservoir.
- *Boise City-Silver City Road* – The Boise City-Silver City Road was a wagon and stage route that ran between Boise and Silver City. Silver City, now a ghost town in Owyhee County, was established after 1863, and is located 15 miles east of the Idaho-Oregon line. Both gold and silver were mined at this location. Silver City was the county seat from 1866 to 1935. The road was in use as part of a major transportation corridor from 1864 to 1910. The Proposed Route in Segment 8, and likely the Proposed Route in Segment 9, would cross this historic route in Canyon County near Melba. The road is listed in the NRHP (ISHS 1971).
  - Walter's Ferry – Located near present-day State Highway 45 and State Highway 78, Walter's Ferry served the Boise to Silver City stage route from 1863, and helped miners, pack trains, and travelers cross the Snake River until 1921, when a steel bridge was built. In the summer of 1863, the Boise County Commissioners granted a license to operate a ferry to John Fruit, and he was allowed to charge a loaded wagon (with one team of horses) a 4-dollar fee, while a man and horse were charged one dollar each. The ferry was sold many times and had numerous owners and operators during the 58 years that it operated (Jones 1982b).

    Today, the old ferry master's house serves as a museum and the site is surrounded by modern roads and buildings. The original 1921 steel bridge still stands, but it has been superseded by a modern concrete structure (Idaho SHPO 1977). A large concrete parking area on the west bank of the river serves the nearby recreation area. Walter's Ferry is located 2 miles east of the Proposed Route in Segment 8 and 1 mile south of Alternative 8B.

<u>Idaho Agricultural/Animal Husbandry Sites</u>

- **Aguila Property** – The Aguila property is located within the Proposed Route in Segment 10 on U.S. Highway 30 near the Twin Falls Main Canal. The property consists of a Craftsman/Bungalow style residential building, several outbuildings, and an outhouse. It has been determined eligible for its contribution to the early agricultural history in the area.

- **A.J. and Lela Newman Water Tank, Well House, and Chicken House** – The A.J. and Lela Newman water tank, well house, and chicken house, was built in 1918 and is located within the Proposed Route in Segment 10. The site is 7 miles south of Shoshone, in Lincoln County. Andrew Jackson Newman was the mayor of Shoshone and owned a 400-acre sheep ranch in Lincoln County. Besides its association with a locally well-known historic person, the site is eligible for its contribution to early agricultural history in the area.
- **Wendell Trail Stock Driveway** – The Wendell Trail Stock Driveway, located between the towns of Wendell and Gooding, was used to herd large numbers of cattle and sheep to stockyards or railroad sidings. The driveway tied into the Wendell-Shoshone Sheep Trail, and apparently extended northeast to the town of Shoshone in Lincoln County. The Proposed Route in Segment 8 would cross the stock driveway at a point several miles east of State Highway 46.

Idaho Energy Exploration/Resource Extraction

Power Transmission Sites

- Site 10PR682 is the remnant of a former transmission line located along the eastern side of State Highway 37 and paralleling the highway for approximately 14 miles south of Rockland. Seven discrete locations define the site, each consisting of one or more bases of sawn-off, wooden poles. Glass insulators present at several of the locations suggest 1893 to 1923 use. Alternatives 7A and 7B would cross this former transmission line.

Idaho Transportation

Historic Roads

The cultural records search identified the following modern roads that have been recorded as historical sites, including U.S. Highway 30 (10BL39), U.S. Highway 93 (10TF1646), and the Yellowstone Highway (now replaced by U.S. Highway 91). The Proposed Route in Segment 4 would cross U.S. Highway 30 in three locations near Montpelier, in Bear Lake County. The Proposed Route in Segment 9 would cross U.S. Highway 93 north of Hollister in Twin Falls County. The Proposed Route in Segment 4 would cross the Yellowstone Highway, also known as U.S. Highway 91, southeast of Downey, in Bannock County.

Bridges

- **Twin Falls Main Canal Bridge** – The Twin Falls Main Canal Bridge, built in 1903, is located on U.S. Highway 30 within the Proposed Route in Segment 10, approximately 10 miles east of Twin Falls. It is NRHP eligible as a principle component of the Twin Falls Southside Project, an early large-scale irrigation system connected to the Snake River (Leary 2003).
- **Rabbit Creek Bridge** – The Rabbit Creek Bridge, built in 1956, is located within the Proposed Route in Segment 9 on State Highway 78 at Murphy in Owyhee County. The bridge is NRHP eligible as a good example of 1950s stringer/girder construction (Gray 2003).

Railroads

- **Oregon Short Line** – The Oregon Short Line Railroad was established in April 1881 to provide a standard gauge railway from Granger, Wyoming, to Huntington, Oregon. The railroad line was completed to the Idaho-Oregon border by 1884, connecting to the Oregon Railway & Navigation Company line. The Oregon Short Line Railroad eventually assumed control of the Oregon Railway & Navigation Company and in turn was taken over by UPRR, giving UPRR a direct line to the Pacific coast. The Proposed Route in Segments 6, 8, and 10 would cross the Oregon Short Line Railroad.
- **UPRR** – Segments of railway identified in the cultural record search as UPRR lines, located south of Twin Falls, are branch lines that extend south of the old Oregon Short Line route, crossing the Snake River at the town of Burley. The Proposed Route in Segments 9 and 10 would cross these lines.
- **Salt Lake & Idaho Railroad** – The segment of abandoned railroad grade identified as the Salt Lake & Idaho Railroad Company line connected to the UPRR/ Oregon Short Line east of Burley and passed south through the Raft River Valley into Utah. The Proposed Route in Segment 9 would cross the Salt Lake & Idaho Railroad at State Highway 81, just south of the intersection of I-84 and U.S. Highway 30.

Idaho Waterworks

Waterwork sites identified within the Proposed Route in Segment 8 include several structures at Indian Creek Reservoir, south of Boise. Specific features at Indian Creek Reservoir that have been recorded as historic sites besides the reservoir itself include the spillway, the dike, and a drain culvert. Other water-supply features in the Ada County area recorded as historical sites include a drop structure and head gate on the Butte Lateral canal, a crosscheck structure on the Waldvogel Canal, and a drop structure on the South Power Lateral.

Canals

The cultural files search identified several canal sites within the Idaho Project area. These include water conveyances known as the Twin Falls Main Canal, Milner Gooding Canal, A Coulee Canal, High Line Canal, X Canal, Portneuf Marsh Valley Canal, and Bear Lake Outlet Canal. The Proposed Route in Segments 8, 9, and 10 would cross several other unnamed or unidentified canals.

Idaho Historic Sites

Military Sites

- **Minidoka National Historic Site** – The NPS established the Minidoka National Historic Site in 2001 to commemorate the Japanese-Americans who were interned there during World War II. It is located 1 mile east of the Proposed Route in Segment 10, between Idaho Falls and Jerome. Between 1942 and 1945, it eventually contained over 600 buildings with a total population of 13,000 internees (NPS 2003). The camp was historically part of one of the largest forced relocation orders in U.S. history (NPS 2003). Since 2003, former internees and their families make yearly pilgrimages to the camp to reunite the

community. In May 2008, P.L. 110-229 established the Minidoka National Historic Site. At that time, the name changed and the boundary expanded to 300 acres.

Urban Sites

- **Owyhee County Courthouse** – The Owyhee County Courthouse was built in 1936 and listed in the NRHP in 1982 for its architectural significance. It represents modern movement architectural style made popular during the years of 1925 to 1949. The courthouse is a single-story, brick and concrete Art Deco structure with a cast concrete square arch entryway and broadly fluted pilasters, and it is still used today. The courthouse is located within the Proposed Route in Segment 9.
- **Our Lady, Queen of Heaven Catholic Church** – Our Lady, Queen of Heaven Catholic Church is located 1 mile south of the Proposed Route in Segment 9, in Owyhee County, in the small town of Oreana. The church, built in 1883, is a single-story structure of mortar and lava rock with a gabled roof. In the 1960s, the building went through a series of renovations, but the historic character has been retained. It is considered an exceptional example of local masonry efforts in the area and was listed in the NRHP in November 1980 (Arrington 1994).

Rural Sites

- **Hollister School** – In 1904, H.L. Hollister, a land agent and developer, founded the small town that eventually bore his name. Hollister saw an agricultural future for the area using water from the Salmon Tract irrigation system that I.B. Perrine developed in 1910 when he set up the Salmon River Canal Company to manage the Salmon Falls Dam and Reservoir. Between 1909 and 1919, the town increased in size and several businesses opened, including hardware and dry goods stores, a hotel, and a bank. Burton Morse built the school in 1925 to compete with nearby towns and to retain its status as an important trade center (Arrington 1994). The school is located 3.25 miles south of the Proposed Route in Segment 9. Hollister School was listed in the NRHP in 1991.
- **Red Rock Pass Cemetery (Jefferson Hunt Memorial)** – The Red Rock Pass Cemetery (also known as the Jefferson Hunt Memorial) is a small cemetery containing the graves of Jefferson Hunt along with several members of his family. Hunt was a key figure within the Mormon community, serving as a major in the Nauvoo militia and as one of Joseph Smith's body guards. Hunt was instrumental in organizing and leading a party of travelers to establish an easier southern route to California. After traveling to California on the Old Spanish Trail, he returned to Utah and moved with his family to Provo where he helped to construct Fort Utah in the spring of 1849. It was at the end of 1849 that Hunt led the emigrant party of gold seekers, known as the Death Valley 49ers, along the new south route to California. During most of the 1850s, Hunt lived in California, helping to establish a Mormon colony there. He was a California State Assemblymen and a General in the California State Militia (Elliot 1955).

  The surnames represented at the cemetery include Barger, Hunt, Norton, Pratt, and Sepdell, with several grave markers being unreadable or missing. Besides

Jefferson Hunt, other members of his immediate family include one of his wives, children, several grandchildren, son-in-laws, daughter-in-laws, and other in-laws (Cemeteries of Bannock County Idaho 2009). A memorial marker, erected in 1950 by the Utah Pioneers Trails and Landmark Association and Jefferson Hunt's descendents, is also present at this location. The resource is located 2.2 miles south of the Proposed Route in Segment 4.

Nevada Historic Resource Overview

One eligible historic resource, a segment of the California NHT, has been previously recorded within the Project area in Nevada. The NHT is located approximately 2 miles south of the Project within the Visual Analysis Area for Alternative 7I/7J.

Nevada National Historic Trail Resource Overview

California NHT

The California NHT enters Nevada 2 miles south of its northeastern corner. The route follows Goose Creek, crosses Hardesty Creek, and then exits the Project area near Nile Spring. The portion of the trail in the Project area is part of a segment of the California NHT known as the Granite Pass to Humboldt River route. This route has been designated a high-potential segment by the NPS (1998). The California Trail Back Country Byway, from Goose Creek to U.S. Highway 93, parallels portions of this segment of the NHT.

- **Granite Pass to Humboldt River** – The Granite Pass to Humboldt River segment of the California NHT was established in 1842 by Joseph B. Chiles, who was joined by members of the Bidwell party to find a passable route to California (ISHS 1995). In 1842, on a return trip from California, Chiles decided on a route that avoided the Bonneville Salt Flats and traversed farther north through Granite Pass and City of Rocks. In the summer of 1843, Chiles was headed back to California on this same route but his party, led by Joseph R. Walker, took the wagon train down Goose Creek and then up through Granite Pass (ISHS 1995).

Phase I Fifteen Percent Sample Cultural Resources Surveys

Wyoming

Pedestrian cultural resources inventories were conducted for a 15 percent sample of the route resulting in 94 1-mile-long and 500-foot-wide segments of the Project area in Wyoming. As a result of the cultural resources inventory, 40 archaeological sites were identified. The BLM Kemmerer FO provided data on percentages of previously inventoried portions of the Segment 4 Proposed Route and Route Alternatives within that jurisdiction, and known cultural resources within a 500-foot-wide corridor equivalent to the Phase I sampling in other segments. The outcome of this analysis is summarized in Table 3.3-5.

Visual impacts to several historic trails in the study area were assessed for this environmental analysis. The Phase II Class III cultural resources inventory will provide additional detailed information to assess impacts on these and other trails in the Project area.

Table 3.3-5. Summary of Previous Survey Coverage in Segment 4, Wyoming

Route	Length (mi)	Survey Coverage (%)	Sites
Proposed	70	10.7	20
Alternative 4A	65	16.6	29
Alternative 4B	83	18.6	23
Alternative 4C	84	17.8	26
Alternative 4D	83	17.8	22
Alternative 4E	85	17.0	23
Alternative 4F	68	14.4	24

Idaho

Pedestrian cultural resources inventories were conducted for a 15 percent sample of the route resulting in 190 1-mile-long and 500-foot-wide segments of the Project area in Idaho. A total of 131 archaeological sites were identified.

Nevada

Pedestrian cultural resources inventories (a 15 percent sample) were attempted for the Nevada portion of Alternative 7I/7J but the attempt was abandoned due to snow. Surveys are planned for the 2011 field season (prior to completion of the Final EIS). One site was documented along the Nevada portion of Alternative 7I/7J.

3.3.3 Direct and Indirect Impacts

This section is organized to present impacts to cultural resources from construction, followed by operations and maintenance activities, and decommissioning for the proposed Project. Unlike pipelines and other linear projects that disturb the entire ROW, transmission line construction disturbance is generally limited to construction of new service roads and pads for the transmission structures and can avoid many resources. For the purposes of this EIS, direct impacts to cultural resources are estimated based on preliminary locations of ground-disturbing activities. The agencies would require pedestrian surveys to be conducted for the entire Preferred Alternative ROW, with a buffer, to allow for micrositing within the ROW to avoid or minimize direct impacts to cultural resources where found. The results of the analysis of direct impacts are addressed in Section 3.3.3.2.

Although tower locations can be shifted somewhat along the centerline, and roads can be realigned, especially in more gentle terrain, the centerline of the route was established based on an analysis of multiple resources, and its location reflects avoidance of many important resources, in addition to cultural resources. For the purposes of this EIS, the indirect visual impacts of the proposed transmission line were estimated by using the location of the centerline and the average tower height and spacing. While direct and indirect impacts may be reduced in some limited individual cases by shifting tower locations, in general the visual impact of a very large high-voltage transmission line is perceptible across a broad extent of landscape, such that moving towers along the centerline does not substantially reduce the indirect impact. The results of the analysis of indirect impacts are addressed in Section 3.3.3.3. Overall

impacts to cultural resources by route alternatives are analyzed in detail in Sections 3.3.3.4 and 3.3.3.5.

There is a Design Variation involving use of two single-circuit structures proposed by the Proponent for Segments 2, 3, and 4 (see Section 2.2 for details), which is analyzed in Section 3.3.3.6 and a Structure Variation that is analyzed in Section 3.3.3.7. The Proponents have also proposed a Schedule Variation, analyzed in Section 3.3.3.8, in which one of the two single circuits to be constructed in Segments 2, 3, and 4 and a portion of Segment 1W would be built on an extended schedule with construction beginning approximately 2.5 years after completion of the initial construction.

3.3.3.1 No Action Alternative

The No Action Alternative states that the agencies would not issue a permit for the construction or operations of the Project on federally managed lands. No impacts would occur to cultural resources identified in this EIS.

3.3.3.2 Impacts Common to All Action Alternatives

Construction

Construction of the transmission line and its ancillary facilities could directly impact existing cultural resources, such as prehistoric or historic archaeological sites, districts, buildings, trails, roads, and landscapes. Construction or other ground-disturbing activities could directly or indirectly impact previously undetected cultural resources, especially buried resources. Such impacts are likely to be adverse. Identification of new or previously recorded cultural resources and increased use of existing and new access roads may encourage unauthorized site access, artifact collection, and vandalism. Impacts on the setting and feeling for cultural resources may be introduced through the addition of structural elements to the landscape. Construction of transmission line towers introduces an indirect (visual) impact upon existing cultural resources, especially historic trails. Because of the abundance and importance of historic trails in the region, these visual impacts are accorded a separate discussion in Section 3.3.3.3.

The Proponents have proposed the following EPM should eligible resources be adversely impacted (Appendix C-1, Attachment D):

CUL-5 If construction will adversely affect any properties listed on, or eligible for listing on, the NRHP, mitigation will be required. Mitigation may include, but not be limited to, one or more of the following measures: a) avoidance through the use of relocation of structures through the design process, realignment of the route, relocation of temporary workspace, or changes in the construction and/or operational design; b) data recovery, which may include the systematic professional excavation of an archaeological site or the preparation of photographic and/or measured drawings documenting standing structures; and c) the use of landscaping or other techniques that will minimize or eliminate impacts on the historic setting or ambience of standing structures.

This mitigation measure would avoid potential direct impacts to cultural resources if relocation of Project features is possible. The Agencies would require the Proponents to revise the siting of ground-disturbing activities to avoid or minimize impacts to cultural resources. If avoidance is not feasible, this measure would minimize potential impacts through recovery and documentation of archaeological sites and the use of techniques to restore the visual setting of standing structures. In addition, the following EPMs have been proposed by the Proponents:

CUL-1 All work conducted under the Cultural Resources and Paleontological Monitoring and Mitigation Plan will be performed by qualified paleontologists and archeologists with trained assistants.

CUL-2 An Unanticipated Discovery Plan will be included as part of the Cultural Resources and Paleontological Monitoring and Mitigation Plan. This plan will specify what steps will be taken if subsurface cultural resources are discovered during construction, including stopping construction in the vicinity of the find, notification of the appropriate land management agency, identification of a qualified archaeologist or paleontologist to conduct an evaluation of the find, and the development of an approved data recovery program or other mitigation measures.

CUL-3 The Cultural Resource and Paleontological Monitoring and Mitigation Plan will include provisions for the preparation for the preparation and curation of any fossil collections from federal lands and for the preparation of a final report based on the data recovered for activities on federal lands.

CUL-4 Literature reviews and Class III surveys will be completed for cultural resources. A literature review will be conducted on public and private lands and will cover a study area of one-half mile on either side of the proposed and alternate transmission line alignments as well as areas identified for use as staging areas and access roads. Class III surveys covering a 500-foot-wide area centered on the transmission line will be conducted on 100 percent of federal and state lands, and for those private lands for which survey access is granted, prior to the completion of the NEPA process. A good-faith effort will be made to obtain survey permission prior to the completion of the NEPA process.

CUL-6 Avoidance areas will be flagged prior to construction activities. Flagging will be removed once construction is completed in an area.

CUL-7 To minimize unauthorized collecting of archaeological materials or vandalism to known archaeological sites, all workers will attend mandatory training on the significance of cultural resources and the relevant federal regulations intended to protect them.

CUL-8 If human remains are discovered, construction will be halted and the county coroner will be notified. If human remains of Native American origin are discovered, or if associated grave goods or objects of cultural patrimony are discovered on lands managed by a federal agency, the provisions of NAGPRA will be followed.

The regulations governing compliance with the NHPA allow for the development of a PA to "govern the implementation of a particular program or the resolution of adverse effects from certain complex project situations (36 CFR Part 800.14(b))." Given the complex nature of the proposed Project and the Route Alternatives being considered, together with the likelihood of adverse effects on historic properties, the BLM is developing a PA, in consultation with the ACHP, the affected SHPOs, affected Tribes, the Project proponents, and other interested parties, to take into account adverse effects on historic properties. The PA spells out the terms of a formal, legally binding agreement among the state and federal agencies involved in the Project, including the BLM, the Forest Service, the NPS, state SHPOs, and the ACHP. The PA covers the following elements:

- Establishes the Area of Potential Effect (APE) for direct, indirect, and cumulative effects,
- Provides for amending the APE if the Project changes,
- Specifies how historic properties will be identified and evaluated using a phased approach and how effects to those properties will be determined,
- Identifies the process for reporting, consultation, and review of documentation,
- Addresses the development of Historic Properties Treatment Plan with mitigation plans for specific properties within it. to provide for the resolution or mitigation of effects to historic properties as a result of the Project,
- Provides for the inadvertent discovery of cultural resources or human remains,
- Details curation requirements,
- Specifies how construction activities may proceed given the phased nature of identification, evaluation, and treatment of historic properties, and
- Discusses how consultation will be conducted.

The ACHP has formally indicated its interest in the Project and is an active participant in the crafting of the PA. The BLM anticipates that a fully executed PA will be completed before the publication of the Final EIS and must be in place prior to signing the ROD.

In addition to the preparation of a PA, the Agencies will require the implementation of the following mitigation measures:

CR-1 (for historic properties in all segments)

- Avoid direct impacts by designing the route so that no Project facilities, including access roads, are placed within the boundaries of historic properties.
- Should avoidance of historic properties not be feasible, assess adverse effects and develop one or more mitigation measures to address all unavoidable adverse impacts.

CR-2 (for historic trails and other linear routes in all segments)

- Design the transmission line to cross where existing development occurs.
- Cross the resource as close to a 90-degree angle as possible using a dog-leg or S curve.
- Adjust tower placement to use the maximum span distance to achieve maximum tower distance from the linear resource.
- Avoid paralleling the linear resource as much as possible and obtain maximum tower distance by shifting alignment and maximize topographic screening with lower structures, such as the two single-circuit steel-lattice design alternative.

CR-3 Compensatory Mitigation Measures – The BLM, in consultation with the Wyoming, Nevada, and Idaho SHPOs, and consulting parties is developing a PA and a Historic Properties Treatment Plan. Compensatory mitigation measures may be developed as appropriate for specific historic resources. The following example measures may be considered for adversely affected properties, or other measures required:

- Fund or provide interpretive, educational exhibits placed in museums or nearby interpretive centers.
- Develop an illustrated guide to the regional archaeology and history, which would present the results of the Project's archaeology/history in layperson's terms for the general public.
- Provide new markers for the BLM and other public groups to position along historic trails, highways, and other linear resources.
- Fund or provide outdoor, interpretive wayside exhibits along access points to trails, highways, and other linear resources
- Fund or provide educational films or curriculum for area school districts about the history and significance of the linear resources.
- Acquire or trade land with willing seller(s).
- Preserve landscapes from a cultural landscape perspective.
- Bury elsewhere other (non-Project) lower kilovolt transmission or distribution lines.
- Commission studies of associated historic sites along the corridor to support a regional context.
- Re-vegetate disturbed areas to protect or restore viewsheds.
- Provide monetary support to historic trail-related state parks.

CR-4 Conservation Easements – Where feasible and appropriate, conservation easements will be considered to preserve important archaeological and historic sites, and high integrity linear resource segments, or to preserve

viewsheds. A conservation easement (sometimes called a conservation covenant) creates a legally enforceable land preservation agreement between a landowner and a government agency (federal, state, county, or municipality) or a qualified land protection organization ("land trust") for the purposes of conservation. It restricts real estate development, commercial and industrial uses, and certain other activities on a property to a mutually agreed upon level. The property remains the private property of the landowner.

CR-5 On NFS lands, a management plan should be developed for each historic property nominated to the NRHP. The plan should be drafted during the nomination process. The National Heritage Strategy should be used to guide decisions on issues related to the Heritage Program.

Operations

Once the transmission line has been constructed, the presence of large transmission towers would introduce long-term visual impacts. The actual impacts on historic resources are described in detail below in the segment-by-segment analysis of the Proposed Route and Route Alternatives.

The Proponents have proposed the following design features to minimize visual impact:

- A surface finish for each galvanized steel lattice tower (single or double circuit) to produce a dulled finish that reduces surface reflectivity;
- A surface finish for each single circuit weathered steel pole H-frame, which forms a rust-like appearance that can blend into some landscapes; and
- Conductors for the 500-kV and 230-kV lines that are made of aluminum/steel stranding with a non-specular or diffuse finish.

Maintenance

Periodic access to the transmission line ROW is required to maintain its operating function. Thus, access roads would be kept open, at least at a two-track level, which increases the potential for vandalism and illicit collection.

Decommissioning

Impacts from decommissioning would be similar to those for construction. No EPMs are provided by the Proponents to address decommissioning; however, the EPMs proposed by the Proponents for construction would be applicable and would be generally effective at reducing the potential for adverse impacts.

3.3.3.3 Visual Impacts of the Proposed Route and Alternatives by Segment

Section 3.3.2.4 explains the structure and methods for establishing the visual contrast level. Visual impacts from each KOP were assessed for both the proposed Project segments and alternatives. Analysis of the cultural setting, specific to each resource, is also assessed at each KOP location with respect to the visual impact analysis. Impact recommendations will be addressed below in the segment-by-segment analysis.

The results of the impact analysis are summarized in Table 3.3-6. “VS” indicates the KOPs that include a photographic simulation. These photographic simulations are assembled together in Appendix E (Figures E.3-12 through E.3-56).

Table 3.3-6. Summary of Cultural Resource Visual Impact Analysis by Segment and Resource

KOP ID	State Location	Proposed Route or Alternative	Figure Number Reference	General Location/ Description	Distance from Resource to Proposed Route or Alternative (miles)	Visual Contrast Level	Recommendation of Impacts to Cultural Resource
Segments 1W(a), 1W(c), 1E, and Alternatives 1E-A, 1E-B, 1E-C, and 1W-A							
Rock Creek and Fort Fetterman Road							
C43	WY	Alt. 1E-B	3.3-1 — 3.3-2	Twentymile Draw	4.1 from Alt. 1E-B	Weak to Moderate	Adverse impact
Oregon NHT							
C48	WY	Seg. 1W(a), Alt. 1W-A, Seg. 1W(c), Seg. 1E, Alt. 1E-A	3.3-3 — 3.3-5	North Platte River	1.6 from Seg. 1W(a) and Alt. 1W-A, 1.1 from Seg. 1W(c), .01 from Seg. 1E and Alt. 1E-A	Weak	No adverse impact
California NHT							
C47	WY	Seg. 1W(a), Alt. 1W-A, Seg. 1W(c), Seg. 1E, Alt. 1E-A	3.3-6 — 3.3-8	Alvah Unthank Grave	2.6 from Seg. 1W(a), 0.6 from Seg. 1W(c), 2.0 from Seg. 1E, Alt. 1E-A and Alt. 1W-A	Weak	No adverse impact
California NHT – Child's Cutoff							
C45	WY	Seg. 1W(a), Seg. 1E	3.3-9 — 3.3-10	North of Big Muddy Oil Field	2.4 from 1W(a), 3.1 from 1E	Weak to Moderate	Adverse impact
C49	WY	Seg. 1W(a), Alt. 1W-A, Seg. 1W(c), Seg. 1E, Alt. 1E-A	3.3-11 — 3.3-14	East of Monkey Hill	0.45 from Seg. 1W(a), 2.0 from Alt. 1W-A, 3.1 from Seg. 1W(c), 2.0 from Seg. 1E, 2.4 from Alt. 1E-A	Weak	No adverse impact
Historic Resource							
C98	WY	Seg. 1W(a), 1W(c), Alt. 1E-C	3.3-15 — 3.3-16	Historic Cabin	2.0 from Seg. 1W(a), 2.3 from Seg. 1W(c), 1.7 from Alt. 1E-C	Moderate	Adverse impact
Segment 2 and Alternatives 2A, 2B, and 2C							
Rawlins to Fort Washakie Stage Road and Freight Road							
C19	WY	Seg. 2	3.3-17 — 3.3-18	NE Rawlins	4.4 from Seg. 2	Weak	No adverse impact

Table 3.3-6. Summary of Cultural Resource Visual Impact Analysis by Segment and Resource (continued)

KOP ID	State Location	Proposed Route or Alternative	Figure Number Reference	General Location/ Description	Distance from Resource to Proposed Route or Alternative (miles)	Visual Contrast Level	Recommendation of Impacts to Cultural Resource
Segment 2 and Alternatives 2A and 2B (continued)							
Lincoln Highway							
C2	WY	Seg. 2, Alt. 2A and 2C	3.3-19 — 3.3-20	Hanna – Saint Mary's Creek	0.6 from Seg. 2, 1.2 from Alt. 2A, 2.8 from Alt. 2C	Weak to Moderate for Seg. 2 and Alt 2A, Weak for Alt. 2C	Adverse impact for Seg. 2 and Alt. 2A, No adverse impact for Alt. 2C
C3	WY	Seg. 2, Alt. 2A and 2C	3.3-21 — 3.3-23	Hanna	0.9 from Seg. 2, 0.4 from Alt. 2A, 2.8 from Alt. 2C	Moderate to Strong for Seg. 2, Weak to Moderate for Alt. 2A, Weak for Alt. 2C	Adverse impact for Seg. 2 and Alt. 2A, No adverse impact for Alt. 2C
C4	WY	Seg. 2, Alt. 2A and 2C	3.3-24 — 3.3-25	Hanna	0.4 from Seg. 2, 0.5 from Alt. 2A, 3.5 from Alt. 2C	Moderate for Seg. 2, Weak to Moderate for Alt. 2A, Weak for Alt. 2C	Adverse impact for Seg. 2 and Alt. 2A, No adverse impact for Alt. 2C
C20	WY	Seg. 2	3.3-26	Rawlins-Hogback Lake area	3.0 from Seg. 2	Weak	No adverse impact
Rawlins to Baggs Stage Road							
C1 (VS)	WY	Seg. 2	3.3-27 VS E-12 — E-13	Sixteenmile Draw	0.9 from Seg. 2	Moderate to Strong	Adverse impact

Table 3.3-6. Summary of Cultural Resource Visual Impact Analysis by Segment and Resource (continued)

KOP ID	State Location	Proposed Route or Alternative	Figure Number Reference	General Location/ Description	Distance from Resource to Proposed Route or Alternative (miles)	Visual Contrast Level	Recommendation of Impacts to Cultural Resource
Segment 2 and Alternatives 2A and 2B (continued)							
Historic Resource							
C51 (VS)	WY	Seg. 2, Alt. 2A and 2B	3.3-28 VS E-14 — E-16	Fort Fred Steele	2.1 ft from Seg. 2, 506 ft from Alt. 2A, 0.4 from Alt. 2B,	Weak to Moderate for Seg. 2, Moderate for Alt. 2A and 2B	Adverse impact
Segment 3							
Lincoln Highway							
C52	WY	Seg. 3	3.3-29	East Desert Ranch Road	0.4 from Seg. 3	Moderate	Adverse impact
C53	WY	Seg. 3	3.3-30 — 3.3-31	Bitter Creek area	0.4 from Seg. 3	Moderate to Strong	Adverse impact
Segment 4 and Alternatives 4A, 4B, 4C, 4D, 4E, and 4F							
Rock Springs to Lander Stage Road							
C13	WY	Seg. 4	3.3-32	NE of Fourteen Mile Ranch	0.6 from Seg. 4	Weak	No adverse impact
C14	WY	Seg. 4	3.3-33	SE of Fourteen Mile Ranch	1.1 from Seg. 4	Weak	No adverse impact
New Fork Wagon Road							
C15	WY	Seg. 4	3.3-34 — 3.3-36	White Mountain area	1.0 from Seg. 4	Weak to Moderate	Adverse impact
Green River to South Pass Stage Road							
C40 (VS)	WY	Seg. 4	3.3-37 VS E-17— E-18	Alkali Creek	702 ft from Seg. 4	Moderate to Strong	Adverse impact

Table 3.3-6. Summary of Cultural Resource Visual Impact Analysis by Segment and Resource (continued)

KOP ID	State Location	Proposed Route or Alternative	Figure Number Reference	General Location/ Description	Distance from Resource to Proposed Route or Alternative (miles)	Visual Contrast Level	Recommendation of Impacts to Cultural Resource
Segment 4 and Alternatives 4A, 4B, 4C, 4D, 4E, and 4F (continued)							
1849 Evans Cherokee Trail							
C12	WY	Seg. 4	3.3-38	Near Blue Rim Road	2.9 from Seg. 4	Weak to Moderate	Adverse impact
C16	WY	Seg. 4	3.3-39 — 3.3-40	NE of Skunk Canyon	0.6 from Seg. 4	Weak	No adverse impact
C18	WY	Seg. 4	3.3-41	Skunk Canyon	0.4 from Seg. 4	Weak	No adverse impact
Oregon / California NHT							
C27	ID	Seg. 4, Alt. 4A, 4B, 4C, 4D, 4E, and 4F	3.3-42 — 3.3-44	Thomas Fork and Big Hill	1.6 from Seg. 4, 1.9 from Alt. 4B, 4C, 4D, and 4E, 1.8 from Alt. 4A and 4F	Weak to Moderate	Adverse impact
C35	WY	Seg. 4, Alt. 4A, and 4F	3.3-45 — 3.3-46	Rusty Hill	3.8 from Seg. 4, Alt. 4A, and Alt. 4F	Weak	No adverse impact
C36	WY	Seg. 4, Alt. 4A, and 4F	3.3-47	Lombard Road	2.6 from Seg. 4, Alt. 4A, and Alt. 4F	Weak	No adverse impact
C37	WY	Seg. 4, Alt. 4A, and 4F	3.3-48	Lombard Road	0.2 from Seg. 4, Alt. 4A, and Alt. 4F	Strong	Adverse impact
C38	WY	Seg. 4, Alt. 4A, 4B, 4C, 4D, 4E, and 4F	3.3-49	South of Otterson Wash	0.3 from Seg. 4 and Alt. 4A, 4.1 from Alt. 4B, 4C, 4D, 4E, and 4F	Moderate	Adverse impact
C39	WY	Seg. 4, Alt. 4A, 4B, 4C, 4D, 4E, and 4F	3.3-50	South of Otterson Wash	0.3 from Seg. 4, Alt. 4A, and Alt 4F, 4.4 from Alt. 4B, 4C, 4D and 4E	Moderate	Adverse impact
C105	ID	Seg. 4	3.3-51 — 3.3-52	Big Hill Historic Marker	3.3 from Seg. 4	Weak	No adverse impact
C110 (VS)	WY	Alt. 4A and 4F	3.3-53 VS E-19 — E-20	White Hill Trail Monument	1.8 from Alt. 4A, 3.0 from Alt. 4F	Weak to Moderate	Adverse impact

Table 3.3-6. Summary of Cultural Resource Visual Impact Analysis by Segment and Resource (continued)

KOP ID	State Location	Proposed Route or Alternative	Figure Number Reference	General Location/ Description	Distance from Resource to Proposed Route or Alternative (miles)	Visual Contrast Level	Recommendation of Impacts to Cultural Resource
Segment 4 and Alternatives 4A, 4B, 4C, 4D, 4E, and 4F (continued)							
Opal Wagon Road							
C6	WY	Alt. 4A and 4F	3.3-54 — 3.3-55	NE of Craven Creek	2.6 from Alt. 4A and 4F	Weak	No adverse impact
California NHT – Slate Creek Cutoff							
C42	WY	Seg. 4	3.3-56	Slate Creek Trail Marker	3.7 from Seg. 4	Weak to Moderate	Adverse impact
C58	WY	Seg. 4	3.3-57	North of Slate Creek Butte	1.2 from Seg. 4	Strong	Adverse impact
California NHT – Sublette Cutoff							
C7	WY	Alt. 4A and 4F	3.3-58	Alfred Corum Grave	1.4 from Alt. 4A, 2.0 from Alt. 4F	Weak to Moderate	Adverse impact
C8 (VS)	WY	Alt. 4A and 4F	3.3-59 — 3.3-60 VS E-21 —E-22	Nancy Hill Grave	1.5 from Alt. 4A, 2.1 from Alt. 4F	Weak to Moderate	Adverse impact
C9	WY	Alt. 4A and 4F	3.3-61	Emigrant Spring	2.5 from Alt. 4A, 3.2 from Alt. 4F	Weak	No adverse impact
C11	WY	Alt. 4A and 4F	3.3-62	Oyster Ridge	3.3 from Alt. 4A and Alt. 4F	Weak to Moderate	Adverse impact
C28	WY	Alt. 4A and 4F	3.3-63	Quakenasp Canyon	1.3 from Alt. 4A, 2.1 from Alt. 4F	Weak to Moderate	Adverse impact
C29	WY	Alt. 4A and 4F	3.3-64	Dempsey Summit	2.6 from Alt. 4A, 4.6 from Alt. 4F	Weak to Moderate	Adverse impact
C30	WY	Seg. 4, Alt. 4A and 4F	3.3-65 — 3.3-67	Stoffer Ridge	3.1 from Seg. 4, 0.5 from Alt. 4A, 2.5 from Alt. 4F	Weak for Seg. 4, Moderate for Alt. 4A, Weak for Alt. 4F	Adverse impact for Alt. 4A, No adverse impact for Seg. 4 and Alt. 4F
C31	WY	Alt. 4A, 4C and 4E	3.3-68 — 3.3-69	Rock Creek Ridge	0.5 from Alt. 4A, 4.9 from Alt. 4C and Alt. 4E	Weak	No adverse impact

Table 3.3-6. Summary of Cultural Resource Visual Impact Analysis by Segment and Resource (continued)

KOP ID	State Location	Proposed Route or Alternative	Figure Number Reference	General Location/ Description	Distance from Resource to Proposed Route or Alternative (miles)	Visual Contrast Level	Recommendation of Impacts to Cultural Resource
Segment 4 and Alternatives 4A, 4B, 4C, 4D, 4E, and 4F (continued)							
California NHT – Sublette Cutoff (continued)							
C56	WY	Seg. 4	3.3-70	North of Sullivan Hollow	0.5 from Seg. 4	Moderate to Strong	Adverse impact
C57 (VS)	WY	Seg. 4	3.3-71 VS E-23 — E-24	South of Sullivan Hollow	1.4 from Seg. 4	Moderate	Adverse impact
C121 (VS)	WY	Seg. 4	3.3-72 — 3.3-73 VS E-25 — E-26	South of Holden Hollow	2.4 from Seg. 4	Weak to Moderate	Adverse impact
C122	WY	Seg. 4	3.3-74 — 3.3-76	Holden Hill	3.8 from Seg. 4	Weak	No adverse impact
C123	WY	Seg. 4	3.3-77 — 3.3-80	Holden Hill Trail Marker	3.7 from Seg. 4	Weak	No adverse impact
C126	WY	Alt. 4A	3.3-81 — 3.3-82	Rock Slide	3.6 from Alt. 4A	Weak	No adverse impact
California NHT – Dempsey-Hockaday Cutoff							
C10 (VS)	WY	Alt. 4F	3.3-83 — 3.3-84 VS E-27 — E-28	West side Lake Viva Naughton	2.5 from Alt. 4F	Weak to Moderate	Adverse impact
C41	WY	Alt. 4A and 4F	3.3-85 — 3.3-86	East side Lake Viva Naughton	4.8 from Alt. 4A, 3.7 from Alt. 4F	Weak to Moderate	Adverse impact
C124	WY	Alt. 4F	3.3-87 — 3.3-88	South Fork of Dempsey Creek	0.6 from Alt. 4F	Strong	Adverse impact
C125 (VS)	WY	Alt. 4F	3.3-89 VS E-29 — E-30	South Fork of Dempsey Creek	0.4 from Alt. 4F	Strong	Adverse impact

Table 3.3-6. Summary of Cultural Resource Visual Impact Analysis by Segment and Resource (continued)

KOP ID	State Location	Proposed Route or Alternative	Figure Number Reference	General Location/ Description	Distance from Resource to Proposed Route or Alternative (miles)	Visual Contrast Level	Recommendation of Impacts to Cultural Resource
Segment 4 and Alternatives 4A, 4B, 4C, 4D, 4E, and 4F (continued)							
Historic Resources							
C32	WY	Alt. 4B, 4C, 4D and 4E	3.3-90 — 3.3-91	Susanna Lewis Homestead	444 ft from Alt. 4B and 4C, 1.9 from Alt. 4D and 4E	Strong for Alt. 4B and 4C, Moderate for Alt. 4D and 4E	Adverse impact
C33	WY	Alt. 4B and 4C	3.3-92 — 3.3-93	Rawlings Homestead	964 ft from Alt. 4B and 4C	Weak	No adverse impact
C21	ID	Seg. 4	3.3-94 — 3.3-95	Red Rock Pass Cemetery (Jefferson Hunt Memorial)	2.2 from Seg. 4	Weak	No adverse impact
Segment 5 and Alternatives 5A, 5B, 5C, 5D, and 5E							
California NHT – Hudspeth Cutoff							
C24	ID	Seg. 5, Alt. 5A, and 5B, Seg. 7, Alt. 7H and 7I	3.3-96	Cedar Mountain	1.4 from Seg. 5, 1.8 from Alt. 5A and 5B, 2.7 from Seg. 7, Alt. 7H and 7I	Weak to Moderate	Adverse impact
C25 (VS)	ID	Seg. 5 and 7, Alt. 5A, 5B and 5C	3.3-97 VS E-31 — E-32	Hawkins Basin	1.3 from Seg. 5, 0.5 from Alt. 5A, 5B and 5C, 0.2 from Seg. 7	Weak to Moderate for Seg. 5 and Alt. 5C, Strong for Alt. 5A, 5B, and Seg. 7	Adverse impact
Oregon / California NHT							
C26	ID	Seg. 5, Alt. 5D and 5E	3.3-98 — 3.3-99	Massacre Rocks	4.3 from Seg. 5, 4.0 from Alt. 5D and 5E	Weak	No adverse impact

Table 3.3-6. Summary of Cultural Resource Visual Impact Analysis by Segment and Resource (continued)

KOP ID	State Location	Proposed Route or Alternative	Figure Number Reference	General Location/ Description	Distance from Resource to Proposed Route or Alternative (miles)	Visual Contrast Level	Recommendation of Impacts to Cultural Resource
Segment 6							
NONE							
Segment 7 and Alternatives 7B, 7C, 7H, 7I, and 7J							
California NHT – Hudspeth Cutoff							
C22	ID	Alt. 5B, 7B, 7H and 7I	3.3-100	Jensen Pass	2.9 from Alt. 5B, 2.5 from Alt. 7B, 7H and 7I	Weak to Moderate	Adverse impact
C23	ID	Alt. 5B, 7B, 7H and 7I	3.3-101	Sublette Canyon	3.4 from Alt. 5B, 3.1 from Alt. 7B, 7H and 7I	Weak to Moderate	Adverse impact
C65	ID	Alt. 7H and 7I	3.3-102	Meadow Creek	1.6 from Alt. 7H, 3.5 from Alt. 7I	Weak to Moderate	Adverse impact
C66	ID	Alt. 7H and 7I	3.3-103	Meadow Creek	2.0 from Alt. 7H and Alt. 7I	Moderate	Adverse impact
C68 (VS)	ID	Alt. 7H and 7I	3.3-104 VS E-33 — E-34	Twin Canyons	2.0 from Alt. 7H and Alt. 7I	Strong	Adverse impact
C69	ID	Alt. 7H and 7I	3.3-105	SE of Erie Canyon	0.7 from Alt. 7H and Alt. 7I	Strong	Adverse impact
C70	ID	Alt. 7H and 7I	3.3-106	SE of Erie Canyon	0.8 from Alt. 7H and Alt. 7I	Strong	Adverse impact
Oregon / California NHT							
C63 (VS)	ID	Seg. 7, Alt. 7C	3.3-107— 3.3-109 VS E-35 — E-36	Parting of the Ways (Raft River)	0.5 from Seg. 7, 3.4 from Alt. 7C	Moderate to Strong for Seg. 7, Weak for Alt. 7C,	Adverse impact for Seg. 7, No adverse impact for Alt. 7C
Oregon NHT							
C64 (VS)	ID	Seg. 7, Alt. 7C	3.3-110 — 3.3-112 VS E-37 — E-38	West of Raft River	1.0 from Seg. 7, 1.8 from Alt. 7C	Strong	Adverse impact

Table 3.3-6. Summary of Cultural Resource Visual Impact Analysis by Segment and Resource (continued)

KOP ID	State Location	Proposed Route or Alternative	Figure Number Reference	General Location/ Description	Distance from Resource to Proposed Route or Alternative (miles)	Visual Contrast Level	Recommendation of Impacts to Cultural Resource
Segment 7 and Alternatives 7B, 7C, 7H, 7I, and 7J (continued)							
California NHT							
C67	ID	Alt. 7H	3.3-113	North of Cassia Creek	1.2 from Alt. 7H	Weak to Moderate	Adverse impact
C78	ID	Alt. 7I	3.3-114	West of Emigrant Canyon	1.6 from Alt. 7I	Moderate	Adverse impact
C79 (VS)	ID	Alt. 7I	3.3-115 VS E-39 — E-40	North of Birch Creek	0.4 from Alt. 7I	Strong	Adverse impact
C80	ID	Alt. 7I	3.3-116 — 3.3-117	SW of Birch Creek	0.5 from Alt. 7I	Moderate to Strong	Adverse impact
California NHT – Salt Lake Alternative							
C72	ID	Alt. 7I	3.3-118	East of Onemile Creek	0.8 from Alt. 7I	Strong	Adverse impact
C73	ID	Alt. 7I	3.3-119	East of Onemile Creek	0.8 from Alt. 7I	Moderate	Adverse impact
C74	ID	Alt. 7I	3.3-120	East of George Creek	1.3 from Alt. 7I	Weak to Moderate	Adverse impact
C75 (VS)	ID	Alt. 7I	3.3-121 — 3.3-122 VS E-41 — E-42	East of Emigrant Canyon	1.4 from Alt. 7I	Weak to Moderate	Adverse impact
C76	ID	Alt. 7I	3.3-123	East of Smoky Mountain	2.6 from Alt. 7I	Weak to Moderate	Adverse impact
C77	ID	Alt. 7I	3.3-124	City of Rocks Emigrant Canyon	2.1 from Alt. 7I	Moderate	Adverse impact

Table 3.3-6. Summary of Cultural Resource Visual Impact Analysis by Segment and Resource (continued)

KOP ID	State Location	Proposed Route or Alternative	Figure Number Reference	General Location/ Description	Distance from Resource to Proposed Route or Alternative (miles)	Visual Contrast Level	Recommendation of Impacts to Cultural Resource
Segment 8 and Alternatives 8A, 8B							
North Alternate Oregon Trail							
C83 (VS)	ID	Seg. 8	3.3-125 — 3.3-126 VS E-43 — E-44	Canyon Creek	0.5 from Seg. 8	Weak to Moderate	Adverse impact
North Alternate Oregon Trail (continued)							
C84	ID	Seg. 8	3.3-127 — 3.3-128	King Hill	0.8 from Seg. 8	Weak to Moderate	Adverse impact
C85	ID	Seg. 8	3.3-129	Pioneer Reservoir	870 ft from Seg. 8	Weak to Moderate	Adverse impact
C87	ID	Seg. 8, Alt. 8A	3.3-130 — 3.3-132	Malad Gorge State Park	2.2 from Seg. 8, 2.5 from Alt. 8A	Weak	No adverse impact
C112	ID	Seg. 8	3.3-133 — 3.3-134	Hot Springs Creek Reservoir	1.9 from Seg. 8	Weak	No adverse impact
C118	ID	Seg. 8, Alt. 8A	3.3-135 — 3.3-136	Blair Trail Reservoir	1.5 from Seg. 8, 3.1 from Alt. 8A	Weak	No adverse impact
C119	ID	Seg. 8, Alt. 8A	3.3-137	Cold Springs Creek	2.6 from Seg. 8, 3.2 from Alt. 8A	Weak	No adverse impact
Oregon NHT							
C61	ID	Alt 8A , Seg. 9	3.3-138 — 3.3-140	SE of Three Island Crossing	3.0 from Seg. 9, 2.8 from Alt. 8A	Moderate	Adverse impact
C95	ID	Alt. 8A and 9B	3.3-141	West Deer Creek Gulch	0.7 from Alt. 8A, 1.4 from Alt. 9B	Weak	No adverse impact
C96 (VS)	ID	Alt. 8A and 9B	3.3-142 — 3.3-143 VS E-45 — E-46	Pilgrim Stage Station-Kelton Road	0.7 from Alt. 8A, 1.4 from Alt. 9B	Strong	Adverse impact

Table 3.3-6. Summary of Cultural Resource Visual Impact Analysis by Segment and Resource (continued)

KOP ID	State Location	Proposed Route or Alternative	Figure Number Reference	General Location/ Description	Distance from Resource to Proposed Route or Alternative (miles)	Visual Contrast Level	Recommendation of Impacts to Cultural Resource
C97	ID	Alt. 8A, Seg. 9, Alt. 9B	3.3-144 — 3.3-145	Rosevear Gulch area	1.6 from Alt. 8A, 4.2 from Seg. 9, 3.7 from Alt. 9B	Weak	No adverse impact
Segment 8 and Alternatives 8A, 8B, 8C, and 8D (continued)							
Oregon NHT (continued)							
C100	ID	Seg. 8	3.3-146 — 3.3-147	Canyon Creek Station	2.1 from Seg. 8	Weak	No adverse impact
C102	ID	Seg. 8	3.3-148 — 3.3-149	Rattlesnake Station	3.8 from Seg. 8	Weak	No adverse impact
C106	ID	Alt. 8A, Seg. 9, Alt. 9B	3.3-150 — 3.3-151	West of Deer Gulch	1.3 from Alt. 8A, 4.4 from Seg. 9, 0.8 from Alt. 9B	Weak to Moderate for Seg. 9 and Alt. 8A, Moderate to Strong for Alt. 9B	Adverse impact
C107	ID	Alt. 8A	3.3-152	Trail Marker, Kelton Road-West of Pasadena Valley	0.6 from Alt. 8A	Moderate to Strong	Adverse impact
C108	ID	Seg. 8, Alt. 8A	3.3-153	SW of Morrow Reservoir	2.9 from Seg. 8, 1.5 from Alt. 8A	Weak to Moderate	Adverse impact
C111	ID	Alt. 8B	3.3-154 — 3.3-156	Bonneville Point	7.7 from Alt. 8B	Weak	No adverse impact
Boise City to Silver City Road							
C88	ID	Seg. 8, Seg. 9, Alt. 8B	3.3-157 — 3.3-158	Walter's Ferry	1.9 from Seg. 8, 1.0 from Alt. 8B, 3.2 from Seg. 9	Weak	No adverse impact
C89	ID	Alt. 8B	3.3-159 — 3.3-160	Kuna Butte	1.0 from Alt. 8B	Moderate to Strong	Adverse impact

Table 3.3-6. Summary of Cultural Resource Visual Impact Analysis by Segment and Resource (continued)

KOP ID	State Location	Proposed Route or Alternative	Figure Number Reference	General Location/ Description	Distance from Resource to Proposed Route or Alternative (miles)	Visual Contrast Level	Recommendation of Impacts to Cultural Resource
Segment 8 and Alternatives 8A, 8B, 8C, and 8D (continued)							
Prehistoric/Historic Resource							
C103 (VS)	ID	Seg. 8, 9	3.3-161 VS E-47 — E-48	Celebration Archeological Park	2.5 from Seg. 8, 4.9 from Seg. 9	Weak	No adverse impact
Segment 9 and Alternatives 9A, 9B, 9C, 9D, and 9E							
Toana Freight Wagon Road							
C92	ID	Alt. 9B, 9C	3.3-162	Balanced Rock Area	1.3 from Alt. 9B, 1.2 from Alt. 9C	Weak	No adverse impact
C93 (VS)	ID	Alt. 9B	3.3-163 — 3.3-164 VS E-49 — E-50	Coyote Spring Stage Station	1.1 from Alt. 9B	Moderate to Strong	Adverse impact
Oregon NHT							
C60	ID	Alt. 8A and 9B, Seg. 9	3.3-165 — 3.3-166	Three Island Crossing	3.8 from Alt. 8A , 2.7 from Seg. 9, 4.7 from Alt. 9B	Weak to Moderate for Alt. 8A, Moderate for Seg. 9, Weak for Alt. 9B	Adverse impact for Seg. 9 and Alt. 8A, No adverse impact for Alt. 9B
C62	ID	Alt. 8A and 9B	3.3-167 — 3.3-168	Hagerman Fossil Beds National Monument	4.9 from Alt. 8A, 1.4 from Alt. 9B	Weak	No adverse impact
C81	ID	Seg. 7, Alt. 7H and 7I, Seg. 9 and 10	3.3-169 — 3.3-170	Rock Creek Station and Stricker Ranch	4.9 from Seg. 7 and 7H, 3.7 from Alt. 7I, 3.2 from Seg. 9, 3.9 from Seg. 10	Weak	No adverse impact

Table 3.3-6. Summary of Cultural Resource Visual Impact Analysis by Segment and Resource (continued)

KOP ID	State Location	Proposed Route or Alternative	Figure Number Reference	General Location/ Description	Distance from Resource to Proposed Route or Alternative (miles)	Visual Contrast Level	Recommendation of Impacts to Cultural Resource
Segment 9 and Alternatives 9A, 9B, 9C, 9D, and 9E (continued)							
Oregon NHT – South Alternate							
C90 (VS)	ID	Seg. 8 and 9, Alt. 9D and 9E	3.3-171 — 3.3-173 VS E-51 — E-52	SRBOP	2.0 from Seg. 8, 1.0 from Seg. 9, 0.5 from Alt. 9D, 1.0 from Alt. 9E	Weak for Seg. 8, Seg. 9 and 9E, Strong for Alt. 9D	Adverse impact for Alt. 9D, No adverse impact for Seg. 8, Seg. 9, and Alt 9E.
C91	ID	Alt. 9D	3.3-174	Sinker Creek Butte Area	2.3 from Alt. 9D	Moderate to Strong	Adverse impact
Oregon NHT – South Alternate (continued)							
C113	ID	Seg. 9	3.3-175 — 3.3-176	SE of Flatiron Butte	2.8 from Seg. 9	Moderate	Adverse impact
C115	ID	Seg. 9	3.3-117 — 3.3-179	SW of Jackass Butte	4.0 from Seg. 9	Weak	No adverse impact
C116	ID	Alt. 9D	3.3-180 — 3.3-182	Core Recreation area	0.5 from Alt. 9D	Moderate	Adverse impact
C117 (VS)	ID	Alt. 9D	3.3-183 — 3.3-184 VS E-53 — E-54	NW of Wilkins Gulch	1.0 from Alt. 9D	Moderate to Strong	Adverse impact
C120	ID	Alt. 9D	3.3-185	West of Loveridge Bridge	2.1 from Alt. 9D	Weak to Moderate	Adverse impact
Historic Resources							
C101	ID	Seg. 9. Alt. 9A	3.3-186	Hollister School	3.3 from Seg. 9, 3.7 from Alt. 9A	Weak	No adverse impact
C104	ID	Seg. 9, Alt. 9E	3.3-187	"Our Lady Queen of Heaven" Catholic Church	1.0 from Seg. 9 and Alt. 9E	Weak to Moderate for Seg. 9, Weak for 9E	Adverse impact for Seg. 9, No adverse impact for Alt. 9E

Table 3.3-6. Summary of Cultural Resource Visual Impact Analysis by Segment and Resource (continued)

KOP ID	State Location	Proposed Route or Alternative	Figure Number Reference	General Location/ Description	Distance from Resource to Proposed Route or Alternative (miles)	Visual Contrast Level	Recommendation of Impacts to Cultural Resource
Segment 9 and Alternatives 9A, 9B, 9C, 9D, and 9E (continued)							
Historic Resources (continued)							
C109	ID	Seg. 8, Seg. 9, Alt. 9D and 9E	3.3-188	Owyhee Court House	3.3 from Seg. 8, 0.4 from Seg. 9, 1.6 from Alt. 9D, 0.8 from Alt. 9E	Weak	No adverse impact
Segment 10							
Prehistoric Resource							
C82	ID	Seg. 6 and 10	3.3-189	Wilson Butte Cave	1.9 from Seg. 6, 5.5 from Seg. 10	Weak	No adverse impact
Historic Resources							
C99 (VS)	ID	Seg. 10	3.3-190 VS E-55 — E-56	Minidoka National Historic Site	1.0 from Seg. 10	Moderate	Adverse impact

1/ VS = visual simulation
2/ Assume all Proposed Routes and Route Alternatives have the same visual contrast level assessment unless otherwise specified.

Segments 1W and 1E

Segment 1W is composed of two parts, Segment 1W(a) and 1W(c), both of which would consist of a new 230-kV line for part of their length and a reconstruction of an existing 230-kV line for the remaining part. Segment 1W(a) would be about 76.5 miles long, and would extend from the Windstar Substation to the Aeolus Substation. Segment 1W(c) would be about 70.6 miles long, and would extend from the Dave Johnson Power Plant to the Aeolus Substation. Alternative 1W-A is a 16.2-mile alternative located near the town of Glenrock, which was the Proponents' initial proposal before moving the Proposed Route at the suggestion of local landowners in order to avoid the more settled area around Glenrock. Twenty acres of the proposed expansion at the Windstar and Aeolus Substations are attributed to Segment 1W(a) and 3 acres of the expansion at the Difficulty Substation and 17 acres of the expansion at the Windstar and Aeolus Substations are attributed to Segment 1W(c). There are no Route Alternatives proposed south of that point (see Appendix A, Figure A-2).

Segment 1E, as proposed, would link the Windstar and Aeolus Substations in south-central Wyoming with a 100.6-mile 230-kV single-circuit transmission line. Twenty acres of the expansion of Windstar and Aeolus Substations and 0.5 acre for one regeneration site are attributed to Segment 1E. Alternative 1E-A is a 16.1-mile alternative along the north end of Segment 1E, which was the Proponents' initial proposal before moving the Proposed Route at the suggestion of local landowners to avoid the more settled area around Glenrock. Alternative 1E-B is 21.4 miles longer than the Proposed Route but is being considered by the Proponents because it would avoid a Wyoming-designated sage-grouse core area to the east. The BLM has required the consideration of Alternative 1E-C, which parallels Segment 1W 230-kV lines into the Aeolus Substation (see Appendix A, Figure A-2).

Rock Creek and Fort Fetterman Road

KOP C43 (Figures 3.3-1 and 3.3-2) is located on a segment of the Rock Creek and Fort Fetterman Road approximately 4.1 miles northwest of Alternative 1E-B.

The resource at this location consists of a shallow two-track road in good condition and no evidence of modern use. The setting for this segment of the road has been minimally impacted by an outbuilding and retention pond that is located less than 0.25 mile to the south.

The proposed Project would introduce new elements in the resource's viewshed; however, the distance from the Proposed Route would diminish the prominence of the structural elements and allow them to blend in with the landscape. The VCR for this KOP is assessed as weak to moderate. The proposed Project elements may draw the attention of the casual observer but would not dominate the setting. There would be an adverse impact to the resource at this location.

Figure 3.3-1. KOP C43. View of Rock Creek and Fort Fetterman Road facing north. Photo taken 11/05/09 at 3:05 p.m.

Figure 3.3-2. KOP C43. View from Rock Creek and Fort Fetterman Road facing southeast towards Alternative 1E-B. Photo taken 11/05/09 at 3:05 p.m.

Oregon NHT

KOP C48 (Figures 3.3-3, 3.3-4, and 3.3-5) is located on a segment of the Oregon NHT south of the North Platte River approximately 2.5 miles east-southeast of Glenrock. The KOP is between Alternatives 1E-A and 1W-A and is located within the Proposed Route in Segment 1E, 1.1 miles north of the Proposed Route in Segment 1W(c), and 1.6 miles southeast of the Proposed Route in Segment 1W(a) and Alternative 1W-A.

The resource at this location is a two-track road that parallels the North Platte River. The road is well-used by the landowner for ranching and recreational purposes and is deeply rutted in many places. The setting contains a housing community 3 miles to the west and the Dave Johnston Power Plant is visible approximately 1.5 miles to the northeast. A large concrete production facility is visible on the west bank of the North Platte River to the northeast. Numerous houses are visible in all directions and existing transmission lines (lattice and wooden, single pole) are visible to the east, west, and north.

Due to the similarity of the Project's design with existing structures in the area, the VCR for this KOP is assessed as weak. The setting for this location has been impacted by existing modern intrusions. There would not be an adverse impact to the resource at this location.

Figure 3.3-3. KOP C48. View of trail facing north. Note the concrete structure in the middleground and the transmission line on the distant hills. Photo taken 11/08/09 at 12:40 p.m.

Figure 3.3-4. KOP C48. View from trail looking southeast towards Alternative 1E-A. Note modern buildings and transmission lines. Photo taken 11/08/09 at 12:40 p.m.

Figure 3.3-5. KOP C48. View from trail looking northwest towards Alternative 1W-A. Note modern buildings and transmission lines on distant hill. Photo taken 11/08/09 at 12:40 p.m.

California NHT

KOP C47 (Figures 3.3-6, 3.3-7, and 3.3-8) is located at the site of Alvah Unthank's grave near a segment of the California NHT. The KOP is north of the Glenrock exit of I-25, approximately 0.5 mile east of the I-25 frontage road, on CR 27. Two markers are present at a parking area in this location, including an interpretive sign placed by OCTA (Wyoming SHPO 2009). The KOP is 0.6 mile northwest of the Proposed Route in Segment 1W(c), approximately 2.0 miles north of the Proposed Route in Segment 1E and Alternative 1E-A, 2.0 miles southeast of Alternative 1W-A, and 2.6 miles southwest of Segment 1W(a).

The portion of the trail associated with the grave is located on private property and a direct assessment of the resource condition could not be obtained due to landowner restrictions. The integrity of setting of the trail at this location has been impacted by the presence of I-25, residential structures, the Dave Johnston Power Plant, and associated transmission lines, which are visible in all directions.

Due to the similarity of the Project's design with existing structures in the area, the VCR for this KOP is assessed as weak. The setting for this location has been impacted by modern intrusions. There would not be an adverse impact to the resource at this location.

Figure 3.3-6. KOP C47. View looking south toward Unthank Grave (fenced area). Photo taken 11/08/09 at 10:02 a.m.

Figure 3.3-7. KOP C47. View from the Unthank Grave interpretive sign facing northeast. Photo taken 11/08/09 at 10:02 a.m.

Figure 3.3-8. KOP C47. View from the Unthank Grave interpretive sign facing west-northwest toward the Proposed Route in Segment 1W(c) and Segment 1E and Alternatives 1E-A and 1W-A. Photo taken 11/08/09 at 10:02 a.m.

California NHT – Child's Cutoff

KOP C45 (Figures 3.3-9 and 3.3-10) is located near a segment of the California NHT-Child's Cutoff that is 2.4 miles northwest of the Proposed Route in Segment 1W(a) and 3.1 miles northwest of the Proposed Route in Segment 1E.

This portion of the trail is located on private property and a direct assessment of the resource condition could not be obtained due to landowner restrictions. A wooden, single-pole transmission line crosses the resource 490 feet east of the trail segment and a railroad track parallels the resource 50 feet to the south. Modern ranch houses dot the landscape in all directions, a radio tower is visible 0.2 mile south of the trail, and property fences are visible in all directions. CR 22 bisects the resource east of the segment.

The Project's design shares some similarities with existing structures in the area but will introduce new elements that are of different material, form, and texture. The VCR for the KOP is assessed as weak to moderate. The proposed Project elements may draw the attention of the casual observer but would not dominate the setting. There would be an adverse impact to the resource at this location.

Figure 3.3-9. KOP C45. View looking toward Child's Cutoff facing east toward the Proposed Route in Segment 1W(a). Photo taken 11/07/09 at 3:45 p.m.

Figure 3.3-10. KOP C45. View from trail area facing south toward railroad. Photo taken 11/07/09 at 3:45 p.m.

KOP C49 (Figures 3.3-11, 3.3-12, 3.3-13, and 3.3-14) is located on a segment of California NHT-Child's Cutoff, east of Monkey Hill near the town of Glenrock. It is approximately 0.5 mile south of the Proposed Route in Segment 1W(a), 2.0 miles northwest of Alternative 1W-A, and the Proposed Route in Segment 1E, 2.4 miles northwest of Alternative 1E-A, and 3.1 miles northwest the Proposed Route in Segment 1W(c).

Figure 3.3-11. KOP C49. View of Child's Cutoff facing northwest. Photo taken 11/09/09 at 8:35 a.m.

Figure 3.3-12. KOP C49. View from Child's Cutoff facing north toward the Proposed Route in Segment 1W(a). Photo taken 11/09/09 at 8:35 a.m.

Figure 3.3-13. KOP C49. View from Child's Cutoff facing east toward Alternative 1W-A. Photo taken 11/09/09 at 8:35 a.m.

Figure 3.3-14. KOP C49. View from Child's Cutoff facing southeast toward Alternative 1W-A. Photo taken 11/09/09 at 8:35 a.m.

The resource at this location consists of a well-used two-track road. The road has been widened and ruts deepened by use from local residents, ranchers, and from use as an access road to nearby utility lines. Railroad tracks parallel the resource segment approximately 195 feet to the south. A housing community in Glenrock is visible 1 mile to the south. The Dave Johnston Power Plant is visible approximately 3 miles to the southeast, and wooden, H-frame transmission lines are visible approximately 195 feet to the north, paralleling the resource. Two underground pipelines parallel the trail and their identification markers are visible approximately 82 feet to the north.

The Project's design shares some similarities with existing structures in the area but would introduce new elements that are of different material, form, and texture. The VCR for the KOP is assessed as weak to moderate. Although the visual assessment resulted in a moderate rating, the historic setting for this location has been impacted by modern intrusions. There would not be an adverse impact to the resource at this location.

Historic Resource

KOP C98 (Figures 3.3-15 and 3.3-16) is located near a historic cabin site in the Shirley Basin approximately 0.25 mile northeast of the Bates Creek Reservoir. The KOP is 1.7 miles west of Alternative 1E-C, 2.3 miles west of the Proposed Route in Segment 1W(c), and 2.0 miles west of the Proposed Route in Segment 1W(a).

Figure 3.3-15. KOP C98. View of historic cabins facing north. Photo taken 07/17/08 at 11:05 a.m.

Figure 3.3-16. KOP C98. View from cabins facing east toward Alternative 1E-C, the Proposed Route in Segment 1-W(c), and the Proposed Route in Alternative 1W-A. Photo taken 07/17/08 at 11:05 a.m.

These cabins have not been officially recorded and the NRHP status of the resource is currently unevaluated. There are no modern intrusions to the setting at this location.

Views of all routes and alternatives are screened to the east but are open to the south. The Project would introduce new structural elements into the viewshed. Due to this factor and the Project's distance from this KOP, the VCR for this KOP is assessed as moderate. The proposed Project elements would dominate the setting to the south. There would be an adverse impact to the resource at this location.

Segment 2

Segment 2, as proposed, would link the Aeolus and Creston Substations in southeast Wyoming with two 500-kV circuits on one structure. One circuit would be operated at 230 kV during the initial phase of the Project. Its total proposed length is 96.7 miles. Fifty-two acres of the expansion of the Aeolus Substation and the construction of the Creston Substation and 0.5 acre for one regeneration site are attributed to Segment 2. There are three Route Alternatives, two of which are near the community of Fort Fred Steele. Alternative 2A at 28.4 miles long is being considered by the BLM because it remains in the WWE corridor nearer the town and the state historic site, and Alternative 2B, at 6.2 miles, is closer to the community than the comparison portion of the Proposed Route and was the initially proposed route before the Proponents responded to local suggestions and relocated the Proposed Route farther to the south. Alternative 2C is a 24.4-mile alternative located north of Hanna, Wyoming. It is being evaluated at the recommendation of the Wyoming Governor's office to follow a utility corridor approved by that office for minimizing effects to sage-grouse (see Appendix A, Figure A-3).

Rawlins to Fort Washakie Stage Road and Freight Road

KOP C19 (Figures 3.3-17 and 3.3-18) is located on a segment of the Rawlins to Fort Washakie Stage Road and Freight Road on the northern toe-slope of the eastern extension of Rawlins Peak and parallels U.S. Highway 287, approximately 0.75 mile to the east. The Proposed Route in Segment 2 of the Project would be located 4.4 miles to the southeast.

The resource at this location consists of a combination of shallow swales and faint two-track segments with no visible ruts. The trail is not visible as a continuous segment through this locale and it is difficult to determine the boundaries of the route. The setting has been impacted by adjacent residential development, stone quarry cuts, and U.S. Highway 287 east and south of the KOP.

The Project's design shares some similarities with existing structures but would introduce new elements that are of different form. The VCR for the KOP is assessed as weak. The setting for this location has been impacted by modern intrusions. There would not be an adverse impact to the resource at this location.

Figure 3.3-17. KOP C19. View of Rawlins to Fort Washakie Road facing west. A two-track road extends horizontally across the middleground of the photograph, at the base of the shallow terrace in background. Photo taken 10/07/09 at 2:35 p.m.

Figure 3.3-18. KOP C19. View from Rawlins to Fort Washakie Road facing southeast toward the Proposed Route in Segment 2. Photo taken 10/07/09 at 2:35 p.m.

Lincoln Highway

KOP C2 (Figures 3.3-19 and 3.3-20) is located on a segment of the Lincoln Highway approximately 550 feet north of U.S. Highway 30/287, 0.6 mile north of the Proposed Route in Segment 2, and 1.2 mile south of Alternative 2A, and 2.8 miles south of Alternative 2C.

The resource at this location consists of a gravel road with degraded asphalt. The setting contains wooden, single-pole transmission lines in all directions within 0.5 mile, the UPRR is 1 mile to the west, and U.S. Highway 287 is 0.25 mile south. Overall, the current setting, with the exception of views of U.S. Highway 287, is consistent with the period of use.

The Project's design shares some similarities with existing structures in the area but would introduce new elements that are of different material, form, size, and texture. The KOP's distance from the Proposed Route would allow for the structural elements to blend with the landscape in some areas. The VCR for the KOP is assessed as weak to moderate for Segment 2 and Alternative 2A and weak for Alternative 2C. The proposed Project elements would draw the attention of the casual observer but would not dominate the setting. There would be an adverse impact to the resource from Segment 2 and Alternative 2A at this location. Due to increased distance from the Project and the potential for the structural elements to blend in to the backdrop, there would not be an adverse impact to the resource from Alternative 2C.

Figure 3.3-19. KOP C2. View from Lincoln Highway facing north toward Alternative 2A and 2C. Photo taken 9/13/09 at 1:25 p.m.

Figure 3.3-20. KOP C2. View from Lincoln Highway facing southeast toward the Proposed Route in Segment 2. Photo taken 9/13/09 at 1:25 p.m.

KOP C3 (Figures 3.3-21, 3.3-22, and 3.3-23) is located on a segment of the Lincoln Highway near the town of Hanna, at the junction of two segments of the highway plotted by the NPS, approximately 0.5 mile north of U.S. Highway 30/287. Alternative 2A is 0.4 mile to the north, the Proposed Route in Segment 2 is 0.9 mile to the southeast, and Alternative 2C is 2.8 miles to the north.

The resource at this location is a two-track road. The road is in good condition, with limited disturbance from public use and wind and water erosion. The setting at this location is relatively undisturbed and includes sweeping views of the landscape in all directions. A wooden, H-frame transmission line is located 0.5 mile to the north but is partially concealed by the surrounding topography.

Due to the Project's proximity to this KOP and the introduction of new elements in the resource's viewshed, the VCR for this KOP is assessed as moderate to strong for the Proposed Route in Segment 2, weak to moderate for Alternative 2A, and weak for 2C. The proposed Project elements from the Proposed Route in Segment 2 and Alternative 2A dominate the setting; therefore, there would be an adverse impact to the resource at this location. Due to increased distance from the Project and the potential for the structural elements to blend into the backdrop, there would not be an adverse impact to the resource from Alternative 2C.

Figure 3.3-21. KOP C3. Overview of Lincoln Highway, facing northeast. Photo taken 9/13/09 at 3:00 p.m.

Figure 3.3-22. KOP C3. View from Lincoln Highway facing north towards Alternative 2A and 2C. Wooden, H-frame transmission line is visible in the middle ground of the photo. Photo taken 9/13/09 at 3:00 p.m.

Figure 3.3-23. KOP C3. View from Lincoln Highway, facing south towards the Proposed Route in Segment 2. Photo taken 9/13/09 at 3:00 p.m.

KOP C4 (Figures 3.3-24 and 3.3-25) is located on a segment of the Lincoln Highway, near the town of Hanna, 1 mile east of KOP C2 and approximately 0.25 mile north of U.S. Highway 30/287. Alternative 2A is 0.5 mile to the north, the Proposed Route in Segment 2 is 0.4 mile to the southeast, and Alternative 2C is 3.5 miles to the north.

The resource at this location is a two-track road and a parallel swale variant to the north. The setting contains a wooden, H-frame transmission line located 0.5 mile to the north that is partially concealed by the surrounding topography. The UPRR is 1.25 miles to the northwest, the town of Hanna is visible approximately 3 miles to the northeast, and U.S. Highway 30/287 is 0.25 mile south. Overall, the current setting, with the exception of views of U.S. Highway 30/287 and the wooden, H-frame transmission line, is consistent with the period of use.

Figure 3.3-24. KOP C4. View from Lincoln Highway, facing north towards Alternatives 2A and 2C. Photo taken 9/13/09 at 3:45 p.m.

Figure 3.3-25. KOP C4. View from Lincoln Highway, facing south towards the Proposed Route in Segment 2. Photo taken 9/13/09 at 3:45 p.m.

Due to the proposed Project's proximity to this KOP and the introduction of new structural elements in the resource's viewshed, the VCR for this KOP is assessed as moderate for the Proposed Route in Segment 2, weak to moderate for Alternative 2A, and weak for 2C. The proposed Project elements from the Proposed Route in Segment 2 and Alternative 2A would dominate the setting; therefore, there would be an adverse impact to the resource at this location. Due to increased distance from the Project and the potential for the structural elements to blend in to the backdrop, there would not be an adverse impact to the resource from Alternative 2C.

KOP C20 (Figure 3.3-26) is located on a segment of the Lincoln Highway approximately 2 miles northwest of Hogback Lake. It is 0.25 mile south of I-80 and 0.5 mile north of the UPRR grade. The Proposed Route in Segment 2 is 3 miles to the south.

The resource at this location consists of an upgraded, bladed road with added gravels. The setting contains views of traffic along I-80 to the north, a wooden, H-frame transmission line that parallels the highway, and views of the UPRR 0.5 mile to the northwest.

The Project would introduce new structural elements to the area of the viewshed away from existing modern impacts. The distance of the Project from this location, however, would decrease the prominence of the Project elements providing a backdrop for them to blend in with the landscape in some areas. The proposed Project elements would not dominate the setting. The VCR for this KOP is assessed as weak; therefore, there would not be an adverse impact to the resource at this location.

Figure 3.3-26. KOP C20. View from Lincoln Highway, facing south toward the Proposed Route in Segment 2. Photo taken 10/7/09 at 4:30 p.m.

Rawlins to Baggs Stage Road

KOP C1 (Figure 3.3-27) is located on a segment of the Rawlins to Baggs Stage Road. The road diverts south of the reported SHPO spatial data, which map the resource as corresponding to CR 605N, also known as Twenty Mile Road. The KOP is located off the two-track road in a pasture where the historic trail trace has not been disturbed by modern vehicle use. KOP C1 is located approximately 0.9 mile south of where the Proposed Route in Segment 2 would cross the resource. Photographic simulations (Appendix E, Figures E.3-12 and E.3-13) depicting indirect (visual) impacts to the resource have been generated for this KOP.

The wagon road at this location consists of a shallow swale with ruts and is in fair to good condition. The part of the trail to the south of this area that corresponds with the two-track road is quite disturbed as a result of spring and winter vehicle travel, which has left deep ruts. The condition of the resource has been further impacted by cattle grazing, and one rut has been used as a cattle/game trail making it perceptibly deeper than the other rut. There are no modern intrusions to the setting.

The proposed Project would introduce new elements in the resource's viewshed; however, the KOP's distance from the Proposed Route allows for the structural elements to blend in with the landscape in some areas. The VCR for this KOP is assessed as moderate to strong. The proposed Project elements would dominate the setting to the north. There would be an adverse impact to the resource at this location.

Figure 3.3-27. KOP C1. View of Rawlins to Bagg's Stage Road (48CR3648), looking north toward the Proposed Route in Segment 2. Photo taken 9/11/09 at 11:42 a.m.

Historic Resource

KOP C51 (Figure 3.3-28) is located just north of the entry gate to Fort Fred Steele, an NRHP listed historic property located on CR 347, 12 miles east of Rawlins. The KOP is located approximately 2.1 miles north of the Proposed Route in Segment 2, 506 feet north of Alternative 2A, and 0.4 mile north of Alternative 2B. Photographic simulations depicting indirect (visual) impacts to the resource have been generated for this KOP (Appendix E, Figures E.3-14 through E.3-16).

The setting contains two parallel sets of wooden, H-frame transmission lines less than 0.25 mile to the south of this KOP. A bridge, housing structures, and other buildings related to ranching and a rest area are visible within 0.5 to 1.0 mile to the south.

Views from this KOP toward the Proposed Route in Segment 2 and Route Alternatives are screened by topography to the west and southwest. The Project would be visible to the southeast. The Project shares some elements with existing structures in the area but would introduce new elements of different form and size. Alternatives 2A and 2B are located to the south and parallel to the two wooden, H-frame transmission lines. Due to these factors, the KOP's proximity to the alternatives, and the cumulative impact of adding additional structures, the VCR is assessed as moderate for Alternatives 2A and 2B. The Proposed Route in Segment 2 would be located at a greater distance from this KOP, decreasing its prominence in the view. Due to this factor and the potential for the elements to blend in with the backdrop, the VCR for the Proposed Route in Segment 2 is assessed as weak to moderate. The proposed Project would draw the attention of the casual observer but would not dominate the setting. There would be an adverse impact to this resource at this location.

Figure 3.3-28. KOP C51. View looking south toward the Proposed Route in Segment 2 and Alternatives 2A and 2B, standing on CR 347, just north of the entry gate to Fort Fred Steele. Photo taken 11/09/09 at 4:00 p.m.

Segment 3

Segment 3, as proposed, would link the Creston and Anticline Substations in southeast Wyoming with two 500-kV circuits on one structure. One circuit would be operated at 230 kV during the initial phase of the Project. Its total proposed length between those two substations is 46.7 miles. Sixty-nine acres of the construction of the Anticline and Creston Substations are attributed to Segment 3. Segment 3 would also link the Anticline and Jim Bridger Substations with a 4.3-mile 230-kV line and a 5.5-mile 345-kV line and includes the 10-acre expansion of the Jim Bridger 345-kV Substation. There are no alternatives proposed along this segment (see Appendix A, Figure A-4).

Lincoln Highway

KOP C52 (Figure 3.3-29) is located on a segment of the Lincoln Highway near East Desert Ranch Road and is 0.4 mile south of the Proposed Route in Segment 3. The resource at this location consists of an upgraded, gravel road that has been bladed and used for access to nearby oil and gas facilities.

The road the road follows and east-to-west course, paralleling I-80. A wooden, H-frame transmission line and gas pipeline markers are visible 0.25 mile to the north. Setting is impacted to the south and north.

Due to the proposed Project's proximity to this KOP and the introduction of new elements in the resource's viewshed, the VCR for this KOP is assessed as moderate for the Proposed Route in Segment 3. The Project's elements would dominate the setting. There would be an adverse impact to the resource at this location.

Figure 3.3-29. KOP C52. View from Lincoln Highway, facing north toward the Proposed Route in Segment 3. Photo taken 11/10/09 at 12:26 p.m.

KOP C53 (Figures 3.3-30 and 3.3-31) is located on a segment of the Lincoln Highway located west of Bitter Creek Road near the Continental Divide. It is located among rolling hills with sandstone outcrops approximately 0.3 mile north of I-80 and 0.75 mile west of Bitter Creek Road. The Proposed Route in Segment 3 would be located 0.4 mile to the north.

The resource at this location consists of a roadbed composed of degrading asphalt and gravels. The road trends east to west paralleling I-80. A wooden, H-frame transmission line and gas pipeline markers are visible 0.25 mile to the north. The setting is impacted to the south and north.

Due to the proposed Project's proximity to this KOP and the introduction of new elements in the resource's viewshed, the VCR for this KOP is assessed as moderate to strong. The proposed Project elements would dominate the setting to the north and northwest. There would be an adverse impact to the resource at this location.

Figure 3.3-30. KOP C53. View of the Lincoln Highway facing southwest. I-80 is visible in the middleground. Photo taken 11/10/09 at 12:26 p.m.

Figure 3.3-31. KOP C53. View from the Lincoln Highway, facing north toward wooden, H-frame transmission line and the Proposed Route in Segment 3. Photo taken 11/10/09 at 12:26 p.m.

Segment 4

Segment 4, as proposed, would link the Anticline Substation near the Jim Bridger Power Plant in southwestern Wyoming with the Populus Substation in Idaho with two 500-kV circuits on one structure. Its total proposed length is 203 miles. Eighty-nine acres of the construction of the Anticline Substation and the expansion of the Populus Substation and 1.5 acres for three regeneration sites are attributed to Segment 4. It has six Route Alternatives in the middle portion of its route but the first 52 miles to the east and the last 61 miles to the west (in Idaho) do not have any Route Alternatives. The middle section of the Proposed Route is 90.2 miles long, and its Route Alternatives vary from 85 to 102 miles long. These alternatives were proposed by the Wyoming Governor's office (4A, paralleling the existing 345-kV lines throughout); by the BLM Kemmerer FO (4B through 4E, including edits from various cooperating agencies), with the intent to avoid impacts to cultural resources to the extent practical; and by the Proponents (4F, attempting to avoid impacts to cultural resources while still remaining north of the existing lines) (see Appendix A, Figures A-5 and A-6).

Rock Springs to Lander Stage Road

KOP C13 (Figure 3.3-32) is located on a segment of the Rock Springs to Lander Stage Road, 1 mile northeast of Fourteen Mile Ranch and 0.6 mile north of the Proposed Route in Segment 4.

Figure 3.3-32. KOP C13. View of Rock Springs to Lander Stage Road, near Fourteen Mile Ranch, facing southwest toward the Proposed Route in Segment 4. Photo taken 10/02/09 at 2:47 p.m.

The resource at this location is a shallow, moderately used, two-track road that trends southwest. The condition of the trail is good with minimal alteration to its physical elements from modern use. The setting contains a lattice transmission line located approximately 0.25 mile to the south, a large ranch house to the southwest, and view of traffic traveling on U.S. Highway 191.

The proposed Project would be located north of and relatively parallel to the existing lattice transmission line. Due to the similarity of the Project's design with the existing structures in the area, the proximity of the KOP to the route, and the cumulative impact of adding additional structures, the VCR for this KOP is assessed as weak. The setting for this resource is impacted by modern intrusions in the direction of the Proposed Route; therefore, there would not be an adverse impact to the resource at this location.

KOP C14 (Figure 3.3-33) is located on a segment of the Rock Springs to Lander Stage Road between U.S. Highway 191 and U.S. Highway 187, just south of CR 17 (Chilton Road) and 1.1 miles south of the Proposed Route in Segment 4.

The resource at this location is a very shallow swale that trends north-south. The setting contains a lattice transmission line located approximately 1.5 miles to the north, a housing community to the southeast approximately 4 miles, and view of traffic, snow fences, and small structures along U.S. Highway 191.

Figure 3.3-33. KOP C14. View looking north from Rock Springs to Lander Stage Road toward the Proposed Route in Segment 4. Note warehouse structure in middleground of photo. Photo taken 10/03/09 at 10:00 a.m.

The proposed Project would be located south of and relatively parallel to the existing lattice transmission line. Due to the similarity of the Project's design with the existing structures in the area, the proximity of the KOP to the route, and the cumulative impact of adding additional structures, the VCR for this KOP is assessed as weak. The setting for this resource is impacted by modern intrusions in the direction of the Proposed Route. There would not be an adverse impact to the resource at this location.

New Fork Wagon Road

KOP C15 (Figures 3.3-34, 3.3-35, and 3.3-36) is located on a segment of the New Fork Wagon Road, 1.3 miles northwest of Fourteen Mile Ranch and approximately 0.4 mile east of U.S. Highway 187/191 and 1.0 mile north of the Proposed Route in Segment 4. U.S. Highway 191 is located 0.5 mile south.

The resource at this location consists of a two-track road with evidence of modern use. An additional, shallow, two-track road extends south from the curve of the resource and may be the actual alignment of the historic road and not the alignment located to the southeast. The setting contains a lattice transmission line 0.75 mile to the south that blends in with the surrounding landscape in many areas. A communications tower is located on the top of a ridge south of this point, and a residential area is located approximately 5 miles to the southeast. A snow fence extends northeast-to-southwest on the south side of U.S. Highway 191.

Figure 3.3-34. KOP C15. Overview of New Fork Wagon Road facing southeast. Note lattice transmission line blending with backdrop. Photo taken 10/03/09 at 10:00 a.m.

Figure 3.3-35. KOP C15. View of shallow two-track road extending south from the recorded segment of New Fork Wagon Road. Photo taken 10/03/09 at 10:00 a.m.

Figure 3.3-36. KOP C15. View from New Fork Wagon Road, looking south towards the Proposed Route in Segment 4. Note lattice transmission line blending with the backdrop. Photo taken 10/03/09 at 10:00 a.m.

The proposed Project's route would be located to the south of and parallel to the lattice transmission line. Due to the similarity of the Project's design with the existing structures in the area, the KOP's distance from the Proposed Route, and the cumulative impact of adding additional structures; the VCR for this KOP is assessed as weak to moderate. The proposed Project may draw the attention of the casual observer but would not dominate the setting. There would be an adverse impact to the resource at this location.

Green River to South Pass Stage Road

KOP C40 (Figure 3.3-37) is located on a segment of the Green River to South Pass Stage Road, approximately 656 feet west of Alkali Creek and 0.6 mile northwest of Alkali Spring where the archaeological remains of the historic stage stop (48SW870) have been recorded. The KOP is approximately 702 feet north of the Proposed Route in Segment 4. Photographic simulations depicting indirect (visual) impacts to the resource have been generated for this KOP (Appendix E, Figures E.3-17 and E.3-18).

The resource at this location consists of a two-track road with modern use that has widened the road and deepened the ruts in some areas. The setting contains a lattice transmission line less than 0.25 mile to the north.

The proposed Project's route would be located to the south of this KOP, away from existing impacts to the cultural landscape. Due to the proposed Project's proximity to this KOP and the introduction of new elements in a new area of the resource's

Figure 3.3-37. KOP C40. View of Green River/South Pass Stage Road looking south toward the Proposed Route in Segment 4. Photo taken 9/30/09 at 12:59 p.m.

viewshed, the VCR for this KOP is assessed as moderate to strong. The proposed Project elements would dominate the setting to the south; therefore, there would be an adverse impact to the resource at this location.

1849 Evans Cherokee Trail

KOP C12 (Figure 3.3-38) is located on a segment of the 1849 Evans Cherokee Trail, approximately 2 miles south of CR 14 (Fourteen Mile Road), 0.35 mile southeast of CR 5 (Blue Rim Road), and 1.5 miles west of Alkali Creek. KOP C12 is 2.9 miles south of the Proposed Route in Segment 4.

The resource at this location consists of a deep swale with evidence of erosion from wind and water action. The setting contains a lattice transmission line visible approximately 5 miles north of the resource. Markers are visible from a gas pipeline that parallels the trail to the north approximately 0.13 mile.

The Proposed Route in Segment 4 is viewed from this KOP approximately 4.2 miles to the northeast. The proposed Project would introduce new structural elements to the setting. The distance of the Project from this location would decrease the prominence of the elements and allow them to blend in with the landscape in some areas; therefore, the VCR for this KOP is assessed as weak to moderate. The proposed Project elements may draw the attention of the casual observer but would not dominate the setting. There would be an adverse impact to the resource at this location.

Figure 3.3-38. KOP C12. View of 1849 Evans Cherokee Trail swale facing northeast toward the Proposed Route in Segment 4. Photo taken 10/02/09 at 11:07 a.m.

KOP C16 (Figures 3.3-39 and 3.3-40) is located on a segment of the 1849 Evans Cherokee Trail along the western foot of White Mountain, approximately 0.3 mile south of CR 14 and 0.6 mile north of the Proposed Route in Segment 4.

The resource at this location consists of a swale with shallow ruts. The trail is in good condition in this area and is free of disturbance from modern vehicle traffic. The setting contains a lattice transmission line paralleling the resource approximately 0.25 mile to the south.

The proposed Project would be located south of and parallel to the existing lattice transmission line. Due to the similarity of the Project's design with the existing structures in the area, the proximity of the KOP to the route, and the cumulative impact of adding additional structures, the VCR for this KOP is assessed as weak. The setting for this resource is impacted by modern intrusions in the direction of the Proposed Route; therefore, there would not be an adverse impact to the resource at this location.

Figure 3.3-39. KOP C16. View of 1849 Evans Cherokee Trail swale with ruts. Standing on trail looking west-southwest. Photo taken 10/03/09 at 1:17 p.m.

Figure 3.3-40. KOP C16. Looking towards the Proposed Route in Segment 4. Standing on trail looking south. Photo taken 10/03/09 at 1:17 p.m.

KOP C18 (Figure 3.3-41) is located at the eastern end of Skunk Canyon on a segment of the 1849 Evans Cherokee Trail, approximately 0.5 mile south of CR 14 and approximately 0.4 mile north of the Proposed Route in Segment 4.

The resource at this location consists of a two-track road with shallow ruts. The setting contains a lattice transmission line paralleling the resource approximately 0.25 mile to the south.

The proposed Project would be located south of and parallel to the lattice transmission line. Due to the similarity of the Project's design with the existing structures in the area, the proximity of the KOP to the route, and the cumulative impact of adding additional structures, the VCR for this KOP is assessed as weak. The setting for this resource is impacted by modern intrusions in the direction of view of the Proposed Route in Segment 4; therefore, there would not be an adverse impact to the resource at this location.

Figure 3.3-41. KOP C18. View from 1849 Evans Cherokee Trail facing southwest toward the Proposed Route in Segment 4. Photo taken 10/06/09 at 1:51 p.m.

Oregon/California NHT

KOP C27 (Figures 3.3-42, 3.3-43, and 3.3-44) is located on a segment of the Oregon/California NHT, near the Thomas Fork and Big Hill ascent. The KOP is located northeast of U.S. Highway 30 where several trail variants come together at the crest of the first ridge on the west side of the Thomas Fork Valley. It is approximately 1.6 miles east of where the Proposed Route in Segment 4 crosses the resource; 1.9 miles northeast of Alternatives 4B, 4C, 4D, and 4E; and 1.8 miles northeast of Alternatives 4A and 4F.

Figure 3.3-42. KOP C27. View of the trail, visible in middle and extending into the shallow hill pass at the left. Looking northwest. Photo taken 10/21/09 at 2:50 p.m.

Figure 3.3-43. KOP C27. View looking west from trail toward the Proposed Route in Segment 4. Lattice transmission line visible on skyline. Photo taken 10/21/09 at 2:50 p.m.

Figure 3.3-44. KOP C27. View looking south from trail toward Alternatives 4B, 4C, 4D, and 4E. Lattice transmission line visible on skyline. Photo taken 10/21/09 at 2:50 p.m.

The resource at this location consists of a faint two-track road with shallow ruts. A lattice transmission line is located less than 1 mile to the west and south. Several ranching properties are visible in the Thomas Fork Valley to the southeast.

Due to the similarity of the Project's design with existing structures in the west and south and the KOP's distance from the Proposed Route and Route Alternatives, the VCR for this KOP is assessed as weak to moderate. The Proposed Route in Segment 4 would be located to the north of and paralleling the existing lattice transmission line to the south of this KOP and would therefore be more prominent in the view from this location than the alternative routes that are located to the south of the existing transmission line. All Project routes would add additional structures to the historic landscape, thus having a cumulative impact on the resource. The Project's elements may draw the attention of the casual observer but would not dominate the setting. There would be an adverse impact to the resource at this location.

KOP C35 (Figures 3.3-45 and 3.3-46) is located along the Oregon/California NHT, 1.5 to 2 miles west of the Green River and represents the view from Rusty Hill. It is located in an area where emigrant wagons climbed the trail toward Whiskey Basin and Hams Fork and represents one of the many trail braids in the Green River area. The historic landscape at this location is characterized by rust stains on the surrounding rocks deposited by wagon wheels. This location provides a good example of trail segments in Wyoming that represent the feeling and sense of the historic time period of the trail's significant use (Rosenberg and Rosenberg 2006). The Rusty Hill site is currently being

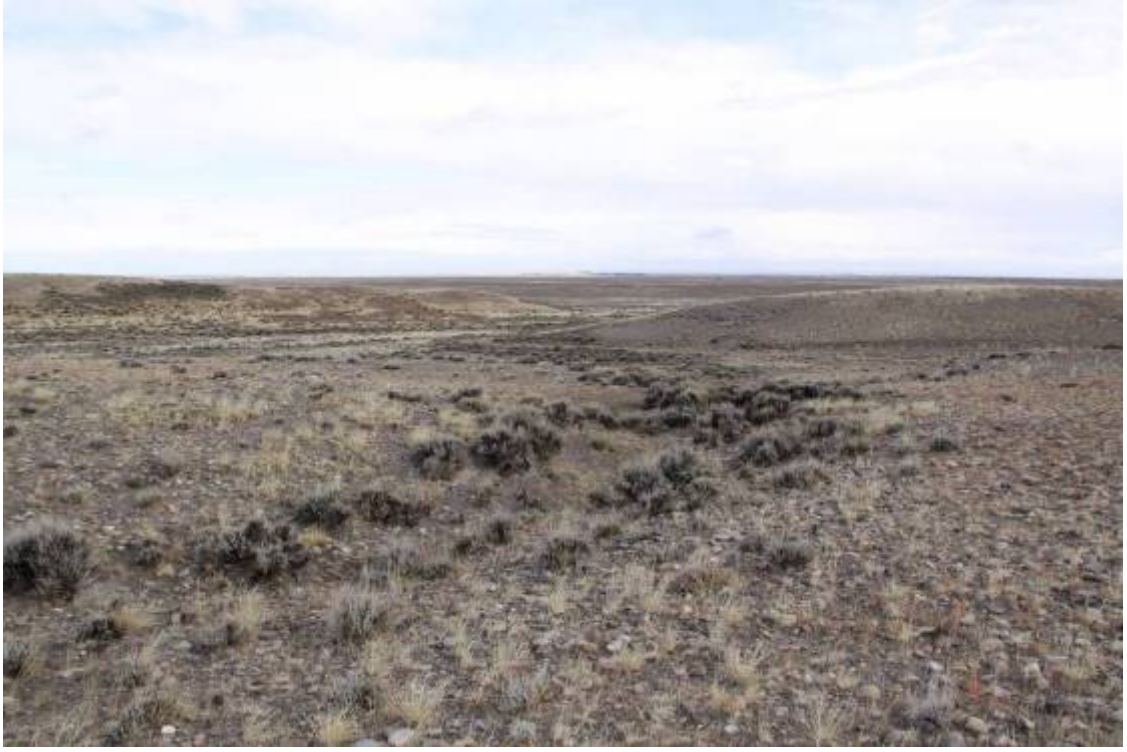


Figure 3.3-45. KOP C35. View of the trail looking toward the northwest from Rusty Hill. Photo taken 9/30/09 at 9:36 a.m.

Figure 3.3-46. KOP C35. View south from Rusty Hill toward the Proposed Route in Segment 4 and Alternative 4A/4F. The lattice transmission line is visible on the horizon. Photo taken 9/30/09 at 9:36 a.m.

considered for nomination to the NRHP. KOP C35 is approximately 3.8 miles north of the Proposed Route in Segment 4, and Alternatives 4A and 4F of the Project.

The resource at this location consists of a swale. The setting contains lattice transmission lines 3.5 mile to the south. State Highway 372 is visible a little over 0.25 mile to the east.

Due to the similarity of the Project's design with existing structures in the area and KOP's distance from the Proposed Route and alternatives, the VCR for this KOP is assessed as weak. The Project elements would not dominate the setting; therefore, there would not be an adverse impact to the resource at this location.

KOP C36 (Figure 3.3-47) is located on a segment of the Oregon/California NHT that corresponds with Lombard Road west of State Highway 372 (La Barge Road). The KOP is approximately 4.5 miles southeast of Whiskey Buttes and 2 miles north of West Otterson Wash. The KOP is 2.6 miles northeast of the Proposed Route in Segment 4, Alternative 4A, and Alternative 4F.

The resource at this location consists of a two-track road with evidence of recent use. Modern use has widened the road and deepened the ruts in some areas. The setting contains existing lattice transmission lines 3 miles to the south. No other modern structures or intrusions are present in the area.

Figure 3.3-47. KOP C36. Overview of trail facing south toward the Proposed Route in Segment 4 Alternative 4A/4F. Existing lattice transmission line is visible on the horizon. Photo taken 9/30/2009 at 11:16 a.m.

Due to the similarity of the Project's design with existing structures in the area and the KOP's distance from the Proposed Route and Route Alternatives, the VCR for this KOP is assessed as weak. The proposed Project elements would not dominate the setting. There would not be an adverse impact to the resource at this location.

KOP C37 (Figure 3.3-48) is located on a segment of the Oregon/California NHT that corresponds with Lombard Road west of State Highway 372 (La Barge Road). The KOP is located 1.5 miles northeast of the point where West Otterson Wash crosses Lombard Road, approximately 0.2 mile north of the Proposed Route in Segment 4, Alternative 4A, and Alternative 4F.

The resource at this location consists of a two-track road with evidence of recent use. Modern use has widened the road and deepened the ruts in some areas. The setting is impacted to the north by lattice transmission lines that are located less than 0.25 mile away.

The proposed Project's route would be located to the south of this KOP, away from existing impacts to the cultural landscape. Due to the Project's proximity to this KOP and the introduction of new elements in a new area of the resource's viewshed, the VCR for this KOP is assessed as strong. The proposed Project elements would dominate the setting to the south. There would be an adverse impact to the resource at this location.

Figure 3.3-48. KOP C37. View of Oregon/California NHT facing southwest toward the Proposed Route in Segment 4, Alternative 4A, and Alternative 4F. Trail marker visible in center left of photo. Photo taken 9/30/2009 at 11:34 a.m.

KOP C38 (Figure 3.3-49) is located on a segment of the Oregon/California NHT that corresponds to an unnamed road that connects to State Highway 372. The KOP is located on the upper terrace of the western floodplain of the Green River, approximately 0.5 mile northeast of State Highway 372 and 1.25 miles southeast of where West Otterson Wash crosses the highway. The KOP is 0.3 mile northeast of the Proposed Route in Segment 4, Alternative 4A, and 4.1 miles south of Alternatives 4B, 4C, 4D, 4E, and 4F.

The resource at this location consists of a two-track road with evidence of recent use. The setting is impacted to the north by the existing lattice transmission lines located approximately 0.25 mile from the KOP. A wooden, single-pole transmission line parallels the resource and crosses the trail to the south of this KOP. A plant facility is located approximately 1.5 miles to the east.

The Proposed Route and Route Alternatives are located to the south of this KOP. Although there are transmission structures present in that direction, the proposed Project elements are a different form, size, and material, thus introducing new structural elements to the landscape. The VCR for this KOP is assessed as moderate. The proposed Project elements would be seen and may attract the attention of the casual observer; therefore, there would be an adverse impact to the resource at this location.

Figure 3.3-49. KOP C38. View of trail facing southwest toward the Proposed Route in Segment 4 and Alternatives 4A and 4F. Note wooden, single-pole transmission line paralleling trail and crossing trail in background of photo. Photo taken 9/30/2009 at 1:47 p.m.

KOP C39 (Figure 3.3-50) is located on a segment of the Oregon/California NHT that corresponds to an unnamed road that connects perpendicularly to State Highway 372. The KOP is located less than 0.25 mile from KOP 38 on the upper terrace of the western floodplain of the Green River, approximately 0.5 mile east of State Highway 372 and 0.5 mile south of West Otterson Wash. KOP C39 is located 0.3 mile northeast of the Proposed Route in Segment 4, Alternatives 4A, and 4F, and 4.4 miles south of Alternatives 4B, 4C, 4D, and 4E.

The resource at this location consists of a two-track road with evidence of recent use. The setting is impacted to the north by the existing lattice transmission lines. A wooden, single-pole transmission line parallels the trail approximately 0.25 mile to the southeast and crosses the trail to the south of this KOP at State Highway 372. A plant facility is located approximately 1.5 miles to the east.

The Proposed Route and Route Alternatives are located to the south of this KOP. Although there are transmission structures present in that direction, the proposed Project elements are a different form, size, and material, thus introducing new structural elements to the landscape. The VCR for this KOP is assessed as moderate. The proposed Project elements may attract the attention of the casual observer; therefore, there would be an adverse impact to the resource at this location.

Figure 3.3-50. KOP C39. Overview of trail facing south towards the Proposed Route in Segment 4 and Alternatives 4A and 4F. Wooden, single-pole transmission line visible in background of photo, paralleling State Highway 372. Photo taken 9/30/2009 at 2:05 p.m.

KOP C105 (Figures 3.3-51 and 3.3-52) is located on a segment of the Oregon/California NHT that is along U.S. Highway 30, 3.3 miles south of the Proposed Route in Segment 4 at the Big Hill historic marker. The marker is approximately 2 miles to the southwest of the actual trail segment located at the crest of the Sheep Creek Hills. Big Hill has been designated as a high-potential site by the NPS.

Access to the resource is through private property and a direct assessment of the resource's condition could not be obtained due to landowner restrictions. The setting, as viewed from the marker toward the Sheep Creek Hills, contains a lattice transmission line that is approximately 2 miles to the northeast.

The Proposed Route in Segment 4 would be located north of the existing lattice transmission lines, 2 miles north of the Big Hill trail segment, decreasing its prominence in the view. Due to the similarity of the Project's design with existing structures, the KOP's distance from the route, and the potential for the elements to blend in with the backdrop in some areas, the VCR for this KOP is assessed as weak. The Project's elements would not dominate the setting; therefore, there would not be an adverse impact to the resource at this location.

Figure 3.3-51. KOP C105. View of Big Hill historic marker along U.S. Highway 30. Photo taken 10/09/08 at 2:58 p.m.

Figure 3.3-52. KOP C105. View from Big Hill historic marker toward the Sheep Creek Hills and the Proposed Route in Segment 4. Lattice transmission line is visible on the edge of the agricultural landscape in the middleground of the photo. Photo taken 10/09/08 at 2:58 p.m.

KOP C110 (Figure 3.3-53) is located on a segment of the Oregon/California NHT at the site of the White Hill Trail Monument. White Hill is located on the Hams Fork Plateau on the north rim of Quakenasp Canyon, approximately 1.5 miles west of the Hams Fork River. The KOP is located 1.8 miles north of Alternative 4A. Alternative 4F is 3.0 miles north of the KOP. Photographic simulations depicting indirect (visual) impacts to the resource have been generated for this KOP (Appendix E, Figures E.3-19 and E.3-20).

The White Hill Trail Monument overlooks the Hams Fork River and provides sweeping views of the Uinta Mountains, the Wind River Mountains, and Ham's Plateau. An interpretive sign describes the experiences of emigrants travelling over White Hill and is a popular stop for visitors on the Sublette Cutoff. The setting contains a lattice transmission line to the north and east.

The proposed Project would be located north and parallel to the lattice transmission line. Due to the similarity of the Project's design with the existing structures in the area, the proximity of the KOP to the Alternatives, and the cumulative impact of adding additional structures, the VCR for this KOP is assessed as weak to moderate. The proposed Project elements would draw the attention of the casual observer but would not dominate the setting. There would be an adverse impact to the resource at this location.

Figure 3.3-53. KOP C110. View northeast toward the Proposed Route in Segment 4 of the Project from KOP C110. The lattice transmission line is visible in the middle ground. Photo taken 9/23/2008 at 9:57 a.m.

Opal Wagon Road

KOP C6 (Figures 3.3-54 and 3.3-55) is located on a segment of the Opal Wagon Road approximately 2.6 miles north of Alternatives 4A and 4F, and 1.6 miles west of State Highway 230.

The resource at this location consists of shallow two-track road with distinct ruts. The historic road is in fair condition having been exposed to extensive alluvial and aeolian erosion. The setting is moderately impacted by lattice and wooden, H-frame transmission lines, located 1.5 to 2.5 miles to the south-southeast and northwest, and a power plant located approximately 5 miles to the east.

Due to the similarity of the Project's design with existing structures in the area and the KOP's distance from the Route Alternatives, the VCR for this KOP is assessed as weak. The proposed Project elements would not dominate the setting; therefore, there would not be an adverse impact to the resource at this location.

Figure 3.3-54. KOP C6. Overview of Opal Wagon Road (48LN949), looking southwest toward Alternative 4F. Photo taken 9/16/09 at 1:15 p.m.

Figure 3.3-55. KOP C6. View from Opal Wagon Road (48LN949), looking southeast toward Alternative 4F with lattice transmission line in skyline view. Photo taken 8/2/10 at 7:53 a.m.

California NHT – Slate Creek Cutoff

KOP C42 (Figure 3.3-56) is located on a segment of the Slate Creek Cutoff, at the California NHT marker. The KOP is located 1.3 miles east of U.S. Highway 189, 0.22 mile north of State Highway 372, and 3.7 miles west of the Proposed Route in Segment 4.

The resource consists of an unused two-track with shallow ruts. The trail is in good condition with minimal alteration from modern use. The Slate Creek Trail marker is visible to the west at the intersection of a two-track road and the trail. Oil and gas tanks are visible to the northeast of this location. State Highway 372 is visible to the south.

The Project's design shares some similarities with existing structures in the area but would introduce new elements that are of different material, form, size, and texture. The KOP's distance from the Proposed Route would allow for the structural elements to blend with the landscape in some areas. The VCR for the KOP is assessed as weak to moderate. The proposed Project elements may draw the attention of the casual observer but would not dominate the setting. There would be an adverse impact to the resource at this location.

Figure 3.3-56. KOP C42. Overview of Slate Creek Cutoff looking east toward the Proposed Route in Segment 4. Oil and gas tanks are visible in the middle ground. Photo taken 11/11/09 at 11:17 a.m.

KOP C58 (Figure 3.3-57) is located on a segment of the Slate Creek Cutoff, near the California NHT. The KOP is 1.6 miles west of Fontenelle, 1 mile north of Slate Creek Butte, and 1.2 miles northeast of the Proposed Route in Segment 4.

The resource at this location is a well-used two-track road with deepened ruts. The setting contains a wooden, H-frame transmission line approximately 2 to 2.5 miles north. Oil and gas tanks are visible to the south.

The proposed Project's route would be located to the southwest of this KOP, away from existing modern impacts to the cultural landscape. Due to the proposed Project's proximity to this KOP and the introduction of new elements in a new area of the resource's viewshed, the VCR for this KOP is assessed as strong. The proposed Project elements would dominate the setting to the southwest; therefore there would be an adverse impact to the resource at this location.

Figure 3.3-57. KOP C58. Overview of Slate Creek Cutoff looking southwest toward the Proposed Route in Segment 4. Photo taken 11/11/09 at 11:54 a.m.

California NHT – Sublette Cutoff

KOP C7 (Figure 3.3-58) is located 0.2 mile east of KOP C8 at the Alfred Corum Grave site, near the California NHT – Sublette Cutoff. The KOP is located on a flat ridge top that overlooks Robinson Creek to the north, Shuster Basin (North Fork Twin Creek) to the south, and the head of Quakenasp Canyon to the east. Alternative 4A is 1.4 miles to the northeast and Alternative 4F is approximately 2.0 miles to the northeast.

Figure 3.3-58. KOP C7. View from Sublette Cutoff looking northeast toward Alternatives 4A and 4F. Note lattice transmission line in the valley in center of photo. Photo taken 9/17/09 at 10:27 a.m.

The trail resource associated with the gravesite consists of a shallow two-track road that grades into a swale to the west toward Nancy Hill's grave. The setting contains a lattice transmission line that runs east to west across the plateau and into the Robinson Creek drainage approximately 1 mile to the northeast. A natural gas tank is visible approximately 1.5 miles to the west.

Due to the similarity of the Project's design with the existing structures in the area and the cumulative impact of adding additional structures, the VCR for this KOP is assessed as weak to moderate. The proposed Project may draw the attention of the casual observer but would not dominate the setting. There would be an adverse impact to the resource at this location.

KOP C8 (Figures 3.3-59 and 3.3-60) is located at the Nancy Hill gravesite along the California NHT – Sublette Cutoff, on a finger ridge between several deep canyons. The KOP is located on a flat ridge top that overlooks Robinson Creek to the north, Shuster Basin (North Fork Twin Creek) to the south, and the head of Quakenasp Canyon to the east. KOP C8 is approximately 1.5 miles southwest of Alternative 4A and 2.1 miles south of Alternative 4F. Photographic simulations depicting indirect (visual) impacts to the resource have been generated for this KOP (Appendix E, Figures E.3-21 and E.3-22).

Figure 3.3-59. KOP C8. View of Sublette Cutoff swale, looking east where it is adjacent to the Nancy Hill grave. Photo taken 9/17/09 at 10:27 a.m.

Figure 3.3-60. KOP C8. View from Sublette Cutoff swale, looking northeast toward lattice transmission line. Photo taken 9/17/09 at 10:27 a.m.

The trail resource associated with the gravesite consists of a deep swale with no visible wheel ruts. The setting contains a lattice transmission line that runs east to west across the plateau and into the Robinson Creek drainage 1 mile to the northeast. A livestock water storage tank is visible approximately 1 mile to the west.

Due to the similarity of the Project's design with the existing structures in the area and the cumulative impact of adding additional structures, the VCR for this KOP is assessed as weak to moderate. The proposed Project may draw the attention of the casual observer but would not dominate the setting. There would be an adverse impact to the resource at this location.

KOP C9 (Figure 3.3-61) is located on a segment of the California NHT – Sublette Cutoff at Emigrant Spring, historically one of the largest and most reliable sources of water and firewood on the Hams Fork Plateau (Jensen 1975). The KOP is located 2.5 miles from southwest of Alternative 4A and 3.2 miles from Alternative 4F.

The resource at this location consists of a deep swale with no visible ruts. The setting is impacted by a lattice transmission line 2 miles to the north and 1.25 miles west, but is undisturbed in all other directions.

Due to the similarity of the Project's design with existing structures in the area and the KOP's distance from the Proposed Route and Route Alternatives, the VCR for this KOP is assessed as weak. The proposed Project would not dominate the setting; therefore, there would not be an adverse impact to the resource at this location.

Figure 3.3-61. KOP C9. View from Sublette Cutoff near Emigrant Spring looking northeast toward Alternative 4A. Photo taken 9/17/09 at 11:43 a.m.

KOP C11 (Figure 3.3-62) is located on a segment of the California NHT – Sublette Cutoff in the Pomeroy Basin. This KOP is approximately 2.5 miles east of Commissary Ridge and 1.5 miles west of Oyster Ridge and is 3.3 miles north of Alternative 4A and 4F.

The resource at this location consists of a two-track road with shallow ruts. The setting contains a lattice transmission line ascending Commissary Ridge 3 miles south of the KOP. A water tank is present less than 1 mile west of the trail.

The Proposed Route would be located to the southwest in front of and parallel to the existing lattice transmission line. Due to the similarity of the Project's design with the existing structures in the area, the KOP's distance from the Route Alternatives, and the cumulative impact of adding additional structures, the VCR for this KOP is assessed as weak to moderate. The proposed Project may draw attention of the casual observer but would not dominate the setting. There would be an adverse impact to the resource at this location.

Figure 3.3-62. KOP C11. View of Sublette Cutoff, standing at trail marker, facing southwest toward Alternative 4F. The lattice transmission line is visible ascending Commissary Ridge on the horizon. Photo taken 9/25/08 at 7:03 a.m.

KOP C28 (Figure 3.3-63) is located at the junction of two California NHT – Sublette Cutoff variants approximately 0.25 mile north of Quakenasp Canyon. It is 1.3 miles south of Alternative 4A and 2.1 miles south of Alternative 4F.

Figure 3.3-63. KOP C28. View of northeast trending variant of the Sublette Cutoff, standing at junction, facing northeast toward Alternative 4A. Photo taken 10/22/09 at 10:50 p.m.

The resource at this location consists of two trail variants, one that heads northwest-southeast along the northern Quakenasp Canyon edge. The other variant connects from that trail on the plateau and descends into the Meadow Creek drainage. The setting contains a lattice transmission line 0.5 mile to the north and a north-to-south trending fence line bisecting the second variant. The setting is undisturbed in all other directions.

The Proposed Route would be located north and parallel to the existing lattice transmission line. Due to the similarity of the Project's design with the existing structures in the area and the cumulative impact of adding additional structures, the VCR for this KOP is assessed as weak to moderate. The proposed Project may draw attention of the casual observer but would not dominate the setting. There would be an adverse impact to the resource at this location.

KOP C29 (Figure 3.3-64) is located on a segment of the California NHT – Sublette Cutoff at the summit of Dempsey Ridge. Rock Creek and Rock Creek Ridge are located 1 to 2 miles west. Alternative 4A is approximately 2.6 miles north of the KOP and 4.6 miles northeast to Alternative 4F.

The resource at this location is a well-used two-track road, deeply rutted from winter and spring use. Weather gauging stations are visible northwest of the trail and a lattice transmission line is approximately 1 mile to the northeast.

Figure 3.3-64. KOP C29. View from Sublette Cutoff on the summit, facing northeast toward lattice transmission line. Photo taken 10/22/09 at 11:55 p.m.

The proposed Project would be located north and parallel to the lattice transmission line. Due to the similarity of the Project's design with the existing structures in the area and the cumulative impact of adding additional structures, the VCR for this KOP is assessed as weak to moderate. The Proposed Project may draw attention of the casual observer but would not dominate the setting. There would be an adverse impact to the resource at this location.

KOP C30 (Figures 3.3-65, 3.3-66, and 3.3-67) is located on a segment of the California NHT – Sublette Cutoff on Stoffer Ridge, approximately 1.5 miles east of the town of Cokeville and 1.25 miles east of Big Hill. It is situated east of where the Sublette Trail crosses Stoffer Ridge and Road 4211. The KOP is 3.1 miles from the Proposed Route in Segment 4, approximately 0.5 mile north of Alternative 4A, and 2.5 miles south of Alternative 4F.

The resource at this location is a two-track road with shallow ruts. The trail is currently used for recreation and ranching with minimal evidence of disturbance. The views toward Rock Creek Ridge to the north and south are relatively undisturbed although a lattice transmission line is visible on the skyline descending the west slope of Rock Creek Ridge approximately 4 miles to the south. A historic structure is visible 1 mile to the east.

Due to the similarity of the Project's design with the existing structures in the area and the KOP's relative proximity to the Route Alternatives, the VCR for this KOP is assessed as moderate for Alternative 4A and weak for the Proposed Route in Segment 4 and Alternative 4F. The proposed Project elements from Alternative 4A would draw

Figure 3.3-65. KOP C30. View of Sublette Cutoff from Stoffer Ridge, facing south/southeast toward Alternative 4A. Trail ruts are visible in the foreground and middle ground. Photo taken 10/23/09 at 2:10 p.m.

Figure 3.3-66. KOP C30. View from Sublette Cutoff from Stoffer Ridge, facing south/southeast toward Alternative 4A. Trail ruts are visible in the foreground and middle ground. The lattice transmission line is visible on top of the ridge to the south. Photo taken 8/1/10 at 12:12 p.m.

Figure 3.3-67. KOP C30. View of Sublette Cutoff from Stoffer Ridge facing northeast toward Alternative 4F. Photo taken 8/1/10 at 12:12 p.m.

the attention of the casual observer but would not dominate the setting; therefore, there would be an adverse impact to the resource at this location. There would not be an adverse impact to the resource from the Proposed Route in Segment 4 and Alternative 4F.

KOP C31 (Figures 3.3-68 and 3.3-69) is located on a segment of the California NHT – Sublette Cutoff that crests Rock Creek Ridge with views of Dempsey Ridge to the east and Cokeville to the northwest. The KOP is 0.5 mile south of Alternative 4A and 4.9 miles east of Alternative 4C and 4E.

The resource at this location consists of a well-used two-track road that has been bladed periodically. An existing transmission line, 0.5 mile from the KOP, is visible ascending Boundary Hills to the northwest and Dempsey Ridge to the east.

The proposed Project would be located north and parallel to the existing lattice transmission line. Due to the similarity of the Project's design with the existing structures in the area, the proximity of the KOP to the alternatives, and the cumulative impact of adding additional structures, the VCR for this KOP is assessed as weak. The proposed elements would not dominate the setting; therefore, there would not be an adverse impact to the resource at this location.

Figure 3.3-68. KOP C31. View of Sublette Cutoff from Rock Creek Ridge facing northeast toward Alternative 4A. Photo taken 10/25/09 at 10:30 a.m.

Figure 3.3-69. KOP C31. View from Sublette Cutoff on Rock Creek Ridge facing west toward Alternatives 4D and 4E. Photo taken 10/25/09 at 10:30 a.m.

KOP C56 (Figure 3.3-70) is located on a segment of the California NHT – Dempsey-Hockaday Cutoff, north of Sullivan Hollow. The KOP is located 0.5 mile south of the Proposed Route in Segment 4. Fontenelle Creek is located 1 mile to the north.

The resource at this location consists of a swale with shallow ruts. The setting contains a wooden, H-frame transmission line that parallels the trail approximately 1 mile to the east and ranches in the Fontenelle Creek Valley are clearly visible.

The Project's design shares some similarities with existing structures in the area but would introduce new elements that are of different material, form, and texture. The VCR for the KOP is assessed as moderate to strong. The proposed Project elements would draw the attention of the casual observer and would dominate the setting; therefore, there would be an adverse impact to the resource at this location (see Appendix G-1, Figure K-1a/b). This setting was also analyzed from the north at KOP 1288, described in Section 3.2 – Visual Resources and depicted in a photo simulation (see Appendix G-1, Figure K-1c/d).

Figure 3.3-70. KOP C56. View from Sublette Cutoff facing northeast toward the Proposed Route in Segment 4. Note ranching structures and wooden, H-frame transmission line in middleground of photo. Photo taken 11/11/09 at 9:40 a.m.

KOP C57 (Figure 3.3-71) is located on a segment of the California NHT – Dempsey-Hockaday Cutoff, 0.5 mile south of Sullivan Hollow. Fontenelle Creek is 2 miles to the north and Willow Creek is 0.75 mile to the south. The Proposed Route in Segment 4 of the Project is 1.4 miles to the north. The KOP is situated on a broad east-to-west trending ridge on a two-track road that bisects the trail. Photographic simulations

depicting indirect (visual) impacts to the resource have been generated for this KOP (Appendix E, Figures E.3-23 and E.3-24).

Figure 3.3-71. KOP C57. View of Sublette Cutoff Trail south of Sullivan Hollow. View is facing northeast towards the Proposed Route in Segment 4. Trail swale is visible in center of photograph. Photo taken 11/11/09 at 10:08 a.m.

The resource at this location consists of a shallow two-track road on the southwest side of the KOP and a swale on northeast side of the KOP. The two-track road is in good condition with minimal disturbance. Wind and water erosion have deepened and altered the trail remnants in the swale. The setting at this KOP is undisturbed in all directions, except for a wooden, H-frame transmission line that is visible on the horizon approximately 3 miles to the east.

The Proposed Route would be located to the north of this KOP and would introduce new structural elements to this area. The distance of the Project from this location

allows the features to blend in with the landscape, decreasing their prominence within the view; therefore, the VCR for this KOP is assessed as moderate. The proposed Project elements would dominate the setting to the north; therefore, there would be an adverse impact to the resource at this location.

KOP C121 (Figures 3.3-72 and 3.3-73) is located on a segment of the California NHT – Dempsey-Hockaday Cutoff on the south side of Holden Hollow, approximately 0.5 mile north of Fontenelle Creek and 2 miles northwest of Fontenelle Reservoir. It is 2.4 miles north of the Proposed Route in Segment 4. The Johnny Williams gravesite is located approximately 0.25 mile south of the KOP. The gravesite is fenced and features an interpretive sign placed by OCTA in 1987. A photographic simulation depicting indirect (visual) effects to the resource has been generated for the KOP (see Figures E-25 and E-26 in Appendix E).

The trail at this location consists of a well-defined swale, but portions have been utilized as a two-track road and have been exposed to extensive alluvial erosion, making individual ruts difficult to discern. A network of heavily used two-track roads is present in the area and cultivated agricultural fields are visible approximately 0.75 mile south of the KOP. A transmission line with wooden, single-post supports runs southeast-to-northwest within 0.1 mile of the KOP. A second transmission line with wooden H-frame support structures runs generally north-to-south 0.3 mile west of the KOP. These two lines converge and parallel one another northwest of the KOP and continue north over Holden Hill, located approximately 1 mile to the north.

Figure 3.3-72. KOP C121. View of the Sublette Cutoff, facing north/northwest. Trail is visible as two-track in center of photo. Photo taken 8/2/10 at 8:52 a.m.

Figure 3.3-73. KOP C121. View from the Sublette Cutoff, facing south/southwest toward the Proposed Route in Segment 4. Johnny Williams' gravesite is visible at the edge of the sage and agricultural field just to the right of the utility pole in the foreground. Photo taken 8/2/10 at 8:52 a.m.

The proposed Project is located southwest of the existing transmission lines and beyond the agricultural fields. View of the Project is largely obstructed by topography. The Project's design shares some similarities with existing structures but will introduce new elements that are of different form and color. Due to this factor and the KOP's distance from the Proposed Route, the VCR for this KOP is assessed as weak to moderate. The Project's elements may draw the attention of the casual observer but would not dominate the setting. There would be an adverse impact to the resource at this location.

KOP C122 (Figures 3.3-74, 3.3-75, and 3.3-76) is located on a segment of the California NHT – Dempsey-Hockaday Cutoff on the top of Holden Hill, approximately 2.1 miles west of U.S. Highway 189 and Fontenelle Reservoir. It is located 3.8 miles north of the Proposed Route in Segment 4.

The resource at this location consists of a well-worn, southeast-to-northwest trending two-track road. A transmission line with wooden, single-post support poles can be seen ascending Holden Hill to the south-southeast. Another transmission line with wooden, H-frame support structures can be seen ascending Holden Hill to the south-southwest. A natural gas pipeline marked with signs bisects the trail approximately 60 feet east-northeast of the KOP and is further evident through disturbance to the ground surface. Two two-track roads running southeast-to-northwest through Holden Hollow are also

Figure 3.3-74. KOP C122. View of the Sublette Cutoff, facing east/southeast. Trail is visible as two-track in center of photo. Photo taken 8/2/10 11:47 a.m.

Figure 3.3-75. KOP C122. View from the Sublette Cutoff, facing east/southeast toward the Proposed Route in Segment 4. Photo taken 8/2/10 11:47 a.m.

Figure 3.3-76. KOP C122. View from the Sublette Cutoff, facing east/southeast toward the Proposed Route in Segment 4. Photo taken 8/2/10 11:47 a.m.

visible to the south of the KOP. Portions of Fontenelle Reservoir can be seen approximately 2 miles to the east.

The proposed Project is located southeast of the existing transmission lines and beyond the agricultural fields in the valley. Views of the Project are largely obstructed by topography. The Project's design shares some similarities with existing structures. Due to this factor, the KOP's distance from the Proposed Route, and the potential for the elements to blend in with the backdrop, the VCR for this KOP is assessed as weak. There would be no adverse impact to the resource at this location.

KOP C123 (Figures 3.3-77, 3.3-78, 3.3-79, and 3.3-80) is located on a segment of the California NHT – Dempsey-Hockaday Cutoff at the top of Holden Hill, approximately 1 mile west of U.S. Highway 189 and Fontenelle Reservoir, at a point where two variants of the Sublette Cutoff diverge from one another. It is 3.7 miles north of the Proposed Route in Segment 4. A concrete trail marker, from which the metal medallion has been removed, is located at the KOP. One variant of the Sublette Cutoff runs north-to-south through this location, while the other follows a west-northwestward course.

The resource at this location consists of two intersecting shallow two-track roads (Class 2 MET). The trail segment heading west-northwest from here is relatively well-worn, showing signs of recent vehicle traffic, whereas the north-south variant appears

Figure 3.3-77. KOP C123. View of the Sublette Cutoff, facing west. Trail is visible as two-track in center of photo. Photo taken 8/2/10 12:24 p.m.

Figure 3.3-78. KOP C123. View of the Sublette Cutoff, facing south. Trail is visible as two-track in center of photo. Photo taken 8/2/10 12:24 p.m.

Figure 3.3-79. KOP C123. View from the Sublette Cutoff, facing south toward the Proposed Route in Segment 4. Photo taken 8/2/10 12:24 p.m.

Figure 3.3-80. KOP C123. View from the Sublette Cutoff, facing southwest toward the Proposed Route in Segment 4. Photo taken 8/2/10 12:24 p.m.

somewhat less traveled, especially south of this point. Two parallel transmission lines—one with single-pole supports and the other with H-frame supports—run north-to-south across the trail approximately 400 feet north of the KOP. These transmission lines can be seen into the distance on the southern horizon, ascending the ridge on the south side of Holden Hollow. A series of communication towers are visible on the southern horizon, sky-lined on a distant ridge, approximately 5 miles away. Cultivated agricultural fields, structures, and fence lines can be seen to the south at a distance of approximately 2 miles.

The proposed Project is located south of the existing transmission lines and beyond the agricultural fields in the valley. Views of the Project are largely obstructed by topography. The Project's design shares some similarities with existing structures. Due to this factor, the KOP's distance from the Proposed Route, and the potential for the elements to blend in with the backdrop, the VCR for this KOP is assessed as weak. There would be no adverse impact on the resource at this location.

KOP C126 (Figures 3.3-81 and 3.3-82) is located on a segment of the California NHT – Dempsey-Hockaday Cutoff between Dempsey Ridge and Rock Creek Ridge, 0.5 mile north of Little Beaver Creek, 0.8 mile east of Rock Creek, and 1 mile southwest of Dempsey Summit. Alternative 4A is located 3.6 miles north of the KOP; Alternative 4C is located 6.3 miles to the west, and Alternative 4A is located 3.6 miles to the northeast. Due to topography, only a portion of Alternative 4A would be visible from this location.

Figure 3.3-81. KOP C126. View of the Sublette Cutoff, facing northeast. Trail is visible as vegetation change. Photo taken 8/3/10 10:59 a.m.

Figure 3.3-82. KOP C126. View from the Sublette Cutoff, facing northeast toward Alternative 4F. Existing transmission line is visible ascending ridge in background. Photo taken 8/3/10 10:59 a.m.

The resource at this location consists of an east-to-west-running, undisturbed swale with clearly visible ruts descending south-southwest from Dempsey Summit to the valley floor west of the KOP. A transmission line with metal lattice support structures is visible approximately 5 miles to the north. A communication tower is skylined on the distant horizon to the south. The visual setting is otherwise undisturbed in the area.

The proposed Project is located north of the existing transmission line. Views of the Project are largely obstructed by topography. The Project's design shares some similarities with existing structures. Due to this factor and the KOP's distance from the Proposed Route, the VCR for this KOP is assessed as weak. There would be no adverse impact on the resource at this location.

California NHT – Dempsey-Hockaday Cutoff

KOP C10 (Figures 3.3-83 and 3.3-84) is located on a segment of the Sublette Cutoff where it converges with the California NHT – Dempsey-Hockaday Cutoff, on the east side of Dempsey Ridge overlooking Dempsey Basin. This KOP is located approximately 2.5 miles southwest of Alternative 4F. Photographic simulations depicting indirect (visual) impacts to the resource have been generated for this KOP (Appendix E, Figures E.3-27 and E.3-28).

Figure 3.3-83. KOP C10. Overview of the Sublette Cutoff, facing north and slightly west, as it turns westward to join the Dempsey-Hockaday Cutoff in the saddle. Photo taken 9/17/09 at 1:27 p.m.

Figure 3.3-84. KOP C10. Looking northeast across Dempsey Basin toward Alternative 4F from the Sublette Cutoff trail marker. Photo taken 9/17/09 at 1:27 p.m.

A trail marker has been placed in this location and a two-track road is visible downslope in the saddle as the trail crests Dempsey Ridge and converges with the Sublette Cutoff. No evidence of a trail trace is visible from this point descending the east side of Dempsey Ridge. Some modern vehicle use is evident near the trail marker, and it appears that portions of the resource have been used as a pull-out or parking area near CR 4211. The swales on the saddle of Dempsey Ridge are otherwise unused and show no evidence of modern disturbance. Although some ranching structures are visible at the bottom of Dempsey Basin, the setting is generally undisturbed.

Views from this KOP of Alternative 4A are screened by topography. Alternative 4F is located to the north of this KOP, spanning across the Hams Fork Plateau and the Dempsey Basin. This alternative would introduce new structural elements to this area of the viewshed. The distance of the Project from this location allows the elements to blend in with the landscape in some areas, decreasing their prominence within the view; therefore, the VCR for this KOP is assessed as weak to moderate. The proposed Project elements draw the attention of the casual observer but would not dominate the setting. There would be an adverse impact to the resource at this location.

KOP C41 (Figures 3.3-85 and 3.3-86) is located on a segment of the California NHT – Dempsey-Hockaday Cutoff that connects to CR 4220 looking west as the trail crosses the Dempsey Basin. The KOP is approximately 1.9 miles east of Lake Viva Naughton, 4.8 miles north of Alternative 4A, and 3.7 miles north of Alternative 4F.

Figure 3.3-85. KOP C41. View from Dempsey-Hockaday Cutoff, facing west, across the Dempsey Basin, toward Alternative 4F. Note ranch houses in middleground of photo. Photo taken 9/16/09 at 5:04 p.m.

Figure 3.3-86. KOP C41. View from Dempsey-Hockaday Cutoff, facing south toward Alternative 4F. Photo taken 9/16/09 at 5:04 p.m.

The resource at this location consists of a two-track road with shallow ruts. The condition of the trail is good, exhibiting light, modern use, as it descends downslope to the bottom of Dempsey Basin. The setting contains a few ranch houses located in the valley approximately 2 miles west from this KOP.

Alternative 4F would be located to the west of this KOP spanning across the Hams Fork Plateau and the Dempsey Basin and south where it crosses the basin south of Lake Viva Naughton. This Route Alternative would introduce new structural elements to this area of the viewshed. The distance of the Project from this location allows the elements to blend in with the landscape in some areas, decreasing their prominence within the view; therefore, the VCR for this KOP is assessed as weak to moderate. The proposed Project elements may draw the attention of the casual observer but would not dominate the setting. There would be an adverse impact to the resource at this location.

KOP C124 (Figures 3.3-87 and 3.3-88) is located on a segment of the California NHT – Dempsey-Hockaday Cutoff, in the Dempsey Basin, north of the South Fork of Dempsey Creek. The KOP is approximately 2 miles west-northwest of Lake Viva Naughton and 0.8 mile southwest of Pink Hill. Alternative 4F is located 0.6 mile to the west. Due to topography, only Alternative 4F would be visible from this location.

The resource at this point consists of a shallow two-track road. Segments of other two-track roads are visible 400 feet to the north and 500 feet to the south. A curvilinear fence line can be seen approximately 200 feet to 250 feet to the east, south, and west. The setting is otherwise undisturbed.

Figure 3.3-87. KOP C124. View of the Dempsey-Hockaday Cutoff, facing southwest. Photo taken 8/2/10 3:57 p.m.

Figure 3.3-88. KOP C124. View from the Dempsey-Hockaday Cutoff, facing west toward Alternative 4F. Photo taken 8/2/10 3:57 p.m.

Alternative 4F would introduce new structural elements to the area. The VCR for this KOP is assessed as strong. There would be an adverse impact to the resource at this location.

KOP 620 (Figure 3.3-89) is located on a segment of the Oregon/California NHT Dempsey-Hockaday Cutoff in the Dempsey Basin. The KOP is just over 0.1 mile north of the South Fork of Dempsey Creek, approximately 3.0 miles west-northwest of Lake Viva Noughton, and 0.5 mile west of Pink Hill. Alternative 4F is located 0.3 mile to the west and 0.2 mile to the northwest. A photographic simulation depicting indirect (visual) effects to the resource has been generated for the KOP (Appendix G-1, Figure K-5a/b).

The resource at this location consists of a shallow two-track road. The setting in this area is undisturbed in all directions. Alternative 4F would introduce new structural elements to the area. The VCR for this KOP is assessed as strong. There would be an adverse impact to the resource at this location.

Figure 3.3-89. KOP 620. View of a Segment of the California/Oregon NHT Dempsey-Hockaday Cutoff, facing east. Photo taken 9/24/08 3:33 p.m.

KOP C125 (Figure 3.3-90) is located on a segment of the California NHT – Dempsey-Hockaday Cutoff, in the Dempsey Basin. The KOP is 0.2 mile north of the South Fork of Dempsey Creek, approximately 3.3 miles west-northwest of Lake Viva Naughton, and 0.9 mile west of Pink Hill. Alternative 4F is located 0.4 mile to the west. Due to topography, only Alternative 4F would be visible from this location. A photographic simulation depicting indirect (visual) effects to the resource has been generated for the KOP (see Figures E-29 and E-30 in Appendix E).

Figure 3.3-90. KOP C125. View of the Dempsey-Hockaday Cutoff, facing east toward Alternative 4F. Photo taken 8/2/10 4:25 p.m.

The resource at this location consists of a shallow two-track road. The setting in this area is undisturbed in all directions.

Alternative 4F would introduce new structural elements to the area. The VCR for this KOP is assessed as strong. There would be an adverse impact to the resource at this location.

Historic Resources

KOP C32 (Figures 3.3-91 and 3.3-92) is located on the northeast corner of the Susanna Lewis Homestead property boundary. The site is located approximately 9.2 miles west and 0.7 mile south of Kemmerer on CR 331, on the west side of the road. The KOP is located approximately 450 feet south of Alternatives 4B and 4C, and 1.9 miles north of Alternatives 4D and 4E.

The setting contains a wooden, H-frame transmission line less than 0.25 mile to the north and views of traffic on U.S. Highway 30 approximately 0.75 mile to the northeast.

Figure 3.3-91. KOP C32. View from the Susanna Lewis Homestead, looking west towards Alternatives 4B and 4C. Photo taken 10/25/09 at 1:10 p.m.

Figure 3.3-92. KOP C32. View from the homestead facing south towards Alternatives 4B and 4C. Photo taken 10/25/09 at 1:10 p.m.

Alternatives 4B and 4C are located to the south away from existing modern impacts to the setting of this resource.

The Project would introduce new structural elements to setting. Due to this factor and the proximity of the KOP to the Route Alternatives, the VCR for this KOP is assessed as strong for Alternatives 4B and 4C, and moderate for Alternatives 4D and 4E. The Project elements would dominate the setting. There would be an adverse impact to the resource at this location.

KOP C33 (Figures 3.3-93 and 3.3-94) is located at the 1880s homestead of Frederick S. Rawlings, one of the earliest settlers of the Fossil area. KOP C33 is located on the southwest corner of the site boundary, located approximately 1,000 feet northwest of Alternatives 4B and 4C.

The setting contains modern houses, as well as U.S. Highway 30 and railroad tracks, 0.8 mile to the north. Modern signs for an underground pipeline are visible 0.3 mile to the south, and a wooden, H-frame transmission line is prominent in the view 0.5 mile to the south.

Figure 3.3-93. KOP C33. View of one of the standing structures at the Rawlings Homestead facing southwest toward Alternatives 4B and 4C. Photo taken 10/25/09 at 1:40 p.m.

Figure 3.3-94. KOP C33. View from the Rawlings Homestead looking southeast towards Alternatives 4B and 4C. Note view of existing transmission lines. Photo taken 10/25/09 at 1:40 p.m.

The Route Alternative are located south of and parallel to the existing transmission line where views are limited by topography. Due to this factor, the similarity of the Project's design with existing structures in the area, and the potential for elements to blend in with the backdrop, the VCR for this KOP is assessed as weak. The Project elements would not dominate the setting; therefore, there would not be an adverse impact to the resource at this location.

KOP C21 (Figures 3.3-95 and 3.3-96) is located at the Red Rock Pass Cemetery (also known as the Jefferson Hunt Memorial). The KOP is on the east side of U.S. Highway 91, overlooking Marsh Valley to the north, and is approximately 2.2 miles south of the Proposed Route in Segment 4.

The setting contains a lattice transmission line 0.5 mile to the north, views of traffic on U.S. Highway 91, the UPRR less than 0.25 mile to the northeast, and several houses visible in all areas of the landscape.

Due to the similarity of the Project's design with existing structures in the area and KOP's distance from the Proposed Route and Route Alternatives, the VCR for this KOP is assessed as weak. The Project elements would not dominate the setting; therefore, there would not be an adverse impact to the resource at this location.

Figure 3.3-95. KOP C21. View of Red Rock Pass Cemetery (Jefferson Hunt Memorial), looking northeast from top of the roadside monument. Photo taken 10/15/09 at 9:23 a.m.

Figure 3.3-96. KOP C21. View from the cemetery looking northeast toward the Proposed Route in Segment 4. Photo taken 10/15/09 at 9:23 a.m.

Segment 5

Segment 5, as proposed, would link the Populus and Borah Substations with a 54.6-mile single-circuit 500-kV line. Forty-four acres of the expansion of the Populus and Borah Substations are attributed to Segment 5. There are five Route Alternatives including two proposed by the BLM to avoid the Deep Creek Mountains (5A and 5B; 8 miles and 19 miles longer than the comparison portion of the Proposed Route), one preferred by Power County that crosses the Fort Hall Indian Reservation (5C; 6 miles shorter than the comparison portion of the Proposed Route), one originally proposed by the Proponents (5D; 2 miles shorter than the comparison portion of the Proposed Route but located within more agricultural lands), and one proposed by Power County as an alternative approach to the Borah Substation (5E) (see Appendix A, Figure A-7).

California NHT – Hudspeth Cutoff

KOP C24 (Figure 3.3-97) is located on a segment of the California NHT – Hudspeth Cutoff that corresponds to the West Sublette Road, also known as S Road. The KOP is located on the two-track road where it begins to ascend the adjacent Cedar Mountains, approximately 1.4 miles northeast of the Proposed Route in Segment 5, 1.8 miles northeast of Alternatives 5A and 5B, and 2.7 miles northeast of the Proposed Route in Segment 7 and Alternatives 7H and 7I.

Figure 3.3-97. KOP C24. View from Hudspeth Cutoff facing southwest toward the Proposed Route in Segment 5. Photo taken 10/17/09 at 12:13 p.m.

The resource at this location consists of a well-used two-track road. The setting contains agricultural structures and ranch houses that are visible in all directions.

Views of the Project to the west and south are screened by topography. Views to the southeast are intermittent. Due to the KOP's distance from the Proposed Route and Route Alternatives and the potential for the elements to blend in with the backdrop, the VCR for this KOP is assessed weak to moderate. The proposed Project elements may draw the attention of the casual observer; therefore, there would be an adverse impact to the resource at this location.

KOP C25 (Figure 3.3-98) is located on a segment of the California NHT – Hudspeth Cutoff that parallels Hermits Ville Road. The KOP is located on the east side of the road on the toe-slope of a hill approximately 0.2 mile northeast of the Proposed Route in Segment 7, 1.3 miles southwest of the Proposed Route in Segment 5, and 0.5 mile southeast of Alternatives 5A, 5B, and 5C. Alternatives 7A, 7B, 7H, and 7I are screened by topography. Photographic simulations depicting indirect (visual) impacts to the resource have been generated for this KOP (Appendix E, Figures E.3-31 and E.3-32).

The resource at this location consists of a deep swale with no visible wheel ruts. Vegetation is very thick and the bottom of the swale is not visible for closer examination. A wooden, H-frame and lattice transmission line crosses the trail approximately 1,000 feet to the northeast.

Figure 3.3-98. KOP C25. View of Hudspeth Cutoff, looking north-northeast towards the Proposed Route in Segment 5. The trail is located in the bottom right corner of photograph, obscured by dense vegetation. Photo taken 10/17/09 at 3:19 p.m.

Views of the all Project routes near this KOP are intermittent and screened in some areas by topography. Due to the KOP's distance or proximity to the Proposed Route and Route Alternatives and the potential for the elements to blend in with the backdrop, the VCR for this KOP is assessed weak to moderate for the Proposed Route in Segment 5 and Alternative 5C, and strong for the Proposed Route in Segment 7 and Alternatives 5A and 5B. The proposed Project elements may dominate the setting or draw the attention of the casual observer; therefore, there would be an adverse impact to the resource at this location.

Oregon/California NHT

KOP C26 (Figure 3.3-99 and 3.3-100) is located on a segment of the Oregon/California NHT near an NPS trail interpretive area on the east side of I-86/U.S. Highway 30, within the rocky outcrops of Massacre Rocks State Park. This segment has been designated as a high-potential route segment by the NPS. KOP C26 is approximately 4 miles southwest of Alternative 5D and 4.3 miles southwest of Segment 5 of the Proposed Route.

The resource at this location consists of a deep swale with no visible wheel ruts. Tourist activities have created paths in and around the trail and water erosion has deepened the swale in areas with steeper slopes. I-86/U.S. Highway 30 parallels the trail through this area and is highly visible at this location. An adjacent highway rest stop and several residential properties are visible. A lattice transmission line is located 5.5 miles to the north-northeast.

Figure 3.3-99. KOP C26. View of trail at Massacre Rocks State Park. Standing near trail looking southwest at trail marker and trail ruts sign. Trail swale is located 3 feet south of trail signs. Photo taken 10/18/09.

Figure 3.3-100. KOP C26. View from trail at Massacre Rocks State Park facing northeast toward Alternative 5D and the Proposed Route in Segment 5. Highway and rest stop in middleground view. Photo taken 10/18/09 12:08 p.m.

Due to the similarity of the Project's design with existing structures in the area and the KOP's distance from the Proposed Route and Route Alternatives, the VCR for this KOP is assessed as weak. Views of the Project are screened in some areas by topography from this location. The Project's elements would not dominate the setting; therefore, there would not be an adverse impact to the resource at this location.

Segment 6

Segment 6 is an existing transmission line linking the Borah and Midpoint Substations; it is now operated at 345 kV but would be changed to operate at 500 kV. This segment has no Route Alternatives. Existing support structures would be used and impacts would be limited to within approximately one-quarter mile from each substation to allow for moving the entry point into the substation to the new 500-kV bay. Thirty-one acres of the expansion of the Borah and Midpoint Substations are attributed to Segment 6. Changes in the two substations would allow it to be operated at 500 kV (see Appendix A, Figure A-8).

Segment 7

Segment 7, as proposed, would link the Populus and Cedar Hill Substations with a 118.1-mile single-circuit 500-kV line. Forty-two acres of the expansion of the Populus and the construction of the Cedar Hill Substations and 1 acre for two regeneration sites are attributed to Segment 7. In addition to the Proposed Route, which is principally on private lands, Route Alternatives have been proposed by the BLM to avoid the Deep

Creek Mountains (7A and 7B; which are 5 miles and 11 miles longer than the comparison portion of the Proposed Route), by local landowners (7C, 7D, 7E, 7F, and 7G, which all represent minor adjustments proposed to address local issues), by the Southern Idaho Task Force to avoid private agricultural lands (7I or the State Line Route, which is 55 miles longer than the Proposed Route and would require 0.5 acre for an additional regeneration site), and by the Proponents to avoid the State Line Route (7H, which is 10 miles longer than the Proposed Route). Alternative 7J, which is a variant of the State Line Route also proposed by the Southern Idaho Task Force, wouldn't terminate at Cedar Hill Substation. This alternative, referred to as the Rogerson Alternative, would require a different substation be constructed near a 345-kV existing transmission line (approximately 24 miles southwest of Cedar Hill Substation; see Appendix A, Figure A-9). The tables and discussion in this document compare 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

California NHT – Hudspeth Cutoff

KOP C22 (Figure 3.3-101) is located on segment of the California NHT – Hudspeth Cutoff that corresponds to an unnamed road forking from Jensen Pass Road. The KOP is located on top of the ridge south of the two-track road, and is approximately 2.5 miles southeast of Alternatives 7B, 7H, and 7I/7J, and 2.9 miles south of Alternative 5B.

Figure 3.3-101. KOP C22. View from Hudspeth Cutoff facing northwest toward Alternatives 7B, 7H, 7I/7J, and 5B. Photo taken 10/5/09 at 1:36 p.m.

The resource at this location consists of a two-track road that is moderately used by hunters. The setting contains agricultural structures that are visible 2 to 3 miles to the west.

Views of the alternatives are limited by topography to a small area to the northwest. Due to the KOP's distance from the Route Alternatives and the potential for the elements to blend in with the backdrop, the VCR for this KOP is assessed weak to moderate. The proposed Project elements may draw the attention of the casual observer; therefore, there would be an adverse impact to the resource at this location.

KOP C23 (Figure 3.3-102) is located on a segment of the California NHT – Hudspeth Cutoff, also called Sublette Canyon Road, and is located on a slope of the west side of a saddle, as the road descends into the valley. KOP C23 is located approximately 3.1 miles southeast of 7B, 7H, and 7I/7J, and 3.4 miles south of Alternative 5B.

Figure 3.3-102. KOP C23. View of Hudspeth Cutoff facing west toward Alternatives 7B, 7H, 7I/7J, and 5B. Photo taken 12/3/09 at 11:35 a.m.

The resource at this location consists of a two-track road with evidence of minimal use by hunters in the area. The setting contains agricultural structures that are visible 2 to 3 miles to the west.

Views of the Alternatives are limited by topography to a small area to the northwest. Due to the KOP's distance from the Alternatives and the potential for the elements to blend in with the backdrop, the VCR for this KOP is assessed weak to moderate. The proposed Project elements may draw the attention of the casual observer; therefore, there would be an adverse impact to the resource at this location.

KOP C65 (Figure 3.3-103) is located on a segment of the California NHT – Hudspeth Cutoff, on a flat plain north of Meadow Creek. The KOP is approximately 1.6 miles north of Alternative 7H and 3.5 miles north of Alternative 7I/7J.

The resource at this location is a two-track road paralleling a shallow swale. The setting contains feedlot facilities approximately 1 mile to the west-northwest; a wooden, single-pole transmission line paralleling the dirt road that bisects the trail approximately 1 mile to the east; and agricultural structures that are visible on the landscape in all directions.

The Project's design shares some similarities with existing structures in the area but would introduce new elements that are of different form. Due to the KOP's distance to the Route Alternatives and the potential for the elements to blend in with the backdrop, the VCR for this KOP is assessed weak to moderate for both alternatives. The Proposed Project elements may draw the attention of the casual observer; therefore, there would be an adverse impact to the resource at this location.

Figure 3.3-103. KOP C65. View from Hudspeth Cutoff facing southeast toward Alternatives 7H and 7I/7J. Photo taken 11/15/09 at 3:05 p.m.

KOP C66 (Figure 3.3-104) is located on a segment of the California NHT – Hudspeth Cutoff along a flat plain just south of Meadow Creek. It is approximately 2 miles north of Alternatives 7H and 7I/7J.

The resource at this location consists of a wide, shallow swale. The setting contains a wooden, single-pole transmission line 0.25 mile to the north. Agricultural structures are visible on the landscape in all directions.

Figure 3.3-104. KOP C66. View of Hudspeth Cutoff facing southwest toward Alternative 7H. Photo taken 11/15/09 at 3:30 p.m.

The Project's design shares some similarities with existing structures in the area but would introduce new elements that are of different form, size, and material. Due to the KOP's distance to the Route Alternatives and the potential for the elements to blend in with the backdrop, the VCR for this KOP is assessed as moderate for both alternatives. The proposed Project elements would draw the attention of the casual observer; therefore, there would be an adverse impact to the resource at this location.

KOP C68 (Figure 3.3-105) is located on a segment of the California NHT – Hudspeth Cutoff, at the intersection of Twin Canyons and the South Fork of Sublette Creek. The KOP is located in the canyon for South Sublette Creek, approximately 2 miles northwest of Alternatives 7H and 7I/7J. Photographic simulations depicting indirect (visual) impacts to the resource have been generated for this KOP (Appendix E, Figures E.3-33 and E.3-34).

Figure 3.3-105. KOP C68. View of Hudspeth Cutoff looking east toward Alternative 7H and 7I/7J. Trail is visible as swale to the left of the marker. Photo taken 11/16/09 at 10:21 a.m.

The trail at this location consists of a deep swale with visible wheel ruts. There are no modern intrusions to the setting at this location.

Views of the Project route near this KOP are intermittent and screened in most areas by topography. Due to the KOP's proximity to the alternatives, the VCR for this KOP is assessed as strong for Alternatives 7H and 7I/7J. The proposed Project elements may dominate the setting; therefore, there would be an adverse impact to the resource at this location.

KOP C69 (Figure 3.3-106) is located on a segment of the California NHT – Hudspeth Cutoff near South Fork Sublette Creek, between Elbow Canyon to the north and Kossman Canyon to the south approximately 0.7 mile north of Alternatives 7H and 7I/7J.

The resource at this location is a bladed road. There are no modern intrusions to the setting at this location.

Views of the Project route near this KOP are intermittent and screened in most areas by topography. Due to the KOP's proximity to the Route Alternatives, the VCR for this KOP is assessed as strong for Alternatives 7H and 7I/7J. The proposed Project elements may dominate the setting; therefore, there would be an adverse impact to the resource at this location.

Figure 3.3-106. KOP C69. View of Hudspeth Cutoff looking southeast toward Alternatives 7H and 7I/7J. Photo taken 11/16/09 at 10:21 a.m.

KOP C70 (Figure 3.3-107) is located on a segment of the California NHT – Hudspeth Cutoff, in the canyon for South Fork Sublette Creek, between Eyrie Canyon to the north and Park Canyon to the south. KOP C70 is located approximately 0.8 mile south of Alternatives 7H and 7I/7J.

The resource at this location is a bladed road. There are no modern intrusions to the setting at this location.

Views of the Project route near this KOP are intermittent and screened in most areas by topography. Due to the KOP's proximity to the Route Alternatives, the VCR for this KOP is assessed as strong for Alternatives 7H and 7I/7J. The proposed Project elements would dominate the setting; therefore, there would be an adverse impact to the resource at this location.

Figure 3.3-107. KOP C70. View from Hudspeth Cutoff facing northwest toward Alternatives 7H and 7I/7J. Photo taken 11/16/09 at 11:22 a.m.

Oregon/California NHT

KOP C63 (Figures 3.3-108, 3.3-109, and 3.3-110) is located at the point of separation of the Oregon NHT and the California NHT known as the Parting of the Ways, just west of the Raft River. The KOP is located on the upper terrace of the Raft River's floodplain, approximately 0.5 mile south of the Proposed Route in Segment 7 and 3.4 miles north of Alternative 7C. Photographic simulations depicting indirect (visual) impacts to the resource have been generated for this KOP (Appendix E, Figures E.3-35 and E.3-36).

The Oregon NHT at this location consists of a shallow, two-track road that transition into a swale within 100 feet of the junction on both sides of the California NHT. The California NHT consists of a two-track road that is used to access the junction. Modern use has widened and deepened the ruts and added ruts from winter and spring travel. The setting contains a wooden, H-frame transmission line and ranch structures approximately 2.5 miles to the southeast.

The Project's design shares some similarities with existing structures in the area but would introduce new elements that are of different form, material, and texture. Due to this factor and the KOP's distance or proximity from the Proposed Route and Route Alternatives, the VCR for this KOP is assessed as moderate to strong for the Proposed Route in Segment 7 and weak for Alternative 7C. The Project's elements would not dominate the setting for Alternative 7C. There would not be an adverse impact to the resource from Alternative 7C. The Project's elements would dominate the setting for the Proposed Route in Segment 7; therefore, there would be an adverse impact to the resource from Segment 7 at this location.

Figure 3.3-108. KOP C63. View of the Oregon NHT at Parting of the Ways facing east. Trail is visible in middle of photo, extending into the agricultural field. Photo taken 11/15/09 at 9:07 a.m.

Figure 3.3-109. KOP C63. View of the California NHT at Parting of the Ways, facing northeast toward the Proposed Route in Segment 7. Photo taken 11/15/09 at 9:07 a.m.

Figure 3.3-110. KOP C63. View of California NHT, visible at left side of photograph, from Parting of the Ways sign, facing south toward the proposed Alternative 7C. Photo taken 11/15/09 at 9:07 a.m.

Oregon NHT

KOP C64 (Figures 3.3-111, 3.3-112, and 3.3-113) is located on a segment of the Oregon NHT, 4 miles west of the Raft River. KOP C64 is located approximately 1 mile south of the Proposed Route in Segment 7 and 1.8 miles north of Alternative 7C. Photographic simulations depicting potential indirect (visual) impacts to the resource have been generated for this KOP (Appendix E, Figures E.3-37 and E.3-38).

The resource at this location is distinguished by a swale with shallow ruts. There are no modern intrusions to the setting at this location.

Due to the Project's proximity to this KOP and the introduction of new elements to the resource's viewshed, the VCR for this KOP is assessed as strong for both routes. The proposed Project elements would dominate the setting; therefore, there would be an adverse impact to the resource at this location.

Figure 3.3-111. KOP C64. View of the Oregon NHT looking west. Trail is visible in middle of photo and extending onto the rolling plains. Photo taken 11/15/09 at 10:37 a.m.

Figure 3.3-112. KOP C64. View from the Oregon NHT looking southwest toward Alternative 7C. Photo taken 11/15/09 at 10:37 a.m.

Figure 3.3-113. KOP C64. View from the Oregon NHT looking north toward Proposed Route in Segment 7. Photo taken 11/15/09 at 10:37 a.m.

California NHT

KOP C67 (Figure 3.3-114) is located on a segment of the California NHT along the base of a shallow mountain range, just north of Cassia Creek. KOP C67 is located less than 0.25 mile north of State Highway 77 and approximately 1.2 miles north of Alternative 7H.

The resource at this location consists of an upgraded two-track road with added gravels that is used heavily for recreation. The setting contains a wooden, single-pole transmission line that parallels the highway. Ranching facilities are visible on the landscape in all directions.

Alternative 7H would be located south of the existing transmission line. The Project's design shares some similarities with existing structures in the area but would introduce new elements that are of a different form, material, and texture. Due to the similarity of the Project's design with existing structures in the north, potential blending of elements into the backdrop in some areas, and the cumulative impact of adding additional structures, the VCR for this KOP is assessed as weak to moderate. The proposed Project elements may draw the attention of the casual observer; therefore, there would be an adverse impact to the resource at this location.

Figure 3.3-114. KOP C67. View of California NHT facing south toward Alternative 7H. Photo taken 11/15/09 at 4:14 p.m.

KOP C78 (Figure 3.3-115) is located on a segment of the California NHT along the eastern edge of Junction Valley and the westernmost edge of Emigrant Canyon. KOP C78 is located approximately 1.6 miles north of Alternative 7I/7J.

The resource at this location consists of a swale with visible ruts. The setting contains a wooden, single-pole transmission line located approximately 0.5 mile to the south and the Moulton Quarry site approximately 0.5 mile to the southwest.

Alternative 7I/7J would be located to the southwest crossing the open landscape of Junction Valley. The Project's design shares some similarities with existing structures in the area but would introduce new elements that are of different material, form, and texture. The VCR for this KOP is assessed as moderate. The proposed Project elements would draw the attention of the casual observer; therefore, there would be an adverse impact to the resource at this location.

Figure 3.3-115. KOP C78. View from the California NHT facing west toward Alternative 7I/7J. Photo taken 11/17/09 at 11:30 a.m.

KOP C79 (Figure 3.3-116) is located on a segment of the California NHT near Birch Creek, approximately 1 mile north of the Utah border. KOP C79 is located approximately 0.4 mile southeast of Alternative 7I/7J. Photographic simulations depicting indirect (visual) impacts to the resource have been generated for this KOP (Appendix E, Figures E.3-39 and E.3-40).

The resource at this location is distinguished by a deep swale/erosion feature with no visible wheel ruts. There are no modern intrusions to the setting at this location.

The proposed Project would introduce new elements in the resource's setting. Due to this factor and the proximity of the route to the KOP, the VCR is assessed as strong. The proposed Project elements would dominate the setting; therefore, there would be an adverse impact to the resource at this location.

Figure 3.3-116. KOP C79. View of California NHT from KOP C79 looking down slope at the swale and facing west toward Alternative 7I/7J. Note trail marker on the left. Photo taken 11/17/09 at 3:30 p.m.

KOP C80 (Figures 3.3-117 and 3.3-118) is located on a segment of the California NHT 0.75 mile west-southwest of Birch Creek and approximately 0.5 mile north of Alternative 7I/7J.

The resource at this location consists of a shallow, unused, two-track road. There are no modern intrusions to the setting at this location.

The proposed Project would introduce new elements in the resource's setting. Some views of Alternative 7I/7J would be screened by topography, particularly to the southwest. Due to this factor and the proximity of the route to the KOP, the VCR is assessed as moderate to strong. The proposed Project elements would dominate the setting; therefore, there would be an adverse impact to the resource at this location.

Figure 3.3-117. KOP C80. View from California NHT facing south toward Alternative 7I/7J. Photo taken 12/3/09 at 11:35 a.m.

Figure 3.3-118. KOP C80. View from California NHT facing east toward Alternative 7I/7J. Photo taken 12/3/09 at 11:35 a.m.

California NHT – Salt Lake Alternate

KOP C72 (Figure 3.3-119) is located on a segment of the California NHT – Salt Lake Alternate, east of Onemile Creek. The KOP is 0.8 mile east southeast of Alternative 7I/7J.

The resource at this location consists of a moderately deep swale that parallels a jeep trail. The setting contains ranching structures approximately 2 miles north of this location.

The proposed Project would introduce new elements in the resource's viewshed. Due to the KOP's proximity to the alternative, the VCR for this KOP is assessed as strong for Alternative 7I/7J. The proposed Project elements would dominate the setting; therefore, there would be an adverse impact to the resource at this location.

Figure 3.3-119. KOP C72. View from Salt Lake Alternate Trail, looking west-northwest, toward Alternative 7I/7J. Trail swale is visible on the left, paralleling the jeep trail. Photo taken 11/16/09 at 3:15 p.m.

KOP C73 (Figure 3.3-120) is located on a segment of the California NHT – Salt Lake Alternative, 0.8 mile west of Alternative 7I/7J.

The resource at this location is a two-track jeep road. The setting contains a wooden, H-frame transmission line less than 0.25 mile to the north. Ranching structures are visible approximately 2 miles north of this location.

The Project's design shares some similarities with existing structures in the area but would introduce new elements that are of different form, material, and texture. Due to these factors and the KOP's proximity to the route, the VCR for this KOP is assessed as moderate. The Proposed Project elements may draw the attention of the casual observer; therefore, there would be an adverse impact to the resource at this location.

Figure 3.3-120. KOP C73. View from Salt Lake Alternate Trail, looking south toward Alternative 7I/7J. Photo taken 11/16/09 at 3:50 p.m.

KOP C74 (Figure 3.3-121) is located on a segment of the California NHT – Salt Lake Alternative near Johnson and George Creek, 1.3 miles north of Alternative 7I/7J.

The resource at this location consists of a very shallow swale, with no visible ruts. The setting contains wooden, single-pole transmission lines less than 0.25 mile to the north and southeast.

The Project's design shares some similarities with existing structures in the area but would introduce new elements that are of different form, material, and texture. Due to these factors and the KOP's proximity to the route and the potential for the elements to blend into the backdrop, the VCR for this KOP is assessed as weak to moderate. The proposed Project elements may draw the attention of the casual observer; therefore, there would be an adverse impact to the resource at this location.

Figure 3.3-121. KOP C74. View from Salt Lake Alternate Trail facing southeast toward Alternative 7I/7J. Photo taken 11/16/09 at 4:15 p.m.

KOP C75 (Figures 3.3-122 and 3.3-123) is located on a segment of the California NHT – Salt Lake Alternative, west of Raft River and east of City of Rocks, 1.4 miles north of Alternative 7I/7J. Photographic simulations depicting indirect (visual) impacts to the resource have been generated for this KOP (Appendix E, Figures E.3-41 and E.3-42).

The resource at this location is a shallow swale with no visible ruts. To the east, approximately 3 miles, along the valley's edge, the setting contains section line fencing, farmsteads, farm facilities, buildings, and warehouses.

The Project's design shares some similarities with existing structures in the area but would introduce new elements that are of different form, material, and texture. Due to these factors and the KOP's proximity to the route and the potential for the elements to blend into the backdrop, the VCR for this KOP is assessed as weak to moderate. The proposed Project elements may draw the attention of the casual observer; therefore, there would be an adverse impact to the resource at this location.

Figure 3.3-122. KOP C75. View of Salt Lake Alternate Trail facing west. Trail visible as swale to left of utility meter. Photo taken 11/17/09 at 9:57 a.m.

Figure 3.3-123. KOP C75. View from Salt Lake Alternate Trail facing southeast toward Alternative 7I/7J. Photo taken 11/17/09 at 9:57 a.m.

KOP C76 (Figure 3.3-124) is located on a segment of the California NHT – Salt Lake Alternate, west of the Raft River, following the creek south of Smoky Mountain, 2.6 miles north of Alternative 7I/7J.

The resource in this location is a moderately deep swale with no visible ruts. The setting contains farm facilities and section fences approximately 1 mile to the east.

The Project's design shares some similarities with existing structures in the area but would introduce new elements that are of different form, material, and texture. Due to these factors and the KOP's distance from the route and the potential for the elements to blend into the backdrop, the VCR for this KOP is assessed as weak to moderate. The proposed Project elements may draw the attention of the casual observer; therefore, there would be an adverse impact to the resource at this location.

Figure 3.3-124. KOP C76. View from Salt Lake Alternate Trail facing south toward Alternative 7I/7J. Photo taken 11/17/09 at 10:16 a.m.

KOP C77 (Figure 3.3-125) is located on a segment of the California NHT – Salt Lake Alternate in Emigrant Canyon, City of Rocks. The KOP is located 2.1 miles north of Alternative 7I/7J.

The resource at this location consists of a two-track road and a swale with shallow ruts adjacent to the two-track road. The two-track shows signs of heavy use from visitors to the City of Rocks. During the wet seasons, additional ruts have been made by vehicle traffic. The swale is in good condition with some evidence of water and wind erosion. There are no modern intrusions to the setting at this location.

Figure 3.3-125. KOP C77. View from Salt Lake Alternate trail in Emigrant Canyon, City of Rocks facing east toward Alternative 7I/7J. Photo taken 11/17/09 at 10:50 a.m.

Views of the Project route near this KOP are intermittent and screened in most areas by topography. The visible portion of the Project is 4.3 miles to the southeast of this location. Due to the KOP's distance to the Route Alternative and the potential for the elements to blend into the backdrop, the VCR for this KOP is assessed as moderate for Alternative 7I/7J. The Proposed Project elements may draw the attention of the casual observer; therefore, there would be an adverse impact to the resource at this location.

Segment 8

Segment 8, as proposed, would link the Midpoint and Hemingway Substations. This 131-mile single-circuit 500-kV transmission line would stay north of the Snake River until crossing through the SRBOP parallel to an existing 500-kV transmission line before ending at the Hemingway Substation. Thirteen acres of the expansion of the Midpoint Substation and 0.5 acre for a regeneration site are attributed to Segment 8. There are five Route Alternatives: 8A, which follows the WWE corridor but crosses the Snake River and I-84 twice (while the Proposed Route would stay north of this area); 8B and 8C, which represent the old routes originally proposed by the Proponents but that have now been changed to avoid the cities of Kuna and Mayfield, respectively; 8D, which represents a small revision involving a rebuild of the existing transmission line to move both away from the National Guard Maneuver Area; and 8E, which was proposed by the BLM in order to avoid crossing the Halverson Bar Nonmotorized portion of the Guffey Butte-Black Butte Archaeological District (see Appendix A, Figure A-10).

North Alternate Oregon Trail

KOP C83 (Figures 3.3-126 and 3.3-127) is located on a segment of the North Alternate Oregon Trail near the site of the Canyon Creek Stage Station where the trail intersects King Hill Road. The KOP is approximately 1.1 miles west of King Hill Creek and 2.7 miles northwest of the Snake River. The KOP is 0.5 mile south of the Proposed Route in Segment 8. Photographic simulations depicting indirect (visual) impacts to the resource have been generated for this KOP (Appendix E, Figures E.3-43 and E.3-44).

The resource at this location consists of a moderately deep swale. The setting contains a wooden, H-frame transmission line less than 0.25 mile to the north and modern ranching properties are visible approximately 2 miles to the east.

Topography in the area screens the view of Alternative 8A. The Project's design shares some similarities with existing structures in the area but would introduce new elements that are of different form, material, and texture. Due to these factors, the KOP's proximity to the route, and the potential for the elements to blend into the backdrop, the VCR for this KOP is assessed as weak to moderate. The Proposed Project elements may draw the attention of the casual observer; therefore, there would be an adverse impact to the resource at this location.

Figure 3.3-126. KOP C83. View of North Alternate Oregon NHT looking east. Photo taken 12/08/09 at 9:10 a.m.

Figure 3.3-127. KOP C83. Looking north toward the Proposed Route in Segment 8. Photo taken 12/08/09 at 9:10 a.m.

KOP C84 (Figures 3.3-128 and 3.3-129) is located on a segment of the North Alternate Oregon Trail approximately 0.8 mile east-northeast of the town of King Hill and 0.8 mile north of the Snake River. The KOP is 0.8 mile southwest of the Proposed Route in Segment 8.

The resource at this location consists of a two-track road that is used by ranchers. The trail has been widened and the ruts have been deepened by modern use. The setting contains a wooden, H-frame transmission line approximately 0.5 mile to the north and east and ranching structures that are visible less than 0.25 mile to the west.

Topography in the area screens the view of Alternative 8A. The Project's design shares some similarities with existing structures in the area but would introduce new elements that are of different form, material, and texture. Due to these factors, the KOP's proximity to the route, and the potential for the elements to blend into the backdrop, the VCR for this KOP is assessed as weak to moderate. The proposed Project elements may draw the attention of the casual observer; therefore, there would be an adverse impact to the resource at this location.

Figure 3.3-128. KOP C84. View from North Alternate Trail facing north toward the Proposed Route in Segment 8. Photo taken 11/17/09 at 10:50 a.m.

Figure 3.3-129. KOP C84. View from North Alternate Trail facing east toward the Proposed Route in Segment 8. Wooden, H-frame transmission line in view. Photo taken 11/17/09 at 10:50 a.m.

KOP C85 (Figure 3.3-130) is located on a segment of the North Alternate Oregon Trail approximately 600 feet west of Pioneer Reservoir where the trail intersects with 100 East Road. This KOP is located 870 feet northeast of the Proposed Route in Segment 8.

The resource at this location consists of a swale with shallow ruts visible. The setting contains a wooden, H-frame transmission line less than 0.25 mile to the south; a wooden, single-pole transmission line approximately 2.5 to 3.0 miles to the northeast; and agricultural structures that are visible within 1.0 mile to the northeast.

The Proposed Route in Segment 8 would be located just to the north and parallel to the existing wooden, H-frame transmission line. The Project's design shares some similarities with existing structures in the area, but would introduce new elements that are of different form, material, and texture. Due to these factors and the KOP's proximity to the route, the VCR for this KOP is assessed as weak to moderate. The proposed Project elements would draw the attention of the casual observer; therefore, there would be an adverse impact to the resource at this location.

Figure 3.3-130. KOP C85. View of North Alternate Trail facing south toward the Proposed Route in Segment 8. Photo taken 12/8/09 at 12:35 p.m.

KOP C87 (Figures 3.3-131, 3.3-132, and 3.3-133) is located on a segment of the North Alternate Oregon Trail within the Malad Gorge State Park near the reported location of the Malad Stage Station. The KOP is approximately 0.4 mile west of the park's eastern boundary and 800 feet north of the Malad River. The KOP is 2.2 miles south of the Proposed Route in Segment 8 and 2.5 miles north of Alternative 8A.

Figure 3.3-131. KOP C87. View of North Alternate Oregon NHT looking east. Photo taken 12/08/09 at 4:10 p.m.

Figure 3.3-132. KOP C87. View from the North Alternate Oregon NHT looking north towards the Proposed Route in Segment 8. Photo taken 12/08/09 at 4:10 p.m.

Figure 3.3-133. KOP C87. View from the North Alternate Oregon looking south towards Alternative 8A. Photo taken 12/08/09 at 4:10 p.m.

The trail segment in this area, recently identified by an OCTA volunteer, is located approximately 525 feet south of where existing SHPO and NPS spatial data depict the trail (Eichhorst 2010a). The trail segment at this location consists of a two-track road. The presence of vegetation in the ruts here suggests that the road has not been recently used. The setting contains views of traffic on I-84 approximately 0.25 mile to the southwest, which includes several related structures, signs, and billboards that are visible from this location. A ranch house with associated agricultural equipment is visible approximately 0.25 mile to the north, and additional houses are visible approximately 1.5 to 2 miles to the southeast. Wind turbines can be seen 2 to 3 miles to the west, and a lattice transmission line is visible on the southwestern skyline.

Views of the Proposed Route in Segment 8 are intermittent and screened in some areas by topography. The Project's design shares some similarities with existing structures in the area. Due to these factors and the KOP's distance from the route and alternative, the VCR for this KOP is assessed as weak. The Proposed Project elements would not dominate the setting; therefore, there would not be an adverse impact to the resource at this location.

KOP C112 (Figures 3.3-134 and 3.3-135) is located on a segment of the North Alternate Oregon Trail, 9.25 miles east of the town of Mountain Home, approximately 0.6 mile north of Hot Springs Creek Reservoir. The KOP is located at a point on the North Alternate Oregon Trail approximately 0.2 mile east of where it diverges from the Oregon NHT. It is 1.9 miles north of the Proposed Route in Segment 8.

Figure 3.3-134. KOP C112. View of the North Alternate Oregon Trail, facing west, visible as a shallow depression in center of photo. Photo taken 7/27/10 at 1:23 p.m.

Figure 3.3-135. KOP C112. View from the North Alternate Oregon Trail, facing south/southeast toward the Proposed Route in Segment 8. Photo taken 7/27/10 at 1:23 p.m.

The resource at this point consists of a well-preserved swale with discernable ruts that are approximately 1 feet deep. The trail is marked, heavily overgrown with vegetation at this location, and bisected by a southeast-to-northwest-trending improved gravel road. Multiple transmission lines with wooden H-frame and metal lattice work support structures are visible to the south. A small wind farm with approximately 17 turbines can be seen approximately 0.5 mile to the southeast. A small agricultural complex containing two structures is visible approximately 0.75 mile to the southeast.

Due to the similarity of the Project's design with existing structures visible to the south, the VCR for this KOP is assessed as weak. The Project's elements would not dominate the setting; therefore, there would not be an adverse impact to the resource at this location.

KOP C118 (Figures 3.3-136 and 3.3-137) is located on a segment of the North Alternate Oregon Trail, on the south side of the Blair Trail Reservoir, 1.4 miles northwest of Little Canyon Creek. It is 1.5 miles north of the Proposed Route in Segment 8 and 3.1 miles north of Alternative 8A.

The resource at this location consists of a wide, shallow swale with faintly visible ruts. The trail here is largely undisturbed, but is bisected by a two-track road at the KOP. The Blair Trail Reservoir is located immediately to the north, and the earthen berm supporting the southern side of the reservoir is visible from the KOP. Three transmission lines—two with wooden, H-frame support structures and one with metal lattice support structures—are visible approximately 0.5 to 1.5 miles southwest.

Figure 3.3-136. KOP C118. View of the North Alternate Oregon Trail, facing west/southwest. Photo taken 7/30/10 at 9:25 a.m.

Figure 3.3-137. KOP C118. View from the North Alternate Oregon Trail, facing south/southwest with transmission line structures in view. Photo taken 7/30/10 at 9:25 a.m.

The proposed Project parallels and bisects the existing transmission lines to the south. Due to the similarity of the Project's design with the existing structures in the area, the proximity of the KOP to the alternative, and the cumulative effect of adding additional structures, the VCR for this KOP is assessed as weak. The Proposed Project's elements would not dominate the setting; therefore, there would not be an adverse impact to the resource at this location.

KOP C119 (Figure 3.3-138) is located on a segment of the North Alternate Oregon Trail, 3 miles northwest of the Blair Trail Reservoir and 0.5 mile northwest of Cold Springs Creek, at the intersection of Walker Road and Alkali Road. The KOP is approximately 0.5 mile south-southeast of the reported location of the Cold Springs Stage Station, which has reputedly been destroyed (Eichhorst 2010b). The KOP is 2.6 miles northeast of the Proposed Route in Segment 8 and 3.2 miles north of Alternative 8A.

The resource at this location consists of a wide, undisturbed swale that possibly represents two parallel traces of the trail. The trail is bisected by Walker Road at this point and is obliterated by a cultivated agricultural field approximately 200 feet north of the KOP. Two transmission lines with wooden, H-frame support structures are visible 0.75 mile and 1.5 miles to the southwest of this location. Additional transmission lines are visible approximately 2.3 miles southwest of this location.

Figure 3.3-138. KOP C119. View of the North Alternate Oregon Trail, facing south toward the Proposed Route in Segment 8 and Alternative 8A. Trail is visible as swale that descends down the valley in the center of the photo. Photo taken 7/30/10 at 10:32 a.m.

The Proposed Project is located south of the existing transmission lines. Due to the similarity of the Project's design with the existing structures in the area, the proximity of the KOP to the alternative, and the cumulative effect of adding additional structures, the VCR for this KOP is assessed as weak. The Proposed Project's elements would not dominate the setting; therefore, there would not be an adverse impact to the resource at this location.

Oregon NHT

KOP C61 (Figures 3.3-139, 3.3-140, and 3.3-141) is located on a segment of the Oregon NHT along the edge of an upper terrace of the Snake River, approximately 0.25 mile east of Rosevear Gulch Road and 0.75 mile east of Rosevear Gulch. KOP C61 is located approximately 2.8 miles southwest of Alternative 8A and 3.0 miles northeast of the Proposed Route in Segment 9.

The resource at this location consists of a swale with no visible ruts. The setting contains agricultural buildings and a holding tank approximately 4 miles to the west, a gravel pit that is prominent in the view approximately 0.5 mile to the west, and a blue water tank that is approximately 2 miles to the south.

Figure 3.3-139. KOP C61. View of Oregon NHT, facing west. Trail swale located to the right of the trail marker. Gravel pit is visible on left side of photo in middle ground. Photo taken 11/18/09 at 2:18 p.m.

Figure 3.3-140. KOP C61. View from Oregon NHT, facing northeast toward Alternative 8A. Photo taken 11/18/09 at 2:18 p.m.

Figure 3.3-141. KOP C61. View from Oregon NHT, facing southwest toward the Proposed Route in Segment 9. Photo taken 11/18/09 at 2:18 p.m.

The Project's design shares some similarities with existing structures in the area but would introduce new elements that are of different form, material, and texture. The view of the Proposed Route in Segment 9 is screened by topography with the exception of a very small area to the southwest. Due to this factor and the KOP's distance from the Proposed Route and Route Alternatives, the VCR for this KOP is assessed as moderate. The Project's elements may draw the attention of the casual observer but would not dominate the setting. There would be an adverse impact to the resource at this location.

KOP C95 (Figure 3.3-142) is located on a segment of the Oregon NHT approximately 1.0 mile west of Deer Gulch and 1.25 miles east of Black Mesa Road. The KOP is 0.7 mile southwest of Alternative 8A and 1.4 miles north of Alternative 9B where views of these routes are screened by topography.

The resource at this location consists of a well-used two-track road to the east of the KOP that transitions to a shallow swale with no visible ruts on the west side of the KOP. The setting contains a wooden, H-frame and lattice transmission line approximately 600 feet to the north. A fence bisects the trail approximately 100 feet to the north.

Figure 3.3-142. KOP C95. View of Oregon NHT facing northeast toward Alternative 8A. Note wooden, H-frame and lattice transmission lines in background. Photo taken 12/11/09 at 9:30 a.m.

Alternative 8A would be located north of and parallel to the existing transmission lines. Due to the similarity of the Project's design with existing structures, the KOP's distance from the alternative, and the cumulative impact of adding additional structures, the VCR

for this KOP is assessed as weak. The Project's elements would not dominate the setting; therefore, there would not be an adverse impact to the resource at this location.

KOP C96 (Figures 3.3-143 and 3.3-144) is located on a segment of the Oregon NHT, a portion of which coincides with the Kelton Road, adjacent to the Pilgrim Stage Station, 1.25 miles south-southeast of the Snake River and approximately 650 feet west of the southern end of Big Pilgrim Gulch. Alternative 8A would be located 0.7 mile southwest and Alternative 9B would be located 1.4 mile south. The Oregon NHT and Kelton Road would be crossed by Alternative 8A, approximately 0.9 mile west. Photographic simulations depicting indirect (visual) impacts to the resource have been generated for this KOP (Appendix E, Figures E.3-45 and E.3-46).

Four variants of the Oregon NHT are visible at this location, which served as the ascent from Big Pilgrim Gulch for westward-bound emigrants. The first trail variant consists of a well-used two-track road. The second and third trail variants are both shallow swales with faintly visible ruts. The fourth variant is a very deep swale that has been impacted by alluvial erosion. Trail condition is assessed as good for the first and fourth variants and excellent for the second and third variants. The setting contains a wooden, H-frame transmission line approximately 1 mile to the south-southeast and a lattice transmission line is 0.5 mile to the north.

Figure 3.3-143. KOP C96. View of Oregon NHT variants looking east toward Big Pilgrim Gulch. Photo taken 12/11/09 at 11:05 a.m.

Figure 3.3-144. KOP C96. View southward toward Alternative 8A and Alternative 9B. Photo taken 12/11/09 at 11:05 a.m.

Topography in the area screens the views of Alternatives 8A and 9B to the west. Alternative 8A would be located to the north of and parallel to the existing wooden, H-frame transmission line increasing its prominence in the view. The Project's design shares some similarities with existing structures in the area but would introduce new elements to the southeast. Due to these factors, the KOP's proximity to the route, and the cumulative impact of adding additional structures, the VCR for this KOP is assessed as strong. The proposed Project elements would dominate the setting; therefore, there would be an adverse impact to the resource at this location.

KOP C97 (Figures 3.3-145 and 3.3-146) is located on a segment of the Oregon NHT approximately 6.2 miles northwest of KOP C96, approximately 1.25 miles east of Rosevear Gulch. KOP C97 is located approximately 4.2 miles northeast of the Proposed Route in Segment 9, 3.7 miles north of Alternative 9B, and 1.6 miles southwest of Alternative 8A.

The resource at this location consists of a shallow swale. The setting contains wooden, H-frame and lattice transmission lines approximately 0.5 to 1.0 mile to the north. Ranch structures are visible 1 mile to the east and a wind farm is visible on the horizon to the southeast.

Alternative 8A would be located north of and parallel to the existing transmission lines. Due to the similarity of the Project's design with existing structures, the KOP's distance from the Proposed Route in Segment 9 and Alternative 9B, and the cumulative impact

Figure 3.3-145. KOP C97. View from trail facing northeast toward Alternative 8A. Photo taken 12/11/09 at 3:15 p.m.

Figure 3.3-146. KOP C97. View from trail facing southwest toward the Proposed Route in Segment 9 and Alternative 9B. Photo taken 12/11/09 at 3:15 p.m.

of adding additional structures, the VCR for this KOP is assessed as weak. The Project's elements would not dominate the setting; therefore, there would not be an adverse impact to the resource at this location.

KOP C100 (Figures 3.3-147 and 3.3-148) is located at the Canyon Creek Stage Station along a segment of the Oregon NHT that crosses Canyon Creek approximately 3.0 miles north of Lockman Butte. The KOP is 2.1 miles northeast of the Proposed Route in Segment 8. In 1970, a fire destroyed part of the roof and wooden addition; however, much of the brick foundation still remains today (Mauser 2005). The setting contains a wooden, H-frame transmission line approximately 0.25 mile to the southwest.

Views toward the Proposed Route in Segment 8 are screened in all areas with the exception of a small area to the southwest. The Project's design shares some similarities with existing structures in the area but would introduce new elements that are of a different form, material, and texture. Due to these factors, the similarity of the Project's design with existing structures, and the KOP's distance from the route, the VCR for this KOP is assessed as weak. The Project's elements would not dominate the setting; therefore, there would not be an adverse impact to the resource at this location.

Figure 3.3-147. KOP C100. View of Canyon Creek Station Marker. Foundation walls of the station are visible in background of photo. Photo taken 8/5/08 at 1:51 p.m.

Figure 3.3-148. KOP C100. View from Canyon Creek Station facing southwest toward the Proposed Route in Segment 8. Photo taken 08/21/08 at 11:40 a.m.

KOP C102 (Figures 3.3-149 and 3.3-150) is located near the Oregon NHT along U.S. Highway 20, 3.8 miles north of the Proposed Route in Segment 8 at the historic Rattlesnake Station marker. Rattlesnake Station has been designated as a high-potential site by the NPS.

The resource is located on private property and a direct assessment of the resource's condition could not be obtained due to landowner restrictions. The setting near the marker contains wooden, single-pole and H-frame transmission lines less than 0.25 mile south of this location.

The Proposed Route in Segment 8 would be located south of and parallel to several existing transmission lines in the view from this location. Due to the similarity of the Project's design with existing structures, the KOP's distance from the route, and the cumulative impact of adding additional structures, the VCR for this KOP is assessed as weak. The Project's elements would not dominate the setting; therefore, there would not be an adverse impact to the resource at this location.

Figure 3.3-149. KOP C102. View of Rattlesnake Station Marker facing southeast. Photo taken 08/21/08 at 11:40 a.m.

Figure 3.3-150. KOP C102. View toward the Proposed Route in Segment 8 from Rattlesnake Station Marker. Photo taken 08/21082008 at 11:40 a.m., looking southeast, from the historic marker.

KOP C106 (Figures 3.3-151 and 3.3-152) is located adjacent to a trail marker for the Oregon NHT near Bell Rapids Road, 4.4 miles northeast of the Proposed Route in Segment 9, approximately 1.3 miles southwest of Alternative 8A, and 0.8 mile north of Alternative 9B.

The resource at this location consists of a swale with visible ruts. The setting contains wooden, H-frame and lattice transmission lines approximately 0.25 to 0.5 mile to the north.

Alternative 8A would be located north of and parallel to several existing transmission lines in the view from this location. Due to the similarity of the Project's design with existing structures in the north, the KOP's proximity to the route, and the cumulative impact of adding additional structures, the VCR for this KOP is assessed as weak to moderate for Alternative 8A. Alternative 9B would be located to the south, away from existing impacts to the historic landscape. Due to this factor and the proximity of the KOP to the alternative, the VCR is moderate to strong for Alternative 9B. Due to the distance of the KOP from the Proposed Route in Segment 9 and the fact that most of the route is screened by topography, the VCR is assessed as weak to moderate. The Project's elements would dominate the setting for Alternative 9B and may draw the attention of the casual observer for the Proposed Route and Alternative 8B; therefore, an adverse impact to the resource is possible at this location.

Figure 3.3-151. KOP C106. View of Oregon NHT/Kelton Road facing south toward Alternative 9B and the Proposed Route in Segment 9. Photo taken 12/11/08 at 2:14 p.m.

Figure 3.3-152. KOP C106. View from Oregon NHT/Kelton Road facing northeast toward Alternative 8A. Wooden, H-frame and lattice transmission lines visible in background. Photo taken 12/11/08 at 2:14 p.m.

KOP C107 (Figure 3.3-153) is located on a segment of the trail adjacent to an Oregon NHT marker on Kelton Road. Alternative 8A would be located approximately 0.6 mile southwest of this KOP.

The resource at this location consists of a deep swale. The setting contains wooden, H-frame and lattice transmission lines less than 0.25 mile to the east.

The Project's design shares some similarities with existing structures in the area but would introduce new elements to the west away from existing impacts. Due to these factors and the KOP's proximity to the route, the potential for the elements to blend into the backdrop in some areas, the VCR for this KOP is assessed as moderate to strong. The proposed Project elements would dominate the setting; therefore, there would be an adverse impact to the resource at this location.

Figure 3.3-153. KOP C107. View from trail facing west toward Alternative 8A from Kelton Road. Photo taken 12/11/08 at 3:12 p.m.

KOP C108 (Figure 3.3-154) is located on a segment of the Oregon NHT located approximately 5 miles northwest of the town of Glenns Ferry. Alternative 8A would be located 1.5 miles northeast of this point, and the Proposed Route in Segment 8 would be located approximately 2.9 miles to the north.

The resource at this location consists of a two-track road. The setting contains a wooden, H-frame transmission line less than 0.25 mile to the north.

Alternative 8A would be located north of and parallel to the existing transmission line in the view from this location. The Project's design shares some similarities with existing structures in the area but would introduce new elements that are of a different form, material, and texture. Due to the similarity of the Project's design with existing structures in the north, the KOP's distance from the Proposed Route and Route Alternatives, and the cumulative impact of adding additional structures, the VCR for this KOP is assessed weak to moderate. The proposed Project elements may draw the attention of the casual observer; therefore, there would be an adverse impact to the resource at this location.

Figure 3.3-154. KOP C108. View from Oregon NHT facing northeast toward Alternative 8A and the Proposed Route in Segment 8. Photo taken 12/12/08 at 3:50 p.m.

KOP C111 (Figures 3.3-155, 3.3-156, and 3.3-157) is near a segment of the Oregon NHT adjacent to the Bonneville Point interpretive kiosk, approximately 3.2 miles northeast of I-84, off of Blacks Creek Road. The KOP was established in the interpretive center parking area, approximately 50 feet west of the kiosk and 285 feet south of the Oregon NHT. The KOP is 7.7 miles north of Alternative 8B.

The resource at this location consists of a marked trail segment located east of the BLM kiosk. Portions of the trail have been used as a two-track road in this area, whereas others have only been subjected to foot traffic, evinced by a well-worn path between the existing, shallow ruts. A radio tower complex is visible 0.25 mile to the east and transmission lines are visible within approximately 1 mile in all directions. This includes lattice transmission line structures to the northwest and four transmission lines (including wooden single-post and H-frame structures) that are visible at a distance of 1 to 3 miles to the south and southwest. Beyond these existing transmission lines, I-84 and the UPRR are visible at distances of 1 and 1.5 miles respectively. Multiple structures are visible to the south, and the city of Boise is visible on the horizon to the west.

Due to the KOP's distance from the Proposed Route and Route Alternatives and the presence of multiple, existing modern intrusions to the setting, the VCR for this KOP is assessed as weak for Alternative 8B. The Project's elements would not draw the attention of the casual observer; therefore, there would not be an adverse impact to the resource at this location.

Figure 3.3-155. KOP C111. View of Bonneville Point interpretive kiosk. Photo taken 7/27/10 at 9:25 a.m.

Figure 3.3-156. KOP C111. View of Oregon NHT looking west toward interpretive kiosk. Photo taken 7/27/10 at 9:25 a.m.

Figure 3.3-157. KOP C111. View from Bonneville Point interpretive kiosk parking area looking south toward the Proposed Route in Segment 8 and Alternatives 8B and 8C. Photo taken 7/27/10 at 9:25 a.m.

Boise City to Silver City Road

KOP C88 (Figures 3.3-158 and 3.3-159) is located on a segment near Boise City to Silver City Road, immediately south of State Highway 45 at Walter's Ferry Historic Site recreation area on the west bank of the Snake River. The KOP is approximately 3.2 miles southwest of the Proposed Route in Segment 9, 1.9 miles northeast of the Proposed Route in Segment 8, and 1.0 mile south of Alternative 8B.

The resource is located on private property and a direct assessment of the resource's condition could not be obtained due to landowner restrictions. Modern developments currently affect the setting of the resource, including a parking lot for a recreation area and a modern bridge. The Oregon NHT crossed the Snake River just south of the ferry's previous location. No trace of the trail is currently visible from this KOP.

The Project's design shares similarities with existing structures in the area and, in general, is screened by natural vegetation. Due to these factors and the KOP's distance from the route, the VCR for this KOP is assessed as weak. The Proposed Project elements would not dominate the setting; therefore, there would not be an adverse impact to the resource at this location.

Figure 3.3-158. KOP C88. View from parking lot at Walter's Ferry Recreational Area looking northwest toward the Snake River and Alternative 8B. Photo taken 8/18/08 at 10:08 a.m.

Figure 3.3-159. KOP C88. View from parking lot at Walter's Ferry Recreational Area looking southwest toward the Proposed Route in Segments 8 and 9. Photo taken 8/18/08 at 10:08 a.m.

KOP C89 (Figures 3.3-160 and 3.3-161) is located on a segment of the Boise City to Silver City Road on the northern slope of Kuna Butte, approximately 3 miles from the town of Kuna. The Mora Canal is less than 0.25 mile to the north. Alternative 8B is 1 mile to the south.

The resource at this location consists of a swale. The southwest portion of the swale has been destroyed and is intersected by a modern two-track road. Although it is a short segment, the remaining swale is in good condition. Due to snow, no artifacts or wheel ruts were observed. Several residences are located within 60 meters of the KOP. More residential properties are visible less than 1 mile to the west-northwest.

Views of Alternative 8B are limited by topography in most areas but would be visible directly south of the KOP. The Project's design would introduce new structural elements to this area. Due to these factors, the KOP's proximity to the route, and the potential for the elements to be skylined along Kuna Butte, the VCR for this KOP is assessed as moderate to strong. The proposed Project elements would dominate the setting; therefore, there would be an adverse impact to the resource at this location.

Figure 3.3-160. KOP C89. Boise to Silver City Road. Standing on the road looking toward the northeast. Swale is visible in the left foreground. Photo taken 12/09/2009 at 11:35 a.m.

Figure 3.3-161. KOP C89. Standing on Boise City to Silver City Road facing south toward Alternative 8B. Photo taken 12/09/2009 at 11:40 a.m.

Prehistoric/Historic Resource

KOP C103 (Figure 3.3-162) is located at Celebration Archaeological Park. The Proposed Route in Segment 8 is 2.5 miles to the south, 2 miles to the southeast, and 3.2 miles to the west. The Proposed Route in Segment 9 would be located 4.9 miles to the southwest. Photographic simulations depicting indirect (visual) impacts to the resource have been generated for this KOP (Appendix E, Figures E.3-47 and E.3-48).

The setting contains a lattice transmission line 1 mile southeast of this KOP. A ranch house is visible 0.25 mile to the southwest.

Due to the similarity of the Project's design with existing structures in the area and KOP's distance from the Proposed Route and Alternatives, the VCR for this KOP is assessed as weak. The Project elements would not dominate the setting; therefore, there would not be an adverse impact to the resource at this location.

Figure 3.3-162. KOP C103. View facing southeast toward the Project from north of Guffey Bridge at Celebration Archaeological Park. Photo taken 08/18/08 at 8:40 a.m.

Segment 9

Segment 9, as proposed, would link the Cedar Hill and Hemingway Substations with a 161.7 mile single-circuit 500-kV transmission line which skirts the Jarbidge and Owyhee Military Operating Areas to the north, then follows the WWE corridor just north of the Saylor Creek Air Force Range, passing through Owyhee County before entering into the Hemingway Substation. Fifteen acres of the construction of the Cedar Hill Substation and 1 acre for two regeneration sites are attributed to Segment 9. There are eight Route Alternatives proposed, including 9A, which was the Proponents' Proposed Route until moving to avoid the Hollister area; 9B, which is being considered by the BLM because it follows the WWE corridor and parallels existing utility corridors; 9C, which was the Proponents' Proposed Route until moving to avoid the Castleford area; and 9D and 9E, proposed by the Owyhee County Task Force, that cross more public lands north and south of the Proposed Route, respectively, than the Proposed Route. Most of Alternative 9D would be within the SRBOP. Alternatives 9F and 9H were proposed to avoid crossing the nonmotorized area south of C.J. Strike Reservoir. Alternatives 9G and 9H provide an alternate route location south of Alternative 8E (see Appendix A, Figure A-11).

Toana Freight Wagon Road

KOP C92 (Figure 3.3-163) is located on a segment of the Toana Freight Wagon Road 1 mile east of the Proposed Route in Segment 9. This KOP is 1.2 miles south and 1.3 miles west of Alternative 9C and 1.3 miles west of the southern end of Alternative 9B.

Figure 3.3-163. KOP C92. View from Toana Freight Road facing east toward Alternative 9C. Photo taken 12/10/09 at 10:14 a.m.

The resource at this location consists of a well-used two-track road. The setting contains a wooden, H-frame transmission line approximately 2.5 miles to the southeast. Ranch and housing structures are visible to the southeast 1 to 3 miles to the south and southeast.

Views of the Proposed Route in Segment 9 are screened by topography. The Project's design shares some similarities with existing structures in the east and southeast, but would introduce new elements of different form, material, and texture. Due to these factors, the KOP's proximity to the route, and the potential for the elements to blend into the backdrop in some areas, the VCR for this KOP is assessed as weak. The Proposed Project elements would not dominate the setting; therefore, there would not be an adverse impact to the resource at this location.

KOP C93 (Figure 3.3-164 and 3.3-165) is located on a segment of the Toana Freight Wagon Road just south of where the wagon road is intersected by a modern two-track road from the east and just north of Coyote Spring and the site of the historical Coyote Spring Stage Station. This KOP is located 1.1 miles west-northwest and 1.4 miles south-southwest of Alternative 9B (a right angle in the Route Alternative would be located approximately 1.7 miles northeast of this KOP). Photographic simulations depicting indirect (visual) impacts to the resource have been generated for this KOP (Appendix E, Figures E.3-49 and E.3-50).

Figure 3.3-164. KOP C93. View looking north toward Alternative 9B with the Toana Freight and Wagon Road in foreground. Photo taken 12/10/09 at 1:45 p.m.

Figure 3.3-165. KOP C93. View from Toana Freight Road facing east toward Alternative 9B. Existing transmission line is visible on skyline. Photo taken 12/10/09 at 1:45 p.m.

The resource at this location consists of a well-used two-track road. Ruts are visible here, but have been deepened by modern use. The setting contains a wooden, single-pole transmission line approximately 1 mile to the east.

The Project's design shares some similarities with existing structures in the east, but would introduce new elements of different form, material, and texture. Due to these factors and the KOP's proximity to the route, the VCR for this KOP is assessed as moderate to strong. The proposed Project elements would dominate the setting; therefore, there would be an adverse impact to the resource at this location.

Oregon NHT

KOP C60 (Figures 3.3-166 and 3.3-167) is located on a segment of the Oregon NHT at the Three Island Crossing overlook on the south side of the Snake River, east of Deadman Canyon. KOP C60 is located approximately 2.7 miles northeast of the Proposed Route in Segment 9, 4.7 miles northeast of Alternative 9B, and 3.8 miles southwest of Alternative 8A.

The overlook is surrounded by several variants of the trail that descend into the canyon. The town of Glenn's Ferry is visible approximately 2 miles to the northeast. A wooden, H-frame transmission line is located approximately 3 miles to the west. Agricultural storage tanks and warehouses are visible on the next ridge approximately 2 miles to the southwest.

Figure 3.3-166. KOP C60. View of Three Island Crossing overlook, facing northwest with interpretive signs in foreground and three islands in the background. Photo taken 11/13/09 at 12:30 p.m.

Figure 3.3-167. KOP C60. View from Three Island Crossing overlook looking southwest toward the Proposed Route in Segment 9. Photo taken 11/13/09 at 12:52 p.m.

The Project's design shares some similarities with existing structures in the area, but would introduce new elements that are of different form, material, and texture to the south. View of the Proposed Route in Segment 9 is screened by topography with the exception of a small area to the southwest. Due to this factor and the KOP's distance from the Proposed Route and Alternatives, the VCR for this KOP is assessed as moderate for the Proposed Route in Segment 9 and weak to moderate for Alternative 8A and weak for Alternative 9B. The Project's elements from the Proposed Route in Segment 9 and Alternative 8A may draw the attention of the casual observer but would not dominate the setting. There would be an adverse impact to the resource at this location. The Project's elements from Alternative 9B would not dominate the setting; therefore, there would not be an adverse impact at this location.

KOP C62 (Figures 3.3-168 and 3.3-169) is located on a segment of the Oregon NHT along the edge of an upper terrace west of the Snake River, overlooking the Hagerman Fossil Beds National Monument to the east. KOP C62 is located approximately 1.4 miles northeast of Alternative 9B and 4.9 miles south of Alternative 8A. The resource at this location consists of a deep swale with no visible ruts.

Alternative 9B would be located to the south of this location on the south side of an existing, wooden H-frame transmission line, which parallels the trail (within feet) at the Hagerman Fossil Beds National Monument, between the trail and the Project, which will be built 1.5 miles away.

Figure 3.3-168. KOP 62. View from Oregon NHT facing southeast toward Alternative 9B. Photo taken 11/13/09 at 4:01 p.m.

Figure 3.3-169. KOP 62. View from Oregon NHT facing north toward Alternative 8A. Photo taken 11/13/09 at 4:01 p.m.

The historic setting is impacted by modern intrusions in this direction. Due to this factor and the KOP's distance from Alternative 8A, the VCR for this KOP is assessed as weak. The Project's elements would not dominate the setting in either direction; therefore, there would not be an adverse impact to the resource at this location.

KOP C81 (Figures 3.3-170 and 3.3-171) is located at the historic Rock Creek Stage Station/Stricker Ranch property adjacent to the Oregon NHT, approximately 330 feet north of Rock Creek and 1 mile west of the High Line Canal. Segment 7 and Alternative 7H are located 4.9 miles to the southeast, Alternative 7I would be located 3.7 miles to the south of the KOP. The Proposed Route in Segment 9 would be located approximately 3.2 miles to the south of this location and the Proposed Route in Segment 10 would be located approximately 3.9 miles to the east.

Though trail markers are present at this locality, it is difficult to discern the location of the Oregon NHT. If the trail is, in fact, coincident with the road that leads to the Stricker House, it is heavily utilized by tourists accessing this attraction. The setting contains several farm houses and associated agricultural equipment visible in all directions. A wooden, single-pole transmission line is visible to the east and paralleling the road leading to the Stricker home site, just southwest of this KOP.

Figure 3.3-170. KOP C81. View to south from behind Stricker Cabin toward the Proposed Route in Segment 9. Photo taken 12/03/09 at 4:15 p.m.

Figure 3.3-171. KOP C81. View to east from behind Stricker Cabin toward the Proposed Route in Segment 10. Photo taken 12/03/09 at 4:15 p.m.

The Project's design shares some similarities with existing structures in the area but would introduce new elements that are of a different form. Vegetation to the south of this KOP, on the edge of Rock Creek, provides a natural screen of views toward the Project in that direction. Due to this factor and the KOP's distance from the Proposed Route and Route Alternatives, the VCR for this KOP is assessed as weak for all routes. The Project's elements would not dominate the setting; therefore, there would not be an adverse impact to the resource at this location.

Oregon NHT – South Alternate

KOP C90 (Figures 3.3-172, 3.3-173, and 3.3-174) is located on a segment of the Oregon NHT – South Alternate route within the SRBOP. The South Alternate forks approximately 0.5 mile to the southeast. The eastern branch follows Rabbit Creek to the northeast. KOP C90 is located on the west branch 1 mile north-northeast of the town of Murphy. Murphy Gulch is 0.5 mile to the east. This portion of the trail continues north following the route of State Highway 75. The KOP is approximately 2 miles south of the Proposed Route in Segment 8, 0.5 mile south of Alternative 9D, and 1 mile east of the Proposed Route in Segment 9 and Alternative 9E. Photographic simulations depicting indirect (visual) impacts to the resource have been generated for this KOP (Appendix E, Figures E.3-51 and E.3-52).

Figure 3.3-172. KOP C90. View of the Oregon NHT-South Alternate, standing on trail and facing northwest. Photo taken 12/09/09 at 1:30 p.m.

Figure 3.3-173. KOP C90. View from the Oregon NHT – South Alternate, standing on trail and facing southwest toward town of Murphy, the Proposed Route in Segment 9. and Alternative 9E. Photo taken 12/09/09 at 1:30 p.m.

Figure 3.3-174. KOP C90. View from the Oregon NHT – South Alternate facing north toward Alternative 9D. Photo taken 12/09/09 at 1:35 p.m.

The resource at this location consists of a well-marked two-track road that bisects Con Shea Road. Off-road vehicle traffic has altered the width of the trail ruts and the road has washed out in some areas to the south of the KOP. There are no modern intrusions to the setting with the exception of a limited view of the town of Murphy to the southwest.

Due to the Project's distance from this KOP and the introduction of new elements to the resource's viewshed to the north, the VCR for this KOP is assessed as strong for Alternative 9D and weak for all other routes.

The proposed Project elements from Alternative 9D may dominate the setting or may draw the attention of the casual observer; therefore, there would be an adverse impact to the resource from Alternative 9D at this location. There would not be an adverse impact to the resource from the Proposed Routes in Segment 8 and Segment 9 or Alternative 9E.

KOP C91 (Figure 3.3-175) is located on a segment of the Oregon NHT – South Alternate in the SRBOP, approximately 1.5 miles northwest of Sinker Creek Butte. The KOP is 2.3 miles southwest of Alternative 9D and views toward the Proposed Route in Segment 9 are screened by topography. This portion of the trail has been designated as a high-potential segment by the NPS (1998).

The resource at this location consists of a deep swale with visible ruts. The setting contains a wooden, single-pole transmission line approximately 3 miles to the northeast.

Figure 3.3-175. KOP C91. View from the Oregon NHT – South Alternate facing northeast toward Alternative 9D. Photo taken 12/09/09 at 3:45 p.m.

The majority of Alternative 9D that is visible from this location parallels an existing transmission line. The Project's design shares some similarities with existing structures in the area but would introduce new elements that are of a different form, material, and texture. Due to the similarity of the Project's design with existing structures in the north, the KOP's distance from the Proposed Route and Route Alternatives, and the cumulative impact of adding additional structures, the VCR for this KOP is assessed as moderate to strong. The proposed Project elements may draw the attention of the casual observer; therefore, there would be an adverse impact to the resource at this location.

KOP C113 (Figures 3.3-176 and 3.3-177) is located on a segment of the Oregon NHT – South Alternate within the SRBOP, approximately 2 miles south of the Snake River and 2.7 miles east-southeast of the C.J. Strike Reservoir. The KOP is located 200 feet north of State Highway 78, where the highway is intersected by an improved gravel road. It is located 2.8 miles north of the Proposed Route in Segment 9.

The resource at this location is bisected by the gravel road, but remains otherwise largely undisturbed. At least two discrete ruts are visible here, but the trail is obscured by dense vegetation. Some alluvial erosion is evident. What appears to be a road maintenance facility, including a chain link fence set in concrete and two large metal refuse containers, is present at the southeast corner of the intersection of the gravel road and State Highway 78. A utility line with wooden, single-pole supports parallels State Highway 78 at this location. Cultivated agricultural fields are visible approximately 0.5 mile southeast of the KOP, and fence lines associated with these fields are present

Figure 3.3-176. KOP C113. View of the Oregon NHT – South Alternate, facing west. Photo taken 7/28/10 at 11:55 a.m.

Figure 3.3-177. KOP C113. View from the Oregon NHT-South Alternate, facing southeast toward the Proposed Route in Segment 9. Photo taken 7/28/10 at 11:55 a.m.

approximately 350 feet to the south. Two gabled roofs of agricultural outbuildings are visible approximately 0.25 mile to the southwest

The Project's design shares some similarities with existing structures, but will introduce new elements that are of different form and material. Due to this factor and the KOP's distance from the Proposed Route, the VCR for this KOP is assessed as moderate. The Project's elements would draw the attention of the casual observer and would dominate the setting for the Proposed Route in Segment 9. There would be an adverse impact to the resource at this location.

KOP C115 (Figures 3.3-178, 3.3-179, and 3.3-180) is located on a segment of the Oregon NHT – South Alternate within the SRBOP, approximately 0.9 mile west of the Snake River and 0.8 mile north of State Highway 78. The KOP is located adjacent to a north-south fence line. The Proposed Route in Segment 9 is located 4 miles south of this location. Due to topographic relief, only portions of the Proposed Route in Segment 9 would be visible from this location.

The resource at this location consists of a southeast-to-northwest trending swale lacking discernable ruts. Northwest of the KOP, the trail is undisturbed. Southeast of the KOP, however, the trail becomes increasingly difficult to discern with distance, and is eventually obliterated by agricultural fields. Several agriculture-related structures are visible to the east of the KOP at a distance of approximately 1 mile. Cultivated fields

Figure 3.3-178. KOP C115. View of the Oregon NHT – South Alternate, facing northwest. Trail is visible as gradual swale in the foreground with trail markers in the background. Photo taken 7/29/10 at 11:24 a.m.

Figure 3.3-179. KOP C115. View from the Oregon NHT-South Alternate, facing southeast toward the Proposed Route in Segment 9. Photo taken 7/29/10 at 11:24 a.m.

Figure 3.3-180. KOP C115. View from the Oregon NHT – South Alternate, facing south toward the Proposed Route in Segment 9. Photo taken 7/29/10 at 11:24 a.m.

occupy most of the land immediately east of the KOP and west of the Snake River. Another north-south fence line is visible approximately 200 feet west of the KOP. Two trail markers are visible just beyond this second fence. A wooden, single-pole utility line parallels State Highway 78 0.8 mile to the south.

Due to the similarity of the Project's design with existing structures, the KOP's distance from the Proposed Route and Route Alternatives, and the potential for the elements to blend in with the backdrop, the VCR for this KOP is assessed as weak. There would not be an adverse impact to the resource at this location.

KOP C116 (Figures 3.3-181, 3.3-182, and 3.3-183) is located on a segment of the Oregon NHT – South Alternate within the SRBOP, off of State Highway 78, at the entrance to the Cove Recreation Site, 1 mile south of the upper body of C.J. Strike Reservoir. It is located 0.5 mile south of Alternative 9D. Due to topographic relief, only Alternative 9D would be visible from this KOP.

The trail is bisected by the BLM recreation area access road but is in otherwise excellent condition at this location. The resource consists of a shallow yet well-defined swale exhibiting 8-inch deep ruts. State Highway 78 parallels the trail in a southeast-to-northwest direction here at a distance of approximately 50 feet. Several structures are visible approximately 2.5 miles to the northwest, on the north bank of C.J. Strike Reservoir. A utility line supported by wooden, single-post support structures crosses the trail to the northwest and is visible approximately 150 feet from the KOP. A

Figure 3.3-181. KOP C116. View of the Oregon NHT – South Alternate, facing southeast. Photo taken 7/29/10 at 12:45 p.m.

Figure 3.3-182. KOP C116. View from the Oregon NHT – South Alternate, facing northwest toward Alternative 9D with view of utility line, agricultural field, and State Highway 78. Trail is visible as swale in foreground. Photo taken 7/29/10 at 12:45 p.m.

Figure 3.3-183. KOP C116. View from the Oregon NHT – South Alternate, facing north toward Alternative 9D with view of utility line and H-frame transmission line. Photo taken 7/29/10 at 12:45 p.m.

transmission line with wooden, H-frame support structures is also visible to the northwest at a distance of approximately 0.25 mile. The trail is obliterated by cultivated agricultural fields approximately 500 feet west of this KOP.

The Project's design shares some similarities with existing structures in the area but would introduce new elements that are of different form and color. Due to the similarity of the Project's design with existing structures in the south, the KOP's distance from Alternative 9D, and the cumulative effect of adding additional structures, the VCR for this KOP is assessed as moderate. The Project's elements would draw the attention of the casual observer but would not dominate the setting. There would be an adverse impact to the resource at this location.

KOP C117 (Figures 3.3-184 and 3.3-185) is located on a segment of the Oregon NHT – South Alternate within the SRBOP, 1.1 miles north of the lower body of C.J. Strike Reservoir. It is located 1 mile north of Alternative 9D. Due to topography, only portions of Alternative 9D would be visible from this location. A photographic simulation depicting indirect (visual) effects to the resource has been generated for the KOP (see Figures E-53 and E-54 in Appendix E).

The trail is bisected by an improved gravel road and a parallel fence line at this location. West of the KOP, the trail consists of an undisturbed set of parallel swales. To the east of the KOP, the trail is obliterated by a cultivated agricultural field. A transmission line with wooden, H-frame support structures is visible approximately 100 feet west of the trail at this location, and an additional transmission line with wooden, single-pole supports is visible approximately 150 feet west of the trail.

Figure 3.3-184. KOP C117. View of the Oregon NHT – South Alternate, facing west. Photo taken 7/29/10 at 1:39 p.m.

Figure 3.3-185. KOP C117. View from the Oregon NHT – South Alternate, facing south toward Alternative 9D. Photo taken 7/29/10 at 1:39 p.m.

The Project is located to the south of this KOP, away from existing impacts to the cultural landscape. Due to the proximity of the KOP and the introduction of new elements in a new area of the resource's viewshed, the VCR for this KOP is assessed as moderate to strong. The proposed Project elements would dominate the setting to the south; therefore, there would be an adverse impact to the resource at this location.

KOP C120 (Figure 3.3-186) is located on a segment of the Oregon NHT – South Alternate south of the C.J. Strike Reservoir, 0.8 mile west of the junction of State Highway 51 and State Highway 78. It is located 2.1 miles northeast of Alternative 9D.

The resource at this point consists of a largely undisturbed, well-defined swale. Individual ruts are difficult to discern at this location due to heavy vegetation. The trail is bisected by an unimproved, two-track recreation area access road. Multiple structures are visible approximately 1 mile north of the KOP, on the north bank of the C.J. Strike Reservoir. A barn and cultivated agricultural field are visible approximately 0.5 mile to the southeast. Two transmission lines—one with wooden, single-pole supports and one with wooden, H-frame supports—are visible approximately 0.25 mile southwest of this point.

The proposed Project is located south of the existing transmission lines and beyond the agricultural field. The view of the Project is largely obstructed by topography. The Project's design shares some similarities with existing structures but would introduce new elements that are of different form and color. Due to this factor and the KOP's distance from the alternative, the VCR for this KOP is assessed as weak to moderate.

Figure 3.3-186. KOP C120. View of the Oregon NHT – South Alternate, facing southwest toward Alternative 9D. Trail is visible as swale with marker partially visible in shrubs. Photo taken 7/30/10 at 12:43 p.m.

The Project's elements may draw the attention of the casual observer but would not dominate the setting; therefore, there would be an adverse impact to the resource at this location.

Historic Resources

KOP C101 (Figure 3.3-187) is located at the historic Hollister School. The point is approximately 3.3 miles south of the Proposed Route in Segment 9 and 3.7 miles south-southwest of Alternative 9A. The setting for this property contains housing structures, communication poles, and property fences within 0.5 mile of this KOP.

Views of the Proposed Route in Segment 9 and Alternative 9A are intermittent and screened by topography. Due to the KOP's distance from the Proposed Route and Route Alternatives and the potential for the elements to blend in with the backdrop, the VCR for this KOP is assessed as weak. The Project elements would not dominate the setting; therefore, there would not be an adverse impact to the resource at this location.

Figure 3.3-187. KOP C101. View northward toward the Proposed Route in Segment 9 from the Hollister School. Photo taken 08/19/08 at 1:24 p.m.

KOP C104 (Figure 3.3-188) is located on Oreana Loop Road near the town of Oreana at the historic Our Lady Queen of Heaven Catholic Church. Segment 9 is located 1.0 mile to the north and Alternative 9E would be located 1.0 mile to the southwest. The setting at this resource contains housing structures, a wooden, single-pole transmission line, and other support structures within 0.25 mile to the north of this KOP.

Views from this KOP toward the Proposed Route in Segment 8 are intermittent and screened by topography. Due to the KOP's distance from the Proposed Route and Route Alternatives and the potential for the elements to blend in with the backdrop, the VCR for this KOP is assessed as weak for Alternative 9E and weak to moderate for Segment 9. The Project elements for the Proposed Route in Segment 9 would not dominate the setting but may draw the attention of the casual observer; therefore, there would be an adverse impact to the resource from Segment 9 at this location. There would not be an adverse impact to the resource from Alternative 9E.

Figure 3.3-188. KOP C104. View toward Alternative 9E from Our Lady Queen of Heaven Catholic Church. Photo taken 08/18/08, facing northwest, 42 feet north of church.

KOP C109 (Figure 3.3-189) is located on the west side of the historic Owyhee County Courthouse. The KOP is 3.3 miles south of the Proposed Route in Segment 8, 0.4 mile northeast of the Proposed Route in Segment 9, 0.8 mile northeast of Alternative 9E, and 1.6 miles southeast of Alternative 9D. The setting contains numerous housing and support structures within the town of Murphy, a wooden, single-pole transmission line, and fences within 0.25 mile to the north and west of the property.

The proximity of the surrounding structures and natural vegetation provides screening of views toward the Proposed Route and all Route Alternatives from this KOP. Due to this factor, the similarity of the Project's design with existing structures, and the potential for the elements to blend in with the backdrop, the VCR for this KOP is assessed as weak. The Project elements would not dominate the setting; therefore, there would not be an adverse impact to the resource at this location.

Figure 3.3-189. KOP C109. View to southwest toward the Proposed Route in Segment 9 and Alternative 9E from the northwest side of the Owyhee County Courthouse. Photo taken 12/11/08 at 10:13 a.m.

Segment 10

Segment 10, as proposed, would link the Cedar Hill and Midpoint Substations with a 33.6-mile single-circuit 500-kV line, following a WWE corridor for most of its distance. Twenty-eight acres of the expansion of the Midpoint Substation and of the construction of the Cedar Hill Substation are attributed to Segment 10. There are no Route Alternatives proposed along this segment (see Appendix A, Figure A-12).

Prehistoric Resource

KOP C82 (Figure 3.3-190) is located southwest of the basaltic lava blister that signifies the exterior of Wilson Butte Cave. The KOP is located 5.5 miles northeast of the Proposed Route in Segment 10. The Proposed Route in Segment 6 would be located 1.9 miles to the north, but the route consists of an extant line on which minimal construction would occur at each end of the route near the existing substations. In addition to that existing line, another wooden, H-frame transmission line is located approximately 0.25 mile to the north and 3.5 miles to the south. The setting also contains an agricultural complex that is visible approximately 4 miles to the south and several communication towers are visible on the horizon.

Figure 3.3-190. KOP C82. View looking southwest towards the Proposed Route in Segment 10. Photo taken 12/04/09 at 9:50 a.m.

Due to the distance of the KOP to the Proposed Route, the similarity of the Project's design with existing structures, and the potential for the elements to blend in with the backdrop, the VCR for this KOP is assessed as weak. The Project elements would not dominate the setting; therefore, there would not be an adverse impact to the resource at this location.

Historic Resource

KOP C99 (Figure 3.3-191) is located at the Minidoka National Historic Site, approximately 1 mile northeast of the Proposed Route in Segment 10. Photographic simulations depicting indirect (visual) impacts to the resource have been generated for this KOP (Appendix E, Figures E.3-55 and E.3-56). The setting contains a wooden, H-frame transmission line located approximately 3 miles to the south and an overhead electric distribution line in the foreground.

Due to the distance of the KOP to the Proposed Route, the similarity of the Project's design with existing structures, and the potential for the elements to blend in with the backdrop, the VCR for this KOP is assessed as moderate. The Project elements may draw the attention of the casual observer; therefore, there would be an adverse impact to the resource at this location.

Figure 3.3-191. KOP C99. View northwest toward the Proposed Route in Segment 10 from Minidoka National Historic Site. Photo taken 07/31/08 at 10:04 a.m.

3.3.3.4 Overall Impacts of the Proposed Route and Alternatives by Segment

One of the purposes of this EIS is to assess the relative impacts of the Proposed Route and Route Alternatives on cultural resources. Because the entirety of each alternative has not been inventoried for cultural resources, a uniform and exact method to calculate the quantity and quality of resources in each alternative, and compare that number against those in the Proposed Route, is elusive. A simple approach could be used, whereby the total number of known cultural resources in the Proposed Route and Route Alternatives are compared, and the route segment that has the fewest resources and, by extrapolation, the least impacts, is selected. Such a one-dimensional approach ignores the fact that all cultural resources are not equal in the quantity and quality of information they can provide to clarify the regional culture history.

Consequently, a pooled quantitative/qualitative approach is used, which identifies variables that are individually incapable of providing a more robust measure of impacts, but collectively provide an approximate assessment of greater or lesser impacts between alternatives. This method incorporates the following variables:

Literature Review + 15% Survey Results + Overall Visual Impact = Estimated Impact

Each of these variables embraces several other measures, as explained below.

- **Literature Review** – Tables 3.3-3 and 3.3-4 summarize the total number of known cultural resources within the Project area. The total numbers of prehistoric and historic resources in each segment are useful measures, but they are somewhat limited in scope, as noted above. Additional information can be extracted from these tabulations; the summary measures differ for prehistoric and historic sites.
  - Data Potential – defined as the capability of an individual site to provide important information about the regional cultural history. Several resource types are included in the tabulation and provide, to a greater or lesser extent, data potential. The focus for this analysis, however, is on open camps and limited activity sites, because together they comprise 96 percent of the documented cultural resources. Open camps usually contain more information about their occupation(s) by having features, structural remains, and/or a diverse and broad range of artifacts. In contrast, limited activity sites are generally varying-sized scatters of lithic materials with more limited (but not necessarily inconsequential) information potential. Thus, the ratio of open camps to limited activity sites was selected as a proxy measure of Data Potential, this value ranging from 0, where open camps are absent, to nearly 4, where many open camps are present. More prehistoric resources and greater Data Potential values per segment equate to greater impacts.
  - Historic Value – defined as an ordinal scale with values ranging from 1 to 4, possibly encompassing two or more criteria of NRHP eligibility. Sites that have standing structures and archaeological potential were assigned a value of 4. Intact historic trail ruts might have been placed in this category but direct impacts to such resources are less likely because the trail segments would be spanned by the transmission line. Indirect (visual) impacts to historic trails are much more likely but those impacts are captured by the Overall Visual Impacts variable (see below). Sites with standing structures but without archaeological potential were assigned a value of 3. Sites that have archaeological potential but no standing structures are slightly less valuable than those with standing structures and were accorded a value of 2. Finally, historic debris scatters have limited importance and were given a value of 1. For each route, these values were summed and divided by the number of resources to achieve a “score” that reflects the Historic Value of resources within that route. More historic resources and higher measures of Historic Value per segment equate to greater impacts.
- **15 percent Survey Results** – for each Route Alternative, a 15 percent sample, consisting of discrete 1-mile-long by 500-foot-wide segments, was surveyed and all cultural resources documented. In the Kemmerer FO, however, the substantial amount of existing cultural resources data provides sufficient information to represent Phase I survey results. In this analysis, these variables are represented by the Kemmerer FO data from previous cultural inventories and known sites within a 500-foot-wide zone along the Segment 4 Proposed Route

and Route Alternatives within the Kemmerer FO. Preliminary results of a 15 percent survey along 7I and 7J in Nevada, conducted July 2011, were used in evaluating these alternatives. Full survey results will be reported in the Final EIS. Overall, the 15 percent survey results are statistically less reliable for comparing routes, given the manner in which the sample was drawn (i.e., confined to Tribal and public lands , from previously unsurveyed areas, on shallower slopes, and in undisturbed areas), but they have modest interpretive value and provide valuable insights into the distribution of cultural resources in each segment. Because the magnitude of the 15 percent survey is probably influenced by the size of the investigated areas and thereby inflates the assessment of impacts, the raw frequency in each segment has been "normalized" by dividing that number by the segment's total length.

- **Overall Visual Impact (OVI)** – defined as general impacts upon historic trails and other cultural resources by the introduction of an overhead transmission line. This variable represents a combination of the VCR assigned to the KOPs for each of the historic trails and cultural resources and the condition of the trail or resource for each route. The VCR values range from 1 (weak) to 5 (strong) (see Methods in Section 3.3.3.3 for additional description of these values). Trail/Resource Condition ranged from 5 (good), with intact, relatively pristine trail segments or resources, to 1 (poor), where little or no evidence of the trail segment or resource remains. The two measures are summed and the average taken to produce a measure of Overall Visual Impact. Higher OVIs per segment equate to greater impacts.
- **Impact Value (IV)** – a combination of the number of prehistoric and historic sites, the 15 percent survey results, Data Potentials, Historic Values, and Overall Visual Impacts. This value measures the intensity of impacts for the Proposed Route and Route Alternatives within each segment and is calculated as follows:

  IV = ((Alt. # P) ÷ (Alt. # comp. P + Alt. # comp. H)) + (DP) + ((Alt. # P) ÷ (Alt. # comp. P + Alt. # comp. H)) + (HV) + (15% ÷ SL) + (OVI)

  Where.

  Alt. # = Alternative segment

  Comp. = comparison route for each segment alternative

  P = total number of prehistoric sites

  H = total number of historic sites

  DP = data potential

  HV = historic value

  15% = 15 percent sample

  SL = segment length (mi)

  OVI = overall visual impact

The raw IV does not, however, take into consideration the fact that the routes differ in length and number of previous surveys. Longer segments and segments with more surveys are likely to have more resources, which can skew the results when the segments are compared. To minimize the effects of these differences, a Survey Coverage Index (SCI) was produced by dividing the number of surveys (defined as the total number of surveys entered into the SHPO GIS database within a 1-mile buffer of the Route Alternative) by the length (in miles) of each segment. The IVs were then "normalized" by dividing the IV by the SCI to produce an Adjusted IV.

Table 3.3-7 summarizes these Adjusted IVs, which are described further below by segment. The impacts for each Route Alternative are compared to the impacts of the comparison portion of the Proposed Route. The route (proposed or alternative) with the lower Adjusted IV is considered to have fewer impacts. Figures 3.3-192 through 3.3-207 graphically compare the Route Alternatives in each segment against the portion of the Proposed Route that corresponds to that Route Alternative. The places where the Proposed Route and Route Alternatives coincide are shown in yellow and labeled "common corridor," within which the impacts are expected to be similar. For each comparison, the route depicted in red has more impacts than the route against which it is compared; routes depicted in green have fewer impacts.

Table 3.3-7. Analysis of Impacts by Segment

Segments		Literature Review				15% Survey Results (total number of sites)	Overall Visual Impact	Survey Coverage			Impact Value	Adjusted Impact Value
		Prehistoric		Historic								
		No.	Data Potential	No.	Historic Value			Segment Length (mi)	Number of Surveys	Survey Coverage Index (surveys/mile)		
1E	Proposed – Total Length	36		38		10		100.6	62	0.62		
	Alternative 1E-A	18	0.21	19	1.0	–	5.0	16.1	34	2.11	7.49	3.54
	Proposed – Comparison Portion for Alternative 1E-A	7	0.50	22	2.5	–	5.2	17.6	34	1.93	8.98	4.65
	Alternative 1E-B	21	1.33	7	2.0	4	7.0	37.8	15	0.40	12.19	30.71
	Proposed – Comparison Portion for Alternative 1E-B	12	1.75	4	1.00	–	–	59.2	30	0.51	3.72	6.55
	Alternative 1E-C	17	1.12	6	2.0	2	4.0	48.7	46	0.94	7.90	8.37
	Proposed – Comparison Portion for Alternative 1E-C	20	1.4	11	1.50	10	–	75.3	29	0.39	4.38	11.37
1W(a)	Proposed – Total Length	33		36		–		76.5	77	1.01		
	Alternative 1W-A	8	0.30	28	2.62	6	5.0	70.5	73	1.04	9.06	8.75
	Proposed – Comparison Portion for Alternative 1W-A	6	0.50	28	3.25	–	5.2	16.2	32	1.98	9.89	5.01
1W(c)	Proposed – Total Length	44		25		3		16.2	35	2.16		
2	Proposed – Total Length	357		109		4		96.7	612	6.33		
	Alternative 2A	82	2.11	41	1.27	–	7.3	28.4	109	3.84	11.79	3.07
	Proposed – Comparison Portion for Alternative 2A	66	1.83	45	1.0	–	7.8	28.7	104	3.62	11.53	3.18
	Alternative 2B	20	0.81	14	1.2	–	8.0	6.2	38	6.13	11.11	1.81
	Proposed – Comparison Portion for Alternative 2B	19	1.00	12	1.0	–	7.0	7.0	34	4.86	9.91	2.04
	Alternative 2C	67	3.57	15	1.0	–	6.0	24.4	47	1.93	11.61	6.03
	Proposed – Comparison Portion for Alternative 2C	40	3.18	39	1.0	–	8.0	28.4	49	1.73	13.14	7.62
3	Proposed – Total Length	293		49		1		46.7	462	9.89		
4	Proposed – Total Length	574		82		21		203.0	603	2.97		
	Alternative 4A	215	1.15	85	1.11	31	6.5	85.4	468	5.48	9.79	1.79
	Proposed – Comparison Portion for Alternative 4A	407	3.82	44	1.25	–	6.9	90.4	456	5.04	13.47	2.67
	Alternative 4B	380	3.15	90	1.04	29	7.8	100.5	440	4.38	13.32	3.04
	Proposed – Comparison Portion for Alternative 4B	407	3.82	44	1.25	–	6.9	90.4	465	5.14	12.93	2.51
	Alternative 4C	228	3.38	34	1.21	28	7.2	101.9	433	4.25	12.65	2.98
	Proposed – Comparison Portion for Alternative 4C	407	3.82	44	1.25	–	6.9	90.4	456	5.04	13.69	2.71
	Alternative 4D	217	3.52	27	1.65	28	7.8	101.1	439	4.34	13.79	3.18

Table 3.3-7. Analysis of Impacts by Segment (continued)

Segments		Literature Review				15% Survey Results (total number of sites)	Overall Visual Impact	Survey Coverage			Impact Value	Adjusted Impact Value
		Prehistoric		Historic								
		No.	Data Potential	No.	Historic Value			Segment Length (mi)	Number of Surveys	Survey Coverage Index (surveys/mile)		
4	Proposed – Comparison Portion for Alternative 4D	407	3.82	44	1.25	–	6.9	90.4	456	5.04	13.82	2.74
	Alternative 4E	216	3.80	26	1.11	27	7.0	102.5	431	4.20	12.71	3.02
	Proposed – Comparison Portion for Alternative 4E	407	3.82	44	1.25	–	6.9	90.4	456	5.04	13.83	2.74
	Alternative 4F	215	3.77	23	1.16	26	6.8	87.8	464	5.28	12.55	2.38
	Proposed – Comparison Portion for Alternative 4F	407	3.82	44	1.25	–	6.9	90.4	456	5.04	13.86	2.75
5	Proposed – Total Length	21		8		5		54.6	52	0.95		
	Alternative 5A	7	–	2	–	–	7.5	34.6	13	0.38	12.00	31.94
	Proposed – Comparison Portion for Alternative 5A	1	–	1	–	–	6.5	27.1	7	0.26	6.72	26.02
	Alternative 5B	3	–	1	–	–	6.8	45.3	18	0.40	8.80	22.15
	Proposed – Comparison Portion for Alternative 5B	1	–	1	–	–	6.5	27.1	7	0.26	7.00	27.10
	Alternative 5C	–	–	–	–	1	7.0	26.1	6	0.23	7.04	30.62
	Proposed – Comparison Portion for Alternative 5C	1	–	–	–	–	8.0	33.2	15	0.45	8.00	17.71
	Alternative 5D	17	–	6	2.50	–	6.0	17.5	26	1.49	9.50	6.39
	Proposed – Comparison Portion for Alternative 5D	16	–	7	2.0	–	6.0	19.4	30	1.55	9.00	5.82
	Alternative 5E	11	–	6	1.50	–	6.0	5.3	21	3.96	8.27	2.09
	Proposed – Comparison Portion for Alternative 5E	15	–	7	2.0	–	6.0	5.7	22	3.86	9.29	2.41
6	Proposed – Total Length	–		–		–		85.3	56	.66		

Table 3.3-7. Analysis of Impacts by Segment (continued)

	Segments	Literature Review				15% Survey Results (total number of sites)	Overall Visual Impact	Survey Coverage			Impact Value	Adjusted Impact Value
		Prehistoric		Historic								
		No.	Data Potential	No.	Historic Value			Segment Length (mi)	Number of Surveys	Survey Coverage Index (surveys/mile)		
7	Proposed – Total Length	17		14		8		118.1	101	.86		
	Alternative 7A	5	–	4	1.0	–	4.0	41.5	18	0.43	6.80	15.68
	Proposed – Comparison Portion for Alternative 7A	2	–	3	2.50	4	8	38.8	19	0.49	11.16	22.79
	Alternative 7B	2	–	4	1.00	–	5.3	50.1	23	0.46	7.50	16.34
	Proposed – Comparison Portion for Alternative 7B	2	–	3	2.50	4	8	38.8	19	0.49	11.44	23.35
	Alternative 7C	1	–	2	–	–	8	20.3	28	1.38	8.75	6.34
	Proposed – Comparison Portion for Alternative 7C	2	–	2	–	–	9.5	20.1	33	1.64	10.83	6.60
	Alternative 7D	–	–	2	–	–	–	6.8	21	3.09	0.33	0.11
	Proposed – Comparison Portion for Alternative 7D	2	–	4	1.5	–	–	6.2	20	3.23	4.50	1.40
	Alternative 7E	–	–	2	–	–	–	4.5	9	2.00	1.00	0.50
	Proposed – Comparison Portion for Alternative 7E	–	–	2	–	–	–	3.8	8	2.11	1.00	0.48
	Alternative 7F	1	–	2	1.00	–	–	10.8	12	1.11	2.50	2.25
	Proposed – Comparison Portion for Alternative 7F	–	–	2	–	–	–	10.5	10	0.95	0.67	0.70
	Alternative 7G	2	–	1	–	–	–	3.2	9	2.81	1.00	0.36
	Proposed – Comparison Portion for Alternative 7G	2	–	1	–	1	–	3.1	9	2.90	1.32	0.46
	Alternative 7H	38	0.02	22	1.0	26	6.5	127.4	161	1.26	9.66	7.64
	Proposed – Comparison Portion for Alternative 7H	17	–	14	2.0	8	7.0	117.9	101	0.86	9.58	11.19
	Alternative 7I	101	0.03	18	1.38	40	7.3	173.0	202	1.17	12.78	10.95
	Proposed – Comparison Portion for Alternative 7I	17	–	14	2.00	8	7.0	117.9	101	0.86	9.33	10.89
	Alternative 7J[2/]	101	0.04	22	3.00	40	7.4	183	189	1.03	13.22	12.80
	Proposed – Comparison Portion for Alternative 7J[1/]	27	0.04	21	2.20	–	7.6	144	168	1.17	10.23	8.77

Table 3.3-7. Analysis of Impacts by Segment (continued)

Segments		Literature Review				15% Survey Results (total number of sites)	Overall Visual Impact	Survey Coverage			Impact Value	Adjusted Impact Value
		Prehistoric		Historic								
		No.	Data Potential	No.	Historic Value			Segment Length (mi)	Number of Surveys	Survey Coverage Index (surveys/mile)		
8	Proposed – Total Length	48		68		13		131.0	160	1.22		
	Alternative 8A	52	0.02	50	1.14	2	6.9	53.6	83	1.55	10.47	6.76
	Proposed – Comparison Portion for Alternative 8A	21	–	22	1.23	11	6.1	51.4	63	1.23	7.97	6.50
	Alternative 8B	9	0.60	25	1.53	3	6.0	44.0	67	1.52	8.73	5.73
	Proposed – Comparison Portion for Alternative 8B	25	1.00	39	2.14	2	4.8	45.2	76	1.68	9.87	5.87
	Alternative 8C	–	–	2	2.00	–	–	6.5	11	1.69	3.00	1.77
	Proposed – Comparison Portion for Alternative 8C	–	–	2	–	1	–	6.5	19	2.92	1.15	0.39
	Alternative 8D	2	1.00	5	1.00	–	–	8.1	8	40.99	2.88	2.91
	Proposed – Comparison Portion for Alternative 8D	2	2.00	6	1.00	–	–	6.9	9	1.30	4.14	3.18
	Alternative 8E	11	–	9	1.00	3	7.6	19	41	2.16	9.31	4.32
	Proposed – Comparison Portion for Alternative 8E	17	0.70	19	3.09	–	6	7	20	2.86	11.59	4.06
9	Proposed – Total Length	75		41		8		161.8	198	1.22		
	Alternative 9A	2	–	–	–	–	6.0	8.1	24	2.96	6.40	2.16
	Proposed – Comparison Portion for Alternative 9A	1	–	4	2.50	–	6.0	8.3	38	4.58	11.00	2.40
	Alternative 9B	30	–	10	1.00	5	7.0	53.2	50	0.94	8.70	9.26
	Proposed – Comparison Portion for Alternative 9B	54	0.09	12	1.37	–	7.3	49.0	38	0.78	10.41	13.42
	Alternative 9C	31	–	6	1.00	5	4.0	14.2	25	1.76	6.21	3.53
	Proposed – Comparison Portion for Alternative 9C	40	0.10	3	2.50	–	–	14.3	20	1.40	3.76	2.69
	Alternative 9D	49	0.20	47	1.43	–	7.8	58.2	71	1.22	12.68	10.39
	Proposed – Comparison Portion for Alternative 9D	10	–	18	2.07	8	5.5	57.2	64	1.12	8.00	7.15
	Alternative 9E	25	0.04	7	1.42	6	5.3	68.7	67	0.98	7.99	8.19
	Proposed – Comparison Portion for Alternative 9E	10	–	18	2.07	8	5.5	57.2	64	1.12	8.58	7.67
	Alternative 9F	16	0.11	30	1.46	4	7.6	63	76	1.21	10.88	9.02
	Proposed – Comparison Portion for Alternative 9F	10	–	18	2.07	–	5.6	57	64	1.12	8.28	7.37
	Alternative 9G	59	0.02	44	1.46	3	6	56	70	1.25	11.21	8.97
	Proposed – Comparison Portion for Alternative 9G	10	–	18	2.07	–	5.6	57	64	1.12	7.94	7.07

Table 3.3-7. Analysis of Impacts by Segment (continued)

	Segments	Literature Review				15% Survey Results (total number of sites)	Overall Visual Impact	Survey Coverage			Impact Value	Adjusted Impact Value
		Prehistoric		Historic								
		No.	Data Potential	No.	Historic Value			Segment Length (mi)	Number of Surveys	Survey Coverage Index (surveys/mile)		
	Alternative 9H	26	0.06	27	1.5	3	5	34	75	2.21	8.54	3.87
	Proposed – Comparison Portion for Alternative 9H	10	–	18	2.07	–	5.6	57	64	1.12	8.20	7.30
10	Proposed – Total Length	0		7		1		33.6	49	1.46		

1/ Alternative 7J connects with Segment 9 approximately 25.8 miles west of the proposed Cedar Hill Substation, which is the western terminus of Segment 7 and the beginning point for Segment 9. The table above compares 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

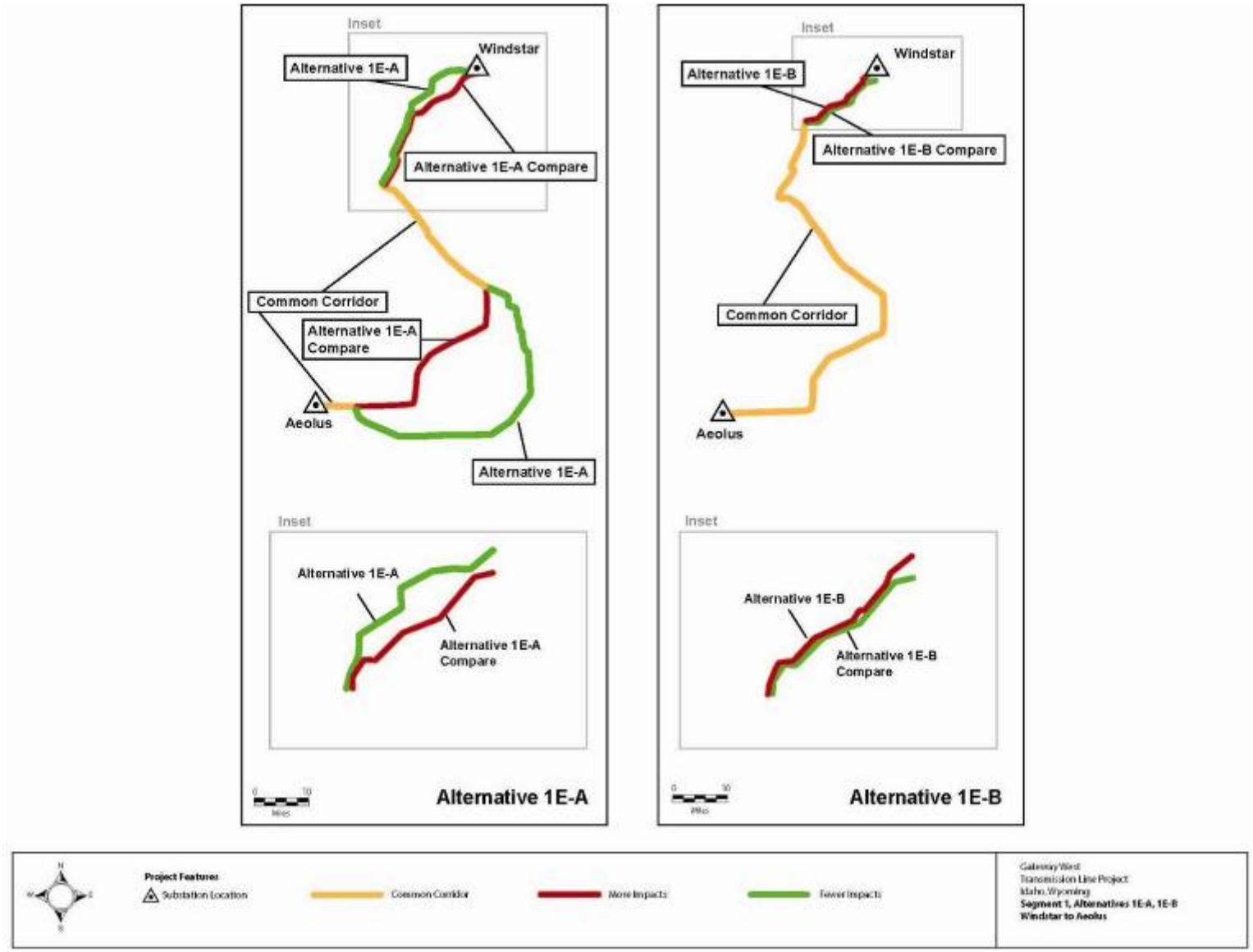


Figure 3.3-192. Segment 1, Alternatives 1E-A, 1E-B, Windstar to Aeolus

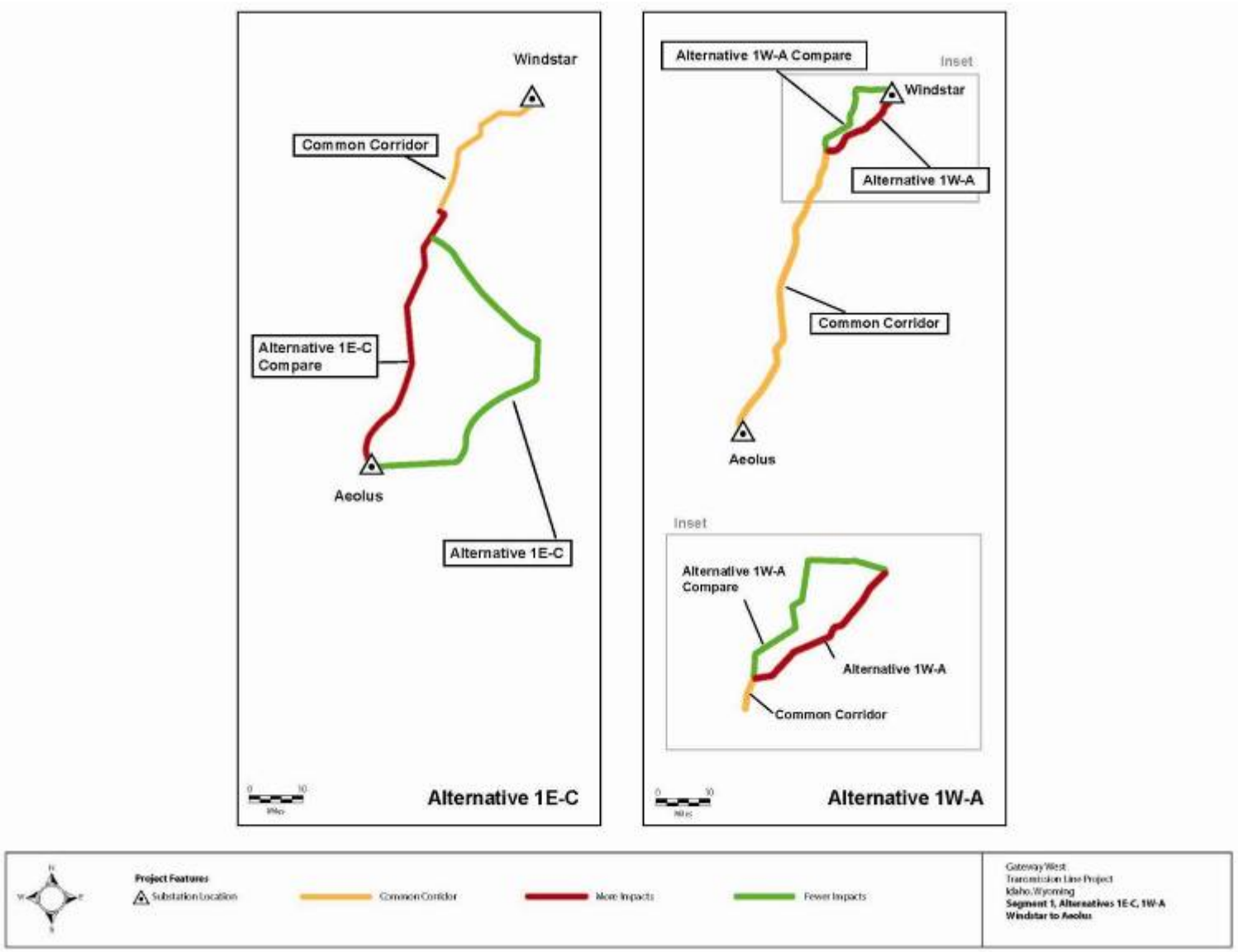


Figure 3.3-193. Segment 1, Alternatives 1E-C, 1W-A, Windstar to Aeolus

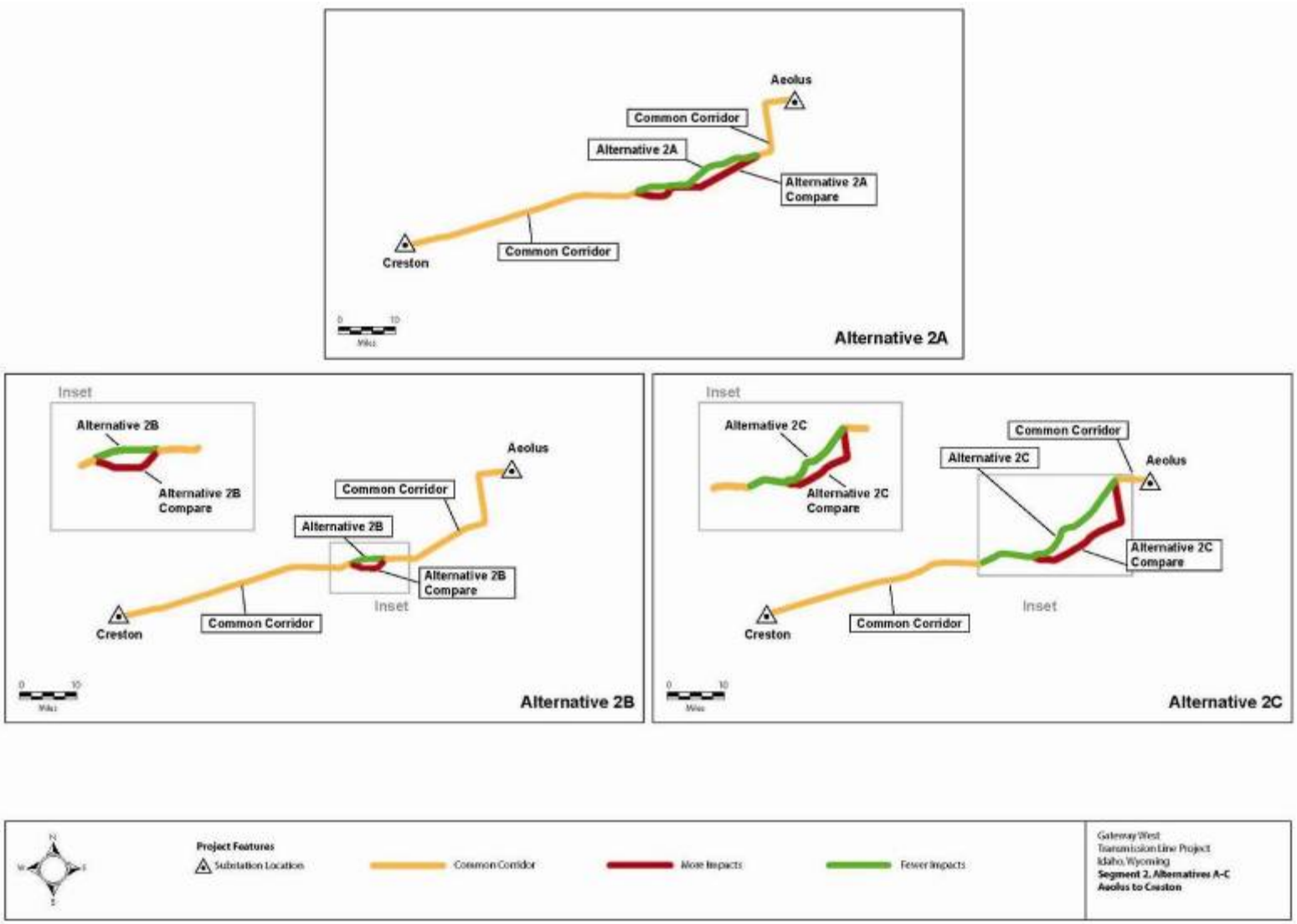


Figure 3.3-194. Segment 2, Alternatives A-C, Aeolus to Creston

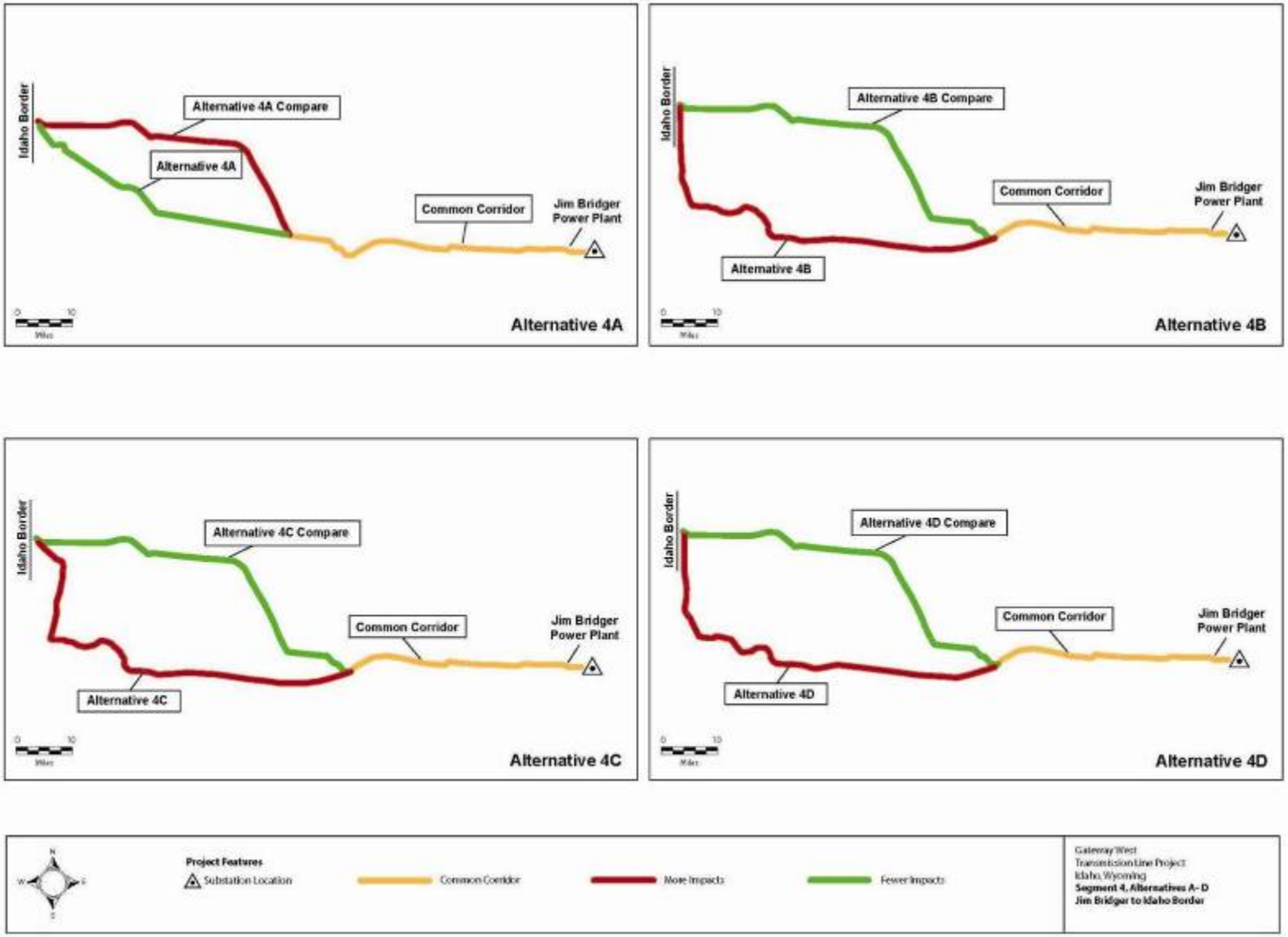


Figure 3.3-195. Segment 4, Alternatives A-D, Jim Bridger to Idaho Border

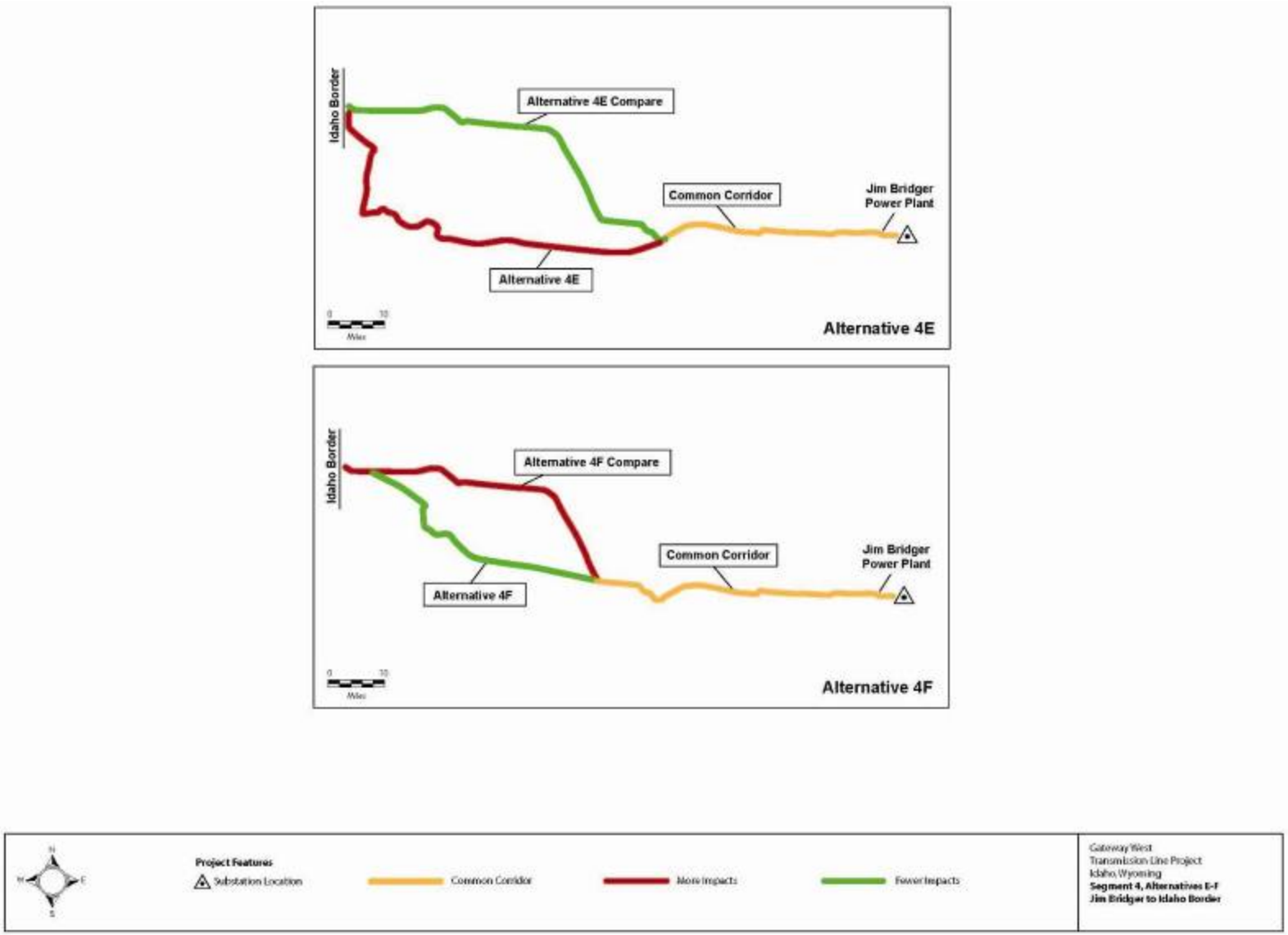


Figure 3.3-196. Segment 4, Alternatives E-F, Jim Bridger to Idaho Border

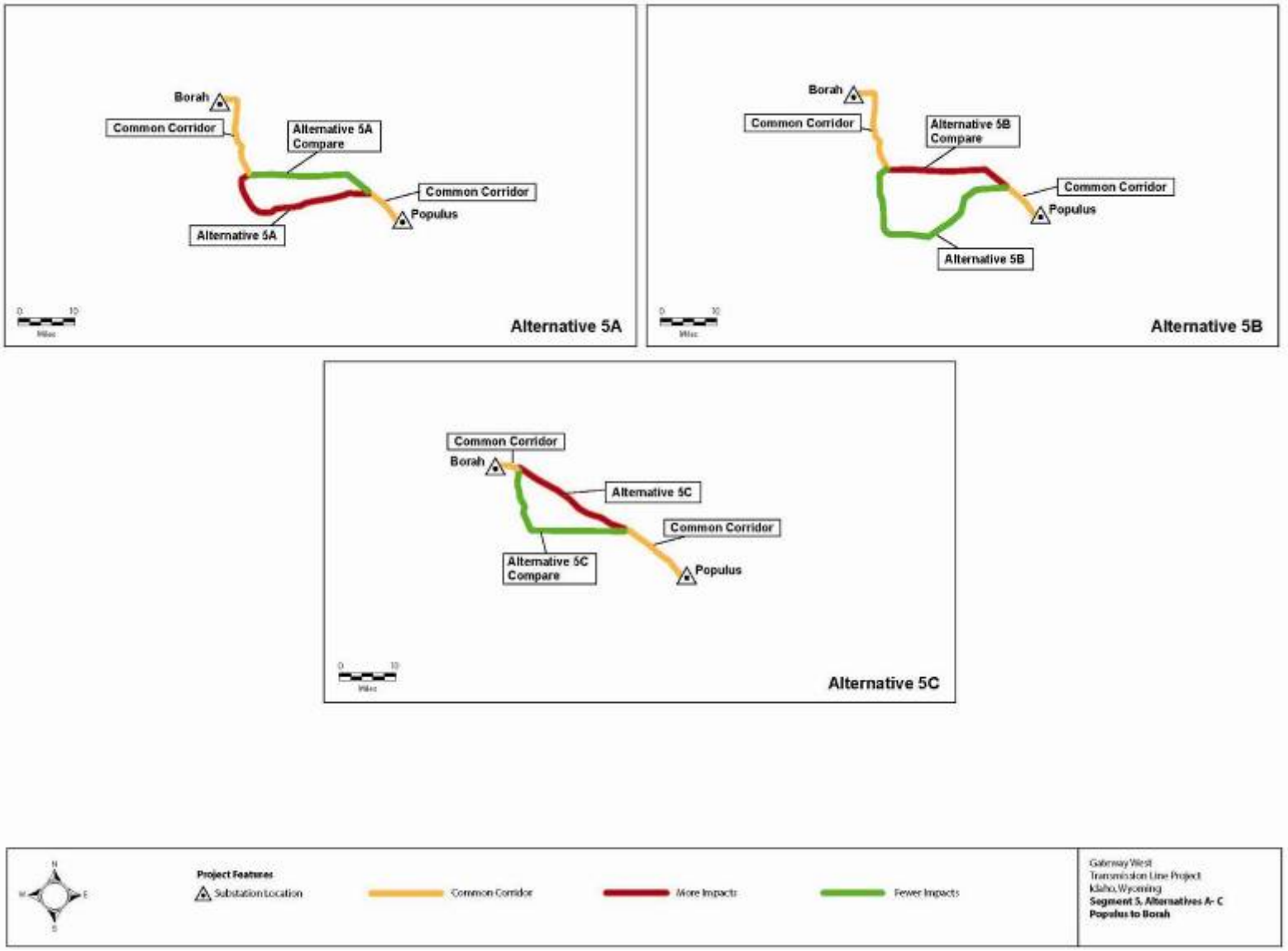


Figure 3.3-197. Segment 5, Alternatives A-C, Populus to Borah

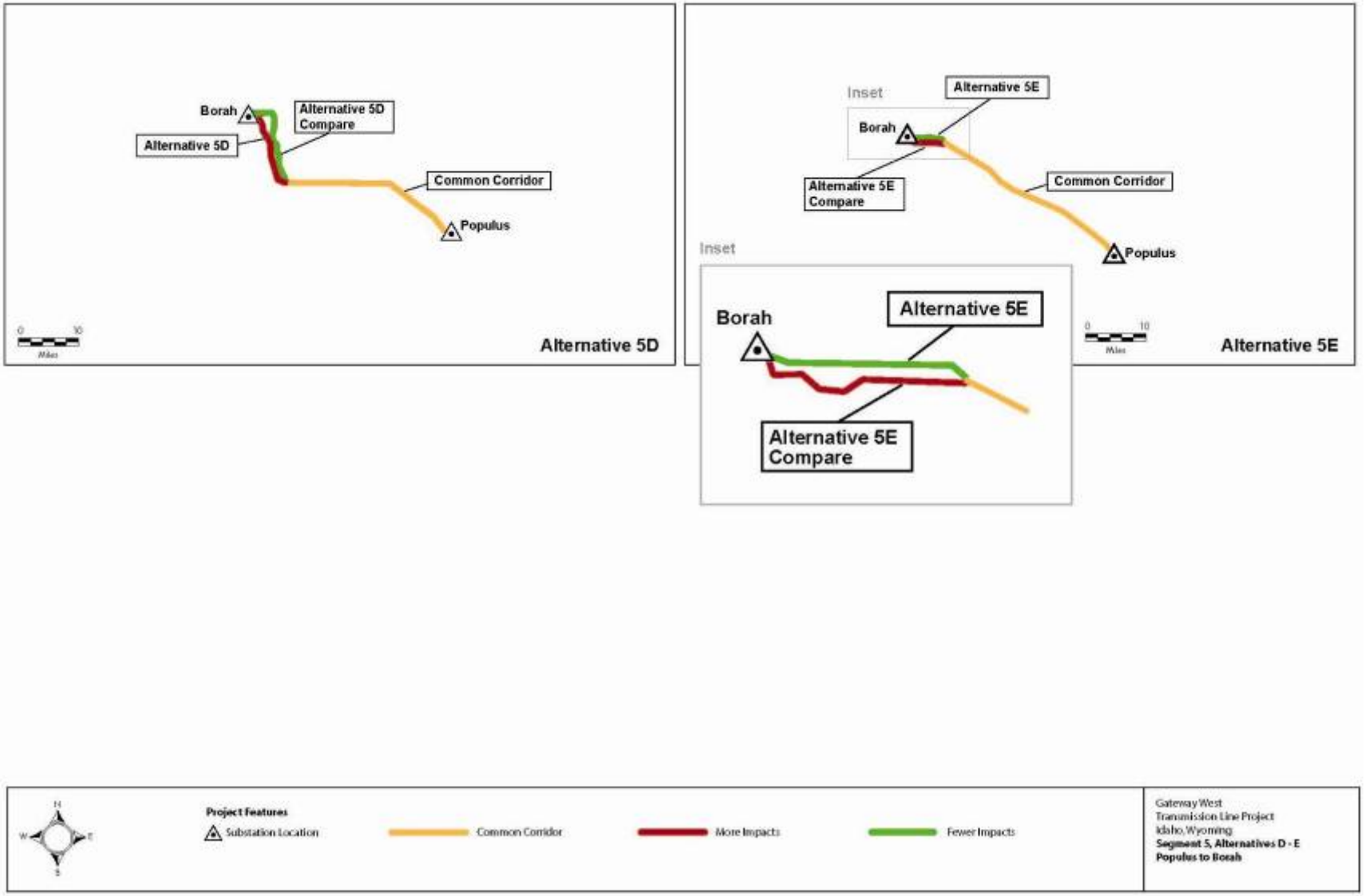


Figure 3.3-198. Segment 5, Alternatives D-E, Populus to Borah

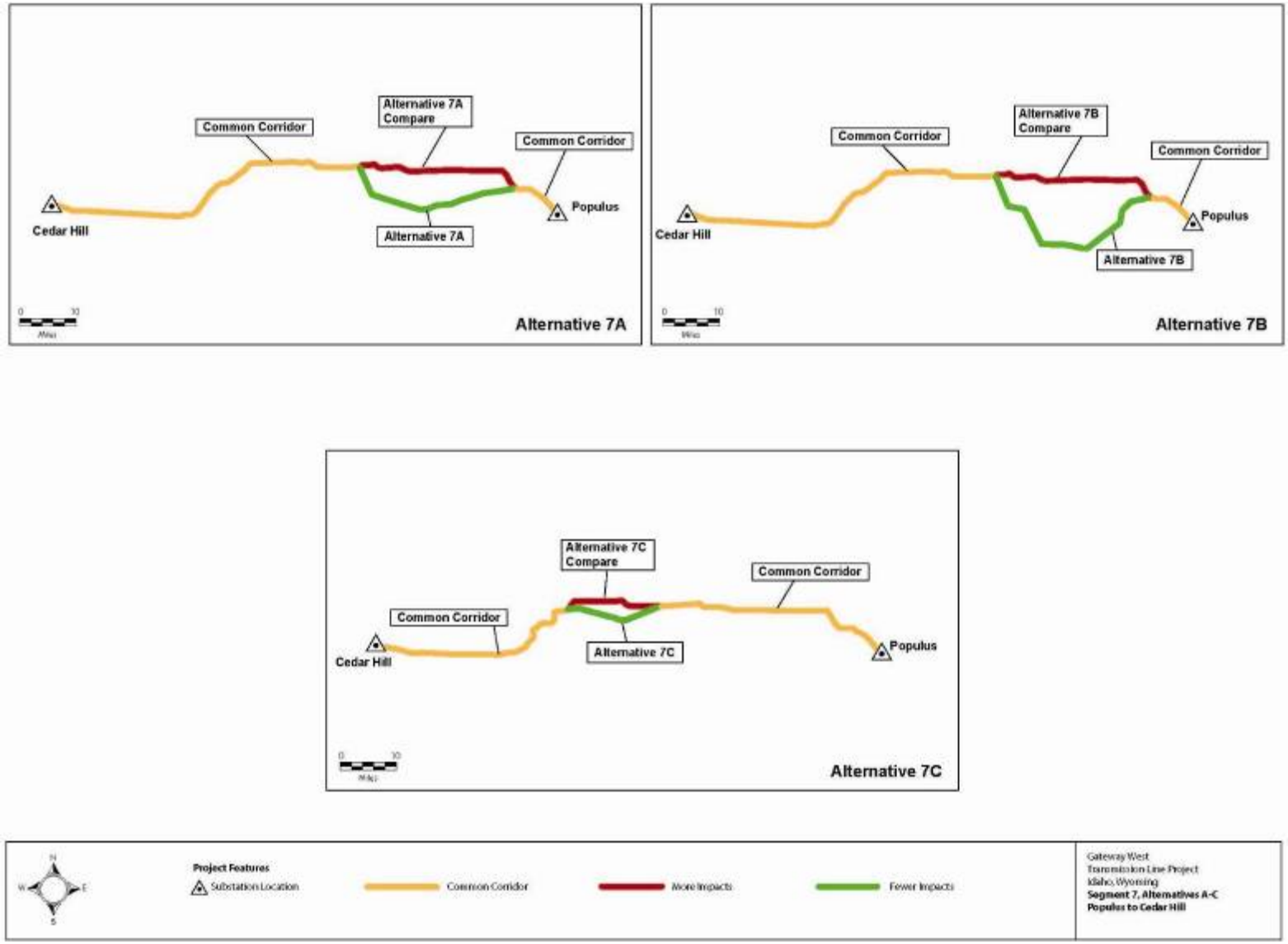


Figure 3.3-199. Segment 7, Alternatives A-C, Populus to Cedar Hill

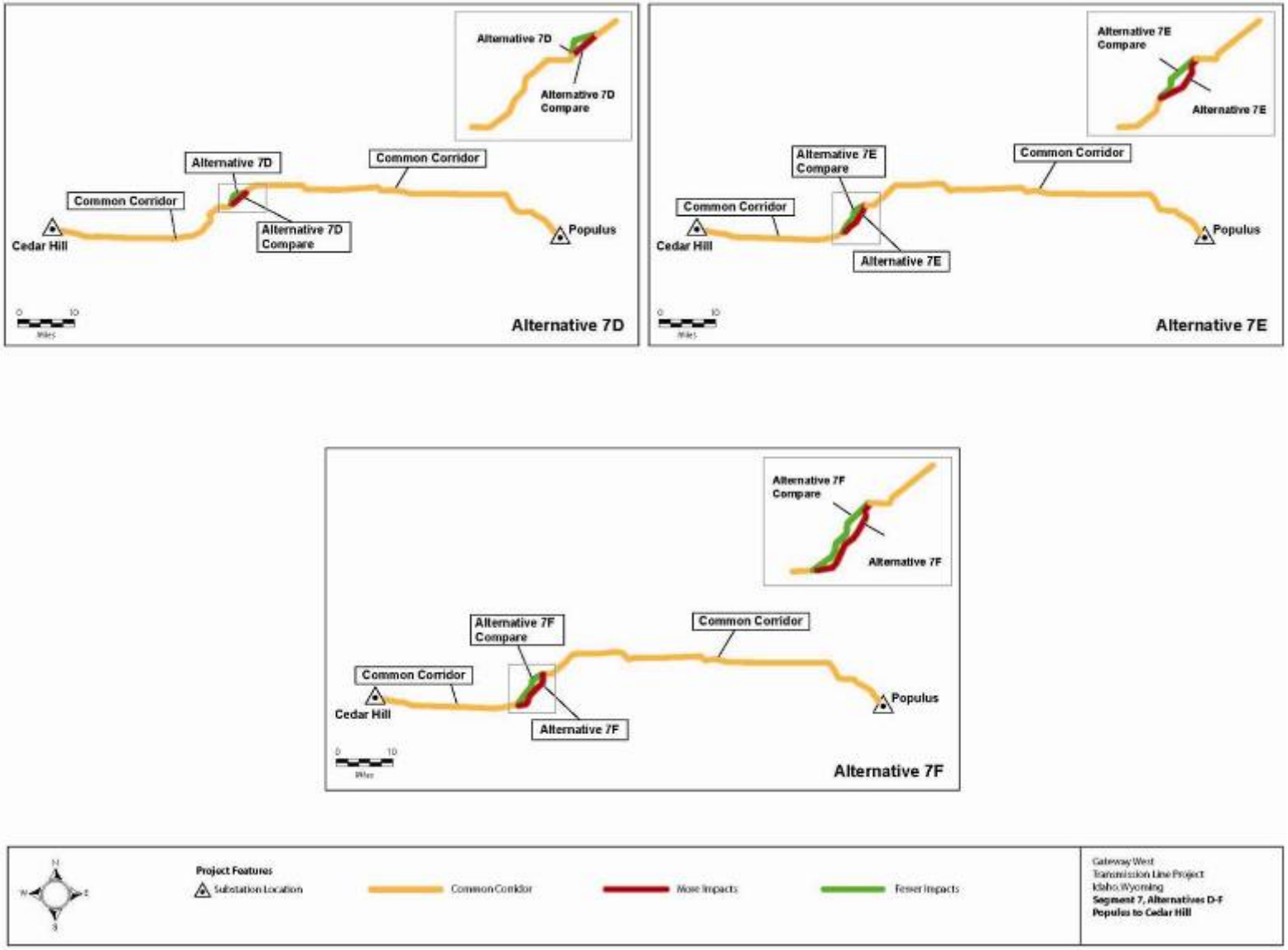


Figure 3.3-200. Segment 7, Alternatives D-F, Populus to Cedar Hill

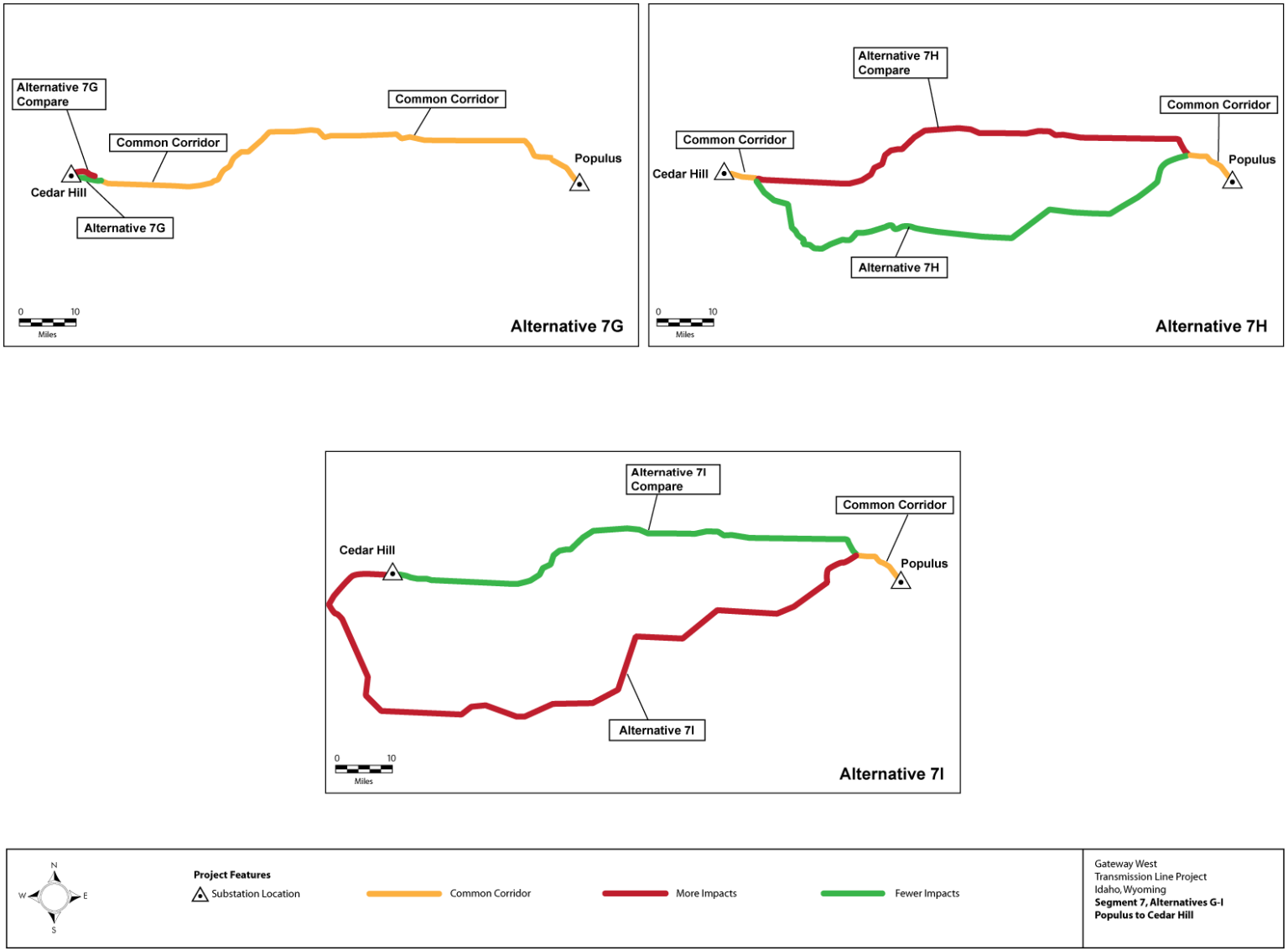


Figure 3.3-201. Segment 7, Alternatives G-I, Populus to Cedar Hill

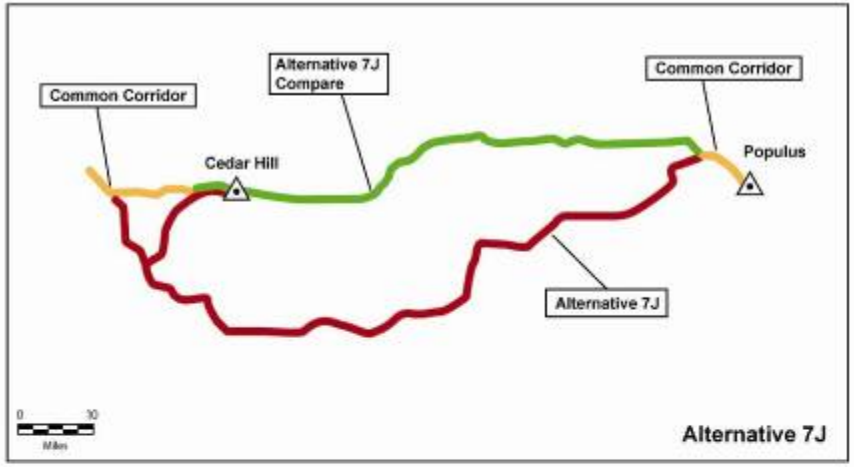


Figure 3.3–202. Segment 7, Alternative J, Populus to Cedar Hill

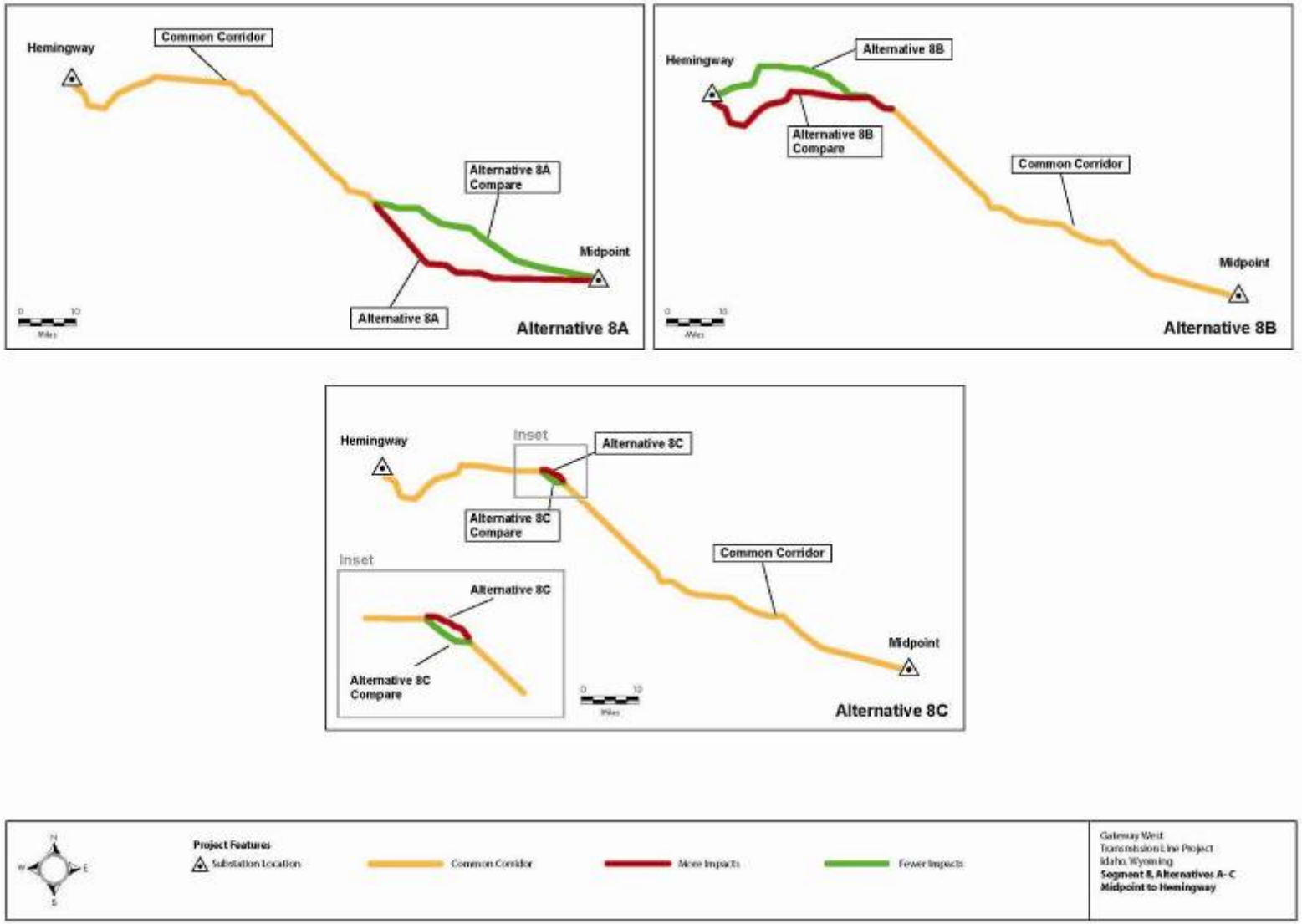


Figure 3.3-203. Segment 8, Alternatives A-C, Midpoint to Hemingway

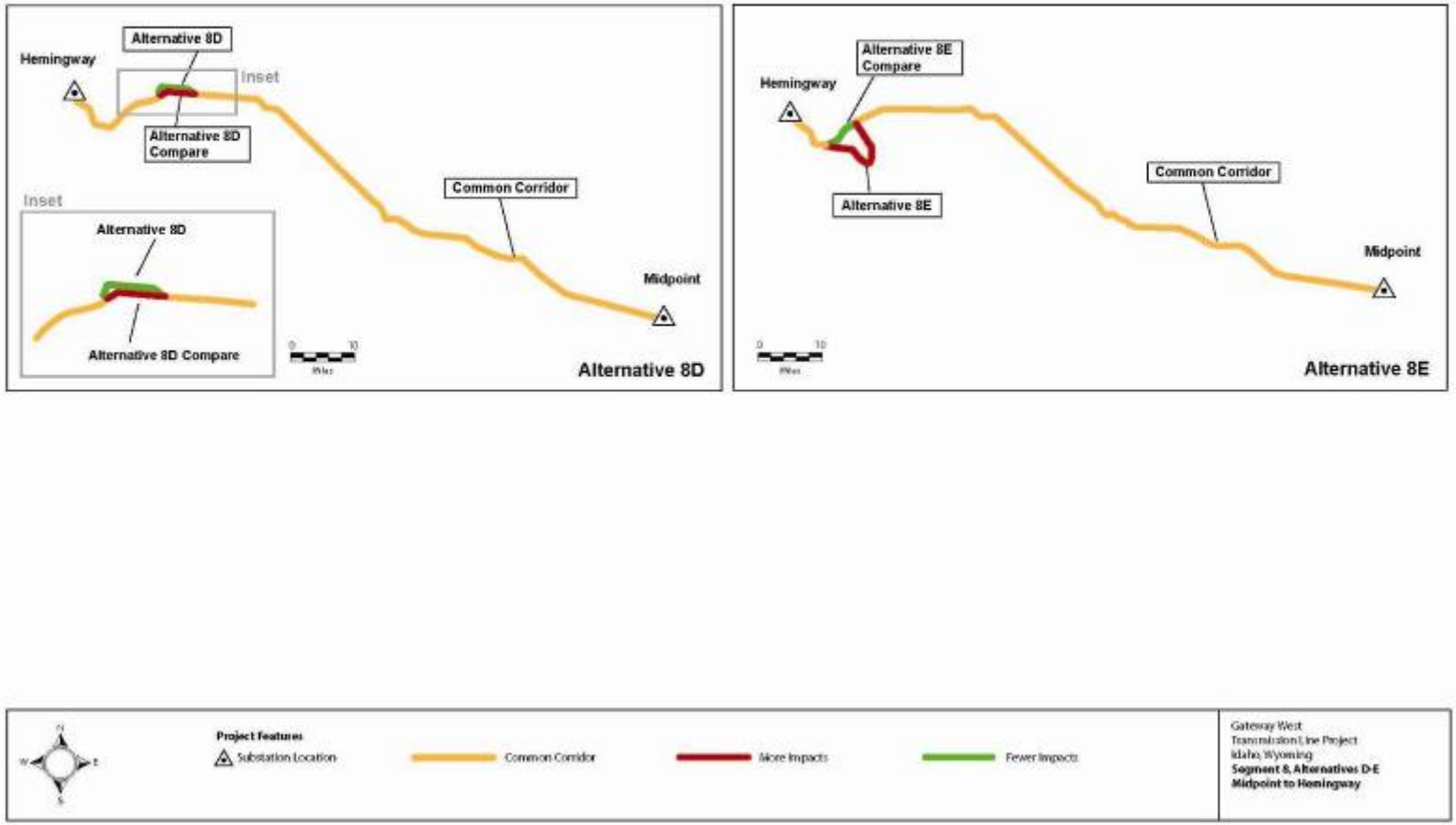


Figure 3.3-204. Segment 8, Alternatives D-E, Midpoint to Hemingway

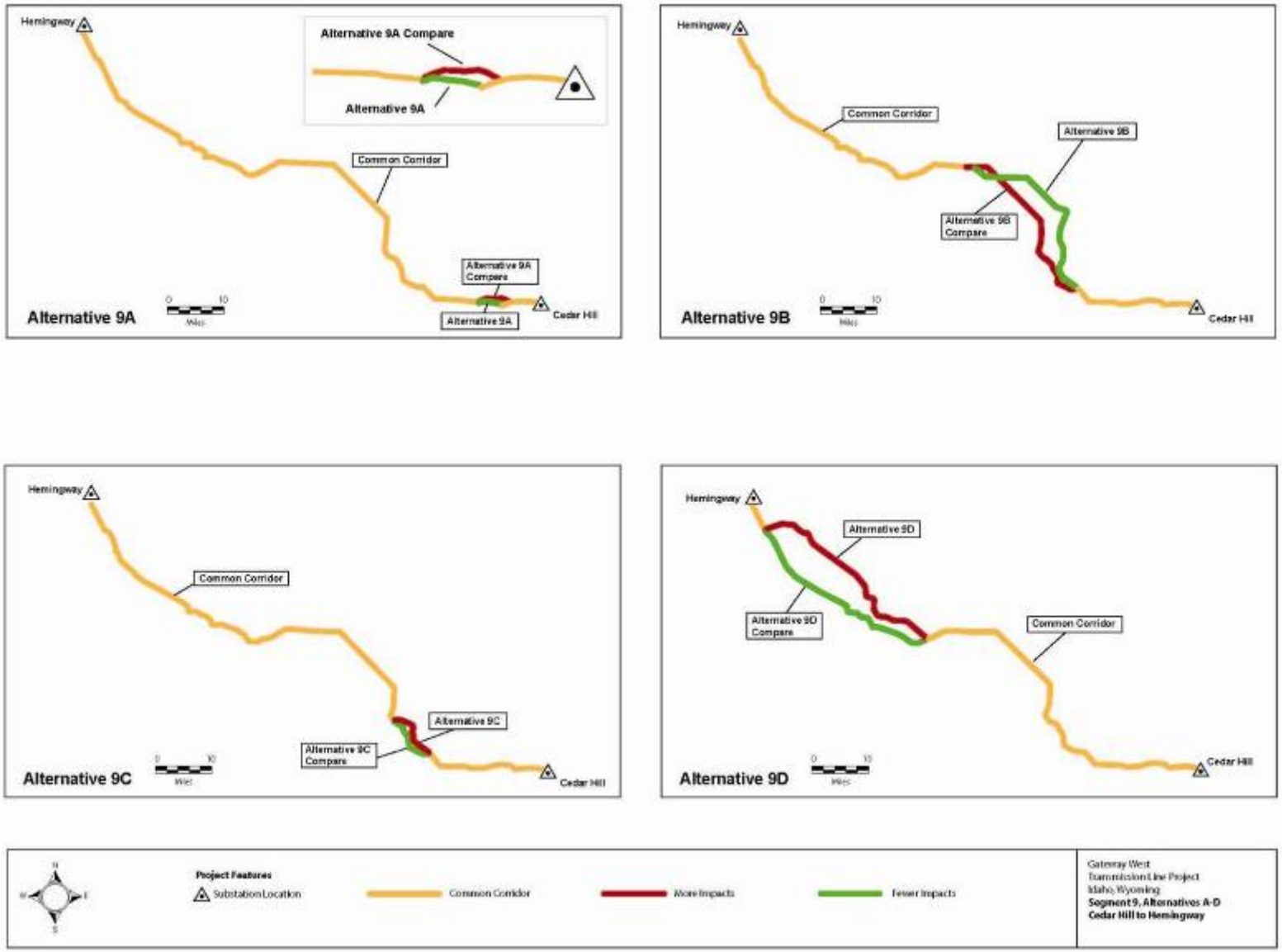


Figure 3.3-205. Segment 9, Alternatives A-D, Cedar Hill to Hemingway

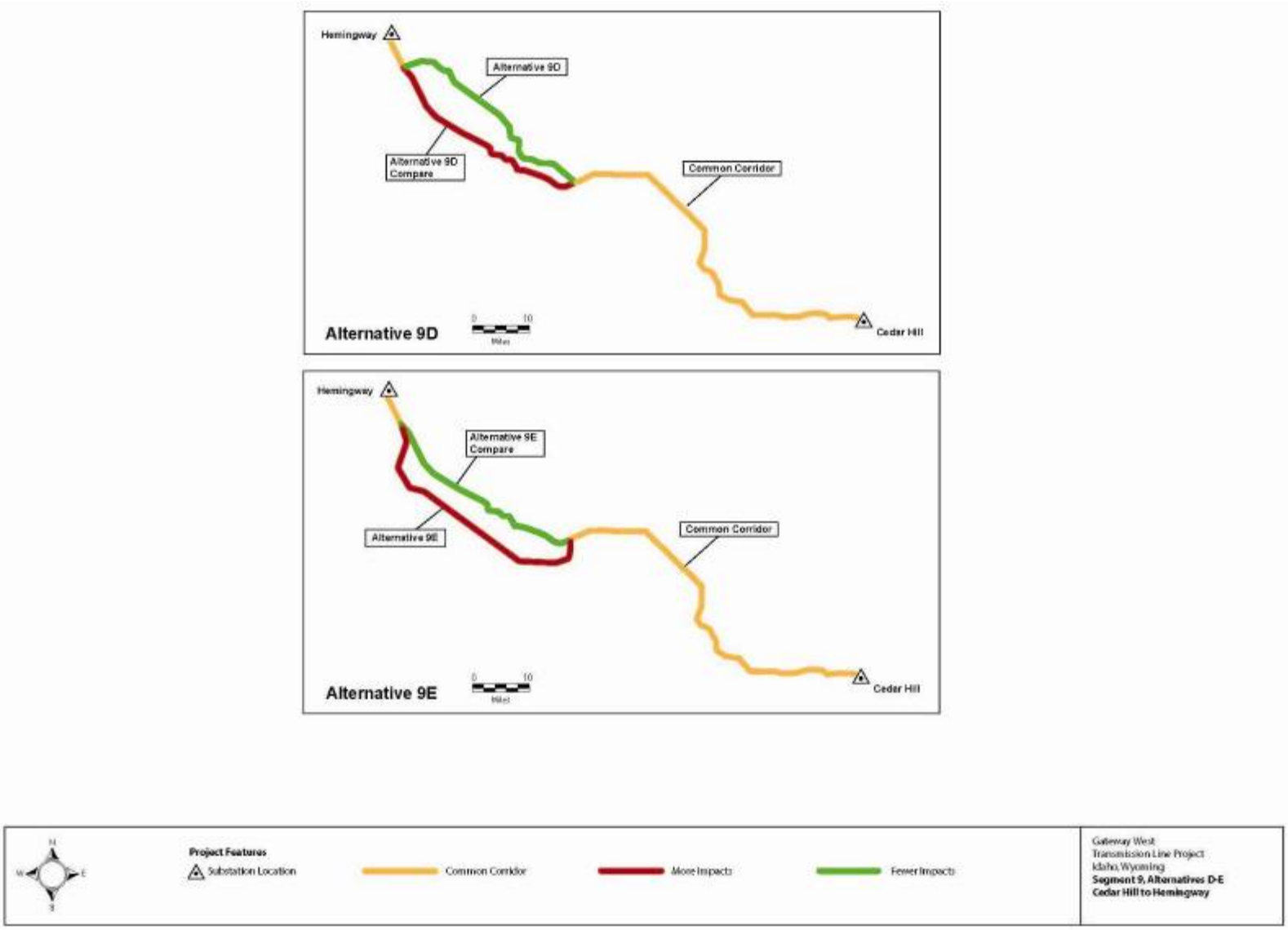


Figure 3.3-206. Segment 9, Alternatives D-E, Cedar Hill to Hemingway

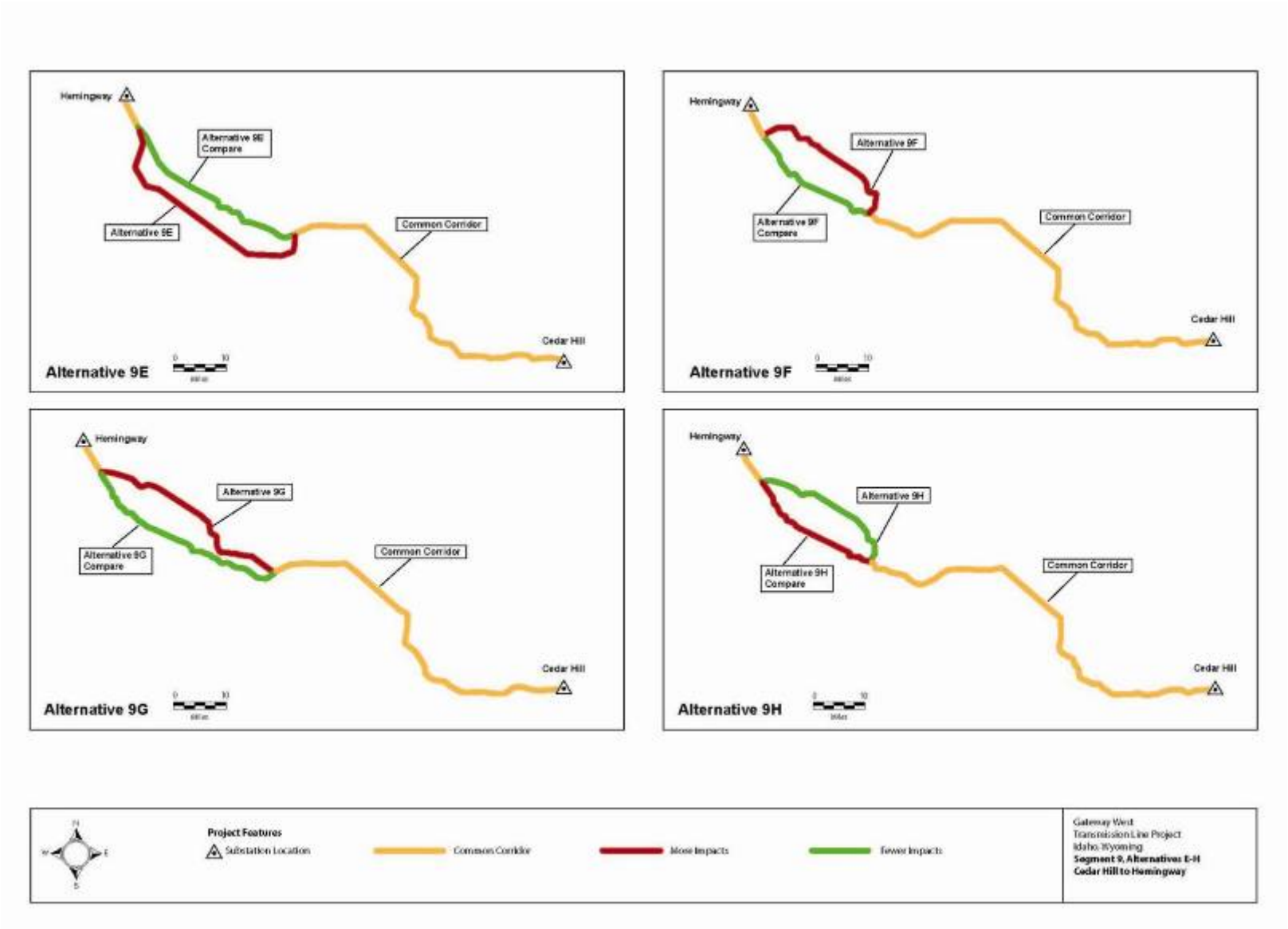


Figure 3.3-207. Segment 9, Alternatives E-H, Cedar Hill to Hemingway

3.3.3.5 Descriptions of Impacts by Route Segments

Segment 1E

The Proposed Route in Segment 1E is 100.6 miles long and has a low number of prehistoric (n=36) and historic (n=38) sites, for a ratio of approximately 0.7 sites per mile. Previous surveys in this area have been limited, which may partially account for the low site density. The comparison portion of the Proposed Route would have substantially fewer impacts than Alternative1E-B and slightly more impacts than Alternative 1E-A. The comparison portion of the Proposed Route would have more impacts than Alternative 1E-C.

Table 3.3-8 summarizes historic trail crossings in Segment 1E. This summary indicates that impacts to significant trail segments are equivalent on the Proposed Route, Alternative 1E-A, and Alternative 1E-B, even though 1E-B would cross only non-NHT segments. The Project would cross no historic trails on Alternative 1E-C.

Table 3.3-8. Historic Trail Crossings in Segment 1E

Segment/Alternative	NHT Segments Crossed by Project	Non-NHT Segments Crossed by Project	Totals
Proposed Route 1E	2	–	2
Alternative 1E-A	2	–	2
Alternative 1E-B	–	2	2
Alternative 1E-C	–	–	–

The Proposed Route in Segment 1E and Alternatives 1E-A, 1E-B, and 1E-C would affect lands managed by the Casper FO, Rawlins FO, and Medicine Bow-Routt NFs.

The Casper RMP Decision 5019 emphasizes that the foreground/middleground of NHTs will be managed as VRM Class II until inventories are completed. The Proposed Route 1E and Alternative 1E-C cross areas classified as VRM Class II and would require a plan amendment to the Casper RMP if selected. The proposed amendment recommends that a single 630-acre VRM Class II parcel be reclassified to VRM Class III and that a one-time allowance be made to permit the Project to cross scattered smaller VRM Class II parcels within the Casper FO boundaries. Some of the effects described for KOP C89 may only apply if the proposed amendment were approved. KOP C89 may include views of land currently managed as VRM Class II and thus an amendment would be needed to build the transmission line. Effects on this KOP due to the routes crossing this land could only occur if the amendment were approved. The effects on NHTs and other cultural resources described for the remaining KOPs are not on BLM-managed lands and therefore would not be a result of the proposed amendments. Proposed amendment language can be found in Appendix F-1. Appendix G-1 further discusses impacts to visual resources.

In the Rawlins FO, the Proposed Route and Alternatives 1E-B would cross areas mapped as VRM Class II and Class III on Map 2-50 of the Rawlins RMP and are not in conformance with the plan. If the Proposed Route and Alternative 1E-B are selected, the land use plan must be amended. The proposed amendment recommends that the project be permitted a one-time allowance for the Proposed Route, and that for Alternative 1E-B, three VRM Class II parcels that would have higher visibility be

reclassified to VRM Class III and the Project be permitted a one-time allowance to cross the remaining AOI parcels. Some of the effects described for KOP 43 may only apply if the amendment is approved because some of the Project visibility from this KOP may occur on VRM Class II lands managed by the BLM that would require an amendment for the Project to be allowed. The proposed amendment language can be found in Appendix F-1. Appendix G-1 further discusses the impacts to visual resources for Segment 1-E and Alternative 1E-B.

The Proposed Route would cross lands managed by the Medicine Bow-Routt NFs. Standards 1, 2, and 3 and six guidelines in the Medicine Bow Forest Plan address the protection of heritage resources. The Project is consistent with these Medicine Bow Forest Plan standards and guidelines that apply to cultural resources and anticipated impacts would be addressed through mitigation measures (see Section 3.3.4).

Segment 1W (1W[a] and 1W[c])

The Proposed Route in Segment 1W(a) is 76.5 miles long and has a low number of prehistoric (n=33) and historic (n=36) sites, for a ratio of approximately 0.9 sites/mile. Previous surveys in this area have been limited, which may partially account for the low site density. Relative to the single alternative, the impacts of the Proposed Route are considered to be moderate.

Alternative 1W-A would have fewer impacts than the Proposed Route 1W(a).. The Proposed Route in Segment 1W(c) is 16.2 miles long and has a moderate number of prehistoric (n=44) and historic (n=25) sites, for a ratio of approximately 4.3 sites/mile. Despite the relatively high site density, previous surveys in this area have been limited.

Table 3.3-9 summarizes historic trail crossings in Segment 1W. As summarized in this table, impacts to significant trail segments would be greatest for the Proposed Route 1W(a), and less so with Alternative 1W-A and Proposed Route 1W(c).

Table 3.3-9. Historic Trail Crossings in Segment 1W

Segment/Alternative	NHT Segments Crossed by Project	Non-NHT Segments Crossed by Project	Totals
Proposed Route 1W(a)	2	1	3
Alternative 1W-A	2	–	2
Proposed Route 1W(c)	1	–	1

The Proposed Routes in Segments 1W(a) and 1W(c) and Alternative 1W-A would affect lands managed by the Casper FO and Medicine Bow-Routt NFs.

The Casper RMP Decision 5019 emphasizes that the foreground/middleground of NHTs will be managed as VRM Class II until inventories are completed. The Proposed Routes 1W(a) and 1W(c) would cross areas classified as VRM Class II and would require a plan amendment to the Casper RMP if selected. The proposed amendment recommends changing a 630-acre VRM Class II parcel, just north of the Medicine Bow-Routt NFs, to VRM Class III and permitting a one-time allowance for the scattered smaller VRM Class II parcels that would be crossed by the Project. See Appendix F-1

for proposed amendment language and impacts. See Appendix G-1 for further discussion of visual impacts in this area.

The Proposed Routes would cross lands managed by the Medicine Bow-Routt NFs. Standards 1, 2, and 3 and six guidelines in the Medicine Bow Forest Plan address the protection of heritage resources. The Project is consistent with these Medicine Bow Forest Plan standards and guidelines and anticipated impacts would be addressed through mitigation measures (see Section 3.3.4).

Segment 2

The Proposed Route in Segment 2 is 96.7 miles long and has a high number of prehistoric (n=357) and historic (n=109) sites, for a ratio of approximately 4.8 sites/mile. Previous surveys in this area indicate that the high site density is due to the abundance of potable water, edible plants and animals, shelter, and lithic raw materials. All three Alternatives – 2A, 2B, and 2C - would have fewer impacts than the respective comparison portions of the Proposed Route.

Table 3.3-10 summarizes historic trail crossings in Segment 2. This summary indicates that impacts to significant trail segments would be greatest for the Proposed Route, followed by Alternatives 2A and 2B. Historic trails would not be impacted by Alternative 2C.

Table 3.3-10. Historic Trail Crossings in Segment 2

Segment/Alternative	NHT Segments Crossed by Project	Non-NHT Segments Crossed by Project	Totals
Proposed Route 2	–	9	9
Alternative 2A	–	6	6
Alternative 2B	–	3	3
Alternative 2C	–	–	–

The Proposed Route 2 would affect lands managed by the Rawlins FO.

The Proposed Route would cross areas mapped as VRM Class III on Map 2-50 of the Rawlins RMP where it would not be in conformance with the land use plan. If the Proposed Route is selected, the land use plan must be amended. The proposed amendment recommends permitting a one-time allowance for the Project to cross a parcel of VRM Class III land within the North Platte SRMA. No cultural KOPs were assessed for this area and thus the amendment would not affect the KOP effects analysis. See Appendix F-1 for the proposed amendment language and Appendix G-2 for further discussion of visual impacts in this area. The alternative routes would conform to the plan.

Segment 3

The Proposed Route in Segment 3 is 46.7 miles long and has a high number of prehistoric (n=293) and historic (n=49) sites, for a ratio of approximately 7.3 sites/mile. Previous surveys in this area indicate that the high site density is due to the abundance of potable water, edible plants and animals, shelter, and lithic raw materials. The impacts of the Proposed Route are considered to be high.

Table 3.3-11 summarizes historic trail crossings in Segment 3. The Proposed Route would cross seven non-NHT segments.

The Proposed Route would affect lands managed by the Green River FO. The Proposed Route would be located near sage-grouse leks and would require a plan amendment to the Green River RMP. The Proposed Route would be consistent with BLM VRM Class IV objectives. KOP 53 is located approximately 3 miles away from a sage-grouse lek and describes effects for parts of the route that are near the lek. Effects of the route on this KOP would likely be dependent upon approval of an amendment to allow the route through this area.

Table 3.3-11. Historic Trail Crossings in Segment 3

Segment/Alternative	NHT Segments Crossed by Project	Non-NHT Segments Crossed by Project	Totals
Proposed Route 3	–	7	7

Segment 4

The Proposed Route in Segment 4 is 203 miles long and has a large number of prehistoric (n=574) and historic (n=82) sites, for a ratio of approximately 3.2 sites/mile. Similar to Segment 3, previous surveys indicate that the moderate site density in this area is due to the abundance of potable water, edible plants and animals, shelter, and lithic raw materials. Alternatives 4A and 4F would have fewer impacts than the comparison portions of the Proposed Route. In contrast, Alternatives 4B, 4C, 4D, and 4E would have more impacts than the comparison portions of the Proposed Route..

Table 3.3-12 summarizes historic trail crossings in Segment 4. Impacts to significant historic trail segments would be greatest for the Proposed Route, followed by Alternatives 4A and 4F. Alternatives 4B, 4C, 4D, and 4E would cross fewer historic trail segments.

Table 3.3-12. Historic Trail Crossings in Segment 4

Segment/Alternative	NHT Segments Crossed by Project	Non-NHT Segments Crossed by Project	Totals
Proposed Route 4	11	5	16
Alternative 4A	9	2	11
Alternative 4B	6	–	6
Alternative 4C	7	–	7
Alternative 4D	6	–	6
Alternative 4E	7	–	7
Alternative 4F	8	2	10

The Proposed Route and Alternatives 4B, 4C, 4D, and 4E would affect lands managed by the Rock Springs FO and the Kemmerer FO in Wyoming, the Pocatello FO in Idaho, and the Caribou-Targhee NF in Idaho. Alternatives 4A and 4F would affect lands in the Kemmerer FO.

The Green River RMP guides actions that occur on lands managed by the Rock Springs FO. The RMP restricts impacts to visual resources, including historic trails, in the vicinity of the proposed Project. Management actions on lands with a Class II VRM

classification must be designed to blend into and retain the existing character of the natural landscape. The Proposed Route would not be in conformance with the Green River RMP visual requirements and would require a land use plan amendment to permit a one-time allowance for the Project to cross a parcel of VRM Class II land near the Green River without changing the VRM classification (see Appendix G-2 for further discussion on visual impacts in this area). No cultural KOPs occur near this VRM Class II area. The Proposed Route and Alternatives 4B, 4C, 4D, and 4E would also require a land use plan amendment of the Green River RMP for construction activities occurring near sage-grouse leks and raptor nests. Effects described for KOP C37 may only occur if an amendment were approved because the route analyzed comes near the 0.25 mile buffer requirement for sage-grouse leks. Effects described for KOPs C53, C15 and C12 would likely only occur if an amendment allowing disturbance within 0.5 mile were approved. Effects described for KOPs C40, C17, C16, and C18 would apply to a portion of the route that would require an amendment to the raptor buffer requirement because at either end of this section, there would be disturbance within the nesting buffer area. See Appendix F-1 for proposed amendment language and discussion of effects.

The Kemmerer RMP guides actions that occur on lands managed by the Kemmerer FO. The Project, as currently designed, is inconsistent with the current direction in the Kemmerer RMP, as it applies to NHTs and other cultural resources. In particular, surface-disturbing activities are prohibited within 0.25 mile on either side of Class 1 NHT trail segments and within 0.25-mile radius of gravesites and landmarks; within 500 feet of Class 2 NHT trail segments and 500-foot radius of gravesites and landmarks; and within 100 feet of Class 3 NHT trail segments and 100-foot radius of gravesites and landmarks. Indicative maps show that new access roads would occur within 0.25-mile of four Class 1 locations on Alternative 4A and one location on Alternative 4F. The viewsheds of NHT segments must be managed to retain the existing character of the landscape so developments do not dominate the visible area and detract from the feeling or sense of the historic time period of the trail setting. Table 3.3-13 depicts the distribution of NHT trail crossings by trail class for the Kemmerer FO. Alternative 4A, followed by Alternative 4F and the Proposed Route, would affect mostly higher quality (Class 1 and 2) trail segments. Alternatives 4B, 4C, 4D, and 4E would affect, however, only those trail segments for which the historic setting has been compromised (Classes 3 and 4). The Proposed Route and six alternatives are inconsistent with the Kemmerer RMP and would require a land use plan amendment.

Table 3.3-13. Crossing by NHT Trail Classes in the Kemmerer FO

	NHT Class			
Segment/Alternative	**Class 1**	**Class 2**	**Class 3**	**Class 4**
Proposed Route 4	1	2	–	1
Alternative 4A	2	3	–	1
Alternative 4B	–	–	3	1
Alternative 4C	–	–	2	1
Alternative 4D	–	–	3	1
Alternative 4E	–	–	2	1
Alternative 4F	1	3	–	1

Proposed amendments to the Kemmerer RMP include amending RMP Decision 5010 to permit a one-time allowance for the Gateway West transmission line to cross the Dempsey Hockaday NHT (Proposed Route), or Sublette NHT (Alternatives 4A and 4F), while requiring mitigation to include crossing trails at, or close to, right angles, placing towers as far from trails as feasible or micrositing to reduce visibility, and not permitting disturbance to trail traces. Effects described for KOPs 56 and 57 would only occur if an amendment permitting the Proposed Route to cross the Dempsy-Hockaday NHT were approved. Effects described for KOPs C125, C124 and possibly C10 would only occur if an amendment permitting Alternative 4F to cross the Sublett-Cuttoff NHT was approved. Effects described for KOPs C29, C31, and C126 would only occur if an amendment permitting Alternative 4A to cross the Sublett-Cuttoff NHT was approved. Effects described for KOPs C9, C8, C7, C28, C30, and C110 are described for routes that would require the amendments permitting the trail crossings described.

Utility corridors are prohibited across NHTs, according to RMP Decision 6008, so an amendment is required for any of the routes to be approved. Additionally an amendment would be needed to Decision 6051 regarding VRM designations and consideration of views connected with NHTs. The Decision would be amended to permit a one-time allowance for the Proposed Route and Alternatives 4A and 4F and portions of 4C and 4E, while reclassifying VRM Class II areas crossed by Alternatives 4B, 4C, and portions of 4D and 4E. Effects described for KOPs C121, C56, C57, C11, C41, C24, C125, C10, C30, C31, C29, C126, C9, C8, C7, C28, and C110 would only occur if amendments permitting a one-time allowance as well as to reclassify VRM Class II areas were approved. Additionally, effects described in KOPs C33 and C32 are for land that is not BLM-managed or NFS land; however, this portion of the route would not be permitted unless an amendment for the adjacent segments that cross VRM Class II land is approved. Mitigation measures are discussed in detail in Appendix F-1, Section 3.4.3. An amendment would also be needed to Decision 6053 if the Proposed Route is selected, permitting the route within 3 miles of designated NRHP sites with mitigation as determined by the Section 106 process. Effects described in KOP 121 would only occur if the amendment were approved. An amendment to Decision 6054 permitting a one-time allowance for the Project to cross within 3 miles of Class 1 and Class 2 NHT segments with micrositing and mitigation measures would be needed if Alternative 4A or 4F is selected. Effects described in KOPs C56, C57, C124, C125, C126, C29 C31, and C10 would only occur if the amendment were approved. Decision 7014 would need to be amended if Alternative 4A 4C, or 4E is selected, permitting a one-time allowance for the route to cross the Rock Creek/Tunp SMA and requiring micrositing and mitigation measures to minimize visual impacts. Effects described for KOP C31 would only occur if the amendment were approved.

If either Alternative 4B or 4D is approved, the Kemmerer FO recommends designating a corridor for future utility placement regarding crossing of the NHTs. A utility corridor, 1 mile in width centered on the transmission line should be designated for future utility placement if either Alternative 4B or 4D is approved. Effects described for KOPs C33 and C32 would apply for this amendment.

The Proposed Route would also cross lands managed by the Caribou-Targhee NF. The Project is consistent with the Caribou Forest Plan standards and guidelines for heritage resources and anticipated impacts would be addressed through mitigation measures (see Section 3.3.4).

Segment 5

The Proposed Route in Segment 5 is 54.6 miles long and has a low number of prehistoric (n=21) and historic (n=8) sites, for a ratio of approximately 0.5 site/mile. Previous surveys in this area have been limited, which may partially account for the low site density. Intensive agricultural activity in this area may also have destroyed many sites. Relative to the five Route Alternatives, the impacts of the Proposed Route are considered to be low. The comparison portions of the Proposed Route would have fewer impacts than alternative routes 5A, 5B, 5C, and 5D, but Alternative 5E would have more impacts than the comparison portion of the Proposed Route.

Table 3.3-14 summarizes historic trail crossings in Segment 5. Impacts to significant trail segments would be greatest for the Proposed Route, followed by Alternatives 5D and 5E and then by Alternatives 5A and 5B. No historic trails would cross Alternative 5C.

Table 3.3-14. Historic Trail Crossings in Segment 5

Segment/Alternative	NHT Segments Crossed by Project	Non-NHT Segments Crossed by Project	Totals
Proposed Route 5	2	1	3
Alternative 5A	1	–	1
Alternative 5B	1	–	1
Alternative 5C	–	–	–
Alternative 5D	1	1	2
Alternative 5E	1	1	2

The Proposed Route and Alternatives 5A, 5B, 5C, 5D, and 5E would affect lands managed by the Pocatello FO. Actions that occur on these lands are guided by the Malad MFP. Alternative 5C would also cross the southern end of the Fort Hall Indian Reservation in southeastern Idaho.

The Malad MFP provides guidance direction for managing land according to existing VRM Class restrictions, maintaining a degree of management that minimizes changes in the visual dominance elements. The Proposed Route would cross VRM Class II and III lands where it would not be consistent with the land use plan, thus requiring an amendment. Where the Proposed Route would cross the Deep Creek Mountains, an amendment permitting one-time allowance without changing the VRM Classifications would be needed. No cultural KOPs were analyzed for this area. An additional amendment was considered for a crossing of a parcel of VRM Class II area near the Snake River. The crossing would be across open water where the VRM Class II area occurs; therefore, the Pocatello FO determined an amendment would not be needed. See Appendix F-1 and Appendix G-1 for proposed amendment language and visual analyses.

The Malad MFP emphasizes that a protective corridor 330 feet wide should be established along visible segments of the Hudspeth Cutoff Trail. Given this restriction, the Proposed Route and Route Alternatives are inconsistent with the Malad MFP and would require an amendment to the land use plan. Effects described for KOPs C24 and C25 would only occur if the amendment were approved. The Project would also require an amendment to the Malad RMP to allow utilities located outside of existing corridors for the Proposed Route and Alternatives 5A and 5B. The Pocatello FO is currently working on a new RMP that would also include the area currently managed under the Malad MFP. This new RMP does not carry the ROW restriction forward. Effects described for all KOPs within the area would be dependent upon the amendment being approved or approval of the new Pocatello RMP, which does not have the ROW restriction. See Appendix F-1 for proposed amendment language.

The Shoshone-Bannock Tribes IRMP encourages examination of resource issues in an interdisciplinary manner before project implementation. If Alternative 5C were chosen, the IRMP would be followed within Reservation boundaries.

Segment 6

Segment 6 is an existing transmission line, 85.3 miles long, linking the Borah and Midpoint Substations. It is now operated at 345 kV but would be changed to operate at 500 kV. This segment has no Route Alternatives. Existing support structures would be used and impacts would be limited to within approximately one-quarter mile from each substation to allow for moving the entry point into the substation to the new 500-kV bay. No prehistoric or historic sites have been documented along this segment. New impacts are minimal and potential adverse impacts are unlikely.

Segment 6 crosses no historic trails and does not contain any Areas of Inconsistency. As such, amendments to local land use plans are not required.

Segment 7

The Proposed Route in Segment 7 is 118.1 miles long and has a very low number of prehistoric (n=17) and historic (n=14) sites, for a ratio of approximately 0.3 site/mile. Surveys in this area are generally limited, which explains the relatively low site density for most of the alternatives. Intensive agricultural activity in this area may also have destroyed many sites. Alternatives 7A, 7B, 7C, 7D, 7G, and 7H would have fewer impacts than their comparison portions of the Proposed Route. The comparison portions of the Proposed Route would have fewer impacts in Alternatives 7E, 7F, 7I, and 7J. The alignment for Alternatives 7I and 7J would pass along the southern edge of the proposed Tunnel Hill Archaeological District, in the southwestern corner of the Cassia Division of the Minidoka Ranger District in the Sawtooth NF, which accounts for the relatively higher site density in those routes. The archaeological district includes 54 sites, nearly all of which are lithic scatters that include flakes and chipped stone tools. Based on projectile point styles, these sites range in age from Paleoindian, through Archaic, to Late Prehistoric. Several historic sites, many of them rock cairns, are included in the district. The Proposed Route for Segment 7 avoids the Tunnel Hill Archaeological District.

Table 3.3-15 summarizes historic trail crossings in Segment 7. Impacts to significant trail segments would be greatest for Alternative 7I, followed by Alternative 7H, Alternative 7C, and the Proposed Route. The Project would cross only one historic trail in Alternatives 7A, 7B, and 7D, and cross no trails in Alternatives 7E, 7F, and 7G.

Table 3.3-15. Historic Trail Crossings in Segment 7.

Segment/Alternative	NHT Segments Crossed by Project	Non-NHT Segments Crossed by Project	Totals
Proposed Route 7	2	1	3
Alternative 7A	1	–	1
Alternative 7B	1	–	1
Alternative 7C	3	–	3
Alternative 7D	1	–	1
Alternative 7E	–	–	–
Alternative 7F	–	–	–
Alternative 7G	–	–	–
Alternative 7H	3	3	6
Alternative 7I	9	–	9
Alternative 7J	9	–	9

The Proposed Route and Route Alternatives would affect lands managed by the Pocatello FO (Pocatello RMP and Malad MFP); the Burley FO (Cassia RMP and Twin Falls MFP), Shoshone FO (Bennett Hills/Timmerman Hills MFP), Fort Hall Indian Reservation, and Sawtooth NF (Sawtooth Forest Plan) in Idaho; and the Wells FO in Nevada.

The Proposed Route and Alternatives 7A, 7B, 7C, 7H, and 7I would cross areas covered by the Malad MFP. The Malad MFP emphasizes that a protective corridor 330 feet wide should be established along visible segments of the Hudspeth Cutoff Trail. The Proposed Route and Alternative 7A are located within the 300-foot zone of the Hudspeth Cutoff Trail. Effects described for KOPs C24 and C25 would only occur if an amendment permitting the route were approved. VRM restrictions in the Malad MFP would impact Proposed Route and Alternative 7A. No cultural KOP analyses were conducted for these portions of the routes. The Malad MFP also restricts major utilities to new corridors, which would affect the Proposed Route and Alternatives 7A and 7B. Effects described for KOPs C22, C23,C24, and C25 would only apply if an amendment permitting the project were approved Given these restrictions, the Proposed Route and two Route Alternatives are inconsistent with the Malad MFP and would require amendments to the land use plan, permitting the Project one-time allowances to these management directions. See Appendix F-1 for amendment language and Appendix G-1 for the visual analyses.

The Proposed Route and Alternatives 7C, 7D, 7E, 7F, 7G, 7H, 7I, and 7J would cross multiple management areas covered by the Cassia RMP. The Proposed Route would cross parcels managed as VRM Class II and III, which will require an amendment to reclassify these areas to VRM Class III if any of these routes are selected and permit the crossing of the VRM Class III parcels without changing their classification. Effects described for KOPs C67 and C80 would only apply if these amendments were approved. The Cassia RMP also limits new ROWs to existing facilities and localities

within MA 11, which would impact the Proposed Route and require an amendment to the Cassia RMP, permitting a one-time allowance for the Gateway West transmission line if the Proposed Route is selected. Effects described for KOPs C63 and C64 would only apply if an amendment were approved. See Appendix F-1 for proposed amendment language and Appendix G-1 for visual analyses.

The Proposed Route and Alternatives 7I and 7J would cross areas covered by the Twin Falls MFP. The Twin Falls MFP restricts major power transmission lines to existing corridors. The Proposed Route and Alternatives 7I and 7J are inconsistent with the Twin Falls MFP and would require a land use plan amendment, permitting a one-time allowance for the Project to cross this area outside of these corridors, if selected. Some of the effects described for KOP C101 would only apply if an amendment allowing the Project outside of the established corridors were approved. In addition, Alternative 7I/7J would cross a small parcel of VRM Class II near Rock Creek. An amendment to reclassify the area adjacent to the powerline would be needed if this route is selected. Some of the effects described for KOP C81 would only apply if the amendment were approved. See Appendix F-1 for proposed amendment language and Appendix G-1 for visual analyses.

Alternatives 7I and 7J would cross areas covered by the Wells RMP. The alternative would not be consistent with the Wells RMP, which restricts new transmission lines to existing corridors and an amendment to permit a one-time allowance for the Project would be needed. In addition, the route crosses a VRM Class II parcel, which would be inconsistent with the visual management guidelines of the Wells RMP. An amendment to permit a one-time allowance without changing the VRM Classification would be needed if Alternative 7I or 7J is selected. No cultural KOPs were analyzed for this area. See Appendix F-1 for proposed amendment language and Appendix G-1 for visual analyses.

Alternatives 7H, 7I, and 7J would cross the Sawtooth NF. The Project is consistent with the Sawtooth NF Forest Plan standards and guidelines for heritage resources, with the exception of the Tunnel Hill Archaeological District in the southwestern corner of the Cassia Division of the Minidoka Ranger District. Most of the anticipated impacts will be addressed through mitigation measures (see Section 3.3.4). No cultural KOPs were analyzed for this area. The archaeological district should be avoided.

Segment 8

The Proposed Route in Segment 8 is 131 miles long and has a modest number of prehistoric (n=48) and historic (n=68) sites, for a ratio of approximately 0.9 site/mile. The known site density in this segment is relatively low, even though superior fisheries, milder climate, fine natural grasses, and meadows with root crops are present. Relative to the five Route Alternatives, the impacts of the Proposed Route are considered to be moderate. Alternatives 8B and 8D would have fewer impacts than their comparison portions of the Proposed Route. The comparison portions of the Proposed Route would have fewer impacts than Alternatives 8A, 8C, and 8E. Proposed Route of Segment 8 passes through the extreme northern end of the Guffey Butte-Black Butte Archaeological District, which was listed in the NRHP in 1978. The district is located along a 35-mile-long section of the Snake River Canyon in Ada, Canyon, Elmore, and

Owyhee Counties and follows the boundaries of the SRBOP. It encompasses 14,000 acres and includes 113 sites, all but four of which are open and sheltered prehistoric sites, as well as elaborate and spectacular prehistoric rock art. The four historic sites include the Swan Falls Dam, Guffey Railroad Bridge, the town site of Guffey, and an unknown historic settlement. Sites in the district offer the potential to address several regionally important research questions. This area should be avoided by using the comparision portion of the Proposed Route along Alternative 8E.

Table 3.3-16 summarizes historic trail crossings in Segment 8. Impacts to significant trail segments are greatest for the Proposed Route, followed by Alternatives 8A and 8B. The Project crosses no trails in Alternatives 8C,8D, and 8E.

Table 3.3-16. Historic Trail Crossings in Segment 8

Segment/Alternatives	NHT Segments Crossed by Project	Non-NHT Segments Crossed by Project	Totals
Proposed Route 8	3	8	11
Alternative 8A	6	3	9
Alternative 8B	1	1	2
Alternative 8C	–	–	–
Alternative 8D	–	–	–
Alternative 8E	–	–	–

The Proposed Route and Alternatives 8A, 8B, 8C, 8D, and 8E would affect lands managed by the Jarbidge FO, Four Rivers FO, and Shoshone FO.

The Proposed Route and Alternative 8A would cross areas covered by the Jarbidge RMP. The Jarbidge RMP specifies a utility avoidance/restricted area (overhead, surface, and underground) at the Oregon NHT, which would be impacted by Alternative 8A. The Proposed Route would also cross areas designated as VRM Class I around the Oregon NHT, which is inconsistent with the visual management guidelines of the land use plan. Alternative 8A would impact paleontological areas restricted by the Jarbidge RMP as well as cross the Kelton Road railroad. The Proposed Route and Alternative 8A are inconsistent with the Jarbidge RMP and would require amendments to the land use plan. Selection of the Proposed Route would require the RMP be amended to reclassify VRM Class II areas associated with the proposed transmission line to VRM Class III. Effects described for KOPs C118 and C83 would apply if the amendment were approved. If Alternative 8A were selected, amendments to the Jarbidge RMP would be needed to change the restricted area near the Project to “avoidance”, change VRM Class II areas to VRM Class III, and allow surface disturbance to within 330 feet of historical and paleontological sites. Effects described for KOPs C96, C106, C95, C61, C107, and C108 would apply if the amendments were approved. See Appendix F-1 for proposed amendment language and Appendix G-1 for visual analyses.

The Proposed Route and Alternatives 8B and 8C would cross areas covered by the Kuna MFP for the Four Rivers FO. The Proposed Project is inconsistent with the Kuna MFP and a land use plan amendment would be required to allow major utility construction outside of existing utility ROWs. Effects described for KOPs 89, 111, 100, 102 and 112 could only occur if the amendment were approved. The Kuna MFP

restricts activities within a ¼ mile corridor on either side of the UPRR, which would be impacted by Proposed Route and Alternatives 8B and 8C. An amendment to the Kuna MFP would be necessary that would allow micrositing of the transmission line such that its crossing would not affect the historic status of the railroad. No cultural KOPs were analyzed for this area. See Appendix F-1 for proposed amendment language.

The Proposed Route and Alternative 8E would cross areas covered by the SRBOP RMP within the Four Rivers FO. The SRBOP RMP emphasizes managing areas along the Oregon NHT and Snake River Canyon as VRM Class II, to provide reasonable protection for the NHT and scenic resources. The Project is not consistent with the SRBOP RMP and would require an amendment to the land use plan to reclassify specified VRM Class II areas affected by the Proposed Route and Alternative 8E to VRM Class III. Effects described for KOP 103 would apply if the amendment were approved.

The Proposed Route would cross areas covered by the Bennett Hills/ Timmerman Hills MFP within the Shoshone FO. The MFP has a goal of managing visual resources in conformance with the BLM guidelines. The Proposed Route would cross VRM Class II areas and would not be consistent with the MFP. An amendment to the land use plan to change the VRM Class II area to the north of the existing transmission line, including the existing ROW, to VRM Class III would be needed if this route were selected. Effects described for KOPs C86, C84, C83 would apply if the amendment was approved. See Appendix F-1 for proposed amendment language and Appendix G-1 for visual analysis.

Segment 9

The Proposed Route in Segment 9 is 161.8 miles long and has a modest number of prehistoric (n=75) and historic (n=41) sites, for a ratio of approximately 0.7 site/mile. Previous surveys in this area have been limited, which accounts for the low known site density, but they have demonstrated that the area was a center for cultural interactions, suggesting that actual site density may be moderate to high. Relative to the eight alternatives, the impacts of the Proposed Route are considered to be moderate to high. Alternatives 9A, 9B, and 9H would have fewer impacts than the comparison portions of the Proposed Route, whereas Alternatives 9C, 9D, 9E, 9F, and 9G would have greater impacts than the comparison portions of the Proposed Route. Alternative 9D also passes through the middle of the NRHP-listed Guffey Butte-Black Butte Archaeological District (see Segment 8 above for a description of the district). This area should be avoided by using the comparison portion of the Proposed Route in Alternative 9D. Alternative 9F would follow the Proposed Route until west of C.J. Strike Reservoir, thus avoiding the Cove Non-motorized Area, at which point it would turn north and join with Alternative 9D. Alternative 9G would follow the same alignment as 9D until 4 miles south of the Snake River crossing for 9D near Sinker Butte, at which point the alternative would cross the Guffey Butte-Black Butte Archeological District and parallel NHTs through the SRBOP. Alternative 9H would share an alignment with 9F until 4 miles south of the Snake River crossing, at which point 9H would follow the same alignment as 9G; paralleling NHTs through the SRBOP.

Table 3.3-17 summarizes historic trail crossings in Segment 9. Impacts to significant trail segments are greatest for Alternative 9D, followed by Alternatives 9B and 9C and the Proposed Route. The Project would cross no historic trails in Alternatives 9A and 9E.

Table 3.3-17. Historic Trail Crossings in Segment 9

Segment/Alternative	NHT Segments Crossed by Project	Non-NHT Segments Crossed by Project	Totals
Proposed Route 9	–	1	1
Alternative 9A	–	–	–
Alternative 9B	–	2	2
Alternative 9C	–	1	1
Alternative 9D	5	–	5
Alternative 9E	–	–	–
Alternative 9F	3	–	3
Alternative 9G	4	–	4
Alternative 9H	5	–	5

The Proposed Route and Alternatives 9A through 9H would affect lands managed by the Burley FO, Four Rivers FO, Jarbidge FO, Bruneau FO, and Owyhee FO.

The Proposed Route and Alternatives 9B, 9C, and 9E would cross areas covered by the Jarbidge RMP. The Jarbidge RMP specifies a utility avoidance/restricted area (overhead, surface, and underground) in the Salmon Falls Canyon. The Proposed Route is inconsistent with the Jarbidge RMP objectives of managing this area as an ACEC and under VRM Class II objectives. This route also would cross an area of Salmon Falls Creek that is eligible for WSR designation. An amendment would not be possible unless the segment were determined unsuitable for WSR designation. Additional VRM Class II areas would require plan amendments for the Proposed Route and Alternative 9D. See Appendix F-1 for proposed amendment language and Appendix G-1 for visual analysis.

The Proposed Route and Alternatives 9D, 9E, 9F, 9G, and 9H would cross areas covered by the SRBOP RMP within the Four Rivers FO. The SRBOP RMP emphasizes managing areas along the Oregon NHT as VRM Class II, to provide reasonable protection for the NHT. The Proposed Route and Alternatives 9D, 9F, 9G, and 9H are not consistent with these VRM requirements in the SRBOP RMP and thus would require an amendment to the land use plan reclassifying specified areas affected by the transmission line to VRM Class III (see Appendix G-1, Section 5.9 for a discussion of specific areas for reclassification). Effects described for KOPs C115, C90 and C109 would only apply if the amendments were approved. For the Proposed Route and Alternatives 9D, 9E, 9F, 9G, and 9H, the SRBOP RMP would also require amendments for impacts to additional visual resources, and sensitive plants. An amendment would be needed for the Proposed Route or Alternative 9D and Alternatives 9F through 9H for a one-time allowance permitting major utility construction outside of existing corridors. Effects described for KOPs C115, C116, C91, C90, and C109 would apply if these amendments were approved. These alternatives would also cross the Guffey Butte-Black Butte Archaeological District in a utility avoidance area. This area should be avoided if possible and if allowed would require significant mitigation to protect historic

resources. Requirements restricting land disturbance near slickspot peppergrass would be amended to permit disturbance to within 50 feet in order to allow the Project. Mitigation measures would be followed. See Appendix F-1 for proposed amendment language and Appendix G-1 for visual analyses.

The Proposed Route and Alternative 9A would cross areas covered by the Twin Falls MFP. The Twin Falls MFP designates the Oregon NHT as an SRMA, stipulating that the trail be fenced and restricting vehicular traffic. An amendment to the Twin Falls MFP would be required for utility construction outside of existing corridors. Effects for KOP C101 would apply if this amendment were approved. The Proposed Route would also cross a VRM Class I area adjacent to a section of Salmon Falls Creek that is Wild and Scenic River–eligible as well as within an ACEC. Selection of the Proposed Route or Alternative 9A would be inconsistent with the Twin Falls MFP and would require land use plan amendments; however, the section of Salmon Falls Creek that would be crossed by the Proposed Route is Wild and Scenic River –eligible and thus an amendment permitting this crossing could not be approved unless this section is determined to be unsuitable for Wild and Scenic River designation.

The Proposed Route would cross areas covered by the Bruneau MFP within the Bruneau FO. The Bruneau MFP has an objective to manage land in a manner that will protect and maintain the existing visual qualities, as well as enhance and rehabilitate land for visual resources as management allows. The Proposed Route would cross a parcel designated as VRM Class II and thus would not be consistent with the MFP and an amendment would be needed to reclassify this parcel to VRM Class III. No cultural KOPs were analyzed for this area. See Appendix F-1 for proposed amendment language and Appendix G-1 for visual analysis.

Segment 10

The proposed Segment 10 is 33.6 miles long and has a very low number of prehistoric (n=1) and historic (n=22) sites, for a ratio of approximately 0.7 site/mile. Previous surveys in this area have been limited and much of the area is private property, which may account for the very low site density. The impacts of the Proposed Route are considered to be low.

Table 3.3-18 summarizes historic trail crossings in Segment 10. The Proposed Route would cross three historic trails.

Table 3.3-18. Historic Trail Crossings in Segment 10

Segment	NHT Segments Crossed by Project	Non-NHT Segments Crossed by Project	Totals
Proposed Route 10	1	2	3

The Proposed Route would affect lands managed by the Burley FO and Shoshone FO. Segment 10 does not contain any Areas of Inconsistency. As such, no amendments to any local land use plans would be necessary.

3.3.3.6 Design Variation

A Design Variation is being considered that would consist of constructing two single-circuit lines in Segments 2 through 4 instead of a single double-circuit line (which is the design assessed above). The disturbance footprint of the two single-circuit towers is greater than that of the double-circuit tower, in part because the requested ROW would be wider, but also because helicopter-assisted construction could be implemented in these areas due to the lighter weight of the towers, which would require additional fly yards. The additional ROW space and the fly yards would cause additional temporary disturbance during construction. Across Segments 2, 3, and 4, the additional disturbance of the single-circuit tower alternative ranges from 25 to 30 percent greater than the comparable portions of the double-circuit tower disturbance under the proposed design. The two single circuits require more ground disturbance, but would be designed and constructed to the same standards as the Proposed Action. The Design Variation offers no noticeable impact on cultural resources other than visual impacts on historic resources.

3.3.3.7 Structure Variation

The proposed guyed Structure Variation would add four guy wires approximately 140 feet long from a point approximately 100 feet up in each tower to four guy anchors spaced in a square around the tower (Appendix B, Figure B-6). This would not change the amount of disturbance during construction or operation appreciably. There is no appreciable difference in impact on cultural resources from the use of this Structure Variation when compared to the use of self-supporting lattice towers, as the guyed towers would be approximately the same height and breadth at the top of the structure as the proposed self-supporting lattice towers and have no appreciable change in adverse impact if visible.

3.3.3.8 Schedule Variation

The Schedule Variation uses the two single-circuit design variation described above but extends construction over a longer timeframe. Initially, only one of the eventual two single-circuit lines would be constructed, with the second to be constructed at a later date. The Schedule Variation proposes that the first single-circuit transmission line in Segments 2, 3, and 4 would be built as soon as the ROW grant is issued, but that the second line would not begin construction until late 2018. This would mean nearly 2 years between the end of construction for the first line and beginning of construction for the second line. Any staging areas and fly yards that had been used for the first stage would have been revegetated after construction was complete and would have to be cleared again. There would be two sets of construction disturbances adding movement, noise, and dust to the area of construction in two instances in any given area. No appreciable difference in impacts on cultural resources exists between the Schedule Variation and the proposed schedule.

3.3.4 Mitigation Measures

Cultural resources previously identified within the Analysis Area have been reviewed to determine if any would be impacted by the Proposed Action and if such action would affect the qualities contributing to their NRHP eligibility. Project impacts include not only

the surface disturbance of the activity but also the visual and auditory elements that may alter the character of a historic property. The Proposed Action includes EPMs designed to avoid or minimize adverse effects on cultural resources. If a property has been determined to be adversely impacted, and efforts to avoid or minimize these impacts are not sufficient, then the following mitigation measures identified by the Agencies would be implemented.

CR-1 (for historic properties in all segments)

- Avoid direct impacts by designing the route so that no Project facilities, including access roads, are placed within the boundaries of historic properties.
- Should avoidance of historic properties not be feasible, assess adverse effects and develop one or more mitigation measures to address all unavoidable adverse impacts.

CR-2 (for historic trails and other linear routes in all segments)

- Design the transmission line to cross where existing development occurs.
- Cross the resource as close to a 90-degree angle as possible using a dog-leg or S curve.
- Adjust tower placement to use the maximum span distance to achieve maximum tower distance from the linear resource.
- Avoid paralleling the linear resource as much as possible and obtain maximum tower distance by shifting alignment and maximize topographic screening with lower structures, such as the two single-circuit steel-lattice design alternative.

The following compensatory mitigation was developed from a review of the Overland Pass Pipeline Project ROD MOA (BLM 2007b), the Oregon/Mormon Pioneer Historic Trails Management Plan (BLM 1986a), and suggestions from the NPS. Compensatory mitigation would be applied where potentially adverse impacts would occur after EPMs and other site-specific mitigation have been implemented, based on consultation with the Idaho, Nevada, and Wyoming SHPOs; the NPS; the CEQ; and other consulting parties, such as the OCTA and the Alliance for Historic Wyoming, to determine which compensatory mitigation measures are appropriate. This may be required in the Proposed Route in Segment 4 for the Dempsey-Hockaday Trail (KOP C10) and portions of the Sublette Cutoff Trail; the Proposed Route in Segment 7 and Alternatives 7C and 7D; Alternatives 8A and 9B for the Hagerman Fossil Beds; and the Proposed Route in Segment 10 for the Minidoka National Historic Site.

CR-3 Compensatory Mitigation Measures – The BLM, in consultation with the Wyoming, Nevada, and Idaho SHPOs, and consulting parties is developing a PA and a Historic Properties Treatment Plan. Compensatory mitigation measures may be developed as appropriate for specific historic resources. The following example measures may be considered for adversely affected properties, or other measures required:

- Fund or provide interpretive, educational exhibits placed in museums or nearby interpretive centers.
- Develop an illustrated guide to the regional archaeology and history, which would present the results of the Project's archaeology/history in layperson's terms for the general public.
- Provide new markers for the BLM and other public groups to position along historic trails, highways, and other linear resources.
- Fund or provide outdoor, interpretive wayside exhibits along access points to trails, highways, and other linear resources
- Fund or provide educational films or curriculum for area school districts about the history and significance of the linear resources.
- Acquire or trade land with willing seller(s).
- Preserve landscapes from a cultural landscape perspective.
- Bury elsewhere other (non-Project) lower kilovolt transmission or distribution lines.
- Commission studies of associated historic sites along the corridor to support a regional context.
- Re-vegetate disturbed areas to protect or restore viewsheds.
- Provide monetary support to historic trail-related state parks.

In addition to the above measures, the following measures would be required as part of Section 106 compliance. The manner in which they will be implemented would be included in the PA executed among the consulting parties:

CR-4 Conservation Easements – Where feasible and appropriate, conservation easements will be considered to preserve important archaeological and historic sites, and high integrity linear resource segments, or to preserve viewsheds. A conservation easement (sometimes called a conservation covenant) creates a legally enforceable land preservation agreement between a landowner and a government agency (federal, state, county, or municipality) or a qualified land protection organization ("land trust") for the purposes of conservation. It restricts real estate development, commercial and industrial uses, and certain other activities on a property to a mutually agreed upon level. The property remains the private property of the landowner.

In addition, the Forest Service requires the following mitigation measure:

CR-5 On NFS lands, a management plan should be developed for each historic property nominated to the NRHP. The plan should be drafted during the nomination process. The National Heritage Strategy should be used to guide decisions on issues related to the Heritage Program.

3.4 SOCIOECONOMICS

This section addresses potential impacts from the Proposed Action and Route Alternatives during construction, operations, and decommissioning. The section analyzes the potential impacts the Project's activities could have on population, economic conditions, housing, property values, education, public services, and tax revenues. The counties crossed by the Proposed Route and Route Alternatives and the communities located within the vicinity of the proposed facilities comprise the overall socioeconomic Analysis Area.

3.4.1 Affected Environment

This section discusses those aspects of the environment that could be impacted by the Project. It starts with a discussion of the Analysis Area considered, identifies the issues that have driven the analysis, and characterizes the existing conditions within the Analysis Area.

3.4.1.1 Analysis Area

The transmission line segments that comprise the Proposed Route together extend approximately 1,103 miles in Wyoming and Idaho. The counties crossed by each segment and the approximate length of each segment are identified in Table 3.4-1.

Table 3.4-1. States and Counties Crossed by Segment

Segment[1/]	State	Counties[2/]	Proposed Route Transmission Length (miles)[3/]
1E	Wyoming	Converse, Natrona, Albany, Carbon	101
1W(a)	Wyoming	Converse, Natrona, Carbon	76
1W(c)	Wyoming	Converse, Natrona, Carbon	71
2	Wyoming	Carbon, Sweetwater	97
3	Wyoming	Sweetwater	56
4	Wyoming	Sweetwater, Lincoln	136
4	Idaho	Bear Lake, Franklin, Bannock	67
5	Idaho	Bannock, Power (Oneida)	55
7	Idaho	Bannock, Power, Cassia, (Oneida), (Elko, Nevada)	118
8	Idaho	Jerome, Lincoln, Gooding, Elmore, Ada, (Canyon), Owyhee	131
9	Idaho	Cassia, Twin Falls, Owyhee, Elmore	162
10	Idaho	Cassia, Twin Falls, Jerome	34
		Total	**1,103**

1/ Segment 6 is not included here because no new transmission line construction would be required along Segment 6 to operate this line segment at 500 kV, except in the vicinity of the Borah and Midpoint Substations, where approximately 10 new structures would be required, 5 at each substation.

2/ Counties are shown by segment in order from east to west. Counties shown in parentheses (Canyon and Oneida Counties, Idaho, and Elko County, Nevada) are not part of the Proposed Route, but are crossed by Route Alternatives to Segments 5, 7, and 8, as shown.

3/ Numbers are approximate; columns may not sum exactly due to rounding.

The length of transmission line by county ranges from less than 5 miles in Lincoln County, Idaho, to approximately 163 miles in Carbon County, Wyoming (Table 3.4-2). Other counties with more than 100 miles of new transmission line under the Proposed Route include Owyhee County, Idaho, and Sweetwater County, Wyoming. The transmission line would cross more counties in Idaho than Wyoming; the overall length of new transmission line would also be longer in Idaho than in Wyoming, 566 miles versus 537 miles, respectively (Table 3.4-2).

Table 3.4-2. Miles by County (Proposed Route)

State/County	Total County Length Crossed by Proposed Route (miles)	State/County	Total County Length Crossed by Proposed Route (miles)
Wyoming		**Idaho**	
Albany	41	Ada	28
Carbon	163	Bannock	49
Converse	77	Bear Lake	37
Lincoln	60	Cassia	72
Natrona	48	Elmore	72
Sweetwater	148	Franklin	16
Total	**537**	Gooding	27
		Jerome	30
		Lincoln	3
		Owyhee	110
		Power	68
		Twin Falls	54
		Total	**566**

The Route Alternatives include the same group of counties as the Proposed Action, with three additions: Canyon and Oneida Counties, Idaho, and Elko County, Nevada. These counties would be crossed under Route Alternatives to parts of Segments 5, 7, and 8 (see Table 3.4-1).

The Proposed Action would involve four separate Engineering, Procurement, and Construction (EPC) contracts. Two of these contracts would involve the same general geographic area, extending west from the Populus Substation in Bannock County, Idaho, to the Hemingway Substation in Owyhee County, Idaho, and are combined here to form one Analysis Area (EPC 3). The facilities and counties covered by each EPC contract are identified in Table 3.4-3 and referred to in this section as the EPC Analysis Areas.

Table 3.4-3. Project Components and Affected Counties by Region

EPC Analysis Area	Transmission Line Segments[1/]	Transmission Line Length (miles)[2/]	Substations	Affected Counties
1 (Eastern)	1E, 1W(a), 1W(c), 2, 3	402	Windstar, Aeolus, Creston	**Wyoming:** Albany, Carbon, Converse, Natrona, Sweetwater
2 (Central)	4	203	Bridger, Populus (RMP)	**Wyoming:** Lincoln, Sweetwater **Idaho:** Bannock, Bear Lake, Franklin

Table 3.4-3. Project Components and Affected Counties by Region (continued)

EPC Analysis Area	Transmission Line Segments[1/]	Transmission Line Length (miles)[2/]	Substations	Affected Counties
3 (Western)[3/]	5, 6, 8, 7, 9, 10	498	Populus (IPCo), Borah, Midpoint, Cedar Hill, Hemingway	**Idaho:** Ada, Bannock, Canyon, Cassia, Elmore, Gooding, Jerome, Lincoln, Oneida, Owyhee, Power, Twin Falls **Nevada:** Elko

1/ Information is presented by segment and county in Tables 3.4-1 and 3.4-2.
2/ Canyon, Oneida, and Elko Counties are included in the EPC 3 Analysis Area because they would be crossed under alternatives to parts of Segments 5, 7, and 8.
3/ The Proposed Action consists of four EPC contracts. Two of these contracts cross the same general area and have been grouped together here as EPC 3.

3.4.1.2 Issues to Be Analyzed

The following socioeconomic-related issues were brought up by the public during public scoping (Tetra Tech 2009a), were raised by federal and state agencies during scoping and agency discussions, or are issues that must be considered as stipulated in law or regulation:

- Whether sufficient housing would be available for temporary and permanent workers;
- Whether the temporary workforce would have detrimental effects on existing services in local municipalities;
- What the effects would be on population numbers;
- What the effects would be on economic conditions;
- Whether education or schools would be affected;
- Whether public services such as police or fire protection would be impacted;
- How the project would affect tax income to local governments;
- How development of the Project would impact municipal infrastructure and other planned development;
- How the presence of the transmission line would affect the quality of life of and enjoyment of the land by local residents;
- What the economic impacts would be to individuals;
- How this Project would affect tourism and recreation;
- Whether construction or operations of the Project would disrupt delivery of any public utilities such as electricity or sewer;
- What municipalities and other population concentrations would be impacted; and
- Under what circumstances private land would be condemned, and what the effects of this would be.

3.4.1.3 Regulatory Framework

Wyoming requires that an Industrial Siting Permit from the Wyoming Industrial Siting Council (ISC) be obtained. A major evaluation factor in granting that permit is the

potential effects of the Project on the local social and economic environment. The Proponents report that the detailed information required by the regulations will be provided to the ISC once the preferred route is identified. Consultation with the ISC staff confirms that an Industrial Siting Permit application filed at the time of the Final EIS would meet that requirement. There is no similar requirement in Idaho.

3.4.1.4 Methods

The potential effects of the Proposed Route and Route Alternatives are evaluated with respect to the key aspects of the socioeconomic environment, including population, economic conditions, housing, property values, education, public services, and tax revenues. These evaluations employ different resource-specific analysis methods, which are described in their respective sections.

Key Project-related variables that are used in these analyses are projected construction and operation employment and expenditures. These variables are used in analyses at the EPC Analysis Area level and, where appropriate, the county level. Construction employment and spending estimates are disaggregated by county primarily based on the share of overall construction that would occur in that county. These estimates represent the best available information and a reasonable approximation of the likely distribution of potential impacts, but should not be considered precise forecasts. In most cases, estimated impacts are compared with existing conditions. Estimated property tax revenues, for example, are compared with total property tax revenues collected in 2010, by county.

Regional economic impacts are estimated by EPC Analysis Area using multi-county input-output models developed using Impact Analysis for Planning (IMPLAN) modeling software and data (Minnesota IMPLAN Group 2008). These models and the associated analysis methods are described in Section 3.4.2.2.

Housing impacts are analyzed at two levels, by EPC Analysis Area and by segment, with a GIS-based commuting analysis used to identify areas where a potential shortage of temporary housing resources may exist.

3.4.1.5 Existing Conditions

Population

The 21 counties in the socioeconomic Analysis Area had a total estimated population of approximately 1.1 million in 2009 (Table 3.4-4). More than half of this total (52 percent) was concentrated in just two counties: Ada (35 percent) and Canyon (17 percent) counties, Idaho. These two counties, located at the western end of the Analysis Area, include the cities of Boise and Nampa, with respective 2009 populations of 205,707 and 81,241 (U.S. Census Bureau 2010a).

Other relatively large cities in the overall socioeconomic Analysis Area include Pocatello and Twin Falls, Idaho, and Casper, Wyoming, with respective 2009 populations of 55,076, 42,741, and 54,874 (U.S. Census Bureau 2010a, 2010b). The presence of these cities is reflected in the population totals for their respective counties (Bannock, Twin Falls, and Natrona), which together comprised 21 percent of the total population in the overall socioeconomic Analysis Area in 2009 (Table 3.4-4).

Table 3.4-4. Demographic Characteristics in the Potentially Affected Counties

Geographic Area	2009 Population	Percent of 2009 Study Area Population	Land Area (Square Miles)	2000 Population Density (Persons/ Square Mile)	Population Change 1990 to 2000 (Percent)	Population Change 2000 to 2009 (Percent)	Net Migration 2000 to 2009	Projected Population Change 2010 to 2020 (Percent)
Wyoming	**544,270**	**NA**	**97,100**	**5.1**	**9**	10	**25,660**	**7**
Albany	33,979	3	4,273	7.5	4	6	90	1
Carbon	15,720	1	7,896	2	-6	1	-407	-2
Converse	13,578	1	4,255	2.8	8	12	962	6
Lincoln	16,995	2	4,069	3.6	15	16	1,327	17
Natrona	74,508	7	5,340	12.5	9	12	4,734	9
Sweetwater	41,226	4	10,425	3.6	-3	10	327	6
Idaho	**1,545,801**	**NA**	**82,747**	**15.6**	**29**	**19**	**134,462**	**15**
Ada	384,656	35	1,055	285.2	46	27	54,942	22
Bannock	82,539	7	1,113	67.9	14	9	-3,147	13
Bear Lake	5,774	1	971	6.6	5	-10	-785	13
Canyon	186,615	17	590	222.9	46	40	36,301	17
Cassia	21,698	2	2,566	8.3	10	1	-1,632	8
Elmore	28,820	3	3,078	9.5	37	-1	-3,621	9
Franklin	12,676	1	665	17	23	12	196	10
Gooding	14,430	1	731	19.4	22	2	-608	15
Jerome	21,262	2	600	30.6	21	15	937	13
Lincoln	4,645	–	1,206	3.4	22	15	197	14
Oneida	4,221	–	1,200	3.4	18	2	-67	7
Owyhee	11,223	1	7,678	1.4	27	5	-204	11
Power	7,734	1	1,406	5.4	6	3	-721	8
Twin Falls	75,296	7	1,925	33.4	20	17	6,988	8
Nevada	**2,643,085**	**NA**	**109,825**	**18.2**	**66**	**31**	**485,443**	**22**
Elko	47,896	4	17,179	2.6	35	6	-1,081	7
County Total	**1,105,491**	**100**	**60,739**	**11.8**	**27**	**19**	**94,728**	**15**
United States	307,006,550	NA	3,537,438	79.6	13	9	8,944,170	10

NA = not applicable

Sources: U.S. Census Bureau 2008a, 2010d, 2010e, 2010f, 2010g, 2010h, 2010i, 2010j; Nevada State Demographer's Office 2008; Valley County Economic Development Council 2008; Wyoming Economic Analysis Division 2006.

Much of the overall socioeconomic Analysis Area is sparsely populated, with an average Analysis Area-wide population density of 11.8 persons per square mile, and population densities below 10 persons per square miles in 13 of the affected counties (compared to a national average of 79.6) (Table 3.4-4).

The Proposed Route and Route Alternatives are mainly located in unincorporated areas of the counties they cross. The Proposed Route would cross two small unincorporated communities and one city impact area. The two unincorporated communities—North Rock Springs and Table Rock in Sweetwater County, Wyoming—are Census Designated Places, concentrations of population identified by the U.S. Census Bureau for statistical purposes. North Rock Springs and Table Rock had respective populations of 1,974 and 82 in 2000, the most recent data available for these communities (Table 3.4-5). The Proposed Route would cross the Impact Area established for the city of Downey in Bannock County, Idaho. City impact areas, as used here, are areas of city impact established under Section 50-222 of the Idaho Code (see Section 3.17 – Land Use and Recreation).

Table 3.4-5. Population for Communities Crossed by the Proposed Route or Route Alternative

Community	County	Population		Percent Change	Segment/ Route Alternative[1/]
		2000	2009		
Wyoming					
Cokeville[2/]	Lincoln	508	501	-1	4A
Glenrock[2/]	Converse	2,251	2,466	10	1E[4/]
North Rock Springs CDP[2/]	Sweetwater	1,974	NA	NA	4
Table Rock CDP[2/]	Sweetwater	82	NA	NA	3
Idaho					
Downey[3/]	Bannock	612	592	-3	4
Kuna[2/,3/]	Ada	6,436	13,909	116	8B
Melba[3/]	Canyon	455	569	25	8B

1/ This column identifies the Proposed Route segment or Route Alternative that would cross the affected community.
2/ The Proposed Route or Route Alternative would cross this community.
3/ The Proposed Route or Route Alternative would cross the Impact Area for this community, as established under Section 50-222 of the Idaho Code.
4/ Glenrock is also within 1 mile of the Proposed Route for Segment 1W(a) and Alternatives 1E-A and 1W-A.
CDP = Census Designated Place; NA = not available
Sources: U.S. Census Bureau 2000a, 2010a, 2010b

Route Alternatives would cross the city of Kuna in Ada County, Idaho, and the cities of Cokeville and Glenrock in Lincoln and Converse counties, Wyoming, respectively, as well as the city impact areas established for Kuna and the city of Melba in Canyon County, Idaho (Table 3.4-5). The population of Kuna, the largest of these communities, has more than doubled since 2000, and city planning documents anticipate it will again more than double over the next 15 years, with a total population of 35,670 projected for 2025 (City of Kuna 2009b). In addition to communities that would be crossed, a number of communities are located within 1 mile of the Proposed Route or Route Alternatives (Table 3.4-6).

Table 3.4-6. Population for Communities Located within 1 Mile of the Proposed Route or Route Alternatives

Community	County	Population		Percent Change	Segment/ Route Alternative[1/]
		2000	2009		
Idaho					
Eden[2/]	Jerome	412	416	1	10
Glenns Ferry[2/3/]	Elmore	1,601	1,368	-15	8A
Hagerman[3/]	Gooding	776	823	6	8A
Oakley[2/3/]	Cassia	722	718	-1	7H
Rockland[3/]	Power	314	312	-1	7
Wyoming					
Hanna[3/]	Carbon	870	871	0	2, 2A
Point of Rocks CDP[3/]	Sweetwater	3	NA	NA	3
Rawlins[3/]	Carbon	9,019	8,793	-3	2
Rolling Hills[3/]	Converse	458	512	12	1W(a)
Superior[3/]	Sweetwater	243	242	NA	4
Taylor CDP[3/]	Lincoln	90	NA	NA	4A, 4C, 4E

1/ This column identifies the Proposed Route segment and/or Route Alternative that would pass within 1 mile of the identified community.
2/ The Proposed Route or Route Alternative would pass within 1 mile of the Impact Area for this community, as established under Section 50-222 of the Idaho Code.
3/ The Proposed Route or Route Alternative would pass within 1 mile of this community.
Sources: U.S. Census Bureau 2000a, 2010a, 2010b

The population data presented in Table 3.4-4 and discussed here and in following sections were primarily compiled from 1990 and 2000 U.S. Census data and more recent Census population estimates. These data are used rather than state and local estimates so that estimates presented for different geographic areas are based on a consistent set of assumptions.

Population Trends

The population of Wyoming increased from 1990 to 2000, and from 2000 to 2009, but at slower rates than the national averages (Table 3.4-4). Population has increased in all of the affected counties in Wyoming since 2000, with increases above the national average in four of these counties (Table 3.4-4). A recent review of land use trends in Wyoming suggests that these summary data may mask recent trends in population, which indicate that statewide percent increases in population in 2006-2007 were higher than in the preceding 5 years, with Wyoming jumping from 31st to 9th place nationally (University of Wyoming 2009). This trend has continued, with Wyoming ranked 1st in 2008–2009 and experiencing the largest statewide annual increase in population in the country (U.S. Census Bureau 2010c).

Idaho, in contrast, experienced rapid population growth in the 1990s, with statewide population increasing at more than twice the national average, and large increases in most of the Analysis Area counties, especially in the more densely populated Ada and Canyon Counties (Table 3.4-4). Ada and Canyon Counties have continued to experience large net gains in population since 2000 but gains elsewhere in the Analysis Area Counties in Idaho have been more modest, with population actually decreasing in some counties (Table 3.4-4). The statewide percent increase in population in 2008-2009 in Idaho ranked 12th nationally (U.S. Census Bureau 2010c).

Nevada also experienced rapid population growth in the 1990s, with a statewide increase more than five times the national average. Population increased at a slower rate in Elko County, but still increased at more than twice the national average. Population has continued to rapidly increase in Nevada since 2000. The population in Elko County has also increased but at a slower rate than the national average (Table 3.4-4). Statewide, the percent increase in population in Nevada in 2008-2009 ranked 17th nationally (U.S. Census Bureau 2010c).

Components of Population Change

Population growth results from either natural increase (more births than deaths) or net in-migration, when more people move to an area than leave. From 2000 to 2009, births exceeded deaths in all six affected Wyoming counties, with five of these counties also experiencing net in-migration; Carbon County experienced net out-migration over this period (Table 3.4-4).

The number of births exceeded the number of deaths in all of the affected counties in Idaho, and Ada and Canyon Counties also experienced large absolute and relative increases in population from net in-migration. However, eight of the affected Idaho counties experienced net out-migration, which in Bear Lake and Elmore Counties resulted in a net loss of population (i.e., out-migration exceeded the gain from natural increase) (Table 3.4-4).

Elko County, Nevada, experienced net out-migration between 2000 and 2009, but total county population increased by 6 percent over this period due to natural increase (Table 3.4-4).

Population Projections

National population projections prepared by the U.S. Census Bureau (2008a) forecast that the U.S. population will increase by 10 percent between 2010 and 2020. Population projections for Wyoming anticipate a statewide increase in population of 7 percent between 2010 and 2020. Population is expected to continue to increase in five of the affected Wyoming counties, with population expected to decline in Carbon County (Table 3.4-4).

The statewide population in Idaho is projected to increase by 15 percent between 2010 and 2020. Population is projected to increase in all of the affected counties, with larger than state average increases projected for Ada and Canyon Counties (Table 3.4-4).

The population in Nevada is projected to increase by 22 percent between 2010 and 2020, with the population of Elko County expected to increase by a more modest 7 percent over the same time period (Table 3.4-4).

Economic Conditions

The USDA Economic Research Service (ERS) developed a set of county typology codes in 2004 designed to capture differences in economic and social characteristics at the county level. These codes consist of six non-overlapping categories of economic dependence (farming, mining, manufacturing, federal/state government, services, and non-specialized) and seven overlapping categories of policy-relevant themes, including non-metropolitan recreation area and retirement destination. The economic

dependence categories are assigned based on the share of average annual labor and proprietors' income and/or the share of total employment associated with the identified categories. The ERS assigned all counties to one of the economic dependence categories based on data from 1998 to 2000 (Table 3.4-7).

The ERS typology indicates that three of the Analysis Area counties in Wyoming are identified as mining-dependent, two are identified as non-specialized (i.e., they did not meet the dependence ratios of one of the other categories), and one is federal/state

Table 3.4-7. Economic Conditions in the Potentially Affected Counties

County	Economic Type	Employment[1/]		Unemployment Rates[2/]		
		Number of Jobs 2008	Percent Change 2000 to 2008	Sept 2010 (Percent)	Sept 2009 (Percent)	Net Change (Percent)
Wyoming	**NA**	**404,855**	**23**	**6.8**	**6.7**	**-0.1**
Albany	Federal/State Government	22,042	4	4.4	4.0	0.4
Carbon	Non-specialized[3/]	11,340	17	6.5	7.4	-0.9
Converse	Mining	8,454	20	5.2	6.2	-1.0
Lincoln	Non-specialized[4/]	10,736	32	7.6	7.4	0.2
Natrona	Mining	55,922	27	6.8	7.8	-1.0
Sweetwater	Mining	32,126	32	6.1	7.9	-1.8
Idaho	**NA**	**939,793**	**19**	**9.0**	**8.7**	**0.3**
Ada	Non-specialized	282,057	22	8.2	8.6	-0.4
Bannock	Federal/State Government	48,397	13	7.7	8.3	-0.6
Bear Lake	Non-specialized[3/]	3,266	14	5.6	5.9	-0.3
Canyon	Manufacturing[3/]	82,672	25	11.2	11.2	0.0
Cassia	Farming	14,197	10	6.9	6.6	0.3
Elmore	Federal/State Government	14,844	6	8.7	8.1	0.7
Franklin	Farming	5,945	24	5.5	4.5	1.0
Gooding	Farming	8,871	11	7.0	6.3	0.7
Jerome	Farming	11,924	18	8.7	7.0	1.8
Lincoln	Farming	2,408	15	14.4	13.6	0.8
Oneida	Non-specialized[4/]	2,116	14	4.9	5.2	-0.2
Owyhee	Farming	4,538	16	5.0	4.3	0.7
Power	Farming	4,575	-16	8.9	8.4	0.5
Twin Falls	Non-specialized	47,784	16	8.2	7.2	1.0
Nevada	**NA**	**1,638,004**	**31**	**14.5**	**12.7**	**1.8**
Elko	Non-specialized[3/]	26,201	10	7.8	6.8	1.0
United States	**NA**	**181,755,100**	**10**	**9.6**	**9.8**	**-0.2**

1/ Total employment includes self-employed individuals. Employment data are by place of work, not place of residence, and, therefore, include people who work in the area but do not live there. Employment is measured as the average annual number of jobs, both full- and part-time, with each job that a person holds counted at full weight.

2/ Unemployment data are seasonally adjusted for the United States, states, and counties in Idaho. Data for the counties in Wyoming and Nevada are not seasonally adjusted. Net change is the difference in the rates between September 2010 and September 2009.

3/ Non-metropolitan Recreation county

4/ Retirement Destination county

Sources: Idaho Department of Labor 2010; Nevada Department of Employment, Training, and Rehabilitation 2010; U.S. Bureau of Economic Analysis 2010; U.S. BLS 2010; USDA Economic Research Service 2004; Wyoming Department of Employment 2010.

government-dependent. Seven of the counties in Idaho are farming-dependent, one is manufacturing-dependent, two are federal/state government-dependent, and the remaining four counties are identified as non-specialized. Two of the counties are also identified as non-metropolitan recreation counties and three are identified as retirement destinations. Elko County, Nevada, was identified as non-specialized and also as a non-metropolitan recreation county (Table 3.4-7).

The ERS typology offers one broad approach to classifying counties based on their economic characteristics. Location quotients, which compare the share of a county's employment with a benchmark region, in this case the affected states (Wyoming, Idaho, or Nevada), offer another measure of economic specialization.

The location quotients for the Analysis Area counties in Wyoming suggest that the economies of these counties in 2008 were broadly similar to the state as a whole. Converse, Natrona, and Sweetwater Counties were relatively specialized in mining in 2007, as suggested by the ERS typology, with location quotients for mining ranging from 1.2 in Natrona County to 2.5 in Sweetwater County. It may also be noted that the state of Wyoming, as a whole, is specialized in mining, with 8 percent of statewide employment in the mining sector compared to 0.6 percent nationwide (U.S. Bureau of Economic Analysis 2010). Using the United States as a benchmark, all of the affected Wyoming counties, with the exception of Albany County, were specialized in mining, with county/national location quotients ranging from 8.6 (Carbon County) to 32.9 (Sweetwater County). The location quotient data also indicated that Albany County is specialized in state government and educational services, as suggested by the ERS typology.

Nine of the Analysis Area counties in Idaho had 2008 farm employment location quotients greater than 2.0, ranging from 3.2 to 6.1, indicating that farm employment accounted for more than twice as much of total employment in these counties as it did statewide. These counties included the seven identified as farming-dependent in Table 3.4-7, as well as Bear Lake and Oneida Counties. Elmore County was specialized in the military government sector with a 2008 location quotient of 25.6, due to the presence of the Mountain Home Air Force Base in the southwestern corner of the county (U.S. Bureau of Economic Analysis 2010).

Using Nevada as a benchmark, location quotients for Elko County, Nevada, suggest that employment is relatively concentrated in the farm and mining sectors, with respective location quotients of 9.0 and 8.9 (U.S. Bureau of Economic Analysis 2010).

Total Employment Trends

The total number of jobs in Wyoming increased at the national average in the 1990s (20 percent), with employment increasing in five of the six affected Wyoming counties. The exception was Carbon County, where the number of jobs decreased by 200, or 2 percent, between 1990 and 2000 (U.S. Bureau of Economic Analysis 2008a). Total employment in Wyoming increased at more than twice the national average between 2000 and 2008 (23 percent versus 10 percent), with the total number of jobs increasing in all six Analysis Area counties, including Carbon County (Table 3.4-7).

Total employment in Idaho increased at more than twice the national average (43 percent versus 20 percent) between 1990 and 2000, with the total number of jobs increasing in all of the affected Idaho counties. The largest relative and absolute increase occurred in Ada County, home to the city of Boise, which experienced a 66 percent increase in the number of jobs over this period (U.S. Bureau of Economic Analysis 2008a). Total employment in Idaho continued to increase at a faster rate than the national average between 2000 and 2008 (19 percent versus 10 percent), with the total number of jobs increasing in all the affected Idaho counties, with the exception of Power County, which experienced a net decrease of 16 percent over this period (Table 3.4-7).

The state of Nevada experienced an even more dramatic increase in employment during the 1990s, with total employment increasing by 65 percent between 1990 and 2000. Total employment has continued to grow in Nevada, increasing by 31 percent between 2000 and 2008, slightly more than three times the national average of 10 percent. Employment gains have been more modest in Elko County, with total employment increasing by 24 percent between 1990 and 2000, and by 10 percent from 2000 to 2008 (Table 3.4-7).

Unemployment Rates

Unemployment rates increased dramatically between September 2008 and September 2009 nationally, in all three states, and in all of the affected counties. Rates remain similarly high a year later in September 2010 (Table 3.4-7). Statewide seasonally adjusted unemployment rates in Wyoming and Idaho were below the national average (6.8 percent and 9.0 percent, respectively, versus 9.6 percent) (Table 3.4-7). Nevada, in contrast, had the highest seasonally adjusted unemployment rate in the country (14.5 percent) (U.S. BLS 2010).

Seasonally adjusted unemployment data are not available for counties in Wyoming or Nevada. Seasonal adjustment is a statistical technique that adjusts monthly unemployment statistics to account for fluctuations in employment that occur as a result of seasonal events, such as changes in weather, harvests, major holidays, and school schedules. The seasonally unadjusted unemployment rate in Wyoming in September 2010 was lower than the adjusted number, 6.2 percent versus 6.8 percent. Unadjusted rates in two of the affected Wyoming counties—Lincoln and Natrona—were equal to or higher than the adjusted state average (Table 3.4-7).

In Idaho, the statewide unemployment rate increased between September 2009 and September 2010, from 8.7 percent to 9.0 percent. Seasonally adjusted unemployment rates were higher than the state average in two of the affected Idaho counties: Canyon (11.2 percent) and Lincoln (14.4 percent) (Table 3.4-7).

The unadjusted unemployment rate in Elko County, Nevada, was 7.8 percent in September 2010, substantially lower than the state average in Nevada (Table 3.4-7).

Agriculture

Land in farms accounted for almost half of the total land area in Wyoming in 2007, 22 percent of Idaho, and 8 percent of Nevada. In the Wyoming counties, land in farms as a share of total land area ranged from 13 percent (Lincoln County) to 87 percent (Converse County). In Idaho, this share ranged from 15 percent (Lincoln County) to

74 percent (Owyhee County). In Elko County, Nevada, land in farms accounted for 19 percent of the total land area (Table 3.4-8). Average farm sizes ranged from 110 acres in Canyon County, Idaho, to 7,570 acres in Carbon County, Wyoming. Viewed as a percent of total market value, livestock, poultry, and products tended to account for a larger share than crops, with some exceptions, including Bannock, Oneida, and Power Counties in Idaho, and Elko County in Nevada (Table 3.4-8).

Table 3.4-8. Summary of Agriculture by County and State, 2007

Geographic Area	Number of Farms	Land in Farms (acres)	Percent of Total Land Area[1/]	Average Farm Size (acres)	Percent of Total Market Value of Agricultural Products Sold	
					Crops	Livestock, Poultry, and Products
Wyoming	**11,069**	**30,169,526**	**49**	**2,726**	**18**	**82**
Albany	448	1,856,054	68	4,143	10	90
Carbon	287	2,172,544	43	7,570	3	97
Converse	435	2,366,020	87	5,439	9	91
Lincoln	535	342,630	13	640	23	77
Natrona	413	2,181,451	64	5,282	17	83
Sweetwater	244	1,486,395	22	6,092	30	70
Idaho	**25,349**	**11,497,383**	**22**	**454**	**41**	**59**
Ada	1,323	191,477	28	145	29	71
Bannock	937	321,870	45	344	60	40
Bear Lake	445	233,112	37	524	16	84
Canyon	2,368	260,247	39	110	41	59
Cassia	644	644,740	39	1,001	28	72
Elmore	381	346,550	18	910	25	75
Franklin	739	224,902	53	304	20	80
Gooding	665	223,068	48	335	8	92
Jerome	604	188,753	49	313	20	80
Lincoln	258	117,377	15	455	16	84
Oneida	463	313,775	41	678	64	36
Owyhee	620	569,305	74	918	25	75
Power	336	451,198	50	1,343	81	19
Twin Falls	1,296	439,537	36	339	30	70
Nevada	**3,131**	**5,865,392**	**8**	**1,873**	**43**	**57**
Elko	456	2,085,135	19	4,573	95	5

1/ Percent of total area is the land in farms divided by the total respective county or state land area.
Source: USDA 2007

Agricultural employment accounted for a relatively small share of total employment in the potentially affected Wyoming counties and Elko County, Nevada, as well as five of the Idaho counties (Table 3.4-9). In the other nine Idaho counties, agricultural employment accounted for more than 10 percent of total employment (see the discussion above under Economic Conditions).

Table 3.4-9. Agricultural Employment, 2008

State/County	Total Employment[1/]	Farm Employment[1/]	Farm Employment as a Percent of Total Employment	Location Quotient[2/]
Wyoming	**404,855**	**12,699**	**3**	**2.2**
Albany	22,042	503	2	0.7
Carbon	11,340	374	3	1.1
Converse	8,454	524	6	2.0
Lincoln	10,736	609	6	1.8
Natrona	55,922	490	1	0.3
Sweetwater	32,126	270	1	0.3
Idaho	**282,057**	**1,769**	**1**	**0.2**
Ada	48,397	949	2	0.5
Bannock	3,266	492	15	3.8
Bear Lake	82,672	3,260	4	1.0
Canyon	14,197	1,810	13	3.2
Cassia	14,844	882	6	1.5
Elmore	5,945	947	16	4.0
Franklin	8,871	2,171	24	6.1
Gooding	11,924	1,933	16	4.0
Jerome	2,408	531	22	5.5
Lincoln	2,116	472	22	5.6
Oneida	4,538	1,092	24	6.0
Owyhee	4,575	758	17	4.1
Power	47,784	2,144	4	1.1
Twin Falls	**1,638,004**	**4,788**	–	**0.2**
Nevada	**26,201**	**677**	**3**	**8.8**
Elko	404,855	12,699	3	2.2

1/ Total full- and part-time employment includes self-employed individuals (see Table 3.4-5, footnote 1).
2/ The location quotient is a relative measure of industry specialization that compares the percentage of employment concentrated in each sector in the study region with a benchmark region. The benchmarks used here are the states of Wyoming, Idaho, and Nevada for their respective counties, with the U.S. used as the benchmark for the three states. A location quotient of 1.0 indicates that the study region has the same percentage of employment in this sector as the benchmark region does. Location quotients above or below 1.0 indicate that the study region is over or under represented in this sector, respectively.
Source: U.S. Bureau of Economic Analysis 2010

Timber

Clearing along the ROW for six of the proposed transmission line segments would require the removal of merchantable timber. Annual harvest totals for the affected Wyoming counties are presented for 2000 and 2005, the most recent years available, in Table 3.4-10. These counties together accounted for less than 8 percent of the statewide timber harvest in Wyoming in 2005.

Table 3.4-10. Timber Harvest in Affected Wyoming Counties, 2000 and 2005 (MBF)

County	2000		2005				
			Harvest by Ownership				
	Total Harvest	Percent of State Total[1/]	National Forest	Private[2/]	Other[3/]	Total	Percent of State Total[1/]
Albany	6,052	9	1,506	–	–	1,506	2
Carbon	3,115	4	–	39	5	44	–
Converse	936	1	–	974	–	974	2
Lincoln	1,100	2	120	325	550	995	2
Natrona	–	–	32	1,221	400	1,653	3
Sweetwater	–	–	–	–	–	–	–
Total	**11,203**	**16**	**1,658**	**2,559**	**955**	**5,172**	**8**

1/ Total statewide harvest in Wyoming in 2001 and 2005 was 70,494 thousand board feet (MBF) and 64,037 MBF, respectively.
2/ Private ownership includes Tribal harvest. Wyoming has no large tracts of timberland owned by individuals or companies.
3/ Other includes BLM and state harvest.
Sources: Morgan et al. 2005; University of Montana 2009a.

Harvest data by all ownerships are not readily available at the county level for the affected counties in Idaho (Bannock, Bear Lake, Cassia, Franklin, Oneida, and Power Counties) (University of Montana 2009b). These counties are part of the “other” southeastern Idaho counties, which includes the entire southeastern Idaho region with the exceptions of Fremont, Lemhi, Clark, and Caribou Counties. Approximately 7,000 thousand board feet (MBF) was harvested in southeast Idaho in both 2001 and 2006, the most recent years available (University of Montana 2009b). Harvest in these counties accounted for approximately 1 percent of the total statewide harvest in Idaho in 2006.

Review of covered employment data for the wood products industry compiled by the U.S. Bureau of Labor Statistics suggests that employment in the forestry and logging, and wood product manufacturing sectors (North American Industrial Classification System [NAICS] codes 113 and 321, respectively) accounts for a very small share of total employment in the affected counties.

Employment in the forestry and logging sector (NAICS 113) in all 12 affected counties was either zero or the number of workers did not meet U.S. Bureau of Labor Statistics or state disclosure standards (U.S. BLS 2009).

In 10 of the 12 potentially affected counties, employment in the wood product manufacturing sector (NAICS 321) was either zero or the number of workers did not meet U.S. Bureau of Labor Statistics or state disclosure standards (U.S. BLS 2009). Employment data are available for this sector in the two remaining counties, Albany and Natrona Counties in Wyoming. An annual average of 187 people were employed in Albany County in the wood product manufacturing sector from 2001 to 2008, ranging from 91 workers in 2008 to 241 in 2006, and accounting for 0.6 to 1.6 percent of total county employment. In Natrona County, an annual average of 33 workers were employed in this sector from 2001 to 2008, ranging from 28 in 2008 to 37 in 2006, and accounting for 0.1 percent of total county employment (U.S. BLS 2009).

Housing

Construction of the proposed transmission line is expected to draw workers from outside the region. The majority of these workers would either temporarily relocate to the Analysis Area or take up overnight lodging on weekdays, commuting from their permanent residences on Sunday nights and returning home Friday evenings. Few of these workers would be expected to permanently relocate to the Analysis Area and the average non-local worker would be expected to rent an existing housing unit, stay in hotels or motels, or reside in an RV or mobile home for the duration of their employment on the Project.

Housing Units

According to the U.S. Census Bureau (2000b, 2010l), the number of housing units in the United States increased by about 14.1 million, or 12.1 percent, between 2000 and 2009 (Table 3.4-11). The Census Bureau defines a housing unit as a house, an apartment, a mobile home or trailer, a group of rooms, or a single room occupied or intended to be occupied as separate living quarters.

The number of housing units in Wyoming increased at a slower rate than the national average over this period (11.4 percent versus 12.1 percent), and increases were below the state and national averages in four of the six Analysis Area counties in Wyoming (Table 3.4-11). The number of housing units increased by 15.5 percent and 25.3 percent in Albany and Lincoln Counties over this period.

Table 3.4-11. Housing Data by State and County

State/County	Housing Units						Hotel and Motel Rooms[4/]	RV Spaces[5/]
	2009	Change 2000 to 2009 (%)	Rental Property 2000 (%)	Rental Vacancy Rate 2000 (%)	Estimated Rental Vacancy Rate 2009 (%)[1/,2/]	Estimated Available Rental Units 2009[3/]		
Wyoming	**249,388**	**11.4**	**29**	**9.7**	**6.1**	**4,370**	**8,131**	**1,565**
Albany	17,577	15.5	45	5.2	2.6	20	1,583	144
Carbon	8,708	4.8	26	16.9	16.0	358	1,415	568
Converse	6,134	8.2	27	19.0	6.9	112	489	175
Lincoln	8,556	25.3	18	21.8	26.3	415	266	120
Natrona	32,222	7.8	30	8.4	4.8	456	2,534	368
Sweetwater	17,471	9.7	26	16.2	7.1	327	2,003	190
Idaho	**647,502**	**22.7**	**27**	**7.6**	**11.0**	**18,938**	**11,624**	**2,773**
Ada	157,178	32.6	30	5.1	5.1	2,350	6,520	731
Bannock	32,265	10.9	30	8.4	8.4	807	1,455	529
Bear Lake	3,630	11.1	13	12.8	11.0	53	170	60
Canyon	68,635	43.1	27	6.9	6.9	1,276	935	540
Cassia	8,257	5.0	28	11.3	11.0	251	469	98
Elmore	12,277	16.6	41	9.3	9.3	465	307	273
Franklin	4,453	15.0	18	4.6	4.6	37	55	12
Gooding	6,083	10.5	27	5.3	5.3	86	16	137
Jerome	7,655	14.0	30	5.4	5.4	123	284	95
Lincoln	1,827	10.7	24	9.2	9.2	41	–	–
Oneida	1,846	5.2	15	5.6	5.6	16	21	46

Table 3.4-11. Housing Data by State and County (continued)

State/County	Housing Units						Hotel and Motel Rooms[4/]	RV Spaces[5/]
	2009	Change 2000 to 2009 (%)	Rental Property 2000 (%)	Rental Vacancy Rate 2000 (%)	Estimated Rental Vacancy Rate 2009 (%)[1,2/]	Estimated Available Rental Units 2009[3/]		
Owyhee	4,880	9.6	28	10.0	10.0	137	–	45
Power	3,055	7.4	24	6.1	6.1	45	54	165
Twin Falls	30,446	19.0	32	7.5	7.5	730	1,160	164
Nevada	**1,137,997**	**37.5**	**39**	**9.7**	**14.2**	**63,578**	**654**	**136**
Elko	19,714	6.8	31	16.9	14.2	858	654	136
United States[6/]	**129,970**	**12.1**	**33**	**6.8**	**10.6**	**4,550**	**na**	**na**

1/ Estimated 2009 rental vacancy rates for the state of Wyoming and Wyoming counties are for December 2009 (WHDP 2010).
2/ The statewide Idaho rental vacancy rate for 2009 (11.0 percent) is used to estimate available rental housing units for those counties in Idaho where the rental vacancy rate was higher than 11.0 percent in 2000. In cases where the county rental vacancy rate was below 11.0 percent in 2000, the lower figure is used (U.S. Census Bureau 2000b, 2010k). The 2009 statewide Nevada vacancy rate (14.2 percent) is used to estimate available rental units in Elko County (U.S. Census Bureau 2010k).
3/ The total numbers of rental units were estimated by applying the ratio of rental units to total housing units from the 2000 Census to the total housing unit estimates for 2009 (U.S. Census Bureau 2000b, 2010k, 2010l). Available rental units were then estimated by applying the 2009 rental vacancy rates to the estimated total rental units.
4/ Hotel, motel, and bed and breakfast inn data are for communities located within 20 miles of the proposed transmission line summarized here by county (Smith Travel Research 2008; Visit Idaho 2008; Wyoming Tourism 2008).
5/ RV space data are also for communities located within 20 miles of the proposed transmission line and summarized here by county (Visit Idaho 2008; Wyoming Tourism 2008).
6/ Housing unit counts for the United States are presented in 1,000s to save space.

The number of housing units in Idaho increased at almost twice the national average, with an increase of 22.7 percent from 2000 to 2009. The largest absolute and relative increases in the number of housing units in the Analysis Area counties in Idaho occurred in Ada and Canyon Counties, with respective increases of 32.6 percent (approximately 38,700 housing units) and 43.1 percent (approximately 20,700 housing units) that reflected the rapid population growth that occurred in these counties over the same time period. Elsewhere in the Analysis Area counties in Idaho, the total number of housing units increased at rates below the state average (Table 3.4-11).

The number of housing units in Nevada increased at more than three times the national average between 2000 and 2009 (37.5 percent versus 12.1 percent). In contrast, the number of housing units in Elko County increased by slightly more than half the national average (Table 3.4-11).

The total share of the housing stock classified as rental property in 2000 was below the national average (33 percent) in both Wyoming (29 percent) and Idaho (27 percent), but rental vacancy rates were higher than the national average in both states (Table 3.4-11). In Nevada, rental property accounted for a larger share of total housing than the national average, and the rental vacancy rate was higher than the national average.

Rental housing vacancy rates were higher than the Wyoming state average (9.7 percent) in four of the six Analysis Area counties in 2000. In Idaho, seven of the affected counties had rental vacancy rates above the corresponding state average (7.6

percent). The rental vacancy rate in Elko County in 2000 was higher than the average vacancy rate in Nevada (Table 3.4-11).

Estimated rental vacancy rates in Wyoming in December 2009 were lower than those estimated by the Census in 2000, with the exception of Lincoln County (Table 3.4-11). The statewide rental vacancy rate in Wyoming was 6.1 percent in December 2009, and estimated rental vacancy rates in four of the six Analysis Area counties were below 7.1 percent. The vacancy rate in Lincoln County was higher in December 2009 than in 2000, reflecting an excess supply of rental housing and a softening of the rental market (WHDP 2010). The numbers of available rental housing units are estimated by affected Wyoming county in Table 3.4-11 based on the 2009 vacancy rates and Census housing data from 2000 and 2009.

The rental vacancy rates from the 2000 Census are the most recent estimates available for Idaho and Nevada counties. Statewide, the estimated rental vacancy rate in Idaho was 11.0 percent in 2009 (U.S. Census Bureau 2010k). The numbers of housing units available for rent in the Analysis Area counties in Idaho are estimated in Table 3.4-11 based on the 2009 statewide vacancy number and Census housing data from 2000 and 2009. The statewide rental vacancy rate for 2009 (11.0 percent) was used to estimate available rental housing units for those counties where the rental vacancy rate was higher than 11.0 percent in 2000. In cases where the county rental vacancy rate was below 11.0 percent in 2000, the lower figure was used to estimate available rental units. This approach is intended to reduce the possibility of overestimating the number of available housing units, but may result in the number of units being underestimated in some counties. In Elko County, Nevada, the state average for 2009 (14.2 percent) was used to estimate the number of available housing units.

Hotels and Motels

Hotel and motel vacancy rates vary seasonally and geographically. Data compiled for cities in the Wyoming Analysis Area and adjacent counties indicate that vacancy rates peak during the winter and dip sharply in the summer months. Hotel and motel vacancy rates generally range from 10 to 20 percent in June through August to 40 to 60 percent and above in December and January. In the Casper area (Natrona County), for example, vacancy rates from April 2005 to June 2007 ranged from lows of 10 to 15 percent during the summer to more than 40 percent in the winter. Vacancy rates were higher in the Laramie area (Albany County), ranging from summer lows in the 25 to 30 percent range to highs above 60 percent (PacifiCorp Energy 2007a, 2007b).

The numbers of hotel and motel rooms located in and around the communities within 20 miles of the proposed transmission line route are identified by county in Table 3.4-11. The identified communities are located within 20 miles of the proposed transmission line at its closest point. There are stretches of the line, particularly in the more sparsely populated counties in Wyoming, that are farther than 20 miles from one of these communities. These numbers are estimates developed from data compiled by Smith Travel Research for hotels, motels, and bed and breakfast inns with 15 or more rooms, and from data available on the Wyoming and Idaho state tourism Web sites (Smith Travel Research 2008; Wyoming Tourism 2008; Visit Idaho 2008). These data do not necessarily account for all of the existing hotel, motel, and bed and breakfast

rooms within 20 miles of the proposed transmission line because the Smith Travel Research data does not include establishments with less than 15 rooms, and the data compiled on the state tourism Web sites, which does include hotels, motels, and bed and breakfast inns with less than 15 rooms, are for participating businesses only. The hotel and motel data summarized in Table 3.4-11 do, however, represent a reasonable approximation of the number of hotel and motel rooms based on the best available data.

A total of 8,131 hotel and motel rooms were identified in and around communities within 20 miles of the proposed transmission line route in Wyoming (Table 3.4-11). A further 11,624 rooms were identified in and around the Idaho communities within 20 miles of the proposed transmission line route. The largest concentrations of hotel and motel rooms occur in and around the major communities in the overall socioeconomic Analysis Area. The cities of Laramie, Rawlins, and Casper accounted for more than half (58 percent) of the hotel and motel rooms located within 20 miles of the proposed transmission line in Wyoming. In Idaho, the city of Boise alone accounted for almost half (47 percent) of the identified hotel rooms, with the cities of Pocatello and Twin Falls together accounting for a further 21 percent.

In Elko County, Nevada, the small communities of Owyhee and Mountain City are located within 20 miles of one of the Route Alternatives (7I). Hotel and motel resources are limited in these communities.

Recreation Vehicle Park Capacity

More than 4,300 RV spaces were identified in RV parks in and around communities within 20 miles of the proposed transmission line (Visit Idaho 2008; Wyoming Tourism 2008). The largest concentration of RV spaces in the potentially affected Wyoming counties are, like the supply of hotel and motel rooms, located in and around the larger cities, with more than half (57 percent) located in Laramie, Rawlins, and Casper. Approximately 17 percent of the RV spaces in the Idaho counties were located in and around the city of Boise. Other communities in Idaho that accounted for relatively large shares of RV spaces include Caldwell (Canyon County) (12 percent) and Lava Hot Springs (Bannock County) (11 percent) (Table 3.4-11). RV spaces in Elko County, Nevada, within 20 miles of one of the Route Alternatives are limited.

The RV data summarized in Table 3.4-11 were compiled from information available on the Wyoming and Idaho state tourism Web sites (Wyoming Tourism 2008; Visit Idaho 2008). These data are for participating businesses only and do not necessarily represent all the available RV spaces within 20 miles of the proposed transmission line. They do, however, represent a reasonable approximation of the supply of RV spaces based on the best available data.

Property Values

Approximately 52 percent of the land required for construction and operations of the Proposed Action is privately owned. The remaining 48 percent is managed by federal (BLM, Bureau of Reclamation, Forest Service) or state agencies. All of the new transmission line segments require new ROWs that would involve a combination of ROW grants and easements between the Proponents and federal, state, and local governments; other companies (e.g., utilities and railroads); and private landowners

(including fee acquisition). ROWs for transmission line facilities on private lands would be obtained in fee simple or perpetual easement by Rocky Mountain Power and as perpetual easements by Idaho Power. Land for substation or regeneration sites would be obtained in fee simple where located on private land.

Education

The total number of school districts, schools, students, and teachers are summarized by county in Table 3.4-12. Schools and students tend to be concentrated in the more heavily populated counties, with the two most populated counties (Ada and Canyon Counties, Idaho), together, accounting for 36 percent of the schools and 53 percent of the students.

Table 3.4-12. School Districts in the Analysis Area – Selected Characteristics (2005/2006)

State/County	Number of School Districts	Total Number of Schools	Total Number of Students	Total Number of Teachers	Student/Teacher ratio (Average)[1/]
Wyoming					**12.9**
Albany	1	18	3,621	316	11.4
Carbon	2	20	2,482	217	11.4
Converse	2	13	2,351	195	12.0
Lincoln	2	13	3,261	233	14.0
Natrona	1	35	11,890	792	15.0
Sweetwater	2	25	7,049	484	14.6
Idaho					**18.3**
Ada	3	110	60,326	3,278	18.4
Bannock	2	36	13,358	696	19.2
Bear Lake	1	7	1,250	74	16.8
Canyon	8	65	30,994	1,621	19.1
Cassia	1	17	5,058	283	17.9
Elmore	3	13	4,545	269	16.9
Franklin	2	8	3,055	154	19.7
Gooding	5	10	3,128	194	16.0
Jerome	2	8	3,900	223	17.4
Lincoln	3	5	987	68	14.4
Oneida	1	5	897	55	16.4
Owyhee	4	14	2,569	161	16.0
Power	3	7	1,729	107	16.1
Twin Falls	8	31	12.266	704	17.4
Nevada					**19.0**
Elko	1	32	9,752	594	16.4

1/ This is the average student/teacher ratio per county. Student teacher ratios also vary by school district and individual school within counties. The largest variation between school districts is in Twin Falls County, Idaho where student-teacher ratios range from 4.0 to 18.2.

Source: U.S. Department of Education 2008.

Student/teacher ratios are also summarized by county in Table 3.4-12. Student/teacher ratios, calculated by dividing the total number of students by the total number of full-time equivalent teachers, are a common measure used to assess the overall quality of a school. The national average student teacher ratio for the 2005–2006 school year (the most recent available data) was 16.0. The statewide average ratio in Wyoming was below the national average (12.9 students per teacher versus 16.0 students per teacher), and this was also the case in three of the affected Wyoming counties (Albany,

Carbon, and Converse); all three of which also had student/teacher ratios below the Wyoming state average (Table 3.4-12).

In Idaho, the statewide average was slightly higher than the national average (18.3 students per teacher versus 16.0 students per teacher), and this was also the case for the majority of the affected Idaho counties, with average student/teacher ratios ranging from 14.4 to 19.7. The statewide average student/teacher ratio in Nevada was also higher than the national average; the average in Elko County was lower than the Nevada state average, but slightly higher than the national average (Table 3.4-12).

It should also be noted that student/teacher ratios vary by school district and by school within each county. The largest variation by school district in the overall Analysis Area counties occurred in Twin Falls County, where student/teacher ratios ranged from 4.0 students per teacher to 18.2 students per teacher.

Public Services

Police and Fire Services

The number of police and fire departments whose jurisdictions either directly overlap or fall within 10 miles of the proposed transmission line are identified by county in Table 3.4-13. In general, the number of police and fire departments is directly related to the overall size and population of the county, as well as the number of larger communities within the county. There are multiple law enforcement agencies and providers in the potentially affected counties, including the state patrol, county sheriffs, and local police departments. In many cases mutual aid agreements between agencies allow members of one agency to provide backup to other agencies in emergency situations.

Table 3.4-13. Police and Fire Departments and Crime Rates by County

County	Police/Sheriff Departments		Fire Departments		Crime Rates (per 10,000 persons)	
	Number of Depts[1/]	Approximate Distance to Nearest (miles) [2/]	Number of Depts.[1/]	Approximate Distance to Nearest (miles) [2/]	Violent Crimes	Total Crimes[3/]
Wyoming						
Albany	1	49	2	15	2	24
Carbon	6	< 1	6	< 1	3	34
Converse	2	< 1	1	< 1	9	45
Lincoln	4	< 1	2	< 1	7	120
Natrona	2	10	3	10	1	54
Sweetwater	5	< 1	6	< 1	6	51
Idaho						
Ada	8	6	6	6	4	38
Bannock	3	3	4	< 1	2	23
Bear Lake	3	2	2	2	5	67
Canyon	3	7	3	< 1	4	49
Cassia	2	8	2	3	19	270
Elmore	5	< 1	3	< 1	4	51
Franklin	2	16	1	16	11	39
Gooding	4	3	3	< 1	13	51
Jerome	3	6	3	1	3	49
Lincoln	3	6	1	6	7	16

Table 3.4-13. Police and Fire Departments and Crime Rates by County (continued)

County	Police/Sheriff Departments		Fire Departments		Crime Rates (per 10,000 persons)	
	Number of Depts[1/]	Approximate Distance to Nearest (miles) [2/]	Number of Depts.[1/]	Approximate Distance to Nearest (miles) [2/]	Violent Crimes	Total Crimes[3/]
Oneida	1	15	1	15	10	104
Owyhee	2	23	1	2	16	145
Power	3	3	1	3	–	49
Twin Falls	4	8	5	2	6	39
Nevada						
Elko	1	13	1	13	5	47

1/ The number of police and fire departments whose jurisdictions either overlap or fall within 10 miles of the proposed transmission line.
2/ This is the estimated distance between the proposed transmission line and the closest police and fire department by county. In some cases, the closest department may be in an adjacent county.
3/ Total crimes include both violent (such as murder or rape) and non-violent crimes (such as arson and other crimes resulting in property damage).
Sources: Capitol Impact 2008; States and Capitols 2008; FBI 2007.

There are also multiple fire departments and districts providing fire protection and suppression services in the potentially affected counties. Many of these fire departments and districts are at least partially staffed by volunteers and tend to be housed in stations and fire houses in the larger communities.

There are police and fire services located within 10 miles of most stretches of the proposed transmission line. There are, however, some locations where the closest police and fire services are farther than 10 miles from the proposed transmission line (Table 3.4-13). Viewed at the county level, this tends to happen in large, less densely populated counties, and in counties where the proposed transmission line skirts along the edge of a county boundary. In some cases, the closest police or fire departments may be located in adjacent counties. Emergency 911 services are available along most of the Project's length, with the exception of the area near the communities of Arbon and Rockland in Power County, Idaho.

Crime rates per 10,000 persons are also summarized by county in Table 3.4-13. Violent crime rates were below 10 incidents per 10,000 people in all of the affected Wyoming counties. Total (both violent and non-violent) crime rates were noticeably higher in Lincoln County, with more than twice as many reported incidents there than in the next highest county. Four of the affected Idaho counties had violent crime rates of more than 10 incidents per 10,000 persons, and two of these counties, Cassia and Owyhee, had total crime rates that were substantially higher than the other Idaho counties (Table 3.4-13). Elko County, Nevada, had a violent crime rate of 5 incidents per 10,000 people.

Health Care

The medical facilities located near the proposed transmission line are identified by location and region in Table 3.4-14. This summary divides the overall Analysis Area into four regions: Wyoming, and southeast, south-central, and southwest Idaho. Each region has at least one medical facility with life flight capacity. This access to facilities with life flight capacity is important due to the remote nature of many portions of the

Table 3.4-14. Medical Facilities Located near the Project Area

Medical Facility/Location [1/]	Available Services
Wyoming	
Wyoming Medical Center, Casper, WY	Life Flight
Memorial Hospital of Converse County, Douglas, WY	24-hour emergency room; 911 service
Ivinson Memorial Hospital, Laramie, WY	24-hour emergency room; 911 service
Memorial Hospital of Carbon County, Rawlins, WY	24-hour emergency room; 911 service; ambulance service
Memorial Hospital of Sweetwater County, Rock Springs, WY	24-hour emergency room; 911 service
South Lincoln Medical Center, Kemmerer, WY	24-hour emergency room; 911 service; ambulance service
Southeast Idaho	
Airmed Life Flight, Salt Lake City, UT	Life Flight
Bear Lake Memorial Hospital, Montpelier, ID	24-hour emergency room; 911 service; ambulance service; Life Flight accessible (but no helicopter)
Caribou Memorial Hospital, Soda Springs, ID	24-hour emergency room; 911 service
Franklin County Medical Center, Preston, ID	24-hour emergency room; 911 service
Portneuf Medical Center, Pocatello, ID	Full 24-hour trauma center (including Life Flight helicopter); 911 service; ambulance service
Harms Memorial Hospital, American Falls, ID	24-hour emergency room; 911 service
Minidoka Memorial Hospital, Rupert, ID	24-hour emergency room; 911 service
South-Central Idaho	
Cassia Regional Medical Center, Burley, ID	24-hour emergency room; Life Flight accessible (but no helicopter); 911 service; ambulance service
St. Lukes Magic Valley Regional Medical Center, Twin Falls, ID	Full 24-hour trauma center (including Life Flight helicopter); 911 service; ambulance service
St. Benedicts Family Medical Center, Jerome, ID	24-hour emergency room; 911 service
Gooding County Memorial Hospital, Gooding, ID	24-hour emergency room; 911 service
Southwest Idaho	
St. Alphonsus Regional Medical Center, Boise, ID	Full 24-hour trauma center (including Life Flight helicopter); 911 service; ambulance service
St. Lukes Meridian Medical Center, Meridian, ID	24-hour emergency room (including Air St. Lukes helicopter); 911 service; ambulance service
Mercy Medical Center, Nampa, ID	24-hour emergency room; 911 service

1/ This overview divides the overall Socioeconomic Analysis Area as follows: Wyoming—all affected Wyoming counties; Southeast Idaho—the portion of the Project area from the Idaho/Wyoming border to Rupert, Idaho; South-Central Idaho—from Rupert, Idaho, west to Gooding, Idaho; and Southwest Idaho—from Gooding, Idaho, west to Melba, Idaho.

Project. As previously noted, Emergency 911 services are available along most of the Project's length, with the exception of the area near the communities of Arbon and Rockland in Power County, Idaho.

Municipal Services

Rocky Mountain Power provides electricity to all or parts of the affected Wyoming counties, as well as Ada, Bannock, Bear Lake, Caribou, and Franklin Counties in Idaho. Idaho Power provides electricity to all or parts of most of the affected Idaho counties, with the exceptions of Bear Lake, Caribou, and Franklin Counties, which are served by Rocky Mountain Power (Table 3.4-15). Idaho Power also serves Elko County, Nevada. Other

smaller electric companies also serve areas in the affected counties (Table 3.4-15). Source Gas supplies all or parts of the affected Wyoming counties. Intermountain Gas is the main source of gas for the affected Idaho counties (Table 3.4-15).

Table 3.4-15. Municipal Services by County

State/County	Electricity	Gas
Wyoming		
Albany	Carbon Power & Light, High West Energy, Rocky Mountain Power, Wheatland Rural Electric Association	Source Gas Town of Walden
Carbon	Carbon Power & Light, High Plains Power, Rocky Mountain Power, Yampa Valley Electric	Source Gas
Converse	Niobrara Electric, Rocky Mountain Power, Wheatland REA	MGTC Inc. Source Gas
Lincoln	Bridger Valley Electric Association, Lower Valley Electric, Rocky Mountain Power	Questar Gas Co. Lower Valley Energy
Natrona	High Plains Power, Rocky Mountain Power	Source Gas
Sweetwater	Bridger Valley Electric Association Rocky Mountain Power	Questar Gas Co. Source Gas
Idaho		
Ada	Idaho Power, Rocky Mountain Power	Intermountain Gas
Bannock	Idaho Power, Rocky Mountain Power	Intermountain Gas
Bear Lake	Rocky Mountain Power	Intermountain Gas
Canyon	Idaho Power	Intermountain Gas
Cassia	Albion Light, Burley Municipal, Declo Municipal, Idaho Power, Raft River Cooperative	Intermountain Gas
Elmore	Idaho Power	Intermountain Gas
Franklin	Rocky Mountain Power	Questar
Gooding	Idaho Power	Intermountain Gas
Jerome	Idaho Power	Intermountain Gas
Lincoln	Idaho Power	Intermountain Gas
Oneida	Idaho Power	Intermountain Gas
Owyhee	Idaho Power	Intermountain Gas
Power	Idaho Power	Intermountain Gas
Twin Falls	Idaho Power	Intermountain Gas
Nevada		
Elko	Idaho Power Company, Raft River Rural Electric Company	NA[1/]

1/ There is no natural gas service in the affected portion of Elko County.
Sources: Fosberg 2010; IPUC 2007; Wyoming Public Service Commission 2007

There are numerous water system companies in the potentially affected counties that could provide water during the construction phase of the Project. In Wyoming, there are more than 200 water system companies serving customer bases that range from 20 to more than 55,000 (Wyoming Water Development Commission 2007). In Idaho, more than 2,100 water system companies serve customer bases ranging from 22 to 78,000 customers (IPUC 2007).

Tax Revenues

Sales, Use, and Lodging Taxes

The State of Wyoming levies a sales and use tax of 4 percent. (Note: tax rate percents in Wyoming are generally referred to as “cents” [Schroeder 2010]). Sales tax is levied on goods and services purchased within the state. Use tax is imposed on goods purchased tax-free outside Wyoming for use in Wyoming. These 4 cents of sales and

use tax revenues are shared between the state (69 percent) and counties (31 percent). The award of a permit from the Wyoming ISC results in the State distribution of impact assistance payments. In general these payments increase distribution of the State's sales and use tax levy to local governments from 31 percent to 40 percent. In the past, such payments have been about $100,000 per month for each month of construction.

In addition to the state levy of 4 percent (the 4 "cents" noted above), general purpose local governments can levy 3 percent. The fifth cent (or fraction of it) may be levied for general purposes. The sixth cent (or fraction of it) may be levied for specific purposes as authorized by an election. The seventh cent (or fraction of it) may be levied for economic development as authorized by an election. As a result, a local government might, for example, have a 1 percent sales and use tax of which one-quarter of a cent is for general use and three-quarters is for specific construction projects that may be finished in 2 years (Schroeder 2010). Revenue generated by these taxes accrues to the local government that imposes the tax.

Cities, towns, and counties in Wyoming may, by voter approval, impose an excise tax of up to 4 percent on all sleeping accommodations for guests staying less than 30 days. This tax also includes mobile accommodations such as tents, trailers, and campers. All lodging tax collections, less a 1 to 2 percent state administrative cost, are distributed to the government entity imposing the tax. At least 90 percent of these tax distributions must be used to promote travel and tourism within that entity's jurisdiction, with the remainder available to be used for general revenue.

Sales, use, and lodging tax revenues are summarized for 2010 by affected Wyoming county in Table 3.4-16.

Table 3.4-16. Sales, Use, and Lodging Tax Revenues in Wyoming Counties, Fiscal Year 2010

County/State	Type of Tax[1/]			
	Sales	**Use**	**Lodging**	**Total**
Albany	25.8	2.7	0.7	29.2
Carbon	23.7	3.6	0.4	27.7
Converse	18.3	2.6	0.2	21.0
Lincoln	12.8	3.5	0.1	16.4
Natrona	82.1	6.0	0.9	89.0
Sweetwater	79.6	16.2	0.7	96.4
Wyoming	**694.9**	**87.1**	**7.4**	**789.4**

1/ Tax revenues are shown in millions of dollars.
Source: Wyoming Economic Analysis Division 2008.

The sales and use tax rate in Idaho is 6 percent. Sales tax is levied on goods and services purchased within the state. Use tax is imposed on goods purchased tax-free outside Idaho for consumption, use, or storage in Idaho. Use tax is paid directly to the state, rather than to the seller of the good. The state also applies a travel and convention tax of 2 percent on hotel/motel occupants and campground users (Idaho State Tax Commission 2010a). Long-term temporary residents (more than 30 days) are exempt from the travel and convention tax. Sales, use, and travel and convention tax revenues are summarized for 2010 by affected Idaho County in Table 3.4-17.

Table 3.4-17. Sales, Use, and Travel and Convention Tax Revenues in Idaho Counties, Fiscal Year 2010

County/State	Type of Tax Revenue[1/]			Total[1/]
	Sales	Use	Travel and Convention	
Ada	244.7	16.5	1.58	262.8
Bannock	25.2	1.6	0.38	27.2
Bear Lake	1.5	0.0	0.03	1.5
Canyon	40.6	2.7	0.20	43.5
Cassia	7.9	0.5	0.08	8.6
Elmore	5.3	0.1	0.08	5.4
Franklin	3.8	0.1	0.01	3.9
Gooding	2.2	0.2	0.01	2.5
Jerome	11.3	0.2	0.01	11.5
Lincoln	0.9	0.0	0.00	0.9
Oneida	1.2	0.0	0.00	1.2
Owyhee	1.5	0.0	0.00	1.6
Power	2.3	0.1	0.00	2.4
Twin Falls	28.4	1.6	0.31	30.3
Idaho	**1,117.5**	**59.3**	**6.26**	**1,183.1**

1/ Tax revenues are shown in millions of dollars.
Source: Idaho State Tax Commission 2010b

Elko County, Nevada, has a sales and use tax rate of 6.5 percent. This tax generated total revenues of $68.7 million in Fiscal Year 2009 (Nevada Department of Taxation 2010).

Ad Valorem and Property Taxes

The State of Wyoming levies ad valorem taxes on the assessed value of property. The assessed or taxable values for most properties are established on a county basis by the appropriate County Assessor and property is taxed at fair market value. Taxable values for electric utilities are an exception to this practice, with taxable values established by the State Ad Valorem Tax Division. Ad valorem tax revenues are summarized for the potentially affected Wyoming counties for 2010 in Table 3.4-18. The major beneficiaries of Wyoming ad valorem taxes are identified in Table 3.4-19.

Table 3.4-18. Ad Valorem Tax Revenues in Wyoming Counties, 2010

County	Locally Assessed Value[1/]	State Assessed Value[2/]	Total Assessed Value	2008 Property Tax Revenue[3/]
Albany	293.9	58.8	352.6	23.6
Carbon	220.3	543.9	764.2	50.3
Converse	178.2	515.2	693.4	42.7
Lincoln	409.0	456.3	865.3	54.4
Natrona	671.1	363.5	1,034.6	73.0
Sweetwater	617.8	1,503.9	2,121.8	143.2
Wyoming	**7,527.1**	**13,789.3**	**21,316.5**	**1,362.5**

Assessed values and tax revenues are shown in millions of dollars.
1/ Locally assessed property includes agricultural, residential, industrial, and commercial land.
2/ State assessed property includes utilities and minerals.
3/ Property tax payments are based on mill levies that vary by and within each county. Total mill levies in the affected counties in 2010 ranged from 61.52 in Converse County to 70.51 in Natrona County.
Sources: Wyoming Department of Revenue 2010

Table 3.4-19. Beneficiaries of Ad Valorem Tax Revenues in Wyoming, 2010

Beneficiary	Percent of Total
School	53.9
County	18.1
Foundation Program	18.8
Special Districts	7.7
Municipalities	1.6
State	–
Total	**100.0**

Source: Wyoming Department of Revenue 2010

Property taxes in Idaho are based on a property's current market value, and most homes, farms, and businesses are subject to property tax. Property tax values for operating property, including industries engaged in electric generation, transmission, and distribution, are set by the Idaho State Tax Commission. The Idaho State Tax Commission appraises operating property using a unit appraisal approach, which values a group of property items as one entity. The market value of each unit is estimated using cost, income, and/or market approaches to valuation (Idaho State Tax Commission 2003). Property tax revenues are summarized for 2010 by affected Idaho county in Table 3.4-20. Table 3.4-21 shows how the total property tax dollars collected in Idaho in 2009 were distributed by beneficiary.

Table 3.4-20. Property Tax Revenues in Idaho Counties, Fiscal Year 2010

County	Real and Personal Property Assessed Value[1/,2/]	Operating Property Assessed Value[1/,3/]	Total Assessed Value[1/]	2008 Property Tax Revenue[1/,4/]
Ada	26,050.8	623.6	26,674.4	401.9
Bannock	3,346.5	233.1	3,579.6	63.4
Bear Lake	652.6	88.4	741.0	4.8
Canyon	7,164.8	186.2	7,351.0	140.0
Cassia	1,071.9	57.2	1,129.1	11.1
Elmore	1,177.4	254.0	1,431.4	20.6
Franklin	514.3	64.8	579.1	6.3
Gooding	773.2	81.1	854.3	9.5
Jerome	1,028.5	83.5	1,112.0	16.7
Lincoln	246.5	57.1	303.6	3.4
Oneida	215.0	65.6	280.5	2.7
Owyhee	439.9	82.5	522.4	4.9
Power	567.0	137.5	704.5	11.5
Twin Falls	4,144.3	185.3	4,329.6	60.2
Idaho	**47,392.6**	**2,199.9**	**49,592.5**	**1,367.9**

1/ Assessed values and tax revenues are shown in millions of dollars.
2/ Real and personal property includes residential, industrial, and commercial property, and farms, timber, and mining.
3/ Operating property includes industries engaged in electric generation, transmission, and distribution.
4/ Property tax rates vary by and within each county. The total property tax revenues shown here are for all taxing districts within each county, including the county and municipalities.
Source: Idaho State Tax Commission 2011

Table 3.4-21. Beneficiaries of Property Tax Revenues in Idaho, 2007

Beneficiary	Percent of Total
School	29.5
County	27.0
City	26.7
Highway	6.3
Other	10.5
State	–
Total	**100.0**

Source: Idaho State Tax Commission 2010a

Property tax revenues in Elko County, Nevada, were $29.1 million in Fiscal Year 2008/09 (Erickson 2010).

Income Tax

Of the three potentially affected states, Idaho is the only one that has an income tax. Idaho imposes an income tax on individuals that ranges from 1.6 percent to 7.8 percent, depending on income, and also imposes a corporate net income tax of 7.6 percent. Income tax is one of the main sources of tax revenue in Idaho and generated $1,176 million in tax revenue in Fiscal Year 2009, 28.3 percent of total state and local tax revenues (Idaho State Tax Commission 2009c).

3.4.2 Direct and Indirect Effects

This section is organized to present first construction, then operations, followed by decommissioning effects from the Proposed Action. The following sections address effects on population, the economy and employment, housing, property values, education, public services, and tax revenues. Route Alternatives are analyzed in detail below in Section 3.4.2.3. There is a Design Variation involving use of two single-circuit structures proposed by the Proponent for Segments 2, 3, and 4 (see Section 2.2 for details), which is analyzed below in Section 3.4.2.4. The Proponents have also proposed a Schedule Variation, analyzed in Section 3.4.2.5, in which one of the two single circuits to be constructed in Segments 2, 3, and 4 and a portion of Segment 1W would be built on an extended schedule with construction beginning approximately 2.5 years after completion of the initial construction.

Mitigation measures or EPMs are presented in detail within this section only if it is the first time they have been discussed in Chapter 3; all other measures are referenced or summarized. A comprehensive list of all Proponent-proposed EPMs and Agency-required mitigation measures can be found in Table 2.7-1 of Chapter 2.

Plan Amendments

Proposed amendments are summarized in Table 2.2-1 of Chapter 2 and detailed in Appendices F and G. Amendments are needed to permit the Project to cross various areas of BLM-managed and NFS lands. Effects described for areas requiring an amendment in order for the Project to be built would only occur if the amendment were approved. Amendments that alter land management designations could change future use of these areas. No amendments specific to socioeconomics are proposed for the

Project and no impacts to socioeconomics resulting from approving the amendments beyond the impacts of the Project are anticipated.

3.4.2.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be constructed, operated, or decommissioned. There would be no Project-related impacts to socioeconomics.

As discussed in Chapter 1 of this EIS, the Gateway West Project is needed to supplement existing transmission lines in order to relieve operating limitations, increase capacity, and improve reliability in the existing electric transmission grid, allowing for the delivery of up to 3,000 MW of additional energy for the Proponents' larger service areas, primarily in Utah and Idaho. The purpose and need of the proposed Project would not be met under the No Action Alternative and existing constraints coupled with projected increases in demand in the Proponents' service areas could result in insufficient supply to meet energy demand and an increase in the potential for supply outages. These potential impacts could have detrimental socioeconomic impacts, with negative impacts to existing businesses and economic activities, as well as businesses and economic activities that might otherwise consider locating in the affected service areas.

3.4.2.2 Effects Common to All Action Alternatives

The following analysis is based on the Proposed Action. Most impacts are common to the Proposed Action and Route Alternatives. Differences between the Route Alternatives and the Proposed Route are discussed in Sections 3.4.2.3 through 3.4.2.6, which discuss Route Alternatives and Design, Structure, and Schedule Variations to the Proposed Action.

<u>Population</u>

Construction

Estimated construction workforce requirements are summarized by EPC contract in Figures 3.4-1 through 3.4-4. These projections were developed for the various Project components by the Proponents' transmission engineering contractor using project planning computer software. Overall, Project construction is expected to occur between June 2013 and December 2018, depending on permitting. The Proponents' proposed schedule identifies general construction time frames by segment and substation, generally 4 to 5 years (see Table 2.1-3). Construction times by segment are, however, expected to range from about 8 months to 27 months; similarly, substation construction times would range from 2 to 9 months. This construction would take place within the broader time frames identified in Table 2.1-3 but the exact timing is unknown. In addition, the start of construction could be delayed based on permitting. This could affect the years identified in the following section, but would not be expected to substantially change the estimated impacts.

The proportion of workers likely to come from outside the Analysis Area would vary by EPC contract and over the construction period since the mix of labor categories or skills will vary. For the purposes of analysis, the Proponents estimate that during peak construction periods 20 percent of the workforce would be local (i.e., normally reside within commuting distance of the job sites), and would likely commute to and from their homes to work each day. The remaining 80 percent of the workforce would either temporarily

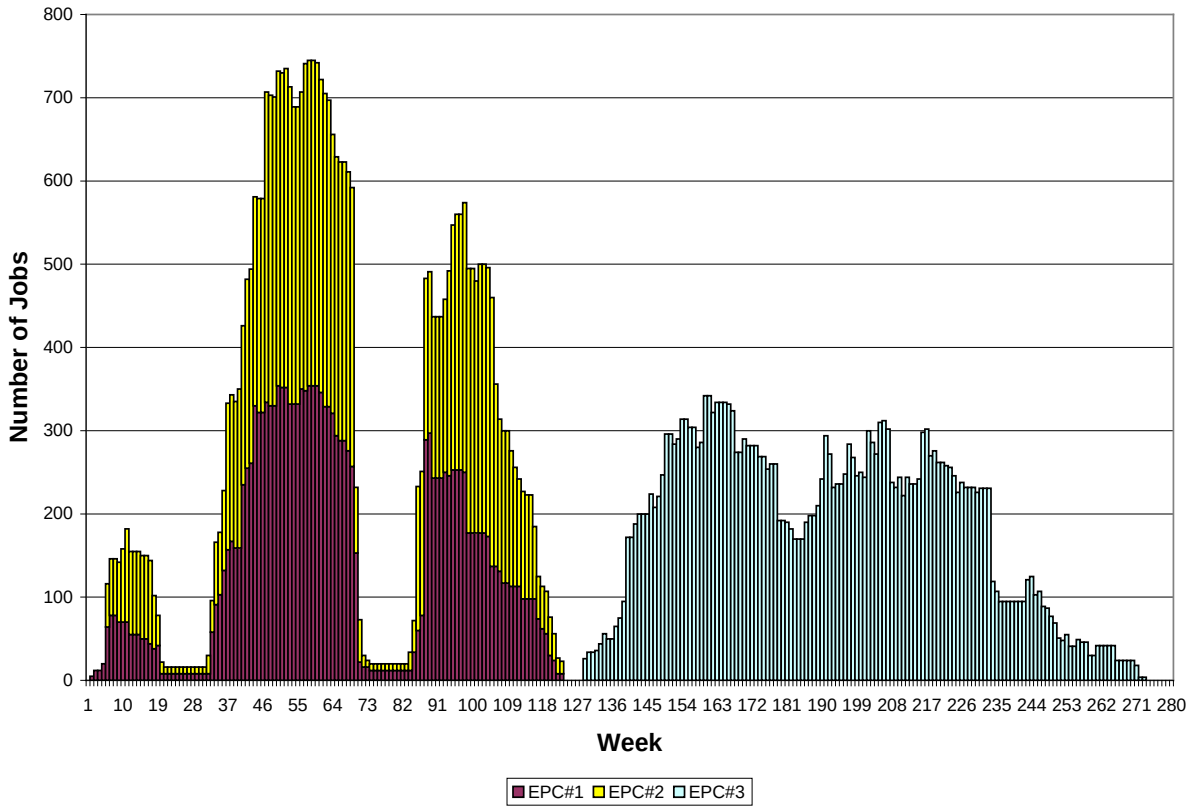


Figure 3.4-1. Total Project Labor Force by EPC Analysis Area and Week

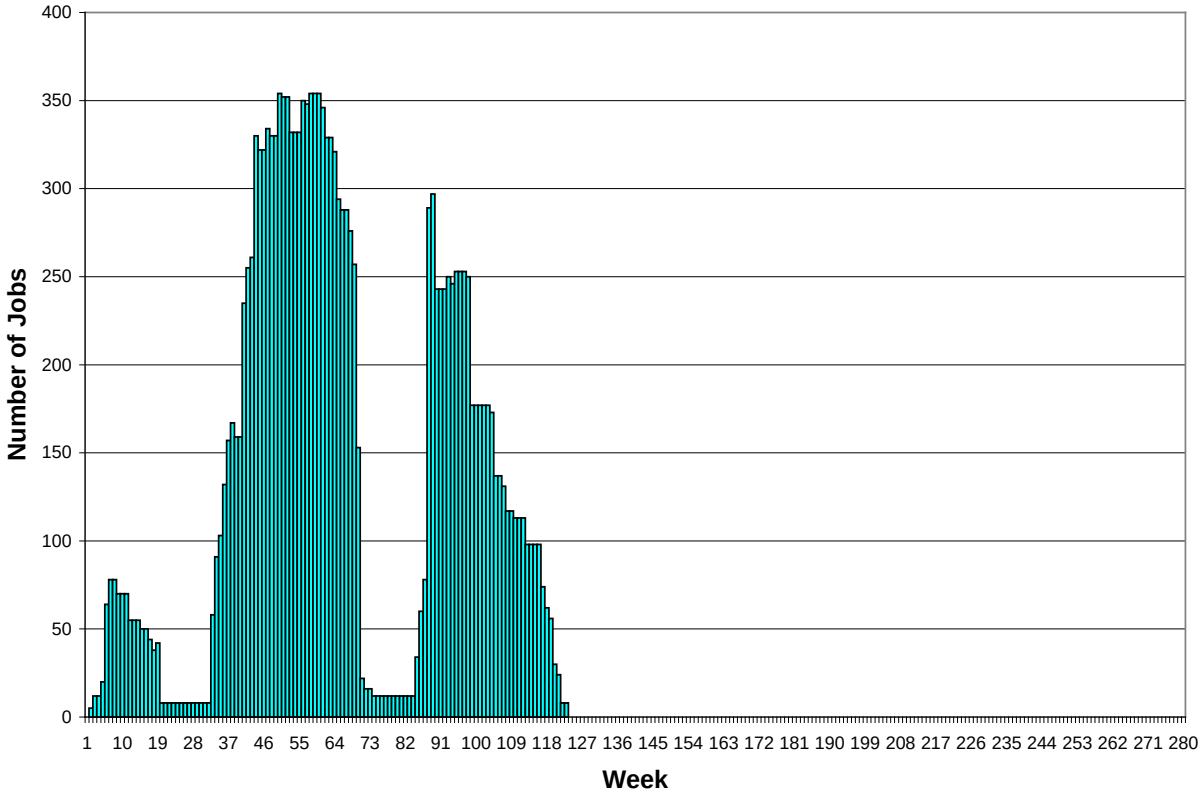


Figure 3.4-2. Project Workforce – EPC 1

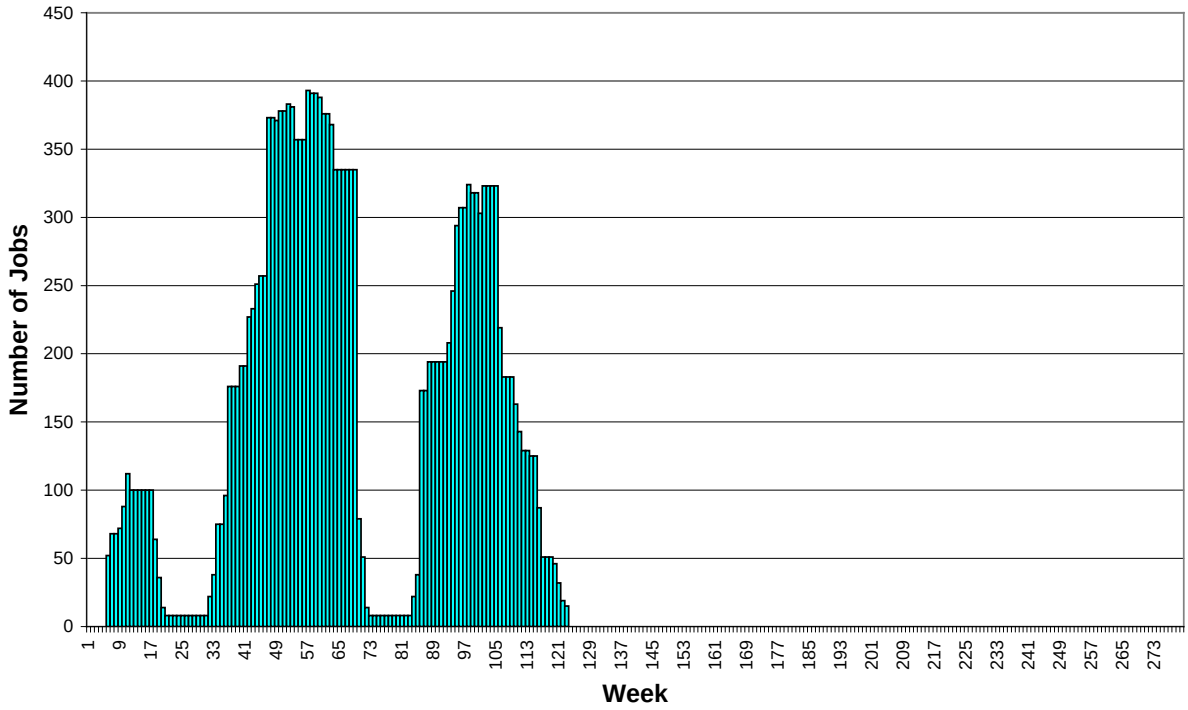


Figure 3.4-3. Project Workforce – EPC 2

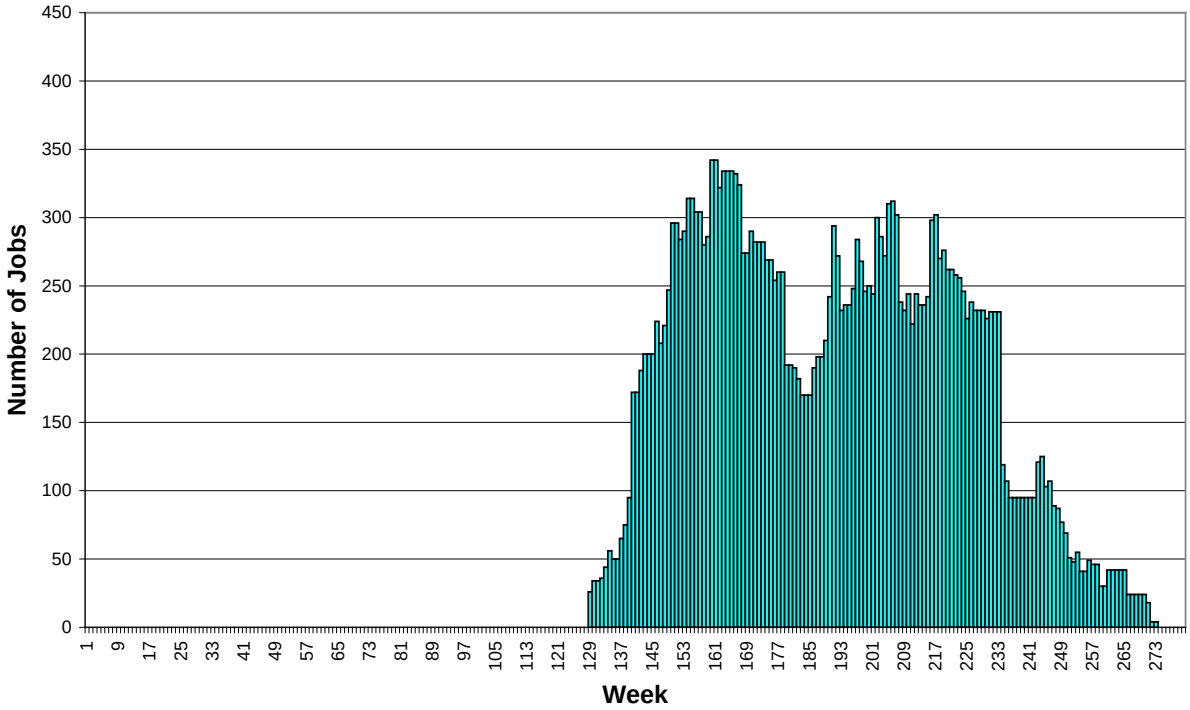


Figure 3.4-4. Project Workforce – EPC 3

relocate to the affected regions or commute in from their permanent residences on Sunday night and stay in overnight lodging on weekdays, returning home on Fridays.

Projected local and non-local employment totals are summarized for average weekly and peak employment by EPC Analysis Area in Table 3.4-22. Very few, if any, of the workers employed during the construction phase of the Project would be expected to permanently relocate to the area. Employment associated with the Gateway West Project would be temporary and the availability of similar employment opportunities in the area in the future is uncertain.

Table 3.4-22. Projected Construction Workforce by EPC Analysis Area

Workers	EPC 1	EPC 2	EPC 3
Average Weekly Forecast			
Commute to Job Site Daily 1/	28	33	37
Move to the Affected Region alone 2/	102	120	134
Move to the Affected Region with family 2/	11	13	15
Total 3/, 4/	**142**	**166**	**186**
Peak Employment Forecast			
Commute to Job Site Daily 1/	71	78	68
Move to the Affected Region alone 2/	255	282	246
Move to the Affected Region with family 2/	28	31	27
Total 3/	**354**	**391**	**342**

1/ Twenty percent of the average and peak workforce is expected to commute to and from the job site each day.
2/ Eighty percent of the average and peak workforce is expected to temporarily relocate to the Project area. 10 percent of workers temporarily relocating are assumed to be accompanied by their families for the purposes of analysis.
3/ Total average and peak employment estimates are based on the projected employment patterns illustrated in Figures 3.4-1 through 3.4-4.
4/ Average employment is estimated for each region based on the projected length of construction in that EPC region, not the overall Project construction period.

Less than 10 percent of the workers temporarily relocating to the Project areas would be expected to be accompanied by their families. This is mainly due to the nomadic nature of the workers on this type of project. Workers would relocate along the line as necessary staying in each location for a fairly short period of time (several months as opposed to several years). These locations are typically not close to schools. For these reasons, workers working on these types of projects do not typically bring children. However, some may bring significant others if they do not have any dependents.

Although it is considered unlikely, 10 percent of the workers temporarily relocating to the four Analysis Areas are assumed, for the purposes of analysis, to be accompanied by their families, including school-age children. Data compiled as part of the 2000 Census indicate that the average number of children under 18 years old per family household in the United States was 0.9. The corresponding figures in Wyoming, Idaho, and Nevada were 0.9, 1.0, and 0.9, respectively (U.S. Census Bureau 2004). The data presented in Table 3.4-22 assume an average relocating family size of two adults and one school-age child.

Table 3.4-23 compares the projected average and peak numbers of people temporarily relocating by EPC Analysis Area with the corresponding 2009 population totals. Projected temporary peak increases in population would be less than 0.3 percent of the

existing population in all three areas, ranging from 0.04 percent of the 2009 population in the EPC 3 Analysis Area to 0.24 percent in the EPC 2 Analysis Area (Table 3.4-23).

Table 3.4-23. Projected Temporary Change in Population During Construction by EPC Analysis Area

Population	EPC 1	EPC 2	EPC 3
2009 Population[1/]	179,011	159,210	891,035
Average Employment Forecast			
Number of People Temporarily Relocating[2/]	136	159	179
As a Percent of 2009 Population	0.08	0.10	0.02
Peak Employment Forecast			
Number of People Temporarily Relocating[2/]	340	375	328
As a Percent of 2009 Population	0.19	0.24	0.04

1/ Population data are from the 2009 estimates prepared by the U.S. Census Bureau. These data are provided by county in Table 3.4-4.
2/ The number of people temporarily relocating assumes that 80 percent of the projected construction workforce would temporarily relocate to the county where they would be employed, with 10 percent of that total accompanied by their families (assuming an average family size of two adults and one child).

The same comparison is provided at the county level in Table 3.4-24. Projected temporary peak increases in population range from 0.1 percent or less of the existing (2009) population in seven of the affected counties to 1.9 percent in Bear Lake County, Idaho (Table 3.4-24).

Table 3.4-24. Projected Temporary Change in Population During Construction by County

State/County	2009 Population[1/]	Average Employment Forecast		Peak Employment Forecast	
		Number of People Temporarily Relocating[2/]	Percent of 2009 Population	Number of People Temporarily Relocating[2/]	Percent of 2009 Population
Wyoming					
Albany	33,979	15	0.0	38	0.1
Carbon	15,720	71	0.5	167	1.1
Converse	13,578	13	0.1	84	0.6
Lincoln	16,995	47	0.3	127	0.8
Natrona	74,508	11	0.0	75	0.1
Sweetwater	41,226	118	0.3	317	0.8
Idaho					
Ada	384,656	28	0.0	79	0.0
Bannock	82,539	30	0.0	78	0.1
Bear Lake	5,774	40	0.7	110	1.9
Cassia	21,698	61	0.3	135	0.6
Elmore	28,820	28	0.2	104	0.8
Franklin	12,676	22	0.2	93	0.6
Gooding	14,430	20	0.1	52	0.2
Jerome	21,262	29	0.6	89	1.9
Lincoln	4,645	7	0.1	11	0.1
Owyhee	11,223	53	0.7	132	1.7
Power	7,734	33	0.0	96	0.1
Twin Falls	75,296	32	0.0	67	0.0

1/ Population data are from the 2009 estimates prepared by the U.S. Census Bureau (see Table 3.4-4).
2/ The number of people temporarily relocating assumes that 80 percent of the projected construction workforce would temporarily relocate to the county where they would be employed, with 10 percent of that total accompanied by their families (assuming an average family size of two adults and one child).

Operations

Long-term operations of the proposed transmission line and associated facilities would require an estimated permanent staff of approximately 12 Idaho Power employees, who would be based in Pocatello, Twin Falls, or Boise. These workers would all be expected to be hired locally. Existing Rocky Mountain Power staff would be responsible for operations and maintenance of the new transmission line and associated facilities that would be owned and operated by Rocky Mountain Power. These estimated staffing requirements would have no noticeable impact on existing population levels in the potentially affected areas.

Decommissioning

When the Project is decommissioned, a labor force approximately equal to that needed for its construction would be deployed. Impacts to population from decommissioning are expected to be similar to those from construction.

Economy and Employment

Economic Conditions

Construction of the Proposed Action would result in a temporary increase in employment and income in the affected local economies. Employment associated with construction would be temporary and last only for the duration of the construction phase of the Project (see Figure 3.4-1). Jobs and income associated with operations of the Proposed Action would occur on an annual basis.

The total economic impacts of construction of the Proposed Action were estimated using input-output models that were developed using IMPLAN modeling software and data (Minnesota IMPLAN Group 2008). The proposed transmission line segments that comprise the Proposed Action extend an approximate total of 1,103 miles and cross 18 counties (6 counties in Wyoming and 12 counties in Idaho). Three additional counties would be crossed by one or more Route Alternatives: Canyon and Oneida Counties, Idaho, and Elko County, Nevada.

The total affected area was divided into three regions for the purposes of analysis based on the three EPC Analysis Areas. Three separate multi-county IMPLAN models were developed to assess the potential impacts for each of these regions (see Figure 3.4-5). The three models consist mainly of the affected counties identified for each respective EPC Analysis Area in Table 3.4-3. Viewed in terms of counties, there is some overlap between the three Analysis Areas, with Sweetwater County, Wyoming, included in both the EPC 1 and EPC 2 Analysis Areas and Bannock County, Idaho, included in both the EPC 2 and EPC 3 Analysis Areas (Figure 3.4-5).

The three IMPLAN models were used to estimate the total (direct, indirect, and induced) change in output (sales), employment, and income that would occur in each Analysis Area as a result of the Proposed Action:

- The *direct* impact component consists of expenditures made specifically for the Proposed Action, such as construction labor and materials. These direct impacts generate economic activity elsewhere in the local economy through the multiplier effect, as initial changes in demand “ripple” through the local economy and generate indirect and induced impacts.

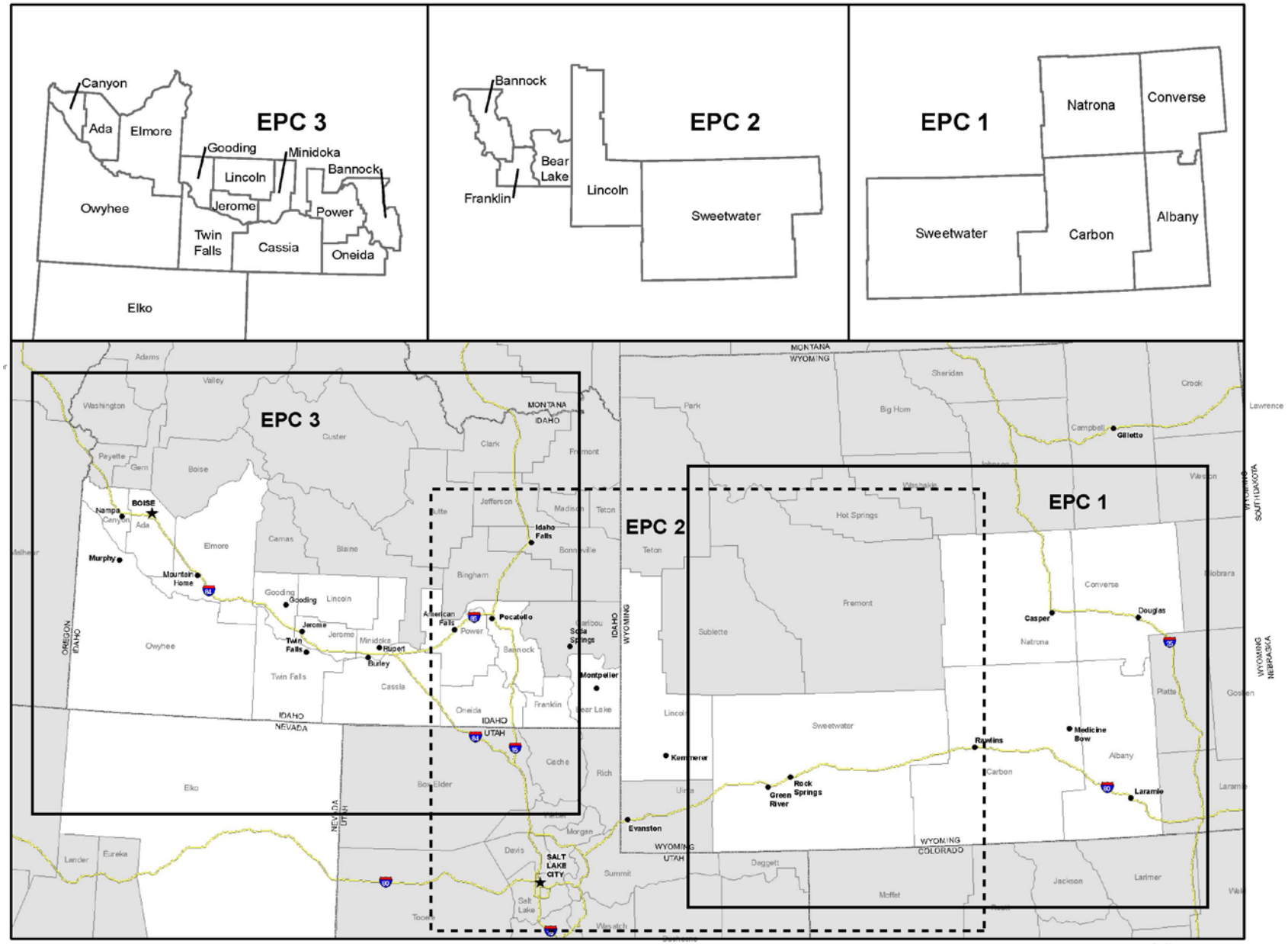


Figure 3.4-5 IMPLAN Model Analysis Areas

R:\projects_2007\Idaho_Power\maps\PDEIS\Chapter_3\20090407\IMPLANModel_Area_4_frame_letter_graphic.mxd

- *Indirect* impacts are generated by the expenditures by suppliers who provide goods and services to the construction Project or for Project operations.
- *Induced* impacts are generated by the spending of households who benefit from the additional wages and business income they earn through the above direct or indirect activity.

Separate estimates were developed for the construction and operations phases of the Project. Estimates are presented by EPC Analysis Area, and also by year because IMPLAN is a short-term model that estimates annual impacts.

Construction

Construction of the Proposed Action would generate economic activity in the EPC Analysis Areas in the form of Project-related expenditures on materials and supplies. The Project would also employ construction workers who would in turn be expected to spend much of their income within the Analysis Areas and increase output in the sectors that provide consumer goods and services.

Project-related expenditures are estimated by EPC Analysis Area and assumed to mainly comprise local expenditures on foundation materials, where available, and miscellaneous Project purchases, such as gas, parts, repairs, tires, and supplies (Table 3.4-25). Total full-time equivalent (FTE) employment is estimated by EPC Analysis Area and year based on the distribution of projected employment shown in Figures 3.4-1 through 3.4-4. These annual spending estimates and FTE employment projections were modeled as inputs to the sector of the IMPLAN model that includes power and communications transmission lines, new construction. To avoid double-counting, this analysis used Type I IMPLAN multipliers that estimate direct and indirect effects only. The induced components were estimated by modeling income expenditures by construction workers separately, as described below.

Table 3.4-25. Proposed Action Inputs Used for the Economic Impact Analysis

Analysis Area[1/]	2012	2013	2014	2015	2016	2017
Local Expenditures on Materials and Supplies ($000)						
EPC 1	1,764	9,480	4,259	–	–	–
EPC 2	738	9,330	9,542	–	–	–
EPC 3	–	–	–	11,510	10,911	2,049
Employment (FTE)						
EPC 1	25	305	169	–	–	–
EPC 2	33	319	211	–	–	–
EPC 3	–	–	–	301	366	111
Income ($000)						
EPC 1	1,015	13,136	7,431	–	–	–
EPC 2	1,380	13,767	8,991	–	–	–
EPC 3	–	–	–	13,982	15,845	4,495

FTE = Full-time Equivalent jobs
1/ Estimated expenditures and income are presented in thousands of dollars.
2/ The counties included in each EPC Analysis Area are shown in Figure 3.4-5.

The income numbers presented in Table 3.4-25 represent the estimated amounts that would be spent locally by construction workers, by EPC Analysis Area and year. These

estimates were developed from overall payroll and per diem payment estimates, which were adjusted to account for the type of construction-related job: transmission line- or substation-related, and whether the job was classified as supervisory, inspector, laborer, or electrical, as well as the assumed 20/80 division between local and non-local construction workers. Local workers (those who would commute daily to and from the job site) are assumed to spend their disposable income locally. Non-local workers temporarily relocating to the Analysis Areas are assumed, based on the Proponents' transmission engineering contractor's past experience with similar projects, to spend 60 percent of their disposable income in the Analysis Areas.

Disposable income was estimated as a share of total income based on 2007 state average of disposable personal income to total personal income, and the 2007 national ratio of personal consumption expenditures to disposable personal income (U.S. Bureau of Economic Analysis 2008b, 2008c). These projected expenditures were modeled using the IMPLAN household consumption function for households in the $50,000 to $75,000 range in each of the EPC Analysis Area models. This analysis used IMPLAN Type Social Accounting Matrix multipliers to estimate direct, indirect, and induced effects.

The total (direct, indirect, and induced) estimated regional economic impacts are summarized by EPC Analysis Area and year in Table 3.4-26. These impacts—expressed in terms of local industrial output (sales), employment, and labor income—would be one-time annual impacts, as indicated, and would occur in the counties that constitute each EPC Analysis Area. Total estimated employment impacts are shown graphically by EPC Analysis Area and year in Figures 3.4-6 through 3.4-8.

Table 3.4-26. Proposed Action Projected Total (Direct, Indirect, and Induced) Economic Impacts

Analysis Area[1/,2/]	2012	2013	2014	2015	2016	2017
Output ($000)[3/,4/]						
EPC 1	3,016	22,848	16,674	–	–	–
EPC 2	1,931	21,656	18,338	–	–	–
EPC 3	–	–	–	30,062	31,180	7,429
Employment						
EPC 1	38	484	404	–	–	–
EPC 2	52	502	331	–	–	–
EPC 3	–	–	–	541	645	192
Labor Income ($000)[4/]						
EPC 1	1,116	7,943	5,684	–	–	–
EPC 2	668	7,658	6,736	–	–	–
EPC 3	–	–	–	10,472	10,748	2,500

1/ The counties included in each EPC Analysis Area are identified in Figure 3.4-5.
2/ All totals include direct, indirect, and induced impacts. Indirect and induced impacts would occur in industries throughout the Analysis Area economies, and not just those in the construction sector.
3/ Output is the sum of total (direct, indirect, and induced) output for all affected industries in the Analysis Area economy. Industrial output represents the total value of an industry's production.
4/ Estimated expenditures and income are presented in thousands of dollars.

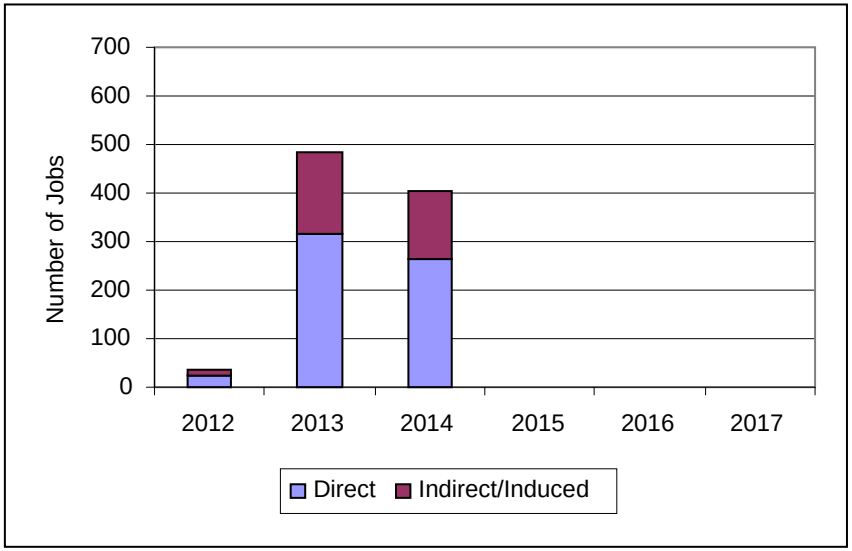


Figure 3.4-6. Total Employment – EPC 1

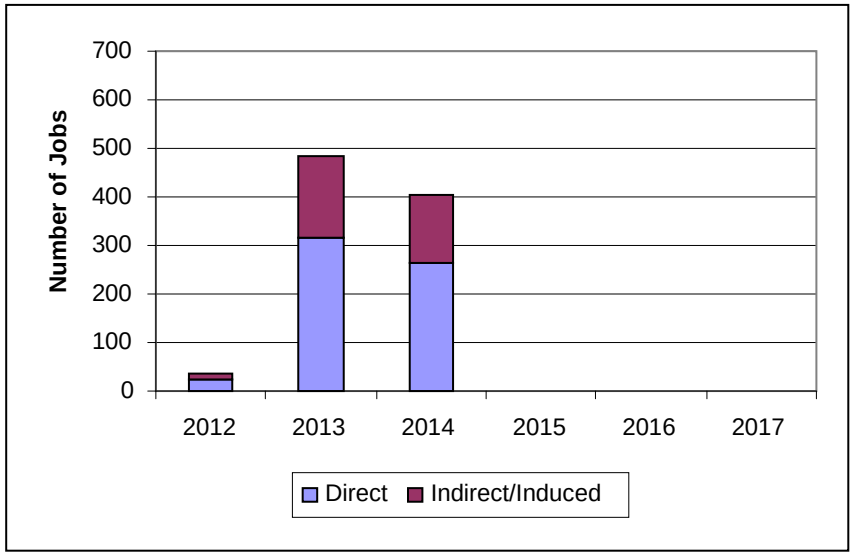


Figure 3.4-7. Total Employment – EPC 2

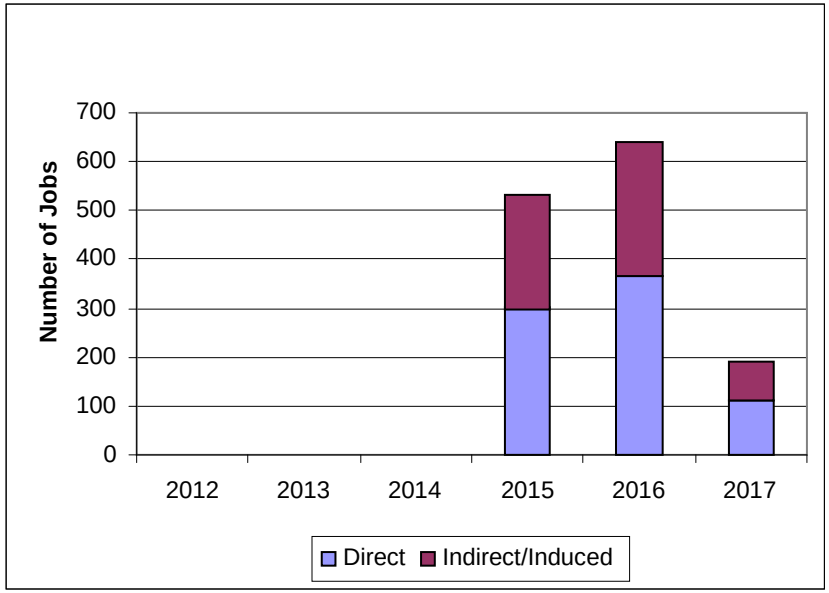


Figure 3.4-8. Total Employment – EPC 3

Operations

Operations of the Proposed Action would generate economic activity in the EPC Analysis Areas in the form of operations and maintenance-related expenditures on materials and supplies. These impacts are expected to be small, especially when compared to the construction-related impacts. Project operations would be centralized and rely upon the use of communications and automated controls. Local labor may be used when infrequent switching is necessary at the substations. Local expenditures are expected to be limited to occasional expenditures on gas and food by crew members.

Decommissioning

When the Project is decommissioned, a labor force approximately equal to that needed for its construction would be deployed. Local expenditures on materials and supplies and payments to workers would likely be similar, resulting in broadly similar economic impacts to those from construction.

Agriculture

The majority of the land crossed by the Proposed Route is used for agriculture, with agricultural land use ranging from about 85 percent to 98 percent of total land use within 500 feet of the proposed segments, with rangeland and pasture accounting for the majority of this use for all segments (Table 3.18-1). Livestock dominates the agricultural sectors of most of the affected counties in terms of total market value of agricultural products sold, with some exceptions, including Bannock, Oneida, and Power counties in Idaho and Elko County, Nevada (Table 3.4-7). Potential impacts to agricultural land are discussed in Section 3.18 – Agriculture, and include the potential impacts to livestock grazing, crop production, and dairy farms and confined animal feeding operations. Impacts addressed include those associated with construction, operations, and decommissioning of the proposed Project.

Viewed in terms of agricultural operations in the potentially affected counties, total estimated construction and operations disturbance represents a very small share of the 17 million acres of land in farms in the 21 potentially affected counties and is unlikely to noticeably affect overall agricultural production and employment in any of the affected counties. Impacts could, however, be potentially significant to the individual operations affected, as discussed in Section 3.18 – Agriculture. The following sections address the potential economic impacts of the proposed Project on livestock production and cropland.

Construction and Operations

Livestock Production

The proposed Project could affect the economic value of livestock production in the Analysis Area by increasing ranchers' costs and decreasing available forage. Potential impacts during construction could result from road construction providing increased access and related disturbance to livestock, temporary reductions in available forage, reductions in the palatability of forage due to construction-related dust, and impacts to livestock if fences are cut and gates left open. These issues would be addressed in the Agricultural Construction Mitigation Plan that would be prepared for the Project. Agricultural mitigation measures are identified in the Proponents' proposed reclamation

plan (Appendix C-2). Additional measures recommended by the Agencies are identified in Section 3.18 – Agriculture (Section 3.18.2.2).

The proposed Project could affect net earnings from livestock production in the following ways:

- Decrease forage from land taken out of production.
- Increase management costs associated with controlling additional noxious and invasive vegetation species introduced by Project construction equipment.
- Increase management costs associated with moving livestock around project-related structures and easements.

Total construction- and operations-related disturbance to rangeland and pasture is discussed by segment in Section 3.18.2.3. This analysis evaluates impacts in terms of acres of forage that would be temporarily (construction) or permanently (operations) unavailable for use.

The value of the grazing land that would be affected can be estimated using data compiled by the U.S. Department of Agriculture. In 2010, average cash rent paid per acre to landlords for pasture land was $4 in Wyoming (USDA 2010a). A cash rent value was not provided for pasture in Idaho, but the average in the other mountain states, including Wyoming, was $4.30 per acre, with values ranging from $2.20 per acre in New Mexico to $5.00 per acre in Colorado (USDA 2010a).

The value of the forage that would be affected can also be estimated using data compiled on the average grazing rates for cattle in Wyoming and Idaho. These rates in 2009 were $16 per Animal Unit Month (AUM) in Wyoming and $12.60 per AUM in Idaho (USDA 2010b). An AUM is the amount of forage required to sustain one cow for one month. Data compiled by the Wyoming Office of State Lands and Investment indicate that State grazing land has an average carrying capacity of 0.28 AUM per acre. Applying this ratio to both Wyoming and Idaho suggests an average value of forage of $4.48 per acre in Wyoming and $3.53 per acre in Idaho. Note that this may represent an overestimate the average in some locations. The Rawlins and Kemmerer RMPs, for example, both identify AUM per acre ratios of 0.11 AUM per acre (BLM 2008a, 2008c).

Power County, Idaho is participating as a cooperating agency in the Gateway West Project. In this capacity, the Power County Planning and Zoning Gateway West Task Force (Power County Task Force) provided estimates of the potential economic impact of the Project on agricultural operations in Power and Cassia Counties in Idaho (Power County Task Force 2009c). These estimates were presented in a letter (Power County Task Force 2009a), with supporting information provided in separate documents (Power County Task Force 2009d, 2009e). Estimates were provided for grazing, irrigated cropland, and dryland farming.

For grazing, the Power County Task Force identified one-time costs of $12,573 per mile and annual costs of $18,837 per mile (Power County Task Force 2009c). These costs appear to be averages of estimates provided by six farmers, but the overall estimates do not track with the supporting information provided by the Task Force (Power County Task Force 2009c, 2009d). One-time costs appear to be primarily related to loss of

feed, potential access restrictions, and reclamation costs. Annual cost items include costs associated with noxious weed management and erosion control. These cost estimates are presented by mile, based on the assumption that a 300-foot-wide ROW would be affected. Converting the Power County Task Force's per mile estimates to acres (1 mile * 300 feet = 36 acres) results in estimated one-time (construction) losses of $349 per acre and estimated annual (operations) losses of $523 per acre. These estimated impacts per acre are considerably higher than the current cash rent per acre and value of forage per acre in Idaho and Wyoming summarized above. It should also be noted that construction and operations of the proposed Project would not affect the entire 300-foot-wide ROW. Impacts are presented in acres of rangeland and pasture affected by segment in Section 3.18.2.3.

Cropland

The percent of the land within 500 feet of the proposed segments cultivated for crop production ranges from 0 percent for Segments 1E, 1W, 2 and 3 to 46 percent in Segment 10 (Table 3.18-1). Cropland in the Analysis Area includes irrigated cropland and dryland farming. Irrigation systems used in the area include pivot, wheel and hand line, and flood irrigation systems, and irrigated lands may have surface irrigation ditches and subsurface drainage systems (drain tiles).

The proposed Project could affect net earnings from cropland in the following ways:

- Reduce acreage available for cultivation and use due to the placement of transmission structures, access roads, and other proposed project uses.
- Increase irrigation costs due to limitations placed with respect to pivot irrigation systems.
- Increase costs due to the need to maneuver farming equipment around transmission structures.
- Increase management costs associated with controlling additional noxious and invasive vegetation species introduced by Project construction equipment.
- Reduce productivity as a result of construction-related soil compaction and erosion, and damage to drainage tiles.

Potential impacts to irrigated cropland and dryland farming would vary based on the design and location of the proposed transmission line structures and access roads relative to existing agricultural operations.

Irrigated Cropland

Total construction- and operations-related disturbance to irrigated cropland is discussed by segment in Section 3.18.2.3. This analysis evaluates impacts in terms of acres that would be temporarily (construction) or permanently (operations) unavailable for cultivation.

The value of the cropland that would be affected can be estimated using data compiled by the U.S. Department of Agriculture. In 2010, average cash rent paid per acre to landlords for cropland was $31 in Wyoming and $132 in Idaho. In Idaho, cropland was

further divided in irrigated and non-irrigated land, with respective average rents in 2010 of $160 per acre and $60 per acre (USDA 2010b).

As noted above with respect to livestock production, the Power County Task Force (2009c) provided estimates of one-time (construction) and annual (operations) economic impacts of the proposed Project on agricultural operations in Power and Cassia counties, Idaho. For irrigated cropland, the Power County Task Force identified one-time costs of $398,520 per mile and annual costs of $48,343.98 per mile (Power County Task Force 2009c).

The one-time costs, $398,520 per mile, estimated by the Power County Task Force (2009c) are "for interference during construction and loss of crop and development opportunities due to lost ground." This estimate consists of two parts: 1) the value of the crops within the easement ($144,000 per mile), and 2) the loss of future development opportunities within 60 feet of the easement ($254,520 per mile). Note that the loss of potential future development opportunities is not an agricultural impact, but a potential loss to landowners wishing to develop their farmland for other, non-agricultural use. This type of potential development would have a larger impact on agriculture than the presence of a transmission line.

The Power County Task Force (2009e) identified a value per acre of $4,000 for the crops within the easement based on the assumption that all land disturbed during construction would be in potatoes at the time, the most expensive crop. Other irrigated crop values per acre identified by the Task Force were $2,100 for beets and $980 for wheat. The Task Force then assumed that crops within the entire 300-foot ROW for the proposed transmission line would be lost during construction resulting in an estimated one-time loss per mile of $144,000 (36 acres * $4,000 per acre). Note losses per mile based on acres disturbed would be much lower because the proposed Project would not disturb 39 acres per mile (see Section 3.18.2.3).

The second component of the Power County Task Force's estimate of one-time losses—the loss of future development opportunities—was estimated to be $14,000 per acre, which they then multiplied by 18 to come up with an estimated cost per mile of $254,520. No explanation or supporting analyses were provided for the per acre value ($14,000) or the number of acres (18) used per mile (Power County Task Force 2009c, 2009e).

The Power County Task Force (2009c) also estimated annual losses for irrigated cropland of $48,343.32 per mile. This estimate, despite its apparent precision, does not appear to track between the Task Force's summary (2009c) and supporting information (2009e), but the items that the Task Force believe would result in increased costs to farmers include easement road maintenance, weed control in and around towers, erosion control, and duplication of processes. However, by far the largest components of the estimated impact per mile are related to costs incurred because the Task Force assumed that aerial chemical applications would no longer be possible within 0.5 mile or more of the proposed transmission line ($22,656 per mile) and appear to assume that all farmers would need to switch from center pivot irrigation systems to wheel lines ($18,000 per mile) (Power County Task Force 2009d). These potential impacts are discussed further in Section 3.18 – Agriculture.

A recent assessment of the economic impacts of transmission line structures on agricultural operations was prepared for the Montana-Alberta Tie Ltd. 230-kV transmission line EIS (HydroSolutions and Fehringer 2007). This study specifically addressed the economic impact that the presence of transmission line structures would have on agricultural operations based on the "overlap areas" that would result from equipment having to pass through more than once to avoid structures. The basic sequence analyzed included pesticide use, fertilizer application, planning, in-crop spraying, harvesting, and post-harvest harrowing, and estimates included labor time and equipment costs. Estimates were developed for different transmission line structures (single pole and H-frame), structure locations (edge and interior), type of farming (dryland and irrigated), and dryland farming practice (spring wheat-fallow and continuous crop) (HydroSolutions and Fehringer 2007).

Adjusted to 2009 dollars, the HydroSolutions and Fehringer estimates for irrigated fields ranged from $16 per structure for a single pole located along the edge of a field to $300 per structure for an H-frame structure located in the interior of the field. The Power County Task Force's (2009e) estimated that duplication of processes (seeding, fertilization, chemical/pesticide application, cultivation, and harvest) on irrigated cropland would result in annual costs of $2,740 per mile, assuming four transmission structures per mile, or $685 per structure.

Dryland Farming

Total construction- and operations-related disturbance to dryland farming is discussed by segment in Section 3.18.2.3. This analysis evaluates impacts in terms of acres that would be temporarily (construction) or permanently (operations) unavailable for cultivation. As noted with respect to irrigated cropland, in 2010 the average cash rent paid per acre to landlords for cropland was $31 in Wyoming and $132 in Idaho, with an average rent of $60 per acre for non-irrigated cropland in Idaho (USDA 2010b).

According to the Power County Task Force (2009c), one-time losses to dryland farming were estimated to be $672,105 per mile. The supporting information provided for this estimate suggests a one-time loss of $7,560 per mile based on a value per acre of $210 (30 bushels of wheat at $7 per bushel), and 36 acres per mile disturbed (Power County Task Force 2009e). (Note that the average acres disturbed per mile would be much fewer than 36). The Task Force also identified the same one-time cost related to loss of potential development opportunities they used for irrigated cropland ($254,520 per acre) (see the preceding section) (Power County Task Force 2009c). (As noted above, the loss of potential future development opportunities is not an impact to agriculture, but a potential impact to individual landowners. Conversion of agricultural land to other uses would have a larger impact on agriculture than the presence of a transmission line.) Adding these two one-time losses ($7,560 + $254,520) would result in a total estimated one-time loss per mile of $262,080. This is $410,025 per mile less than the total estimate provided by the Power County Task Force (2009c). No explanation or supporting information is provided for this additional amount.

The Power County Task Force (2009c) also identified estimated annual losses for dryland farming of $69,122 per mile. This figure does not track with the supporting information provided by the Task Force (2009e), which suggests a lower annual cost,

about $15,000 per mile, based on increased costs associated with easement road maintenance, weed control in and around towers, erosion control, and duplication of processes. The Task Force's estimated costs for duplication of processes address seeding, fertilization, and chemical/pesticide application, with a total estimated cost of $3,697 per mile or $924 per structure, with the majority (96 percent) of this cost assumed to be due to increased costs for chemical/pesticide application (Power County Task Force 2009e). In comparison, adjusted to 2009 dollars, the HydroSolutions and Fehringer (2007) estimates for dryland fields ranged from $14 per structure for a single pole located along the edge of a field to $184 per structure for an H-frame structure located in the interior of the field.

As discussed in Section 3.18 – Agriculture and below in this section under General Property Impacts and Compensation, the Proponents would negotiate damage-related issues, such as reductions in the acreage available for cultivation, with affected farmers during the easement acquisition process.

Decommissioning

Post-operations decommissioning of the transmission line would cause similar disturbance and disruption to agricultural lands and operations as construction. However, once reclamation is complete, areas would be restored to the prior condition.

Timber

Construction

The ROW for the proposed transmission line segments would range from 125 feet for a single-circuit 230-kV line to 300 feet for a double-circuit 500-kV line. The ROW for a single-circuit 500-kV line would be 250 feet. ROW clearing would involve the removal of trees, as well as structures, structure-supported crops, brush, and other vegetation and potential fire and electrical hazards. ROW clearing for seven of the proposed transmission line segments would require the removal of merchantable timber (Table 3.4-27). The largest total merchantable volume is expected to be harvested along Segment 4, which extends approximately 203 miles across five counties from Jim Bridger Substation to Populus Substation.

A comparison between the projected harvest volumes and annual harvest volume data available for the counties that would be crossed suggests that projected harvest volumes would range from about 1 percent of annual harvest for Segment 1W(a) to 20 percent for Segment 1E (Table 3.4-27). Projected harvest along Segment 4 would account for about 11 percent of annual harvest volumes in the affected counties. In most cases the projected harvest volumes would not all be generated in one year.

The shares of annual harvest summarized in Table 3.4-27 may be slightly misleading. The timber industry accounts for a very small share of total employment in the counties that comprise the socioeconomic Analysis Area (see the discussion in the Affected Environment section) and the addition of the projected harvest volumes is not expected to support many jobs in the logging and saw mill sectors in these counties. The Forest Service estimates that nine direct FTE jobs are supported per 1,000 MBF harvested in Forest Service Region 4, which includes the states of Idaho, Nevada, Utah, and Wyoming (Forest Service 2000). This suggests that the projected harvest volumes by

segment would support less than 9 jobs over several counties. Direct employment from timber clearing is included in the overall construction labor force estimates developed for the Project (see Figures 3.4-1 through 3.4-4) and the associated indirect and induced impacts are included in the overall indirect and induced impacts summarized in Figures 3.4-6 through 3.4-8.

The estimated value of timber that would be harvested is summarized by segment in Table 3.4-27. These estimates are based on an average stumpage value of $75 per MBF harvested.

Table 3.4-27. Projected Timber Harvest Volume and Estimated Value

Segment[1/]	State	Counties	Annual Harvest 2005 (MBF)[2/]	Projected Harvest (MBF)[3/]	Projected as a Share of Annual Harvest (%)	Estimated Value ($000)[4/]
1E	Wyoming	Converse, Albany, Carbon	2,524	508	20	38.1
1W(a)	Wyoming	Converse, Natrona, Carbon	2,524	33	1	2.5
1W(c)	Wyoming	Converse, Natrona, Carbon	2,524	380	15	28.5
4[5/]	Wyoming	Sweetwater, Lincoln	995	897	11	67.3
4[5/]	Idaho	Bear Lake, Franklin, Bannock	7,000			
5	Idaho	Bannock, Power, (Oneida)	7,000	234	3	17.6
7	Idaho	Bannock, Power, Cassia	7,000	155	2	11.6

1/ Information is only presented for segments that would require the removal of merchantable timber.
2/ Annual volumes are for 2005 for Wyoming counties and 2006 for Idaho counties. The volume used for the Idaho counties (7,000 MBF) is for the entire southeastern Idaho region (see the discussion in the Affected Environment section).
3/ Volume estimates are based on the following assumptions: 1) a 300-foot ROW would be cleared in all areas that cross conifer forest; 2) an average volume of 7 MBF/acre; and 3) 50 percent of the cleared timber would be merchantable.
4/ Estimated values are based on an average value of $75/MBF.
5/ Segment 4 crosses counties in Wyoming and Idaho. The projected harvest (897 MBF) would be spread along the entire segment length and comprise 11 percent of the combined annual harvest for the affected Wyoming and Idaho counties (995 MBF plus 7,000 MBF) in 2005–2006.

Operations

Vegetation would be controlled during Project operations in accordance with the EPMs presented in the Operations and Maintenance Plan developed for this Project. Vegetation control may involve the occasional removal of danger trees over the life of the Project. These activities would provide some employment, but would have negligible effects on overall timber employment in the affected counties.

Segment 4 would cross 9.2 miles of the Caribou-Targhee NF. The majority of this length, 6.4 miles, crosses lands allocated to Management Prescription 5.2 – Forest Vegetation Management, which emphasizes scheduled wood-fiber production, timber growth, and yield (Forest Service 2003a). Maintenance of the 300-foot ROW across this Management Prescription would preclude this area from future timber management and reduce the acres available to the Caribou-Targhee NF to meet its allowable sale quantity for timber. This area, approximately 233 acres, would, however, comprise just 0.14 percent of the 163,900 acres allocated to this prescription in the 2003 Caribou NF ROD (Forest Service 2003d). As a result, Segment 4 would not be expected to noticeably affect the Caribou-Targhee NF's ability to meet its allowable sale quantity in the future.

Decommissioning

Once structures and facilities are removed, former uses could resume and forested areas could be replanted. It is unlikely that decompaction of soils would be 100 percent effective and, therefore, it is possible that forests reestablished in some areas would not be as productive as they might have been prior to Project construction and operations. These occurrences would be rare and small in extent and unlikely to noticeably affect post-decommissioning timber harvest activities.

Housing

Construction

Approximately 80 percent of the projected construction workforce is expected to temporarily relocate to the Analysis Area for the duration of their employment or, in some cases, commute in from their permanent residences on Sunday night and stay in overnight lodging on weekdays, returning home on Fridays. Approximately 10 percent of workers relocating to the Project area are assumed for the purposes of analysis to be accompanied by their families (see Tables 3.4-23 and 3.4-24). The remaining 20 percent of the workforce would be local and would likely commute to and from their homes to work each day.

Based on past experience with similar projects, the Proponents' transmission engineering contractor estimates that approximately 35 percent of non-local workers would provide their own housing in the form of RVs or pop-up trailers, with the remaining non-local workers expected to require rental housing (apartments/houses) (25 percent), mobile homes (5 percent), and motel or hotel rooms (35 percent). Construction workers, particularly those working in less populated areas, would be expected to commute long distances to the job site, with commutes of up to 90 minutes each way possible.

Existing housing resources, rental housing, hotels and motels, and RV spaces, tend to be concentrated in and around the larger communities in the Analysis Areas. Workers temporarily relocating to the EPC Analysis Areas would generally be expected to reside in or near larger communities, where more housing options and services are available.

Table 3.4-28 compares projected peak housing demand by housing type with the estimated housing resources available in 2009 by EPC Analysis Area. A detailed explanation of how the existing housing data were derived is provided in the Affected Environment discussion of this section. The comparison presented in Table 3.4-28 may overestimate the potential demand for housing because it assumes that none of the workers relocating to the area would share accommodation. Past experience with construction projects of this type indicates that a large share of workers temporarily relocating to the Analysis Area would likely share temporary accommodation with other Project workers. The Wyoming Department of Environmental Quality (WDEQ) Industrial Siting Division has found that a large number of in-migrating workers rent a room in a house, or live five in a rented house (Schroeder 2010).

The available rental housing data summarized in Table 3.4-28 include houses, apartments, and mobile homes, many of which have more than one bedroom and, if rented, would likely be occupied by more than one construction worker.

Table 3.4-28. Projected Housing Demand by Housing Type and EPC Analysis Area

Analysis Area[1/]	EPC 1	EPC 2	EPC 3
Projected Non-Local Employment[2/]			
Construction Duration (Weeks)	122	118	145
Average Employment (Jobs/Week)	138	133	149
Peak Employment (Jobs/Week)	394	391	342
Projected Housing Demand[3/]			
RV Spaces	110	109	96
Rental Housing	95	94	82
Total Motel/Hotel Rooms	110	109	96
Estimated Available Housing Units[4/]			
RV Spaces	1,445	1,000	2,777
Available Rental Housing Units[5/]	1,457	1,639	7,185
Total Hotel and Motel Rooms	8,024	4,127	11,200
Available Hotel and Motel Rooms[6/]	787	413	1120
Projected Demand as a Share of Existing Resources			
RV Spaces	8%	11%	3%
Available Rental Housing Units	7%	6%	1%
Available Hotel and motel Rooms	14%	27%	9%

1/ The counties included in each EPC Analysis Area are identified in Figure 3.4-5.
2/ Eighty percent of the peak construction labor force is assumed to be non-local for the purposes of analysis.
3/ Projected housing demand is assumed to be divided as follows: RV spaces (35 percent); Rental Housing (30 percent; including Houses/Apartments [25 percent] and Mobile Homes [5 percent]); and Hotel and Motel Rooms (35 percent).
4/ A detailed explanation of how these data were derived is provided in the affected environment portion of this section. Available rental housing units are identified for the counties included in each Analysis Area. RV spaces and hotel and motel rooms are identified for communities located within 20 miles of the Proposed Action.
5/ Note that many of these available units include more than one bedroom and, if rented, would likely be occupied by more than one construction worker temporarily relocating to the area.
6/ Assumes that 10 percent of the hotel and motel rooms identified within 20 miles of the Proposed Action would normally be vacant and available for rent.

The data presented in Table 3.4-28 also tend to underestimate the potential supply of available housing in the Analysis Area. The comparison in Table 3.4-28 assumes that only 10 percent of the identified hotel and motel rooms would normally be vacant and available for rent. This is likely an underestimate because hotel and motel vacancy rates vary seasonally and geographically, with vacancy rates tending to peak during the winter months and decrease during the summer. As a result, the 10 percent vacancy assumption likely underestimates the available supply of hotel and motel rooms for most of the year.

In addition, as discussed in the Affected Environment section above, recent economic trends suggest that construction activity will continue to decline in both states, with downturns anticipated in natural gas exploration and mining activity in Wyoming. These trends suggest that more temporary housing options may be available for construction workers at least in the short term. Potential cumulative effects are addressed in Chapter 4 of this EIS.

The data summarized in Table 3.4-28 indicate that there are sufficient housing resources to meet projected peak housing demand by EPC Analysis Area.

Construction of the proposed Project would involve transmission line and substation work (see Table 3.4-3). Workers employed to build the proposed substations would be stationary for the duration of construction activities and would be likely to seek out more permanent housing options, such as rental housing or apartments, in the vicinity of the substation construction site. Workers employed to install the transmission lines and towers would generally be more transient and more likely to move as construction advances.

Substation construction would in most cases involve substantially fewer workers than the transmission line segments, with peak labor forces by substation ranging from 12 to 60 workers. A review of housing resources within commuting distances of the proposed substations indicated that at least one large community is located within a one-hour drive of the proposed substation sites, with the exception of Aeolus, which is located approximately 100 minutes drive from the closest larger community, Rawlins. Workers employed to build the planned Aeolus Substation could reside in the smaller communities of Hanna, Medicine Bow, and Elk Mountain, but there may be insufficient housing resources in these communities to accommodate the peak substation workforce of 50.

While there may be sufficient housing resources when viewed from an EPC Analysis Area perspective, many of the counties crossed by the proposed transmission line segments have low population densities and parts of the segments cross undeveloped areas that are more than 90 minutes commute from the closest larger community. This is addressed in the following analysis, which evaluates the availability of housing resources based on commuting distances and times to the proposed transmission line segments. This analysis compares projected housing demand by segment and housing type with the estimated available housing resources in communities within daily commuting distance. The analysis assumes that communities within a one-way drive of 90 minutes are within daily commuting distance. The analysis also assumes that only 10 percent of the identified motel and hotel rooms within this commuting distance would normally be vacant and available for rent.

Commuting distances and times were estimated using a GIS analysis that identified the quickest route from the surrounding communities to each segment by segment MP. This analysis took into account driving distances and road types (e.g., interstate highways, county roads, local unpaved roads) to estimate driving times.

The key findings of the segment-based housing analysis are as follows:

- Most segments would involve lengthy one-way commutes of 1 hour or more.
- Insufficient temporary accommodation appears to exist within 90 minutes driving time of parts of Segments 1E, 1W, and 2 but sufficient accommodation likely exists within 2 hours, with the exception of about 6 miles of Segment 1E.

- Segment 4 has insufficient temporary accommodation within 90 minutes driving time of parts of the segment, and insufficient accommodation within 2 hours of parts (MPs 177 to 189).
- Segment 8 has insufficient temporary accommodation within 90 minutes driving time of parts of the segment, and insufficient accommodation within 2 hours of parts (MPs 25 to 32).
- Segment 9 has insufficient temporary accommodation within 90 minutes driving time of parts of the segment, but likely sufficient accommodation within 2 hours.
- Sufficient temporary accommodation likely exists within 90 minutes driving time of the remaining segments.

The findings of this analysis are discussed by segment in the following paragraphs. Weeks in the following discussion refer to the overall Project construction schedule.

Segment 1E – Windstar to Aeolus

This segment would extend approximately 101 miles across parts of four counties (Converse, Natrona, Albany, and Carbon Counties) from the proposed Windstar Substation near Glenrock, Wyoming, to the planned Aeolus Substation near Hanna, Wyoming. The segment crosses a remote, undeveloped area, including part of the Medicine Bow-Routt NFs. There are no major roads or incorporated communities in this area.

The larger communities within daily commuting distance of this segment (90 minutes) are located north and southwest of the segment, which generally extends south from the proposed Windstar Substation. Casper is the largest community to the north and within an estimated 90-minute commute of the first 32 miles of this segment. The last 25 miles of the segment range from an estimated one-way drive of 82 minutes to a slightly less than 2-hour drive from Rawlins, the largest community to the south.

Workforce requirements for this segment would peak at an estimated 55 workers in week 44, with more than 40 workers required from week 41 to week 64. There would be insufficient temporary housing resources available to accommodate estimated housing demand within 90 minutes of the middle stretch of Segment 1E (from about MPs 35 to 90), but adequate housing resources likely exist between 90 minutes and 2 hours driving time from most of this part of the segment, mainly in Casper and Rawlins, the larger communities to the north and southwest of the segment. There do not, however, appear to be adequate housing resources within a 5-mile stretch (MPs 70 to 75) of the segment.

The Proponents would evaluate potential housing mitigation measures for this part of the segment, including those measures outlined at the end of this section. Mitigation in this case would likely involve seeking temporary accommodation for workers in the larger communities located between 90 minutes and about 2 hours driving time from the affected parts of the segment, and the provision of transportation, in the form of buses or vans, to ensure that workers are able to travel safely to the site.

Segment 1W – Windstar to Aeolus

This segment would extend approximately 71 to 76 miles west and south across parts of Converse, Natrona, and Carbon Counties from the proposed Windstar Substation near Glenrock, Wyoming, to the planned Aeolus Substation near Hanna, Wyoming. The larger communities within daily commuting distance of this segment (90 minutes) are located north and southwest of the segment. Casper, the largest community to the north, is within an estimated 90-minute driving distance of the first 34 miles of this segment.

This segment consists of two separate transmission lines—1W(a) (76 miles) and 1W(c) (71 miles)—that would be constructed in separate ROWs to meet reliability criteria but would, for the most part, follow the same alignment. Workforce requirements for the two transmission lines that comprise this segment would peak at 45 workers and 36 workers, respectively. The construction schedules for these two lines would overlap, with a combined peak workforce requirement of about 81 workers, with approximately 70 to 80 workers required from about week 93 to week 112.

Adequate temporary housing resources likely exist within 90 minutes driving time of the first 28 miles of this segment as it extends west, then south from the proposed Windstar Substation. There would be insufficient temporary housing resources available to accommodate estimated housing demand within 90 minutes of the remainder of the line, but adequate housing resources likely exist between 90 minutes and 2 hours driving time from this part of the segment, mainly in Casper and Rawlins, the larger communities to the north and southwest of the segment.

The Proponents would evaluate potential housing mitigation measures for this part of the segment, including those measures outlined at the end of this section. Mitigation in this case would likely involve seeking temporary accommodation for workers in the larger communities located between 90 minutes and about 2 hours driving time from the affected parts of the segment, and the provision of transportation, in the form of buses or vans, to ensure that workers are able to travel safely to the site.

Segment 2 – Aeolus to Creston

This segment would extend approximately 96 miles west through parts of Carbon and Sweetwater Counties from the planned Aeolus Substation to the proposed Creston Substation near Wamsutter. The largest community within commuting distance of this segment is Rawlins, which is within 90 minutes driving time of the majority of the segment, and less than 60 minutes from most of the segment. Rawlins is, however, approximately 100 minutes driving time from the planned Aeolus Substation and workers may have longer commutes for the first 3 or 4 miles of the segment originating from the planned Aeolus Substation.

Workforce requirements for this segment would peak at approximately 146 workers in weeks 50 through 56, with more than 140 workers required from week 50 to week 62. Construction of this segment would extend over two construction seasons with a second peak in employment in weeks 88 through 98.

Adequate temporary housing resources exist within 90 minutes driving time of nearly all of this segment, with most of the workers temporarily relocating to work on this segment

expected to reside in Rawlins for the duration of the construction period. Other smaller communities within daily commuting distance of parts of this segment include Hanna, Medicine Bow, and Saratoga.

Segment 3 – Creston to Bridger

This segment would be located entirely within Sweetwater County and extend approximately 47 miles west from the proposed Creston Substation to the proposed Bridger Substation near the Jim Bridger Power Plant. The larger communities within commuting distance of this segment are Rawlins, Rock Springs, and Green River. At least two of these communities are within 90 minutes driving time of the entire length of this segment, and in most locations all three are within 90 minutes. Workforce requirements for this segment would peak at approximately 116 workers in weeks 50 through 56, with more than 100 workers required from week 44 to week 69. Construction of this segment would extend over two construction seasons with a second peak in employment in weeks 88 and 89.

Adequate temporary housing resources exist within 90 minutes driving time of the entire length of this segment, with most of the workers temporarily relocating to work on this segment expected to reside in Rawlins, Rock Springs, and Green River. Peak demand for temporary accommodation for workers employed on this segment would coincide with peak demand from workers employed on Segment 2. Most of the workers temporarily relocating to work on Segment 2 would likely reside in Rawlins, as would a share of the workers on Segment 3. Housing data compiled for Rawlins suggest that there would be sufficient available housing in this community to accommodate both groups of workers.

Segment 4 – Bridger to Populus

This segment would extend approximately 203 miles from the proposed Bridger Substation to the planned Populus Substation near I-15 in southern Bannock County, Idaho. This segment would cross Sweetwater and Lincoln Counties in Wyoming, as well as Bear Lake, Franklin, and Bannock Counties in Idaho. Rock Springs, Wyoming, the largest community within commuting distance (90 minutes) of the east side of this segment, is within an estimated 90-minute driving time of the first 65 miles of this segment. Pocatello, Idaho, is the largest community within commuting distance of the west side of the segment and within 90 minutes of the first 10 miles or so of the west side of the segment. The city of Kemmerer, located in Lincoln County, Wyoming, is within 90 minutes drive of parts of the central section of the segment (from about MPs 61 to 145).

This segment would be constructed over two spreads (east and west), with construction starting at each end and the crews moving toward one another. Workforce requirements for each spread would peak at about 180 workers and would extend over two construction seasons. The east spread would employ more than 130 workers from week 37 through 69 in the first construction season, and from week 86 to week 94 in the second. The west spread would employ more than 130 workers from week 47 through 69 and from week 95 to week 104.

Adequate temporary housing resources exist within 90 minutes driving time of much of this segment, with most of the workers likely to commute from Rock Springs and Pocatello. There are, however, parts of this segment that are more than 90 minutes drive from these larger communities. These locations include from about MPs 90 to 125 and from about MPs 180 to 192 where there would be an insufficient number of available motel rooms (10 percent of the total estimated number) within 90 minutes to accommodate a projected demand for 43 rooms (35 percent of the projected peak non-local workforce). There does, however, appear to be sufficient temporary housing within 2 hours drive of MPs 90 to 125, but not within 2 hours of MPs 180 to 192.

The Proponents would evaluate potential housing mitigation measures for these parts of the segment, including those measures outlined at the end of this section. Mitigation in this case would likely involve seeking temporary accommodation for workers in the larger communities located between 90 minutes and about 2 hours driving time from the affected parts of the segment, and the provision of transportation, in the form of buses or vans, to ensure that workers are able to travel safely to the site. In locations where there are insufficient housing resources within 2 hours drive, primarily from about MPs 180 to 192 (in Bear Lake and Franklin Counties, Idaho), mitigation could include securing more than 10 percent of the total estimated motel rooms within commuting distance, providing RV accommodation, and seeking temporary accommodation farther afield, along with the provision of Company transportation (van or bus) to and from the Project site each day.

Segment 5 – Populus to Borah

This segment would extend approximately 55 miles west through parts of Bannock and Power Counties, Idaho, from the planned Populus Substation to the existing Borah Substation. The largest community within commuting distance of this segment is Pocatello, which is within 90 minutes driving time of the entire segment, and less than 60 minutes from about 80 percent of the segment. Workforce requirements for this segment would peak at approximately 116 workers in weeks 226 through 229, with more than 100 workers required from week 216 to week 233.

Adequate temporary housing resources exist with 90 minutes driving time of the entire length of this segment, with most of the workers temporarily relocating to work on this segment expected to reside in Pocatello. Other smaller communities within daily commuting distance of parts of this segment include Lava Hot Springs, American Falls, Heyburn, and Rupert.

Segment 6 – Borah to Midpoint

This segment consists of the existing Midpoint-Kinport 345-kV transmission line that extends from the existing Borah Substation to the existing Midpoint Substation. The voltage of this line would be increased from 345 kV to 500 kV under the Proposed Action. No new transmission line construction would be required along Segment 6 to operate this line segment at 500 kV, except in the vicinity of the Borah and Midpoint Substations, where approximately 10 new structures would be required, 5 at each substation.

Segment 7 – Populus to Cedar Hill

This segment would extend approximately 118 miles west through parts of Bannock, Power, and Cassia Counties, Idaho, from the planned Populus Substation to the proposed Cedar Hill Substation. The larger communities within commuting distance of this segment are Pocatello to the east and Twin Falls to the west. One of these communities is within 90 minutes driving time of the entire length of this segment. Workforce requirements for this segment would peak at approximately 146 workers in week 170, with more than 100 workers required from week 160 to week 192.

Adequate temporary housing resources exist within 90 minutes driving time of the entire length of this segment, with most of the workers temporarily relocating to work on this segment expected to reside in Pocatello and Twin Falls. Other smaller communities within daily commuting distance of parts of this segment include American Falls, Heyburn, Burley, and Rupert. The representative construction schedule used for this analysis (see Figure 3.4-1) suggests that construction of this segment would not coincide in time with Segment 5 and workers on these two segments (Segments 5 and 7) seeking accommodation in Pocatello would be there at different times.

Segment 8 – Midpoint to Hemingway

This segment would extend approximately 131 miles west through parts of Jerome, Lincoln, Gooding, Elmore, Ada, and Owyhee Counties, Idaho, from the existing Midpoint Substation to the planned Hemingway Substation. The larger communities within commuting distance of this segment are Twin Falls to the east, Boise to the west, and Mountain Home near the central part of the segment. Workforce requirements for this segment would peak at approximately 146 workers in week 212, with more than 100 workers required from week 202 to week 233.

Adequate temporary housing resources exist within 90 minutes driving time of much of the length of this segment. There are, however, parts of this segment that appear to be more than 90 minutes drive from sufficient housing resources. These areas include from about MP 25 to MP 34 where there would be an insufficient number of available motel rooms (10 percent of the total estimated number) within 90 minutes to accommodate a projected demand for 43 rooms (35 percent of the projected peak non-local workforce). With the exception of the stretch from about MPs 25 to 32, there does, however, appear to be sufficient temporary housing within 2 hours drive from the affected areas.

The Proponents would evaluate potential housing mitigation measures for these parts of the segment, including those measures outlined at the end of this section. Mitigation in this case would likely involve seeking temporary accommodation for workers in the larger communities located between 90 minutes and about 2 hours driving time from the affected parts of the segment, and the provision of transportation, in the form of buses or vans, to ensure that workers are able to travel safely to the site. In locations where there are insufficient housing resources within 2 hours, primarily from about MPs 25 to 32, mitigation could include securing more than 10 percent of the total estimated motel rooms within commuting distance, providing RV accommodation, and seeking temporary accommodation farther afield, along with the provision of Company transportation (van or bus) to and from the Project site each day.

Segment 9 – Cedar Hill to Hemingway

This segment would extend approximately 162 miles west through parts of Cassia, Twin Falls, Elmore, and Owyhee Counties, Idaho, from the proposed Cedar Hill Substation to the planned Hemingway Substation. The larger communities within commuting distance of this segment are Twin Falls to the east, Boise to the west, and Mountain Home near the central part of the segment. Workforce requirements for Segment 9 would peak at approximately 148 workers in weeks 150 to 152, with more than 100 workers required from week 140 to week 178.

Adequate temporary housing resources exist within 90 minutes driving time of much of the length of this segment. Part of this segment, however, appears to be more than 90 minutes drive from sufficient housing resources. There would be an insufficient supply of available motel rooms (10 percent of the total estimated number) within 90 minutes of parts of this segment (from about MPs 67 to 77 and from about MPs 94 to 127) to accommodate a projected demand for 43 rooms (35 percent of the projected peak non-local workforce). Adequate housing resources likely exist between 90 minutes and 2 hours driving time from this part of the segment, mainly in Boise, Nampa, and Twin Falls.

The Proponents would evaluate potential housing mitigation measures for this part of the segment (from about MPs 67 to 77 and from about MPs 94 to 127), including those measures outlined at the end of this section. Mitigation in this case would likely involve seeking temporary accommodation for workers in the larger communities located between 90 minutes and about 2 hours driving time from the affected parts of the segment, and the provision of transportation, in the form of buses or vans, to ensure that workers are able to travel safely to the site.

Segment 10 – Midpoint to Cedar Hill

This segment would extend approximately 33 miles south through parts of Jerome, Twin Falls, and Cassia Counties from the existing Midpoint Substation to the proposed Cedar Hill Substation. The largest community within commuting distance of this segment is Twin Falls, which is less than 40 minutes drive from the entire segment. Workforce requirements for this segment would peak at approximately 110 workers in weeks 206 and 207, with more than 100 workers also required from week 197 to week 200.

Adequate temporary housing resources exist with 90 minutes driving time of the entire length of this segment, with most of the workers temporarily relocating to work on this segment expected to reside in Twin Falls. Other smaller communities within daily commuting distance of parts of this segment include Jerome, Gooding, Heyburn, and Rupert.

Mitigation

As discussed above, construction activities would extend approximately 1,103 miles across two states and multiple counties, and some of the areas crossed have limited housing resources. Housing shortages could occur in some locations if the Proposed Action coincides in time and space with other construction or development projects that involve large transient workforces. This type of scenario could result in fewer housing resources being available than is normally the case.

The Proponents should address these types of potential housing shortages prior to construction by updating the housing analysis to reflect current conditions at the time of construction, including EPC-specific housing demands by community and housing type, the available supply of housing units, and projected demand from other sources, based on average demand patterns and demand from other large permitted and scheduled projects.

In addition, the Proponents should prepare and submit a Housing Plan for review and approval. The Housing Plan would address those areas in Wyoming and Idaho where potential housing shortage concerns are identified and demonstrate mitigation of any projected housing shortage during construction:

SOC-1 Housing Plan

- Contract with local motels and hotels for temporary accommodation within daily commuting distance of the Project site. Temporary accommodations will be selected based on value, cleanliness, and proximity to the Project site.
- Contract with local RV parks for rental spaces to accommodate workers who have access to RVs.
- If temporary accommodation is not available within the Project area, seek motel and hotel accommodations outside the Project area. In this event, the Proponents would provide transportation to the Project site in the form of buses or vans, depending on workforce numbers, to ensure workers arrive at the Project site safely.
- If sufficient temporary accommodation is not available, depending on the location and the number of workers involved, the Proponents would explore other temporary housing options, including the use of temporary housing facilities established for other projects, establishing temporary RV lots, and developing Project-specific temporary housing camps. The Proponents would provide bus or other transportation to the Project site if these facilities were located outside the Project area.

Operations

There would be no new expected demand for short- or long-term housing during the operations phase of the Proposed Action because the estimated permanent staff of 12 Idaho Power employees would be recruited locally, and, therefore, no operations-related impacts to housing resources are expected.

Decommissioning

When the Project is decommissioned, a labor force approximately equal to that needed for its construction would be deployed. Impacts from decommissioning are expected to be similar to those from construction and the Proponents would evaluate potential mitigation measures for those areas where insufficient housing resources are available within a 90-minute commute.

Property Values

General Property Impacts and Compensation

As noted in the Affected Environment section, all of the new transmission line segments would require new ROWs that would involve a combination of ROW grants and easements between the Proponents and federal, state, and local governments; other companies (e.g., utilities and railroads); and private landowners (including fee acquisition). ROWs for transmission line facilities on private lands would be obtained in fee simple or perpetual easement by Rocky Mountain Power and as perpetual easements by Idaho Power. Land for substation or regeneration sites would be obtained in fee simple where located on private land.

The effect that a transmission line easement may have on property value is a damage-related issue that would be negotiated between the landowner and Proponents during the fee simple or easement acquisition process. The easement acquisition process is designed to provide fair compensation to the landowner for the right to use the property for transmission line construction and operations. The easement value in theory is equal to the difference in value of the affected property before and after easement acquisition and construction of the proposed facilities. Rocky Mountain Power establishes fee value for affected lands based on county assessor valuation, market research (sold property comparison), parcel appraisal, and zonal appraisal information. Contract negotiators for Idaho Power would make offers based on land valuation studies provided by licensed appraisers.

The required transmission line easements may encumber the affected ROW area with land use limitations. Each easement would specify the extent of any encumbrances. Typical transmission line easement conditions include the right to clear the ROW and keep it clear of trees, structures, including structure-supported crops, brush, vegetation, and other potential fire and electrical hazards. Non-structure supported agricultural crops less than 12 feet in height may be allowed on some easement properties.

The impact of introducing a new ROW for transmission structures and lines can vary depending on the placement of the ROW in relation to the property's size, shape, and the location of existing improvements. A transmission line may diminish the utility of a portion of property if the line effectively severs this area from the remaining property, resulting in what is known as "severance damage." If it is determined that a specific property might obtain serious severance damages resulting from the final line route, an appraisal would likely be ordered to assess the compensation for the land and damages.

The introduction of a new transmission line can also have detrimental impacts on farms by reducing the acreage available for cultivation and in some cases disrupting existing harvest patterns, with new transmission line structures affecting the farmer's ability to maneuver equipment in the vicinity of the immediately affected area. A new transmission line also has the potential to negatively affect farm operations that employ pivot irrigation systems. (Potential impacts to agricultural land are discussed in Section 3.18 – Agriculture.) The Proponents would work with individual landowners to coordinate the timing of construction so as to minimize short-term impacts to agriculture.

The placement of the transmission line across a property also affects the visual quality. Each individual landowner has their own perception of what is visually acceptable or unacceptable. (The potential visual impacts of the Proposed Route and Route Alternatives are evaluated in Section 3.2 – Visual Resources.) These factors, as well as any other elements unique to the property, are generally taken into consideration to determine the loss in value within the easement area, as well as outside the easement area in cases of severance.

With regard to access roads, if the Proponents acquire an easement on an existing access road and the landowner is the only other user, market compensation is generally 50 percent of full fee value. If other landowners share the access road use, compensation is usually something less than 50 percent. For fully improved roads, an appraiser may prepare a cost analysis to identify the value of the access road easement. If the Proponents acquire an easement for the right to construct a new access road and the landowner has equal benefit and need of the access road, market compensation is generally 50 percent of full fee value. If the landowner has little or no use for the new access road, market compensation for the easement is generally close to full fee value.

Property Value Impacts

Changes in land use often raise concerns about the potential effect that these changes may have on nearby property values. Zoning is the primary means that most local governments use to protect property values. Zoning is intended to avoid conflicting uses by allowing some uses and disallowing others, or permitting them only as conditional uses (see Section 3.17 – Land Use and Recreation).

Research into the relationship between electric transmission facilities and local property values has employed research methods that can, for the most part, be divided into surveys and opinion-based studies on the one hand and quantitative studies, largely based on comparisons of market data, on the other. These studies have resulted in a wide range of findings that reflect the different study approaches employed, as well as the unique characteristics of the particular case or cases being evaluated.

From the 1950s to the late 1980s almost all reported research concluded that transmission lines have little or no effect on property values. More recently, the popular press and academic and professional literature have tended to support the idea that proximity to transmission lines may affect the desirability and, therefore, the value of residential property (Colwell 1990; Delaney and Timmons 1992; Hamilton and Schwann 1995; Cowger et al. 1996). Some observers linked this general change in perspective to increased concerns regarding potential EMF-related health effects, but a nationwide survey of real estate appraisers suggests that, for the most part, potential negative effects on property values tend to be related to the visual impact of transmission line facilities (Delaney and Timmons 1992). This nationwide survey found that 84 percent of the surveyed appraisers believed that property values are negatively affected by transmission facilities, with an average decrease in value of 10 percent. Ten percent of those surveyed felt transmission lines did not affect property values, while the remaining 6 percent felt they had a positive impact (Delaney and Timmons 1992).

Studies based on quantitative comparisons of market data have also identified negative impacts. Hamilton and Schwann (1995) studying a residential neighborhood in Vancouver, Canada, found that properties adjacent to a transmission line lose 6.3 percent of their value due to proximity and the visual impact. They also found that this effect decreases with distance, with properties more distant from the transmission line losing roughly 1 percent of their value. Colwell (1990) found that properties within 50 feet of a transmission line have property values that are 6 percent to 9 percent lower than the values of comparable properties. He also found that this reduction in value tends to decrease over time. A more recent study in Montreal found that direct views of a transmission line tend to reduce residential property value by roughly 10 percent (Des Rosiers 2002). BPA conducted studies in the Portland, Oregon, and Seattle, Washington, areas that found that the presence of high-voltage transmission lines tends to have a small but negative impact on the value of adjacent residential properties, with impacts ranging from 0 to 2 percent (Cowger et al. 1996; Bottemiller et al. 2000).

The results of these studies suggest that proximity to electric transmission lines can have negative effects on residential property values, with average impacts ranging from less than 1 percent to about 10 percent. The findings of these studies also suggest that this impact decreases with distance and tends to decline over time. While these studies are informative, it is important to recognize the difficulties in generalizing the findings of case studies to other situations and locations. Unique Project characteristics that need to be taken into consideration when assessing the potential effects of transmission line structures on property values include the type and height of the structures, the distance and view from the potentially affected property, intervening topography and vegetation, and the property market and type of landscape involved.

Studies of property value impacts during periods of physical change, such as new transmission line construction or structural rebuilds, have generally revealed greater short-term impacts than long-term effects. However, most studies have concluded that other factors, such as general location, size of property, improvements, condition, amenities, and supply and demand factors in a specific market area are more important criteria than the presence or absence of transmission lines in determining the value of residential real estate.

Some short-term adverse impacts on residential property values (and saleability) might occur on an individual basis as a result of the Proposed Route and Route Alternatives. However, these impacts would be highly variable, individualized, and unpredictable.

A review of studies of the impact on agricultural land found that overhead transmission lines have the potential to reduce the sales price and the effect can vary widely, ranging from no effect to a decrease of 20 percent or more, depending on the productivity of the land and the amount of disruption to farm operations (Kroll and Priestly 1992).

Few studies have addressed the impacts of transmission lines on the value of commercial and industrial properties. Those that have done so generally find the impacts are less than the impacts on residential properties. In interviews with appraisers, real-estate brokers, and owners and managers of commercial and industrial parks, Chapman (2005) found for the most part that the presence of a transmission line had little effect on market prices for commercial and industrial properties.

Education

Construction

The numbers of workers expected to temporarily relocate to each EPC Analysis Area with their families are identified in Table 3.4-29. This table also identifies the projected peak and average number of school-age children expected to temporarily relocate to each EPC Analysis Area, and compares the peak estimates with the existing number of students in each Analysis Area. The projected peak number of school children temporarily relocating to the area would be equivalent to approximately 0.02 percent to 0.14 percent of the existing enrollment in school districts in the EPC Analysis Areas and would have no noticeable effect on existing average student/teacher ratios (Table 3.4-29).

Table 3.4-29. Projected Demand for Education Resources by Analysis Area

Analysis Area[1/]	EPC 1	EPC 2	EPC 3
Projected Non-Local Employment[2/]			
Construction Duration (Weeks)	122	118	145
Average Employment (Jobs/Week)	173	166	186
Peak Employment (Jobs/Week)	394	391	342
Projected Number of School Age Children[3/]			
Average	17	17	19
Peak	39	39	34
Estimated Education Resources (2005/2006)[4/]			
Number of Schools	111	100	316
Number of Students	27,393	29,580	138,860
Number of Teachers	2,004	1,742	7,604
Student/Teacher Ratio (average)	13.7	17.0	18.3
Peak Comparison with Existing Student Numbers			
Percent of Existing Students	0.14	0.13	0.02

1/ The counties included in each EPC Analysis Area are identified in Table 3.4-3.
2/ 80 percent of the peak construction labor force is assumed to be non-local for the purposes of analysis.
3/ Projected numbers of school children are based on the assumptions that: 10 percent of workers would be accompanied by their families; the average family household includes 1.0 child under the age of 18 years; and all children relocating to the area would be school age.
4/ A detailed explanation of how these data were derived is provided in the Affected Environment discussion in this section.

Operations

Long-term operations of the proposed transmission line and associated facilities would require an estimated permanent staff of 12 Idaho Power employees. These workers would all be expected to be hired locally. Existing Rocky Mountain Power staff would be responsible for operations and maintenance of the new transmission line and associated facilities that would be owned and operated by Rocky Mountain Power. As a result, operations of the proposed transmission line and associated facilities are not expected to have an impact on education resources in the Analysis Areas.

Decommissioning

When the Project is decommissioned, a labor force approximately equal to that needed for its construction would be deployed. Impacts to education from decommissioning are expected to be similar to those from construction.

Public Services

Police and Fire Services

Projected peak employment and the number of workers and family members expected to temporarily relocate are identified by EPC Analysis Area in Table 3.4-23, with peak increases in EPC Analysis Area populations ranging from 0.04 percent to 0.24 percent of 2008 population totals. The temporary addition of these workers to local communities within the four EPC Analysis Areas is not expected to affect the levels of service provided by existing law and fire protection personnel. Police and sheriff and fire departments within 10 miles of the proposed transmission line are identified by county in Table 3.4-13. Increased demands for local services that could occur from construction workers and family members temporarily relocating to the area would be short-term.

Crime rate indexes, presented per 10,000 persons for the potentially affected counties in Table 3.4-13, suggest that the temporary relocation of non-local workers and family members to the three EPC Analysis Areas could result in potential increases of less than 0.1 violent crime and less than 1 total crime in each EPC Analysis Area.

Construction of the Proposed Action could result in increased demand for emergency services. Local police assistance would likely be required to facilitate traffic flows during construction at some road crossings and permits may be required for vehicle load and width limits for some of the vehicles delivering Project materials and supplies.

Public safety issues associated with fire are discussed in Section 3.22 – Public Safety.

Condemnation and removal of transmission line features and electrical structures (i.e., decommissioning) would be regulated in Wyoming by the State Fire Marshal. When the Project is decommissioned, a labor force approximately equal to that needed for its construction would be deployed. Impacts from decommissioning on police and fire services are generally expected to be similar to those from construction.

Health Care

Medical facilities located near the proposed transmission line are identified by location in Table 3.4-14. Construction and operations of the proposed transmission line and substations should not have significant adverse impacts on local and regional medical facilities and services. The Proponents' construction contractors would implement a health and safety program that would include first aid and cardio-pulmonary resuscitation training for on-site construction personnel.

The temporary relocation of workers and family members to the counties in the Analysis Area is not expected to affect existing levels of health care and medical services. Minor increases in demands for local services that could occur from workers and family members temporarily relocating to the area would be short-term.

Municipal Services

Construction Workers

Construction workers temporarily relocating to counties in the Analysis Area would be expected to reside in hotels and motels, rental housing, and RVs located at established sites. These temporary increases would be equivalent to 0.04 percent to 0.24 percent

of 2008 EPC Analysis Area populations (Table 3.4-23) and could result in short-term increases in demand for municipal services, such as water and wastewater, and solid waste disposal. However, temporary residents would reside at locations throughout the Project region and these short-term, modest increases in local population are not expected to affect existing levels of municipal services.

Solid Waste

Substation and transmission line construction would generate a variety of solid wastes, including concrete, hardware, and wood debris. Above-grade waste would include packing material such as crates, pallets, and paper wrapping used to protect equipment during shipping. All waste and scrap material that cannot be recycled would be removed from the site and deposited in local permitted landfills in accordance with local ordinances.

Excavation along the ROW and at substations would generate solid waste that could be used as fill; however, some of the excavated material would be removed for disposal. Excavated material that is clean and dry would be spread along the ROW. The majority of waste associated with substation construction would result from spoils created during site grading. Very little of the soil excavated during foundation installation would be waste product.

Decommissioning of the Project would generate solid waste. As noted with respect to construction, all waste and scrap material that is unable to be recycled would be removed from the site and deposited in local permitted landfills in accordance with local ordinances.

Other Municipal Services

Construction of the proposed transmission line segments and substations would require water. Major water uses would be for transmission line structure and substation foundations, and dust control during ROW and substation grading and site work. Minor uses of water during construction would include substation landscaping where required. Foundation construction typically involves the transportation of water to the batch plant site where it is used to mix wet concrete. From the batch plant the wet concrete is transported to the structure site in concrete trucks for use in foundation installation. Construction of the transmission line segments, substations, and related facilities would generate a temporary increase in fugitive dust. If the level of fugitive dust were too high in specific areas, as determined in cooperation with the landowner or agency, water would be applied to disturbed areas to minimize dust. The required water would be procured from municipal sources and/or from landowners. No new water rights would be required.

Construction, operations, and decommissioning of the Proposed Action would not require wastewater treatment or the construction or expansion of wastewater facilities or stormwater drainage systems. The Proposed Action is also not expected to affect local supplies of electricity and natural gas in the Analysis Area.

Tax Revenues

Construction

Construction of the Proposed Action would generate sales and use tax revenues through Project expenditures on construction materials, supplies and equipment. Local Project-related expenditures that would generate sales tax are assumed to be mainly for foundation materials, where available, and miscellaneous Project purchases, such as gas, parts, repairs, tires, and supplies. Based on past experience with similar projects, the Proponents' transmission engineering contractor anticipates that all materials and supplies purchased out of state for use in construction would be subject to use tax, and not taxed at the point of purchase. Estimated expenditures were assigned to counties based on the share of construction activity that would take place in that county.

Estimated sales and use tax revenue is summarized by potentially affected Wyoming county in Table 3.4-30. This table also compares these estimates with actual sales, use, and lodging tax revenues in 2010. Overall, total estimated sales and use tax would be equivalent to about 6.8 percent of the sales, use, and lodging tax revenues generated in Wyoming in 2010.

Table 3.4-30. Estimated Sales and Use Tax Revenue in Wyoming Counties

County/State	Projected Sales and Use Tax[1/,2/]	2010 Sales, Use and Lodging Tax Revenues	Projected Tax as a Percent of 2010 Total[3/]
Albany	471	29,171	1.6
Carbon	12,028	27,662	43.5
Converse	4,146	21,030	19.7
Lincoln	7,489	16,414	45.6
Natrona	456	89,013	0.5
Sweetwater	29,100	96,441	30.2
Wyoming	**53,690**	**789,430**	**6.8**

1/ Estimated and actual tax revenues are shown in thousands of dollars.
2/ The estimated Project-related sales and use tax estimates are for the total duration of construction activities in each county. They are not annual estimates and, in most cases, would be generated over a period of several years.
3/ Projected sales and use tax is shown here as a percentage of actual sales, use, and lodging tax revenues in 2010.

The award of a permit from the Wyoming ISC results in the state distribution of impact assistance payments. In general, these payments increase distribution of the state's sales and use tax levy to local governments from 31 percent to 40 percent. In the past, such payments have been about $100,000 per month for each month of construction.

Estimated sales and use tax revenue is summarized by potentially affected Idaho county in Table 3.4-31. This table also compares the estimated sales and tax revenues with 2008 actual sales, use, and travel and convention tax revenues collected in each county. Sales and tax revenues in Idaho are collected by the state with a small share distributed to local governments, including counties and municipalities, based on population size and other factors. In Fiscal Year 2010, for example, 11.5 percent of Idaho's sales tax revenues was distributed to local governments, including counties and municipalities (Idaho State Tax Commission 2010a). Total estimated Project-related

sales and use tax revenues are equivalent to about 3 percent of sales, use, and travel and convention tax revenues collected in Idaho in 2010 (Table 3.4-31).

Table 3.4-31. Estimated Sales and Tax Revenue in Idaho Counties ($000s)

County/State	Projected Sales and Use Tax[1/2/]	2008 Sales, Use, and Convention Tax Revenues[1/]	Projected Tax as a Percent of 2008 Total[3/]
Ada	885	262,804	0.3%
Bannock	10,583	27,206	39%
Bear Lake	2,282	1,523	150%
Cassia	4,613	8,560	54%
Elmore	2,319	5,424	43%
Franklin	984	3,908	25%
Gooding	879	2,469	36%
Jerome	3,721	11,469	32%
Lincoln	81	949	9%
Owyhee	6,052	1,576	384%
Power	2,164	2,385	91%
Twin Falls	4,847	30,276	16%
Idaho	**39,410**	**1,183,089**	**3%**

1/ Estimated and actual tax revenues are shown in thousands of dollars.
2/ The estimated Project-related sales and use tax estimates are for the total duration of construction activities in each county. They are not annual estimates and, in most cases, would be generated over a period of several years.
3/ Projected sales and use tax is shown here as a percentage of actual sales, use, and lodging tax revenues in 2008.

The tax revenue estimates presented above provide an approximate indication of the amount of sales and use tax that would be generated by the Project. These estimates are based on a number of simplifying assumptions, as discussed in the preceding paragraphs, and are not intended to be precise forecasts. This is particularly important in Wyoming where a share of sales and use tax revenues is directly distributed to the county where it is collected (see Table 3.4-30). It should also be noted that the estimated sales and use tax revenues are total estimates for the duration of construction activities in each county and are not, in most cases, directly comparable to the annual tax revenues they are compared to in Tables 3.4-30 and 3.4-31.

The proposed Project is a large capital project that involves substantial investment in those counties where new facilities would be built. In a number of cases, the total estimated value of materials that would be used for construction in a county (and assumed here to be subject to sales or use tax in that county) is larger than the total sales and use values subject to tax in 2008, as shown in Tables 3.4-30 and 3.4-31.

Expenditures by construction workers would also generate sales tax revenues, but the amount of spending and distribution by county is difficult to accurately forecast, and, therefore, sales tax associated with these expenditures is not estimated here. In Idaho, income from in-state employment on the Project and income from in-state employment supported by Project-related expenditures would be subject to state income taxes. These potential revenues are also not estimated here.

Operations

Estimated ad valorem (Wyoming) and property (Idaho) tax revenues are presented by county in Table 3.4-32. These estimates are based on the projected value of the Proposed Action by county and average property tax rates, and are intended to provide an approximation of potential tax revenues that could be generated as a result of the Project. This table illustrates the relative contribution of the estimated Project-related revenues to county budgets by comparing estimated annual revenues with actual property tax revenues for 2010 by county. Estimated property tax revenues ranged from 0.1 percent of 2010 property tax revenues in Ada County, Idaho, to about 18 percent of property tax revenues collected in Bear Lake County, Idaho (Table 3.4-32). As these numbers indicate, the annual ad valorem and property tax revenues generated from the Proposed Action could provide substantial additions to tax revenue income in a number of the potentially affected counties.

Table 3.4-32. Estimated Ad Valorem (Wyoming) and Property (Idaho) Tax Revenues

State/County	Estimated Annual Project-Related Property Taxes ($000)[1/,2/,3/]	Actual 2010 Property Tax Revenues ($000) [1/,4/]	Estimated Property Tax as a Percent of 2010 Property Tax Revenues
Wyoming			
Albany	176.8	23,553.6	0.8
Carbon	2,728.6	50,271.2	5.4
Converse	1,195.5	42,660.1	2.8
Lincoln	842.8	54,381.3	1.5
Natrona	126.8	72,952.0	0.2
Sweetwater	3,516.5	143,191.7	2.5
Idaho			
Ada	219.7	401,888.0	0.1
Bannock	4,441.2	63,360.7	7.0
Bear Lake	870.9	4,771.8	18.3
Cassia	1,171.6	11,072.3	10.6
Elmore	554.7	20,603.5	2.7
Franklin	372.2	6,287.5	5.9
Gooding	224.2	9,488.7	2.4
Jerome	498.8	16,661.0	3.0
Lincoln	22.9	3,371.3	0.7
Owyhee	734.1	4,866.0	15.1
Power	1,188.7	11,545.5	10.3
Twin Falls	461.7	60,201.2	0.8

1/ Estimated Project-related property tax revenues and actual property tax revenues from 2008 are in thousands of dollars ($000s).

2/ Property tax estimates are based on the projected value of the proposed improvements, including: transmission line and substation costs, transmission line ROW, communications fiber, regeneration stations, access, and permits.

3/ Property tax estimates for Ada, Canyon, Cassia, Elmore, Gooding, Jerome, Lincoln (Idaho), Owyhee, Power, and Twin Falls Counties are based on county-specific tax rates provided by Idaho Power. Estimates for the remaining counties are based on composite rates prepared by Rocky Mountain Power.

4/ These are actual property tax revenues received for 2010 and represent the total for all taxing districts in each county.

These estimates do not include potential tax revenues for individual municipalities within each affected county or account for potential negative impacts on local property tax revenues that could occur if the Project were to discourage or displace higher value development that might otherwise occur along or in the vicinity of the ROW. It is not possible to project development that would otherwise occur with any degree of certainty or the potential impact development of a transmission line would have on this type of development, and, therefore, it is not possible to quantify these potential impacts. However, almost half the Proposed Action would be constructed on public lands that are not subject to local property taxes, and an estimated 99.4 percent of the land use Analysis Area crosses land that is currently rangeland, agricultural, forest, water and wetlands, and existing ROW (see Section 3.17 – Land Use and Recreation, Table 3.17-2), which suggests that the potential for foregone high value development in many locations is likely to be low. There are, however, several locations where local governments and others have expressed concern that the proposed Project could negatively affect proposed municipal expansions or the potential for future expansions. These are discussed in Section 3.4.2.3 – Proposed Route and Alternatives by Segment, under Tax Revenues.

Operations of the Proposed Action would generate sales and use tax revenues in Wyoming and Idaho as a result of local operations and maintenance expenditures. These impacts are expected to be small, especially when compared to the construction-related impacts. Project operations would be centralized and rely upon the use of communications and automated controls. Local labor may be used when infrequent switching is necessary at the substations. Local expenditures are expected to be limited to occasional expenditures on gas and food by crew members.

Decommissioning

Decommissioning the Project would involve local expenditures for supplies and services and would likely require the temporary influx of construction workers to remove the project components. This spending would be expected to generate local sales and use tax. It is not possible to estimate approximate values but, adjusted for inflation, tax revenues would likely be generally equivalent to those estimated for construction, other conditions remaining equal. Removal of the Project would reduce the value of the affected property and result in a net reduction in ad valorem and property taxes, generally equivalent to the estimates developed for project operations.

The Wyoming ISC considers reclamation and restoration (referred to here as decommissioning) as a phase of work in the product life cycle, potentially eligible for impact assistance payments similar to those available for the construction phase.

3.4.2.3 Proposed Route and Alternatives by Segment

The Route Alternatives are alternatives to sections of the 10 segments that comprise the Proposed Route, not complete alternative routes or complete alternative segments (Table 3.4-33).

Table 3.4-33. Alternatives by Segment

Alternative Name	Net Change in Segment Length (miles)	Percent Change in Segment Length	Percent Change in Overall EPC Length
EPC 1 Analysis Area			
Alternative 1E-A	-1.5	-1	–
Alternative 1E-B	21.5	21	5
Alternative 1E-C	-26.7	-27	-7
Alternative 1W-A	-4.0	-5	-1
Alternative 2A	-0.4	–	–
Alternative 2B	-0.8	-1	–
Alternative 2C	-4.0	-4	-1
EPC 2 Analysis Area			
Alternative 4A	-5.0	-2	-2
Alternative 4B	10.0	5	5
Alternative 4C	11.4	6	6
Alternative 4D	10.6	5	5
Alternative 4E	12.0	6	6
Alternative 4F	-2.7	-1	-1
EPC 3 Analysis Area			
Alternative 5A	8.4	15	2
Alternative 5B	19.1	35	4
Alternative 5C	-7.1	-13	-1
Alternative 5D	-1.9	-4	–
Alternative 5E	-0.5	-1	–
Alternative 7A	2.8	2	1
Alternative 7B	11.3	10	2
Alternative 7C	0.2	–	–
Alternative 7D	0.6	–	–
Alternative 7E	0.7	1	–
Alternative 7F	0.3	–	–
Alternative 7G	0.1	–	–
Alternative 7H	9.4	8	2
Alternative 7I	55.3	47	11
Alternative 7J	58.2	49	12
Alternative 8A	2.2	2	–
Alternative 8B	0.5	–	–
Alternative 8C	-0.1	–	–
Alternative 8D	1.2	1	–
Alternative 8E	11.5	9	2
Alternative 9A	-0.1	–	–
Alternative 9B	3.8	2	1
Alternative 9C	0.6	–	–
Alternative 9D	1.2	1	–
Alternative 9E	11.5	7	2
Alternative 9F	5.7	4	1
Alternative 9G	-0.7	–	–
Alternative 9H	3.8	2	1

Table 3.4-34 identifies the net change in the number of estimated construction workers relative to the Proposed Route by county. In some cases, the miles of transmission line in one county are affected under more than one alternative. The miles of transmission line in Cassia County, Idaho, for example, would be affected under Alternatives 7C to 7J. The largest estimated change for each county is identified in Table 3.4-34 to ensure that the following analyses consider the largest potential impact to each county.

Table 3.4-34. Projected Construction Workforce for Route Alternatives by County

State/ County[1/]	Proposed Route (Miles)	Largest Net Change (Miles)[2/]	Percent Change in Miles	Estimated Change Relative to the Proposed Route			
				Peak Workers[3/]	Peak Workers Temporarily Relocating[4/]	Total Number of People Temporarily Relocating[5/]	Number of School-Age Children[6/]
Wyoming							
Albany	41.3	-41.3	-100	-42	-33	-44	-3
Carbon	162.5	16.5	10	15	12	15	1
Converse	77.3	-7.6	-10	-7	-6	-7	-1
Lincoln	59.6	16.5	28	35	28	37	3
Natrona	47.9	5.7	12	8	7	9	1
Sweetwater	148.0	-6.3	-4	-13	-10	-13	-1
Idaho							
Ada	27.6	14.0	51	37	29	38	3
Bannock	49.3	-3.6	-7	-9	-7	-9	-1
Bear Lake	36.8	1.8	5	6	5	6	–
Canyon	0.0	5.9	NA	16	13	17	1
Cassia	72.2	4.9	7	10	8	10	1
Elmore	72.4	15.6	22	30	24	31	2
Gooding	27.5	-12.6	-46	-25	-20	-26	-2
Jerome	29.6	3.5	12	14	11	14	1
Lincoln	2.5	-2.5	-100	-11	-9	-11	-1
Oneida	0.0	24.4	NA	55	44	57	4
Owyhee	110.4	-28.4	-26	-42	-34	-44	-3
Power	67.6	-16.3	-24	-39	-31	-40	-3
Twin Falls	54.4	44.6	82	56	45	59	5
Nevada							
Elko	0.0	9.4	NA	21	17	22	2

1/ Information is only presented for those counties that would be affected by one or more alternative.
2/ The miles of transmission line in some counties would be affected under more than one alternative. This column presents the largest change (positive or negative) that could occur in each county.
3/ Estimated changes in peak workers are based on the ratio of peak workers per mile by county estimated for the Proposed Route. Ratios vary by county. Estimates for counties not crossed under the Proposed Route are based on an average ratio for the entire line.
4/ Eighty percent of the construction labor force is assumed to be non-local and would need to temporarily relocate to the Analysis Areas.
5/ 10 percent of workers relocating to the Analysis Areas are assumed to be accompanied by their families.
6/ The average family size is assumed to consist of two adults and one school-age child.

Population

The Route Alternatives to the Proposed Route would result in changes to the proposed mileage in 19 counties, including Canyon and Oneida Counties, Idaho, and Elko County, Nevada, which are not crossed by the Proposed Route. The relative net changes in mileage range from a net decrease of 41 miles in Albany County, Wyoming, to a net addition of 45 miles in Twin Falls County, Idaho. Assuming that 80 percent of

the proposed construction workforce would temporarily relocate to the Analysis Area for the duration of their employment, and 10 percent of those relocating would be accompanied by their families, net changes in peak population relative to the Proposed Route would range from minus 44 in Owyhee County (Alternatives 9G and 9D) to plus 59 in Twin Falls County (Alternative 7J) (Table 3.4-34).

Economy and Employment

Substituting one or more of the Route Alternatives for the corresponding section or sections of the Proposed Route would not, in most cases, substantially affect the regional economic impact estimates presented for the Proposed Action in Table 3.4-26. Viewed in terms of miles of transmission line by EPC Analysis Area, the largest changes (positive or negative) by EPC Analysis Area would be a 7 percent decrease in total miles in the EPC 1 Analysis Area (Alternative 1E-C), a 6 percent increase in the EPC 2 Analysis Area (Alternatives 4C and 4E), and an 12 percent increase in the EPC 3 Analysis Area (Alternative 7J) (Table 3.4-33).

The largest potential impacts relative to the Proposed Action would occur under Alternatives 7I and 7J, which would add approximately 55 miles and 58 miles to the length of Segment 7, respectively, including 9.4 miles in Elko County, Nevada in both cases. As noted above, Alternative 7J would result in a 12 percent increase in the total miles constructed in the EPC 3 Analysis Area. This increase would translate into a corresponding increase in the inputs used to estimate the economic impacts for the EPC 3 Analysis Area (Table 3.4-25). Viewed in terms of employment, this would result in an approximate 9 percent increase in total (direct, indirect, and induced) employment compared to the Proposed Action. Peak annual employment (expressed as FTEs) is assumed to occur in the EPC 3 Analysis Area in 2016 (Table 3.4-26). All other things remaining the same, estimated total employment in this area in 2016 would increase from 645 under the Proposed Action to 705 under Alternative 7J (Table 3.4-35). Net changes in total estimated employment impacts are also presented for Alternative 1E-C (EPC 1 Analysis Area) and Alternatives 4C and 4E (EPC 2 Analysis Area) in Table 3.4-35.

Table 3.4-35. Projected Total Employment for Other Alternatives by EPC Analysis Area

EPC Analysis Area	2012	2013	2014	2015	2016	2017
Total Employment[1/]						
EPC 1 Alternative 1E-C[2/]	35	450	376	–	–	–
EPC 2 Alternative 4E[3/]	56	538	355	–	–	–
EPC 3 Alternative 7J[4/]	–	–	–	590	705	210
Net Change from Proposed Action						
EPC 1 Alternative 1E-B	-3	-34	-28	–	–	–
EPC 2 Alternatives 4C and 4E	4	36	24	–	–	–
EPC 3 Alternative 7J	–	–	–	50	60	18

1/ Total employment includes direct, indirect, and induced employment and would occur in industries throughout the Analysis Area economies, not just those in the construction sector.
2/ Substituting Alternative 1E-B for the comparison portion of the Proposed Route would decrease the length of transmission line in the EPC 1 Analysis Area by 7 percent.
3/ Substituting Alternative 4E for the comparison portion of the Proposed Route would increase the length of transmission line in the EPC 2 Analysis Area by 6 percent.
4/ Substituting Alternative 7J for the comparison portion of the Proposed Route would increase the length of transmission line in the EPC 3 Analysis Area by 12 percent.

Housing

The net changes in the number of workers who would temporarily relocate to each county, relative to the Proposed Action, are identified in Table 3.4-34. The relative net change in the projected peak demand for temporary housing would range from net decrease of approximately 35 housing units in Owyhee County to a net increase of 47 housing units in Owyhee County. These estimates are based on the number of peak workers who would temporarily relocate to the area (see Table 3.4-34). These and the other estimated changes in the number of peak workers expected to temporarily relocate shown in Table 3.4-34 would not affect the findings described earlier under the Proposed Action.

Commuting distances and times were estimated for the Route Alternatives and compared with commuting distances and times for the comparison portion of the Proposed Route.[1] There were some differences between the alternatives and the comparison portions of the Proposed Route, but in most cases the conclusions and potential mitigation measures identified for the comparison portion of the Proposed Route would apply to the Route Alternative. In five cases, comparison between a Route Alternative and its Proposed Route counterpart indicated that fewer temporary housing resources would be available within 90 minutes driving time under the alternative. These five cases are discussed below.

Alternative 1E-C

Under Alternative 1E-C, the impacts associated with Segment 1E would be similar to those described for Segment 1W in the Effects Common to All Action Alternatives section.

Alternative 5A

Under the Proposed Route, adequate temporary housing resources exist within 90 minutes driving time of the entire length of Segment 5, with most of the workers temporarily relocating to work on this segment expected to reside in Pocatello, Idaho. A small stretch of Alternative 5A (around MP 20) would be more than 90 minutes from communities with sufficient housing resources to accommodate projected demand. Sufficient temporary housing resources would, however, likely be available within 2 hours drive of the entire alternative.

Alternative 7H

Under the Proposed Route, adequate temporary housing resources exist within 90 minutes driving time of the entire length of Segment 7, with most of the workers temporarily relocating to work on this segment expected to reside in Pocatello and Twin Falls, Idaho. This would also be the case for the majority of Alternative 7H, with the exception of a short stretch between MP 40 and MP 50 where there would be insufficient resources within 90 minutes commute. Sufficient temporary housing resources would, however, likely be available within 2 hours drive of the entire alternative.

[1] The “comparison portion of the Proposed Route” refers to the portion of the Proposed Route that starts and ends at the same nodes as a Route Alternative.

Alternative 7I

Alternative 7I is approximately 55 miles longer than the comparison portion of the Segment 7 Proposed Route and runs through a more remote area in south Cassia and Twin Falls Counties in Idaho, crossing the state line, with approximately 9.4 miles located in Elko County, Nevada. There would be insufficient housing resources within 90 minutes driving time of one-third of this alternative; however, sufficient temporary housing would likely be available within 2 hours drive of the entire alternative.

Alternative 7J

Alternative 7J is approximately 58 miles longer than the comparison portion of the Segment 7 Proposed Route and like Alternative 7I runs through a more remote area in south Cassia and Twin Falls Counties in Idaho, crossing the state line, with approximately 9.4 miles located in Elko County, Nevada. There would be insufficient housing resources within 90 minutes driving time of one-third of this alternative; however, sufficient temporary housing would likely be available within 2 hours drive of the entire alternative.

In these cases, the Proponents would evaluate potential mitigation measures for the parts of the Route Alternatives with insufficient resources within 90 minutes drive, including the measures outlined in Section 3.4.3 – Mitigation Measures.

Property Values

The general property impacts, compensation, and property value impacts described above under Property Value Impacts would also apply to the Route Alternatives. The relative shares of public versus private land would vary by alternative as discussed in Section 3.17 – Land Use and Recreation.

Education

The net changes in the peak number of school-age children who would temporarily relocate to each county, relative to the Proposed Action, are identified in Table 3.4-34. These estimated changes range from minus 3 students to plus 5 students and are not expected to alter the conclusions presented with respect to the Proposed Action and education earlier in this section.

Public Services

The estimated net changes in workers and family members temporarily relocating to the affected counties identified in Table 3.4-34 are not expected to alter the conclusions presented with respect to the Proposed Action and public services earlier in this section.

Tax Revenues

The net changes in estimated sales and use tax revenues, relative to the Proposed Action, are identified by county in Table 3.4-36. The largest net gain in construction-related sales and use tax would occur in Twin Falls County (under Alternative 7J). This estimated increase in sales and use tax revenues would be collected by the State of Idaho and would not be directly distributed to Twin Falls County. This would also be the case with the other projected relative net increases and decreases in projected construction-related sales and use tax revenues in the affected Idaho counties.

Table 3.4-36. Projected Tax Revenues for the Other Alternatives by County

State/County[1/]	Total County Length Crossed by Proposed Route	Largest Net Change (Miles)	Percent Change in Miles	Estimated Change Relative to the Proposed Route	
				Construction Phase Sales and Use Tax Revenues ($000)[2/]	Ad Valorem and Property Tax Revenues ($000) [2/]
Wyoming					
Albany	41.3	-41.3	-100	-20.4	-172.3
Carbon	162.5	16.5	10	84.8	135.3
Converse	77.3	-7.6	-10	6.4	-21.9
Lincoln	59.6	16.5	28	50.0	232.4
Natrona	47.9	5.7	12	10.1	14.6
Sweetwater	148.0	-6.3	-4	-35.3	-57.3
Idaho					
Ada	27.6	14.0	51	37.5	109.4
Bannock	49.3	-3.6	-7	-10.8	-64.9
Bear Lake	36.8	1.8	5	6.5	42.8
Canyon	0.0	5.9	NA	10.9	57.2
Cassia	72.2	4.9	7	9.2	56.6
Elmore	72.4	15.6	22	11.1	118.7
Gooding	27.5	-12.6	-46	-23.2	-100.8
Jerome	29.6	3.5	12	7.6	33.2
Lincoln	2.5	-2.5	-100	-4.7	-22.9
Oneida	0.0	24.4	NA	50.5	442.2
Owyhee	110.4	-28.4	-26	-42.7	-169.8
Power	67.6	-16.3	-24	-37.0	-196.6
Twin Falls	54.4	44.6	82	71.0	375.5
Nevada					
Elko	–	9.4	NA	19.4	57.6

1/ Information is only presented for those counties that would be affected by one or more alternative.
2/ Estimated changes in tax revenues relative to the Proposed Action are presented in thousands of dollars ($000).

The largest relative net increase in estimated sales and use tax revenue in Wyoming would occur in Lincoln County (under Alternative 4D). This net gain in revenue would be distributed to the state and county, with approximately 46 percent paid to the state and the remainder paid to the county. This would also be the case with the projected relative net increases in the other Wyoming counties (Table 3.4-34).

Ad valorem tax (Wyoming) and property tax (Idaho) revenues are estimated for the Proposed Action for the purposes of analysis based on projected costs per mile and average state and county tax rates (see Table 3.4-32). Net changes in these estimates, relative to the Proposed Action, are also identified by county in Table 3.4-34.

These estimates do not include potential tax revenues for individual municipalities within each affected county or account for potential negative impacts on local property tax revenues that could occur if the Project were to discourage or displace higher value development that might otherwise occur along or in the vicinity of the ROW. As noted for the Proposed Action, existing land ownership and use patterns along the majority of the Analysis Area suggest that the potential for foregone higher value development is

low. There are, however, several locations where local governments and others have expressed concern that this could occur with long-term negative impacts to future tax revenues.

The City of Rockland in Power County, Idaho, has expressed concern that construction of Segment 7 of the proposed Project would hinder potential future growth of the city because this segment of the proposed transmission line would pass approximately 0.5 mile south of the city and cross an area where the City believes future growth would be likely to occur. Rockland, which had a total estimated population of 312 in 2009, estimates that this would result in foregone revenue from federal highway dollars paid per capita, and from local liquor taxes and property taxes (Power County Task Force 2009c, 2009f). These estimates are based on the assumption that 25 households that would otherwise move to Rockland over the next 40 years would, as a result of the proposed transmission line, move elsewhere. The City of Rockland has also indicated that Alternative 5D, which passes almost 3 miles east of the city at its closest point, would have similar impacts, but provided no supporting discussion (Power County Task Force 2010).

Under Alternative 8B, the proposed Project would pass close to a planned development near Mayfield in Elmore County, Idaho. This alternative also crosses approximately 6 miles of the city of Kuna in Ada County, as well as 3 miles of its city impact area in the vicinity of the Hemingway Substation. Alternative 8B also runs 2 miles along the north edge of the city impact area identified for the city of Melba in Canyon County (see Section 3.17 – Land Use and Recreation).

The City of Kuna and a number of private landowners in Kuna and Melba commissioned an evaluation of Alternative 8B (at that point the Proposed Route) with the goal of proposing a feasible alternative (ECS 2009). The ECS evaluation states that Alternative 8B would “considerably impair Kuna’s and Melba’s economic development opportunities by diminishing potential revenue from property taxes, building permits, and utility fees” from future planned developments like Osprey Ridge (ECS 2009). The ECS evaluation supports this contention with estimates of potential losses in future tax revenues, building permit fees, and potential utility billings based on potential impacts to the City of Kuna.

The area within the City of Kuna limits that would be crossed by Alternative 8B is currently largely agricultural land, with existing residential and commercial development mainly limited to farms and rural residences (Figure 3.17-10). Part of this area was recently annexed to include the proposed Osprey Ridge development and other smaller proposed developments; although the area is currently agricultural in use, the City of Kuna has installed sewer lines in this area and modified its treatment plant to accommodate future development (City of Kuna 2009b; Hasson 2010).

The estimates presented in the ECS (2009) evaluation were prepared by the City of Kuna (City of Kuna 2009b) based on conceptual site drawings for the proposed Osprey Ridge development. These estimates assume that if Alternative 8B were built, no development would occur within 660 feet of the centerline of the proposed transmission line, and the value of all future development—residential, office, and commercial—within 660 feet to 1,000 feet from the centerline would be permanently reduced by 10

percent. The Kuna estimates also assume that, in the absence of the transmission line, the area within 660 feet of the centerline would be developed for mixed use with an average residential density of 3.5 homes per acre, as well as relatively high density commercial/office, and public or church uses. Based on these assumptions, Kuna estimates that 1,563.8 houses that would otherwise be built incrementally over a 15-year period would not be constructed and 66 potential retail or office buildings would also be lost. Using these numbers, the City then estimates potentially foregone property tax revenues, building permit fees, and utility billings. In addition to the identified houses (1,563.8) and retail/office buildings (66), Kuna also appears to include lost revenues from schools and churches that are assumed would otherwise be built and identifies a total loss over 15 years of $69.7 million in public revenues.

The City of Kuna (2009b) notes with respect to these estimates that "(t)he aim of this exercise is to illustrate a minimal financial impact" and the estimates clearly illustrate that City of Kuna staff believe that construction of Alternative 8B would result in a *net* loss of future revenue, based on potential property tax revenues, building permit fees, and utility billings that would be foregone. They also illustrate the difficulties of trying to project foregone revenues from development that might otherwise occur.

Developing estimates of future behavior and outcomes requires a number of assumptions that may approximate future events or may not. In this case, the City of Kuna first projects what would happen in the absence of the transmission line and appears to assume that the area would be fully developed in accordance with development ratios identified in the conceptual site plans developed for Osprey Ridge. The City of Kuna has annexed land and made investments in infrastructure based on the assumption that this type of development will occur, and this may happen. However, other outcomes also seem possible at this time, given the current downturn in real estate markets.

Using this full development scenario as the baseline, the City of Kuna then makes some assumptions about how the proposed Osprey Ridge development would be affected by the proposed transmission line. It is possible that development may not occur within 660 feet if the proposed transmission line were built, as Kuna assumes, but there are many cases where a variety of land uses abut transmission line ROWs, as noted below. This assumption of a no development zone is central to Kuna's estimates but the extent of this impact is unknown and is not possible to predict with any degree of accuracy, especially for development that may or may not occur up to 15 years into the future.

The assumption that the area between 660 feet to 1,000 feet from the transmission line centerline would see a permanent decrease in value of 10 percent is also debatable. It is possible but so are many other possible outcomes. Most studies related to transmission lines and residential property values have found that factors such as general location, size of property, improvements, condition, and market supply and demand are more important than the presence or absence of a transmission line in determining the value of residential real estate. In the case of industrial and commercial real estate, research has indicated transmission lines have little impact (see the Property Value Impacts section).

Further, the analysis identifies two displaced schools and five displaced churches but appears to assume that rather than being displaced to another location they would not be built at all. This is consistent with the City of Kuna's position that a transmission line could result in the developer of the proposed Osprey Ridge development not providing the public amenities required as part of the city's Planned Unit Development zoning designation (City of Kuna 2009b). This is one possible outcome but again depends upon the assumption that no development would take place within 660 feet of the transmission line and that the schools and churches would simply not be built.

The City of Kuna estimates also appear to present permit fees and utility billings as gross rather than net revenue. Net revenue in the case of permit fees would, for example, be the difference between the fees paid by developers, schools, and churches, and the cost to provide the services the fees are paid for. In the case of utility billings, net revenue would be payments for services less the cost of providing those services. In other words, gross revenues present just one side of the equation—the benefits—and do not account for the costs of providing the services in question. Similarly, the property tax revenue estimates identify potential revenue the City assumes would otherwise be generated but, as City of Kuna (2009b) acknowledges, do not account for the property tax revenue that would be generated by the proposed transmission line.

Construction of the proposed transmission line along Alternative 8B could affect future development plans in the planned Osprey Ridge development and other areas identified as part of the city impact areas for Kuna and Melba, as could many other factors, including housing market trends and the availability of development capital. The presence of a transmission line corridor could discourage some development in the immediate vicinity, but high voltage transmission lines coexist with residential and other types of development in cities, suburbs, and rural subdivisions, throughout the United States, with many examples of commercial and residential development abutting the transmission line ROW.

3.4.2.4 Design Variation

A Design Variation is being considered that would consist of constructing two single-circuit lines in Segments 2 through 4 instead of a single double-circuit line (which is the design assessed above). The disturbance footprint of the two single-circuit towers is greater than that of the double-circuit tower, in part because the requested ROW would be wider, but also because helicopter-assisted construction could be implemented in these areas due to the lighter weight of the towers, which would require additional fly yards. The additional ROW space and the fly yards would cause additional temporary disturbance during construction. Across Segments 2, 3, and 4, the additional disturbance of the single-circuit tower alternative ranges from 25 to 30 percent greater than the comparable portions of the double-circuit tower disturbance under the proposed design. The two single circuits require more ground disturbance, but would be designed and constructed to the same standards as the Proposed Action. Construction of the Design Variation along Segments 2, 3, and 4 instead of the Proposed Action would not be expected to affect the findings described for the Proposed Action.

3.4.2.5 Structure Variation

The proposed guyed Structure Variation would add four guy wires about 140 feet long from a point about 100 feet up in each tower to four guy anchors spaced in a square around the tower (Appendix B, Figure B-6). Use of the Structure Variation would not be expected to affect the findings described for the Proposed Action.

3.4.2.6 Schedule Variation

The Schedule Variation uses the two single-circuit design variation described above but extends construction over a longer timeframe. Initially only one of the eventual two single-circuit lines would be constructed with the second to be constructed at a later date. The Schedule Variation proposes that the first single-circuit transmission line in Segments 2, 3, and 4 would be built as soon as a ROW grant is issued, but that the second line would not begin construction until late 2018. This would mean nearly 2 years between the end of construction for the first line and beginning of construction for the second line. Any staging areas and fly yards that had been used for the first stage would have been revegetated after construction was complete and would have to be cleared again. There would be two sets of construction disturbances adding movement, noise, and dust to the area of construction in two instances in any given area.

The Proponents' proposed schedule identifies general construction time frames by segment and substation, generally 2 to 5 years (see Table 2.1-7). Construction times by segment are, however, expected to be similar to those identified under the Proposed Action and range from about 8 months to 27 months; similarly, substation construction times would range from 2 to 9 months. This construction would take place within the broader timeframes identified in Table 2.1-7 but the exact timing is unknown. In addition, the start of construction could be delayed based on permitting. This could affect the years identified in the following section, but would not be expected to substantially change the estimated impacts. The combined labor requirements by EPC shown in Figures 3.4-9 through 3.4-12 are, therefore, based on a representative Project schedule and used here for the purposes of analysis.

The Schedule Variation would involve the same three EPC contracts identified for the Proposed Action (see Table 3.4-3 and Figure 3.4-5).

<u>Population</u>

Construction

Under the Schedule Variation, overall Project construction would occur between June 2012 and December 2020. Projected manpower requirements are summarized by week and EPC Analysis Area in Figures 3.4-9 through 3.4-12. In contrast to the Proposed Action, construction in each EPC Analysis Area would occur in two distinct phases under the Schedule Variation. Viewed in terms of Analysis Area, the projected average and peak temporary changes in population in the EPC 3 Analysis Area are similar to those projected under the Proposed Action. The projected changes in the other two Analysis Areas are approximately half the corresponding estimates under the Proposed Action (Table 3.4-37). Projected temporary peak increases in population would be less than 0.2 percent of the existing population in all three areas, ranging from

0.04 percent of the 2009 population in the EPC 3 Analysis Area to 0.13 percent in the EPC 1 Analysis Area (Table 3.4-38).

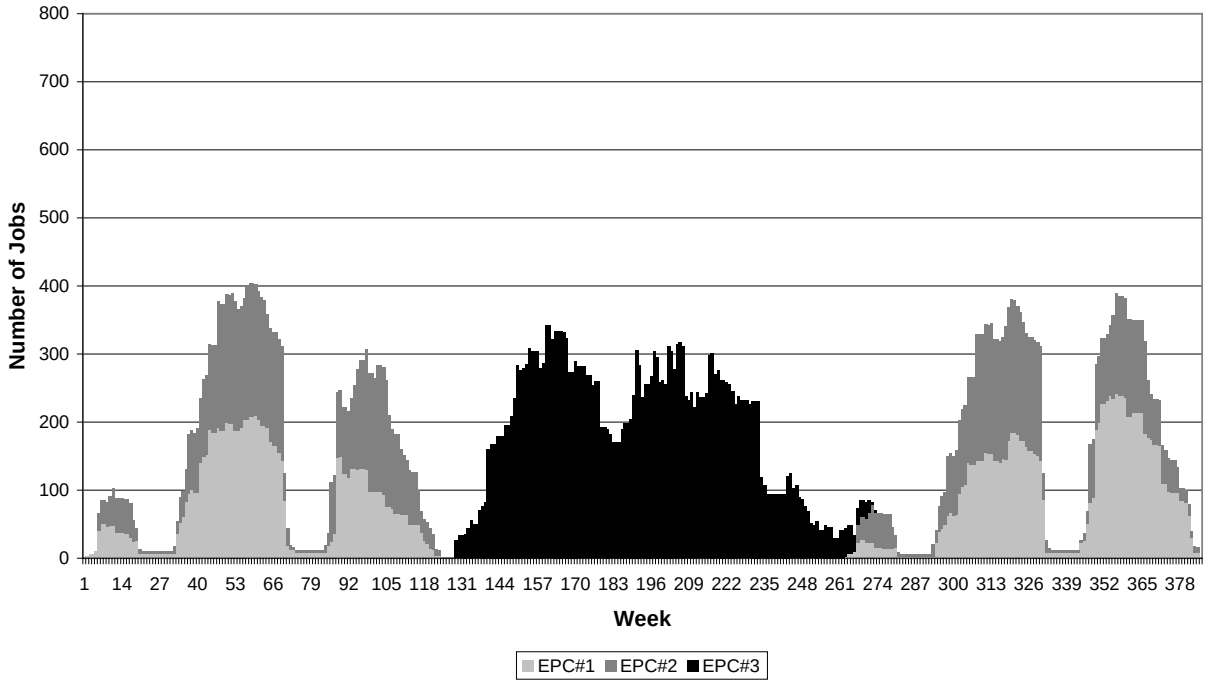


Figure 3.4-9. Schedule Variation – Total Project Labor Force by EPC Analysis Area and Week

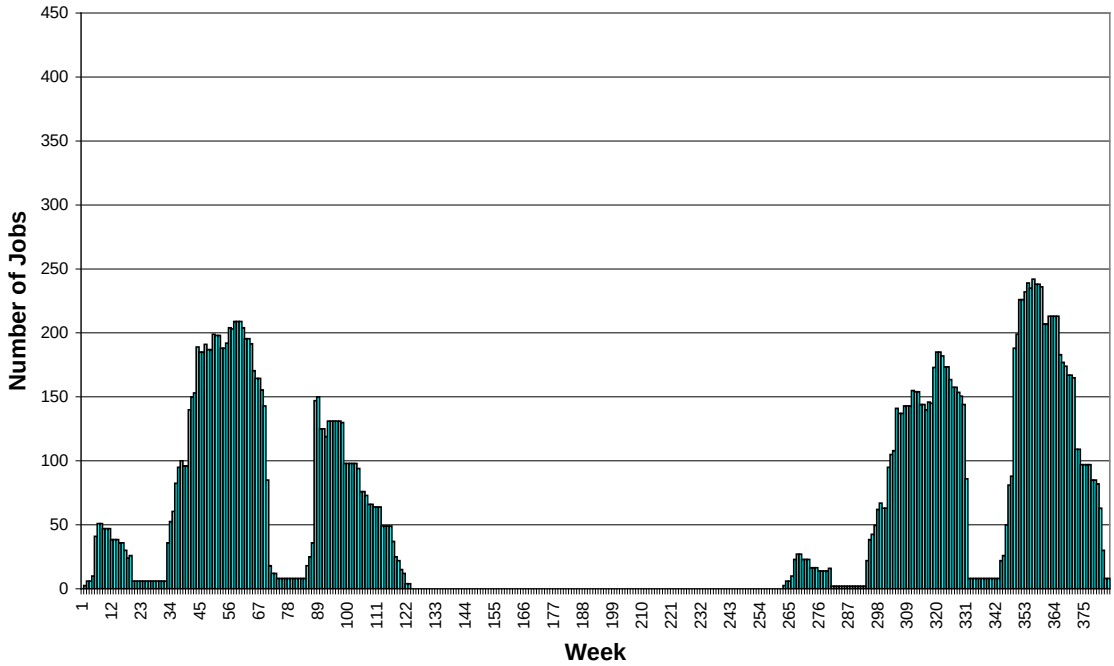


Figure 3.4-10. Schedule Variation—Project Workforce – EPC 1

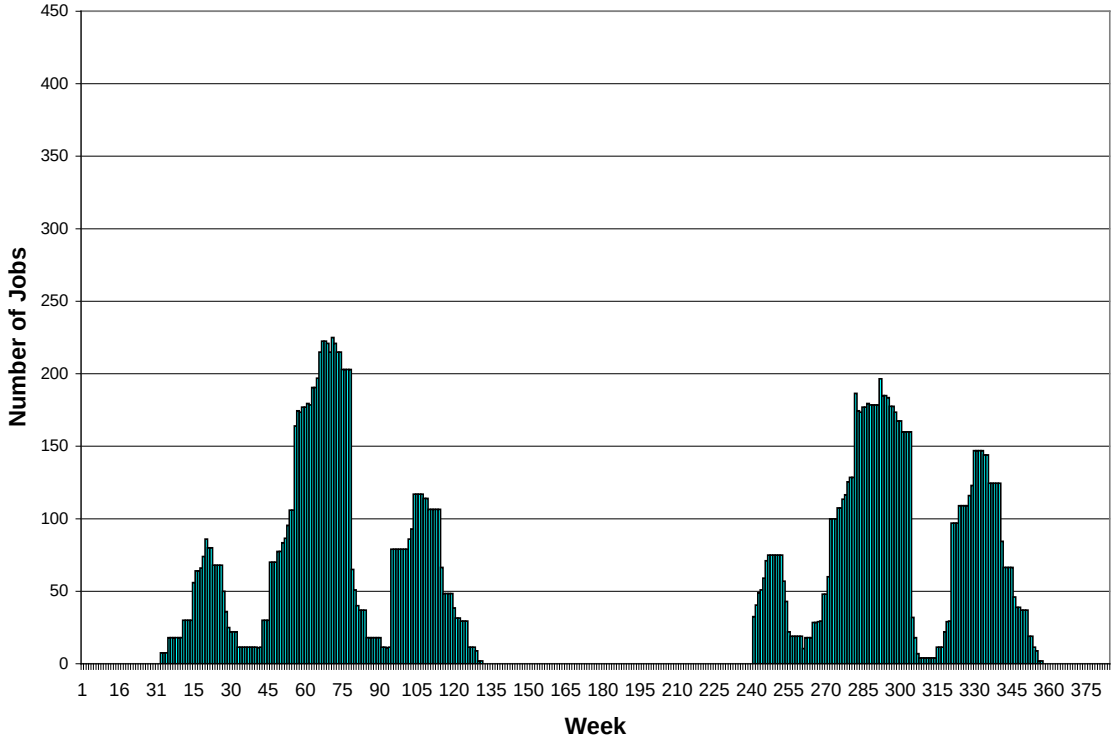


Figure 3.4-11. Schedule Variation—Project Workforce – EPC 2

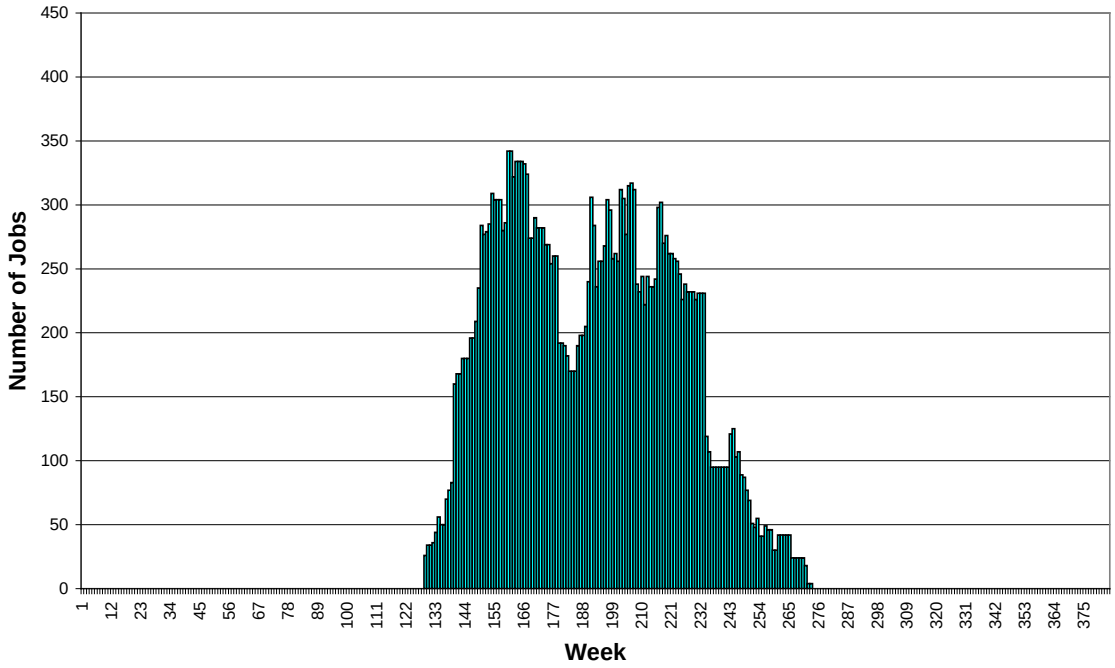


Figure 3.4-12. Schedule Variation—Project Workforce – EPC 3

Table 3.4-37. Schedule Variation Projected Construction Workforce by EPC Analysis Area

Workers	EPC 1	EPC 2	EPC 3
Average Weekly Forecast			
Commute to Job Site Daily [1/]	18	16	40
Move to the Affected Region alone [2/]	65	57	143
Move to the Affected Region with family [2/]	7	6	16
Total [3/, 4/]	**91**	**79**	**198**
Peak Employment Forecast			
Commute to Job Site Daily [1/]	48	39	68
Move to the Affected Region alone [2/]	172	142	246
Move to the Affected Region with family [2/]	19	16	27
Total [3/]	**239**	**197**	**342**

1/ Twenty percent of the average and peak workforce is expected to commute to and from the job site each day.
2/ Eighty percent of the average and peak workforce is expected to temporarily relocate to the Project area. Ten percent of workers temporarily relocating are assumed to be accompanied by their families for the purposes of analysis.
3/ Total average and peak employment estimates are based on the projected employment patterns illustrated in Figures 3.4-9 through 3.4-12.
4/ Average employment is estimated for each region based on the projected length of construction in that EPC region, not the overall Project construction period.

Table 3.4-38. Schedule Variation Projected Temporary Change in Population During Construction by EPC Analysis Area

Population	EPC 1	EPC 2	EPC 3
2009 Population [1/]	179,011	159,210	891,035
Average Employment Forecast			
Number of People Temporarily Relocating [2/]	87	76	190
As a Percent of 2009 Population	0.05	0.05	0.02
Peak Employment Forecast			
Number of People Temporarily Relocating [2/]	229	189	328
As a Percent of 2009 Population	0.13	0.12	0.04

1/ Population data are from the 2008 estimates prepared by the U.S. Census Bureau. These data are provided by county in Table 3.4-4.
2/ The number of people temporarily relocating assumes that 80 percent of the projected construction workforce would temporarily relocate to the county where they would be employed, with 10 percent of that total accompanied by their families (assuming an average family size of two adults and one child).

Viewed at the county level, projected temporary peak increases in population under the Schedule Variation range from 0.1 percent or less of the existing (2009) population in five of the affected counties to 1.9 percent in Bear Lake County, Idaho (Table 3.4-39). The projected changes by county are the same as they would be under the Proposed Action for the affected counties in Idaho. Projected increases would be lower under the Schedule Variation in Carbon, Converse, Lincoln, Natrona, and Sweetwater Counties, Wyoming (compare with Table 3.4-22).

Table 3.4-39. Schedule Variation Projected Temporary Change in Population During Construction by County

State/County	2009 Population 1/	Average Employment Forecast		Peak Employment Forecast	
		Number of People Temporarily Relocating 2/	Percent of 2009 Population	Number of People Temporarily Relocating 2/	Percent of 2009 Population
Wyoming					
Albany	33,979	15	0.0	38	0.1
Carbon	15,720	43	0.3	115	0.7
Converse	13,578	15	0.1	66	0.5
Lincoln	16,995	23	0.1	63	0.4
Natrona	74,508	16	0.0	59	0.1
Sweetwater	41,226	59	0.1	159	0.4
Idaho					
Ada	384,656	28	0.0	79	0.0
Bannock	82,539	30	0.0	78	0.1
Bear Lake	5,774	40	0.7	110	1.9
Cassia	21,698	61	0.3	135	0.6
Elmore	28,820	28	0.1	104	0.4
Franklin	12,676	17	0.1	71	0.6
Gooding	14,430	20	0.1	52	0.4
Jerome	21,262	29	0.1	89	0.4
Lincoln	4,645	7	0.2	11	0.2
Owyhee	11,223	51	0.5	132	1.2
Power	7,734	33	0.4	96	1.2
Twin Falls	75,296	32	0.0	67	0.1

1/ Population data are from the 2009 estimates prepared by the U.S. Census Bureau (see Table 3.4-4).
2/ The number of people temporarily relocating assumes that 80 percent of the projected construction workforce would temporarily relocate to the county where they would be employed, with 10 percent of that total accompanied by their families (assuming an average family size of two adults and one child).

Operations

Operating staff requirements would be the same under the Schedule Variation as under the Proposed Action. These estimated staffing requirements would have no noticeable impact on existing population levels in the potentially affected areas.

Decommissioning

When the Project is decommissioned, a labor force approximately equal to that needed for its construction would be deployed. As discussed for the Proposed Action, impacts from decommissioning under the Schedule Variation are expected to be similar to those from construction.

Economy and Employment

Construction of the Proposed Action would result in a temporary increase in employment and income in the affected local economies. Employment associated with construction would be temporary and last only for the duration of the construction phase of the Project (see Figure 3.4-9). The total economic impacts of construction under the Schedule Variation were evaluated using the same input-output models that were used to assess the Proposed Action.

Construction

Construction of the Schedule Variation would generate economic activity in the EPC Analysis Areas in the form of Project-related expenditures on materials and supplies. The Project would also employ construction workers who would in turn be expected to spend much of their income within the Analysis Areas and increase output in the sectors that provide consumer goods and services.

Project-related expenditures are estimated by EPC Analysis Area and assumed to mainly comprise local expenditures on foundation materials, where available, and miscellaneous Project purchases, such as gas, parts, repairs, tires, and supplies. Total FTE employment is estimated by EPC Analysis Area and year based on the distribution of projected employment shown in Figures 3.4-9 through 3.4-12. Annual spending estimates and FTE employment projections were modeled as inputs to the IMPLAN model analyses (Table 3.4-40).

Table 3.4-40. Schedule Variation Inputs Used for the Economic Impact Analysis

Analysis Area[1/]	2012	2013	2014	2015	2016	2017	2018	2019
Local Expenditures on Materials and Supplies ($000)								
EPC 1	3,203	4,322	795	–	322	4,765	4,369	38
EPC 2	2,156	5,939	1,702	–	527	5,352	3,894	39
EPC 3	–	–	–	14,409	826	–	7,169	2,067
Employment (FTE)								
EPC 1	71	178	35	–	5	134	185	1
EPC 2	39	171	72	–	13	155	113	1
EPC 3	–	–	–	443	28	–	226	82
Income ($000)								
EPC 1	3,060	7,497	1,484	–	259	5,733	7,783	66
EPC 2	1,725	7,312	3,025	–	574	6,619	4,825	58
EPC 3	–	–	–	19,593	1,244	–	9,961	3,524

1/ Estimated expenditures and income are presented in thousands of dollars.
2/ The counties included in each EPC Analysis Area are shown in Figure 3.4-5.

The overall totals for each category and EPC Analysis Area under the Schedule Variation are the same as those estimated for the Proposed Action. Total local expenditures in the EPC 1 Analysis Area are, for example, estimated to be $17.8 million under both the Proposed Action and the Schedule Variation. This is the case with all the other categories and EPC Analysis Areas identified in Tables 3.4-25 and 3.4-40.

The total (direct, indirect, and induced) estimated regional economic impacts are summarized for the Schedule Variation by EPC Analysis Area and year in Table 3.4-41.

These impacts expressed in terms of local industrial output (sales), employment, and labor income would be one-time annual impacts and would occur in the counties that compose each EPC Analysis Area. The total impacts are the same as those estimated for the Proposed Action, but would be distributed over longer periods of time.

Table 3.4-41. Schedule Variation Projected Total (Direct, Indirect, and Induced) Economic Impacts

Analysis Area[1/]	2012	2013	2014	2015	2016	2017	2018	2019
Output ($000)								
EPC 1	6,416	11,262	2,153	–	607	10,458	11,542	99
EPC 2	3,930	13,079	4,336	–	952	11,211	8,327	90
EPC 3	–	–	9,804	35,231	2,406	–	14,782	6,448
Employment								
EPC 1	108	270	53	–	8	205	280	2
EPC 2	62	273	112	–	19	240	177	2
EPC 3	–	–	135	710	49	–	340	144
Labor Income ($000)								
EPC 1	2,297	3,847	731	–	220	3,679	3,934	34
EPC 2	1,461	4,672	1,508	–	354	4,044	2,992	32
EPC 3	–	–	3,470	12,185	828	–	5,036	2,202

1/ The counties included in each EPC Analysis Area are identified in Figure 3.4-5.
2/ All totals include direct, indirect, and induced impacts. Indirect and induced impacts would occur in industries throughout the Analysis Area economies, and not just those in the construction sector.
3/ Output is the sum of total (direct, indirect, and induced) output for all affected industries in the Analysis Area economy. Industrial output represents the total value of an industry's production.
4/ Estimated expenditures and income are presented in thousands of dollars.

Total estimated employment impacts are shown graphically by EPC Analysis Area and year in Figures 3.4-13 through 3.4-15.

Operations

Operations of the Proposed Action under the Schedule Variation would generate economic activity in the EPC Analysis Areas in the form of operations and maintenance-related expenditures on materials and supplies. These impacts are expected to be small, especially when compared to the construction-related impacts. Project operations would be centralized and rely upon the use of communications and automated controls. Local labor may be used when infrequent switching is necessary at the substations. Local expenditures are expected to be limited to occasional expenditures on gas and food by crew members.

Decommissioning

When the Project is decommissioned, a labor force approximately equal to that needed for its construction would be deployed. Local expenditures on materials and supplies and payments to workers would likely be similar, resulting in broadly similar economic impacts to those from construction.

Agriculture

Potential impacts to the agricultural sector would be the same under the Schedule Variation as under the Proposed Action, with the difference that construction would take place over a longer time frame in some areas. Operations and decommissioning impacts would be the same as they would be under the Proposed Action.

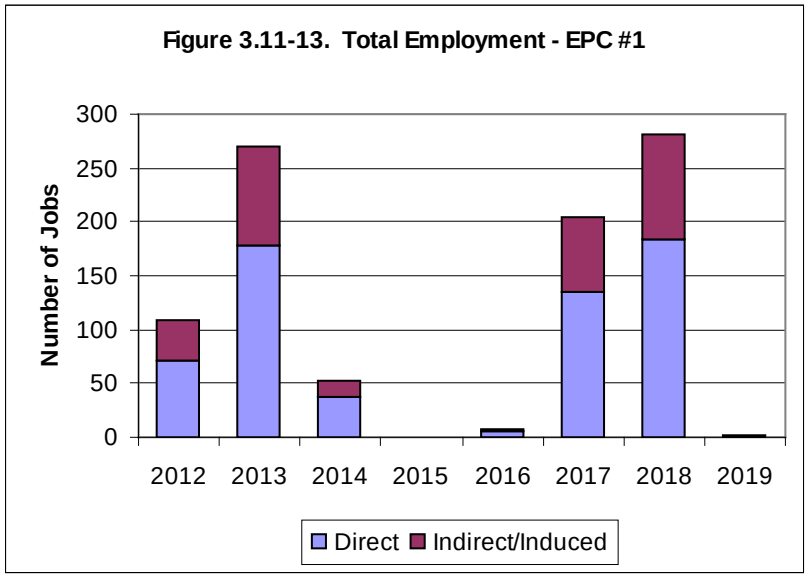


Figure 3.4-13. Schedule Variation Total Employment – EPC 1

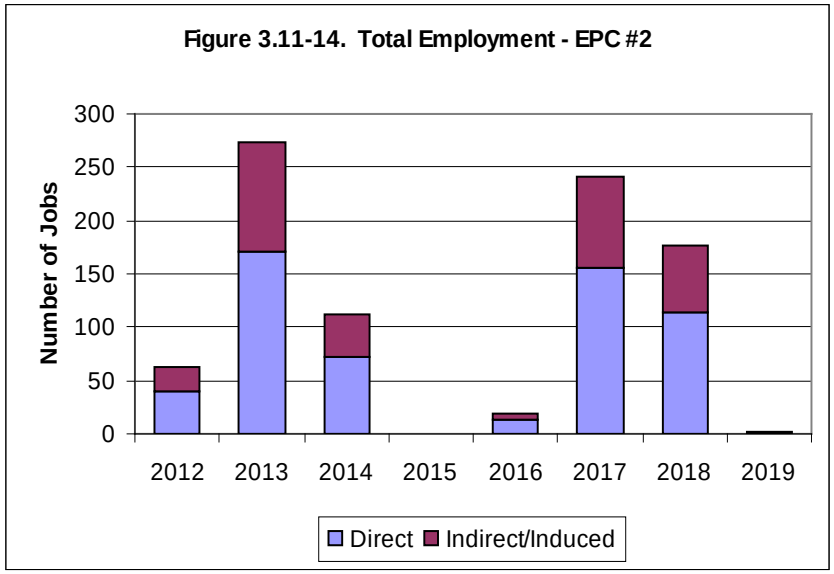


Figure 3.4-14. Schedule Variation Total Employment – EPC 2

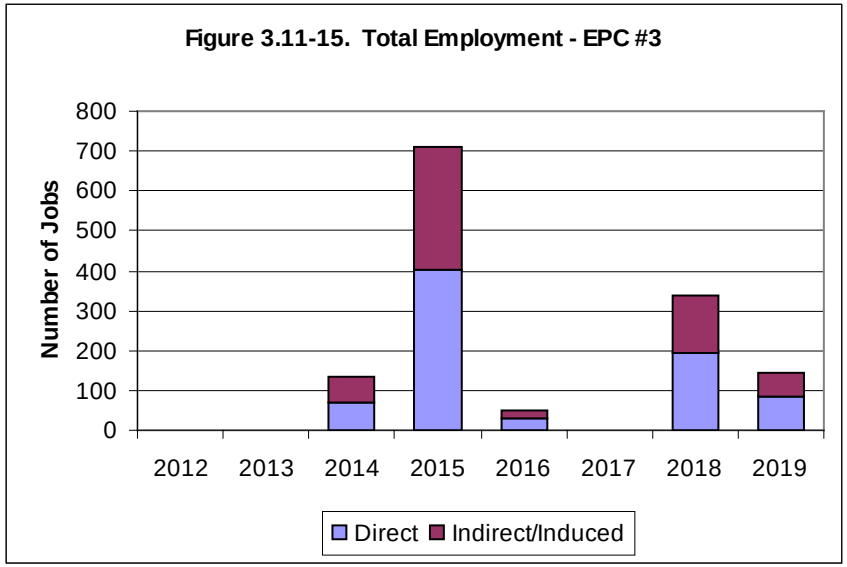


Figure 3.4-15. Schedule Variation Total Employment – EPC 3

Timber

Projected timber harvest volumes and estimated stumpage values would be the same under the Schedule Variation as they would be under the Proposed Action (see Table 3.4-27), with the difference that harvest would take place over a longer time frame in some areas. Operations and decommissioning impacts would be the same as they would be under the Proposed Action.

Housing

The methodology used to assess the projected demand for housing is described in Section 3.4.2.2. Table 3.4-42 compares projected peak housing demand under the Schedule Variation by housing type with the existing housing resources available in 2008 by EPC Analysis Area. Projected demand in the EPC 3 Analysis Area would be higher under the Schedule Variation than under the Proposed Action. Projected peak demand in each of the other two EPC Analysis Areas would be slightly more than half the corresponding estimates under the Proposed Action. The data summarized in this table indicate that there are sufficient housing resources to meet projected peak housing demand by EPC Analysis Area.

Table 3.4-42. Schedule Variation Projected Housing Demand by Housing Type and Analysis Area

Analysis Area[1/]	EPC 1	EPC 2	EPC 3
Projected Non-Local Employment[2/]			
Construction Duration (Weeks)	232	247	136
Average Employment (Jobs/Week)	73	63	159
Peak Employment (Jobs/Week)	245	225	467
Projected Peak Housing Demand[3/]			
RV Spaces	69	63	131
Rental Housing	59	54	112
Total Motel/Hotel Rooms	69	63	131
Estimated Available Housing Units[4/]			
RV Spaces	1,445	1,000	2,777
Available Rental Housing Units[5/]	762	1,247	6,144
Total Motel/Hotel Rooms	8,024	4,127	11,200
Available Hotel and motel Rooms[6/]	802	413	1,120
Projected Peak Demand as a Share of Existing Resources			
RV Spaces	5%	6%	5%
Estimated Available Housing Units	8%	4%	2%
Available Hotel and motel Rooms	9%	15%	12%

1/ The counties included in each EPC Analysis Area are identified in Table 3.4-3.
2/ Eighty percent of the peak construction labor force is assumed to be non-local for the purposes of analysis.
3/ Projected housing demand is assumed to be divided as follows: RV spaces (35 percent); Rental Housing (30 percent; including Houses/Apartments [25 percent] and Mobile Homes [5 percent]); and Hotel and Motel Rooms (35 percent).
4/ A detailed explanation of how these data were derived is provided in Section 3.4.1.5, Housing subsection, of this EIS. Available rental housing units are identified for the counties included in each Analysis Area. RV Spaces and hotel and motel rooms are identified for communities located within 20 miles.
5/ Note that many of these available units include more than one bedroom and, if rented, would likely be occupied by more than one construction worker temporarily relocating to the area.
6/ Assumes that 10 percent of the hotel and motel rooms identified within 20 miles would normally be vacant and available for rent.

As noted for the Proposed Action, while there may be sufficient housing resources when viewed from an EPC Analysis Area perspective, many of the counties crossed by the proposed transmission line segments have low population densities and parts of the segments cross undeveloped areas that are more than 90 minutes commute from the closest larger community. This is addressed in the segment housing analysis presented for the Proposed Action, which evaluates the availability of housing resources based on commuting distances and times to the proposed transmission line segments.

Projected peak demand for temporary housing by segment would be the same as under the Proposed Action for 7 of the 11 segments that would involve construction. The projected construction date for Segment 1W(c) would shift from 2013 to between November 2018 and January 2020 but would otherwise stay the same. Three other segments (Segments 2, 3, and 4) would consist of two single-circuit lines on an extended construction schedule. In each case, the first circuit would be constructed between June 2013 and December 2016, with the second circuit built between November 2018 and January 2020. Housing demand would be about half that evaluated for these segments under the Proposed Action but would occur during two construction phases, rather than the one projected under the Proposed Action. These changes would not affect the findings described for the majority of these segments under the Proposed Action. Peak demand for housing would be reduced for Segment 4 but would still exceed the supply of housing in the same locations that are discussed with respect to the Proposed Action. The potential housing mitigation measures discussed with respect to the Proposed Action segments, including the measures outlined in Section 3.4.3 – Mitigation Measures, would also be applicable to this Schedule Variation.

Property Values

The general property impacts, compensation, and property value impacts described for the Proposed Action would also apply to the Schedule Variation.

Education

The projected peak number of school children relocating to the EPC 3 Analysis Area would be similar under the Schedule Variation as under the Proposed Action. The projected peak number of children in each of the other two EPC Analysis Areas is approximately half the corresponding estimates under the Proposed Action. The projected peak number of school children temporarily relocating to the area under the Schedule Variation would be equivalent to approximately 0.02 percent to 0.09 percent of the existing enrollment in school districts in the EPC Analysis Areas and would have no noticeable effect on existing average student/teacher ratios. Operations of the proposed transmission line and associated facilities is also not expected to have an impact on education resources in the Analysis Areas.

Public Services

The estimated net changes in workers and family members temporarily relocating to the affected counties under the Schedule Variation are the same as they would be under the Proposed Action for the affected counties. Projected increases would be lower under the Schedule Variation in Carbon, Converse, Lincoln, Natrona, and Sweetwater

Counties, Wyoming. The Schedule Variation would, therefore, not be expected to alter the conclusions presented with respect to the Proposed Action and public services in Section 3.4.2.2.

Tax Revenues

Construction

Estimated construction-related sales and use tax revenue is summarized for the Proposed Action by potentially affected Wyoming and Idaho counties in Tables 3.4-30 and 3.4-31. These tax revenues were estimated based on Project expenditures on construction supplies and equipment. They are not broken down by year. Project expenditures on construction supplies and equipment, and expenditures by construction workers are assumed to be the same under the Schedule Variation as they would be under the Proposed Action. As a result, the estimated tax revenues summarized in Tables 3.4-30 and Table 3.4-31 are equally applicable to this alternative.

Operations

Although construction in two of the EPC Analysis Areas and five of the counties in Wyoming would be distributed over a longer period of time under the Schedule Variation, the projected value of the Project would be the same as under the Proposed Action. As a result, the estimated impacts to ad valorem (Wyoming) and property (Idaho) taxes that are presented in Table 3.4-32 would also apply to the Schedule Variation.

3.4.3 Mitigation Measures

Construction activities, depending on alternatives chosen, could extend approximately 1,100 miles across three states and multiple counties, and some of the areas crossed have limited housing resources. Housing shortages could occur in some locations if the Project coincides in time and space with other construction or development projects that involve large transient workforces. This type of scenario could result in fewer housing resources being available than is normally the case.

The Proponents should address these types of potential housing shortages prior to construction by updating the housing analysis to reflect current conditions at the time of construction, including EPC-specific housing demands by community and housing type, the available supply of housing units, and projected demand from other sources, based on average demand patterns and demand from other large permitted and scheduled projects.

In addition, the Proponents should prepare and submit a Housing Plan for review and approval. The Housing Plan must address those areas in Wyoming and Idaho where potential housing shortage concerns are identified and must demonstrate mitigation of any projected housing shortage during construction. The Agencies recommend that the Proponents incorporate the following measure into their EPMs and apply it Project-wide.

To whom should this housing plan be submitted and who will approve it and what will happen if it is neither submitted nor approved?

SOC-1 Housing Plan

- Contract with local motels and hotels for temporary accommodation within daily commuting distance of the Project site. Temporary accommodations will be selected based on value, cleanliness, and proximity to the Project site.
- Contract with local RV parks for rental spaces to accommodate workers who have access to RVs.
- If temporary accommodation is not available within the Project area, seek motel and hotel accommodations outside the Project area. In this event, the Proponents would provide transportation to the Project site in the form of buses or vans, depending on workforce numbers, to ensure workers arrive at the Project site safely.
- If sufficient temporary accommodation is not available, depending on the location and the number of workers involved, the Proponents would explore other temporary housing options, including the use of temporary housing facilities established for other projects, establishing temporary RV lots, and developing Project-specific temporary housing camps. The Proponents would provide bus or other transportation to the Project site if these facilities were located outside the Project area.

3.5 ENVIRONMENTAL JUSTICE

This section addresses potential impacts from the Proposed Route and Route Alternatives during construction, operations, and decommissioning. This section analyzes the potential for Project activities to have disproportionately high or adverse human health or environmental effects on minority and/or low income populations in accordance with EO 12898.

3.5.1 Affected Environment

This section discusses those aspects of the environment that could be impacted by the Project. It starts with a discussion of the Analysis Area considered, identifies the issues that have driven the analysis, and characterizes the existing conditions along the Proposed Route and Route Alternatives in Wyoming, Idaho, and Nevada.

3.5.1.1 Analysis Area

The Analysis Area for environmental justice is the counties crossed or potentially affected by the proposed transmission line and alternatives and associated facilities. These counties are identified in Section 3.4 – Socioeconomics (Tables 3.4-1 through 3.4-3).

3.5.1.2 Issues to be Analyzed

The following environmental justice–related issues were brought up by the public during public scoping (Tetra Tech 2009a), were raised by federal and state agencies during scoping and agency discussions, or are issues that must be considered as stipulated in law or regulation:

- What the effects would be on minority populations or communities;
- What the effects would be on low income populations or communities, and
- What the effects would be on Tribes.

3.5.1.3 Regulatory Framework

EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires each federal agency to make the achievement of environmental justice part of its mission by identifying and addressing disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations. The EO further stipulates that the agencies conduct their programs and activities in a manner that does not have the effect of excluding persons from participation in them, denying persons the benefits of them, or subjecting persons to discrimination because of their race, color, or national origin.

3.5.1.4 Methods

Identifying whether disproportionately high and adverse impacts on minority and/or low-income populations would occur typically involves two steps: first, identifying whether minority and/or low-income communities are present, and, then, if these types of communities are present, evaluating whether high and adverse human health or

environmental effects would disproportionately affect the identified community or communities.

Data from the U.S. Census Bureau are used to identify minority and/or low-income communities that could be affected by the proposed Project. The results of other resource-specific analyses conducted for this Project are used to evaluate the potential for adverse or human health effects.

3.5.1.5 Existing Conditions

Guidelines provided by the CEQ (1997a) and USEPA (1998) indicate that a minority community may be defined as either: 1) where the minority population comprises more than 50 percent of the total population, or 2) where the minority population is meaningfully greater than the minority population in the general population of an appropriate benchmark region used for comparison. Minority communities may consist of a group of individuals living in geographic proximity to one another, or a geographically dispersed set of individuals who experience common conditions of environmental effect. Further, a minority population exists if there is “more than one minority group present and the minority percentage, as calculated by aggregating all minority persons, meets one of the above-stated thresholds” (CEQ 1997a).

The CEQ and USEPA guidelines indicate that low income populations should be identified based on the annual statistical poverty thresholds established by the U.S. Census Bureau. Like minority populations, low income communities may consist of individuals living in geographic proximity to one another, or a geographically dispersed set of individuals who would be similarly affected by the proposed action or program. The U.S. Census Bureau defines a poverty area as a census tract or other area where at least 20 percent of residents are below the poverty level (U.S. Census Bureau 2008b).

The potentially affected counties range from approximately 600 square miles to more than 10,000 square miles (see Table 3.4-4 in the Section 3.4 – Socioeconomics). Larger and more populated geographic areas may have the effect of “masking” or “diluting” the presence of concentrations of minority and/or low income populations (CEQ 1997a; USEPA 1998). Data were, therefore, also reviewed at the census block group level to identify the potential existence of minority and/or low income communities. A census block group is a subdivision of a census tract and typically contains between 600 and 3,000 people.

The Proposed Route and Route Alternatives cross 67 census block groups, which range from approximately 4 square miles to 4,367 square miles. Approximately 80 percent (52) of these block groups are less than 1,000 square miles. The large areas included in some of these census block groups reflect the lightly populated and undeveloped nature of much of the Analysis Area. Slightly more than half of the affected block groups (34 out of 67) had less than 1,000 residents in 2000 (the most recent data available at this geographic scale) and just two had more than 2,000 residents (U.S. Census Bureau 2000c).

Race and Ethnicity

Counties

The populations of Wyoming and Idaho are predominantly White, with White persons comprising 86 percent and 84 percent of the estimated populations in these states in 2010, compared to 64 percent in the United States as a whole. Persons identified as White alone accounted for 54 percent of the total population in Nevada in 2010 (Table 3.5-1). In the potentially affected Wyoming counties, the percent of the population identified as White in 2010 ranged from 80 percent in Carbon County to 94 percent in Lincoln County. In the Idaho counties, the percent of the population identified as White ranged from 66 percent in Power County to 95 percent in Bear Lake and Oneida Counties. An estimated 69 percent of the population in Elko County, Nevada, was White in 2008 (Table 3.5-1).

Table 3.5-1. Race and Ethnicity by County, 2010

Geographic Area	Total Population	Percent of Total Population				
		White[1/]	Hispanic or Latino	American Indian and Alaska Native[1/]	Other Race[1/,2/]	Two or More Races[1/]
Wyoming	**563,626**	**85.9**	**8.9**	**2.1**	**1.7**	**1.5**
Albany	36,299	84.8	8.8	0.5	4.0	1.8
Carbon	15,885	79.8	16.8	0.8	1.5	1.1
Converse	13,833	91.3	6.3	0.6	0.6	1.1
Lincoln	18,106	93.5	4.3	0.7	0.6	0.9
Natrona	75,450	89.1	6.9	0.8	1.6	1.6
Sweetwater	43,806	80.9	15.3	0.7	1.8	1.3
Idaho	**1,567,582**	**84.0**	**11.2**	**1.1**	**2.0**	**1.7**
Ada	392,365	86.5	7.1	0.5	3.8	2.1
Bannock	82,839	86.4	6.7	2.8	2.3	1.8
Bear Lake	5,986	94.7	3.6	0.4	0.6	0.7
Canyon	188,923	72.3	23.9	0.7	1.5	1.7
Cassia	22,952	72.9	24.9	0.5	0.8	0.9
Elmore	27,038	75.1	15.2	0.8	5.9	2.9
Franklin	12,786	91.8	6.6	0.3	0.4	0.9
Gooding	15,464	69.6	28.1	0.6	0.6	1.2
Jerome	22,374	66.9	31.0	0.7	0.6	0.9
Lincoln	5,208	69.3	28.3	0.6	0.8	1.0
Oneida	4,286	95.0	2.9	0.5	0.7	0.8
Owyhee	11,526	68.3	25.8	3.7	0.8	1.4
Power	7,817	66.1	29.8	2.1	0.7	1.4
Twin Falls	77,230	82.7	13.7	0.6	1.7	1.4
Nevada	**2,700,551**	**54.1**	**26.5**	**0.9**	**15.5**	**2.9**
Elko	48,818	69.1	22.9	4.7	1.8	1.6
United States	**308,745,538**	**63.7**	**16.3**	**0.7**	**17.2**	**1.9**

1/ Non-Hispanic only. The federal government considers race and Hispanic/Latino origin to be two separate and distinct concepts. People identifying Hispanic or Latino origin may be of any race. The data summarized in this table present Hispanic/Latino as a separate category.

2/ The "Other Race" category presented here includes census respondents identifying as "Black or African American," "Asian," "Native Hawaiian and Other Pacific Islander," or "Some Other Race." The relative high percentage of the populations of the U.S. and Nevada in this category (17.2 percent and 15.5 percent, respectively) reflects the inclusion of the Black or African American population, which comprised 12.2 percent of the national population and 7.7 percent of Nevada in 2010, but just 0.8 percent and 0.6 percent in Wyoming and Idaho, respectively.

Source: U.S. Census Bureau 2011a

Persons of Hispanic or Latino origin are the largest minority group in Wyoming, Idaho, and Nevada, and all of the potentially affected counties. Hispanic or Latino populations comprised more than 20 percent of the total population in seven of the counties in Idaho in 2010 (Table 3.5-1). Persons of Hispanic or Latino origin also comprised more than 20 percent of the total population in Elko County, Nevada.

American Indians and Alaska Natives comprised less than 1 percent of total population in the affected Wyoming counties in 2008. There are no Indian Reservations located in these counties. In Idaho, American Indians and Alaska Natives comprised less than 1 percent of the population in most of the potentially affected counties; the exceptions were Owyhee (3.7 percent), Bannock (2.8 percent), and Power (2.1 percent) Counties. American Indians and Alaska Natives accounted for 4.6 percent of the population in Elko County, Nevada, in 2008. The relatively high percentages in these four counties reflect the presence of the Fort Hall Indian Reservation, part of which is in Power and Bannock Counties; and the Duck Valley Indian Reservation, partially located in Owyhee County, Idaho, and Elko County, Nevada. The Proposed Route would not cross either of these reservations and would be located more than 60 miles north of the Duck Valley Indian Reservation. Alternative 5C would cross the Fort Hall Indian Reservation in Power County and this is reflected in the census block group data discussed below.

Census Block Groups

Race and ethnicity data from the 2010 Census are available at the census block group level. The percent of the population identifying as White alone in the 2010 Census exceeded 50 percent in all but one of the potentially affected census block groups, with shares ranging from 55 percent to 97 percent, and, as a result, the population in these census block groups did not meet the definition of a minority community based on the criteria that the minority population comprises more than 50 percent of the total population. The block group that would be crossed in Elko County, Nevada, is the one exception, with 42 percent of the total population identifying as White in the 2000 Census and a minority population that exceeds 50 percent of the total (Table 3.5-2).

The minority population in each census block group was also compared with its respective county average in 2010 to identify areas where the minority population is potentially “meaningfully greater” than the minority population in the general population. This comparison identified ten census block groups (including the one in Elko County) where the Hispanic or Latino share of the population was more than 10 percent higher than the county average. In addition, the American Indian and Alaska Native share of the population of one of the census block groups in Power County was 15 percent, compared to a county average of 2 percent (Table 3.5-2).

Table 3.5-2. Race and Ethnicity Census Block Group Comparison

County/Block Group	Total Population 2010[1/]	Percent of Total Population 2000				
		White[2/]	Hispanic or Latino	American Indian and Alaska Native[2/]	Other Race[2/,3/]	Two or More Races[2/]
Cassia County, Idaho	**22,952**	**72.9**	**24.9**	**0.5**	**0.8**	**0.9**
Block Group 1, Census Tract 9501	680	61.5	36.2	2.2	–	0.1
Block Group 1, Census Tract 9506	1,024	59.6	38.4	0.3	0.6	1.2
Elmore County, Idaho	**27,038**	**75.1**	**15.2**	**0.8**	**5.9**	**2.9**
Block Group 2, Census Tract 9601	1,164	69.3	27.2	1.0	0.7	1.7
Block Group 2, Census Tract 9604	1,316	68.5	25.5	1.3	2.7	1.9
Gooding County, Idaho	**15,464**	**69.6**	**28.1**	**0.6**	**0.6**	**1.2**
Block Group 3, Census Tract 9602	1,699	59.4	38.3	0.8	0.5	1.1
Block Group 7, Census Tract 9602	1,037	59.5	38.5	0.6	0.4	1.1
Power County, Idaho	**7,817**	**66.1**	**29.8**	**2.1**	**0.7**	**1.4**
Block Group 2, Census Tract 9601	820	68.9	11.3	15.0	1.2	3.5
Twin Falls County, Idaho	**77,230**	**82.7**	**13.7**	**0.6**	**1.7**	**1.4**
Block Group 1, Census Tract 3	909	73.5	24.9	0.4	0.9	0.3
Block Group 1, Census Tract 14	1,159	55.2	43.6	0.1	0.7	0.4
Elko County, Nevada	**48,818**	**69.1**	**22.9**	**4.7**	**1.8**	**1.6**
Block Group 3, Census Tract 9517	1,220	41.6	55.2	0.7	1.6	0.9

1/ Data are for 2010.
2/ Non-Hispanic only. The federal government considers race and Hispanic/Latino origin to be two separate and distinct concepts. People identifying Hispanic or Latino origin may be of any race. The data summarized in this table present Hispanic/Latino as a separate category.
3/ The "Other Race" category presented here includes census respondents identifying as "Black or African American," "Asian," "Native Hawaiian and Other Pacific Islander," or "Some Other Race."
Source: U.S. Census Bureau 2011b

Income and Poverty

Counties

Median household income in Wyoming, Idaho, and Nevada was equivalent to 108 percent, 89 percent, and 106 percent, respectively, of the national median in 2009 (Table 3.5-3). Median household income in the potentially affected counties in Wyoming ranged from 75 percent to 127 percent of the state median. Median household income was below the state median in all the Idaho counties, with the exceptions of Ada, Franklin, and Lincoln Counties. Median household income in Elko County was 16 percent higher than the Nevada state median (Table 3.5-3).

Table 3.5-3. Income and Poverty by State and Affected County

State/County	2009 Median Household Income		2009 Poverty All Ages (Percent)[2/]
	2009 ($)	Percent of U.S./State Median[1/]	
Wyoming	**54,400**	**108**	**10.2**
Albany	40,772	75	18.7
Carbon	50,353	93	11.7
Converse	58,658	108	8.9
Lincoln	59,160	109	8.0
Natrona	55,179	101	9.5

Table 3.5-3. Income and Poverty by State and Affected County (continued)

State/County	2009 Median Household Income		2009 Poverty All Ages (Percent)[2/]
	2009 ($)	Percent of U.S./State Median[1/]	
Sweetwater	69,297	127	7.3
Idaho	**44,644**	**89**	**14.4**
Ada	53,828	121	11.8
Bannock	44,451	100	14.5
Bear Lake	42,199	95	13.0
Canyon	39,457	88	18.2
Cassia	40,389	90	16.3
Elmore	41,922	94	13.8
Franklin	45,404	102	10.6
Gooding	36,298	81	16.5
Jerome	39,636	89	15.4
Lincoln	46,100	103	12.2
Oneida	43,057	96	12.8
Owyhee	33,753	76	17.4
Power	38,509	86	16.6
Twin Falls	41,194	92	12.5
Nevada	**53,310**	**106**	**12.4**
Elko	62,091	116	8.2
United States	**50,221**	**NA**	**14.3**

1/ Statewide median household incomes are presented as a percent of the national median; county medians are shown as a percentage of their respective state medians.
2/ This represents the percentage of the population of all ages below the poverty level.
Sources: U.S. Census Bureau 2010m

The percent of the population below the poverty level in Wyoming in 2009 was lower than the national average (10.2 percent versus 14.3 percent). The percent of population below the poverty rate in the Wyoming Analysis Area counties ranged from 7.3 percent in Sweetwater County to 18.7 percent in Albany County (Table 3.5-3).

The percent of the population below the poverty level in Idaho in 2008 was very similar to the national average (14.4 percent versus 14.3 percent) (Table 3.5-3). Poverty rates were higher than the state average in 7 of the 14 potentially affected Idaho counties, with the highest rates occurring in Canyon (18.2 percent) and Owyhee (17.4 percent) Counties (Table 3.5-3).

Census Block Groups

The most recent year that income and poverty data are available at the census block group level is 1999. Two of the affected census block groups had more than 20 percent of their population below the poverty level in 1999. Four others had between 19.5 percent and 20 percent of their population below the poverty level (Table 3.5-4). The U.S. Census Bureau defines a poverty area as a census tract or other area where at least 20 percent of residents are below the poverty level (U.S. Census Bureau 2008b).

The 1999 per capita income in each census block group was also compared with its respective county average in 1999 to identify areas where income was more than 20 percent lower than the county average. Four census block groups met this criterion. In two of these cases, block groups in Elmore and Twin Falls Counties, more than 20

percent of the population was below the poverty level (Table 3.5-4). The other two census block groups, in Ada and Elko Counties, had relatively low poverty rates in 1999, 12.5 percent and 9.4 percent, respectively (U.S. Census Bureau 2000d).

Table 3.5-4. Poverty Census Block Comparison

County/Block Group	Total Population	Income in 1999 Below Poverty Level	Percent below Poverty Level
Carbon County, Wyoming	**14,595**	**1,879**	**12.9**
Block Group 3, Census Tract 9681	575	114	19.8
Bear Lake County, Idaho	**6,355**	**610**	**9.6**
Block Group 1, Census Tract 9501	872	170	19.5
Elmore County, Idaho	**25,148**	**2,814**	**11.2**
Block Group 2, Census Tract 9804	976	232	23.8
Twin Falls County, Idaho	**63,123**	**8,038**	**12.7**
Block Group 1, Census Tract 9802	1,024	201	19.6
Block Group 1, Census Tract 9814	1,230	285	23.2
Block Group 5, Census Tract 9803	877	173	19.7

1/ Data are for 1999. The most recent data available at the census block group level. Data presented here for Carbon, Bear Lake, and Twin Falls counties are also from 2000.
Source: U.S. Census Bureau 2000d

3.5.2 Direct and Indirect Effects

This section is organized to present effects to environmental justice from construction, then operation, followed by decommissioning activities for the proposed Project. Route Alternatives are analyzed in detail below in Section 3.5.2.3. There is a Design Variation involving use of two single-circuit structures proposed by the Proponent for Segments 2, 3, and 4 (see Section 2.2 for details), which is analyzed below in Section 3.5.2.4 and a Structure Variation that is analyzed in Section 3.5.2.5. The Proponents have also proposed a Schedule Variation, analyzed in Section 3.5.2.6, in which one of the two single circuits to be constructed in Segments 2, 3, and 4 and a portion of Segment 1W would be built on an extended schedule with construction beginning approximately 2.5 years after completion of the initial construction.

Plan Amendments

Proposed amendments are summarized in Table 2.2-1 of Chapter 2 and detailed in Appendices F and G. Amendments are needed to permit the Project to cross various areas of BLM-managed and NFS lands. Effects described for areas requiring an amendment in order for the Project to be built would only occur if the amendment were approved. Amendments that alter land management designations could change future use of these areas. No amendments specific to environmental justice are proposed for the Project and no impacts to environmental justice resulting from approving the amendments beyond the impacts of the project are anticipated.

3.5.2.1 No Action Alternative

The Proposed Route or Route Alternatives would not be constructed under the No Action Alternative, and, therefore, this alternative would have no environmental justice impacts.

3.5.2.2 Effects Common to All Action Alternatives

Disproportionate High and Adverse Effects on Minority or Low-Income Populations

Construction

Geographic Communities

Construction of the proposed Project is not expected to have high and adverse human health or environmental effects on nearby communities. Adverse construction-related impacts would likely include increases in local traffic and noise, as well as dust, and could result in temporary delays at some highway crossings. Construction workers temporarily relocating to the Project area would increase demand for local housing resources. These impacts would be temporary and localized, and are not expected to be high. Potential impacts on public safety are discussed in Section 3.22 – Public Safety.

Construction-related activities would result in some short-term visual impacts primarily on high-sensitivity viewers with foreground and possibly middleground views. Visual impacts would likely result from the use of cranes, pulling and tensioning equipment, other construction equipment, and temporary lighting, as well as dust from clearing and grading. However, disturbance would be transient and of short duration as construction activities progress along the transmission line route. Visual impacts are discussed in more detail in Section 3.2 – Visual Resources.

Construction would also increase demand for education, health care, and municipal services, as well as potentially increase demand for police and fire protection services. However, these impacts are also expected to be temporary and would not measurably affect the quality of services currently received by local communities and residents.

Local construction expenditures for materials and supplies and spending by workers directly employed by the Project are expected to benefit local economies. Construction would also generate state and local tax revenues (see Section 3.4 – Socioeconomics).

Communities of Shared Interest

The term community of shared interest is used here to refer to geographically dispersed individuals who could experience common conditions of environmental effect. The National Agricultural Workers Survey for fiscal years 2001 and 2002 (the most recent available) found that 83 percent of crop workers in the United States identified themselves as members of a Hispanic group, and 78 percent of crop workers were born outside the United States, primarily in Mexico (75 percent of all crop workers) (U.S. Department of Labor 2005). This survey also found that 30 percent of all farm workers had total family incomes below federal poverty guidelines.

The potential effects of construction on agricultural production are addressed in Section 3.18 – Agriculture. Potential effects to the agricultural sector and employment are discussed in Section 3.4 – Socioeconomics. Viewed in terms of agricultural operations in the potentially affected counties, total estimated construction disturbance represents a very small share of the 17 million acres of land in farms in the 21 potentially affected counties and is unlikely to noticeably affect overall agricultural production and employment in the affected counties. In addition, the impacts to agricultural production that would

occur are not expected to have adverse human health or environmental effects on farm workers.

The Proposed Route and Route Alternatives would benefit service industry occupations that are typically relatively low paid, particularly those associated with accommodation and food service. These benefits would result from increased demand and spending by construction workers temporarily relocating to the Project region, and would be short-term.

Operations

Geographic Communities

Operation of the proposed Project is not expected to have high and adverse human health or environmental effects on nearby communities. Long-term visual impacts would result from the long-term presence of the transmission line structures and overhead conductors. Other long-term visual impacts could include land scarring from grading and other construction activities in semi-arid environments where vegetation recruitment and growth are slow. Vegetation would also remain cleared or partially cleared along some portions of the ROW for the operational life of the Project (see Section 3.2 – Visual Resources).

Local operation expenditures for materials and supplies and spending by workers would, however, have beneficial effects on the local economy, and the Project would generate state and local tax revenues (see Section 3.4 – Socioeconomics).

Communities of Shared Interest

Operation of the Proposed Route and Route Alternatives has the potential to negatively affect minority and low-income farm workers. However, as noted above with respect to construction, operation-related impacts to agricultural operations are not expected to noticeably affect overall agricultural production and employment in the affected counties or have adverse human health or environmental effects on farm workers. Potential effects on agricultural production are addressed in Section 3.18 – Agriculture and potential effects to the agricultural sector and employment are discussed in Section 3.4 – Socioeconomics.

Decommissioning

Overall impacts associated with decommissioning the proposed Project are expected to be similar to those that would occur under construction. Decommissioning would not be expected to result in high and adverse human health or environmental effects on nearby communities, workers employed in decommissioning activities, or agricultural workers and these activities would, therefore, have no potential to disproportionately affect minority and low income communities. There would be residual visual impacts resulting from the long-term presence of the ROW after the Project has been decommissioned and the structures removed. These impacts would primarily be related to ground disturbance and primarily visible at ground level, and would be expected to diminish over time.

Public Participation

Construction and Operations

The BLM has considered all input from persons or groups regardless of race, income status, or other social and economic characteristics. Public scoping efforts are described in Chapter 4.

Native American Consultation

Potentially affected minority populations include American Indian Tribes with an interest in the federal lands that could be affected by the Project. The BLM initiated government-to-government consultation with seven Native American Tribes in the Project area in April 2008. The consultation was conducted to inform the various Tribes of the proposed undertaking and solicit their concerns and/or comments regarding the possible presence of TCPs or places of cultural, traditional, or religious importance to the Tribes in the proposed Project area. The following Tribes have been contacted:

- Northern Arapaho
- Northern Cheyenne
- Eastern Shoshone
- Shoshone-Bannock
- Ute Indian Tribe
- Shoshone-Paiute
- Northwest Shoshone Band
- Southern Arapaho
- Southern Cheyenne
- Oglala Sioux

This is discussed further in Section 3.3 – Cultural Resources and a summary of the status of the Native American consultation process is presented in Table 3.3-2.

Decommissioning

Decommissioning would be conducted in a manner that would not exclude minority and low income groups from participation or subject persons to discrimination because of their race, color, or national origin.

3.5.2.3 Proposed Route and Alternatives by Segment

The analysis of minority and low income populations by Census Block Group presented in the preceding Affected Environment section suggests the potential presence of minority and low income communities in the vicinity of the Proposed Route and Route Alternatives. This analysis identified 10 potential minority Census Block Groups. These block groups and the Proposed Route and Route Alternatives that would cross them are identified in Table 3.5-5.

Alternative 5C would cross the Fort Hall Indian Reservation in Power County. The Shoshone-Bannock Tribal Council has given permission for BLM to consider the route across the reservation.

Table 3.5-5. Potential Minority Populations by Proposed Route / Route Alternative

County/State	Census Tract	Block Group	Proposed Route / Route Alternatives	Percent Minority Population
Cassia County, Idaho	9501	1	7, 7C, 7D, 7H, 7I, 7J	39
Cassia County, Idaho	9506	1	7	40
Elmore County, Idaho[1/]	9601	2	8, 8A, 9, 9B	31
Elmore County, Idaho[1/2/]	9604	2	9D	31
Gooding County	9602	3	8A	41
Gooding County	9602	7	8A	41
Power County, Idaho	9601	2	5C	31
Twin Falls County, Idaho[1/2/]	3	5	9B, 9C	27
Twin Falls County, Idaho[1/2/]	14	1	10	45
Elko County, Nevada[1/]	9517	1	7I	58

1/ The number of this Census Tract changed between 1999 and 2010 (compare with Table 3.5-6)
2/ Also identified as a potential low income community, with 20 percent of more of the total population below the poverty level in 1999.
Source: U.S. Census Bureau 2011b

The low income analysis identified six Census Block Groups where 20 percent or more of the population were below the poverty level in 1999 (the most recent data available). These block groups and the Segment and Route Alternatives that would cross them are identified in Table 3.5-6. Three of these block groups were also identified as potential minority communities in 2010. The block groups in Carbon County, Wyoming, and Bear Lake County, Idaho, are relatively small, 11 and 12 square miles, respectively, with population densities approaching the national average.

Table 3.5-6. Potential Low Income Populations by Proposed Route / Route Alternative

County/State	Census Tract	Block Group	Proposed Route / Route Alternatives	Percent Below Poverty Level
Carbon County, Wyoming	9681	3	2	20
Bear Lake County, Idaho	9501	1	4	20
Elmore County, Idaho[1/,2/]	9804	2	9, 9D	24
Twin Falls County, Idaho[1/]	9802	1	7, 7I, 9, 9A, 9B, 9C	20
Twin Falls County, Idaho[1/,2/]	9803	5	9B, 9C	20
Twin Falls County, Idaho[1/,2/]	9814	1	10	23

1/ The number of this Census Tract changed between 1999 and 2010 (compare with Table 3.5-5).
2/ Also identified as a potential minority community.
Source: U.S. Census Bureau 2000d

As discussed above, construction of the proposed Project is not expected to have high and adverse human health or environmental effects on nearby communities. The Project would, however, have high, long-term visual impacts in some locations as discussed in detail in Section 3.2 – Visual Resources. The Census Block Groups identified in Tables 3.5-5 and 3.5-6 are, for the most part, large, sparsely populated areas. Visual impacts have the potential to be high in these areas where the structures and overhead conductors would be visible to private residences. This is, for example, the case with the portion of Alternative 5C that crosses the Fort Hall Indian Reservation. The visual resources analysis found that there would be some areas of high impact where residential areas are located in the vicinity.

While these potential impacts exist, the proposed Project overall does not appear to exhibit systematic bias toward placing the Project in minority or low income communities. The Proposed Route and Route Alternatives cross a total of 64 Census Block Groups; approximately 13 percent or 8 of these have the potential to be minority communities, and 9 percent or 6 could potentially be low income. The major factors influencing routing decisions are described by proposed segment in Chapter 2 of this EIS.

3.5.2.4 Design Variation

A Design Variation is being considered that would consist of constructing two single-circuit lines in Segments 2 through 4 instead of a single double-circuit line (which is the design assessed above). The disturbance footprint of the two single-circuit towers is greater than that of the double-circuit tower, in part because the requested ROW would be wider, but also because helicopter-assisted construction could be implemented in these areas due to the lighter weight of the towers, which would require additional fly yards. The additional ROW space and the fly yards would cause additional temporary disturbance during construction. Across Segments 2, 3, and 4, the additional disturbance of the single-circuit tower alternative ranges from 25 to 30 percent greater than the comparable portions of the double-circuit tower disturbance under the proposed design. The two single circuits require more ground disturbance, but would be designed and constructed to the same standards as the Proposed Action.

The primary potential visual benefit of this Design Variation is reduced structure height (average height of 156 feet versus 170 feet for the Proposed Action). Other benefits include reduced structure contrast in areas where the Proposed Route and Route Alternatives would parallel existing structures of a similar type. Conversely, this Design Variation would introduce more towers in the landscape than the double-circuit option. Anticipated visual impacts would be similar to those described for the Proposed Action. Impacts to minority or low-income populations would not vary by structure type or ROW configuration.

3.5.2.5 Structure Variation

The proposed guyed Structure Variation would add four guy wires about 140 feet long from a point about 100 feet up in each tower to four guy anchors spaced in a square around the tower (Appendix B, Figure B-6). This would not change the amount of disturbance during construction or operation appreciably.

There is no appreciable difference in impact on visual resources from the use of this Structure Variation when compared to the use of self-supporting lattice towers, because the guyed towers would be around the same height and breadth at the top of the structure as the proposed self-supporting lattice towers. The use of guyed structures would not change the impacts to minority and low-income populations.

3.5.2.6 Schedule Variation

The Schedule Variation uses the two single-circuit design variation described above but extends construction over a longer time frame. Initially only one of the eventual two single-circuit lines would be constructed with the second to be constructed at a later date. The Schedule Variation proposes that the first single-circuit transmission line in

Segments 2, 3, and 4 would be built as soon as a ROW grant is issued, but that the second line would not begin construction until late 2018. This would mean nearly 2 years between the end of construction for the first line and beginning of construction for the second line. Any staging areas and fly yards that had been used for the first stage would have been revegetated after construction was complete and would have to be cleared again. There would be two sets of construction disturbances adding movement, noise, and dust to the area of construction in two instances in any given area.

In the short term, overall impacts on visual resources would be reduced when compared to the Proposed Action and Design Variation due to the single smaller tower used and roughly half of the total transmission towers being in the landscape. However, in the future any short-term reduction in visual impacts would be lost with construction of the second line. The Schedule Variation would not alter impacts to minority or low-income populations.

3.5.3 Mitigation Measures

No mitigation measures are needed.

3.6 VEGETATION COMMUNITIES

This section addresses potential impacts to vegetation communities from the Proposed Route and Route Alternatives, during both construction and operations.

3.6.1 Affected Environment

The Project crosses two major ecological zones (see Figures E.10-1 and E.10-2 in Appendix E). Proceeding from east to west, the ecological zones are the Temperate Steppe which grades into the Temperate Mountain System as the route proceeds west across the Continental Divide. The route crosses seven ecoregions. It starts in the east in the Northwestern Great Plains Ecoregion, then crosses the Southern Rockies and Wyoming Basin Ecoregions before entering Idaho. There it crests the Wasatch and Uinta Mountains Ecoregion and Middle Rockies Ecoregion before entering the Northern Basin and Range Ecoregion. The westernmost section of the route lies on the Snake River Plain Ecoregion. Nearly two dozen subregions are crossed in the 1,100 miles traversed by the Proposed Route and Route Alternatives.

Due to the length of the Project, nearly all the vegetation communities present in southern Wyoming and Idaho are crossed. These include expanses of semi-arid shrubland and grassland, irrigated agricultural land (principally in the Snake River Plains), forested mountains, shrub and woodland covered hills, and riparian woodlands and wetlands. Vegetation types crossed by the Project are presented in Section 3.6.1.5. Approximately 47 percent of the vegetation crossed by the Proposed Route and Route Alternatives is natural sagebrush (established native sagebrush communities).

Nearly all the vegetation communities present in the Project area have been modified to some degree by human activities, and about one-third has been modified to an extent that it was mapped as either disturbed vegetation or agriculture for the EIS. Principal activities occurring within the Project area include livestock ranching, oil and gas exploration and development, mining, timber harvest, and agricultural development including both dryland farming and irrigated cropland and pastures.

3.6.1.1 Analysis Area

The Analysis Area used to determine vegetation impacts was defined as a buffer of 250 to 500 feet on either side of the Proposed Route and Route Alternatives centerlines (a 500 to 1,000 feet total, hereafter referred to as “buffer”). This buffer width was variable in that originally vegetation was mapped in a wider buffer, but as Route Alternatives were added with certainty of locale or bound by constraints, the mapped area was reduced to 500 feet. The Analysis Area also includes a buffer of 25 feet (50 feet total) around the centerline of any access road that extends outside of the buffer area. In addition, the Analysis Area includes vegetative mapping of all ancillary facilities (such as laydown yards, fly yards, staging areas) that may occur outside the buffer area. These distances were used because they encompass the area of greatest activity during construction and operations, and any Project-related impacts (changes in size or function) to vegetation would occur within these buffers while allowing for minor route alterations during final design. The Analysis Area for vegetation includes a total of approximately 297,600 acres.

3.6.1.2 Issues to be Analyzed

The following vegetation-related issues were brought up by the public during public scoping (Tetra Tech 2009a), were raised by federal and state agencies during scoping and agency discussions, or must be considered as stipulated by law or regulation:

- How much vegetation would be cleared, and how much would be kept clear or otherwise maintained during operations;
- How quickly the various vegetation communities that are cleared for construction but allowed to regrow during operations would recover from disturbance;
- How much disturbance in sagebrush communities would occur and what the effects would be;
- How much disturbance in native grasslands would occur and what the effects would be;
- Whether old-growth forest stands would be affected, and what measures would be taken to protect this vegetation type; and
- What the effects of construction, operations, and maintenance on fire occurrence, frequency, and severity would be, especially as they relate to important shrub-steppe and forest habitats.

Issues related to special status plants, noxious weeds and invasive plants, and wetlands and riparian areas are discussed in Sections 3.7 – Special Status Plants, 3.8 – Invasive Plant Species, and 3.9 – Wetlands and Riparian Areas, respectively. Effects to agricultural lands and timber production on federal lands are addressed in Sections 3.18 – Agriculture and 3.17 – Land Use and Recreation, respectively.

3.6.1.3 Regulatory Framework

Federal, state, and local agencies manage vegetation for wildlife habitat, public use, watershed protection, livestock forage, and other uses under the authority of various laws, including the Taylor Grazing Act of 1934 as amended, the Federal Land Management and Policy Act of 1976, the Sikes Act, NEPA, the SRBOP, as well as the BLM and Forest Service policies and manuals including BLM rangeland standards and guidelines, Forest Plans and RMPs. In addition, there are laws and regulations for sensitive plant species, and some sensitive vegetative communities (such as wetlands). Laws and regulations related to specific sensitive plant species or communities are discussed in Section 3.7 – Special Status Plants, Section 3.8 – Invasive Plant Species, and Section 3.9 – Wetlands and Riparian Areas.

3.6.1.4 Methods

The primary source of information used for analysis of impacts to vegetation was a detailed remote sensing-based vegetation mapping study conducted specifically for this Project. In addition, information on general vegetation characteristics was obtained from BLM RMPs and Forest Service Forest Plans, other agency publications and databases, published scientific literature, and limited field surveys. The goal of the mapping effort was to identify vegetation types using a combination of GIS-assisted segmentation, aerial imagery interpretation, and limited ground surveys. Details of this vegetation/habitat mapping effort are presented in the *Vegetation and Habitat Baseline*

Technical Report (Tetra Tech 2009b). Vegetation typing and GIS modeling were used to identify habitats for several wildlife species (see Section 3.11 – Special Status Wildlife and Fish). Below is a summary of the steps used during this mapping effort:

- Digital ortho quarter quad tiles of the Project were downloaded from the USDA Farm Service Agency's National Agriculture Imagery Program (NAIP). This program acquires 1-meter resolution digital ortho imagery for agricultural regions in the United States during the summer crop growing season. The program updates their datasets annually by rotating among states or over regions within larger states; therefore, only a portion of the United States is flown each year. NAIP imagery is acquired at a 1-meter ground sample distance with a horizontal accuracy that matches within 6 meters of reference aerial control points, which are used during image inspection. Latest imagery available for Idaho had been flown in 2004 and for Wyoming and Nevada in 2006. This imagery was used for the purposes of initial segmentation.
- Field reconnaissance indicated that relatively small changes had occurred in native vegetation areas subsequent to the acquisition of the aerial imagery described above. To account for these changes, and to capture current vegetation communities, multi-spectral digital aerial imagery with 1-foot resolution was acquired specifically for this Project. Data collection was conducted in three phases. The first two phases were planned to coincide with early spring growth across the Analysis Area. Phase one included the Snake River Plain in Idaho (flown April 28 to May 5, 2008), central and southwest Wyoming (flown June 3 to 15, 2008), and the mountainous areas of southeastern Idaho and southwestern Wyoming (flown July 7 to 11, 2008). Phase two included southern Idaho and southwestern Wyoming (flown September 25 to 28, 2008). The last phase was flown in response to changes in the Proposed Route and Route Alternatives. Phase three included the mountains of southeastern Idaho and southwestern Wyoming (flown October 22 to 24, 2008). A few Project elements were not covered during these Project-specific surveys. Vegetation types in these areas were identified using the NAIP imagery described above.
- A GIS program (SPRING 5.0) was used to segment the NAIP imagery into polygons representing distinct vegetation stands. The initial minimum mapping unit was 0.1 acre and the average polygon size after segmentation was 4.6 acres. Oversegmentation (i.e., when resulting polygons of like pixels were too small or too fragmented) was corrected by using Environmental Systems Research Institute (ESRI) ArcInfo ® program. This resulted in a minimum mapping unit of 5 acres, which more accurately and consistently identified vegetation types.
- The resultant polygon layer was overlaid on the Project-specific imagery.
- A team of biologists assigned names to each polygon using National Vegetation Classification System (NVCS) vegetation alliances and associations. The NVCS is a hierarchical classification system (Grossman et al. 1998) that defines vegetation associations by species composition, uniform habitat conditions, and uniform physiognomy (i.e., the general characteristic of the landscape such as shrub-steppe or mixed conifer). Biologists also used data obtained from the Landscape Fire and Resource Management Planning Tools Project LANDFIRE

vegetation classification (available Project-wide) as reference or comparison layers (USGS 2006). In the summer of 2009, a similar mapping effort was undertaken to incorporate changes to the Proposed Route and Route Alternatives, following the methodology described above.

- Field sampling was conducted from April through December 2008 and in September and October 2009 to collect quality assessment data (i.e., data to verify mapped vegetation). In the field, transects were run to collect vegetation data at targeted locations for assessment of the accuracy of interpretation of vegetation. This accounted for the original Proposed Route and Route Alternatives, as well as modifications made to the Proposed Route and new Route Alternatives developed in 2009.
- The remote sensing imagery segmentation and interpretation resulted in the identification of 77 vegetation alliances, including 25 shrubland alliances, 18 forest or woodland alliances, 9 developed or disturbed alliances (commercial, CAFO, extractive, recreation, residential, urban, residential, ROW, "other"; not seeded fields used for agriculture or grazing), 4 herbaceous or grassland alliances, 6 agricultural alliances, 5 general wetland or riparian alliances, 4 water types, and 6 other cover types (e.g., rock outcrop and scree). For the EIS analysis, the vegetation alliances were aggregated into general vegetation types. By combining alliances with similar dominants, 11 upland vegetation types (including disturbed shrubland and grassland types), and 1 wetland/riparian vegetation type were identified. In addition, 4 other cover types were identified: agriculture, open water, miscellaneous, and disturbed/developed (see Table 3.6-1 for a description of each).
- For the more detailed wetland analysis, where impacts to specific wetland types must be addressed, wetlands/riparian areas were analyzed in greater detail using aerial photo interpretation of Project-specific imagery and NAIP photography, as well as some field validation. In the summer of 2009, site visits were conducted at 79 locations to verify mapped wetland and riparian features. Wetlands and riparian vegetation were mapped in eight categories (e.g., forest, shrub, herbaceous) and the results were combined with the other vegetation associations in the GIS database (see Section 3.9 – Wetlands and Riparian Areas).
- The results of the vegetation type analyses were incorporated onto maps containing the Proposed Route and Route Alternatives. A quantitative assessment of impacts was then developed with an additional GIS analysis, by overlaying the vegetation type polygons with the footprint of the Project (based on the Project's preliminary engineering design). The acreage of impacts to vegetation types was determined for both the construction and operations phases of this Project. Construction impacts include all areas that would be disturbed during construction. Operations impacts include all areas that would either be permanently disturbed due to Project facilities (roads, tower structures, etc.) or where disturbance would continue due to Project maintenance. All of the operations impacts would be initiated during construction; therefore, values reported for operations impacts are a subset of the construction disturbances.

Analysis of ROW clearing and maintenance impact was assessed by GIS by overlaying the vegetation with the ROW width.

- The values reported for operations impacts due to ROW maintenance/clearing may be larger than those reported for construction ROW clearing in some instances (e.g., see Tables D.6-2 and D.6-3). This is because the disturbance footprint necessary to construct tower pads and access roads is larger during construction, compared to the permanent footprint of these same tower pads and access roads during operations. In addition, some disturbances (e.g., fly-yards) would only occur during construction, and these same areas may be later classified as ROW maintenance disturbances during operations if they occurred within the forested ROW. As a result, the areas classified as "ROW disturbances" compared to the areas classified as "project facility disturbances" can be smaller during construction than during operations. For example, as shown in Figure 3.6-1, the total area disturbed during construction and operations is identical within this hypothetical forested area; however, the area that would be classified as ROW maintenance/clearing is smaller during construction than during operations.

3.6.1.5 Existing Conditions

The Proposed Route and its Route Alternatives span more than a thousand miles from 41.6° to 43.4°N latitude and 105.7° to 116.6°W longitude. Elevation, slope, aspect, seasonal temperatures, and annual precipitation exhibit a wide range across the Project area and ultimately support a diversity of ecological units defined by the composition of vegetation.

Table 3.6-1 presents the vegetation types used in this analysis, as well as the sub-communities and species found within each vegetation type. Table D.6-1 in Appendix D presents the number of miles of each vegetation type crossed by the Proposed Route and its Alternatives.

Table 3.6-1. Vegetation Types in Gateway West Analysis Area

Vegetation Type	Segment	Percent of Analysis Area	Sub-Communities[1/]	Common Species
Shrubland Natural/Semi-Natural Vegetation				
Sagebrush	All	41.2	Big sagebrush shrubland, big sagebrush shrub herbaceous, mountain big sagebrush shrubland herbaceous, mountain big sagebrush shrubland, Wyoming big sagebrush shrubland, black sagebrush shrubland, low sagebrush shrubland, silver sagebrush shrubland herbaceous	Shrubs: Basin big sagebrush, Wyoming big sagebrush, mountain sagebrush, rubber rabbitbrush, shadscale, green rabbitbrush, antelope bitterbrush, black greasewood, fourwing saltbush Grasses: bluebunch wheatgrass, Sandberg bluegrass, needle-and-thread, Thurber's needlegrass, squirreltail, western wheatgrass, Idaho fescue, Indian ricegrass Non-native: cheatgrass

Table 3.6-1. Vegetation Types in Gateway West Analysis Area (continued)

Vegetation Type	Segment	Percent of Analysis Area	Sub-Communities[1/]	Common Species
Disturbed Sagebrush	All	12.8	Disturbed Wyoming big sagebrush, Basin big sagebrush	Shrubs: Wyoming big sagebrush, Basin big sagebrush, rubber rabbitbrush Grasses: Sandberg bluegrass Non-native: cheatgrass, crested wheatgrass, other species present within big sagebrush and disturbed grassland types
Greasewood	1E,1W, 2, 3, 4, 7, 8, 9	3.1	Black greasewood shrubland	Shrubs: black greasewood, rubber rabbitbrush, Torrey seablite, shadscale, fourwing saltbush, Gardner saltbush, bud sagebrush Grasses: western wheatgrass, blue grama Non-native: cheatgrass, Japanese brome, sixweeks fescue, tansy mustard, Russian thistle, desert alyssum, halogeton, povertyweed
Saltbush	1E, 2, 3, 4, 7, 8, 9	2.3	Fourwing saltbush shrubland, shadscale saltbush shrubland, spiny hopsage shrubland	Shrubs: fourwing saltbush, shadscale saltbush, spiny hopsage, winterfat, bud sagebrush, black greasewood, rubber rabbitbrush, winterfat, big sagebrush, black sagebrush Grasses: Indian ricegrass, bluebunch wheatgrass, needle-and-thread
Dwarf Shrub	1E, 2, 3, 4	4.4	Dwarf shrubland	Shrubs: little sagebrush, Gardner saltbush, winterfat Grasses: Indian ricegrass, Sandberg bluegrass, western wheatgrass
Other Shrub	1E, 1W, 4, 7, 9	0.7	Saskatoon serviceberry shrubland, curlleaf mountain mahogany shrubland and woodland, alder leaf mountain mahogany shrubland, yellow rabbitbrush shrubland, chokecherry shrubland, antelope bitterbrush shrubland	Shrubs: curlleaf mountain mahogany, Saskatoon serviceberry, mountain mahogany, chokecherry, yellow rabbitbrush, western snowberry Grasses: western wheatgrass, needle and thread
Grassland				
Disturbed Grassland	All	14.2	Disturbed grassland	Native grass: western wheatgrass, needle-and-thread, purple three-awn, Sandberg bluegrass Non-native: crested wheatgrass, annual brome grasses, intermediate wheatgrass, smooth brome, cheatgrass, and others
Native Grass	1E, 1W, 4, 7, 8, 9	0.4	Streambank wheatgrass-prairie junegrass herbaceous, bluebunch wheatgrass herbaceous	Grasses and grass-like species: streambank wheatgrass, Sandberg bluegrass, bluebunch wheatgrass, needle-and-thread, prairie junegrass, red threeawn, streamside wild rye, western wheatgrass, smallwing sedge, rushes Shrubs: rubber rabbitbrush, green rabbitbrush, big sagebrush Non-native: cheatgrass, alyssum, salsify

Table 3.6-1. Vegetation Types in Gateway West Analysis Area (continued)

Vegetation Type	Segment	Percent of Analysis Area	Sub-Communities[1/]	Common Species
Forest and Woodland				
Conifer Forest	1E, 1W, 4, 5, 7	1.5	Douglas-fir forest and woodland, subalpine fir-aspen forest, lodgepole pine forest, limber pine-aspen forest, ponderosa pine forest and woodland, ponderosa pine-aspen forest, upper treeline whitebark and limber pine	Trees: lodgepole pine, Douglas-fir, whitebark pine, limber pine, bigtooth maple, aspen Shrubs: Saskatoon serviceberry, chokecherry, Scouler willow, Rocky Mountain juniper, creeping barberry, gooseberry/ currant
Deciduous Forest	1E, 1W, 4, 5, 7	2.3	Bigtooth maple montane forest, Aspen – Douglas-fir forest, aspen forest, aspen woodland,	Trees: aspen, bigtooth maple, Douglas-fir Shrubs: chokecherry, mountain snowberry, common juniper, Saskatoon serviceberry, big sagebrush, gooseberry/currant, Woods rose Grasses and grass-like species: pinegrass, elk sedge, mountain brome
Juniper	1E, 1W, 2, 4, 5, 7, 9	2.8	Western juniper woodland, Utah juniper woodland, Rocky Mountain juniper woodland	Trees: Utah juniper, Rocky Mountain juniper, western juniper Shrubs: big sagebrush, black sagebrush, fourwing saltbush, shadscale, green rabbitbrush, ephedra, rubber rabbitbrush, broom snakeweed, serviceberry, fringed sage, prickly pear, bitterbrush snowberry Grasses and grass-like species: Indian ricegrass, squirreltail, needle and thread, western wheatgrass, bluebunch wheatgrass, galleta, Sandberg bluegrass, blue grama, junegrass, muttongrass, sedges
Wetland and Riparian	All	1.5	Forested riparian, forested wetland, shrub riparian, shrub wetland, herbaceous wetland, mixed wetland, mixed riparian	Herbaceous emergents: common reed, cattail, bulrush, woolly sedge, Nebraska sedge, creeping spikerush, clustered field sedge, Baltic rush, saltgrass. Shrubs and trees: coyote willow, yellow willow, Woods rose, common chokecherry, black hawthorn, red-osier dogwood, water birch, narrowleaf cottonwood, black cottonwood, peachleaf willow Non-native: Russian olive
Other Cover Types				
Miscellaneous (substrate-dominated)	E, 1W, 2, 4, 5, 7, 8, 9	0.2	Inter-Mountain Basins Cliff and Canyon, Inter-Mountain Basins Volcanic Rock and Cinder Land, Large Eroding Bluffs Sparsely Vegetated, Rock Outcrop Sparsely Vegetated, scree, badlands	Ponderosa pine, lodgepole pine, Indian ricegrass, big sagebrush, sand sagebrush, fourwing saltbush, others
Water	All	0.3	Lake, pond, playa, reservoir, river/stream/ canal	Aquatic plants may be present
Agriculture	All except 3	10.9	Dryland farming, fallow/hay pasture, herbaceous pasture, irrigated farming, orchard, shrub pasture	Crops, non-native grasses and forbs, weeds, shrubs

Table 3.6-1. Vegetation Types in Gateway West Analysis Area (continued)

Vegetation Type	Segment	Percent of Analysis Area	Sub-Communities[1/]	Common Species
Disturbed/ Developed (unvegetated by human disturbance)	All except 10	1.4	Barren, burned, commercial, disturbed, extractive, recreation area, residential, ROW, urban	Much of this cover is unvegetated, other parts have landscaped or weedy vegetation, few native species

1/ "Shrubland herbaceous" communities are those with a moderate to dense herbaceous layer; "shrubland" communities without this designation are typically characterized by a sparse herbaceous layer.
Scientific names of plants are provided in Tetra Tech (2009b).
Source: Tetra Tech 2009b; Jankovsky-Jones 2001

Shrubland

Shrubland is the most common vegetation type found within the Analysis Area. It is the dominant type throughout the Wyoming portions of the Analysis Area and is common within Idaho. Major shrub types include sagebrush, disturbed sagebrush, saltbush, and greasewood.

The Sagebrush type is the most widely distributed type of shrubland, occurring on the plains, intermountain basins, and slopes. It occurs in all segments and makes up more than 20 percent of the Analysis Area for all proposed segments except 10. This vegetation type has an overstory of sagebrush and a variable understory of species of grass, forbs, and sub-shrubs. This vegetation type includes eight sagebrush associations that were identified during mapping.

Disturbed sagebrush vegetation is found in the Analysis Area of all segments and is most common in Segments 8 and 9. It includes many of the plant associations of the Wyoming big sagebrush shrubland alliance, some of which are of poorer quality due to recent disturbance.

The greasewood type is most common in Segments 2, 3, and 4 in Wyoming, but also occurs in Segments 1E, 1W, 7, 8, and 9. This vegetation type includes one association.

The saltbush type occurs along Segments 1E, 2, and 3 in Wyoming, and parts of Segments 7, 8, and 9 in Idaho. It includes three associations. This is the most arid vegetation type within the Analysis Area, occurring in areas with 8 to 10 inches of annual rainfall.

Dwarf shrub consists of arid areas dominated by dwarf shrubs less than one foot in height. Common dominants include sagebrush, Gardner saltbush, and winterfat. This vegetation type is restricted to the Wyoming portions of the Project and occurs on Segments 1E, 2, 3, and 4. Other shrub communities occur in the mountainous portions of the Analysis Area in Segments 1E, 1W, 4, 5, and 7, but occupy only small areas. The most common types are dominated by mountain mahogany.

Grasslands

Grasslands occur on all segments but are especially abundant on Segments 8, 9, and 10. Nearly all of the grasslands are disturbed or semi-natural plant communities dominated by non-native perennial grass species including crested wheatgrass and intermediate wheatgrass, and weeds such as cheatgrass. The crested wheatgrass and

intermediate wheatgrass stands typically result from revegetation or seeding, while dominance by cheatgrass is a result of disturbance and wildfire and therefore have different management considerations. Some disturbed grasslands are dominated by seral native grass species such as purple threeawn and Sandberg bluegrass.

Native grassland occurs most commonly along Segment 1W(a), where it occupies about 7 percent of the Analysis Area, and less commonly on Segments 1E, 1W, 7, 8, and 9. Most of the native grassland is in the bluebunch wheatgrass association.

Forest and Woodland

Forests are limited in extent and primarily occur in Segments 1E, 1W, 4, 5, and 7 where the Proposed Route and Alternatives cross areas of higher elevation in the Laramie Mountains, the Tunp Range, and Commissary Ridge of Wyoming and the Wasatch Range, Portneuf Range, Deep Creek, and Sublette Mountains in Idaho (Appendix E, Figures E.10-1 and E.10-2). Seven deciduous and seven conifer forest and woodland associations were mapped. Deciduous forests occupy about 6 to 8 percent of the Analysis Area along Segments 4 and 5, and 2 to 3 percent along Segments 1E, 1W, and 7. Most of the deciduous forest is dominated by aspen; other species include bigtooth maple, Douglas-fir and other conifers. Conifer forests occupied 2 to 7 percent of the Analysis Area for Segments 1E, 1W, 4, 5, and 7. They are dominated by Douglas-fir, ponderosa pine, and lodgepole pine. Limber and whitebark pine, two species that have recently been added to the Wyoming BLM sensitive species list in 2010, are found at the upper treeline on the mountains along Segment 4 in southwestern Wyoming and eastern Idaho (R. Means, BLM Wyoming State Office, personal communication, September 13, 2010). These species are discussed in Section 3.7 – TES Plants.

Juniper woodlands occur within the Analysis Area in both Idaho and Wyoming, and are most prevalent along Segments 1E, 5, and 7, where they occupy about 6 to 10 percent of the Analysis Area. They also occur in Segments 1E and 1W, 2, 4, and 9. Most of the juniper woodlands are dominated by Utah juniper in Idaho and Rocky Mountain juniper in Wyoming.

Wetland and Riparian Types

Wetlands and riparian vegetation occupy 1 to 3 percent of the Analysis Area for Segments 1E, 1W, 2, 3, and 4, and less than 1 percent for all other segments. The most common type is herbaceous wetland, but shrub and forested wetlands and riparian areas are also present. Wetlands and riparian areas are discussed in more detail in Section 3.9 – Wetlands.

Other Cover Types

Several substrate-dominated natural communities are included under miscellaneous, including cliffs and canyons, sand dunes, and volcanic rocks. Cliffs and canyons are present near Segments 1W, 4, and 9. There are no sand dunes present in the Analysis Area. Volcanic rock and cinder occurs near several segments, but mostly in Segments 1E, 4, and 9.

Other cover types include open water, disturbed/developed areas, and agricultural lands (irrigated and unirrigated). Disturbed/developed covers 1 to 5 percent of all segments. Agricultural lands represent 10 to 50 percent of the Idaho Analysis Area for Segments 5, 7, 8, 9, and 10, but only a small portion of the Analysis Area in Wyoming.

Vegetation Types of Concern

Vegetation types of concern are those that have been identified by land management agencies or by legal requirement because they are uncommon or underprotected. Many of these vegetation types provide habitat for special status plant and animal species. Vegetation types of concern include wetlands and riparian areas (discussed in detail within Section 3.9 – Wetlands and Riparian Areas), cushion plant communities in Wyoming, limber pine and whitebark pine in Wyoming, sand dunes, old-growth forests on NFS lands, and intact sagebrush communities in Idaho. There are no sand dunes or cushion plant communities in the Analysis Area; therefore, they will not be addressed further here. Limber pine and whitebark pine, which have recently been added to the BLM Sensitive Species List in Wyoming, are addressed in Section 3.7 – Special Status Plants. Effects to intact sagebrush communities and old-growth forests are discussed in subsection 3.6.2.2 below.

3.6.2 Direct and Indirect Effects

This section is organized to present effects to vegetation from construction, operations, and decommissioning of the proposed Project. Route Alternatives are analyzed in detail below in Section 3.6.2.3. There is a Design Variation involving use of two single-circuit structures proposed by the Proponents for Segments 2, 3, and 4 (see Section 2.2 for details), which is analyzed below in Section 3.6.2.4 and a Structure Variation that is analyzed in Section 3.6.2.5. The Proponents have also proposed a Schedule Variation, analyzed in Section 3.6.2.6, in which one of the two single circuits to be constructed in Segments 2, 3, and 4 and a portion of Segment 1W would be built on an extended schedule with construction beginning approximately 2.5 years after completion of the initial construction.

Mitigation measures or EPMs are presented in detail within this section only if it is the first time they have been discussed in Chapter 3; all other measures are referenced or summarized. A comprehensive list of all Proponent-proposed EPMs and Agency-required mitigation measures can be found in Table 2.7-1 of Chapter 2.

3.6.2.1 No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed or operated. No Project-related impacts to vegetation would occur, but changes in vegetation would continue as a result of natural conditions (including but not limited to fire, flooding, and extreme weather conditions) and existing and future development (including but not limited to, oil and gas exploration/development, coal and trona mining, and residential development) within the Analysis Area. Changes to vegetation from other existing and future developments would generally be similar to that which may occur from the proposed Project, including disturbance and loss of vegetation during construction.

3.6.2.2 Effects Common to All Action Alternatives

Construction

The proposed Project would directly affect vegetation communities though the temporary trampling of herbaceous vegetation, the partial removal of aboveground plant cover, and the complete removal of vegetation due to construction of the transmission line and associated aboveground structures, access roads, temporary work spaces, and other project facilities. Vegetation removal can have a variety of effects on vegetation communities ranging from changes in community structure and composition to alteration of soil moisture or nutrient regimes. The degree of impact depends on the type and amount of vegetation affected, and the rate at which vegetation would regenerate after construction. Ultimately, these direct and indirect effects can reduce or change the functional qualities of vegetation including wildlife habitat (described in Section 3.10 – General Wildlife and Fish) and livestock forage (grazing impacts are discussed in Section 3.16 – Water Resources). To put Project-related disturbance in context, on a landscape scale, the total removal or alteration of vegetation under the Proposed Action during construction would comprise a small proportion of the total acres of vegetation mapped within the Analysis Area: 5.3 percent of shrubland, 12.5 percent of forest/woodland, 3.3 percent of wetland/riparian, 6.0 percent of grassland, and 5.6 percent of other cover types.

Direct and Indirect Effects on Vegetation Communities

Overstory vegetation, whether in a forest or shrubland community, physically protects understory plants, stabilizes the soil, and provides vertical structure adding diversity to the plant community. Removal of this vegetation shifts the community into an earlier successional stage, changing both its structure (reducing vertical structure) as well as the dominant species. Removal of mature forest by the Project would create a new forest succession pattern through conversion to a younger, less complex (i.e., fewer canopy levels) forest. Additionally, tree clearing opens the forest canopy, creating growing conditions that favor shade-intolerant species. The presence of a mature forest canopy also influences microclimate conditions such as soil moisture and temperature, which can be altered when overstory shading is reduced.

Sagebrush vegetation, due to its deep taproot and shallow, diffuse root system also provides an important function in soil moisture and nutrient regime; therefore, the removal of this vegetation alters the soil moisture content and nutrient availability for surrounding plants. The characteristic tap root and shallow, diffuse root system of sagebrush species brings deep soil moisture to the surface, facilitating nutrient uptake and microbial activity and providing normally unavailable moisture to neighboring plants (Caldwell and Richards 1989 as cited in MFWP 2010). The root system also adds to the soil organic material, developing both the shallow and deep soil profiles (Daubenmire 1970 as cited in MFWP 2010). For these reasons, mature sagebrush are often associated with well developed grass and forb understories, particularly in areas with proper grazing management practices. Thus, the removal of sagebrush and shrubland vegetation by the Project may alter growing conditions for other plants.

Indirectly, vegetation removal can increase the potential for invasive plants and the introduction and spread of noxious weeds (Levine et al. 2002; addressed in detail in Section 3.8 – Invasive Plant Species). Non-native plant invasions have the potential to

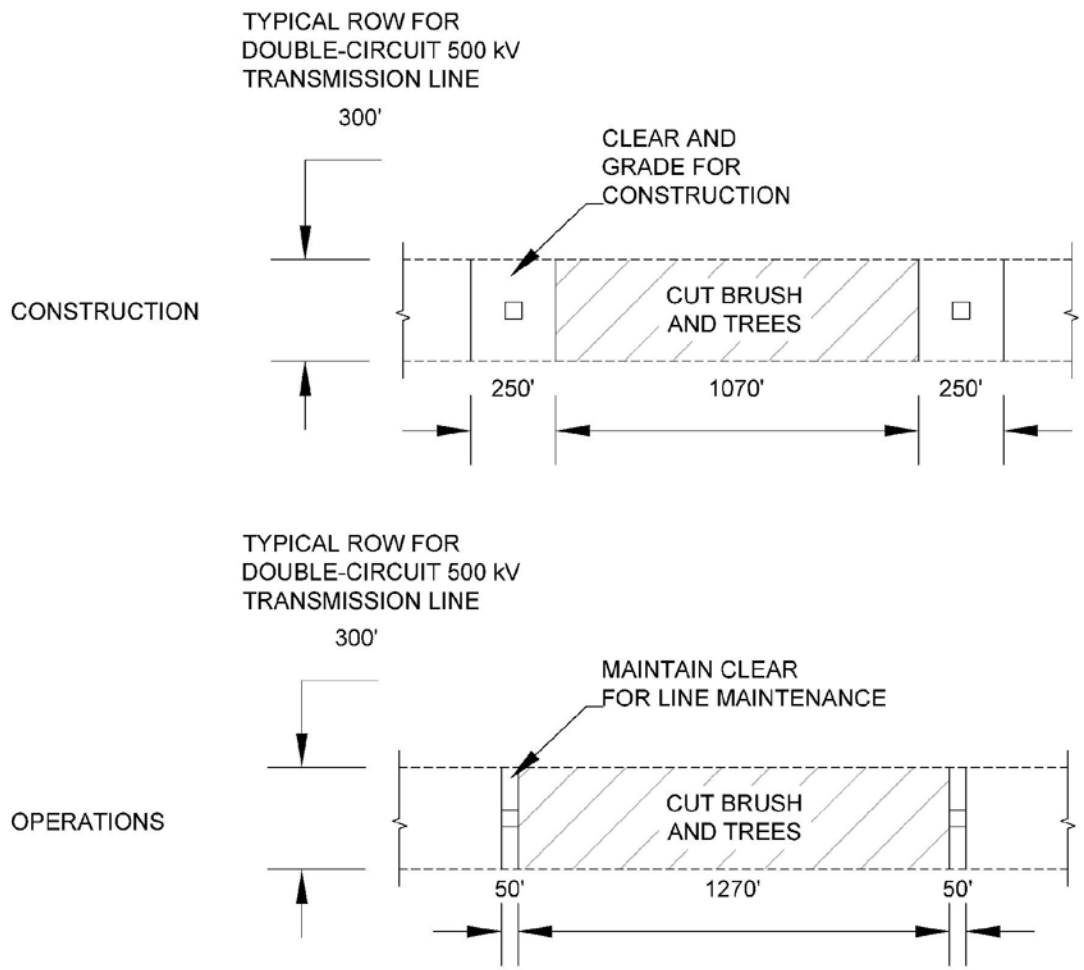
change the composition and diversity of native plants through competition, by altering the natural fire regime, and by altering other ecosystem processes (e.g., nitrogen cycling). Non-native plants such as cheatgrass create a more continuous fuel bed than their native bunchgrass counterparts, resulting in a dramatic increase in fire frequency and intensity. This has resulted in a substantial loss of native shrubland and grasslands throughout the western United States (Levine et al. 2002). The Project would incorporate standard BMPs and proposed EPMs (described below) for minimizing the potential for introduction and spread of noxious weeds (see additional discussion in Section 3.8 – Invasive Plant Species and the Framework Reclamation Plan for Construction Activities included in Appendix C-2). Thus under the Proposed Action and all Action Alternatives, increases in noxious weeds would be minimized.

Indirectly, removal of protective vegetation would also expose soil to potential wind and water erosion. This can result in further loss of soil and vegetation, as well as increase sediment input to water resources. However, with implementation of the Project SWPPP, erosion and sedimentation effects on vegetation would be temporary and limited to the construction period under the Proposed Action and all Action Alternatives. Proposed EPMs and BMPs (as defined in Sections 2.8 and 2.12, respectively) aimed at minimizing the effects of erosion caused by vegetation removal are discussed in detail in Section 3.15 – Soils and Section 3.16 – Water Resources.

Finally, there would also be indirect effects resulting from the fragmentation of connected vegetation types. Fragmentation refers to the breaking up of contiguous areas of vegetation into smaller patches, which results in the creation of habitat edges (areas where two or more vegetation types meet) along the ROW. Edge areas have different microclimatic conditions and structure, which may lead to different species composition than interior area. Due to their greater height and structural complexity, edge effects would be the most drastic in forest and woodland vegetation communities compared to shrubland or grassland communities. Fragmentation and the loss of landscape connectivity can also impact wildlife. A detailed fragmentation analysis is provided in Section 3.10 – General Wildlife and Fish.

Extent and Duration of Effects to Vegetation

The direct and indirect effects of a transmission line crossing shrub-steppe and other low vegetation are generally minor, beyond the localized impacts of structure installation and the construction of roads and other facilities, because the surrounding vegetation is low-growing (i.e., the existing low-growing vegetation would be maintained, thus minimizing changes to vegetation community structure or composition and other functional values). However, in forested areas, in addition to the effects of roads and structures, the entire ROW would be cleared of trees tall enough to endanger the line. Therefore, in forested environments, due to the removal of this vertical structure, there would be greater changes in vegetation community structure and composition than in non-forested environments. Construction clearing limits in forested environments are illustrated in Figure 3.6-1. Chapter 2 provides a detailed description of the construction ROW, access roads, and other Project facilities.



Gateway West
Transmission Line Project
Idaho, Wyoming, Nevada

Comparison of Typical Double Circuit 500 kV Clearing in Forested Area for Construction and Operation

FIGURE 3.6-1

After construction, the portions of the structure pad not needed for normal transmission line maintenance, including fire and personnel safety clearance zones, would be restored to approximate their pre-construction conditions and would be reseeded with a weed-free seed mix. The recovery of vegetation following reclamation would vary by plant community type desired following construction (i.e., low-growing vegetation maintained in the ROW for safety). Grasslands and herbaceous wetlands would generally recover within 5 to 7 years. Shrublands may require 30 to 50 years, and forested and woodland areas could take 50 to 100 years to reach mature conditions. Sites with naturally sparse vegetation, saline or alkaline soils, high erosion potential, or shallow soils may be difficult to restore and may require special techniques or repeated revegetation efforts. The vegetative communities that reestablish after construction may differ from pre-construction conditions if soils are modified during construction due to compaction or by breaking up of hardpans.

Measures to Minimize Effects to Vegetation

To minimize direct and indirect effects of vegetation removal under all alternatives, the Proponents have proposed a Framework Reclamation Plan for Construction Activities (Appendix C-2) that provides procedures for pre-construction treatment of noxious weeds and invasive plants, weed prevention and control, topsoil treatment, ROW restoration (recontouring, decompaction, and cleanup), stabilization of disturbed areas to minimize erosion and runoff, seedbed preparation, seeding methods, preliminary seed mixes, road reclamation, monitoring, and remedial actions. This plan would be implemented under the Proposed Action and all Alternatives. Reclamation efforts would be scheduled for late fall to early winter where feasible and permitted to facilitate seed establishment when snow and rainfall are more likely. A detailed reclamation schedule would be prepared as part of the Project Reclamation Plan for each segment. Project-specific seed mixes would be developed in consultation with the land manager or landowner.

Reclamation actions would meet short- and long-term reclamation objectives by (pertinent EPMs included in the Framework Reclamation Plan for Construction Activities are referenced):

- Using proper soil management techniques, including stripping, stockpiling, and reapplying topsoil material at temporarily disturbed areas of active cropland to restore soil horizons and establish surface conditions that would allow for rapid reestablishment of the productivity of agricultural crops and rangelands. Establishing stable soil surface and drainage conditions, which would minimize surface erosion and sedimentation (REC-16 through REC-22 in the Framework Reclamation Plan).
- Conducting pre-construction weed surveys, applying pre-construction weed control measures where appropriate, controlling weed introduction and spread during construction, and conducting post-construction weed monitoring and control activities where needed (REC-1 through REC-15 in the Framework Reclamation Plan).
- Revegetating disturbed areas with plant species and weed-free seed mixes adapted to site conditions to establish long-term, productive, self-maintaining plant communities to blend in with existing land uses; and concurrently minimize

the chances for noxious and invasive weed establishment (REC-13 through REC-17 in the Framework Reclamation Plan).

- Reestablishing topography to blend in with the surrounding landscape (REC-19 through REC-21 in the Framework Reclamation Plan).
- Monitoring for a minimum of 3 years following construction to ensure the achievement of both short-term and long-term reclamation goals (WEED-4).
- Minimizing temporary construction impacts along the route by limiting the temporary construction ROW width to avoid impacts to native soil and vegetation, where practical and safe.

The Agencies have identified the following mitigation measures that would reduce construction effects on vegetation on lands managed by the BLM and/or the Forest Service:

VEG-1 The Proponents shall consult with each appropriate local land management agency (Forest Service and BLM) office or landowner to determine appropriate seed mix for revegetation. Also see WEED-1.

VEG-2 During construction, blading of native plant communities should be minimized, consistent with safe construction practices. Where feasible, shrubs should be cut at or near ground level to facilitate regrowth after construction. The footprint of construction and operations facilities should be kept to the minimum necessary.

VEG-3 Where feasible, locate new access roads to minimize the number of trees removed during construction.

VEG-4 In areas where revegetation would be completed, topsoil salvage and replacement should be used for areas larger than 1 acre where soils would be disturbed during construction. In areas where revegetation would be completed, topsoil salvage will be used in all areas of cut or fill in order to facilitate revegetation.

In addition, in specific sensitive areas (such as VRM Class II and areas near NHT trails), the access road used for construction will be restored and an alternative access route for operations designated (mitigation measure VIS-9; see Section 3.2 – Visual Resources).

Given the dry climate, that construction would occur during the summer when the weather is hot and dry, and the vegetation present in the vicinity of the ROW, the potential for fire is relatively high. To minimize the potential for wildfires, state and federal fire prevention requirements would be followed. Fire prevention measures would include enforcing red flag warnings, providing "fire behavior" training to all pertinent personnel, keeping vehicles on or within designated roads or work areas, and providing fire suppression equipment and emergency notification numbers. All construction personnel would also be trained in wildfire risk and prevention and adequate fire suppression equipment would be maintained with each construction crew. Fire prevention measures have been developed (refer to Table 2.7-1), which outline the responsibilities of Project personnel for prevention and suppression of fires and define minimum fire prevention and suppression measures that would be used during Project

construction. The Proponents would inspect the transmission line for fire hazards and require that work vehicles carry appropriate fire prevention tools and equipment. Implementing these measures would reduce the risk of fire under all alternatives.

The Agencies have identified the following mitigation measures related to fire prevention and control for lands managed by the BLM and/or the Forest Service:

VEG-5 The Proponents' employees and contractors will employ typical practices to prevent fire during construction and operation including brush clearing prior to work, stationing a water truck at the job site to keep the ground and vegetation moist in extreme fire conditions, enforcing red flag warnings, providing training to all pertinent personnel, keeping vehicles on designated roads and within work areas, and providing fire suppression and emergency notification numbers at each construction site. Brush clearing will be limited to the construction ROW.

Operations

During operations, long-term vegetation loss would occur in association with the ROW, where only low-growing vegetation would be maintained, and with permanent structures, where vegetation would be completely removed. Permanent structures include the transmission tower pads and maintenance areas, the substations, the regeneration stations, and permanent access roads. Roads developed specifically for this Project that are identified by the Proponents as no longer necessary would be reclaimed as specified in the Reclamation, Revegetation, and Weed Management Plan. Operations ROW clearing limits in forested environments are illustrated above in Figure 3.6-1.

Maintenance of the ROW under the Proposed Action and all Action Alternatives would involve the use of Integrated Vegetation Management to establish sustainable plant communities on the ROW that are compatible with the electric facilities (i.e., stable, low-growing plant ecotypes that reduce fire risk and maintain safe access to the line and associated facilities). Thus all alternatives would involve some level of site conversion in areas where vegetation management would involve removing tall-growing shrub and tree species and other obstructions near structures. (See descriptions of border and wire zones in the following paragraphs.) Vegetation management practices are outlined in Appendix C-4 and in Appendix B. Integrated Vegetation Management may involve use of manual control methods, mechanical control methods, chemical controls, biological controls, or cultural controls, such as taking advantage of seed banks of native, compatible species.

Under Integrated Vegetation Management, the ROW would be divided into two zones, each with different levels of vegetation maintenance (Figure 3.6-2). Approximately half of the ROW would fall in each zone, as shown on the following illustration. Descriptions of the zones are provided below:

- **The wire zone**. A linear zone under the wires, and extending 10 feet beyond them, would have all trees removed, except where terrain is such that there would be more than 50 feet between the tree tops and the conductors. This may occur where conductors span a valley or canyon,

- **The border zone**. A zone on each side of the wire zone to the edge of the ROW, which would be maintained to exclude vegetation more than 25 feet tall. Where terrain is such that the conductors span a valley or canyon, the border zone would be maintained to prevent trees from growing up that could fall or drop branches onto the conductors at maturity.

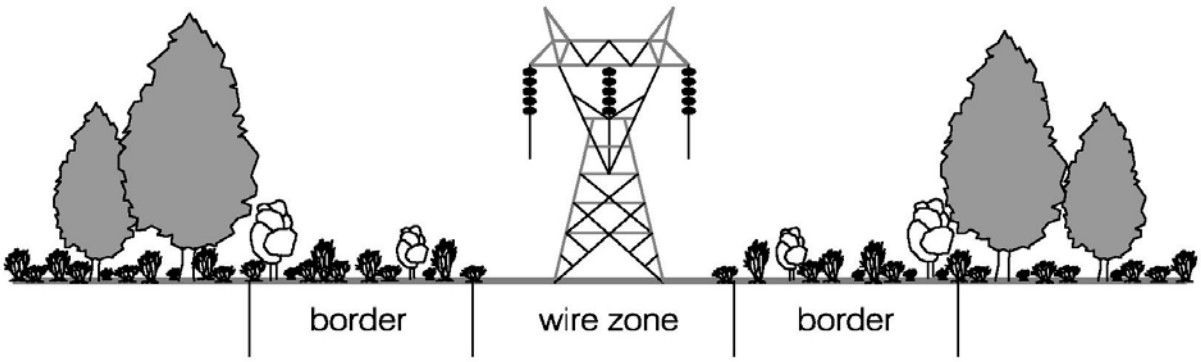


Figure 3.6-2. ROW Integrated Vegetation Management Zones

Vegetation management would be conducted every 3 to 10 years, depending on conditions such as topography, vegetation types and growth rates, and the potential for vegetation to interfere with safe operation of the line prior to the next clearing cycle. Forested vegetation types (conifer forest, deciduous forest, juniper, forested wetland and riparian; approximately 30 percent of the areas requiring maintenance) would undergo vegetation management on a regular cycle. Other vegetation types would require minimal vegetation management in either the wire zone or border zone during operation because the natural or existing managed vegetation does not grow tall enough to present a hazard to the safe operation of the transmission line. Additional information about Integrated Vegetation Management is provided in the Revised Plan for Operations, Maintenance and Emergency Response in Appendix C-4.

While access roads constructed for the Project would be allowed and encouraged to revegetate, the vegetation (grass and shrubs) would be kept low because maintenance and inspection personnel would need to access the towers periodically during the life of the Project. For normal maintenance, an 8-foot-wide portion would be used and vehicles would drive directly over the vegetation. The full width of the access road would be used for access by larger vehicles during non-routine maintenance.

Other ROW maintenance activities would consist of ground inspections, live line maintenance, and grading or repair of access roads and work areas. These activities could result in increased risk of fire or introduction and spread of noxious weeds. The Revised Plan for Operations, Maintenance and Emergency Response in Appendix C-4 includes specific measures that would reduce impacts to vegetation during operation under all alternatives, including noxious weed control and fire protection.

The Agencies have identified the following mitigation measures related to vegetation management during Project operations for lands managed by the BLM and/or the Forest Service:

VEG-6 The Reclamation, Revegetation, and Weed Management Plan must provide a site-specific plan for access road and ROW vegetation management in areas where removal of trees is proposed. The site-specific plan must include tree removal, slash disposal plans, and BMPs to avoid erosion and sedimentation of watercourses or wetlands. This plan must be submitted to each applicable land management agency for approval prior to clearing.

VEG-7 Herbicide use must conform to the existing types and application methods approved by those land-managing agencies. The Reclamation, Revegetation, and Weed Management Plan must specify where herbicides would be used, what types would be used, and what application methods would be used. The plan must be in conformance with regulations regarding herbicide use from the land-managing agency or county in which herbicide use is proposed.

VEG-8 Prior to the start of construction and maintenance activities, all contractor vehicles and equipment (including personal protective equipment) shall be cleaned of soil and debris capable of transporting invasive plant seeds or other propagates. All vehicles and equipment shall be inspected by Agency-approved inspectors and certified as weed free by agency-approved personnel, in order to ensure they have been cleaned properly. The final Reclamation, Revegetation, and Weed Management Plan will include the location of all cleaning stations, how materials cleaned from vehicles at these stations would be either captured or treated so that cleaning station locations would not also become infected, and who would confirm/certify that vehicles leaving cleaning stations and/or entering construction sites are free of invasive plant materials.

VEG-9 Agency staff will approve weed-free straw or other erosion control on federal lands prior to application.

VEG-10 Agency staff will approve tree seedlings planted in decommissioned roadbeds and other temporarily disturbed areas on federal lands to assure seedlings are matched to site conditions.

VEG-11 The Proponents will consult with appropriate Forest Service staff to identify the top soil layer on NFS lands.

VEG-12 Post-construction monitoring and treatment of invasive plants on closed roads and fly yards shall continue for at least 3 years. If after 3 years post-construction conditions are not equivalent or better than pre-construction conditions, monitoring and treatment will continue until these conditions are met.

VEG-13 The Proponents will meet Wyoming State Forest Practices Act requirements and apply Region 4 BMPs for timber removal operations on the Medicine Bow-Routt NFs and meet Idaho State Forest Practices Act

requirements and apply Region 2 BMPs for timber removal operations on the Caribou-Targhee and Sawtooth NFs.

VEG-14 Where the route would be visible on timbered slopes on lands managed by the Kemmerer FO, allow tree removal only at structure locations and where required for safety rather than from the entire ROW in order to prevent a linear feature on the landscape from clear-cutting trees. Vegetation removal requirements will consider Appendix A, Key Standards Relating to Electric System Reliability and Safety, of the MOU with the Edison Electric Institute (2006).

Decommissioning

Decommissioning activities would restore vegetation within the Project footprint. Project facilities would be removed at the end of the operational life of the transmission line. Structures and foundations would be removed to below ground surface. In order to complete decommissioning, impacts similar to the initial construction disturbance would be expected. Roads would be rewidened to accommodate the large cranes and heavy equipment needed to dismantle and remove the steel towers, regeneration stations, and substations. Staging areas would be needed to temporarily store decommissioned materials, and some further disassembly would be expected at the staging areas before the materials were hauled away for recycling or disposal. After towers and conductors were removed from the ROW, heavy equipment would restore contours to the extent feasible. Disturbed areas would be reseeded with a weed-free seed mix. Where feasible and in coordination with the land-managing agency or landowner, roads would be recontoured to match adjacent areas, and would be ripped to facilitate revegetation where required. Recovery times for vegetation would be similar to those previously described for recovery from temporary construction activities but could be longer depending on the amount of compaction. Decompaction may be necessary for successful reclamation. Mitigation measure AGRI-11, found in Section 3.18 – Agriculture, provides for this activity prior to reseeding after decommissioning. Forest type–appropriate tree species would be replanted if there is not adequate natural regeneration. Additional details concerning decommissioning are provided in Section 2.7.4.

Effects to Vegetation on Federal Lands

Table 3.6-2 summarizes construction and operations effects to vegetation on federal lands under the Proposed Action. Tables D.6-5 and D.6-6 in Appendix D summarize effects to vegetation on federal lands from construction and operations of the Project, respectively, by proposed and alternative transmission line segments.

Table 3.6-2. Impacts (acres) to Vegetation on Federal Lands under the Proposed Action

	Shrubland[1/]	Forest/ Woodland[2/]		Wetland/ Riparian		Grassland	Other Cover Types[4/]	
Land Ownership	Const. Fac.[3/]	Const./ Fac.	ROW	Const./ Fac.	ROW	Const. Fac.	Const. Fac.	Total Impacts[5/]
Construction								
BLM	4,689	268	547	20	<1	1,645	162	**7,332**

Table 3.6-2. Impacts (acres) to Vegetation on Federal Lands under the Proposed Action (continued)

Land Ownership	Shrubland[1/]	Forest/ Woodland[2/]		Wetland/ Riparian		Grassland	Other Cover Types[4/]	Total Impacts[5/]
	Const. Fac.[3/]	Const./ Op. Fac.	ROW	Const./ Op. Fac.	ROW	Const. Fac.	Const. Fac.	
Forest Service	61	117	261	2	2	–	4	**745**
Caribou-Targhee NF	22	90	221	1	1	–	4	**339**
Medicine Bow-Routt NFs	40	26	39	<1	<1	–	<1	**107**
Sawtooth NF	–	–	–	–	–	–	–	**–**
Bureau of Reclamation	50	–	–	<1	–	3	<1	**54**
Military Reservation/Corps of Engineers	2	–	–	–	–	2	–	**4**
National Park Service	–	–	–	–	–	<1	–	**<1**
Operations								
BLM	825	50	704	4	<1	212	38	**1,833**
Forest Service	12	29	328	<1	2	–	2	**373**
Caribou-Targhee NF	4	21	278	<1	1	–	2	**307**
Medicine Bow-Routt NFs	7	8	50	<1	<1	–	<1	**67**
Sawtooth NF	–	–	–	–	–	–	–	**–**
Bureau of Reclamation	12	–	–	<1	–	1	<1	**14**
Military Reservation/Corps of Engineers	1	–	–	–	–	<1		**2**
National Park Service	–	–	–	–	–	<1	–	**<1**

1/ "Shrublands" include sagebrush, saltbush, greasewood, and dwarf shrub.
2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.
3/ Const./Op. Fac. = clearing for facilities such as infrastructure, roads, temporary staging areas, and fly yards; ROW = right-of-way clearing.
4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).
5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding.
6/ Value is less than 0.1 acre.

Impacts to Mature and Old-growth Forest

The Forest Service requested that impacts to old-growth forest be addressed by national forest crossed by the Project. Old-growth forests are ecosystems distinguished by old trees and related structural features such as tree size, amount of large dead woody material, number of canopy layers, species composition, and ecosystem function (Hamilton 1993). Available vegetation data were obtained from the Sawtooth, Medicine Bow-Routt, and Caribou NFs to determine whether the Project crosses areas of mature or old-growth forest. In all cases data were limited in that only the Medicine Bow-Routt NFs had a GIS layer indicating forest successional stages. For the Sawtooth NF a broad scale vegetation layer was provided by the Forest which included data on tree size, canopy cover, and cover type. Using the Forest Service Region 4 definition for old-growth (Hamilton 1993), it was possible to identify if these were mature or old-growth conifer forest stands.

Approximately 311 acres of forest/woodland vegetation would be impacted by the Project on the Caribou-Targhee NF under the Proposed Action along Segment 4, of

which 40 acres are conifer, 235 acres are deciduous, and 36 acres are juniper woodland. Of these, 38 acres of conifer forest, 227 acres of deciduous forest, and 35 acres of juniper woodland would be permanently impacted during operation (Proposed Route for Segment 4). Roughly 95 percent of these acres consist of mature forest (Beck 2010). The landscape outside of the ROW is also dominated by mature forest (Forest Service 2003a) and has similar species composition. At the 5th code HUC scale, the acreage of mature forest impacted by the Project would be well below the maximum allowable by the Caribou Forest Plan Vegetation Standard 2 and should not prevent the Forest Service from meeting the requirements of maintaining at least 20 percent of the forest in mature and old age classes. To ensure compliance with their Forest Plan, the Montpelier Ranger District of the Caribou-Targhee NF requested that a field study be conducted to verify whether or not forest stands crossed by the Project along Segment 4, and identified as having characteristics suggestive of old-growth during an initial qualitative assessment using Project vegetation mapping and aerial photography, consisted of old-growth. In response, a field study was conducted in July 2010, using Forest Service Region 4 Common Stand Exam (CSE)/Quick Plot protocol, to determine if four stands crossed by the Project met the Region 4 definition of old-growth (as required in Vegetation Standard 3 of the Caribou Forest Plan) in terms of tree size, age, and density. Results of this field study indicated that none of the forest stands crossed by the Project meet the minimum definitions of old-growth (Tetra Tech 2010a). Compliance with related standards and guidelines is discussed below.

The Project would impact 50 acres of mature forest during construction and 42 acres during operations on the Medicine Bow-Routt NFs along Proposed Routes for Segments 1E, 1W(a), and 1W(c); Alternative 1E-C would impact 1.7 acres during construction and 1.5 acres during operations. However, neither the Proposed Route nor its Route Alternatives cross areas defined as old-growth forest. Additionally, no tree removal would occur on slopes greater than 40 percent, in accordance with Medicine Bow Forest Plan standards.

Likewise, on the Sawtooth NF, which is not crossed by the Proposed Route, Alternatives 7H, 7I, and 7J would cross forested vegetation. Route Alternatives 7H, 7I, and 7J would impact 45 acres,15 acres, and 15 acres of mature forest during construction, respectively. Approximately 40 acres, 11 acres, and 11 acres of mature forest would be impacted by Route Alternatives 7H, 7I, and 7J during operations, respectively. GIS data from the Sawtooth NF do not include information on forest age class or seral stage. Based on aerial photo interpretation, these forest areas do not appear to possess characteristics of old-growth.

On the Medicine Bow-Routt and Caribou-Targhee NFs, where the ROW passes through the forest/woodland habitat type, the edges of the ROW would be “feathered,” or cut so that the edge of the ROW is not straight, to reduce visual effects. This would be accomplished by removing some larger trees farther into the forest than the standard width of the ROW. In areas where feathering would occur, impacts to forest/woodland vegetation would increase by approximately 15 percent on these forests, above that reported in the tables below and in Appendix D (Tables D.6-2 through D.6-6). Feathering would be a one-time vegetation treatment, and this type of ROW edge would not be maintained throughout Project operations. An impact to the forest/woodland

vegetation from feathering would be to convert the forest to an earlier successional stage due to the removal of the largest trees.

Impacts to Suitable Timberlands

Approximately 221 acres of forest would be within the ROW on the Caribou-Targhee NF. Merchantable timber would be cut and yarded to landings where the logs would be loaded on to trucks and hauled to market. Unmerchantable logs would be stored along the edge of the ROW for later use in site restoration. Ground-based logging equipment would be used to harvest the majority of the logs. Approximately 36 acres of mature conifer forest within the ROW are on slopes greater than 40 percent. The Caribou Forest Plan does not permit ground-based logging equipment to be used on slopes greater than 40 percent. Helicopters would be used to harvest these areas. Approximately 5 acres of forest on slopes greater than 40 percent would be harvested and removed by helicopter in Section 3, Township 12 South, Range 42 East. This timber could be flown to the proposed fly yard near Forest Road 20138. Approximately 4 acres in Section 3, Township 12 South, 8 acres in Section 6, Township 12 South, Range 42 East, and 6 acres in Section 2, Township 12 South, Range 41 East could be flown to landings adjacent to roads on relatively flat areas within the ROW. The largest concentration of timber on slopes greater than 40 percent, approximately 13 acres, is in Section 1, Township 12 South, Range 41 East. This timber could be flown the proposed fly yard just east of Forest Road 20444.

The Project crosses areas mapped as being suitable for commercial management activities on the BLM Pocatello FO. However, according to the BLM, these mapped areas in many cases are based on 50-year old stand inventories and have been affected by bark beetle infestation, and are thus no longer representative of current commercial forest conditions (Swan 2010). However, on the Pocatello FO there are two upcoming salvage sale areas, scheduled for summer 2011. One is approximately 59 acres, located approximately 0.5 mile north of Route Alternative 5A. The other is approximately 56 acres and is crossed by Route Alternatives 7B and 5B. Route Alternative 7B would impact approximately 0.3 acre of conifer forest in this area, and Route Alternative 5B would impact 5.2 acres. Given that under both alternatives less than 10 percent of the salvage sale would be impacted, no appreciable reduction in the timber base would occur. In addition, roads constructed by the Project (one would pass through the salvage sale area) would provide the BLM with access to these areas, which would off-set any loss of timber acreage.

The BLM Pocatello FO has also identified four other potential areas in the Deep Creek Mountains where commercial forestry activities will be a future focus (Swan 2010). These are broad areas ranging in size from roughly 4,950 acres to 10, 320 acres in which commercial forest projects would be considered. Four transmission line segment traverse these areas and would require clearing of conifer forest including Segment 5 (13 acres), Alternative 5A (70 acres), Proposed Segment 7 (25 acres), and Alternative 7A (73 acres), including acreage disturbed for facilities as well as within the cleared ROW.

The Kemmerer FO has identified three ongoing or foreseeable commercial timber projects that coincide with the Project footprint. These projects include:

- **Proposed Aspen Front KFO**—Removal of competing subalpine fir from aspen stands and salvage of dead lodgepole pine (planning process)
- **Proposed Commissary White Bark Sanitation Project**—Removal of competing subalpine fir from whitebark pine stands (planning process)
- **Proposed Wheat Creek Aspen Treatment**—Removal of competing subalpine fir from aspen stands (pre-planning process)

The BLM expressed concern that Project-related timber removal could reduce revenue potential from sale of associated forest products. The proposed Aspen Front Project is crossed by Segment 4 (conifer removal: 54 acres construction, 53 acres operations) and Alternative 4F (conifer removal: 26 acres construction, 25 acres operations). The proposed Commissary White Bark Sanitation Project and the proposed Wheat Creek Aspen Treatment Project would be crossed by Segment 4, which would result in the clearing of 1 acres of conifer forest during construction and operations within each of these projects.

Prior to Project construction, a timber cruise would be performed on portions of the ROW that overlap BLM and Forest Service timbered areas to determine the volume of the timber before it is cut. The price of the timber would be negotiated according to 43 CFR Part 5402.0-6. Payment to Treasury would be made, or the sale of the timber would be complete, before the trees are cut.

Plan Amendments

There are several plan amendments, listed in Appendix F, that do not directly apply to vegetation but would impact vegetation if implemented. These include:

- Amendments necessary to reclassify BLM VRM classes or Forest Service Land Use Designations to allow construction of the Project due to nonconformance with visual resource standards. Specific amendments would be required under the Casper RMP (Proposed Routes for Segments 1E, 1W[a,c], and Alternative 1E-C), Rawlins RMP (Alternative 1E-B), Kemmerer RMP (Alternatives 4B, 4C, 4D, and 4E), Malad MFP (Alternative 5D), Cassia RMP (Alternatives 7E, 7H, 7I, and 7J), Twin Falls MFP (Alternatives 7I and 7J), Jarbidge RMP (Proposed Routes for Segments 8 and 9, Alternatives 8A, 9B, 9D), Bennett Hills/Timmerman Hills (Proposed Route for Segment 8), and SRBOP RMP (Proposed Route for Segment 8, Alternative 8E, 9D, 9F, 9G, and 9H).
- Amendments to standards that limit utilities to existing facilities and locations. Specific amendments would be required under the Malad MFP (Proposed Route for Segment 5, Alternative 5A and 5B, Proposed Route for Segment 7, and Alternatives 7A and 7B), Cassia RMP (Proposed Route for Segment 7), Twin Falls MFP (Proposed Route for Segment 9, Alternative 9A, and Alternatives 7I and 7J), and SRBOP RMP (Proposed Route for Segments 8 and 9, and Alternatives 8D, 8E, 9D, 9E, 9F, 9G, and 9H).
- Amendments to allow a single-use exemption for a visually altering action without changing the VRM or for construction in an otherwise restricted area. Specific amendments for the former circumstance would be required under the Casper RMP (Proposed Route for Segments 1E, 1W[a,c], and Alternative 1E-C), Rawlins

RMP (Proposed Route for Segments 1E and 2, and Alternative 1E-B), Green River RMP (Proposed Route for Segment 4), Kemmerer RMP (Proposed Route for Segment 4, and Alternatives 4A, 4C, 4D 4F, 4D, 4E), Malad MFP (Proposed Route for Segments 5 and 7), Cassia RMP (Alternatives 7I and 7J), Twin Falls MFP (Proposed Route for Segment 8), Medicine Bow Forest Plan (Proposed Route Segments 1E and 1W[a,c], and Alternative 1E-C), Caribou Forest Plan (Proposed Route Segment 4), and Sawtooth Forest Plan (Alternatives 7H, 7I, and 7J). Specific amendments for the latter circumstance would be required under the Kemmerer RMP (Proposed Route for Segment 4 and Alternatives 4A through 4F), Malad MFP (Proposed Route for Segments 5 and 7), Twin Falls MFP (Proposed Route Segment 9), Jarbidge RMP (Proposed Route for Segment 9, Alternative 9B, Proposed Route for Segment 8, and Alternative 8A), SRBOP (Proposed Route for Segments 8 and 9, Alternative 8E, and Alternatives 9D through 9H). Sawtooth Forest Plan (Alternatives 7H and 7I), and Caribou Forest Plan (Proposed Route for Segment 4).

- Amendments to allow construction in the habitat of a special status wildlife species, including the goshawk nesting and foraging areas, sage-grouse breeding areas, raptor nests, and wetland habitat for the boreal toad, wood frog, and northern leopard frog. Specific amendments would be required under the Medicine Bow Forest Plan (Proposed Route for Segments 1E and 1W [a,c] and Alternative 1E-C), Caribou Forest Plan (Proposed Route for Segment 4), and Green River RMP (Proposed Route for Segments 3 and 4 and Alternatives 4B-4E).

Amendments associated with BLM VRM classification and Forest Service Land Use Designations would result in the disturbance to or removal of vegetation within the ROW and associated indirect effects (invasive species, fire risk, fragmentation). The Project would have the greatest effect on forest/woodland vegetation where tree removal would result in conversion of the vegetation to an earlier successional stage, and would be maintained within the ROW during operations. In shrubland and other low-growing vegetation types, vegetation would regrow within the ROW after construction. These effects are described in detail above and acres of vegetation impacted along the various segments are provided below in Section 3.6.2.3. Additional vegetation impacts could occur if future projects are permitted and built within these newly reclassified areas. This cumulative effect is discussed in Chapter 4. The amendments for single-use exemptions due to incompliance for visual resource standards or for development in otherwise restricted areas would have similar effects to the VRM reclassification amendments, except that there would be no long-term indirect effect of other projects being proposed in the same area.

Amendments to standards that limit utilities to existing facilities and locations would also result in the disturbance to or removal of vegetation and associated impacts. Impacts to vegetation along the segments where these amendments would be required are also described below in Section 3.6.2.3. In these circumstances, vegetation removal would increase the level of fragmentation because development would occur outside of existing facilities, creating new disturbance.

Amendments to allow construction within a goshawk nesting and foraging area, within raptor nest buffers, and within habitat for the boreal toad, wood frog, and northern

leopard frog may result in removal of forest and wetland vegetation within the ROW, respectively. Impacts to these vegetation types along the segments where these amendments would be required are described below in Section 3.6.2.3.

There are standards and guidelines related to restoration of disturbed areas and weed control in multiple land use management plans. Amendments were not proposed for these measures, because the EPMs described above, within the following discussions of impacts by segments, and listed in Section 3.6.3 as well as in Table 2.7-1 would ensure Project conformance with these standards. For example, Decision 003 of the Casper RMP requires "appropriate mitigation measures to minimize impacts to vegetative resources" where surface disturbance or development occurs. Mitigation measure VEG-2 requires minimizing disturbance footprints and restoration of Project areas using native vegetation.

3.6.2.3 Proposed Route and Alternatives by Segment

It is assumed that the direct and indirect effects of the construction and operations of the proposed Project area discussed above are proportional to the acres of land affected during construction and operations. Table D.6-2 in Appendix D contains the anticipated disturbance from construction for the Proposed Route and each of the Route Alternatives. Table D.6-3 in Appendix D provides a summary of impacts resulting from operation and maintenance for the Proposed Route and each of the Route Alternatives. Route Alternatives are compared to the portion of the Proposed Route that starts and ends at the same nodes as the Route Alternative (referred to as the "comparison portion of the Proposed Route"). Based on the vegetation-related issues identified during public scoping (see Section 3.6.1.2 above), the Alternatives discussion below focuses on impacts to sagebrush/shrubland, forest, and grassland. These are major vegetation types important to many of the special status plant and wildlife species addressed in Sections 3.7 – Special Status Plants and 3.11 – Special Status Fish and Wildlife, respectively.

Segment 1E

Segment 1E, as proposed, would link the Windstar and Aeolus Substations in south-central Wyoming with a 100.6-mile 230-kV single-circuit transmission line. Twenty acres of the expansion of Windstar and Aeolus Substations and 0.5 acre for one regeneration site are attributed to Segment 1E. Alternative 1E-A is a 16.1-mile alternative along the north end of Segment 1E, which was the Proponents' initial proposal before moving the Proposed Route at the suggestion of local landowners to avoid the more settled area around Glenrock. Alternative 1E-B is 21.4 miles longer than the Proposed Route but is being considered by the Proponents because it would avoid a Wyoming-designated sage-grouse core area to the east. The BLM has required the consideration of Alternative 1E-C, which parallels the Segment 1W 230-kV lines into the Aeolus Substation (see Appendix A, Figure A-2).

Segment 1E crosses an area of predominantly sagebrush, dwarf sagebrush, and juniper, with smaller components of forest and woodland and wetland/riparian vegetation (Table D.6-1 in Appendix D). Alternative 1E-A and its comparison portion of the Proposed Route cross an area primarily consisting of disturbed grassland and sagebrush, while Alternative 1E-B and its comparison portion mostly cross sagebrush

and dwarf sagebrush. Alternative 1E-C and its comparison portion of the Proposed Route cross natural sagebrush with smaller components of forest and woodland and wetland/riparian vegetation.

Construction

The impacts from construction of Segment 1E and its alternatives are presented in Table 3.6-3. Construction of the Proposed Route and clearing of the ROW along Segment 1E would directly affect 1,292 acres for construction of the transmission line, a majority of which (65 percent) is shrubland. As noted above, none of the forested acreage crossed by Segment 1E or its alternatives is classified as old growth.

Table 3.6-3. Comparison of Construction-related Vegetation Impacts (acres) for Segment 1E Proposed Route and Alternatives 1E-A, 1E-B, and 1E-C

Segment or Alternative	Shrubland[1/]	Forest/ Woodland[2/]		Wetland/ Riparian		Grassland	Other Cover Types[4/]	
	Const. Fac.[3/]	Const. Fac.	ROW	Const. Fac.	ROW	Const. Fac.	Const. Fac.	Total [5/]
Proposed 1E – Total Length	844.7	124.0	194.4	8.9	2.2	71.2	46.8	**1,292.3**
Proposed – Comparison Portion for Alternative 1E-A	126.0	t[6/]	t[6/]	0.1	1.3	70.4	16.9	**214.7**
Alternative 1E-A	52.6	0.7	0.6	1.8	2.5	51.9	17.7	**127.7**
Proposed – Comparison Portion for Alternative 1E-B	370.3	5.7	9.5	2.9	–	0.1	14.0	**402.5**
Alternative 1E-B	633.2	36.5	47.9	4.3	–	41.6	13.4	**776.9**
Proposed – Comparison Portion for Alternative 1E-C	680.8	112.2	177.8	8.8	0.9	0.8	29.5	**1,010.8**
Alternative 1E-C	284.4	13.9	24.7	2.7	0.2	t[6/]	10.1	**336.0**

1/ "Shrublands" include sagebrush, saltbush, greasewood, disturbed shrub, and dwarf shrub.
2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.
3/ Const. Fac. = clearing for facilities such as infrastructure, roads, temporary staging areas, and fly yards; ROW = right-of-way clearing
4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).
5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding.
6/ Indicates only a trace amount of impact (i.e., <0.1 acre)

The Proposed Route as well as Alternative 1E-C would impact vegetation within the Medicine Bow-Routt NFs. See Table D.6-5 for the acres of vegetation types impacted on federally managed lands.

Alternative 1E-A would result in less total disturbance than the comparison portion of the Proposed Route, but would affect more acres of wetland/riparian vegetation. The comparison portion of the Proposed Route would have a greater effect on natural sagebrush than Alternative 1E-A (Appendix Table D.6-2).

Alternative 1E-B is longer than the comparison portion of the Proposed Route and would therefore have a greater effect on vegetation during construction. Both segments primarily would disturb shrubland vegetation, primarily consisting of natural sagebrush (Table D.6-2 in Appendix D).

Alternative 1E-C would result in approximately a third of the disturbance resulting from the comparison portion of the Proposed Route (Table 3.6-3). The comparison portion of the Proposed Route would also affect more sensitive vegetation types (forest and woodland, wetland/riparian, and natural sagebrush) than Alternative 1E-C.

Operations

The impacts from operations of Segment 1E and its alternatives are presented in Table 3.6-4. During operations of the proposed Project along Segment 1E, about 480 acres would be permanently affected through clearing for operations facilities or vegetation maintenance within the ROW. Approximately half of the operations impacts would occur in forest and woodlands because of vegetation height management in the ROW.

Alternative 1E-A and the comparison portion of the Proposed Route would have comparable permanent impacts (54 and 45 acres, respectively). However, Alternative 1E-A would permanently affect more wetland/riparian vegetation than the Proposed Route. Alternative 1E-B, which covers over twice as much acreage, would permanently affect more overall vegetation types than the comparison portion of the Proposed Route (211 acres and 99 acres, respectively). Due to its greater length, it crosses more juniper forest (Table D.6-1 in Appendix D) and therefore requires more acres of vegetation maintenance in forest/woodland areas. .Alternative 1E-C is shorter than the

Table 3.6-4. Operations and Maintenance Vegetation Impacts (acres) for Segment 1E Proposed Route and Alternatives 1E-A, 1E-B, and 1E-C

Segment or Alternative	Shrubland[1/]	Forest/ Woodland[2/]		Wetland/ Riparian		Grassland	Other Cover Types[4/]	
	Op. Fac.[3/]	Op. Fac.	ROW	Op. Fac.	ROW	Op. Fac.	Op. Fac.	Total[5/]
Proposed 1E Total Length	206.7	38.2	241.7	2.2	2.3	20.3	15.6	**479.8**
Proposed – Comparison Portion for Alternative 1E-A	25.7	–	–	t[6/]	1.3	20.1	5.2	**53.6**
Alternative 1E-A	14.8	t[6/]	0.6	0.4	3.0	18.0	5.4	**44.8**
Proposed – Comparison Portion for Alternative 1E-B	83.1	1.8	9.5	0.8	–	–	4.8	**99.2**
Alternative 1E-B	136.3	12.5	59.1	0.6	–	11.2	3.5	**211.4**
Proposed – Comparison Portion for Alternative 1E-C	170.0	35.0	220.5	2.2	1.0	0.2	10.2	**395.2**
Alternative 1E-C	84.6	3.5	31.9	0.8	7.2	–	3.6	**116.8**

1/ "Shrublands" include sagebrush, saltbush, greasewood, disturbed shrub, and dwarf shrub.
2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.
3/ Op. Fac. = clearing for facilities such as infrastructure, roads, temporary staging areas, and fly yards; ROW = right-of-way clearing
4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).
5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding.
6/ Value is less than 0.1 acre.

comparison portion of the Proposed Route, and therefore would permanently disturb about a third of the vegetation that would be affected by the Proposed Route. Alternative 1E-C results in less maintenance of forest/woodland areas for the ROW and

fewer permanent impacts to shrublands; however, Alternative 1E-C would permanently remove or alter more wetland/riparian vegetation (Table D.6-4).

Segment 1W

Segment 1W is composed of two parts, Segment 1W(a) and 1W(c), both of which would consist of a new 230-kV line for part of their length and a reconstruction of an existing 230-kV line for the remaining part. Segment 1W(a) would be about 76.5 miles long, and would extend from the Windstar Substation to the Aeolus Substation. Segment 1W(c) would be about 70.6 miles long, and would extend from the Dave Johnston Power Plant to the Aeolus Substation. Alternative 1W-A is a 16.2-mile alternative located near the town of Glenrock, which was the Proponents' initial proposal before moving the Proposed Route at the suggestion of local landowners in order to avoid the more settled area around Glenrock. Twenty acres of the proposed expansion at the Windstar and Aeolus Substations are attributed to Segment 1W(a) and 3 acres of the expansion at the Heward Substation and 17 acres of the expansion at the Windstar and Aeolus Substations are attributed to Segment 1W(c). There are no Route Alternatives proposed south of that point (see Appendix A, Figure A-2).

The Proposed Routes for Segments 1W(a) and 1W(c), the two single-circuit lines, would cross sagebrush for a majority of their lengths (Table D.6-1 in Appendix D). Alternative 1W-A primarily crosses disturbed grassland and natural sagebrush whereas the comparison portion of the Proposed Route primarily crosses natural sagebrush and grassland vegetation (Table D.6-2 in Appendix D).

Construction

The impacts from construction of Segment 1W and its alternatives are presented in Table 3.6-5. Construction of the Proposed Route and clearing of the ROW along Segment 1W would directly affect 1,553 acres (1W[a] and 1W[c] combined) for installation of the transmission line, a majority of which (over 70 percent) is shrubland.

Table 3.6-5. Comparison of Construction-related Vegetation Impacts (acres) for Segment 1W Proposed Routes and Alternative 1W-A

Segment or Alternative	Shrubland[1/]	Forest/ Woodland[2/]		Wetland/ Riparian		Grassland	Other Cover Types[,4/]	
	Const. Fac. [3/]	Const. Fac.	ROW	Const. Fac.	ROW	Const. Fac.	Const. Fac.	Total [5/]
Proposed 1W(a) Total Length	479.4	26.4	48.2	6.5	0.4	88.8	20.1	**671.5**
Proposed – Comparison Portion for Alternative 1W-A	115.5	0.3	1.8	0.7	–	82.3	11.3	**212.2**
Alternative 1W-A	46.7	0.1	0.2	1.6	3.4	73.1	14.8	**140.0**
Proposed 1W(c) Total Length	641.3	38.9	61.4	9.1	3.2	100.5	27.2	**882.0**

1/ "Shrublands" include sagebrush, saltbush, greasewood, and dwarf shrub.
2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.
3/ Const. Fac. = clearing for facilities such as infrastructure, roads, temporary staging areas, and fly yards; ROW = right-of-way clearing
4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).
5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding.

The Proposed Route would impact vegetation within the Medicine Bow-Routt NFs. See Table D.6-5 for the acres of vegetation types impacted on federally managed lands.

Alternative 1W-A would result in approximately one-third less vegetation disturbance than the comparison portion of the Proposed Route. Alternative 1W-A would require less forest clearing but more disturbance to wetland/riparian areas. Alternative 1W-A would also affect less natural vegetation (e.g., natural sagebrush and native grassland; Table D.6-2 in Appendix D) than the comparison portion of the Proposed Route.

Operations

Table 3.6-6 presents operations impacts associated with Segment 1W and its alternative. During operations of the proposed Project along Segment 1W, approximately 465 acres of vegetation would be permanently affected by Project features (Segments 1W[a] and 1W[c] combined), of which approximately 326 acres would be cleared for operations facilities and 138 acres of vegetation, located between structures along the ROW, would be maintained in early seral stage.

Alternative 1W-A and the comparison portion of the Proposed Route would permanently affect a comparable total amount of vegetation (44 acres and 49 acres, respectively), primarily consisting of shrubland and grassland. Alternative 1W-A would result in a greater permanent reduction in wetland/riparian communities than the Proposed Route (Table 3.6-6).

Table 3.6-6. Comparison of Operations and Maintenance Vegetation Impacts (acres) for Segment 1W Proposed Routes and Alternatives 1W-A

Segment or Alternative	Shrubland[1/]	Forest/ Woodland[2/]		Wetland/ Riparian		Grassland	Other Cover Types [4/]	
	Op. Fac.[3/]	Op. Fac.	ROW	Op. Fac.	ROW	Op. Fac	Op. Fac.	Total [5/]
Proposed 1W(a) Total Length	140.5	7.1	59.5	2.1	0.4	22.2	10.5	**242.3**
Proposed – Comparison Portion for Alternative 1W-A	24.6	0.1	2.0	0.3	–	17.0	5.1	**49.1**
Alternative 1W-A	11.9	t[6/]	0.2	0.4	4.0	22.1	5.4	**44.0**
Proposed 1W(c) Total Length	115.9	8.8	77.1	1.8	3.9	11.9	5.9	**225.2**

1/ "Shrublands" include sagebrush, saltbush, greasewood, and dwarf shrub.
2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.
3/ Op. Fac. = clearing for facilities such as infrastructure, roads, temporary staging areas, and fly yards; ROW = right-of-way clearing
4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).
5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding.
6/ Value is less than 0.1 acre.

Segment 2

Segment 2, as proposed, would link the Aeolus and Creston Substations in southeast Wyoming with two 500-kV circuits on one structure. One circuit would be operated at 230 kV during the initial phase of the Project. Its total proposed length is 96.7 miles. Fifty-two acres of the expansion of the Aeolus Substation and the construction of the Creston Substation and 0.5 acre for one regeneration site are attributed to Segment 2. There are three Route Alternatives, two of which are near the community of Fort Fred Steele. Alternative 2A, at 28.4 miles long, is being considered by the BLM because it

remains in the WWE corridor nearer the town and the state historic site. Alternative 2B, at 6.2 miles, is closer to the community than the comparison portion of the Proposed Route and was the initially proposed route before the Proponents responded to local suggestions and relocated the Proposed Route farther to the south. Alternative 2C is a 24.4-mile alternative located north of Hanna, Wyoming. It is being evaluated at the recommendation of the Wyoming Governor's office to follow a utility corridor approved by that office for minimizing effects to sage-grouse (see Appendix A, Figure A-3). Proposed Segment 2 and its alternatives cross an area primarily consisting of sagebrush, disturbed sagebrush, dwarf shrub, and greasewood.

Construction

The impacts from construction of Segment 2 and its alternatives are presented in Table 3.6-7. Construction of the Proposed Route and clearing of the ROW along Segment 2 would directly affect 1,550 acres for installation of the transmission line, a majority of which (93 percent) is shrubland. Because this segment crosses low-growing vegetation, most of the construction disturbance is related to the installation of Project facilities rather than vegetation removal for the ROW.

Table 3.6-7. Comparison of Construction-related Vegetation Impacts (acres) for Segment 2 Proposed Route and Alternatives 2A, 2B, and 2C

Segment or Alternative	Shrubland[1/,]	Forest/ Woodland[2/]		Wetland/ Riparian		Grassland	Other Cover Types [4/]	Total [5/]
	Const. Fac.[3/]	Const. Fac.	ROW	Const. Fac.	ROW	Const. Fac.	Const. Fac.	
Proposed Segment 2 – Total Length	1,438.9	1.6	5.9	9.5	0.2	34.1	59.9	**1,550.1**
Proposed – Comparison Portion for Alternative 2A	387.8	–	–	3.1	0.2	t[6/]	6.5	**97.8**
Alternative 2A	425.4	–	–	5.7	4.6	–	14.2	**450.4**
Proposed – Comparison Portion for Alternative 2B	101.2	–	–	0.1	–	t[6/]	3.1	**104.4**
Alternative 2B	73.2	–	–	2.5	3.4	–	3.8	**83.0**
Proposed – Comparison Portion for Alternative 2C	326.4	–	–	1.5	0.2	32.8	7.8	**369.0**
Alternative 2C	306.7	–	–	0.1	–	0.7	14.6	**322.1**

1/ "Shrublands" include sagebrush, saltbush, greasewood, disturbed shrub, and dwarf shrub.
2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.
3/ Const. Fac. = clearing for facilities such as infrastructure, roads, temporary staging areas, and fly yards; ROW = right-of-way clearing
4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).
5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding.
6/ Value is less than 0.1 acre.

Alternative 2A would impact more vegetation than the comparison portion of the Proposed Route.

Alternative 2B would result in comparable amounts of vegetation disturbance, primarily consisting of shrublands. However, Alternative 2B would have a greater effect on wetland/riparian communities than the comparable portion of the Proposed Route.

Alternative 2C and the comparison portion of the Proposed Route would affect a comparable amount of vegetation, consisting primarily of shrubland.

Operations

Operations impacts to vegetation along Segment 2 and its alternatives are presented in Table 3.6-8. During operations of the proposed Project along Segment 2, approximately 408 acres of vegetation would be permanently affected by Project features, of which 99 percent would be cleared for operations facilities.

Alternative 2A and the comparison portion of the Proposed Route would permanently affect a comparable amount of vegetation (95 acres and 74 acres, respectively). However, Alternative 2A would result in greater permanent reduction in wetland/riparian vegetation than the comparison portion of the Proposed Route. Alternative 2B and the comparison portion of the Proposed Route would also have similar permanent effects to vegetation, with greater reduction in wetland/riparian vegetation occurring under Alternative 2B. Alternative 2C and the comparison portion of the Proposed Route would also impact a similar amount of vegetation during operations, most of which would be shrubland along both routes.

Table 3.6-8. Comparison of Operations and Maintenance Vegetation Impacts (acres) for Segment 2 Proposed Route and Alternatives 2A, 2B, and 2C

Segment or Alternative	Shrubland[1/]	Forest/ Woodland[2/]		Wetland/ Riparian		Grassland	Other Cover Types [4/]	
	Op. Fac.[3/]	Op. Fac.	ROW	Op. Fac.	ROW	Op. Fac	Op. Fac.	Total [5/]
Proposed Segment 2 – Total Length	370.3	0.3	7.0	3.2	0.2	6.6	20.3	**408.0**
Proposed – Comparison Portion for Alternative 2A	71.7	–	–	0.6	0.2	t[6/]	1.4	**74.0**
Alternative 2A	83.7	–	–	1.2	4.6	–	5.6	**95.0**
Proposed – Comparison Portion for Alternative -2B	16.1	–	–	t[6/]		t[6/]	0.4	**16.4**
Alternative 2B	16.6	–	–	0.4	3.4	–	0.6	**21.0**
Proposed - Comparison Portion for Alternative 2C	67.5	–	–	0.5	0.2	6.3	3.0	**77.5**
Alternative 2C	49.0	–	–	t[6/]	–	0.1	3.0	**52.2**

1/ "Shrublands" include sagebrush, saltbush, greasewood, disturbed shrub, and dwarf shrub.
2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.
3/ Op. Fac. = clearing for facilities such as infrastructure, roads, temporary staging areas, and fly yards; ROW = right-of-way clearing
4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).
5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding.
6/ Value is less than 0.1 acre.

Segment 3

Segment 3, as proposed, would link the Creston and Anticline Substations in southeast Wyoming with two 500-kV circuits on one structure. One circuit would be operated at 230 kV during the initial phase of the Project. Its total proposed length between those

two substations is 46.7 miles. Sixty-nine acres of the construction of the Anticline and Creston Substations are attributed to Segment 3. Segment 3 would also link the Anticline and Jim Bridger Substations with a 4.3-mile 230-kV line and a 5.5-mile 345-kV line, and includes the 10-acre expansion of the Jim Bridger 345-kV Substation. There are no alternatives proposed along this segment (see Appendix A, Figure A-4). Proposed Segment 3 crosses an area primarily consisting of sagebrush, saltbush, dwarf shrub, and greasewood.

Construction

The impacts to vegetation from construction of Segment 3 are presented in Table 3.6-9. Construction of the Proposed Route and clearing of the ROW along Segment 3 would directly affect 863 acres for installation of transmission line facilities (infrastructure, roads, temporary staging areas, and fly yards). A majority of the vegetation impacted consists of shrubland (94 percent) but also includes 13 acres of wetland/riparian vegetation.

Operations

The impacts from operations of Segment 3 are presented in Table 3.6-9. During operations of the proposed Project along Segment 3, approximately 221 acres of vegetation would be permanently affected by Project features, including 4 acres of wetland/riparian vegetation.

Table 3.6-9. Acreage Affected by Construction and Operations of Segment 3 Proposed Route

Segment or Alternative	Shrubland[1/]	Forest/ Woodland[2/]		Wetland/ Riparian		Grass land	Other Cover Types [4/]	Total [5/]
	Fac.[3/]	Fac.	ROW	Fac.	ROW	Fac.	Fac.	
Proposed Segment 3 – Total Length – Construction	811.8	–	–	12.6	–	0.6	38.1	**863.1**
Proposed Segment 3 – Total Length – Operations and Maintenance	204.4	–	–	2.3	–	0.1	12.7	**219.4**

1/ "Shrublands" include sagebrush, saltbush, greasewood, disturbed shrub, and dwarf shrub.
2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.
3/ Fac. = clearing for facilities such as infrastructure, roads, temporary staging areas, and fly yards; ROW = right-of-way clearing
4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).
5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding.
6/ Value is less than 0.1 acre.

Segment 4

Segment 4, as proposed, would link the Anticline Substation near the Jim Bridger Power Plant in southwestern Wyoming with the Populus Substation in Idaho with two 500-kV circuits on one structure. Its total proposed length is 203 miles. Eighty-nine acres of the construction of the Anticline Substation and the expansion of the Populus Substation and 1.5 acres for three regeneration sites are attributed to Segment 4. It has six Route Alternatives in the middle portion of its route, but the first 52 miles to the east and the last 61 miles to the west (in Idaho) do not have any Route Alternatives. The middle section of the Proposed Route is 90.2 miles long, and its Route Alternatives vary

from 85 to 102 miles long. These alternatives were proposed by the Wyoming Governor's office (4A, paralleling the existing 345-kV lines throughout); by the BLM Kemmerer FO (4B through 4E, including edits from various cooperating agencies), with the intent to avoid impacts to cultural resources to the extent practical; and by the Proponents (4F, attempting to avoid impacts to cultural resources while still remaining north of the existing lines) (see Appendix A, Figures A-5 and A-6). Proposed Segment 4 and its alternatives cross an area dominated by shrubland, with components of disturbed sagebrush, conifer and deciduous forest, and agriculture (Table D.6-1).

Construction

The impacts from construction of Segment 4 and its alternatives are presented in Table 3.6-10. Construction of the Proposed Route and clearing of the ROW along Segment 4 would directly affect about 3,521 acres for installation of the transmission line, primarily consisting of shrubland (61 percent) and forest/woodland vegetation (27 percent). This includes vegetation cleared to accommodate installation of facilities including infrastructure, roads, temporary staging areas, and fly yards, as well as vegetation along the ROW that would be cleared.

Table 3.6-10. Comparison of Construction-related Vegetation Impacts (acres) for Segment 4 Proposed Route and Alternatives 4A through 4F

Segment or Alternative	Shrubland[1/]	Forest/ Woodland[2/]		Wetland/ Riparian		Grassland	Other Cover Types [4/]	Total [5/]
	Const. Fac.[3/]	Const. Fac.	ROW	Const. Fac.	ROW	Const. Fac.	Const. Fac.	
Proposed Segment 4 – Total Length	2,146.9	369.9	671.5	61.9	3.3	85.6	280.3	**3,520.9**
Proposed – Comparison Portion for Alternatives 4A,B,C,D,E,F	1,034.5	108.7	264.3	15.5	1.1	45.5	29.4	**1,499.1**
Alternative 4A	1,100.8	13.9	37.4	53.1	2.3	26.5	55.2	**1,289.3**
Alternative 4B	1,321.6	2.1	3.1	42.5	0.6	17.1	100.7	**1,487.7**
Alternative 4C	1,311.4	1.4	2.5	35.7	0.6	15.2	114.0	**1,480.9**
Alternative 4D	1,345.9	3.0	5.6	39.2	0.6	17.1	100.0	**1,511.4**
Alternative 4E	1,328.1	2.3	5.0	35.6	0.6	15.2	113.7	**1,500.4**
Alternative 4F	1,113.8	32.7	64.0	39.9	3.0	26.3	47.7	**1,327.4**

1/ "Shrublands" include sagebrush, saltbush, greasewood, and dwarf shrub.
2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.
3/ Const. Fac. = clearing for facilities such as infrastructure, roads, temporary staging areas, and fly yards; ROW = right-of-way clearing
4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).
5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding.

Within the Caribou portion of the Caribou-Targhee NF, construction along the Proposed Route of Segment 4 would affect approximately 339 acres (see Table D.6-5). Of this, approximately 311 acres are dominated by forest/woodland vegetation and the rest are dominated by non-forested vegetation. As requested by the Montpelier District of the Caribou-Targhee NF, an initial mapping effort and field review was conducted to identify whether or not any of the forest stands crossed by the Project potentially met the Forest Service Region 4 definition of old-growth (Hamilton 1993). Four stands identified as warranting more detailed stand examination were subsequently visited in July 2010. The results of this field effort, which involved the use of Forest Service Region 4

Common Stand Exam/Quick Plot protocol, indicated that none of the forest stands crossed by the Project met the Region 4 definition of old growth (Tetra Tech 2010a). Therefore, the proposed Project would not result in the removal of any old-growth forest stands.

The Caribou Forest Plan has a standard that states that at least 20 percent of the forested acres within a fifth-field HUC watershed must be maintained in mature and old-age classes. The Project would not result in reducing the amount of mature and old-age classes to below the 20 percent level in either of the two fifth-field watersheds that would be crossed. The standard also states that at least 15 percent of the forested acres must meet, or be managed to attain, Region 4 old-growth conditions (Hamilton 1993). Field surveys conducted in 2010 in forest stands on the Caribou-Targhee NF that exhibited potential old-growth characteristics determined that none of these forest stands on the Forest crossed by the Project met Forest Service Region 4 definitions for old-growth. Given that the Project would not result in the removal of any old-growth, the Project would be consistent with these Forest Plan standards.

Alternative 4D would have the greatest effect on general vegetation (1,511 acres), followed by Alternative 4E (1,501 acres), the comparison portion of the Proposed Route (1,499 acres) Alternative 4B (1, 488 acres), Alternative 4C (1,481 acres), Alternative 4F (1,327 acres), and Alternative 4A (1,289 acres). All of the alternatives would affect more sensitive vegetation types including shrubland and wetland/riparian vegetation than the comparison portion of the Proposed Route, the most being under Alternatives 4D (shrubland) and 4A (wetland/riparian). However, the amount of forest and woodland affected by the comparison portion of the Proposed Route would be much greater than any of the Route Alternatives (Table 3.6-10). Given that there would be no loss of old-growth under any of the alternatives, all alternatives would be consistent with the Caribou-Targhee NF standard of maintaining at least 20 percent mature and old age classes within each fifth-field HUC watershed.

Operations

The impacts from operations of Segment 4 and its alternatives are presented in Table 3.6-11. During operations of the proposed Project along Segment 4, approximately 1,496 acres of vegetation would be permanently affected by Project features, of which 651 acres would be cleared for operations facilities and 845 acres of vegetation, located between structures along the ROW, would be maintained in an early seral stage.

The comparison portion of the Proposed Route would have the greatest permanent effect on vegetation (599 acres), followed by Alternative 4F (366 acres), Alternative 4D (363 acres), Alternative 4B (353 acres), Alternative 4E (352 acres), Alternative 4C (345 acres), and Alternative 4A (324 acres). Along all alternative segments, 75 percent or more of the vegetation affected would be shrubland. The comparison portion of the Proposed Route would permanently affect the most forest/woodland vegetation (Table 3.6-11). Alternative 4F and Alternative 4A would affect the most wetland/riparian vegetation.

Table 3.6-11. Comparison of Operations and Maintenance Vegetation Impacts (acres) for Segment 4 Proposed Route and Alternatives 4A through 4F

Segment or Alternative	Shrubland[1/]	Forest/ Woodland[2/]		Wetland/ Riparian		Grassland	Other Cover Types [4/]	
	Op. Fac. [3/]	Op. Fac.	ROW	Op. Fac.	ROW	Op. Fac.	Op. Fac.	Total [5/]
Proposed Segment 4 – Total Length	509.8	56.5	841.9	13.0	3.3	16.4	55.3	**1,496.2**
Proposed – Comparison Portion for Alts. 4A–F	222.3	19.6	336.1	2.9	1.1	9.7	7.7	**599.4**
Alternative 4A	243.4	4.0	44.8	6.6	2.7	8.6	14.0	**324.1**
Alternative 4B	314.1	0.4	4.3	3.8	0.6	3.7	25.6	**352.6**
Alternative 4C	306.5	0.2	3.4	2.9	0.6	3.3	27.8	**344.8**
Alternative 4D	321.1	0.8	7.1	4.0	0.6	3.7	25.6	**363.0**
Alternative 4E	309.7	0.6	6.2	3.1	0.6	3.3	27.9	**351.5**
Alternative 4F	246.7	6.7	82.8	4.2	3.4	8.5	13.5	**365.8**

1/ "Shrublands" include sagebrush, saltbush, greasewood, and dwarf shrub.
2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.
3/ Op. Fac. = clearing for facilities such as infrastructure, roads, temporary staging areas, and fly yards; ROW = right-of-way clearing
4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).
5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding.

Segment 5

Segment 5, as proposed, would link the Populus and Borah Substations with a 54.6-mile single-circuit 500-kV line. Forty-four acres of the expansion of the Populus and Borah Substations are attributed to Segment 5. There are five Route Alternatives, including two proposed by the BLM to avoid the Deep Creek Mountains (5A and 5B; 8 miles and 19 miles longer than the comparison portion of the Proposed Route), one preferred by Power County that crosses the Fort Hall Indian Reservation (5C; 7 miles shorter than the comparison portion of the Proposed Route), one originally proposed by the Proponents (5D; 2 miles shorter than the comparison portion of the Proposed Route but located within more agricultural lands), and one proposed by Power County as an alternative approach to the Borah Substation (5E) (see Appendix A, Figure A-7). Proposed Segment 5 and its alternatives cross an area of predominantly sagebrush, forest (deciduous, conifer, and juniper), and agriculture (Table D.6-1 in Appendix D).

Construction

The impacts from construction of Segment 5 and its alternatives are presented in Table 3.6-12. Construction of the Proposed Route and clearing of the ROW along Segment 5 would directly affect 1,282 acres for installation of the transmission line, primarily consisting of forest/ woodland vegetation (40 percent), shrubland (35 percent), and other cover types (agriculture; 21 percent).

The comparison portion of the Proposed Route would result in less vegetation disturbance during construction (646 acres), than Alternative 5A (751 acres) and Alternative 5B (842 acres). Of the three routes, the comparison portion of the Proposed Route would affect the most forest/ woodland vegetation and wetland/riparian vegetation (Table 3.6-12).

Table 3.6-12. Comparison of Construction-related Vegetation Impacts (acres) for Segment 5 Proposed Route and Alternatives 5A through 5E

Segment or Alternative	Shrubland[1/]	Forest/ Woodland[2/]		Wetland/ Riparian		Grassland	Other Cover Types [4/]	Total [5/]
	Const. Fac.[3/]	Const. Fac.	ROW	Const. Fac.	ROW	Const. Fac.	Const. Fac.	
Proposed Segment 5 – Total Length	449.8	201.3	299.2	9.5	0.1	47.0	274.9	**1,281.8**
Proposed – Comparison Portion for Alternative 5A,5B	165.7	154.8	207.0	4.5	0.1	5.5	108.8	**646.4**
Alternative 5A	240.2	118.5	197.8	1.0	t[6/]	59.1	134.1	**751.4**
Alternative 5B	361.7	85.7	158.8	0.8	0.7	26.8	207.5	**842.4**
Proposed – Comparison Portion for Alternative 5C	273.8	163.3	232.9	3.7	–	15.0	134.0	**823.0**
Alternative 5C	292.8	51.9	104.1	5.2	1.0	10.5	71.9	**537.9**
Proposed – Comparison Portion for Alternative 5D	208.0	57.9	85.2	4.5	–	13.6	127.1	**496.3**
Alternative 5D	136.3	71.2	83.3	4.4	5.7	8.3	144.5	**454.5**
Proposed – Comparison Portion for Alternative 5E	56.6	2.3	3.2	1.1	–	8.8	68.8	**140.8**
Alternative 5E	41.2	– t[6/]	–	0.1	–	9.2	53.7	**104.2**

1/ "Shrublands" include sagebrush, saltbush, greasewood, disturbed shrub, and dwarf shrub.
2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.
3/ Const. Fac. = clearing for facilities such as infrastructure, roads, temporary staging areas, and fly yards; ROW = right-of-way clearing
4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).
5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding.
6/ Value is less than 0.1 acre.

Alternative 5C would disturb less vegetation during construction than the comparison portion of the Proposed Route (538 acres and 823 acres, respectively). The comparison portion of the Proposed Route would affect over twice as many acres of forest/ woodland vegetation (nearly 50 percent of its total acreage) than Alternative 5C; effects to wetland/riparian vegetation and shrubland would be comparable.

Alternative 5D would disturb less vegetation during construction than the comparison portion of the Proposed Route (455 acres and 496 acres, respectively). Impacts to wetland/riparian and forest/woodland vegetation would be comparable along both route segment; however, impacts to natural sagebrush would be greater under the comparison portion of the Proposed Route.

Alternative 5E would disturb less vegetation during construction than the comparison portion of the Proposed Route (104 acres and 141 acres, respectively). The comparison portion of the Proposed Route would affect more forest/woodland, wetland/riparian, and natural sagebrush vegetation (Table D.6-2 in Appendix D) than Alternative 5E.

Operations

The impacts from operations of Segment 5 and its alternatives are presented in Table 3.6-13. During operations of the proposed Project along Segment 5 approximately 572

acres of vegetation would be permanently affected by the Project features, of which 175 acres of vegetation would be cleared for operations facilities and 397 acres of vegetation, located between structures along the ROW, would be maintained in an early seral stage. A majority (76 percent) of the operations impacts would occur in forest and woodlands, mainly due to vegetation management in the ROW.

Table 3.6-13. Comparison of Operations-related Vegetation Impacts (acres) for Segment 5 Proposed Route and Alternatives 5A through 5E

Segment or Alternative	Shrubland[1/]	Forest/ Woodland[2/]		Wetland/ Riparian		Grassland	Other Cover Types [4/]	Total [5/]
	Op. Fac. [3/]	Op. Fac.	ROW	Op. Fac.	ROW	Op. Fac.	Op. Fac.	
Proposed Segment 5 – Total Length	101.7	38.3	397.3	0.8	0.1	5.0	28.8	**572.0**
Proposed – Comparison Portion for Alts. 5A,5B	31.5	28.8	274.7	0.3	0.1	0.9	11.2	**347.5**
Alternative 5A	38.4	23.9	253.1	0.3	0.4	5.4	18.9	**340.5**
Alternative 5B	54.9	13.6	206.4	0.3	1.0	2.4	27.4	**306.0**
Proposed – Comparison Portion for Alternative 5C	45.9	32.1	306.7	0.6	–	2.0	13.8	**401.1**
Alternative 5C	35.6	10.4	133.5	0.1	1.3	1.1	8.8	**190.9**
Proposed – Comparison Portion for Alternative 5D	38.8	9.4	111.9	0.6	–	1.4	13.3	**175.3**
Alternative 5D	28.2	6.3	109.9	0.2	8.1	2.1	16.0	**170.8**
Proposed – Comparison Portion for Alternative 5E	16.4	–	4.4	–	–	0.5	7.0	**28.4**
Alternative 5E	16.2	–	–	–	–	0.2	7.7	**24.1**

1/ "Shrublands" include sagebrush, saltbush, greasewood, disturbed shrub, and dwarf shrub.
2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.
3/ Op. Fac. = clearing for facilities such as infrastructure, roads, temporary staging areas, and fly yards; ROW = right-of-way clearing
4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).
5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding.
6/ Value is less than 0.1 acre.

Although they are longer segments, Alternatives 5A and 5B would have fewer permanent impacts on vegetation (341 acres and 306 acres, respectively) than the comparison portion of the Proposed Route (348 acres). This is because both alternatives require fewer acres of ROW maintenance within forested communities during operations than the Proposed Route.

Likewise, Alternative 5C and the comparison portion of the Proposed Route, which are comparable in length, also differ substantially in permanent vegetation impacts (191 acres and 401 acres, respectively). This is because the comparison portion of the Proposed Route crosses more forested/woodland vegetation requiring vegetation maintenance within the ROW than Alternative 5C.

Alternative 5D and the comparison portion of the Proposed Route would result in similar permanent effects to vegetation, including similar amounts of forest/woodland vegetation that would be maintained within the ROW. However, Alternative 5D would

have a greater permanent effect on wetland/riparian vegetation than the comparison portion of the Proposed Route.

Alternative 5E and the comparison portion of the Proposed Route would also result in similar permanent effects to vegetation. The comparison portion of the Proposed Route would have greater clearing of forest/ woodland vegetation within the ROW than Alternative 5E.

Segment 6

Segment 6 is an existing transmission line linking the Borah and Midpoint Substations; it is now operated at 345 kV but would be changed to operate at 500 kV. This segment has no Route Alternatives. Existing support structures would be used and impacts would be limited to within approximately one-quarter mile from each substation to allow for moving the entry point into the substation to the new 500-kV bay. Thirty-one acres of the expansion of the Borah and Midpoint Substations are attributed to Segment 6. Changes in the two substations would allow it to be operated at 500 kV (see Appendix A, Figure A-8).

The impacts from construction and operations of Segment 6 are presented in Table 3.6-14. Construction of Segment 6 would impact about 65 acres of vegetation for installation of the transmission line, consisting of grassland, and other cover types (disturbed/ developed); no additional acreage would be cleared for the ROW. Of these acres, 61 acres would be permanently impacted during operations.

Table 3.6-14. Acreage Affected by Construction and Operations of Segment 6 Proposed Route

Segment or Alternative	Shrubland[1/]	Forest/ Woodland[2/]		Wetland/ Riparian		Grassland	Other Cover Types [4/]	Total [5/]
	Fac. [3/]	Fac.	ROW	Fac.	ROW	Fac.	Fac.	
Proposed Segment 6 – Total Length – Construction	16.1	–	–	–	–	26.0	22.6	**64.7**
Proposed Segment 6 – Total Length – Operations and Maintenance	15.2	–	–	–	–	25.3	20.2	**60.7**

1/ "Shrublands" include sagebrush, saltbush, greasewood, disturbed shrub, and dwarf shrub.
2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.
3/ Fac. = clearing for facilities such as infrastructure, roads, temporary staging areas, and fly yards; ROW = right-of-way clearing
4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).
5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding.

Segment 7

Segment 7, as proposed, would link the Populus and Cedar Hill Substations with a 118.1-mile single-circuit 500-kV line. Forty-two acres of the expansion of the Populus Substation and the construction of the Cedar Hill Substation, and 1 acre for two regeneration sites are attributed to Segment 7. In addition to the Proposed Route, which is principally on private lands, Route Alternatives have been proposed by the BLM to avoid the Deep Creek Mountains (7A and 7B; which are 3 miles and 11 miles longer than the comparison portion of the Proposed Route), by local landowners (7C, 7D, 7E, 7F, and 7G, which all represent minor adjustments proposed to address local issues), by local landowners to avoid private agricultural lands (7I or the State Line

Route, which is 55 miles longer than the Proposed Route and would require 0.5 acre for an additional regeneration site), and by the Proponents to avoid the State Line Route (7H, which is 9 miles longer than the Proposed Route). Alternative 7J, which is a variant of the State Line Route also proposed by local landowners, would not terminate at the Cedar Hill Substation. This alternative, referred to as the Rogerson Alternative, would require a different substation be constructed near a 345-kV existing transmission line (approximately 24 miles southwest of the Cedar Hill Substation; see Appendix A, Figure A-9). The tables and discussion in this document compare 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

Segment 7 crosses an area of predominantly agriculture and sagebrush, with components of forest and woodland vegetation. The vegetation surrounding the Segment 7 alternatives is similar, although Alternatives 7C through 7G would not cross forest/woodland vegetation.

Construction

The impacts from construction of Segment 7 and its alternatives are presented in Table 3.6-15. Construction of the Proposed Route and clearing of the ROW along Segment 7 would directly affect 2,083 acres for installation of the transmission line, primarily consisting of other cover types (agriculture 40 percent, shrubland 30 percent, and forest/ woodland vegetation 20 percent).

Table 3.6-15. Comparison of Construction-related Vegetation Impacts (acres) for Segment 7 Proposed Route and Alternatives 7A through 7J

Segment or Alternative	Shrubland[1/]	Forest/ Woodland[2/]		Wetland/ Riparian		Grassland	Other Cover Types [4/]	Total [5/]
	Const. Fac. [3/]	Const. Fac	ROW	Const. Fac.	ROW	Const. Fac.	Const. Fac.	
Proposed Segment 7 – Total Length	619.8	139.6	278.7	7.9	–	210.7	826.1	**2,082.9**
Proposed – Comparison Portion for Alternative 7A,7B	175.6	79.1	158.4	3.6	–	51.5	189.1	**657.3**
Alternative 7A	294.8	107.2	158.9	4.3	0.3	60.2	151.3	**777.4**
Alternative 7B	409.9	50.6	81.2	1.2	–	27.6	256.9	**827.7**
Proposed – Comparison Portion for Alt. 7C	151.2	–	–	t[6/]	–	16.3	120.6	**288.2**
Alternative 7C	115.1	–	–	–	–	99.7	74.1	**289.1**
Proposed – Comparison Portion for Alt. 7D	37.1	2.6	5.8	2.9	–	24.8	44.9	**118.2**
Alternative 7D	38.8	2.6	5.1	2.9	–	35.0	46.0	**130.8**
Proposed – Comparison Portion for Alt. 7E	33.0	4.0	9.5	–	–	15.0	14.4	**76.2**
Alternative 7E	41.0	7.1	17.4	–	–	16.3	12.7	**95.3**
Proposed – Comparison Portion for Alt. 7F	54.7	38.4	59.2	0.4	–	38.1	69.5	**260.7**
Alternative 7F	53.2	42.7	63.5	t[6/]	–	41.7	31.6	**232.9**
Proposed – Comparison Portion for Alt. 7G	39.3	–	–	t[6/]	–	1.5	7.5	**48.4**
Alternative 7G	44.2	–	–	0.8	–	6.4	20.8	**72.1**

Table 3.6-15. Comparison of Construction-related Vegetation Impacts (acres) for Segment 7 Proposed Route and Alternatives 7A through 7J (continued)

Segment or Alternative	Shrubland[1/]	Forest/ Woodland[2/]		Wetland/ Riparian		Grassland	Other Cover Types [4/]	
	Const. Fac. [3/]	Const. Fac	ROW	Const. Fac.	ROW	Const. Fac.	Const. Fac.	Total [5/]
Proposed – Comparison Portion for Alt. 7H,I	619.8	139.6	278.7	7.9	–	210.7	826.1	**2,082.8**
Alternative 7H	1,372.3	272.4	431.9	8.6	1.2	139.4	322.2	**2,550.6**
Alternative 7I	1,613.4	418.2	477.6	20.2	5.3	373.6	309.5	**3,217.7**
Proposed – Comparison Portion 7/9 for Alt. 7J[7/]	787.8	139.6	278.7	8.2	–	357.6	937.4	**2,59.6**
Alternative 7J[7/]	2,055.5	372.2	425.7	19.3	1.2	406.4	325.5	**3,606.4**

1/ "Shrublands" include sagebrush, saltbush, greasewood, and dwarf shrub.
2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.
3/ Const. Fac. = clearing for facilities such as infrastructure, roads, temporary staging areas, and fly yards; ROW = right-of-way clearing
4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).
5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding.
6/ Value is less than 0.1 acre.
7/ Alternative 7J connects with Segment 9 approximately 25.8 miles west of the proposed Cedar Hill Substation, which is the western terminus of Segment 7 and the beginning point for Segment 9. The table above compares 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

Alternatives 7A and 7B would have greater impacts to vegetation during construction (777 acres and 828 acres, respectively) than the comparison portion of the Proposed Route (657 acres). Alternative 7B would have the greatest effect on shrubland vegetation, followed by Alternative 7A, and the comparison portion of the Proposed Route, respectively (Table D.6-2 in Appendix D). Alternative 7A would have the greatest effect on forest/ woodland vegetation, followed by the comparison portion of the Proposed Route, and Alternative 7B, respectively. Finally, the Alternative 7A would have the greatest effect on wetland/riparian vegetation, followed by the comparison portion of the Proposed Route and Alternative 7B, respectively.

Alternative 7C and the comparison portion of the Proposed Route would impact a comparable amount of vegetation. Alternative 7C would impact more grassland (all of which is disturbed), and the comparison portion of the Proposed Route would impact more shrubland vegetation (Table D.6-2 in Appendix D).

Alternative 7D would impact more vegetation than the comparison portion of the Proposed Route (131 acres and 118 acres, respectively). Impacts to individual vegetation types are comparable between the segments, with Alternative 7D affecting more grassland and other cover types (Table 3.6-15).

Alternative 7E results in a slightly greater amount of construction disturbance than the comparison portion of the Proposed Route (95 and 76 acres, respectively). Alternative 7E would affect slightly more forest and woodland and shrubland vegetation than the comparison portion of the Proposed Route.

Alternative 7F would impact fewer acres of vegetation than the comparison portion of the Proposed Route (233 acre and 261 acres, respectively). Alternative 7F would

impact more forest/woodland vegetation and grassland than the comparison portion of the Proposed Route, which would impact more acres of other cover types.

Alternative 7G would affect more vegetation during construction than the comparison portion of the Proposed Route (72 acres and 48 acres, respectively); however, much of the acreage affected by Alternative 7G includes previously disturbed shrublands, disturbed grasslands, and agriculture (Table D.6-2 in Appendix D).

Alternative 7I would have a greater effect on vegetation during construction (3,218 acres), followed by Alternative 7H (2,551 acres), and the comparison portion of the Proposed Route (2,083 acres). Alternative 7H and 7I would primarily impact shrubland, whereas the comparison portion of the Proposed Route would impact an abundance of shrublands and other cover types such as agriculture. Alternative 7I would affect the most forest/woodland and wetland/riparian vegetation, followed by Alternative 7H and the comparison portion of the Proposed Route, respectively.

Alternative 7J would have a greater effect on vegetation during construction (3,606 acres) than the comparison portion of the Proposed Route (2,510 acres). Alternative 7J would have greater impacts to shrublands and forested vegetation types than the comparison portion of the Proposed Route, which would primarily impact other cover types (mainly agriculture). However, due to the routing of Alternative 7J in relation to the Proposed Routes of Segments 7 and 9, it cannot be directly compared with the Proposed Route of Segment 7, as can the other alternatives for this segment.

Alternatives 7H, 7I, and 7J cross the Sawtooth NF, impacting a total of 255 acres,329 acres, and 244 acres, respectively, of forest/woodland vegetation on the Forest during construction (Table D.6-5 in Appendix D). Based on the vegetation layer provided by the Forest, Alternatives 7H, 7I, and 7J would impact 45 acres, 15 acres, and 15 acres of mature forest during construction, respectively. GIS data from the Forest does not include information on forest age class or seral stage. Based on aerial photo interpretation, these forest areas do not appear to possess characteristics of old-growth meeting the Forest Service Region 4 definition.

Alternatives 7H and 7I also cross the Caribou-Targhee NF. Impacts to vegetation from the Project would be minimal and would include less than an acre disturbance to sagebrush (Table D.6-5).

Operations

The impacts from operations and maintenance of Segment 7 and its alternatives are presented in Table 3.6-16. A total of 587 acres of vegetation would be permanently affected by Segment 7, of which 231 acres of vegetation would be cleared for operations facilities and 356 acres of vegetation, located along the ROW between structures, would be maintained in early seral stage.

Alternative 7A would have the greatest permanent impacts to vegetation (304 acres), followed by the comparison portion of the Proposed Route (246 acres), and Alternative 7B (205 acres), respectively. Alternative 7A would require the most maintenance of forest/ woodland vegetation and wetland/riparian vegetation, followed by the comparison portion of the Proposed Route and Alternative 7B.

Table 3.6-16. Comparison of Operations-related Vegetation Impacts (acres) for Segment 7 Proposed Route and Alternatives 7A through 7J

Segment or Alternative	Shrubland[1/]	Forest/ Woodland[2/]		Wetland/ Riparian		Grassland	Other Cover Types [4/]	Total [5/]
	Op. Fac. [3/]	Op. Fac.	ROW	Op. Fac.	ROW	Op. Fac.	Op. Fac.	
Proposed Segment 7 – Total Length	96.7	18.9	356.0	0.5	–	22.1	92.5	**586.7**
Proposed – Comparison Portion for Alternative 7A,7B	15.8	10.7	199.8	0.1	–	4.0	15.9	**246.3**
Alternative 7A	46.5	23.1	208.3	0.6	0.4	4.3	21.1	**304.3**
Alternative 7B	59.9	9.9	106.0	0.2	–	0.1	28.6	**204.8**
Proposed – Comparison Portion for Alternative 7C	21.4	–	–	t[6/]	–	3.4	11.6	**36.4**
Alternative 7C	13.0	–	–	–	–	7.6	7.0	**27.7**
Proposed – Comparison portion for Alternative 7D	3.7	0.4	7.5	t[6/]	–	4.4	2.8	**18.9**
Alternative 7D	4.5	0.4	6.8	t[6/]	–	5.1	2.7	**19.6**
Proposed – Comparison Portion for Alternative 7E	3.2	0.5	12.5	–	–	1.5	1.0	**18.7**
Alternative 7E	5.5	0.9	21.5	–	–	1.9	0.1	**29.9**
Proposed – Comparison Portion for Alternative 7F	6.8	4.6	80.6	t[6/]	–	4.9	10.9	**107.9**
Alternative 7F	7.8	4.5	86.0	t[6/]	–	5.7	5.5	**109.6**
Proposed – Comparison Portion for Alternative 7G	3.5	–	–	t[6/]	–	0.1	1.9	**5.5**
Alternative 7G	2.7	–	–	t[6/]	–	0.1	2.7	**5.5**
Proposed – Comparison Portion for Alternative 7H,I	96.7	18.9	356.0	0.5	–	22.1	92.5	**586.7**
Alternative 7H	221.5	46.7	564.6	1.1	1.4	14.2	56.2	**905.7**
Alternative 7I	311.0	52.6	616.3	3.5	6.7	38.2	45.6	**1,073.9**
Proposed – Comparison Portion 7/9 for Alt. 7J[4/]	119.4	18.9	356.0	0.5	–	41.8	113.1	**649.7**
Alternative 7J[4/]	372.2	48.1	550.8	3.4	1.4	41.9	46.0	**1,065.8**

1/ "Shrublands" include sagebrush, saltbush, greasewood, disturbed shrub, and dwarf shrub.
2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.
3/ Op. Fac. = clearing for facilities such as infrastructure, roads, temporary staging areas, and fly yards; ROW = right-of-way clearing
4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).
5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding.
6/ Value is less than 0.1 acre.
7/ Alternative 7J connects with Segment 9 approximately 25.8 miles west of the proposed Cedar Hill Substation, which is the western terminus of Segment 7 and the beginning point for Segment 9. The table above compares 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

Alternative 7C would have fewer permanent impacts on vegetation than the comparison portion of the Proposed Route (28 acres and 36 acres, respectively). Differences in vegetation types would be similar to those described above for construction.

Alternative 7D would also have similar permanent effects on vegetation relative to the comparison portion of the Proposed Route. Vegetation types affected would also be similar.

Alternative 7E would have greater permanent effects on vegetation than the comparison portion of the Proposed Route (30 acre and 19 acres, respectively). Alternative 7E would permanently disturb more forest/ woodland vegetation than the Proposed Route.

Alternatives 7F and 7G would have effects on vegetation similar to the comparison portions of the Proposed Route for these segments. Effects to vegetation types would be similar between these alternatives and the comparison portions of the Proposed Route.

Alternative 7I would have more permanent effects on vegetation (1,074 acres) than Alternative 7H (906 acres) and the comparison portion of the Proposed Route (587 acres), respectively. This relates to the amount of forest and woodland vegetation and wetland/riparian vegetation that would require maintenance within the ROW along each segment. Most of the shrubland affected by the three segments is undisturbed (Table D.6-3 in Appendix D).

Alternative 7J would also have more permanent effects on vegetation (1,064 acres) than the comparison portion of the Proposed Route (650 acres). Alternative 7J would require more maintenance of forest and woodland vegetation and wetland/riparian vegetation than the Proposed Route. However, due to the routing of Alternative 7J in relation to the Proposed Routes of Segments 7 and 9, it cannot be directly compared with the Proposed Route of Segment 7, as can the other alternatives for this segment.

Segment 8

Segment 8, as proposed, would link the Midpoint and Hemingway Substations. This 131-mile single-circuit 500-kV transmission line would stay north of the Snake River until crossing through the SRBOP parallel to an existing 500-kV transmission line before ending at the Hemingway Substation. Thirteen acres of the expansion of the Midpoint Substation and 0.5 acre for a regeneration site are attributed to Segment 8. There are five Route Alternatives: 8A, which follows the WWE corridor but crosses the Snake River and I-84 twice (while the Proposed Route would stay north of this area); 8B and 8C, which represent the old routes originally proposed by the Proponents but that have now been changed to avoid the cities of Kuna and Mayfield, respectively; 8D, which represents a small revision involving a rebuild of the existing transmission line to move both away from the National Guard Maneuver Area; and 8E, which was proposed by the BLM in order to avoid crossing the Halverson Bar nonmotorized portion of the Guffey Butte-Black Butte Archaeological District (see Appendix A, Figure A-10). Proposed Segment 8 and its alternatives would cross an area consisting of agriculture, disturbed grassland and sagebrush, and sagebrush (Table D.6-1 in Appendix D).

Construction

The impacts from construction of Segment 8 and its alternatives are presented in Table 3.6-17. Construction of the Proposed Route along Segment 8 would directly affect 2,125 acres for installation of the transmission line, primarily consisting of shrubland (55 percent) and grassland (32 percent).

Alternative 8A would disturb more vegetation during construction than the comparison portion of the Proposed Route (830 acres and 815 acres, respectively). Alternative 8A would disturb more agricultural lands than the comparison portion of the Proposed Route. Alternative 8A would disturb more wetland/riparian vegetation within the ROW than the comparison portion of the Proposed Route.

Alternative 8B would also disturb more vegetation during construction than the comparison portion of the Proposed Route (779 acres and 754 acres, respectively).

Alternative B would impact more wetland/riparian vegetation than the comparison portion of the Proposed Route (Table D.6-2 in Appendix D).

Table 3.6-17. Comparison of Construction-related Vegetation Impacts (acres) for Segment 8 Proposed Route and Alternatives 8A through 8E

Segment or Alternative	Shrubland[1/]	Forest/ Woodland[2/]		Wetland/ Riparian[3/]		Grassland	Other Cover Types [4/]	Total [5/]
	Const. Fac. [3/]	Const. Fac.	ROW	Const. Fac.	ROW	Const. Fac.	Const. Fac.	
Proposed Segment 8 – Total Length	1,175.7	–	–	4.6	0.3	680.1	264.6	**2,125.1**
Proposed – Comparison Portion for Alternative 8A	439.0	–	–	2.0	0.3	167.0	206.5	**814.6**
Alternative 8A	378.3	–	–	1.6	4.8	163.7	280.5	**829.0**
Proposed – Comparison Portion for Alternative 8B	388.6	–	–	0.7	–	317.7	46.5	**753.8**
Alternative 8B	299.7	–	–	7.0	0.4	189.7	281.6	**779.3**
Proposed – Comparison Portion for Alternative 8C	69.8	–	–	0.1	–	66.0	2.6	**138.6**
Alternative 8C	43.6	–	–	t[6/]	–	54.6	39.0	**138.2**
Proposed – Comparison Portion for Alternative 8D	7.4	–	–	–	–	110.8	4.6	**122.7**
Alternative 8D	7.0	–	–	–	–	118.9	16.6	**142.5**
Proposed – Comparison Portion for Alternative 8E	44.9	–	–	–	–	42.1	11.0	**97.9**
Alternative 8E	198.7	–	–	0.2	–	80.7	2.9	**283.2**

1/ "Shrublands" include sagebrush, saltbush, greasewood, and dwarf shrub.
2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.
3/ Const. Fac. = clearing for facilities such as infrastructure, roads, temporary staging areas, and fly yards; ROW = right-of-way clearing
4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).
5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding.
6/ Value is less than 0.1 acre.

Alternative 8C and the comparison portion of the Proposed Route would result in comparable vegetation impacts during construction. Alternative 8C would impact more other cover types whereas the comparison portion of the Proposed Route would impact more shrubland.

Alternative 8D would disturb more vegetation during construction than the comparison portion of the Proposed Route (143 acres and 123 acres, respectively).

Alternative 8E would disturb more vegetation during construction than the comparison portion of the Proposed Route (283 and 98 acres, respectively).

Operations

The impacts from operations of Segment 8 and its alternatives are presented in Table 3.6-18. During operations of the Proposed Route along Segment 8, approximately 246 acres of vegetation would be permanently impacted. Much of the vegetation affected consists of disturbed grasslands and disturbed shrublands (Table D.6-3 in Appendix D).

Alternative 8A and the comparison portion of the Proposed Route would have comparable permanent impacts to vegetation. However, Alternative 8A would impact more wetland/riparian vegetation than the comparison portion of the Proposed Route, much of this due to vegetation maintenance in the ROW.

Table 3.6-18. Comparison of Operations-related Vegetation Impacts (acres) for Segment 8 Proposed Route and Alternatives 8A through 8E

Segment or Alternative	Shrubland[1/]	Forest/ Woodland[2/]		Wetland/ Riparian		Grassland	Other Cover Types [4/]	Total [5/]
	Op. Fac. [3/]	Op. Fac.	ROW	Op. Fac.	ROW	Op. Fac.	ROW	
Proposed Segment 8 – Total Length	138.6	–	–	0.7	0.3	79.0	27.6	**246.2**
Proposed – Comparison Portion for Alternative 8A	54.3	–	–	0.2	0.3	25.0	19.4	**99.3**
Alternative 8A	47.0	–	–	0.4	5.5	28.2	26.6	**107.7**
Proposed – Comparison Portion for Alternative 8B	48.6	–	–	0.2	–	31.2	7.0	**87.0**
Alternative 8B	35.4	–	–	0.2	0.4	18.7	14.7	**69.4**
Proposed – Comparison Portion for Alternative 8C	8.9	–	–	t[6/]	–	5.8	0.3	**14.9**
Alternative 8C	6.4	–	–	t[6/]	–	8.7	0.7	**15.8**
Proposed – Comparison Portion for Alternative 8D	0.7	–	–	–	–	15.7	2.2	**18.6**
Alternative 8D	0.5	–	–	–	–	11.0	3.8	**15.4**
Proposed – Comparison Portion for Alternative 8E	5.7	–	–	–	–	3.0	0.9	**9.6**
Alternative 8E	19.0	–	–	–	–	7.3	0.5	**26.8**

1/ "Shrublands" include sagebrush, saltbush, greasewood, and dwarf shrub.
2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.
3/ Op. Fac. = clearing for facilities such as infrastructure, roads, temporary staging areas, and fly yards; ROW = right-of-way clearing
4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).
5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding.
6/ Value is less than 0.1 acre.

Alternative 8B would have fewer permanent effects to vegetation that the comparison portion of the Proposed Route (69 acres and 87 acres, respectively). The comparison portion of the Proposed Route would permanently impact more shrubland and grassland vegetation, whereas Alternative 8B would impact more other cover types.

Alternatives 8C and 8D would have similar permanent effects to vegetation as their respective comparison portions of the Proposed Route.

Alternative 8E would have a greater permanent effect to vegetation than the comparison portion of the Proposed Route (27 acres and 10 acres, respectively). Both route segments would primarily impact shrubland and grassland vegetation.

Segment 9

Segment 9, as proposed, would link the Cedar Hill and Hemingway Substations with a 161.7 mile single-circuit 500-kV transmission line which skirts the Jarbidge and Owyhee Military Operating Areas to the north, then follows the WWE corridor just north of the Saylor Creek Air Force Range, passing through Owyhee County before entering into the Hemingway Substation. Fifteen acres of the construction of the Cedar Hill Substation and 1 acre for two regeneration sites are attributed to Segment 9. There are eight Route Alternatives proposed, including 9A, which was the Proponents' Proposed Route until moving to avoid the Hollister area; 9B, which is being considered by the BLM because it follows the WWE corridor and parallels existing utility corridors; 9C, which was the Proponents' Proposed Route until moving to avoid the Castleford area; and 9D and 9E, proposed by the Owyhee County Task Force, that cross more public lands north and south of the Proposed Route, respectively, than the Proposed Route. Most of Alternative 9D would be within the SRBOP. Alternatives 9F, 9G, and 9H were proposed to avoid crossing the nonmotorized area south of C.J. Strike Reservoir. Alternatives 9G and 9H provide an alternate route location south of Alternative 8E (see Appendix A, Figure A-11). Proposed Segment 9 and its alternatives cross an area consisting of both natural and disturbed shrubland with a small agricultural component (Table D.6-1 in Appendix D).

Construction

The impacts from construction of Segment 9 and its alternatives are presented in Table 3.6-19. Construction of the Proposed Route and clearing of the ROW along Segment 9 would directly affect 2,671 acres for installation of the transmission line, primarily consisting of shrubland (45 percent) and grassland (39 percent). Potentially sensitive vegetation crossed by Segment 9 includes natural sagebrush, native grassland, and a small amount of wetland/riparian vegetation (Table D.6-2 in Appendix D).

Alternative 9A would impact more vegetation during construction than the comparison portion of the Proposed Route (133 acres and 117 acres, respectively); however, Alternative 9A would disturb more shrubland (75 percent of which is previously disturbed; Table D.6-2 in Appendix D), whereas the Proposed Route would disturb more grassland (all of which is disturbed).

Alternative 9B would result in a similar amount of vegetation disturbance during construction than the comparison portion of the Proposed Route. However, the comparison portion of the Proposed Route would affect more shrubland and grassland than Alternative 9B; effects to wetland/riparian vegetation would be similar between segments (Table D.6-2 in Appendix D).

Alternative 9C would result in more vegetation disturbance during construction than the comparison portion of the Proposed Route (279 acres and 239 acres, respectively). The comparison portion of the Proposed Route would impact a greater amount of sagebrush vegetation, whereas Alternative 9C would impact more other cover types (Table D.6-2 in Appendix D).

Table 3.6-19. Comparison of Construction-related Vegetation Impacts (acres) for Segment 9 Proposed Route and Alternatives 9A through 9H

Segment or Alternative	Shrubland[1/]	Forest/ Woodland[2/]		Wetland/ Riparian		Grassland	Other Cover Types [4/]	Total [5/]
	Const. Fac. [3/]	Const. Fac.	ROW	Const. Fac.	ROW	Const. Fac.	Const. Fac.	
Proposed Segment 9 – Total Length	1,200.9	0.5	0.6	3.2	t[6/]	1,035.1	430.1	**2,670.5**
Proposed – Comparison Portion for Alternative 9A	48.2	–	–	0.3	–	51.8	16.8	**117.4**
Alternative 9A	83.2	–	–	0.3	–	32.6	16.2	**132.9**
Proposed – Comparison Portion for Alternative 9B	304.7	0.5	0.6	0.3	–	454.5	64.1	**825.5**
Alternative 9B	233.3	–	–	0.2	0.3	355.2	226.9	**816.1**
Proposed – Comparison Portion for Alternative 9C	93.4	0.5	0.6	0.2	–	132.8	11.9	**239.4**
Alternative 9C	64.4	–	–	–	–	136.0	78.3	**278.6**
Proposed – Comparison Portion for Alts. 9D–H	542.3	–	–	2.6	–	183.9	225.4	**954.5**
Alternative 9D	401.4	0.6	0.9	2.5	–	368.9	40.8	**815.6**
Alternative 9E	772.2	–	–	2.2	–	218.1	12.0	**1,004.5**
Alternative 9F	460.0	–	–	6.0	–	362.8	141.9	**971.4**
Alternative 9G	426.8	0.6	0.9	3.6	–	367.8	49.1	**848.8**
Alternative 9H	485.6	–	–	6.3	–	341.7	145.1	**978.9**

1/ "Shrublands" include sagebrush, saltbush, greasewood, and dwarf shrub.
2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.
3/ Const. Fac. = clearing for facilities such as infrastructure, roads, temporary staging areas, and fly yards; ROW = right-of-way clearing
4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).
5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding.
6/ Value is less than 0.1 acre.

Alternative 9E would result in the greatest amount of vegetation disturbance during construction (1,004 acres), followed by Alternative 9H (979 acres), Alternative 9F (971 acres), the comparison portion of the Proposed Route (954 acres), Alternative 9G (849 acres), and Alternative 9D (816 acres). Minor impacts to forest/woodland would occur under Alternatives 9D and 9G. Impacts to wetland/riparian would be greatest under Alternatives 9F and 9H. Impacts to shrub vegetation would be the greatest under Alternative 9E.

Operations

The impacts from operations of Segment 9 and its alternatives are presented in Table 3.6-20. During operations of the proposed Project along Segment 9, approximately 360 acres would be permanently impacted, consisting primarily of shrubland and grassland vegetation. Alternative 9A and the comparison portion of the Proposed Route would have similar permanent impacts to vegetation. Alternative 9B would have fewer permanent impacts to vegetation than the comparison portion of the Proposed Route (85 acres and 122 acres, respectively). Both routes primarily impact shrubland and grassland. Alternative 9C and the comparison portion of the Proposed

Route would have comparable impacts to vegetation, also both primarily impacting shrubland and grassland.

Table 3.6-20. Comparison of Operations-related Vegetation Impacts (acres) for Segment 9 Proposed Route and Alternatives 9A through 9H

	Shrubland[1/]	Forest/ Woodland[2/]		Wetland/ Riparian		Grassland	Other Cover Types [4/]	
Segment or Alternative	**Op. Fac.[3/]**	**Op. Fac.**	**ROW**	**Op. Fac.**	**ROW**	**Op. Fac.**	**Op. Fac.**	**Total [5/]**
Proposed Segment 9 – Total Length	171.9	t[6/]	1.0	0.9	t[6/]	138.7	47.0	**359.6**
Proposed – Comparison Portion for Alternative 9A	5.6	–	–	t[6/]	–	7.5	1.9	**15.1**
Alternative 9A	11.6	–	–	t[6/]	–	4.5	1.7	**17.7**
Proposed – Comparison Portion for Alternative 9B	52.0	t[6/]	1.0	t[6/]	–	65.7	3.5	**122.3**
Alternative 9B	30.9	–	–	t[6/]	0.3	38.4	15.7	**85.4**
Proposed – Comparison Portion for Alternative 9C	11.8	t[6/]	1.0	t[6/]	–	12.3	2.0	**27.1**
Alternative 9C	12.5	–	–	–	–	13.0	6.0	**31.4**
Proposed – Comparison Portion for Alternatives 9D and 9E	70.1	–	–	0.9	–	16.4	18.7	**106.0**
Alternative 9D	40.5	t[6/]	1.4	t[6/]	–	34.1	5.6	**81.6**
Alternative 9E	108.6	–	–	0.2	–	23.2	2.4	**134.5**
Alternative 9F	47.5	–	–	0.6	–	32.8	12.0	**93.0**
Alternative 9G	42.1	t[6/]	1.4	0.2	–	33.9	7.1	**84.8**
Alternative 9H	49.1	–	–	0.8	–	32.6	13.6	**96.2**

1/ "Shrublands" include sagebrush, saltbush, greasewood, and dwarf shrub.
2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.
3/ Op. Fac. = clearing for operations facilities such as infrastructure and roads; ROW = right-of-way clearing
4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).
5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding.
6/ Value is less than 0.1 acre.

Alternative 9E would have the greatest permanent impacts to vegetation (135 acres), followed by Alternative 9H (96 acres), the comparison portion of the Proposed Route (106 acres), Alternative 9 F (93 acres), Alternative 9 G (85 acres), and Alternative 9D (82 acres). Alternatives 9D and 9G would require a minor amount of forest/woodland vegetation maintenance within the ROW (1.4 acres along each). All segments would result in the removal of a minor amount of wetland/riparian vegetation.

Segment 10

Segment 10, as proposed, would link the Cedar Hill and Midpoint Substations with a 33.6-mile single-circuit 500-kV line, following a WWE corridor for most of its distance. Twenty-eight acres of the expansion of the Midpoint Substation and of the construction of the Cedar Hill Substation are attributed to Segment 10. There are no Route Alternatives proposed along this segment (see Appendix A, Figure A-12). Segment 10 would cross an area consisting of agriculture, disturbed grassland, and disturbed sagebrush (Table D.6-1 in Appendix D).

Construction

The impacts from construction of Segment 10 are presented in Table 3.6-21. Construction of the Proposed Route and clearing of the ROW along Segment 10 would

Table 3.6-21. Summary of Construction- and Operations-related Vegetation Impacts (acres) for Segment 10 Proposed Route

Segment or Alternative	Shrubland[1/]	Forest/ Woodland[2/]		Wetland/ Riparian[3/]		Grassland	Other Cover Types [4/]	Total [5/]
	Fac.[3/]	Fac.	ROW	Fac.	ROW	Fac.	Fac.	
Proposed Segment 10 – Total Length – Construction	96.5	–	–	0.1	–	157.1	294.8	**549.0**
Proposed Segment 10 – Total Length – Operations and Maintenance	13.5	–	–	–	–	23.9	44.0	**81.4**

1/ "Shrublands" include sagebrush, saltbush, greasewood, and dwarf shrub.
2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.
3/ Fac. = clearing for construction or operation facilities such as infrastructure, roads, temporary staging areas, and fly yards; ROW = right-of-way clearing
4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).
5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding.

directly affect 549 acres for installation of the transmission line, primarily consisting of other cover types and disturbed grassland (Table D.6-3 in Appendix D).

Operations

The impacts from operations of Segment 10 and its alternatives are presented in Table 3.6-21. During operations of the Proposed Route along Segment 10, approximately 81 acres would be permanently disturbed by Project features. Vegetation impacted would consist of other cover types, grassland, and shrubland.

3.6.2.4 Design Variation

A Design Variation is being considered that would consist of constructing two single-circuit lines in Segments 2 through 4 instead of a single double-circuit line (which is the design assessed above). The disturbance footprint of the two single-circuit towers is greater than that of the double-circuit tower, in part because the requested ROW would be wider, but also because helicopter-assisted construction could be implemented in these areas due to the lighter weight of the towers, which would require additional fly yards. The additional ROW space and the fly yards would cause additional temporary disturbance during construction. Across Segments 2, 3, and 4, the additional disturbance of the single-circuit tower alternative ranges from 25 to 30 percent greater than the comparable portions of the double-circuit tower disturbance under the proposed design. The two single circuits require more ground disturbance, but would be designed and constructed to the same standards as the Proposed Action.

Impacts to vegetation communities under the design variation are included in Table D.6-4 in Appendix D. Impacts from ROW maintenance in forests, woodlands, and tall shrub communities would increase. While the wire zone would only slightly increase from a 146-foot width for the one double-circuit structure to a total of 154 feet for the two single-circuit structures, the border zone would increase more, from 154 feet for the double-circuit option to 196 feet for the two single-circuit structures. The average increase in impacts from ROW maintenance would be about 21 percent.

3.6.2.5 Structure Variation

The proposed guyed Structure Variation would add four guy wires about 140 feet long from a point about 100 feet up in each tower to four guy anchors spaced in a square around the tower (Appendix B, Figure B-6). This would not change the amount of disturbance during construction or operations appreciably, given that it would be limited to the size of the guy anchors. Extra care would be needed where towers are near sensitive vegetation types such as native grasslands, wetland/riparian areas, areas of intact shrubland (sagebrush) or forest and woodland vegetation to avoid placing guy wires in these areas. Therefore, there is no measurable difference in impact on vegetation from the use of this Structure Variation when compared to the use of self-supporting lattice towers.

3.6.2.6 Schedule Variation

The Schedule Variation uses the two single-circuit Design Variation described above but extends construction over a longer time frame. Initially, only one of the eventual two single-circuit lines would be constructed, with the second to be constructed at a later date. The Schedule Variation proposes that the first single-circuit transmission line in Segments 2, 3, and 4 would be built as soon as a ROW grant is issued, but that the second line would not begin construction until late 2018. This would mean nearly 2 years between the end of construction for the first line and beginning of construction for the second line. Any staging areas and fly yards that had been used for the first stage would have been revegetated after construction was complete. There would be two sets of construction disturbances, adding movement, noise, and dust to the area of construction in two instances in any given area. In addition to the loss of regenerating vegetation, the two periods of vegetation disturbance would also result in two periods in which there is increased risk of noxious weed introduction and spread.

3.6.3 Mitigation Measures

To minimize or avoid impacts on vegetation communities, the Proponents have committed to EPMs and mitigation measures that would be implemented Project-wide, as outlined in this section (identified above) and in Appendix C.

The following mitigation measures identified by the Agencies are required on federally managed lands. The Agencies recommend that the Proponents incorporate the measures into their EPMs and mitigation measures and apply them Project-wide.

VEG-1 The Proponents shall consult with each appropriate local land management agency (Forest Service and BLM) office or landowner to determine appropriate seed mix for revegetation. Also see WEED-1.

VEG-2 During construction, blading of native plant communities should be minimized, consistent with safe construction practices. Where feasible, shrubs should be cut at or near ground level to facilitate re-growth after construction. The footprint of construction and operations facilities should be kept to the minimum necessary.

VEG-3 Where feasible, locate new access roads to minimize the number of trees removed during construction.

VEG-4 In areas where revegetation would be completed, topsoil salvage and replacement should be used for areas larger than 1 acre where soils would be disturbed during construction. In areas where revegetation would be completed, topsoil salvage will be used in all areas of cut or fill in order to facilitate revegetation.

There are state and county regulations pertaining to fire prevention and control that the Proponents would adhere to on all lands. In addition, the Agencies have identified the following measure on federally managed lands and recommend the Proponents incorporate these measures into their EPMs and apply them Project-wide:

VEG-5 The Proponents' employees and contractors will employ typical practices to prevent fire during construction and operations including brush clearing prior to work, stationing a water truck at the job site to keep the ground and vegetation moist in extreme fire conditions, enforcing red flag warnings, providing training to all pertinent personnel, keeping vehicles on designated roads and within work areas, and providing fire suppression and emergency notification numbers at each construction site. Brush clearing will be limited to the construction ROW.

In addition to the Proponents' Framework Reclamation Plan for Construction Activities, referenced above, the Agencies have identified the following additional measures during operations and maintenance on federally managed lands and recommend the Proponent incorporate these measures into their EPMs and apply them Project-wide:

VEG-6 The Reclamation, Revegetation, and Weed Management Plan must provide a site-specific plan for access road and ROW vegetation management in areas where removal of trees is proposed. The site-specific plan must include tree removal, slash disposal plans, and BMPs to avoid erosion and sedimentation of watercourses or wetlands. This plan must be submitted to each applicable land management agency for approval prior to clearing.

VEG-7 Herbicide use must conform to the existing types and application methods approved by those land-managing agencies. The Reclamation, Revegetation, and Weed Management Plan must specify where herbicides would be used, what types would be used, and what application methods would be used. The plan must be in conformance with regulations regarding herbicide use from the land-managing agency or county in which herbicide use is proposed.

VEG-8 Prior to the start of construction and maintenance activities, all contractor vehicles and equipment (including personal protective equipment) shall be cleaned of soil and debris capable of transporting invasive plant seeds or other propagates. All vehicles and equipment shall be inspected by Agency-approved inspectors and certified as weed free by agency approved personnel, in order to ensure they have been cleaned properly. The final Reclamation, Revegetation, and Weed Management Plan will include the location of all cleaning stations, how materials cleaned from vehicles at these stations would be either captured or treated so that

cleaning station locations would not also become infected, and who would confirm/certify that vehicles leaving cleaning stations and/or entering construction sites are free of invasive plant materials.

VEG-9 Agency staff will approve weed-free straw or other erosion control on federal lands prior to application.

VEG-10 Agency staff will approve tree seedlings planted in decommissioned roadbeds and other temporarily disturbed areas on federal lands to assure seedlings are matched to site conditions.

VEG-11 The Proponents will consult with appropriate Forest Service staff to identify the top soil layer on NFS lands.

VEG-12 Post-construction monitoring and treatment of invasive plants on closed roads and fly yards shall continue for at least 3 years. If after 3 years post-construction conditions are not equivalent or better than pre-construction conditions, monitoring and treatment will continue until these conditions are met.

VEG-13 The Proponents will meet Wyoming State Forest Practices Act requirements and apply Region 4 BMPs for timber removal operations on the Medicine Bow NF and meet Idaho State Forest Practices Act requirements and apply Region 2 BMPs for timber removal operations on the Caribou-Targhee and Sawtooth NFs.

VEG-14 Where the route would be visible on timbered slopes on lands managed by the Kemmerer FO, allow tree removal only at structure locations and where required for safety rather than from the entire ROW in order to prevent a linear feature on the landscape from clear-cutting trees. Vegetation removal requirements will consider Appendix A, Key Standards Relating to Electric System Reliability and Safety, of the MOU with the Edison Electric Institute (2006).

3.7 SPECIAL STATUS PLANTS

The Proposed Route and Route Alternatives would pass through multiple habitats that could support special status plant species. These species include threatened, endangered, and candidate species listed under the ESA, those listed by the Forest Service and/or BLM as Sensitive, and State Heritage Program species of concern. For discussion purposes where appropriate, these various groups will be referred to collectively as threatened, endangered, and sensitive (TES) plant species. TES wildlife and fish species are discussed in Section 3.11 – Special Status Wildlife and Fish Species.

3.7.1 Affected Environment

This section describes the existing environmental conditions for TES plant species that could be impacted by the Project, if constructed. The discussion will first define the Analysis Area. It will then outline the issues that were raised during public scoping, followed by a description of the laws and regulations in place to manage TES plant species. This section will then conclude by describing the methods used to determine the probable locations of and the potential impacts to these species, as well as a description of the existing conditions found within the Project area and the TES plant species potentially present within this area.

3.7.1.1 Analysis Area

The Project would cross a portion of the Intermountain West region, in southern Wyoming and Idaho, as well as a small portion of northern Nevada (under Alternative 7I). Elevation, slope, aspect, average seasonal temperatures, and annual precipitation exhibit a wide range across the more than 1,100 miles crossed by the Project. This diversity in environmental conditions supports a wide range of habitat types that can support various TES plant species.

The Analysis Area for the TES plant species and their habitat was set as a 1-mile-wide area centered on the Proposed Route and its Alternatives (a half mile on either side of the centerline of each route), and a 0.5-mile-wide area centered on any access roads that extended outside of the 1-mile-wide route buffer (0.25 mile on either side of the access road's centerline). The Analysis Area, as designed, encompasses all Project components including the entire Project ROW, all access roads and ancillary facilities, as well as all staging areas and fly yards. While most of the Analysis Area would not be impacted by the proposed Project, information gathered for this larger area allows for an understanding of the context in which the impacts would occur and permits an assessment of indirect effects. Potential direct impacts to plants species that are living in the immediate vicinity of construction are limited to the actual footprint of disturbance during construction. Chapter 2 and Appendix B of this EIS provide additional details regarding the disturbance footprint that would occur during construction. However, indirect impacts to habitat and to species occupying them would extend beyond the footprint during construction.

The Analysis Area for some species was expanded to include known information regarding those species, which included:

- Lists of endangered and threatened species by county (USFWS 2008a, 2008b), and
- Natural heritage program databases of occurrences within 5 miles of the Proposed Route and Route Alternatives (Idaho Conservation Data Center [CDC] Wyoming Natural Diversity Database [WYNDD], and Nevada Natural Heritage Program).

The primary habitat types found within the Analysis Area include shrublands, grasslands, forest/woodlands, and wetland/riparian areas (see Section 3.6 – Vegetation Communities). Shrublands are the most common habitat type found within the general region of the Project. It is the dominant type throughout the Wyoming, Nevada, and Utah portions of the Project, and is common within the Idaho portions. Grasslands occur in both Wyoming and Idaho but are most abundant along Segments 8, 9, and 10 within Idaho. Nearly all of the grasslands crossed by the Project are semi-natural plant communities, dominated by introduced grass species. Forest and woodlands are limited in the portion of the states crossed by the Project; the majority of the forest/woodlands crossed by the Project occur near Segments 1, 4, 5, and 7, where the Project would cross areas of high elevation in the Laramie Mountains of Wyoming, and the Wasatch, Portneuf, and Deep Creek Mountains in Idaho. Wetlands and riparian vegetation are present but not common in the general region of the Project (see Section 3.9 – Wetlands and Riparian Areas).

3.7.1.2 Issues to be Analyzed

The following special status plant species issues were brought up by the public during public scoping (Tetra Tech 2009a), were raised by federal and state agencies during scoping and agency discussions, or are issues that must be considered as stipulated by laws or regulations:

- The effects to endangered and threatened species, both individuals and populations;
- The effects from changes in habitat for TES plants;
- The effect of the potential spread of noxious weeds on special status plants; and
- Whether hydrology would be altered in occupied habitat for TES species associated with wetlands and what effect the alteration would have on those species.

3.7.1.3 Regulatory Framework

Regulations that address and govern impacts to TES plant species include the ESA and various BLM and Forest Service land management plans. Below is a discussion of the relevant regulations with which the Project must comply for TES plant species.

Federal Regulations

The ESA was enacted in 1973. This law established a regulatory system to protect species that are at risk of extinction. Plant species listed under the ESA are protected from any action that would remove, reduce to possession, damage, or destroy any such species from areas under federal jurisdiction (Section 9[a][2][(B]). Under Section 7 of the ESA, federal agencies are required to evaluate impacts to species listed as threatened and endangered under the ESA for all projects or actions that they carry out, fund, or approve. They are also required to consult with the USFWS when any project or action may affect a listed species. Impacts to species listed under the ESA, as well as candidate species and those pending listing, are addressed in this EIS. In addition, a separate BA, which assesses these ESA-listed species, will be released at a date approximately correlated to the release of the Draft EIS.

Both the Forest Service and the BLM have established a list of species that they consider at risk on lands they manage. The Regional Forester's Sensitive Species list includes plant and animal species for which population viability is a concern within lands managed by the Forest Service. In Forest Service Manual [FSM] 2670.32, the Forest Service must avoid or minimize adverse effects to Sensitive Species. Likewise, BLM Sensitive Species, designated by the BLM State Director per BLM Manual 6840, are managed under the special status species policy, which is to conserve listed species and their ecosystems and to ensure that actions taken by the BLM are consistent with the conservation of special status species, and do not contribute to the listing of any species under the ESA. Additional species are included on the BLM Watch List of species whose populations and range appear to be restricted, but information is lacking as to the cause or if the species is headed for extinction and in need of management action to remove or reduce threats. BLM Sensitive and Watch List species and Forest Service Sensitive Species are addressed in the EIS. In addition, separate Biological Evaluations (BEs) will be prepared for Forest Service sensitive species following Forest Service policy (FSM 2672.4), which will address all sensitive species by forest. The BEs will be released at a date approximately correlated to the release of the Final EIS.

The BLM and Forest Service have developed land management plans for the various FOs and NFs under each of their jurisdictions that detail land management goals and objectives, specify permissible and prohibited activities by geographic designation, and provide BMPs and standards required for activities in that NF's or BLM FO's jurisdiction. They include temporal and spatial restrictions for any activities within areas inhabited by TES species. Appendix F of this EIS includes required plan amendments where the Project is inconsistent with these standards. Standards related to TES plants are discussed individually below.

State Regulations

Neither Idaho nor Wyoming have established state laws that protect rare or sensitive plant species on private lands. The State of Nevada (which is crossed by Alternative 7I) protects species it has identified as critically endangered; however, none of these plants are likely to occur within or near the Analysis Area. Likewise, the State of Utah (which is crossed by Alternative 7I) also maintains a sensitive species list; however, none of these plants are likely to occur within or near the Analysis Area.

3.7.1.4 Methods

Project-specific surveys have not been conducted for TES plant species, with the exception of the Ute ladies'-tresses orchid (*Spiranthes diluvialis*), which was surveyed for along Segments 1E, 1W(a), and 1W(c) in September 2009 (Tetra Tech 2010b). Therefore, available information on the known and potential occurrences of TES species in and near the Analysis Area was obtained from federal and state agencies; as listed in Table 3.7-1. Known occurrence data, obtained from federal and state agencies, are likely to be incomplete because many areas have not been surveyed and occurrence data may be old or of variable precision and completeness. Therefore, it is possible that additional species or occurrences may be found during species-specific surveys, which would be conducted prior to construction. In addition, potential habitat has been mapped and delineated by agencies and organizations, such as the WYNDD. These data on potential habitat were also used to predict the potential locations of TES plant species within the Analysis Area.

Table 3.7-1. Agency Data Sources Used to Determine the Location of TES Plant Species

Data Source	Reference
Idaho Natural Heritage Program	Idaho CDC 2010
Wyoming Natural Diversity Database (WYNDD)	WYNDD 2007[1/]
Nevada Natural Heritage program	Nevada Department of Conservation and Natural Resources 2009
USFWS Databases	USFWS 2008a, 2008b
Forest Service Databases	Forest Service 2007a, 2007b, 2008a
BLM Databases	BLM 2000b, 2003a, 2008d, 2008e
NatureServe	NatureServe 2008

1/ The most recent WYNDD will be used for the Final EIS.

Species that were determined to have known occurrences within 5 miles of the Analysis Area, or that had suitable habitat located within the Analysis Area (Wyoming only based on agency data listed in Table 3.7-1) were carried forward for analysis. A distance of 5 miles outside of the Analysis Area was chosen in order to deal with the uncertainty regarding the exact location of TES species; as species that fall just outside of the Analysis Area, based on agency data may in fact have a slightly larger distribution, and could still occur within the Analysis Area. It was assumed that the Project would have no effect on the remaining species that are located more than 5 miles from the Analysis Area or that do not have suitable habitat within the Analysis Area.

The analysis of impacts was conducted by overlaying the Project's construction and operational footprint onto known or suspected TES plant occurrences, models of potential occurrence of habitat developed by the WYNDD, as well as known locations of suitable habitat. Areas where the Project's construction or operational footprints are collocated with known or suspected TES plant occurrences or their suitable habitats were considered to be potential direct impact to TES plant species. However, the federal and state location data are of variable precision. Most of the Wyoming data and some of the Idaho data consisted of general locations, represented by circles with radii from 500 to 3,000 meters (the size of the circle representing the relative level of uncertainty in the location). Most of the Idaho data and some of the Wyoming data

consisted of specific locations comprising surveyed polygons or relatively precise locations. Therefore, exact impacts to TES plant species that could occur will not be known until pre-construction surveys are conducted.

3.7.1.5 Existing Conditions

This section discusses the TES plant species that could potentially be present within the Analysis Area. The discussion is broken down into two parts: 1) threatened, endangered, or candidate species listed under the ESA; and 2) other special status species, including BLM Sensitive and Watch List species, Forest Service Sensitive Species, and State Heritage Program species of concern (referred to collectively as ”other special status species”).

ESA-listed and Candidate Plant Species

The threatened, endangered, and candidate plant species, listed under the ESA, that could potentially occur within or in close proximity of (within 5 miles) the Analysis Area are listed in Table 3.7-2 (based on agency data; see Section 3.7.1.4). There are no other species in the Analysis Area proposed for listing at this time. Table 3.7-2 includes all ESA-listed plant species that occur within the various counties that are crossed by the Project (regardless of the location within the county), and may contain some species that are not likely to occur within the Analysis Area itself. Additional information, including the likelihood of occurrence in the Analysis Area, on each species is provided in the text that follows.

***Blowout penstemon* (Endangered)**

Blowout penstemon was listed as endangered under the ESA on April 29, 1986 (51 *Federal Register* 15929-15932). This species occurs on shifting, sparsely vegetated sand dunes. It is known to occur in the northern part of Carbon County in Wyoming. Based on the detailed vegetation mapping conducted for this Project (see Section 3.6 – Vegetation Communities), no sand dune habitat occurs within the Analysis Area; therefore, it is highly unlikely that this species would occur within the Analysis Area. However, as the USFWS has indicated that all portions of the Analysis Area in Wyoming are within the potential range of this species (USFWS 2008a), blowout penstemon will be carried forward for analysis.

***Christ’s Indian paintbrush* (Candidate)**

Christ’s Indian paintbrush was added to the list of candidate species eligible for protection under the ESA on October 25, 1999 (64 *Federal Register* 57534-57547). This species only occurs on one mountain in Cassia County, Mount Harrison in the Albion Mountains in Idaho. The species occurs in grassy upper sub-alpine meadows along the crest and slopes of the mountain in loamy gravel, and most often in areas where snowdrifts remain into early summer. None of the routes would cross suitable habitat for this species. Even though this species is known to occur within 6 miles of the Segment 7 Analysis Area and about 4 miles from the Alternative 7H Analysis Area, it is highly unlikely that it occurs within the Analysis Area because its range is restricted to Mount Harrison, which is not crossed by the Project.

Table 3.7-2. Federally Listed Threatened, Endangered, Proposed, and Candidate Plant Species That May Occur in the Counties Crossed by the Project

Species	Status[1/]	Habitat	Range	Potential for Occurrence in Analysis Area or within 5 miles of the Analysis Area			
				Idaho	Wyoming	Nevada	Utah
Blowout penstemon *Penstemon haydenii*	E	Shifting, sparsely vegetated sand dunes	Occurs in WY (northern part of Carbon County).	None – Does not occur in ID.	None - No suitable habitat or know occurrences within Analysis Area	None – Does not occur in NV	None – Does not occur in UT
Christ's Indian paintbrush *Castilleja christii*	C	Subalpine meadows at about 9,100 feet	Only known from summit of Mount Harrison in Cassia County, ID; located within 4 miles of Alternative 7H.	Occurs within 4 miles of Alternative 7H (restricted to Mount Harrison). However, it is highly unlikely that this species occurs within the Analysis Area, as no suitable habitat occurs within the Analysis Area.	None – Does not occur in WY	None – Does not occur in NV	None – Does not occur in UT
Colorado butterfly plant *Gaura neomexicana* ssp. *coloradensis*	T	Sub-irrigated meadows in prairie	Occurs in WY. Critical habitat in Platte and Laramie Counties, WY.	None – Does not occur in ID	None – No suitable habitat or know occurrences within Analysis Area	None – Does not occur in NV	None – Does not occur in UT
Desert yellowhead *Yermo xanthoceph-alus*	T	Barren areas with Indian rice grass and cushion plants	Only occurs in Fremont County, WY.	None – Does not occur in ID.	None – Analysis Area is outside known range in WY.	None – Does not occur in NV	None – Does not occur in UT
Goose Creek milkvetch *Astragalus anserinus*	C[2/]	White ryolitic ash in pinyon-juniper, sagebrush and rabbitbrush communities	Restricted to a small portion of the Goose Creek drainage in northeastern NV, northwestern UT, and southern ID.	Occurs within 0.5 mile of Alternative 7I and within 5 miles of Alternative 7J	None – Does not occur in WY	Occurs within 5 miles of Alternatives 7I and 7J	Occurs within half a mile of Alternatives 7I and 7J
Slickspot peppergrass *Lepidium pappileferum*	T	Slickspot microsites in sagebrush steppe	Occurs in Ada, Canyon, Gem, Elmore, Payette, and Owyhee Counties, ID.	Occurs within 0.5 mile of Segment 8 and Alternatives 8B, 8C, 8D; within 5 miles of 8E	None – Does not occur in WY	None – Does not occur in NV	None – Does not occur in UT

Table 3.7-2. Federally Listed Threatened, Endangered, Proposed, and Candidate Plant Species That May Occur in the Counties Crossed by the Project (continued)

Species	Status[1/]	Habitat	Range	Potential for Occurrence in Analysis Area or within 5 miles of the Analysis Area			
				Idaho	Wyoming	Nevada	Utah
Western prairie fringed orchid *Platanthera praeclara*	T	Moist prairies and sedge meadows along the Platte River in Wyoming	Occurs outside of the Analysis Area (downstream of the Platte River). However, according to the USFWS tiered biological opinion (see Section 3.11) any water withdrawals from the Platte River would result in an adverse impact to listed species located downstream of the water depletion.	None – No suitable habitat or known occurrences found within Analysis Area	Segments 1E, 1W, and most of 2 are in the Platte River watershed, and would be affected under the USFWS tiered biological opinion for the Platte River.	None – Does not occur in NV	None – Does not occur in UT
Whitebark pine *Pinus albicaulis*	C[3/]	Upper treeline; 8,000 to over 11,000 feet in elevation within sub-alpine habitats	Occurs in the Sierra Nevada, Cascade, Pacific Coast and northern Rocky Mountain Ranges. Is found in seven states: Nevada, Wyoming, Montana, Idaho, Washington, Oregon and California.	Known to occur along Segment 4	Known to occur along Segment 4	Unlikely – Analysis Area is outside of the known range in NV.	None – Does not occur in UT
Ute ladies'-tresses orchid *Spiranthes diluvialis*	T	Moist stream banks, wet meadows, and abandoned stream channels; 5,100 to 5,200 feet in Wyoming (720 to 7,000 feet across range)	Occurs in eight states, including ID, WY, and NV. May occur in all WY counties located within the Analysis Area. In ID, it occurs in Jefferson, Madison, Bonneville, and Fremont Counties, which are outside of analysis area. In Nevada, it occurs in White Pine and Lincoln Counties, which are outside the Analysis Area.	Unlikely – Analysis Area is outside known range in ID.	No known occurrences are located in the Analysis Area; however, suitable habitat is present in along Segments 1E, 1W, 2, 3, and 4.	Unlikely – Analysis Area is outside of the known range in NV.	None – Does not occur in UT

1/ E = endangered, T = threatened, C = candidate
2/ Also a BLM Watch List species.
3/ Currently the subject of USFWS status review to determine if listing is warranted (12-month finding anticipated in summer 2011); Also a BLM Wyoming Sensitive species.

Colorado butterfly plant (Threatened)

The Colorado butterfly plant was listed as threatened under the ESA on October 18, 2000 (65 *Federal Register* 62302-62310). This species occurs in sub-irrigated, alluvial soils of drainage bottoms surrounded by mixed grass prairie at elevations of 5,800 to 6,400 feet in southeastern Wyoming. Critical habitat includes specific wet meadows and riparian areas in Laramie and Platte Counties. No portions of the Analysis Area are located within counties where Colorado butterfly plant is known or expected to occur.

*Desert yellowhead (*Threatened)

Desert yellowhead was listed as threatened under the ESA on March 14, 2002 (67 *Federal Register* 11442-11449), and critical habitat was designated in 2004. It occurs on barren and dry sandstone and limestone soils with a high concentration of volcanic ash, associated with Indian rice grass and cushion plants. This species is only known from Fremont County, Wyoming, which is outside of the Analysis Area. Therefore, this species is unlikely to occur in the Analysis Area.

Goose Creek milkvetch (Candidate)

Goose Creek milkvetch was added to the list of candidate species eligible for protection under the ESA on September 10, 2009 (74 *Federal Register* 52014-52064). This species occurs on deeply weathered, sandy, white rhyolitic ash of the Salt Lake Formation in the Goose Creek drainage in Idaho, Nevada, and Utah. It occurs in drainage bottoms, lower to upper slope and crest positions, typically within open Utah juniper, big sagebrush, or rabbitbrush communities. In Idaho, it is restricted to a small portion of Cassia County near the state line. Known occurrences in Idaho are located within 0.5 mile of Alternative 7I for a length of about 4 miles. Known occurrences also occur with 0.5 mile of Alternative 7J. Known occurrences in Nevada are less than 5 miles from Alternatives 7I and 7J. It also occurs in Box Elder County, Utah, where there is a known occurrence within 0.5 mile of Alternatives 7I and 7J.

Slickspot peppergrass (Threatened)

Slickspot peppergrass was listed as threatened under the ESA on October 8, 2009 (74 *Federal Register* 46521-46542). On May 10, 2011, the USFWS published a proposed rule in the Federal Register for designation of critical habitat for slickspot peppergrass (76 *Federal Register* 27184-27215). This species occurs in semi-arid, sagebrush-steppe habitats of the Snake River Plain and adjacent foothills in southwestern Idaho and the Owyhee Plateau in south-central Idaho. It occurs only in slick spots, which have soils much higher in clay content and significantly higher in sodium than adjacent areas. These areas have frequent ponding during winter and early spring, and stay moist a few weeks longer than surrounding soils (69 *Federal Register* 3094-3116). Known occurrences are located within 0.5 mile of the Segment 8 Proposed Route and Alternatives 8A, 8B, and 8C, and within 5 miles of Alternative 8E. The IDANG noted in a recent letter that there is slickspot peppergrass on the Orchard Training Area that would be crossed by the Proposed Route for Segment 8. The BLM Idaho office commented that the Proposed Route for Segment 9 likely crosses potential habitat for slickspot peppergrass. Based on maps provided by the USFWS, Alternatives 8B and

8C would cross approximately 4.3 miles and 0.7 mile, respectively, of proposed critical habitat. As described in more detail below, clearance surveys would be conducted in all areas of potential habitat (slickspot microsites) prior to construction.

Western prairie fringed orchid (Threatened)

Western prairie fringed orchid was listed as threatened under the ESA on September 28, 1989 (54 *Federal Register* 39857-39863). This species occurs in moist calcareous or subsaline prairies and sedge meadows on the eastern Great Plains, including the Platte River watershed located downstream of the Analysis Area (within Nebraska). According to the USFWS, projects that result in water depletions within the Platte River watershed could adversely affect species located downstream. Therefore, although this species is not located within or near the Analysis Area, it has been included in the analysis due to the potential for Project-related water depletions from the Platte River system along Segments 1E, 1W, and 2 (due to water use for dust control).

Whitebark pine (under consideration for listing)

On July 19, 2010, the USFWS initiated a status review of the whitebark pine following an initial review of a petition seeking to protect whitebark pine under the ESA. Issuance of a 12-month finding by the USFWS on whether listing under the ESA is warranted is anticipated in summer 2011. This species occurs in subalpine to montane forests of western North America, on thin, rocky soils at or near the timberline. It is found in seven states, three of which are crossed by the Project (Idaho, Nevada, and Wyoming); however, this species' suspected range in Nevada is limited to isolated pockets found in the northern portion of the state that are not intersected by the Project (Little 1971; Forest Service 1990a). Surveys conducted by the Proponents in 2010 on ridges overlooking the Proposed Route along Segment 4 in Wyoming (MPs 110 to 118) indicate that the species is likely present in these areas (see Administrative Record). Additionally, the Kemmerer FO provided maps showing areas where the species has been confirmed. These areas are along, and to the south of, Segment 4 of the Proposed Route (Commissary Ridge; Oles 2010). In addition, whitebark pine can be difficult to distinguish from limber pine[1] (Kendall 2010), and both species have overlapping ranges along Segment 4.

Ute ladies'-tresses (Threatened)

Ute ladies'-tresses was listed as threatened under the ESA on January 17, 1992 (60 *Federal Register* 49003). This species occurs on moist stream banks, wet meadows, and abandoned stream channels in Idaho and Wyoming, as well as six other states. In Idaho, no portions of the Analysis Area are in counties where Ute ladies'-tresses is known or expected to occur. In Wyoming, it has been reported from Goshen, Laramie, Converse, and Niobrara Counties. It is not known to occur within or near the Analysis Area; however, the known populations in Converse County occur in the northern portion of the county and are more than 25 miles from the Analysis Area. Potential habitat (riparian and wetland areas) is present within the Analysis Area along the Proposed

[1] A BLM Wyoming Sensitive species.

Routes for Segments 1E, 1W, 2, 3, and 4 and their Route Alternatives. Surveys were conducted in 2009 for portions of the Segment 1E, 1W(a), and 1W(c) Proposed Routes and Alternatives 1E-A and 1W-A (Tetra Tech 2009c). The survey focused on 12 streams but 6 could not be surveyed due to access issues and lack of landowner permission. Of the 6 sites surveyed, only one had suitable habitat for Ute ladies'-tresses; however, no Ute ladies'-tresses was observed. Additional surveys of this potential habitat will be conducted in 2011 to verify and/or check the findings of the 2009 survey.

Other Special Status Plant Species

There are a number of other special status plant species that could occur within or near the Analysis Area. These include BLM and Forest Service Sensitive Species, BLM Watch List species, as well as species of concern listed by the Idaho Natural Heritage Program, Idaho Native Plant Society, WYNDD, Wyoming Natural Heritage Program, and Utah Conservation Data Center. Table 3.7-3 lists the species with known occurrences (based on agency data; see Section 3.7.1.4) located within 5 miles of the Analysis Area. As discussed earlier, in some cases known occurrences may represent historic locations where the species are no longer present; furthermore, additional special status plant species may be present within the Analysis Area but are currently undiscovered and would, therefore, not be included in known occurrence data used for this assessment. Pre-construction surveys may discover other special status plant species within the Analysis Area in addition to those listed in Tables 3.7-2 and 3.7-3.

Table 3.7-3. Other Special Status Plant Species Known to Occur Within 5 Miles of the Analysis Area

Species[2/]	Status[3/, 4/]			General Habitat	Segments and Alternatives with Nearby Known or Modeled Occurrence[1/]	
	BLM	Forest Service	State Heritage Programs		Known Occurrences or Habitat within 0.5 Mile of the Analysis Area	Known Occurrences or Habitat within 5 Miles of the Analysis Area
Wyoming						
Swallen's mountain-ricegrass *(Achnatherum swallenii)*	--	--	SC	Sagebrush, rocky slopes		Mapped: 4, 4-A, 4-F
Meadow pussytoes *(Antennaria arcuata)*	S	S (R4)	SC	Riparian areas	Modeled low: 4, 4F Modeled likely: 2, 2A, 4, 4A, 4D, 4E, 4F Modeled medium: 2, 2A, 2C	Modeled medium: 2, 2A, 2C, 4B, 4D; Modeled low: 3, 4, 4A, 4B 4C,4D, 4E, 4F; modeled likely: 2, 2A, 2C, 4, 4A, 4B, 4C, 4D, 4E, 4F
Laramie columbine *(Aquilegia laramiensis)*	S	S (R2)	SC	Granite outcrops	Modeled likely: 1-E, 1E-B, 1E-C 1W(a), 1W(c)	
Mystery wormwood *(Artemisia biennis* var. *diffusa)*	S	--	SC	Desert shrublands, playas	Mapped: 3	Mapped: 3, 4
Porter's sagebrush (*Artemesia porteri*)	S	--	SC	Clay flats, badlands slopes, depressions, or gullies at 4,600-7,000 feet		Modeled medium: 1W(a)
Bedstraw milkweed *(Asclepias subverticillata)*	--	--	SC	Disturbed areas	Mapped: 2, 2C	Mapped: 2, 2C
Dwarf milkweed (*Asclepias unicalis*)	--	S (R2)	SC	Desert grasslands		Mapped 4, 4A, 4F
Hayden's milkvetch *(Astragalus bisculcatus* var. *haydenianus)*	--	--	SC	Sagebrush, juniper	Mapped: 4B, 4C, 4D, 4E	Mapped: 4B, 4C, 4D, 4E
King's milkvetch *(Astragalus calycosus* var. *calycosus)*	--	--	SC	Barren, rocky ridges	Mapped: 4A, 4B, 4C, 4D, 4E, 4F	Mapped: 4, 4A, 4B, 4C, 4D, 4E, 4F
Sodaville milkvetch *(Astragalus lentiginosus* var. *salinus)*	--	--	SC	Sagebrush		Mapped: 4B, 4C, 4D, 4E

Table 3.7-3. Other Special Status Plant Species Known to Occur Within 5 Miles of the Analysis Area (continued)

Species[2/]	Status[3/, 4/]			General Habitat	Segments and Alternatives with Nearby Known or Modeled Occurrence[1/]	
	BLM	Forest Service	State Heritage Programs		Known Occurrences or Habitat within 0.5 Mile of the Analysis Area	Known Occurrences or Habitat within 5 Miles of the Analysis Area
Nelson's milkvetch *(Astragalus nelsonanus))*	S	--	PC	Clay flats, sparsely vegetated areas	Mapped: 3 Modeled low: 4, 4A, 4E; Modeled medium: 3, 1E, 1E-A, 1E-B, 1W(a), 1W(c), 1W-A, 4, 4A, 4F	Mapped: 1E, 1W(a), 3; Modeled medium: 1E, 1E-A, 1E-B, 1E-C, 1W(a), 1W(c), 1W-A, 3, 4, 4A, 4B, 4C, 4D, 4E, 4F; Modeled low: 2, 2A, 2C, 3, 4, 4A, 4B, 4C, 4D, 4E, 4F
Payson's milkvetch *(Astragalus paysonii)*	--	S (R4)	SC	Disturbed areas with sandy soils		Mapped: 4
Trelease's milkvetch *(Astragalus racemosus var treleasii)*	S	--	SC	Sagebrush	Modeled likely: 3, 4, 4A, 4B, 4C, 4D, 4E, 4F	Modeled likely: 3, 4, 4A, 4B, 4C, 4D, 4E, 4F
Crandall's rockcress *(Boechera crandallii)*	--	--	SC	Sagebrush, juniper		Mapped: 3
Daggett rockcress (*Boechera pendulina*)	--	--	SC	Crevices and sparsely vegetated granite soil	Mapped: 1E-B	Mapped: 1E, 1E-B
Hall's sedge *(Carex parryana* var. *unica)*	--	--	SC	Springs, wet meadows		Mapped: 4A, 4C, 4E
Utah mountain lilac (*Ceanothus martini)*	--	--	SC	Sagebrush, mtn. shrub		Mapped 4B, 4C
Cedar Rim thistle *(Cirsium aridum)*	S	--	SC	Barren slopes and ridges	Modeled high: 3; Modeled low: 4B, 4D, 4F	Modeled high: 3, 4; Modeled medium: 1E-C, 1W(a), 2, 2C, 3, 4, 4A, 4B, 4C, 4D, 4E, 4F; Modeled low: 4, 4A, 4B, 4C, 4D, 4E, 4F
Ownbey's thistle (*Cirisium ownbeyi*)	S	--	SC	Semi-barrens rims or steep slopes of broken gray slate		Modeled likely: 3
Western dodder *(Cuscuta occidentalis)*	--	--	SC	Mountain big sagebrush		Mapped: 4, 4B, 4C
Payson's tansymustard *(Descurainia pinnata* ssp. *paysoni)*	--	--	SC	Dunes, sand flats	Mapped: 3	Mapped: 3
Wyoming tansymustard *(Descurainia torulosa)*	S	S (R2)	SC	Rock crevices and ledges		Modeled medium: 4, 4A, 4F

Table 3.7-3. Other Special Status Plant Species Known to Occur Within 5 Miles of the Analysis Area (continued)

Species[2/]	Status[3/, 4/]			General Habitat	Segments and Alternatives with Nearby Known or Modeled Occurrence[1/]	
	BLM	Forest Service	State Heritage Programs		Known Occurrences or Habitat within 0.5 Mile of the Analysis Area	Known Occurrences or Habitat within 5 Miles of the Analysis Area
Winward's goldenweed (*Ericameria discoidea* var. *winwardii)*	--	--	SC	Rocky slopes at higher elevations		Mapped: 4B, 4C, 4D, 4E
Divergent wild buckwheat (*Eriogonum divaricatum)*	--	--	SC	Cushion plants		Mapped: 4B, 4C, 4D, 4E
Slender-leaved buckwheat (*Eriogonum exilifolium)*	--	S (R2)	SC	Cushion plants		Mapped: 1E-C, 1W(a), 1W(c)
Hooker wild buckwheat (*Eriogonum hookeri)*	--	--	SC	Sagebrush		Mapped: 2
Showy prairie-gentian (*Eustoma grandiflorum*)	--	--	SC	Wet meadows and pond margins		Mapped: 1E, 1E-A, 1W(a), 1W-A, 1W(c)
Compact gilia (*Ipomopsis crebrifolia*)	--	--	SC	Sagebrush steppe	Mapped: 4A, 4F	Mapped: 4A, 4F
Entire-leaved peppergrass (*Lepidium integrifolium* var. *integrifolium)*	S	--	SC	Greasewood. alkaline meadows	Mapped: 4C, 4E; Modeled likely: 4A, 4B, 4C, 4D, 4E	Mapped: 4A, 4B, 4C, 4D, 4E; Modeled likely: 4, 4A, 4B, 4C, 4D, 4E, 4F
Fremont bladderpod (*Lesquerella fremontii)*	S	S (R2)	SC	Cushion plant communities	Modeled high: 4, 4A, 4F; Modeled medium: 4A, 4F; Modeled low: 4, 4A, 4F	Modeled low/med/high: 4, 4A, 4B, 4C, 4D, 4E, 4F
Large-fruited bladderpod (*Lesquerella macrocarpa)*	S	--	SC	Barren slopes and ridges	Mapped: 4B, 4C, 4D, 4E; Modeled medium: 4B, 4C, 4D, 4E, 4F; Modeled low: 4, 4A, 4B, 4C, 4D, 4E, 4F	Mapped: 4B, 4C, 4D, 4E Modeled medium/low: 4, 4A, 4B, 4C, 4D, 4E, 4F
Western bladderpod (*Lesquerella multiceps)*	S	--	SC	Sparse grassland, cushion plants	Modeled likely: 4, 4A, 4F	Modeled likely: 4, 4A, 4F
Prostrate bladderpod (*Lesquerella prostrate)*	S	--	SC	Sandstone and shale outcrops	Modeled likely: 44A, 4B, 4C, 4D, 4E, 4F	Mapped: 4B, 4C, 4D, 4E; Modeled likely: 3, 4, 4A, 4B, 4C, 4D, 4E, 4F
Western biscuitroot (*Lomatium bicolor*)	--	--	SC	Dry slopes and meadows	Mapped: 4A, 4B, 4C, 4D, 4E, 4F	Mapped: 4A, 4B, 4C, 4D, 4E, 4F
Ternate desert-parsley (*Lomatium triternatum* var. *anomalum)*	--	--	SC	Dwarf sagebrush-grasslands	Mapped: 4A	Mapped: 4A, 4F
Red poverty-weed (*Monolepis pusilla)*	--	--	SC	Sandy lowlands, greasewood flats	Mapped: 3	Mapped: 3, 4, 4A, 4B, 4C, 4D, 4E, 4F

Table 3.7-3. Other Special Status Plant Species Known to Occur Within 5 Miles of the Analysis Area (continued)

Species[2/]	Status[3/, 4/]			General Habitat	Segments and Alternatives with Nearby Known or Modeled Occurrence[1/]	
	BLM	Forest Service	State Heritage Programs		Known Occurrences or Habitat within 0.5 Mile of the Analysis Area	Known Occurrences or Habitat within 5 Miles of the Analysis Area
Ward's goldenweed (*Oonopsis wardii*)	--	--	SC	shale-clay slopes, barren plains, and disturbed roadsides	Mapped: 1E, 2, 2C	Mapped: 1E, 1E-B, 2, 2C
Stemless beardtongue (*Penstemon acaulis*)	S	S (R4)	SC	cushion plant/bunchgrass		Modeled likely: 2
Gibbens' beardtongue[5/] (*Penstemon gibbensii*)	S	--	SC	steep, bare slopes with poor soil development	Modeled likely: 2	Modeled likely: 2, 2A, 2C
Desert glandular phacelia *(Phacelia glandulosa* var. *deserta)*	--	--	SC	Semi-barren slopes, cushion plants	Mapped: 4	Mapped: 4, 4A, 4B, 4C, 4D, 4E, 4F
Western phacelia *(Phacelia incana)*	--	--	SC	Juniper		Mapped: 2
Opal phlox (*Phlox opalensis*)	W	--	SC	Cushion plant communities	Mapped: 4, 4B, 4C, 4D, 4E	Mapped 4, 4A, 4B, 4C, 4D, 4E, 4F
Beaver Rim phlox *(Phlox pungens)*	S	--	SC	Barren slopes and ridges, cushion plant communities	Mapped: 4A; Modeled medium: 1E, 1E-B, 1E-C, 1W(a), 1W(c), 2, 2A, 2C, 4, 4A, 4B, 4C, 4D, 4E, 4F	Mapped: 4A, 4C, 4E, 4F Modeled medium: 1E-B, 1E-C, 1W(a), 1W(c), 2, 2A, 2B, 2C, 3, 4, 4A, 4B, 4C, 4D, 4E, 4F; Modeled high: 1E-C, 1W(a), 1W(c)
Tufted twinpod *(Physaria condensate)*	S	--	SC	Barren slopes and ridges	Mapped: 4B, 4C, 4D, 4E; Modeled medium: 3 4, 4A, 4B, 4C, 4D, 4E, 4F; Modeled low: 4, 4A, 4B, 4C, 4D, 4E, 4F	Mapped: 4, 4A, 4B, 4c, 4D, 4E, 4F; Modeled low: 3, 4, 4A, 4B, 4C, 4D, 4E, 4F
Dorn's twinpod *(Physaria dornii)*	S	--	SC	Sparse mountain mahogany and cushion plants	Mapped: 4B, 4E, 4F; Modeled likely: 4A, 4B, 4C, 4D, 4E, 4F	Mapped: 4A, 4B, 4C, 4D, 4E, 4F; Modeled likely: 4, 4A, 4B, 4C, 4D, 4E, 4F
Devil's gate twinpod (*Physaria eburniflora*)	--	--	SC	Cushion plant communities		Mapped: 1E-C, 1W(a), 1W(c)
Rocky Mountain twinpod *(Physaria saximontana)*	S	--	SC	Barren slopes and ridges	Modeled medium: 1E, 1W(c), 4	Modeled high: 4; Modeled medium: 1E, 1E-A, 1W(a), 1W-A, 1W(c), 4, 4F
Limber pine (*Pinus flexilis*)	S	--	--	Upper treeline; 8,000 to over 11,000 feet in elevation	mapped 4: 4	4, 4A, 4B, 4C, 4D, 4E, 4F
Longleaf pondweed *(Potamogeton nodosus)*	--	--	SC	Rivers	Mapped: 2, 2A, 2B	Mapped: 2, 2A, 2B

Table 3.7-3. Other Special Status Plant Species Known to Occur Within 5 Miles of the Analysis Area (continued)

Species[2/]	Status[3/, 4/]			General Habitat	Segments and Alternatives with Nearby Known or Modeled Occurrence[1/]	
	BLM	Forest Service	State Heritage Programs		Known Occurrences or Habitat within 0.5 Mile of the Analysis Area	Known Occurrences or Habitat within 5 Miles of the Analysis Area
Persistent Sepal Yellow-cress *(Rorippa calycina)*	S	--	PC	Shorelines	Mapped: 2, 2A, 2B; Modeled likely: 1E-C, 1W(a), 1W(c), 2, 2A, 2B, 2C, 3, 4, 4A, 4F	Mapped: 1E-B, 2, 2A, 2B; Modeled likely: 2, 2A, 2B, 1E, 1E-B, 1E-C, 1W(a), 1W(c), 2, 2A, 2B, 2C, 3, 4, 4A, 4B, 4C, 4D, 4E, 4F
Pale blue-eyed grass (*Sisyrinchium pallidum*)	S	--	--	Wetlands, fens, riparian corridors, meadows		Modeled likely: 1E, 1E-B, 1E-C, 1W(a), 1W(c), 2, 2A, 2C, 4, 4A, 4B, 4C, 4D, 4E, 4F
Laramie false sagebrush *(Sphaeromeria simplex)*	S	--	SC	Cushion plant communities	Mapped: 1E; Modeled High: 1E, 1E-C, 1E-B, 1W(a), 1W(c); Modeled medium: 1E, 1E-B, 1E-C, 1W(a), 1W(c); Modeled low: 1E, 1E-C, 1W(a), 1W(c)	Mapped: 1W(a), 1W(c); Modeled High: 1E, 1E-B, 1E-C, 1W(a), 1W(c), 2; Modeled medium: e, 4A, 4F; Modeled low: 1E, 1E-C, 1W(a), 1W(c)
Haperman's sullivantia (Sullivantia hapermanii)	--	S (R2)	SC	Moist calcareous outcrops		Mapped: 1E, 1W(a), 1W(c)
Uinta greenthread (*Thelesperma caespitosa*)	S	S (R4)	SC	cushion plant communities and sagebrush grasslands		Modeled likely: 4
Idaho						
Twinleaf onion, Kellogg's onion *(Allium anceps)*	S	--	SC	Low sagebrush	Mapped: 7I,, 7J, 9, 9A	Mapped: 7I, 7J, 9, 9A
King snapdragon *(Antirrhinum kingii)*	--	--	SC	Washes in sagebrush and saltbush	Mapped: 9	Mapped: 8, 8B, 9
Mourning milkvetch (*Astragalus atratus* var. *inseptus)*	S	--	SC	Sagebrush	Mapped: 8, 8A	Mapped: 8, 8A
Stiff milkvetch *(Astragalus conjunctus)*	--	--	SC	Sagebrush		Mapped: 8, 9, 9E
Starveling milkvetch *(Astragalus jejunus* var. *jejunus)*	S	S (R4)	SC	Barren slopes and ridges	Mapped: 4, 4A, 4B, 4C, 4D, 4E, 4F	Mapped 4, 4A, 4B, 4C, 4D, 4E, 4F
Mulford's milkvetch (*Astragalus mulfordiae)*	S	--	SC	Sagebrush, saltbush	Mapped: 8, 8B, 9, 9E	Mapped: 8, 8B, 8E, 9, 9D, 9E, 9F, 9G, 9H
Newberry's milkvetch (*Astragalus newberryi* var. *castoreus)*	S	--	SC	Sagebrush	Mapped: 7I	Mapped: 7I, 9, 9A, 9E
Snake River milkvetch *(Astragalus purshii var ophiogenes)*	W	---	SC	Sands and gravelly sands	Mapped: 8, 8E, 9, 9D, 9E, 9F, 9G, 9H	Mapped: 8A, 8B, 8E, 9B, 9F, 9G, 9H
King's desertgrass *(Blepharidachne kingii)*	S	--	SC	Low sagebrush	Mapped: 9E	Mapped: 9, 9E

Table 3.7-3. Other Special Status Plant Species Known to Occur Within 5 Miles of the Analysis Area (continued)

Species[2/]	Status[3/, 4/]			General Habitat	Segments and Alternatives with Nearby Known or Modeled Occurrence[1/]	
	BLM	Forest Service	State Heritage Programs		Known Occurrences or Habitat within 0.5 Mile of the Analysis Area	Known Occurrences or Habitat within 5 Miles of the Analysis Area
Lichen (*Catapyrenium congestum)*	W	--	SC	Saltbush	Mapped: 9E	Mapped: 8, 9, 9E
Desert pincushion *(Chaenactis stevioides)*	S	--	SC	Sagebrush	Mapped: 9, 9D, 9E, 9F, 9G, 9H	Mapped: 8, 8B, 8E, 9, 9D, 9E, 9F, 9G, 9H
Alkali cleomella *(Cleomella plocasperma)*	S	--	SC-historic	Greasewood	Mapped: 9E	Mapped: 9, 9E
Cushion cactus *(Coryphantha vivipara)*	S	--	SC	Sagebrush, conifer		Mapped: 9
Silky cryptantha *(Cryptantha sericea)*	W	--	SC	Barren clay or sandy soils		Mapped: 4, 4A, 4B, 4C, 4D, 4E, 4F
Greeley's wavewing (*Cymopterus acaulis* var. *greeleyorum)*	S	--	SC	Sagebrush	Mapped: 9, 9B, 9D, 9E, 9F, 9G, 9H	Mapped: 8, 8A, 9, 9B, 9D, 9E, 9F, 9G, 9H
Davis' wavewing (*Cymopterus davisii*)	--	S (R4)	SC	Subalpine rock outcrops and gravel areas >9,000 ft		Mapped: 7H
Shining flatsedge *(Cyperus bipartitus)*	--	--	SC	Wetlands, shores	Mapped: 8, 9D	Mapped: 8A, 8B, 9, 9B, 9D, 9E
Howell dimersia (*Dimersia howellii*)	S	--	SC	Dry rocky soil of foothills and low mountains		Mapped: 8, 9
White eatonella *(Eatonella nivea)*	S	--	SC	sagebrush, saltbush	Mapped: 8, 9, 9D, 9E	Mapped: 8A, 9F, 9G, 9H
Giant helleborine *(Epipactis gigantea)*	S	--	SC	Riparian, wetlands	Mapped: 9D, 10	Mapped: 8, 8A, 9, 9B, 9C, 9D, 9E, 10
Calcareous buckwheat *(Eriogonum ochrocephalum* var. *calcareum)*	S	--	SC	Saltbush	Mapped: 8A, 9	Mapped: 8A, 9, 9B
Packard's buckwheat *(Eriogonum shockleyi* var. *packardiae)*	S	--	SC	Sagebrush, saltbush	Mapped: 8, 9D, 9E, 9G	Mapped: 7J, 8, 8D, 8E, 9, 9D, 9E, 9F, 9G, 9H
Matted cowpie buckwheat (*Eriogonum shockleyi* var. *shockleyi*)	S	--	SC	Sagebrush, saltbush	Mapped: 8A, 9, 9D, 9E, 9F, 9G, 9H	Mapped: 8, 8A, 9, 9B, 9D, 9E, 9F, 9G, 9H
Cushion cactus (*Escobaria [Coryphantha] vivipara*)	S	--	SC	Dry valleys and plains		Mapped: 9

Table 3.7-3. Other Special Status Plant Species Known to Occur Within 5 Miles of the Analysis Area (continued)

Species[2/]	Status[3/, 4/]			General Habitat	Segments and Alternatives with Nearby Known or Modeled Occurrence[1/]	
	BLM	Forest Service	State Heritage Programs		Known Occurrences or Habitat within 0.5 Mile of the Analysis Area	Known Occurrences or Habitat within 5 Miles of the Analysis Area
White-margined wax plant (*Glyptopleura marginata*)	S	--	SC	Saltbush, greasewood	Mapped: 8, 9, 9D, 9E, 9F, 9G, 9H	Mapped: 8B, 8E, 9D, 9E, 9F, 9G, 9H
Spreading gilia *(Ipomopsis polycladon)*	S	--	SC	Sagebrush,	Mapped: 8E, 9D, 9E, 9G	Mapped:8E, 9, 9D, 9E, 9F, 9G, 9H
Davis' peppergrass (*Lepidium davisii)*	S	--	SC	Playas, sagebrush	Mapped: 9	Mapped: 7J, 9, 9D, 9F, 9G, 9H
Bruneau River prickly phlox *(Leptodactylon glabrum)*	S	--	SC	Cliffs	Mapped: 9E	Mapped: 9, 9E
Packard's desert parsley *(Lomatium packardiae)*	S	--	SC	Sagebrush		Mapped: 8, 8A
Rigid threadbush (*Nemacladus rigidus*)	S	--	SC	Shadscale, sagebrush	Mapped: 9, 9E	Mapped: 8, 9, 9D, 9E, 9F, 9G, 9H
Simpson's hedgehog cactus (*Pediocactus simpsonii)*	W	--	SC	Dry or rocky soils	Mapped: 7H	Mapped; 7H, 7I, 7J, 8, 8B, 9, 9E
Idaho penstemon *(Penstemon idahoensis)*	S	S (R4)	SC	Juniper	Mapped: 7I, 7J	Mapped: 7H, 7I, 7J
Janish's penstemon *(Penstemon janishiae)*	S	--	SC	Low sagebrush	Mapped: 8A, 9, 9E	Mapped: 8, 8A, 8B, 9, 9B, 9D, 9E, 9F, 9G, 9H
Spine-noded milkvetch *(Peteria thompsoniae)*	S	--	SC	Saltbush	Mapped: 9E	Mapped: 9, 9E, 9F, 9H
Malheur yellow phacelia (*Phacelia lutea*)	S	--	SC	Volcanic substrates	Mapped: 9	Mapped: 8, 8B, 9
Profuseflower mesamint *(Pogogyne floribunda)*	--	--	SC	Playas, vernal pools		Mapped: 8B
Annual brittlebrush *(Psathyrotes annua)*	S	--	SC	Saltbush	Mapped: 9, 9E, 9G, 9H	Mapped: 8, 8E, 9, 9D, 9E, 9F, 9G, 9H
King's snapdragon (*Sairocarpus kingii*)	--	--	SC	Pinyon-Juniper Woodland	Mapped: 9	Mapped: 8, 8B, 9
Red glasswort *(Salicornia rubra)*	S	--	SC	Playas		Mapped: 5, 7, 7H, 7I, 7J
Biennial princesplume *(Stanleya confertiflora)*	S	--	SC	Saltbush		Mapped: 9, 9D, 9F, 9G, 9H
American wood sage *(Teucrium canadense* var *occidentale)*	S	--	SC	Riparian/ wetland	Mapped: 8, 8B, 8D	Mapped: 8, 8B, 8E, 9, 9D, 9F, 9G, 9H

Table 3.7-3. Other Special Status Plant Species Known to Occur Within 5 Miles of the Analysis Area (continued)

Species[2/]	Status[3/, 4/]			General Habitat	Segments and Alternatives with Nearby Known or Modeled Occurrence[1/]	
	BLM	Forest Service	State Heritage Programs		Known Occurrences or Habitat within 0.5 Mile of the Analysis Area	Known Occurrences or Habitat within 5 Miles of the Analysis Area
Wovenspore lichen (*Texosporinum sancti-jacobi*)	S	--	SC	Sagebrush, disturbed sagebrush	Mapped: 8, 8B, 8D	Mapped: 8, 8B, 8C, 9D, 9F, 9G, 9H
Purple meadow-rue (*Thalictrum dasycarpum*)	S	--	SC	Wetlands		Mapped: 4, 4A, 4B, 4C, 4D, 4E, 4F
Nevada						
None						
Utah						
Idaho penstemon (*Penstemon idahoensis*)	S	S (R4)	SC	Juniper	Mapped: 7J	Mapped: 7J

1/ Source for distribution: GIS data from Idaho Natural Heritage Program, WYNDD, Nevada Natural Heritage Program, and Utah Conservation Data Center. Modeled distributions from WYNDD.
2/ Christ's Indian paintbrush and Goose Creek milkvetch are both candidates for listing under the ESA (Table 3.7-2) and are also listed as Sensitive by the BLM and Forest Service.
3/ Source of status: USFWS 2008a, 2008b; BLM 2008d, 2003a; Forest Service 2007a, 2007b; Idaho CDC 2010; and WYNDD 2007.
4/ Definitions: BLM: S = sensitive, W = watch list species; USFS: S= Region 2 or 4 sensitive; SC = species of concern tracked by CDC or WYNDD
5/ The USFWS is currently conducting a status review to determine if federal listing is warranted.

3.7.2 Direct and Indirect Effects

This section is organized to present effects to TES plants from construction, then operations, followed by decommissioning activities for the proposed Project. Route Alternatives are analyzed in detail below in Section 3.7.2.3. There is a Design Variation involving use of two single-circuit structures proposed by the Proponent for Segments 2, 3, and 4 (see Section 2.2 for details), which is analyzed below in Section 3.7.2.4 and a Structure Variation that is analyzed in Section 3.7.2.5. The Proponents have also proposed a Schedule Variation, analyzed in Section 3.7.2.6, in which one of the two single circuits to be constructed in Segments 2, 3, and 4 and a portion of Segment 1W would be built on an extended schedule with construction beginning approximately 2.5 years after completion of the initial construction.

Mitigation measures or EPMs are presented in detail within this section only if it is the first time they have been discussed in Chapter 3; all other measures are referenced or summarized. A comprehensive list of all Proponent-proposed EPMs and Agency-required mitigation measures can be found in Table 2.7-1 of Chapter 2.

Plan Amendments

The land use plans for the Sawtooth NF, Medicine Bow NF, Caribou NF, Kemmerer FO, Rawlins FO, Green River FO, and SRBOP all contain standards related to the protection and enhancement of TES plants that include measures such as minimizing and avoiding effects to TES plants or occupied habitat (including conducting pre-construction surveys); prohibiting actions that would contribute to the listing of a species; and requiring mitigation measures for actions that might contribute to the establishment or spread of invasive plant species in occupied TES plant habitat or other adverse effects. Given the EPMs described above, no population-level effects to any species would be anticipated because all Project-related impacts to TES plants would be avoided or minimized.

There is one land use plan standard related to TES plants with which the Project would not be in conformance and therefore would require a plan amendment.

- **Morley Nelson Snake River Birds of Prey Special Status Species Standard 6.** Include in all BLM authorizations permitting surface disturbing activities (non-grazing), requirements that (1) affected areas be reseeded with a perennial vegetative cover, and (2) surface-disturbing activities be located at least 0.5 mile from occupied sensitive plant habitat.

The Gateway West Project as proposed comes within 0.5 mile of occupied sensitive plant habitat on the SRBOP. Therefore, a plan amendment would be required to allow the construction of the Project within this distance (see Appendix F for the plan amendment) along the Proposed Route for Segment 8, Alternative 8B, Alternative 8D, Proposed Route for Segment 9, Alternative 9D, and Alternatives 9E, 9F, 9G, and 9H. With the EPMs identified above, the Project would avoid or minimize adverse impacts to TES plant populations. Therefore, the Project would not preclude the BLM from meeting the SRBOP's goal of emphasizing maintenance, protection, and enhancement of sensitive habitats (BLM 2008b, p. 2-7).

Kemmerer Decision 6041 states that new unpaved roads could be allowed within 250 feet of special status plant species only if, under NEPA analysis, the road would not adversely impact the species. Under a plan amendment, access roads needed for the Project would be allowed. Given the EPMs and mitigation measures identified above that would avoid or minimize adverse impacts to TES plant species, the Project would not preclude the Kemmerer FO from achieving its goal of managing to facilitate the conservation, recovery, and maintenance of populations of special status species (Goal BR-4) and of providing quality habitats to support the expansion in range of identified high priority plant species (Goal BR:5; BLM 2010b, p.2-30).

3.7.2.1 No Action Alternative

Under the No Action Alternative, the Project would not be constructed or operated. No Project-related impacts to TES plant species would occur; however, impacts would continue as a result of natural events (such as fire, drought, and severe weather) and existing developments within the Analysis Area.

3.7.2.2 Effects Common to All Action Alternatives

The following sections discuss both construction and operational effect common to all Route Alternatives. ESA-listed and candidate plant species are discussed first, followed by other special status species (BLM Sensitive and Watch List species; Forest Service Sensitive Species; and State Heritage Program species of concern).

ESA-listed and Candidate Plant Species

Construction

Direct impacts from construction activities could result in crushing or removal of plants, as well as direct loss of habitat. Indirect impacts include fragmentation of suitable habitat, alteration of fire regimes, introduction or spread of invasive exotic species, isolation of subpopulations due to physical separation by access roads or transmission infrastructure, increased erosion, and alteration of habitat microclimates or hydrology. Information about fire and erosion risks, as well as the measures proposed by the Proponents and BLM to reduce these risks, is presented in Section 3.17 – Land Use and Recreation. Information regarding invasive species, and the measures proposed to prevent their spread, is presented in Section 3.8 – Invasive Plant Species. Fragmentation is discussed in Section 3.10 – General Wildlife and Fish. Maintenance of vegetation in the ROW, including cutting of trees and taller shrubs, is not expected to affect any of the ESA-listed or candidate plant species because all of these species occur in habitats dominated by low-growing vegetation.

The Proponents have proposed a series of EPMs meant to reduce or prevent impacts to ESA-listed or candidate plant species as well as to general vegetation (see Appendix C-2). In many cases, these EPMs are sufficient to protect sensitive resources; however, in some cases the Agencies have determined that these EPMs are not sufficient or do not conform with agency policy, and therefore have recommended additional mitigation measures. Section 3.6.2.2 lists the EPMs proposed for general vegetation, all of which would help reduce impacts to ESA-listed or candidate plant species (e.g., revegetation efforts, re-establishment of soil contours, prevention of exotic plant spread, and so on).

To avoid impacting ESA-listed or candidate plant species, the Proponents have proposed the following species-specific EPMs for blowout penstemon (PPC-1), Colorado butterfly plant (PPC-2), slickspot peppergrass (PPC-3), and Ute ladies'-tresses (PPC-4; Table 2.2-2):

PPC-1 through PPC-4 Surface disturbance will be allowed in suitable habitat where species specific surveys have determined that no populations are present. The species-specific surveys will be conducted the year prior to construction, and the proposed disturbance areas will be redesigned to avoid direct impact to populations.

The Agencies have recommended an additional mitigation measure for Goose Creek milkvetch and whitebark pine:

TESPL-1 Surface disturbance will be allowed in suitable habitat for Goose Creek milkvetch and whitebark pine where species-specific surveys have determined that no populations are present. The species-specific surveys will be conducted the year prior to construction, and the proposed disturbance areas will be redesigned to avoid direct impacts to populations.

The survey windows for these species-specific pre-construction surveys are listed in Table 3.7-4, with the exception of whitebark pine, because this tree species can be identified year-round (although it may be difficult to distinguish from limber pine when cones are not present). Surveys would not be required for the western prairie fringed orchid or the desert yellowhead yermo because these species are not located within the Analysis Area; however, the western prairie fringed orchid may still be impacted due to water withdrawals from the Platte River (see additional discussion below).

Table 3.7-4. Pre-construction Survey Windows for Five ESA-listed or Candidate Plant Species

Species	Survey Window
Blowout penstemon	May through early July[1/]
Colorado butterfly plant	June through October
Goose Creek milkvetch	Mid-June to Mid-July
Slickspot peppergrass	Mid-May through September
Ute ladies'-tresses	July through September

1/ In Wyoming, due to elevation and climate conditions, surveys for blowout penstemon would occur between mid-June and mid-July.

The results of these surveys would be used to micro-site the route away from any newly discovered ESA-listed or candidate plants or populations. However, if the route cannot be moved due to other Project constraints, the Proponents have proposed the following EPM:

OM-29 In the event any special status plants require relocation, permission will be obtained from the federal agency. If avoidance or relocation is not practical, the topsoil surrounding the plants will be salvaged, stored separately from subsoil, and respread during the restoration process.

Relocation of an ESA-listed or candidate plant species would be inconsistent with the ESA, which prohibits removal of plants from lands under federal jurisdiction. Should avoidance on federal lands not be possible, or should these plants require relocation, consultation would occur with the USFWS on adverse effects to these species, and additional mitigation may be required if OM-29 is implemented. The relocation location would be determined in conjunction with the federal agency.

The pre-construction surveys proposed in the Proponents EPMs PPC-1 through PPC-4, OM-29, and Agency required mitigation measure TESPL-1 would likely be adequate to protect blowout penstemon, Colorado butterfly plant, and Goose Creek milkvetch, because these species are not likely to occur within the Analysis Area or, if present, would likely be discovered during pre-construction surveys and subsequently avoided. However, these EPMs would be only partially effective in preventing impacts to Ute ladies'-tresses and slickspot peppergrass because these two species are more likely to occur within the Analysis Area than the aforementioned species, and they have life history traits (e.g., dormancy) that make them likely to be missed by a one-time pre-construction survey. In addition, whitebark pine is known to occur in the Project area and could occur in extensive stands that may be difficult to avoid during construction. Also, although the pre-construction surveys would likely identify whitebark pine, this species can be difficult to distinguish from limber pine, and both species are known to occur within the Project area. Therefore, the Agencies have recommended additional mitigation measures to further protect Ute ladies'-tresses, slickspot peppergrass, and whitebark pine (discussed below). Western prairie fringed orchid is also addressed in more detail below, because this species could be impacted by water withdrawals from the Platte River (an impact that would not be mitigated for through preconstruction surveys or avoidance of individuals).

<u>Ute Ladies'-Tresses</u>

The currently proposed Proponent EPMs are insufficient to protect Ute ladies'-tresses, because this species does not flower every year, is very inconspicuous when not in flower, and can be difficult to find even when flowering. In addition, populations may consist of a small number of plants that can easily be missed by surveyors. A one-time survey could miss populations if it was conducted before or after blooming has occurred, even if surveys were conducted during the proper survey window. If populations are missed during the surveys, Ute ladies'-tresses plants and/or populations could be destroyed or damaged during construction. No known Ute ladies'-tresses populations occur within any of the watersheds crossed by the Proposed Route and Alternatives (BLM 2007c, Map 1); however, as stated earlier, known occurrences should not be considered exhaustive and this species could still be present. Therefore, the Agencies have identified the following mitigation measure to comply with the ESA that would be applied on all federal lands:

TESPL-2 Pre-construction surveys for the Ute ladies' tresses shall be conducted by qualified botanists in all areas of potential habitat, in accordance with federal land management agency and USFWS requirements. These pre-construction surveys shall be conducted during the appropriate survey window, for a total of 3 years.

TESPL-3 Qualified botanists shall conduct pre-construction surveys during a season when target species are readily identifiable for special status or globally rare species. Where feasible, micrositing of project facilities shall avoid direct impacts to identified populations. Survey reports documenting the surveys, their results, and recommendations must be provided to land management agency for approval prior to construction. Agency botanists may evaluate individual sites based on site-specific conditions. Documentation of the evaluation of avoidance of impacts to sensitive and globally rare plants must be provided to the Agencies prior to construction.

Slickspot Peppergrass

The Proponent-proposed EPMs are insufficient to protect slickspot peppergrass because this species is an annual or biennial plant, and its aboveground populations may fluctuate greatly from year to year (depending on precipitation or other environmental factors). The aboveground plants represent only a small portion of the population, with the largest components consisting of the soil-stored seed bank (69 *Federal Register* 3094-3116; 74 *Federal Register* 52013-52064). Only a small portion of the seeds germinate in a single year; therefore, the seed bank typically covers a larger area than what is occupied by aboveground plants in any given year. A single pre-construction survey could miss slickspot peppergrass populations and slickspots that do not currently exhibit aboveground plants could still contain this species. Therefore, the Agencies have identified the following mitigation measure to comply with the ESA, which would be applied on all federal lands:

TESPL-4 Environmental monitors shall be used to identify and mark aboveground populations of slickspot peppergrass and higher-quality microsites within 50 feet of the construction area, including access roads, so that they are avoided by construction equipment and vehicles. Full field clearances shall be conducted that meet USFWS protocols prior to construction. No construction shall occur within 50 feet of any slickspot peppergrass plant or habitat, including known occurrences of slickspot peppergrass (based on Idaho CDC data) even if aboveground plants are not observed during the surveys. Seeding during reclamation must use methods that minimize soil disturbance such as no-till drills or rangeland drills with depth bands, in areas of suitable habitat. Reclamation must use certified weed-free native seed. Excess soils will not be stored or spread on slickspots.

Whitebark Pine

The BLM has indicated that both whitebark pine and limber pine occur in the upper treeline areas along the Segment 4 Proposed Route and Route Alternatives (within the Kemmerer FO), though the full extent of these two species has not yet been mapped (Means 2010a; Guyon 2009). Pre-construction surveys as well as timber cruises would likely identify the locations of these two species in relation to the Project area; however, it is possible that the Project would not be able to avoid every individual of these two

species due to the potential extent of their distribution within a stand (see discussion in Section 3.7.2.3). Therefore, the Agencies have identified the following mitigation measure:

TESPL-5 If a whitebark pine or limber pine (a similar species that can be difficult to distinguish from whitebark pine) stand cannot be avoided, off-site mitigation in the form of appropriate silvicultural treatments of adjacent stands, collection of seed, identification of "plus" trees, or other acceptable mitigations will be done to offset the loss of the stand in addition to replanting whitebark pine on reclaimed areas.

Western Prairie Fringed Orchid

Because the western prairie fringed orchid is not located within the Analysis Area, there would not be direct impacts to this species resulting from soil disturbances and/or direct removal; however, water depletions to the Platte River system have the potential to affect the western prairie fringed orchid. Depletions can result in waterflows that are insufficient to maintain the wetlands inhabited by this species. Additionally, as these wetlands become dry, invasive plants may become dominant such as leafy spurge, a species which has been identified as a major threat to the western prairie fringed orchid's survival (Kirby et al. 2003).

Under the Programmatic Biological Opinion for the Platte River Recovery Implementation Program (USFWS 2006a), any depletion from the Platte River system of more than 0.1 acre-feet/year would result in a *may affect, likely to adversely affect* determination for the covered species, which includes the western prairie fringed orchid. The Project would use water for dust control and concrete preparation during construction, depending on the segment, for a total water requirement of 102,500,000 gallons or 314.6 acre-feet for both transmission line and substation construction (see Table B-10, Appendix B). Table D.16-12 in Appendix D provides estimated water usage and construction period length by transmission line segment.

However, whether Project-related withdrawals constitute a depletion depends in part upon whether the water is withdrawn under a new or existing water right (i.e., an existing water right is purchased and water is withdrawn in accordance the limitations of the right such that the withdrawal does not create a new demand on the existing water supply). New depletions require mitigation to offset water depletion impacts. At this time it is uncertain whether the Proponents would be able to draw water from existing developed water sources, and thus if Project-related water use would constitute a new or existing depletion. Consultation with the USFWS on Project-related water depletion, and determination of appropriate mitigation, will occur prior to publication of the Final EIS.

Operations

There is less potential for adverse impacts to occur to ESA-listed and candidate plant species during operations than during construction, due to the limited level of disturbance that would occur during operations and the avoidance and micro-siting measures that would be taken following the pre-construction surveys. However, some disturbances could occur due to routine maintenance activities, including the potential for altered fire regimes resulting from the increased risk of fire starts associated with use

of maintenance vehicles, bird collisions with lines, and other sources, and the continuing potential for spreading exotic plant species. Therefore, to limit the potential of operational impacts to ESA-listed and candidate plant species, the Proponents have proposed the following EPMs:

OM-23 Prior to the start of O&M activities, all supervisory personnel will be instructed on the protection of natural resources, including sensitive plant and wildlife species and habitats. If a contractor is used, the construction contract will address (a) the sensitive plant species that may be present in a particular area based on previous surveys and literature review; (b) the federal and state laws regarding protection of plants and wildlife; (c) the importance of these resources; (d) the purpose and necessity of protecting them; and (e) methods for protecting sensitive resources (e.g., Endangered Species Act, Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, and BLM wildlife policy).

OM-24 Sensitive plant populations that occur within or near the ROW and work areas will be marked on the ground, where practical, to ensure that they are avoided. If species are discovered during the work, the Proponents will establish a spatial buffer zone, will contact the appropriate Agency within 24 hours, and will continue with the O&M activities outside of the established buffer unless otherwise directed. The Agency may evaluate the adequacy of the buffer on a case-by-case basis. Unless the Proponents are informed otherwise, work outside of the buffer area will continue. If the Proponents need to work within the buffer area, the Agencies and Proponents will work together to develop a solution that is acceptable to both parties and will allow for the Proponents to complete the work in a timely manner or within the scheduled outage window, if applicable. After the project is complete or no longer poses a threat to the plant population, the marking (stakes), if used, will be promptly removed to protect the site's significance and location from unwanted attention. As needed, marking will be reinstated during the land rehabilitation period.

OM-28 The Proponents will provide crews and contractors with maps showing avoidance areas; these maps will include work zones as well as ROW areas where overland travel will be avoided.

Decommissioning

Project facilities would be removed at the end of the operational life of the transmission line. Structures and foundations would be removed to below the ground surface level. Removal of Project structures following decommissioning may result in temporary impacts to ESA-listed and candidate species, if present in close proximity to the facilities being removed. Re-initiation of consultation with the USFWS would be needed if any ESA-listed or candidate species is located near a facility proposed for decommissioning. To determine the location of any such plant species near Project components and to limit potential impacts to these species, the EPMs and mitigation measures identified in the construction and operations phases would be applied, prior to decommissioning.

Other Special Status Plant Species

Construction

During construction, other special status plant species or their habitats could be crushed or removed during construction. Construction activities could also result in the removal of suitable habitat for other special status plant species. Construction of the transmission line and other Project facilities could also result in fragmentation of suitable habitat or the loss or reduction in quality of suitable habitat due to altered fire regimes (i.e., potential for increased fire frequency) or changes in microclimates associated with Project-related vegetation removal. Project construction could also reduce suitable habitat quality for other special status plant species through the introduction and spread of noxious weeds, which can compete with native plant species.

For species associated with wetlands, Project-related impacts on hydrology could result in a reduction in habitat quality. Any blasting that may occur within or adjacent to a wetland could fracture the bedrock and alter the hydrology of a perched water table, thereby leading to drier conditions and impairment of revegetation efforts. Withdrawal of water for use during construction may have temporary effects on wetlands adjacent to streams, by reducing the water input that they would receive. Additionally, soil disturbances and removal of vegetation within a wetland or riparian area could temporarily alter the area's ability to moderate flood flow, control sediments, or facilitate surface water flow. To minimize the potential impacts that could occur to wetlands-associated plant species due to changes in hydrology, the Proponents would develop a Reclamation, Revegetation, and Weed Management Plan, which would include measures listed in Appendix C-2 and measures to ensure that disturbed areas are revegetated and restored to pre-construction conditions.

General mitigation measures for vegetation as identified in Section 3.6.1.2 would reduce these impacts to some extent; however, these measures alone do not ensure consistency with Forest Service (FSM 2670.32) and conformance with BLM (BLM Manual 6840) policies, which require that impacts to sensitive species be avoided or minimized. Measure TESPL-3, as identified by the Agencies and described above, applies to all TES plant species and would require that pre-construction surveys be conducted for other special status plant species that have been documented within the analysis area or have the potential to occur in the Analysis Area (Table 3.7-3 above). Therefore, with the implementation of TESPL-3, construction impacts to *all* TES plants species or populations that are located on lands managed by the BLM and/or the Forest Service would be avoided or minimized. Where avoidance is not possible, the Project would apply EPM OM-29, which applies to the relocation of plants.

The Agencies have also identified the following mitigation measure to reduce construction and operations effects on cushion plant communities:

TESPL-6 Sand dune and cushion plant communities should be avoided, where feasible.

Operations

During operations, direct or indirect impacts would generally be minor during maintenance and repair activities because other special status plants are likely to have

already been avoided on federal lands prior to construction (TESPL-3 described above). However, some species may be able to reoccupy previously disturbed habitat and could be re-disturbed. Additional impacts that could occur as a result of operations include changes in fire regime, changes in hydrology, and degradation of habitat by noxious weeds and invasive plant species. The EPMs that would be implemented during operations identified above for ESA-listed and candidate species would also be implemented for other special status species on federal lands.

Decommissioning

Impacts from decommissioning on other special status plant species would be similar to those identified above for ESA-listed and candidate species. These impacts would include temporary disturbance due to the removal of Project structures. Prior to decommissioning on federal lands, surveys for other special status plant species would be conducted to flag and avoid them during decommissioning.

Impacts on Federal Lands

Federal land management agencies have established goals and objectives related to the protection and enhancement of TES plant populations and their habitat. The assessment of potential Project-related impacts to TES plants under each of the Action Alternatives below is based on the current state of knowledge regarding the distribution of these plant species and the preliminary Project design, which is likely to change as a result of refinements made to the location of facilities during final design and new information on occurrences of these species. .Pre-construction surveys, as identified above, would focus on areas with known populations of TES plant species and areas of suitable habitat. This would ensure that the Project is in compliance with the ESA and with BLM and Forest Service-specific policies regarding avoiding and minimizing effects to TES plant species.

Based on the results of these pre-construction surveys, the ROW route would either be modified to avoid suitable habitat of TES plant species, or additional agency-approved conservation measures would be identified as necessary to minimize impacts in areas where suitable habitat cannot be completely avoided (Appendix C-3, Revised Proposed Plant and Wildlife Conservation Plan). Surface disturbance would be allowed in suitable habitat where species-specific surveys (conducted on all lands for ESA-listed and candidate species and federal lands for other special status species) have determined that no populations of TES plants are present. This would be particularly important for endemic species such as the Laramie columbine, for which disturbance could result in a trend toward federal listing if complete avoidance is not possible. Indirect impacts could occur to all populations and habitat especially through degradation of habitat by invasive plant species, however these impacts would be minimized through the Project's Reclamation Plan, which would include pre-construction, construction, and post-construction weed control measures (see Appendix C-2 for the framework of the Reclamation Plan). The determinations of effect for ESA-listed and candidate species, by segment and alternative, based on the implementation of these measures, are summarized in Table 3.7-5. For Forest Service and BLM sensitive species, the Project could affect individuals but is not likely to contribute towards a trend toward federal listing or loss of viability.

Table 3.7-5. Impacts to Threatened, Endangered, Proposed, and Candidate Plant Species

Segment Number	Proposed Route or Alternative	Goose Creek Milkvetch *Astragalus anserinus*	Christ's Indian Paintbrush *Castilleja christii*	Colorado butterfly plant *Gaura neomexicana* ssp. *coloradensis*	Slickspot peppergrass *Lepidium pappileferum*	Blowout penstemon *Penstemon haydenii*	Western prairie fringed orchid *Platanthera praeclara*	Whitebark Pine *Pinus albicaulis*	Ute ladies'-tresses orchid *Spiranthes diluvialis*	Desert Yellowhead *Yermo xanthocephalus*
	Status	**Candidate**	**Candidate**	**Threatened**	**Proposed Endangered**	**Endangered**	**Threatened**	**Under Consideration for Listing**	**Candidate**	**Threatened**
1E	Proposed – Total Length	No effect	No effect	No effect	No effect	No effect	May affect, likely to adversely affect[1]	No effect	May affect, not likely to adversely affect	No effect
	Alternatives 1E-A, 1E-B, 1E-C	No effect	No effect	No effect	No effect	No effect	May affect, likely to adversely affect[1]	No effect	May affect, not likely to adversely affect	No effect
1W(a)	Proposed – Total length	No effect	No effect	No effect	No effect	No effect	May affect, likely to adversely affect[1]	No effect	May affect, not likely to adversely affect	No effect
	Alternative 1W-A	No effect	No effect	No effect	No effect	No effect	May affect, likely to adversely affect[1]	No effect	May affect, not likely to adversely affect	No effect
1W(c)	Proposed – Total Length	No effect	No effect	No effect	No effect	No effect	May affect, likely to adversely affect[1]	No effect	May affect, not likely to adversely affect	No effect
2	Proposed – Total length	No effect	No effect	No effect	No effect	No effect	May affect, likely to adversely affect[1]	No effect	May affect, not likely to adversely affect	No effect
	Alternatives 2A, 2B, 2C	No effect	No effect	No effect	No effect	No effect	May affect, likely to adversely affect[1]	No effect	May affect, not likely to adversely affect	No effect
3	Proposed – Total length	No effect	No effect	No effect	No effect	No effect	No effect	No effect	May affect, not likely to adversely affect	No effect

Table 3.7-5. Impacts to Threatened, Endangered, Proposed, and Candidate Plant Species (continued)

Segment Number	Proposed Route or Alternative	Goose Creek Milkvetch *Astragalus anserinus*	Christ's Indian Paintbrush *Castilleja christii*	Colorado butterfly plant *Gaura neomexicana* ssp. *coloradensis*	Slickspot peppergrass *Lepidium pappileferum*	Blowout penstemon *Penstemon haydenii*	Western prairie fringed orchid *Platanthera praeclara*	Whitebark Pine *Pinus albicaulis*	Ute ladies'-tresses orchid *Spiranthes diluvialis*	Desert Yellowhead *Yermo xanthocephalus*
	Status	**Candidate**	**Candidate**	**Threatened**	**Proposed Endangered**	**Endangered**	**Threatened**	**Under Consideration for Listing**	**Candidate**	**Threatened**
4	Proposed – Total length	No effect	No effect	No effect	No effect	May affect, not likely to adversely affect	No effect	May affect, likely to adversely affect	May affect, not likely to adversely affect	No effect
	Alternatives 4A,4B,4C,4D, 4E, 4F	No effect	No effect	No effect	No effect	May affect, not likely to adversely affect	No effect	May affect, likely to adversely affect	May affect, not likely to adversely affect	No effect
5	Proposed – Total length	No effect	No effect	No effect	No effect	No effect	No effect	No effect	No effect	No effect
	Alternatives 5A, 5B, 5C, 5D, 5E	No effect	No effect	No effect	No effect	No effect	No effect	No effect	No effect	No effect
7	Proposed-Total Length	No effect	No effect	No effect	No effect	No effect	No effect	No effect	No effect	No effect
	Alternatives 7A,7B, 7C, 7D, 7E, 7F, 7G, 7H, 7I	No effect	No effect	No effect	No effect	No effect	No effect	No effect	No effect	No effect
	Alternative 7I, 7J	May affect, not likely to adversely affect	No effect	No effect	No effect	No effect	No effect	No effect	No effect	No effect
8	Proposed– Total Length	No effect	No effect	No effect	May affect, not likely to adversely affect	No effect	No effect	No effect	No effect	No effect

Table 3.7-5. Impacts to Threatened, Endangered, Proposed, and Candidate Plant Species (continued)

Segment Number	Proposed Route or Alternative	Goose Creek Milkvetch *Astragalus anserinus*	Christ's Indian Paintbrush *Castilleja christii*	Colorado butterfly plant *Gaura neomexicana* ssp. *coloradensis*	Slickspot peppergrass *Lepidium pappileferum*	Blowout penstemon *Penstemon haydenii*	Western prairie fringed orchid *Platanthera praeclara*	Whitebark Pine *Pinus albicaulis*	Ute ladies'-tresses orchid *Spiranthes diluvialis*	Desert Yellowhead *Yermo xanthocephalus*
	Status	**Candidate**	**Candidate**	**Threatened**	**Proposed Endangered**	**Endangered**	**Threatened**	**Under Consideration for Listing**	**Candidate**	**Threatened**
	Proposed-Comparison Portion for Alternative 8A	No effect	No effect	No effect	May affect, not likely to adversely affect	No effect	No effect	No effect	No effect	No effect
	Alternative 8A	No effect	No effect	No effect	No effect	No effect	No effect	No effect	No effect	No effect
	Proposed-Comparison Portion for Alternative 8B	No effect	No effect	No effect	May affect, not likely to adversely affect	No effect	No effect	No effect	No effect	No effect
	Alternative 8B	No effect	No effect	No effect	May affect, not likely to adversely affect	No effect	No effect	No effect	No effect	No effect
	Proposed-Comparison Portion for Alternative 8C	No effect	No effect	No effect	May affect, not likely to adversely affect	No effect	No effect	No effect	No effect	No effect
	Alternative 8C	No effect	No effect	No effect	May affect, not likely to adversely affect	No effect	No effect	No effect	No effect	No effect
8	Proposed-Comparison Portion for Alternative 8D	No effect	No effect	No effect	No effect	No effect	No effect	No effect	No effect	No effect
	Alternative 8D	No effect	No effect	No effect	No effect	No effect	No effect	No effect	No effect	No effect

Table 3.7-5. Impacts to Threatened, Endangered, Proposed, and Candidate Plant Species (continued)

Segment Number	Proposed Route or Alternative	Goose Creek Milkvetch *Astragalus anserinus*	Christ's Indian Paintbrush *Castilleja christii*	Colorado butterfly plant *Gaura neomexicana* ssp. *coloradensis*	Slickspot peppergrass *Lepidium pappileferum*	Blowout penstemon *Penstemon haydenii*	Western prairie fringed orchid *Platanthera praeclara*	Whitebark Pine *Pinus albicaulis*	Ute ladies'-tresses orchid *Spiranthes diluvialis*	Desert Yellowhead *Yermo xanthocephalus*
	Status	**Candidate**	**Candidate**	**Threatened**	**Proposed Endangered**	**Endangered**	**Threatened**	**Under Consideration for Listing**	**Candidate**	**Threatened**
8 (cont.)	Proposed-Comparison Portion for Alternative 8E	No effect	No effect	No effect	No effect	No effect	No effect	No effect	No effect	No effect
	Alternative 8E	No effect	No effect	No effect	No effect	No effect	No effect	No effect	No effect	No effect
9	Proposed-Total Length	No effect	No effect	No effect	No effect	No effect	No effect	No effect	No effect	No effect
	Alternatives 9A, 9B, 9C, 9D, 9E, 9F, 9G, 9H	No effect	No effect	No effect	No effect	No effect	No effect	No effect	No effect	No effect
10	Proposed	No effect	No effect	No effect	No effect	No effect	No effect	No effect	No effect	No effect

3.7.2.3 Proposed Route and Alternatives by Segment

The following discussion of potential impacts to TES plant species by transmission line segment focuses on direct impacts from construction (removal or disturbance of surface vegetation and soils). Route Alternatives are compared to the portion of the Proposed Route that starts and ends at the same nodes as the Route Alternative (referred to as the "comparison portion of the Proposed Route"). Acres of impact to special status plant species in the segment-specific tables below were derived by overlaying the Project disturbance footprint on known occurrences and mapped suitable habitat for other special status plant species. Where mapped suitable habitat is included in the calculations, disturbance acreages are not additive because in some cases polygons of mapped suitable habitat for several species overlap.

Potential impacts are discussed in relation to known occurrences (i.e., mapped populations) and mapped suitable habitat (Wyoming only; based on state and federal data). Collectively, there is the greatest potential for harm to individual plants in these areas and accordingly they would be the focus of pre-construction survey efforts. There is also the potential for direct disturbance to suitable but unoccupied habitat for some species, where Project-related disturbance could affect soil seed banks. Associated impacts to long-term population viability would vary locally, with overall impacts to individual taxa depending on the scale of the disturbance relative to the size of the population. As identified in mitigation measure TESPL-3, Agency botanists may evaluate individual sites based on site-specific conditions and documentation of the evaluation of avoidance of impacts to sensitive and globally rare plants must be provided to the agencies prior to construction. For these reasons, the discussion below should be interpreted as highlighting potential effects of the Project, indicating where surveys and other pre-construction Agency coordination efforts would be focused.

Segment 1E

Segment 1E, as proposed, would link the Windstar and Aeolus Substations in south-central Wyoming with a 100.6-mile 230-kV single-circuit transmission line. Twenty acres of the expansion of Windstar and Aeolus Substations and 0.5 acre for one regeneration site are attributed to Segment 1E. Alternative 1E-A is a 16.1-mile alternative along the north end of Segment 1E, which was the Proponents' initial proposal before moving the Proposed Route at the suggestion of local landowners to avoid the more settled area around Glenrock. Alternative 1E-B is 21.4 miles longer than the Proposed Route but is being considered by the Proponents because it would avoid a Wyoming-designated sage-grouse core area to the east. The BLM has required the consideration of Alternative 1E-C, which parallels the Segment 1W 230-kV lines into the Aeolus Substation (see Appendix A, Figure A-2).

ESA-listed and Candidate Species

There are no known occurrences of ESA-listed or candidate species in Segment 1E; however, the Proposed Route would impact approximately 11 acres of wetland/ riparian habitat (potential habitat for Ute ladies'-tresses). Alternative 1E-A would impact more potential Ute ladies'-tresses habitat (approximately 4 acres of wetland/riparian vegetation) than the comparison portion of the Proposed Route (approximately 1 acre;

Table D.9-1 of Appendix D). Alternative 1E-B would also impact more potential Ute ladies'-tresses habitat compared to the Proposed Route (approximately 4 acres and 3 acres of wetland/riparian vegetation, respectively). Alternative 1E-C would impact less potential Ute ladies'-tresses habitat than the comparison portion of the Proposed Route (approximately 8 acres and 10 acres of wetland/riparian vegetation, respectively). Wetlands would be avoided to the extent practical and, where avoidance is not possible, any permanent loss of wetlands or wetland function would require compensatory mitigation (e.g., creation, enhancement, or restoration of wetlands to replace the lost wetland function/acreage) as part of the USACE Section 404 permitting process (see Section 3.9 – Wetlands and Riparian Areas for additional discussion). Given that pre-construction surveys for Ute ladies'-tresses would be conducted in areas of suitable habitat and that loss of wetland habitat would be adequately mitigated, construction and operations of the Project along Segment 1E may affect, but is not likely to adversely affect, this species.

Segment 1E is within the Platte River watershed where the western prairie fringed orchid is located downstream of the Analysis Area. As described above, in the Programmatic BO for the Platte River system, water depletions of greater than 0.1 acre-feet per year from the Platte River constitute a "may affect, likely to adversely affect" determination to downstream listed species; therefore, if Project-related water withdrawals are not taken from existing water rights (and thus are considered to constitute a new depletion), the Proposed Route for Segment 1E and its Route Alternatives may affect, and are likely to adversely affect, the western prairie fringed orchid. Consultation with the USFWS on Project-related water withdrawals will be completed for the Final EIS.

Other Special Status Species

No known populations of other special status plant species occur along Segment 1E; however, suitable habitat for six of these species would be crossed by the Project. Construction and operations of the Segment 1E Proposed Route would remove or disturb suitable habitat four special status plant species, nearly all of which is suitable habitat for Laramie false sagebrush and Nelson's milkvetch (Table 3.7-6).

Alternative 1E-A and the comparison portion of the Proposed Route would impact suitable habitat for Nelson's milkvetch during construction and operations, with fewer acres impacted under Alternative 1E-A (Table 3.7-6). Both Alternative 1E-B and the comparison portion of the Proposed Route would each impact suitable habitat for three species; however, more suitable habitat for Laramie columbine, Laramie false sage brush, and Nelson's milkvetch would be impacted by Alternative 1E-B than the comparison portion of the Proposed Route, which would impact about 2 acres of suitable habitat for pale blue-eyed grass. Both Alternative 1E-C and the comparison portion of the Proposed Route would impact mapped suitable habitat for five special status plant species. Alternative 1E-C would impact a greater number of acres of suitable habitat for Laramie false sagebrush, persistent sepal yellow-cress, Beaver Rim phlox, and Laramie columbine; the comparison portion of the Proposed Route would impact more acres of suitable habitat for Nelson's milkvetch. Pre-construction

Table 3.7-6. Potential Impacts to Other Special Status Plant Species along Segment 1E Proposed and Alternative Routes

Proposed Route or Alternative	Acres											
	Laramie Columbine[1/]		Laramie False Sagebrush[1/]		Persistent Sepal Yellow-cress[1/]		Nelson's Milkvetch[1/]		Beaver Rim Phlox[1/]		Pale Blue-eyed Grass[1/]	
	Const	Op	Const	Op	Const	Op	Const	Op	Const	Op	Const	Op
Proposed 1E – Total Length	8.7	2.7	110.5	24.7	–	–	169.4	39.4	–	–	2.1	0.5
Proposed – Comparison Portion for Alternative 1E-A	–	–	–	–	–	–	155.0	35.6	–	–	–	–
Alternative 1E-A	–	–	–	–	–	–	97.5	28.2	–	–	–	–
Proposed – Comparison Portion for Alternative 1E-B	–	–	33.7	6.3	–	–	3.6	1.1	–	–	2.1	0.5
Alternative 1E-B	42.8	6.9	102.2	27.3	–	–	15.4	6.8	–	–	–	–
Proposed – Comparison Portion for Alternative 1E-C	8.6	2.7	110.5	24.7	–	–	3.6	1.1	–	–	2.1	0.5
Alternative 1E-C	9.5	2.7	115.2	32.2	0.3	t[2/]	–	–	6.9	1.4	0.4	0.1

1/ Based on modeled suitable habitat.
2/ Value is less than 0.1 acre.

clearance surveys along the Proposed Route and Route Alternatives would ensure that these species would be identified and impacts avoided and minimized during construction and operations.

Segment 1W

Segment 1W is composed of two parts, Segment 1W(a) and 1W(c), both of which would consist of a new 230-kV line for part of their length and a reconstruction of an existing 230-kV line for the remaining part. Segment 1W(a) would be about 76.5 miles long, and would extend from the Windstar Substation to the Aeolus Substation. Segment 1W(c) would be about 70.6 miles long, and would extend from the Dave Johnston Power Plant to the Aeolus Substation. Alternative 1W-A is a 16.2-mile alternative located near the town of Glenrock, which was the Proponents' initial proposal before moving the Proposed Route at the suggestion of local landowners in order to avoid the more settled area around Glenrock. Twenty acres of the proposed expansion at the Windstar and Aeolus Substations are attributed to Segment 1W(a) and 3 acres of the expansion at the Heward Substation and 17 acres of the expansion at the Windstar and Aeolus Substations are attributed to Segment 1W(c). There are no Route Alternatives proposed south of that point (see Appendix A, Figure A-2).

ESA-listed and Candidate Species

There are no known occurrences of ESA-listed or candidate species in Segment 1W(a) and 1W(c); however, collectively the Proposed Routes in these segments would impact approximately 19 acres of wetland/riparian vegetation (potential habitat for Ute ladies'-

tresses; Table D.9-1 of Appendix D). Alternative 1W-A would impact more potential habitat for Ute ladies'-tresses than the comparison portion of the Proposed Route (approximately 5 acres and 1 acre of wetland/riparian vegetation, respectively; Table D.9-1 in Appendix D). As noted above, wetlands would be avoided to the extent practical and, where avoidance is not possible, any permanent loss of wetlands or wetland function would require compensatory mitigation (e.g., creation, enhancement, or restoration of wetlands to replace the lost wetland function/acreage) as part of the USACE Section 404 permitting process. Given that pre-construction surveys for Ute ladies'-tresses would be conducted in areas of suitable habitat and that loss of wetland habitat would be adequately mitigated, construction and operations of the Project along Segment 1W may affect, but is not likely to adversely affect, this species.

Segment 1W is within the Platte River watershed where the western prairie fringed orchid is located downstream of the Analysis Area. As described above, in the Programmatic BO for the Platte River system, water depletions of greater than 0.1 acre-feet per year from the Platte River constitute a "may affect, likely to adversely affect" determination to downstream listed species; therefore, if Project-related water withdrawals are not taken from existing water rights (and thus are considered to constitute a new depletion), the Proposed Route and all Route Alternatives along Segment 1W may affect, and are likely to adversely affect, the western prairie fringed orchid. Consultation with the USFWS on Project-related water withdrawals will be completed for the Final EIS.

Other Special Status Species

No known populations of other special status plants occur along Segment 1W; however, there is suitable habitat for six of these plant species that would be crossed by the Project. The Segment 1W(a) and 1W(c) Proposed Routes would primarily remove or disturb suitable habitat for Laramie false sagebrush and Nelson's milkvetch (Table 3.7-7). Suitable habitat for only one species, Nelson's milkvetch, would be impacted by Alternative 1W-A and the comparison portion of the Proposed Route during construction (approximately 108 acres and 159 acres, respectively) and operations (approximately 32 acres and 34 acres, respectively). Pre-construction clearance surveys along the Segment 1W Proposed Route and Route Alternative would ensure that these species would be identified and impacts avoided and minimized during construction and operations.

Table 3.7-7. Potential Impacts to Other Special Status Plant Species along Segment 1W Proposed and Alternative Routes

Proposed Route or Alternative	Acres											
	Laramie Columbine[1/]		Laramie False Sagebrush[1/]		Persistent Sepal Yellow-cress[1/]		Nelson's Milkvetch[1/]		Beaver Rim Plox[1/]		Pale Blue-eyed Grass[1/]	
	Const	Op	Const	Op	Const	Op	Const	Op	Const	Op	Const	Op
Proposed 1W(a) Total Length	9.3	2.9	123.7	36.5	1.2	0.3	177.5	39.6	9.4	3.1	0.1	0.1
Proposed – Comparison Portion for Alternative 1W-A	–	–	–	–	–	–	158.7	34.1	–	–	–	–
Alternative 1W-A	–	–	–	–	–	–	107.8	31.6	–	–	–	–
Proposed 1W(c) Total Length	21.9	2.7	219.3	37.5	0.7	0.2	144.3	25.0	8.9	1.4	1.8	0.5

1/ Data based on mapped suitable habitat.

Segment 2

Segment 2, as proposed, would link the Aeolus and Creston Substations in southeast Wyoming with two 500-kV circuits on one structure. One circuit would be operated at 230 kV during the initial phase of the Project. Its total proposed length is 96.7 miles. Fifty-two acres of the expansion of the Aeolus Substation and the construction of the Creston Substation and 0.5 acre for one regeneration site are attributed to Segment 2. There are three Route Alternatives, two of which are near the community of Fort Fred Steele. Alternative 2A at 28.4 miles long is being considered by the BLM because it remains in the WWE corridor nearer the town and the state historic site, and Alternative 2B, at 6.2 miles, is closer to the community than the comparison portion of the Proposed Route and was the initially proposed route before the Proponents responded to local suggestions and relocated the Proposed Route farther to the south. Alternative 2C is a 24.4-mile alternative located north of Hanna, Wyoming. It is being evaluated at the recommendation of the Wyoming Governor's office to follow a utility corridor approved by that office for minimizing effects to sage-grouse (see Appendix A, Figure A-3).

ESA-listed and Candidate Species

There are no known occurrences of ESA-listed or candidate species in Segment 2; however, the Proposed Route would impact approximately 10 acres of wetland/riparian vegetation (potential habitat for Ute ladies'-tresses; Table D.9-1 of Appendix D). Greater impacts to potential Ute ladies'-tresses habitat would occur under Alternatives 2A (approximately 10 acres of wetland/riparian vegetation) and 2B (approximately 3 acres of wetland/riparian vegetation) than the comparison portions of the Proposed Route (approximately 3 acres of wetland/riparian vegetation along the comparison portion for Alternative 2A and less than 1 acre of wetland/riparian vegetation along the comparison portion for Alternative 2B). As noted above, wetlands would be avoided to

the extent practical and, where avoidance is not possible, any permanent loss of wetlands or wetland function would require compensatory mitigation (e.g., creation, enhancement, or restoration of wetlands to replace the lost wetland function/acreage) as part of the USACE Section 404 permitting process. Given that pre-construction surveys for Ute ladies'-tresses would be conducted in areas of suitable habitat and that loss of wetland habitat would be adequately mitigated, construction and operations of the Project along Segment 2 may affect, but are not likely to adversely affect, this species.

Segment 2 is within the Platte River watershed where the western prairie fringed orchid is located downstream of the Analysis Area. As described above, in the Programmatic BO for the Platte River system, water depletions of greater than 0.1 acre-feet per year from the Platte River constitute a "may affect, likely to adversely affect" determination to downstream listed species; therefore, if Project-related water withdrawals are not taken from existing water rights (and thus are considered to constitute a new depletion), the Proposed Route and all Route Alternatives along Segment 2 may affect, and are likely to adversely affect, the western prairie fringed orchid. Consultation with the USFWS on Project-related water withdrawals will be completed for the Final EIS.

Other Special Status Species

No known populations of other special status plants occur along this segment; however, suitable habitat for five of these plant species would be crossed by the Project (Table 3.7-8). The Proposed Route along Segment 2 would impact suitable habitat for all five species, most of it consisting of suitable habitat for meadow pussy toes and Beaver Rim phlox. Alternative 2A would impact suitable habitat for three plant species versus four along the comparison portion of the Proposed Route and would impact fewer acres, the largest difference being for Beaver Rim phlox (approximately 4 acres versus 20 acres, respectively; Table 3.7-8). Alternative 2B and the comparison portion of the Proposed

Table 3.7-8. Potential Impacts to Other Special Status Plant Species along Segment 2 Proposed and Alternative Routes

Proposed Route or Alternative	Acres									
	Persistent Sepal Yellow-cress[1/]		Meadow Pussytoes[1/]		Pale Blue-eyed Grass[1/]		Cedar Rim Thistle[1/]		Beaver Rim Phlox[1/]	
	Const	Op	Const	Op	Const	Op	Const	Op	Const	Op
Proposed Segment 2 – Total Length	19.3	4.8	55.3	6.1	1.0	0.5	4.7	1.0	31.1	6.2
Proposed – Comparison Portion for Alternative 2A	16.7	4.3	55.3	6.1	0.4	0.7	–	–	20.2	2.8
Alternative 2A	12.8	3.7	37.3	2.3	–	–	–	–	3.5	1.1
Proposed – Comparison Portion for Alternative 2B	6.5	2.0	–	–	–	–	–	–	10.9	1.5
Alternative 2B	14.9	1.5	–	–	–	–	–	–	–	–
Proposed – Comparison Portion for Alternative 2C	1.3	0.2	18.6	3.3	0.4	–	–	–	2.4	0.4
Alternative 2C	–	–	14.1	1.8	–	–	–	–	2.4	0.7

1/ Data based on mapped suitable habitat.

Route would impact similar acres of suitable habitat for other special status plant species; however, Alternative 2B would impact more acres of suitable habitat for persistent sepal yellow-cress and the comparison portion of the Proposed Route would impact more acres of suitable habitat for Beaver Rim phlox. Alternative 2C would impact fewer special status plant species than the comparison portion of the Proposed Route; however, of the two species impacted by both routes (meadow pussy toes and Beaver Rim phlox) acres of impact would be comparable between the routes. Pre-construction clearance surveys along the Proposed Route and Route Alternatives would ensure that these species would be identified and impacts avoided and minimized during construction and operations.

Segment 3

Segment 3, as proposed, would link the Creston and Anticline Substations in southeast Wyoming with two 500-kV circuits on one structure. One circuit would be operated at 230 kV during the initial phase of the Project. Its total proposed length between those two substations is 46.7 miles. Sixty-nine acres of the construction of the Anticline and Creston Substations are attributed to Segment 3. Segment 3 would also link the Anticline and Jim Bridger Substations with a 4.3-mile 230-kV line and a 5.5-mile 345-kV line and includes the 10-acre expansion of the Jim Bridger 345-kV Substation. There are no alternatives proposed along this segment (see Appendix A, Figure A-4).

ESA-listed and Candidate Species

There are no known occurrences of ESA-listed or candidate species in Segment 3; however, the Proposed Route would impact approximately 13 acres of wetland/riparian vegetation (potential habitat for Ute ladies'-tresses; Table D.9-1 of Appendix D). As noted above, wetlands would be avoided to the extent practical and, where avoidance is not possible, any permanent loss of wetlands or wetland function would require compensatory mitigation (e.g., creation, enhancement, or restoration of wetlands to replace the lost wetland function/acreage) as part of the USACE Section 404 permitting process. Given that pre-construction surveys for Ute ladies'-tresses would be conducted in areas of suitable habitat, and that loss of wetland habitat would be adequately mitigated, construction and operations of the Project along Segment 3 may affect, but are not likely to adversely affect, this species.

Other Special Status Species

Construction and operations of Segment 3 could result in impacts to the red poverty-weed. A known area of occurrence southeast of the Jim Bridger Substation would be crossed by the Proposed Route for Segment 3. The Proposed Route would impact approximately 12 acres of red poverty-weed during construction and 2 acres during operations. Construction and operations along Segment 3 would also impact suitable habitat for Nelson's milkvetch, Cedar Rim thistle, tufted twin pod, and persistent sepal yellow-cress (Table 3.7-9). Pre-construction clearance surveys along Segment 3 would ensure that these species would be identified and impacts avoided and minimized during construction and operations.

Table 3.7-9. Potential Impacts to Other Special Status Plant Species along Segment 3 Proposed and Alternative Routes

Proposed Route or Alternative	Acres									
	Red Poverty-Weed		Nelson's milkvetch[1/]		Cedar Rim thistle[1/]		Tufted Twinpod[1/]		Persistent Sepal Yellow-cress[1/]	
	Const	Op	Const	Op	Const	Op	Const	Op	Const	Op
Segment 3 Proposed Total Length	11.7	2.1	556.8	153.1	46.7	10.9	47.2	10.9	1.6	0.3

1/ Data based on mapped suitable habitat.

Segment 4

Segment 4, as proposed, would link the Anticline Substation near the Jim Bridger Power Plant in southwestern Wyoming with the Populus Substation in Idaho with two 500-kV circuits on one structure. Its total proposed length is 203 miles. Eighty-nine acres of the construction of the Anticline Substation and the expansion of the Populus Substation and 1.5 acres for three regeneration sites are attributed to Segment 4. It has six Route Alternatives in the middle portion of its route but the first 52 miles to the east and the last 61 miles to the west (in Idaho) do not have any Route Alternatives. The middle section of the Proposed Route is 90.2 miles long, and its Route Alternatives vary from 85 to 102 miles long. These alternatives were proposed by the Wyoming Governor's office (4A, paralleling the existing 345-kV lines throughout); by the BLM Kemmerer FO (4B through 4E, including edits from various cooperating agencies), with the intent to avoid impacts to cultural resources to the extent practical; and by the Proponents (4F, attempting to avoid impacts to cultural resources while still remaining north of the existing lines) (see Appendix A, Figures A-5 and A-6).

ESA-listed and Candidate Species

The Proposed Route would impact approximately 65 acres of wetland/riparian vegetation (potential habitat for Ute ladies'-tresses; Table D.9-1 of Appendix D). Potential habitat for Ute ladies'-tresses occurs on all six alternatives found along Segment 4, the most being potentially impacted under Alternative 4A (54.4 acres), followed by Alternative 4B (43 acres), Alternative F (42 acres), Alternative 4D (40 acres), Alternative 4C (36 acres), Alternative 4E (36 acres), and the comparison portion of the Proposed Route (17 acres; Table D.9-1 in Appendix D). As noted above, wetlands would be avoided to the extent practical and, where avoidance is not possible, any permanent loss of wetlands or wetland function would require compensatory mitigation (e.g., creation, enhancement, or restoration of wetlands to replace the lost wetland function/acreage) as part of the USACE Section 404 permitting process. Given that pre-construction surveys for Ute ladies'-tresses would be conducted in areas of suitable habitat, and that loss of wetland habitat would be adequately mitigated, construction and operations of the Project along the Proposed Route and Route Alternatives may affect, but are not likely to adversely affect, this species.

The BLM has indicated that whitebark pine (a species under consideration for federal listing) and limber pine (a BLM Wyoming Sensitive Species, which is discussed here due to its relation to whitebark pine) occur in the upper treeline areas along the

Segment 4 Proposed Route and Route Alternatives (within the Kemmerer FO), though the full extent of these two species has not yet been mapped (Means 2010a; Guyon 2009). Field observations indicate widespread mountain pine beetle epidemics with mortality approaching 90 to 100 percent of infected trees (Means 2010b). The Project would cross through two known stands (containing both species) along Segment 4, including one on Commissary Ridge and one on Dempsey Ridge. Commissary Ridge consists of a 250-acre stand, the entire extent of which the Project would cross. The extent of the population on Dempsey Ridge is unknown but is estimated to be over 100 acres (Means 2010b), so it is not possible to determine to what extent the Project would cross it. These stands, which are on the range margins of whitebark pine, are the southernmost stands in Wyoming and the southernmost east of the Rocky Mountains. The BLM is currently conducting a whitebark pine and limber pine mapping effort and more detailed information will be incorporated into the Final EIS as it becomes available. In addition, more information regarding this species location in relation to the Project area would be determined during pre-construction surveys and timber cruises. The Agencies have proposed a mitigation measure for any stands of whitebark pine or limber pine that cannot be avoided. Due to the uncertainty regarding this species extent within the Project area, and the EPM and mitigation measures proposed by the Proponents and Agencies, construction of the Project may affect, and is likely to adversely affect, whitebark pine.

Other Special Status Species

Known occurrences of starveling milkvetch would be directly affected by construction and operations of the Proposed Route in Segment 4 (1 acre and less than 1 acre, respectively) due to the improvement of existing roads in Idaho. Construction and operations of the Project along Segment 4 also have the potential to impact suitable habitat for 13 other special status species, the majority being suitable habitat for Nelson's milkvetch, tufted twinpod, and Beaver Rim phlox (Table 3.7-10). Species with known occurrences that could be impacted by the Segment 4 Route Alternatives include Hayden's milkvetch (Alternatives 4B, 4C, 4D, and 4E), King's milkvetch (Alternatives 4A and 4F), tufted twinpod (Alternatives 4A, 4B, 4C, 4F), and Dorn's twinpod (Alternatives 4A, 4B, 4C, 4D, and 4E). Acreages impacted are comparable among alternatives (Table 3.7-10). None of these known occurrences would be impacted by the comparison portion of the Proposed Route. The construction and operations of the Route Alternatives would have the greatest impact on suitable habitat for Tufted twinpod, starveling milkvetch, Nelson's milkvetch, Trelease's twinpod, large-fruited bladderpod, and Beaver Rim phlox. Suitable habitat of the greatest number of species would be impacted by Alternative 4F (15 species), followed by Alternative 4A (14 species), the comparison portion of the Proposed Route (12 species), Alternatives 4B and 4D (11 species each), and Alternatives 4C and 4E (10 species each). Total acreage impacted by each alternative would be variable among species (Table 3.7-10). Pre-construction clearance surveys along the Proposed Route and Route Alternatives would ensure that these species would be identified and impacts avoided and minimized during construction and operations.

Table 3.7-10. Potential Impacts to Other Special Status Plant Species along Segment 4 Proposed and Alternative Routes

Proposed Route or Alternative	Meadow Pussytoes[1]		Hayden's Milkvetch[2]		King's Milkvetch[2]		Trelease's milkvetch[1]		Entire-leaved peppergrass[1]		Fremont bladderpod[1]		Western Bladderpod[1]		Prostrate Bladderpod[1]		Tufted Twinpod [1, (2)]	
	Const	Op	Const	Op	Const	Op	Const	Op	Const	Op	Const	Op	Const	Op	Const	Op	Const	Op
Proposed Segment 4 – Total Length	14.4	3.8	–	–	–	–	0.2	t[3]	–	–	24.7	5.3	4.2	0.8	8.9	2.0	132.7	32.4
Proposed – Comparison Portion for Alternatives 4A,B,C,D,E, F	14.4	3.8	–	–	–	–	0.1	t[3]	–	–	24.7	5.3	4.2	0.78	8.9	1.2	129.2	30.7
Alternative 4A	12.5	3.3	–	–	0.5	0.2	44.9	8.8	–	–	7.3	2.5	18.2	4.7	7.3	1.33	212.5 (2.2)	54.2 (1.1)
Alternative 4B	3.6	1.1	1.0	0.5	–	–	84.7	18.8	18.8	4.0	–	–	–	–	30.5	6.7	284.5 (5.4)	65.2 (1.4)
Alternative 4C	3.5	1.0	1.0	0.5	–	–	34.8	7.6	20.7	3.0	–	–	–	–	30.5	6.7	257.2 (5.4)	60.4 (1.4)
Alternative 4D	8.1	3.1	1.0	0.5	–	–	80.6	18.9	17.2	4.0	–	–	–	–	36.8	9.4	323.9	75.6
Alternative 4E	8.0	3.1	1.0	0.5	–	–	34.9	7.6	20.7	3.0	–	–	–	–	36.8	9.4	300.8	70.8
Alternative 4F	21.7	4.7	–	–	0.5	0.2	–	–	–	–	13.9	2.9	5.1	2.0	7.2	1.3	302.9 (2.2)	72.2 (1.1)

Table 3.7-10. Potential Impacts to Other Special Status Plant Species along Segment 4 Proposed and Alternative Routes (continued)

Proposed Route or Alternative	Dorn's Twinpod[1/, (2/)]		Persistent Sepal Yellow-cress[1/]		Starveling Milkvetch[2/]		Nelson's Milkvetch[1/]		Cedar Rim Thistle[1/]		Wyoming Tansymustard[1/]		Large-fruited Bladderpod[1/]		Beaver Rim Phlox[1/]		Rocky Mountain Twinpod[1/]	
	Const	Op	Const	Op	Const	Op	Const	Op	Const	Op	Const	Op	Const	Op	Const	Op	Const	Op
Proposed Segment 4 – Total Length	–	–	0.9	0.1	0.7	0.4	139.2	73.1	2.2	0.7	–	–	–	–	45.6	12.3	9.0	0.9
Proposed – Comparison Portion for Alternatives 4A,B,C,D,E, F	–	–	0.9	0.1	0.7	0.4	0.7	0.3	2.2	0.7	–	–	–	–	35.0	8.1	9.0	0.9
Alternative 4A	0.5 (t[3/])	0.2 (t[3/])	6.0	0.1	0.7	0.4	25.7	5.2	7.9	1.1	16.9	3.4	9.2	3.4	21.6	5.4	–	–
Alternative 4B	51.4 (0.8)	11.1 (0.1)	–	–	0.7	0.4	131.5	24.3	0.2	0.1	–	–	44.7	10.5	57.7	12.4	–	–
Alternative 4C	42.2 (0.8)	10.2 (0.1)	–	–	0.7	0.4	90.7	13.3	–	–	–	–	44.8	10.5	56.1	12.0	–	–
Alternative 4D	115.1 (0.8)	27.3 (0.1)	–	–	0.7	0.4	132.0	24.3	0.2	0.1	–	–	55.0	14.6	51.2	12.2	–	–
Alternative 4E	109.0 (0.8)	26.4 (0.1)	–	–	0.7	0.4	90.8	13.3	–	–	–	–	55.0	14.6	49.6	11.7	–	–
Alternative 4F	0.2	0.1	0.3	–	0.7	0.4	19.3	5.3	2.1	0.7	13.7	4.4	9.2	3.4	21.5	5.4	–	–

1/ Data based on mapped suitable habitat.
2/ Data based on mapped known occurrences (shown in parentheses for Dorn's twinpod and tufted twinpod).
3/ Value is less than 0.1 acre.

New access roads in Alternatives 4A and 4C are not in conformance with Decision 6041 in the Kemmerer RMP that restricts new roads in the vicinity of special status plant species. Under a plan amendment, access roads needed for the Project would be allowed. Given the EPMs and mitigation measures identified above that would avoid or minimize adverse impacts to TES plant species, the Project would not preclude the Kemmerer FO from achieving its goal of managing to facilitate the conservation, recovery, and maintenance of populations of special status species (Goal BR-4) and of providing quality habitats to support the expansion in range of identified high priority plant species (Goal BR:5; BLM 2010b, p.2-30).

Segment 5

Segment 5, as proposed, would link the Populus and Borah Substations with a 54.6-mile single-circuit 500-kV line. Forty-four acres of the expansion of the Populus and Borah Substations are attributed to Segment 5. There are five Route Alternatives including two proposed by the BLM to avoid the Deep Creek Mountains (5A and 5B; 8 miles and 19 miles longer than the comparison portion of the Proposed Route), one preferred by Power County that crosses the Fort Hall Indian Reservation (5C; 6 miles shorter than the comparison portion of the Proposed Route), one originally proposed by the Proponents (5D; 2 miles shorter than the comparison portion of the Proposed Route but located within more agricultural lands), and one proposed by Power County as an alternative approach to the Borah Substation (5E) (see Appendix A, Figure A-7).

ESA-listed and Candidate Species

There are no known occurrences of ESA-listed or candidate species or suitable habitat in Segment 5. Therefore, construction and operations of the Proposed Route and Route Alternatives would have no impacts to ESA-listed or candidate plant species.

Other Special Status Species

No impacts to known occurrences or potential habitat for other special status plants have been identified for the Proposed Route along Segment 5 or Alternatives 5A, 5B, 5C, 5D, or 5E. One species, red glasswort, has been reported within 5 miles of the Project along Segment 5; however, this species is unlikely to occur within the Analysis Area because suitable habitat (playas) is not present.

Segment 6

Segment 6 is an existing transmission line linking the Borah and Midpoint Substations; it is now operated at 345 kV but would be changed to operate at 500 kV. This segment has no Route Alternatives. Existing support structures would be used and impacts would be limited to within approximately 0.25 mile from each substation to allow for moving the entry point into the substation to the new 500-kV bay. Thirty-one acres of the expansion of the Borah and Midpoint Substations are attributed to Segment 6. Changes in the two substations would allow it to be operated at 500 kV (see Appendix A, Figure A-8).

ESA-listed and Candidate Species

There are no known occurrences of ESA-listed or candidate species or suitable habitat in Segment 6. Therefore, construction and operations of the Proposed Route and Route Alternatives would have no impacts to ESA-listed or candidate plant species.

Other Special Status Species

There are no other special status plant species that occur within the footprint of the Project along Segment 6, and there are no known occurrences of such species within 0.5 mile of the Project (Table 3.7-3); therefore, construction and operations of the Project along Segment 6 would have no impacts to other special status plant species.

Segment 7

Segment 7, as proposed, would link the Populus and Cedar Hill Substations with a 118.1-mile single-circuit 500-kV line. Forty-two acres of the expansion of the Populus and the construction of the Cedar Hill Substations and 1 acre for two regeneration sites are attributed to Segment 7. In addition to the Proposed Route, which is principally on private lands, Route Alternatives have been proposed by the BLM to avoid the Deep Creek Mountains (7A and 7B; which are 5 miles and 11 miles longer than the comparison portion of the Proposed Route), by local landowners (7C, 7D, 7E, 7F, and 7G, which all represent minor adjustments proposed to address local issues), by local landowners to avoid private agricultural lands (7I or the State Line Route, which is 55 miles longer than the Proposed Route and would require 0.5 acre for an additional regeneration site), and by the Proponents to avoid the State Line Route (7H, which is 10 miles longer than the Proposed Route). Alternative 7J, which is a variant of the State Line Route also proposed by local landowners, would not terminate at the Cedar Hill Substation. This alternative, referred to as the Rogerson Alternative, would require a different substation be constructed near a 345-kV existing transmission line (approximately 24 miles southwest of the Cedar Hill Substation; see Appendix A, Figure A-9). The tables and discussion in this document compare 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

ESA-listed and Candidate Species

There are no known occurrences of ESA-listed or candidate species or suitable habitat in Segment 7, with the exception of Goose Creek milkvetch along Alternative 7J. Alternative 7J, as indicatively sited, would impact 0.1 acre of Goose Creek milkvetch during construction and operations. Additionally, based on the most recent Idaho Natural Heritage Data, less than 1 acre of Goose Creek milkvetch lies within an area identified for existing road improvements along Alternative 7I. It is anticipated that the occurrence of this species would be surveyed and flagged prior to construction, in accordance with TESPL-3, and avoided. There is the potential for indirect impacts associated with the introduction and spread of invasive plant species or Project-related fires; however, these impacts would be minimized by measures included in the Project's Framework Reclamation Plan (Appendix C-2) related to weed control and revegetation, and the fire prevention and control measures identified in mitigation measure VEG-5

(see Section 3.6 – Vegetation Communities). Therefore, the construction and operations of the Proposed Route for Segment 7 and Route Alternatives may affect, but are not likely to adversely affect, Goose Creek milkvetch.

Other Special Status Species

The Proposed Route for Segment 7 and Alternatives 7A through 7H would not directly impact any other special status plant species. Alternatives 7I and 7J would directly impact known occurrences of two-headed onion (less than 1 acre during construction and operations), and Idaho penstemon (less than 1 acre during construction and operations). Pre-construction clearance surveys along Alternative 7I and 7J would ensure that these species would be identified and impacts avoided and minimized during construction and operations.

Segment 8

Segment 8, as proposed, would link the Midpoint and Hemingway Substations. This 131-mile single-circuit 500-kV transmission line would stay north of the Snake River until crossing through the SRBOP parallel to an existing 500-kV transmission line before ending at the Hemingway Substation. Thirteen acres of the expansion of the Midpoint Substation and 0.5 acre for a regeneration site are attributed to Segment 8. There are five Route Alternatives: 8A, which follows the WWE corridor but crosses the Snake River and I-84 twice (while the Proposed Route would stay north of this area); 8B and 8C, which represent the old routes originally proposed by the Proponents but that have now been changed to avoid the cities of Kuna and Mayfield, respectively; 8D, which represents a small revision involving a rebuild of the existing transmission line to move both away from the National Guard Maneuver Area; and 8E, which was proposed by the BLM in order to avoid crossing the Halverson Bar non-motorized portion of the Guffey Butte-Black Butte Archaeological District (see Appendix A, Figure A-10).

ESA-listed and Candidate Species

The Project, as indicatively sited, would directly impact a total of approximately 7 acres of known occurrences of slickspot peppergrass along the Proposed Route for Segment 8 during construction and approximately 1 acre during operations (Table 3.7-11). Slickspot peppergrass occurs within the general vicinity of Segment 8 for about 40 miles. Occupied habitat would also be directly affected during construction and operations under Alternatives 8B and 8C (both approximately 3 acres during construction and less than 1 acre during operations). The comparison portion of the Proposed Route for Alternative 8B would impact more slickspot peppergrass than Alternative 8B (approximately 7 acres during construction and 1 acre during operations). The comparison portion of the Proposed Route for Alternative 8C would impact fewer acres of slickspot peppergrass than Alternative 8C (approximately 1 acre during construction and less than 1 acre during operations). Alternatives 8A, 8D, and 8E and their comparison portions of the Proposed Route would not impact this species.

Table 3.7-11. Potential Impacts to Slickspot Peppergrass Habitat along Segment 8 Proposed and Alternatives Routes

Proposed Route or Alternative	Slickspot Peppergrass (Acres)	
	Construction	Operations
Proposed Segment 8 – Total Length	7.4	0.8
Proposed – Comparison Portion for Alternative 8A	–	–
Alternative 8A	–	–
Proposed – Comparison Portion for Alternative 8B	7.4	0.8
Alternative 8B	2.7	0.4
Proposed – Comparison Portion for Alternative 8C	0.8	0.4
Alternative 8C	2.7	0.6
Proposed – Comparison Portion for Alternative 8D	–	–
Alternative 8D	–	–
Proposed – Comparison Portion for Alternative 8E	–	–
Alternative 8E	–	–

As noted above, impact acreages are based on the preliminary Project design. Pre-construction clearance surveys would be conducted for slickspot peppergrass consistent with established protocols to microsite Project facilities to avoid or minimize impacts. Additionally, any aboveground populations of slickspot peppergrass and higher-quality microsites within 50 feet of the construction area and access roads would be marked by environmental monitors. Under mitigation measure TESPL-4, no construction would occur within 50 feet of any slickspot peppergrass plant or habitat, including known occurrences of slickspot peppergrass (based on Idaho Natural Heritage data) even if aboveground plants are not observed during the surveys.

Construction and operations of the Segment 8 Proposed Route and Route Alternatives could result in indirect impacts to slickspot peppergrass due to the introduction and spread of noxious weeds or invasive plant species if reseeding activities in disturbed areas outside of slickspots are unsuccessful in establishing native perennial cover. However, these effects would be minimized through implementation of the Project's reclamation plan, which would include measures identified in Appendix C-2 such as post-construction monitoring of revegetated areas to ensure plant establishment. Therefore, with the implementation of these measures, construction and operations of the Project along the Segment 8 Proposed Route, Alternative 8B, and Alternative 8C may affect, but are not likely to adversely affect, slickspot peppergrass. Construction and operations of Alternatives 8A and 8D would have no effects on slickspot peppergrass because this species does not occur within the Analysis Area for either of these alternatives.

Additionally, as noted above, Alternatives 8B and 8C cross approximately 4.3 miles and 0.7 mile, respectively, of areas identified as proposed critical habitat for slickspot peppergrass. The Proponents are currently consulting with the USFWS under Section 7 of the ESA, and would continue to do so should critical habitat become designated. Pre-construction surveys would be conducted in all areas of critical habitat crossed by the Project, should it become designated, to avoid and minimize impacts to slickspot peppergrass populations. Mitigation measure TESP-4 and measures contained in

Appendix C-2 would be implemented in all areas of proposed critical habitat, which would minimize Project-related effects.

Other Special Status Species

Construction and operations of Segment 8 of the Proposed Route have the potential to directly affect eight other special status species (Table 3.7-12). Wovenspore lichen and mourning milkvetch would have the greatest number of acres impacted by Segment 8. Alternative 8A would impact fewer acres of mapped occurrences of other special status species (less than 1 acre of matted cowpie buckwheat during construction and operations) than the comparison portion of the Proposed Route (approximately 7 acres during construction and 1 acre during operations of mourning milkvetch). Alternative 8B would also impact fewer acres of mapped occurrences of special status species than the comparison portion of the Proposed Route. Alternative 8B would impact mapped occurrences of wovenspore lichen (approximately 3 acres during construction and less than 1 acre during operations) whereas the comparison portion of the Proposed Route would impact more acres of mapped occurrences of wovenspore lichen (approximately 18 acres during construction and less than 1 acre during operations) as well as Mulford milkvetch, Snake River milkvetch, and white-margined wax plant (Table 3.7-12). Alternative 8C and the comparison portion of the Proposed Route would both impact an equal, minor amount (less than 1 acre) of wovenspore lichen. Alternative 8D and the comparison portion of the Proposed Route would also impact wovenspore lichen, with more acres impacted under Alternative 8D. Finally, Alternative 8E would impact fewer aces of mapped occurrences of special status species (less than an acre of spreading gilia) than the comparison portion of the Proposed Route (less than an acre each of Mulford's milkvetch and Snake River milkvetch). Pre-construction clearance surveys along the Proposed Route and Route Alternatives would ensure that these species would be identified and impacts avoided and minimized during construction and operations.

Portions of the Segment 8 Proposed Route and Alternatives 8B, 8D and 8E cross the SRBOP. Its associated RMP requires that "surface disturbing activities be located at least ½ mile from occupied sensitive plant habitat." Therefore, an amendment to the RMP would be required for the Proposed Route and Alternatives 8B, 8D, and 8E to be in conformance with the RMP (Table 2.2-1). With the implementation of EPMs and mitigation measures related to conducting pre-construction clearance surveys, weed control, and reclamation, the Project would avoid or minimize adverse impacts to TES plant populations. Therefore the Project would not preclude the BLM from meeting the SRBOP's goal of emphasizing maintenance, protection, and enhancement of sensitive habitats (BLM 2008b, p. 2-7).

Table 3.7-12. Potential Impacts to Other Special Status Plant Species along Segment 8 Proposed and Alternative Routes

Proposed Route or Alternative	Acres																	
	Mourning Milkvetch[1/]		Mulford's Milkvetch[1/]		Snake River Milkvetch[1/]		White-margined Wax Plant[1/]		American Wood Sage[1/]		Wovenspore Lichen[1/]		Calcareous Buckwheat[1/]		Matted Cowpie Buckwheat[1/]		Spreading Gilia[1/]	
	Const	Op	Const	Op	Const	Op	Const	Op	Const	Op	Const	Op	Const	Op	Const	Op	Const	Op
Proposed Segment 8 – Total Length	6.8	1.0	2.1	0.3	0.2	t[2/]	0.1	t[2/]	1.4	0.6	17.6	0.1	–	–	–	–	–	–
Proposed – Comparison Portion for Alternative 8A	6.8	1.0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Alternative 8A	–	–	–	–	–	–	–	–	–	–	–	–	0.1	t[1/]	0.5	0.3	–	–
Proposed – Comparison Portion for Alternative 8B	–	–	2.1	0.3	0.2	t[2/]	0.1	t[2/]	–	–	17.6	0.1	–	–	–	–	–	–
Alternative 8B	–	–	–	–	–	–	–	–	–	–	3.1	0.1	–	–	–	–	–	–
Proposed – Comparison Portion for Alternative 8C	–	–	–	–	–	–	–	–	–	–	0.3	0.1	–	–	–	–	–	–
Alternative 8C	–	–	–	–	–	–	–	–	–	–	0.2	0.1	–	–	–	–	–	–
Proposed – Comparison Portion for Alternative 8D	–	–	–	–	–	–	–	–	–	–	17.4	–	–	–	–	–	–	–
Alternative 8D	–	–	–	–	–	–	–	–	–	–	25	0.1	–	–	–	–	–	–
Proposed – Comparison Portion for Alternative 8E	–	–	0.1	t[2/]	0.2	t[2/]	–	–	–	–	–	–	–	–	–	–	–	–
Alternative 8E	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.9	0.1

1/ Data are based on mapped occurrences.
2/ Value is less than 0.1 acre.

Segment 9

Segment 9, as proposed, would link the Cedar Hill and Hemingway Substations with a 161.7-mile single-circuit 500-kV transmission line which skirts the Jarbidge and Owyhee Military Operating Areas to the north, then follows the WWE corridor just north of the Saylor Creek Air Force Range, passing through Owyhee County before entering into the Hemingway Substation. Fifteen acres of the construction of the Cedar Hill Substation and 1 acre for two regeneration sites are attributed to Segment 9. There are eight Route Alternatives proposed, including 9A, which was the Proponents' Proposed Route until moving to avoid the Hollister area; 9B, which is being considered by the BLM because it follows the WWE corridor and parallels existing utility corridors; 9C, which was the Proponents' Proposed Route until moving to avoid the Castleford area; and 9D and 9E, proposed by the Owyhee County Task Force, that cross more public lands north and south of the Proposed Route, respectively, than the Proposed Route. Most of Alternative 9D would be within the SRBOP. Alternatives 9F, 9G, and 9H were proposed to avoid crossing the non-motorized area south of C.J. Strike Reservoir. Alternatives 9G and 9H provide an alternate route location south of Alternative 8E (see Appendix A, Figure A-11).

ESA-listed and Candidate Species

There are no ESA-listed or candidate species within the analysis area for the Segment 9 Proposed Route or Route Alternatives. Therefore, construction and operations would have no effect on ESA-listed or candidate plant species.

Other Special Status Species

There are four other special status plant species that are known to occur within the Segment 9 Analysis Area that have the potential to be affected by construction and operations of the Project (Table 3.7-13). No other special status plant species would be directly affected by Alternatives 9A, 9B, 9C, or their comparison portions of the Proposed Route; however, one species, Greeley's wavewing, is within 0.5 mile of the Proposed Route and Alternatives 9B, 9D, and 9E (Table 3.7-3). Pre-construction surveys would document whether this species occurs within the immediate vicinity of the Project (TESPL-3) and therefore impacts to this species would be avoided or minimized. Neither Alternative 9C nor the comparison portion of the Proposed Route would directly affect other special status plant species.

Alternative 9E would affect the greatest number of other special status plant species during construction (10 species) followed by Alternatives 9D, 9F, 9G or the comparison portion of the Proposed Route (4 species each), and Alternative 9H (3 species). Alternative 9E would also impact the most acres of mapped species occurrences, with the greatest number of acres being white-margined wax plant and Packard's buckwheat (Table 3.7-13). The comparison portion of the Proposed Route would impact more acres of mapped species occurrences than Alternatives 9D and 9F. Alternatives 9G and 9H would impact more acres of desert pincushion and spreading gila than the Proposed Route. During operations, these segments would result in disturbance of 1 acre or less to the impacted species. There are also several species that occur within 0.5 mile of the Project along Alternatives 9 F, 9G, and 9H (Table 3.7-3). Pre-

Table 3.7-13. Potential Impacts to Other Special Status Plant Species along Segment 9 Proposed and Alternative Routes

Proposed Route or Alternative	Acres									
	White Eatonella[1/]		Matted Cowpie Buckwheat[1/]		White-margined wax plant[1/]		Rigid Threadbush[1/]		Desert Pincushion[1/]	
	Const	Op	Const	Op	Const	Op	Const	Op	Const	Op
Proposed Segment 9 – Total Length	4.4	0.7	3.1	0.5	6.4	1.4	2.2	0.6	0.2	0.1
Proposed– Comparison Portion for Alternative 9A	–	–	–	–	–	–	–	–	–	–
Alternative 9A	–	–	–	–	–	–	–	–	–	–
Proposed– Comparison Portion for Alternative 9B	–	–	–	–	–	–	–	–	–	–
Alternative 9B	–	–	–	–	–	–	–	–	–	–
Proposed– Comparison Portion for Alternative 9C	–	–	–	–	–	–	–	–	–	–
Alternative 9C	–	–	–	–	–	–	–	–	–	–
Proposed– Comparison Portion for Alternatives 9D–9H	4.2	0.6	–	–	–	1.1	2.2	0.6	0.2	0.1
Alternative 9D	0.6	–	–	–	1.7	0.2	–	–	4.3	0.2
Alternative 9E	0.2	t[2/]	3.6	0.4	22.5	1.2	0.2	–	1.9	0.3
Alternative 9F	0.6	–	–	–	1.7	0.2	–	–	4.3	0.2
Alternative 9G	0.6	–	–	–	0.5	–	–	–	5.6	0.3
Alternative 9H	0.6	–	–	–	0.5	–	–	–	5.6	0.3

Proposed Route or Alternative	Acres									
	Spreading Gilia[1/]		King's Desert Grass[1/]		Packard's Buckwheat[1/]		Janish's penstemon[1/]		Spine-noded milkvetch[1/]	
	Const	Op	Const	Op	Const	Op	Const	Op	Const	Op
Proposed Segment 9 – Total Length	–	–	–	–	–	–	t[2/]	t[2/]	–	–
Proposed– Comparison Portion for Alternative 9A	–	–	–	–	–	–	–	–	–	–
Alternative 9A	–	–	–	–	–	–	–	–	–	–
Proposed– Comparison Portion for Alternative 9B	–	–	–	–	–	–	–	–	–	–
Alternative 9B	–	–	–	–	–	–	–	–	–	–
Proposed– Comparison Portion for Alternative 9C	–	–	–	–	–	–	–	–	–	–
Alternative 9C	–	–	–	–	–	–	–	–	–	–
Proposed– Comparison Portion for Alternatives 9D–9H	–	–	–	–	–	–	–	–	–	–
Alternative 9D	2.6	0.4	–	–	–	–	–	–	–	–
Alternative 9E	0.6	t[2/]	0.2	0.1	5.2	0.8	2.6	0.4	0.5	–
Alternative 9F	0.9	0.1	–	–	–	–	–	–	–	–
Alternative 9G	1.7	0.3	–	–	–	–	–	–	–	–
Alternative 9H	–	–	–	–	–	–	–	–	–	–

1/ Data based on mapped occurrences.
2/ Value is less than 0.1 acre.

construction clearance surveys along the Proposed Route and Route Alternatives would ensure that these species would be identified and impacts avoided and minimized during construction and operations.

The SRBOP is crossed by the Proposed Route and Alternatives 9D, 9E, 9F, 9G, and 9H. Its associated RMP requires that "surface disturbing activities be located at least ½ mile from occupied sensitive plant habitat." Therefore, an amendment to the RMP would be required for the Segment 9 Proposed Route and Alternatives 9D, 9E, 9F, 9G, and 9H to be in conformance with the RMP (Table 2.2-1). With the implementation of EPMs and mitigation measures related to conducting pre-construction clearance surveys, weed control, and reclamation, the Project would avoid or minimize adverse impacts to TES plant populations. Therefore, the Project would not preclude the BLM from meeting the SRBOP's goal of emphasizing maintenance, protection, and enhancement of sensitive habitats (BLM 2008b, p. 2-7).

Segment 10

Segment 10, as proposed, would link the Cedar Hill and Midpoint Substations with a 33.6-mile single-circuit 500-kV line, following a WWE corridor for most of its distance. Twenty-eight acres of the expansion of the Midpoint Substation and of the construction of the Cedar Hill Substation are attributed to Segment 10. There are no Route Alternatives proposed along this segment (see Appendix A, Figure A-12).

ESA-listed and Candidate Species

There are no known occurrences or suitable habitat for ESA-listed or candidate plant species in the Analysis Area for Segment 10. Therefore, construction and operations of the Proposed Route along this segment would have no effect on ESA-listed or candidate plants.

Other Special Status Species

No potential direct impacts to known occurrences or mapped suitable habitat of other special status plants have been identified for Segment 10. One other special status species, giant helleborine, is present in nearby springs along the Snake River. Segment 10 does include wetland/riparian vegetation with which this species is associated and would impact less than 1 acre of this vegetation during construction. Pre-construction clearance surveys along Segment 10 would ensure that this species would be identified and avoided during construction.

3.7.2.4 Design Variation

A Design Variation is being considered that would consist of constructing two single-circuit lines in Segments 2 through 4 instead of a single double-circuit line (which is the design assessed above). The disturbance footprint of the two single-circuit towers is greater than that of the double-circuit tower, in part because the requested ROW would be wider, but also because helicopter-assisted construction could be implemented in these areas due to the lighter weight of the towers, which would require additional fly yards. The additional ROW space and the fly yards would cause additional temporary disturbance during construction. Across Segments 2, 3, and 4, the additional disturbance of the single-circuit tower alternative ranges from 25 to 30 percent greater

than the comparable portions of the double-circuit tower disturbance under the proposed design. The two single circuits require more ground disturbance, but would be designed and constructed to the same standards as the Proposed Action. Table 3.7-14 summarizes the potential construction impacts to known occurrences and mapped suitable habitat for these species associated with the Design Variation along Segments 2, 3, and 4 and their associated alternatives. suitable habitat for these species associated with the Design Variation along Segments 2, 3, and 4 and their associated alternatives.

3.7.2.5 Structure Variation

The proposed guyed Structure Variation would add four guy wires about 140 feet long from a point about 100 feet up in each tower to four guy anchors spaced in a square around the tower (Appendix B, Figure B-6). This would not change the amount of disturbance during construction or operations appreciably. Therefore, there is no appreciable difference in impact on special status plant communities from the use of this Structure Variation when compared to the use of self-supporting lattice towers.

3.7.2.6 Schedule Variation

The Schedule Variation uses the two single-circuit Design Variation described above but extends construction over a longer time frame. Initially, only one of the eventual two single-circuit lines would be constructed with the second to be constructed at a later date. The Schedule Variation proposes that if the Design Variation is adopted, the first single-circuit transmission line, energized at 500 kV, in Segments 2, 3, and 4 would be built as soon as the ROW grant is issued, but that the second line would not be constructed until late 2018. This would mean nearly 2 years would pass between the end of construction for the first line and beginning of construction for the second line. The Schedule Variation further calls for construction of Segment 1W, the expansion of the Windstar and Aeolus Substations, the expansion of the Populus Substation, and the construction of the proposed Bridger 500-kV Substation to accommodate the single circuit.

Any staging areas and fly yards that had been used for the first stage would have been revegetated after construction was complete and would have to be cleared again. There would be two separate sets of construction disturbances adding movement, noise, and dust to the area of construction in two instances in any given area. The Schedule Variation would therefore have essentially double the adverse indirect impacts on habitats and populations (temporally) as the simultaneous construction of both single-circuit lines or the double-circuit Proposed Route, even though direct habitat disturbance overall would not be any greater (spatially). However, TES plant species that were impacted by the initial clearing would likely be absent from the area during the second clearing (unless they resprouted or germinated from soil-stored seed banks).

Table 3.7-14. Potential Impacts (acres) to Other Special Status Plant Species Associated with the Design Variation Along Segments 2, 3, and 4 Proposed and Alternative Routes

Proposed Route or Alternative	Dorn's Twinpod[1/,(2/)]	Hayden's Milkvetch[1/]	Meadow Pussytoes [1/]	King's Milkvetch[2/]	Red Poverty-weed[3/]	Tufted Twinpod[1/, 2/]	Rocky Mountain Twinpod[1/]
Proposed Segment 2 –Total Length	–	–	60.1	–	–	–	–
Proposed Comparison Portion for Alternative 2A	–	–	60.1	–	–	–	–
Alternative 2A	–	–	39.4	–	–	–	–
Proposed Comparison Portion for Alternative 2B	–	–	–	–	–	–	–
Alternative 2B	–	–	–	–	–	–	–
Proposed Comparison Portion for Alternative 2C	–	–	21.3	–	–	–	–
Alternative 2C	–	–	16.1	–	–	–	–
Proposed Segment 3 – Total Length	–	–	–	–	13.3	52.8	–
Proposed Segment 4 –Total Length	–	–	–	–	–	184.8	10.3
Comparison Portion for Alternatives 4A–4F	–	–	–	–	–	181.3	10.3
Alternative 4A	0.5 (t[3/])	–	–	0.5	–	285.6 (2.2)	–
Alternative 4B	57.5 (0.9)	1.0	–	–	–	3890.8 (6.0)	–
Alternative 4C	46.8 (0.9)	1.0	–	–	–	349.5 (6.0)	–
Alternative 4D	128.4 (0.9)	1.0	–	–	–	411.3	–
Alternative 4E	121.3 (0.9)	1.0	–	–	–	384.9	–
Alternative 4F	0.2	–	–	0.5	–	386.0 (2.2)	–

Proposed Route or Alternative	Ward's Goldenweed[2/]	Cedar Rim Thistle[2/]	Beaver Rim Phlox[2/]	Persistent Sepal Yellow-cress[2/]	Pale Blue-eyed Grass[1/]	Nelson's Milkvetch[1/]	Treleases Milkvetch[1/]
Proposed Segment 2 –Total Length	0.3	5.4	46.3	21.4	1.0	–	–
Proposed Comparison Portion for Alternative 2A	–	–	34.4	18.4	0.4	–	–
Alternative 2A	–	–	3.8	14.7	–	–	–
Proposed Comparison Portion for Alternative 2B	–	–	14.9	7.1	–	–	–
Alternative 2B	–	–	–	17.4	–	–	–
Proposed Comparison Portion for Alternative 2C	t3/	–	11.7	1.5	0.4	–	–
Alternative 2C	10.7	–	2.6	–	–	–	–

Table 3.7-14. Potential Impacts (acres) to Other Special Status Plant Species Associated with the Design Variation Along Segments 2, 3, and 4 Proposed and Alternative Routes (continued)

Proposed Route or Alternative	Dorn's Twinpod 1/,(2/)	Hayden's Milkvetch1/	Meadow Pussytoes 1/	King's Milkvetch2/	Red Poverty-weed2/	Tufted Twinpod1/, 2/	Rocky Mountain Twinpod1/
Proposed Segment 3 – Total Length	–	52.3	–	1.8	–	674.5	–
Proposed Segment 4 –Total Length	–	2.6	64.2	1.1	–	166.9	0.3
Comparison Portion for Alternatives 4A–4F	–	2.6	40.5	1.1	–	0.8	0.1
Alternative 4A	–	8.8	23.9	6.6	–	7.6	50.2
Alternative 4B	–	0.2	69.0	–	–	175.0	119.7
Alternative 4C	–	–	67.4	–	–	124.7	38.7
Alternative 4D	–	0.2	61.6	–	–	175.5	114.9
Alternative 4E	–	–	60.0	–	–	124.9	38.7
Alternative 4F	–	2.3	23.9	0.4	–	4.9	–

Proposed Route or Alternative	Wyoming Tansymustard1/	Entire-leaved Peppergrass1/	Freemont Bladderpod1/	Western Bladderpod1/	Prostrate Bladderpod1/	Large-fruited Bladderpod1/
Proposed Segment 2 –Total Length	–	–	–	–	–	–
Proposed Comparison Portion for Alternative 2A	–	–	–	–	–	–
Alternative 2A	–	–	–	–	–	–
Proposed Comparison Portion for Alternative 2B	–	–	–	–	–	–
Alternative 2B	–	–	–	–	–	–
Proposed Comparison Portion for Alternative 2C	–	–	–	–	–	–
Alternative 2C	–	–	–	–	–	–
Proposed Segment 3 – Total Length	–	–	–	–	–	–
Proposed Segment 4 –Total Length	–	–	27.6	4.9	10.1	–
Comparison Portion for Alternatives 4A–4F	–	–	27.6	4.9	10.1	–
Alternative 4A	18.9	–	7.8	19.9	8.3	31.8
Alternative 4B	–	21.1	–	–	45.6	49.2
Alternative 4C	–	23.4	–	–	45.6	49.2
Alternative 4D	–	19.2	–	–	53.0	60.1
Alternative 4E	–	23.4	–	–	53.0	60.1
Alternative 4F	14.8	–	15.6	5.4	8.2	31.8

1/ Data based on mapped suitable habitat.
2/ Data based on mapped occurrences.
3/ Value is less than 0.1 acre.

3.7.3 Mitigation Measures

To minimize or avoid impacts on TES plant species, the Proponents have committed to EPMs that would be implemented Project-wide as outlined in this section and in Appendix C.

The following mitigation measures identified by the Agencies are required on federally managed lands. The Agencies recommend that the Proponents incorporate the measures into their EPMs and apply them Project-wide.

TESPL-1 Surface disturbance will be allowed in suitable habitat for Goose Creek milkvetch and whitebark pine where species-specific surveys have determined that no populations are present. The species-specific surveys will be conducted the year prior to construction, and the proposed disturbance areas will be redesigned to avoid direct impacts to populations.

TESPL-2 Pre-construction surveys for the Ute ladies' tresses shall be conducted by qualified botanists in all areas of potential habitat, in accordance with federal land management agency and USFWS requirements. These pre-construction surveys shall be conducted during the appropriate survey window, for a total of 3 years.

TESPL-3 Qualified botanists shall conduct pre-construction surveys during a season when target species are readily identifiable for special status or globally rare species. Where feasible, micrositing of project facilities shall avoid direct impacts to identified populations. Survey reports documenting the surveys, their results, and recommendations must be provided to land management agency for approval prior to construction. Agency botanists may evaluate individual sites based on site-specific conditions. Documentation of the evaluation of avoidance of impacts to sensitive and globally rare plants must be provided to the Agencies prior to construction.

TESPL-4 Environmental monitors shall be used to identify and mark aboveground populations of slickspot peppergrass and higher-quality microsites within 50 feet of the construction area, including access roads, so that they are avoided by construction equipment and vehicles. Full field clearances shall be conducted that meet USFWS protocols prior to construction. No construction shall occur within 50 feet of any slickspot peppergrass plant or habitat, including known occurrences of slickspot peppergrass (based on Idaho CDC data) even if aboveground plants are not observed during the surveys. Seeding during reclamation must use methods that minimize soil disturbance such as no-till drills or rangeland drills with depth bands, in areas of suitable habitat. Reclamation must use certified weed-free native seed. Excess soils will not be stored or spread on slickspots.

TESPL-5 If a whitebark pine or limber pine (a similar species that can be difficult to distinguish from whitebark pine) stand cannot be avoided, off-site mitigation in the form of appropriate silvicultural treatments of adjacent

stands, collection of seed, identification of “plus” trees or other acceptable mitigations will be done to offset the loss of the stand in addition to replanting whitebark pine on reclaimed areas.

TESPL-6 Sand dune and cushion plant communities should be avoided, where feasible.

3.8 INVASIVE PLANT SPECIES

Two terms will be used throughout this section: invasive plant species and noxious weeds. Invasive plant species consist of non-native plants[1] that have been spread beyond their natural range of dispersal by human activities. Invasive plants are typically adaptable, aggressive, and have a high reproductive capacity. Their introduction causes or is likely to cause economic or environmental harm, or harm to human health (National Invasive Species Information Center 2008). Invasive plants are of concern because they can spread to new areas rapidly, threaten the genetic integrity of native flora through hybridization, typically flourish in disturbed areas resulting in the exclusion of native vegetation, and can change the structure and function of ecosystems through alterations of geochemical and geophysical processes.

"Noxious weed" is a legal term for any invasive plant species that has been officially designated by a federal, state, or local agency as injurious to public health, agriculture, recreation, wildlife, or property (Sheley and Petroff 1999). Noxious weeds are a concern for federal, state, and county governments because of their potential to degrade wildlife habitat, reduce plant diversity, adversely affect agricultural production, and impact management of both natural and agricultural systems.

3.8.1 Affected Environment

This section discusses the existing environmental conditions, in relation to invasive plant species, that could be impacted by the Project. It starts by defining the Analysis Area. It then identifies the issues that have driven the analysis and characterizes the existing conditions within the Analysis Area.

3.8.1.1 Analysis Area

The Project would cross a wide variety of habitat types, including expanses of semi-arid shrublands and grasslands, irrigated agricultural lands (principally in the Snake River Plains), forested mountains, shrub and woodland covered hills, and riparian woodlands and wetlands. Previously disturbed habitats are present to some extent along all segments of the Proposed Route (see Table 3.6-1); with approximately one-third having either been modified by human activities or containing invasive plant species to an extent that they were mapped as either disturbed vegetation or agriculture during the project-specific remote sensing effort (see Section 3.6 – Vegetation Communities, or Tetra Tech 2009b for more details regarding this mapping effort). Areas described as disturbed vegetation (or previously disturbed areas) within this EIS likely already contain populations of invasive species; whereas areas described as undisturbed vegetation (or previously undisturbed areas) are more likely to contain weed-free areas, and are subsequently at a greater risk of ecological effects associated with invasive species introduction and/or spread.

[1] Not all non-native plant species are considered invasive plants, or are detrimental to economic or environmental conditions (e.g., some non-native horticultural landscaping species have low dispersal rates or are unable to survive outside of maintained landscaped areas).

The Analysis Area includes the extent of all counties crossed by the Project. This area encompasses the disturbance footprint of the Project (i.e., the ROW of the Proposed Route and Route Alternatives, and the access roads, staging areas, and other work spaces) as well as areas outside the Project footprint where invasive plant species could be introduced as a result of construction and operation. Counties provide an appropriate scale of analysis because detailed information on site-specific invasive plant species occurrences within the Analysis Area is not currently available; however, information on invasive plant species and noxious weed occurrences is available at the county level. Additionally, the existing regulatory framework pertaining to invasive plant species and noxious weeds directs agencies to manage these species on a county by county basis within designated weed management areas, weed control districts, or similar jurisdictions (see Section 3.8.1.3 – Regulatory Framework).

3.8.1.2 Issues to be Analyzed

The following invasive plant species-related issues were brought up by the public during public scoping (Tetra Tech 2009a), were raised by federal and state agencies during scoping and agency discussions, or are issues that must be considered as stipulated in law or regulation:

- Whether noxious weeds would be introduced or spread into the ROW and adjacent areas,
- How the presence of the Project would impact efforts to control existing noxious weeds, and
- Whether a noxious weed prevention and abatement plan would be developed in conjunction with the appropriate agencies.

3.8.1.3 Regulatory Framework

Federal

Federal EO 13112 – Invasive Species requires each federal agency to prevent the introduction of invasive species, to provide for their control, and not to authorize, fund, or carry out actions that are likely to cause or promote the introduction or spread of invasive species. The Federal Noxious Weed Act of 1974, as amended in 1990 (7 U.S.C. § 2814), requires federal land management agencies to develop a management program for control of plants that are classified under federal or state law as undesirable, noxious, or harmful, and to cooperate with state governments in control of undesirable plants on federal lands. The Carson-Foley Act of 1968 (P.L. 90-583, 43 U.S.C. § 1241) as well as the individual BLM FO Land Use Plans and Forest Service National Forest Plans also provide direction for management of invasive plant species and noxious weeds on federal lands.

The BLM and Forest Service have developed land management plans for the various FOs and NFs under each of their jurisdictions that detail land management goals and objectives, specify permissible and prohibited activities by geographic designation, and provide BMPs and stipulations required for activities in that NF or BLM FO's jurisdiction.

In 2009 the Department of the Interior amended the BLM's Land Use Plan in 11 contiguous western states to designate energy transport corridors (WWE corridors), consistent with the requirements of Section 368 of the Energy Policy Act of 2005 (Forest Service 2009a). This decision also adopted a series of IOPs, which include requirements that must be met (such as NEPA and interagency consultation requirements, as well as specific requirements related to invasive plant species) in order to approve ROW grants within the designated corridors. These IOPs are mandatory, as appropriate, for projects proposed within the Section 368 corridors. Portions of the Gateway West transmission line are proposed within the WWE corridor and therefore must comply with these IOPs. All IOPs and the Project's compliance to these measures are provided in Appendix H.

State

In Wyoming, noxious weeds are managed under the Wyoming Weed and Pest Control Act of 1973. The act provides for weed and pest districts associated with each county, covering all lands within a county including federal lands. Wyoming has 23 weed and pest districts; the Proposed Route and Route Alternatives are located in the following six districts: Albany, Carbon, Converse, Lincoln, Natrona, and Sweetwater. Noxious weeds and pests are designated at the state level, but each weed district can declare additional species applicable only within the district. The district board has the right to conduct investigations on lands when it has probable cause to believe that noxious weeds or pest infestations exist that are liable to spread to adjacent areas and could contribute to the injury or detriment of others. If the suspected area is deemed to be infested, the board then issues a resolution to the landowner containing specific remedial action for the control of the noxious weed or pest. The board may then put a lien on the property of any landowner who fails or refuses to perform these requirements.

The Idaho Noxious Weed Law (Title 22, Chapter 24, Idaho Code) is the basis for management and control of noxious weeds by the State of Idaho. The Idaho State Department of Agriculture (ISDA) is responsible for administering the State Noxious Weed Law. Noxious Weeds Rules (Idaho Administrative Procedures Act [IDAPA] 02 Title 06 Chapter 22) designate weeds as noxious statewide. Each county has a weed control superintendent. In addition, there are 30 cooperative weed management areas in Idaho, which are formed cooperatively by landowners and land managers. The Proposed Route and Route Alternatives are located within nine cooperative weed management areas and include Highlands, Utah and Idaho, Power, Raft River, Goose Creek, Minidoka, Northside Tri-County, Shoshone Basin, and Southfork Boise. Segments 8 and 9 (see Appendix A, Figures A-11 and A-12) in Owyhee, Canyon, and Ada Counties are not located within a cooperative weed management areas; however, these counties do have county weed programs. Under the Idaho Noxious Weed Law, Idaho landowners are responsible for the control of noxious weeds on their land. Landowners who fail to comply with the Idaho Noxious Weeds Law may be subject to fines and imprisonment.

The Nevada Noxious Weed Program is governed by Nevada Revised Statutes (NRS) Chapter 555 – Control of Insects, Pest, and Noxious Weeds (Title 49). The Program is administered by the Nevada Department of Agriculture Plant Industry Division State Quarantine Officer. The State Quarantine Officer has the authority to declare by regulation the noxious weeds of the state (NRS 555.130). There are 39 weed control districts in Nevada. A portion of Alternative 7I is located within the Elko County weed management area (no other Route Alternative would cross into Nevada). The Noxious Weed Program advises that the control of noxious weeds is the responsibility of every landowner or occupant. Should a landowner or occupant fail, neglect, or refuse to comply with the with Noxious Weed Program, NRS 555 gives the State Quarantine Officer and the County Board of Commissions the authority to issue citations or put a lien against a property to enforce the program.

The BLM and Forest Service use the Wyoming, Idaho, and Nevada state noxious weed lists to guide weed management on federal lands. The BLM also manages county declared species on federal lands in Wyoming.

3.8.1.4 Methods

Information regarding the identity and location of invasive plant species and noxious weeds within the Analysis Area was obtained from conversations with federal, state, and county agency personnel, as well as from county weed lists and existing distribution databases (ISDA 2008; Wyoming Weed and Pest 2008a, 2008b; University of Montana–Missoula 2009; Belliston et al. 2009; NRCS 2009). These lists provide information on the probable conditions within the Analysis Area; however, they should be considered preliminary at this time. Prior to construction, the extent and composition of invasive plant species in relation to the Project will be determined and verified via pre-construction surveys (discussed in more detail in Section 3.8.2.2). The results of these surveys, in conjunction with the lists discussed above, will serve as a basis for directing Project-specific weed control efforts

The primary source of information used during the assessment of existing vegetation was a detailed remote sensing–based vegetation mapping study conducted specifically for this Project. The goal of the mapping effort was to identify existing vegetation types using a combination of GIS-assisted segmentation, aerial imagery interpretation, and limited ground surveys. This effort identified 77 different vegetation alliances within the Analysis Area; 9 of which were classified as “disturbed,” and included agricultural areas as well as various disturbed grassland and sagebrush types (see Section 3.6 – Vegetation Communities, or Tetra Tech 2009b for more details regarding this mapping effort).

The disturbance acreages presented in Section 3.8.2 were determined by overlaying the Project footprint onto the GIS layer of vegetation types developed during the remote sensing effort (see Chapter 2 for a detailed discussion of how the Project footprint was determined for the transmission line and ancillary facilities). It was assumed that although all soil and vegetation disturbances could result in the spread or establishment of invasive plant species, the greatest ecological impact would likely occur within previously undisturbed areas, because it is likely that these areas currently contain few

if any invasive plant species. To identify the amount of disturbance that would occur within previously undisturbed areas, the acreages of impact to areas classified as "undisturbed" during the remote sensing effort were summed by segment.

3.8.1.5 Existing Conditions

Moving from east to west through the Analysis Area, the extent of natural vegetation crossed by each transmission line segment decreases. Segments in the eastern portion of the Analysis Area (Segments 1 through 4) cross the most (by percentage) natural vegetation (Table D.6-1 in Appendix D), followed by Segment 5, Segments 6 through 9, and Segment 10. Therefore, it is likely that the abundance of invasive plant infestations is higher along the western portion of the Analysis Area compared to the eastern portion.

Table D.8-1 in Appendix D lists, by segment and Route Alternative, the invasive plant species and noxious weeds that are known or expected to occur within the Analysis Area, based on various federal, state, and county weed lists. Note that Table D.8-1 contains only those species known or expected to occur within the Analysis Area and is dominated by noxious weeds due to the increased effort by agencies to track these species. However, it is possible that additional invasive species, not listed in Table D.8-1, could occur within the Analysis Area. These species would also need to be considered if encountered during Project construction and operation, because the introduction or spread of any invasive species, including those not listed in Table D.8-1, must be minimized to comply with federal, state, and county requirements. The extent and composition of invasive plant species in relation to the Project would be determined during pre-construction surveys (discussed in more detail in Section 3.8.2.2); the goal of Table D.8-1 is to show a list of the invasive species that are expected occur along the line, based on available information at this time.

As shown in Table D.8-1, noxious weed designations are inconsistent between the various states crossed by the Project. This is because some species may be considered problematic in some locations but not in others, or they are too widespread or abundant to be economically controlled. Wyoming has designated 25 species as noxious, all of which could occur within the Analysis Area (Wyoming Weed and Pest Council 2008a). Idaho has designated 64 species as noxious, 44 of which are suspected to occur within the Analysis Area (ISDA 2008). The state of Nevada has designated 47 plant species as noxious, 36 of which are suspected to occur within the Analysis Area; however, only 15 are suspected to occur within the portion of the Analysis Area that crosses into Nevada (in Elko County along Alternative 7I; NDA 2009). In addition, Idaho and Nevada have further categorized various noxious weed type; these categories are defined below in more detail.

Idaho's noxious weeds are divided into three categories: Statewide Early Detection and Rapid Response Noxious Weed List, Statewide Control Noxious Weed List, and Statewide Containment Noxious Weed List (ISDA 2008). Forty-four Idaho-designated

species are suspected to occur within the Analysis Area, including 1 Early Detection and Rapid Response, 20 Control, and 23 Containment species (Table D.8-1). These three categories are defined as:

- Statewide Early Detection and Rapid Response Noxious Weed List: If any of the weeds listed in the Early Detection and Rapid Response list are found to occur in Idaho, they shall be reported to the ISDA within 10 days following positive identification by the University of Idaho or other qualified authority as approved by the ISDA Director. These weeds shall be eradicated during the same growing season as identified.
- Statewide Control Noxious Weed List: Weeds listed in the control list are known to exist in varying populations throughout the state. The concentration of these weeds is at a level where control and/or eradication may be possible. A written plan for weeds on the Statewide Control Noxious Weed List shall be developed by the control authority that specifies active control methods to reduce known population in no more than 5 years. The plan shall be available to the ISDA upon request.
- Statewide Containment Noxious Weed List: Weeds listed in the Containment Noxious Weeds List are known to exist in various populations throughout the state. Weed control efforts may be directed at reducing or eliminating new or expanding weed populations, while known and established weed populations, as determined by the weed control authority, may be managed by any approved weed control methodology, as determined by the weed control authority.

Nevada's noxious weeds are divided into three categories: Category A, Category B, and Category C (NDA 2009). Fifteen Nevada-designated species have the potential to occur within the portion of the Analysis Area located in Nevada, including 6 Category A, one Category B, and 8 Category C species (Table D.8-1). These three categories are defined as:

- Category A: Weeds not found or limited in distribution throughout the state; actively excluded from the state and actively eradicated wherever found; actively eradicated from nursery stock dealer premises; control required by the state.
- Category B: Weeds established in scattered populations in some counties of the state; actively excluded where possible, actively eradicated from nursery stock dealer premises; control required by the state in areas where populations are not well established or previously unknown to occur.
- Category C: Declared noxious weeds not native to the state that are widely spread, but pose a threat to the agricultural industry and to agricultural products with a focus on stopping invasion.

3.8.2 Direct and Indirect Effects

This section is organized to present the effects of construction and operation, followed by decommissioning activities on the spread and/or introduction of invasive plant species. The various Route Alternatives are analyzed in detail within Section 3.8.2.3.

There is a Design Variation involving the use of two single-circuit structures proposed by the Proponent for Segments 2, 3, and 4 (see Section 2.2 for details), which is analyzed below in Section 3.8.2.4 and a Structure Variation that is analyzed in Section 3.8.2.5. The Proponents have also proposed a Schedule Variation, analyzed in Section 3.8.2.6, in which one of the two single circuits to be constructed in Segments 2, 3, and 4 and a portion of Segment 1W would be built on an extended schedule with construction beginning approximately 2.5 years after completion of the initial construction.

Mitigation measures or EPMs are presented in detail within this section only if it is the first time they have been discussed in Chapter 3; all other measures are referenced or summarized. A comprehensive list of all Proponent-proposed EPMs and Agency-required mitigation measures can be found in Table 2.7-1 of Chapter 2.

Plan Amendments

Proposed amendments are summarized in Table 2.2-1 of Chapter 2 and detailed in Appendices F and G. Amendments are needed to permit the Project to cross various areas of BLM-managed and NFS lands. Effects described for areas requiring an amendment in order for the Project to be built would only occur if the amendment were approved. Amendments that alter land management designations could change future use of these areas. No amendments specific to invasive plant species are proposed for the Project and no impacts to invasive plant species resulting from approving the amendments beyond the impacts of the Project are anticipated.

3.8.2.1 No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed or operated. No Project-related impacts would occur from invasive plant species. However, invasive plant species are likely to continue to be introduced and may continue to spread as a result of natural dispersal or from various land-disturbing activities, such as oil and gas development, wind farms, transportation, recreation, and agriculture. Increases in the numbers or extent of invasive plant species would be restricted by monitoring and control measures implemented by weed control boards, federal land management agencies, and private landowners. For some species and areas there may be a reduction in weeds compared to current conditions, but others may increase and could cause degradation of natural and agricultural systems.

3.8.2.2 Effects Common to All Action Alternatives

Construction

The establishment of invasive plant species can affect the quality of habitat through competition with, and eventual replacement of, desirable native species. Replacement of native species can have various environmental effects including changes in fire regime (increasing the frequency and severity of fires), changes in the nutrient regime of soils, and increased soil erosion. Invasive plant species can negatively impact vegetation community structure by creating, changing the density of, or eliminating vegetation layers or canopy cover. In agricultural and grazing lands, invasive plant species have the potential to reduce the quality, quantity, and value of forage or crops, and can increase land management procedures and costs. In addition, riparian and

irrigated areas can provide favorable growing conditions for invasive plant species that require regular moisture, and the hydrological movement in these areas can spread these species to downslope or downriver areas.

Vegetation removal and soil disturbance during construction could create optimal conditions for the establishment of invasive plant species. These species typically produce an abundance of seed, thrive in disturbed areas, and have few natural competitors; therefore, once established they spread quickly and can overtake desirable plant communities. Vehicles and construction equipment traveling from areas that contain invasive species into “weed-free areas” could disperse invasive plant seeds and propagates, resulting in their establishment in previously undisturbed areas that may not have contained invasive species, as well as increasing the distribution or abundance of existing populations in previously disturbed areas. Furthermore, disturbed areas may be seeded by airborne seeds originating from plants within adjacent areas; therefore, direct contact between infected areas and construction equipment is not required for invasive plant species to spread to new areas. In addition, the transportation of materials into areas disturbed by construction (e.g., borrow materials, mulch, gravel, as well as native seed mixtures and/or saplings used during revegetation efforts) may contribute to the spread of invasive plant species. If measures are not taken to prevent and control newly established infestations resulting from construction, then invasive plant species can persist in disturbed and reclaimed areas, and those that are present in the construction area may spread into adjacent areas. However, measures would be implemented to reduce the potential for introduction or spread of invasive plant species; these measures are discussed below.

The Proponents have identified EPMs within their Framework Reclamation Plan for Construction Activities (Appendix C-2) to reduce the potential spread or establishment of invasive plant species. The final Reclamation Plan will be developed once the final location of all Project facilities is identified and will be submitted to the BLM and cooperating agencies for approval. The items outlined in the preliminary plan include pre-construction surveys, pre-construction weed treatments, the weed prevention and control methods to be used during construction, and post-construction control and monitoring.

To effectively implement measures for limiting the spread or introduction of invasive plant species, the location and extent of existing invasive plant infestations would need to be known. Therefore, pre-construction surveys for invasive plants would be conducted within all areas that would be disturbed by construction. These surveys would have multiple goals, including documenting the presence of plant species and evaluating the presence or potential habitat for plant species of special concern (state and federally listed), the overall landscape condition relative to plant growth (healthy plants, overgrazed, previously disturbed, recently burned, etc.), and the presence and extent of invasive plant species. These vegetation surveys would be conducted during the appropriate growing season prior to construction, and would provide baseline data to plan for weed control efforts as well as provide additional information to guide short- and long-term reclamation efforts. The locations of all invasive plant species (including any that are not identified in Table D.8-1 of Appendix D) would be documented with a hand-held GPS instrument; these data would be used to develop a pre-construction

weed map. The pre-construction weed map would be used to define the infected area(s) prior to construction, and would be compared to post-construction conditions to document any weeds the Proponents are responsible for introducing and/or spreading.

Existing invasive plant species may be treated prior to the onset of construction activities. Because various landowners and land management agencies have differing requirements regarding invasive species, whether an invasive plant species would be treated at a specific location and how it would be treated would depend on its status (e.g., is it a noxious weed or not), requests/requirements of the landowner or land management agency, the nature and extent of the infestation, and the surrounding conditions (e.g., predominance of invasive species near the Project). The following EPMs proposed by the Proponents would be followed during pre-construction treatments, as well as during construction activities, to limit the potential spread or introduction of invasive plant species:

REC-1 Company personnel and their contractors will be trained on noxious and invasive weed identification to facilitate avoidance of infestations where possible or identification of new infestations.

REC-2 Pre-construction weed treatment would be conducted prior to the start of ground disturbing activities and at the time most appropriate for the target species.

REC-3 Pre-construction weed treatment would be limited to the areas that are expected to have surface disturbing activities. The final Reclamation Plan will include a schedule showing the phased in-service dates for different segments. Pre-construction weed treatment will be scheduled accordingly.

REC-4 Pre-construction treatment may use mechanical control, hand spraying, grazing, or herbicides. The final Reclamation Plan will discuss those options, as applicable.

REC-5 All herbicide applications would comply with label restrictions, federal, state and/or county regulation, the Proponents' specifications and landowner agreements. No spraying would occur prior to notification of the applicable land management agency. On federal or state controlled lands, a herbicide use plan will be submitted prior to any herbicide application as recommended in the BLM herbicide PEIS http://www.blm.gov/wo/st/en/prog/more/veg_eis.html. The herbicide use plan will include the dates and locations of application, target species, herbicide, adjuvants, and application rates and methods (e.g., spot spray vs. boom spray). No herbicide would be applied to any private property without written approval of the landowner. The final Reclamation Plan will contain a list of herbicides that may be used, target species, best time for application, application rates, and if they are approved for use on BLM-managed and NFS lands.

REC-6 Herbicides may be applied using a broadcast applicator mounted on a truck or all-terrain vehicle (ATV), backpack sprayers, or with hand sprayers as conditions dictate. Herbicide applications would be conducted only by licensed operators or under the supervision of a licensed operator. Where allowed, a broadcast applicator would likely be used. In areas where noxious weeds are more isolated and interspersed with desirable vegetation, noxious and invasive weeds would be targeted, thereby avoiding other plants. Pre-construction herbicide applications would not occur adjacent to known special status species or near water bodies.

REC-7 All areas treated would be documented using GPS technologies and included in the annual report.

REC-8 Areas of existing noxious weeds and invasive species will be avoided where possible.

REC-9 Project vehicles will arrive at the job site clean of all soil and herbaceous material.

REC-10 When the contractors demobilize from the job site where identified infestations of noxious weeds are present, they will use appropriate decontamination measures as defined in the final Reclamation Plan.

REC-11 Soil stockpiles from areas that did not have noxious weeds or invasive species present, will not be placed adjacent to populations of noxious weeds or invasive species, where practicable.

REC-12 Areas disturbed by Project activities are susceptible to the establishment and spread of noxious weeds. Erosion control measures identified in the SWPPP(s) would also assist in preventing the establishment of weeds on exposed soils.

REC-13 Project-related storage and staging yards, fly yards, and other areas that are subject to regular long-term disturbance will be kept weed-free through regular site inspections and herbicide applications, subject to the consent of the land owner.

REC-14 Where pre-construction surveys have identified noxious or invasive weed species infestations, topsoil and other soils will be placed next to the infested area and clearly identified as coming from an infested area. Topsoil would be returned to the area it was taken from and will not be spread in adjacent areas. If the topsoil is not suitable for backfill, then it will be spread in another previously disturbed area and clearly identified for future weed treatments as applicable.

REC-15 Straw or hay that may be used as a BMP to control erosion and sedimentation must be certified weed free. If certified weed-free materials are not available, then alternative BMPs will be used. The use of alternative BMPs will be coordinated with the construction storm water inspector.

Revegetation of disturbed areas with native species is essential to limit the spread or establishment of invasive plant species. Therefore, disturbed areas would be revegetated with native plant species adapted to local site conditions to establish long-term, productive, self-maintaining plant communities that are compatible with existing land uses. The final Reclamation Plan would include success criteria for determining whether revegetation efforts have been successful and what remediation requirements would be implemented if the success criteria are not met. The Framework Reclamation Plan for Construction Activities in Appendix C-2 provides details of the proposed revegetation activities.

The Proponents' proposed EPMs should substantially reduce the potential for the introduction and spread of invasive plant species as a result of Project construction activities; however, the BLM and cooperating agencies have identified additional mitigation measures that would further reduce the effects related to the introduction and spread of invasive plant species on federally managed lands. These include VEG-7, VEG-8, VEG-9, and VEG-12 (which are described in Section 3.6 – Vegetation Communities, and include general control/preventative measures including requirements for establishing cleaning stations to remove weed propagules from construction equipment), as well as the following mitigation measures:

WEED-1 The Proponents shall consult with each appropriate local land management agency (Forest Service and BLM) office or landowner to determine appropriate seed mix and commercial seed source for revegetation. The Reclamation, Revegetation, and Weed Management Plan must specify the approved seed mixes for each area (also see VEG-1).

WEED-2 Weed control and prevention measures shall adhere to all agency standards and guidelines. These measures shall be developed in consultation with local, state, and federal weed agencies; all implemented measures would follow the principle of integrated weed management.

WEED-3 Gravel and other materials used for road construction shall come from certified weed-free sources.

WEED-6 Soil stockpiles in areas containing invasive plants shall be reseeded or revegetated as soon as feasible, or the soil replaced in or near the original excavation. If requested by the applicable land-management agency, soil stockpiles shall be covered with plastic during the time prior to reseeding or replacement; however, plastic coverings will not be used on lands where the managing agency or landowner have requested that these piles not be covered with plastic (e.g., the Forest Service).

Operations

Impacts resulting from operations and maintenance activities would be similar to those discussed for construction; however, there would be less ground disturbance and fewer vehicles traveling along the ROW. Therefore, there would be less potential for adverse effects associated with the introduction and spread of invasive plant species. Activities during operations would include routine ground patrols, routine maintenance of facilities

and roads, emergency response, routine cyclical vegetation height management every 3 to 10 years (e.g., removal of trees that would interfere with height restrictions, hazard trees, and low-growing vegetation encroaching on access roads), and invasive plant control. As was discussed for construction-related impacts, any vehicles and equipment passing through weed-infested areas could potentially serve as a source of invasive plant species propagation/spread. Additionally, the vegetation removal conducted during operations (i.e., ROW maintenance; see Section 3.6 – Vegetation Communities) may encourage weed seed germination and provide opportunities for weed spread. However, measures would be implemented to limit the spread and establishment of invasive plant species during the Project's operations (discussed in more detail within the following paragraphs).

As outlined in the Proponents' Framework Reclamation Plan for Construction Activities (Appendix C-2), post-construction weed control efforts would be conducted to limit the spread and establishment of invasive plant species, followed by annual monitoring to ensure that these efforts are successful. Based on this Plan, annual post-construction weed control spraying would most likely occur during the months of May to June; however, the potential for fall treatments does exist, depending on the weed species present. All spraying of herbicides would be conducted in compliance with agency requirements (see REC-5 and WEED-2). Following annual spraying, monitoring surveys would be conducted to determine the locations and abundance of invasive plant species in the Project vicinity. The Proponents have proposed to conduct annual post-construction monitoring for a 3-year period following the conclusion of ground-disturbing activities (however, see mitigation measures WEED-4 and VEG-12). These monitoring surveys are expected to occur in the fall (August–September) and would be conducted following the same methods as the pre-construction survey. Annual herbicide spraying would be planned and coordinated with the applicable agencies (based on the results of the prior years' survey data) to ensure spraying is conducted only where necessary, in areas approved for herbicide use, at the proper growing period, during favorable environmental conditions, and using only the appropriate chemicals to control targeted species. All chemicals would be approved by the affected land management agency. It is anticipated that most spraying would be conducted using ATV-mounted spray equipment, supported by one or more four-wheel-drive pickups equipped with water tanks. The final Reclamation Plan would provide site-specific information on invasive plant species, relative abundance, and the range of treatment methods that would be used.

The Proponents have also identified EPMs within their Revised Plan for Operations, Maintenance, and Emergency Response Activities (Appendix C-4) intended to limit the spread of invasive plant species during operation and maintenance. These measures include the following:

OM-14 Any chemical control will be done in accordance with any applicable local, state and federal rules and regulations. Herbicides or other chemical control will be selected from the BLM and Forest Service's list of previously approved herbicides and in accordance with any herbicide plans. If the federal land managing agency determines that a previously

approved herbicide and/or plan is unacceptable, they shall notify the Proponents.

OM-16 Before beginning an O&M project on federal or state land, the Proponents or their subcontractors will clean all equipment that will operate off-road or disturb the ground. Tracks, skid plates, and other parts that can trap soil and debris will be removed for cleaning when feasible, and the entire vehicle and equipment will be cleaned at an off-site location.

OM-17 To help limit the spread and establishment of noxious weed species in disturbed areas, desired vegetation needs to be established promptly after disturbance. The Proponents will rehabilitate significantly disturbed areas as soon as possible after ground-disturbing activities and during the optimal period. Seed and mulch will be certified “noxious weed free” and seed mix will be agreed to in advance by the landowner or land managing agency.

OM-22 Only herbicides approved by the land managing agency as safe to use in aquatic environments and reviewed by the Proponents for effectiveness will be used within 100 feet of sensitive aquatic resources.

Revegetating disturbed areas with “desired vegetation” promptly after the initial disturbance (as outlined in the Proponents’ EPM OM-17) is an essential component needed to limit the spread and establishment of invasive plant species; however, “significantly disturbed areas” are not explicitly defined within the Revised Plan for Operations, Maintenance, and Emergency Response Activities. The Proponents would need to clearly define this term, in order to ensure that they (the Proponents or construction contractor) would adhere to the commitment to revegetate all disturbed areas that are not permanently occupied by Project facilities. In addition, measures would be needed to stabilize any areas that cannot be revegetated within a reasonable time after initial disturbance (potentially due to unforeseen environmental conditions).

The measures proposed by the Proponents should substantially reduce the potential for the introduction and spread of invasive species as a result of Project operation and maintenance activities. However, the BLM and cooperating agencies have identified the following mitigation measure that would further reduce operations and maintenance impacts on federally managed lands:

WEED-4 Annual post-construction monitoring and treatment of invasive plants shall continue for at least 3 years. If after 3 years post-construction conditions are not equivalent or better than pre-construction conditions, monitoring and treatment will continue until these conditions are met (also see VEG-12).

WEED-5 During operations, access roads and maintenance areas shall be surveyed annually between May 1 and September 30 (or as determined by Agency staff) for the presence of new weed introductions and existing invasive plant species. Coordinate with Agency specialists to identify the most appropriate time for survey. A weed control program would be

implemented if new weeds were found, which would define how and when these invasive plants would be treated. Weeds shall be treated before their seed heads have become viable, or if heads will become viable, whole plant removal of all weeds shall occur before seed drop occurs.

Decommissioning

Impacts from decommissioning would be similar to those for construction. Removal of structures and vehicle travel along the ROW could result in the spread or introduction of invasive plant species. No EPMs are provided by the Proponents to address decommissioning; however, the EPMs proposed by the Proponents for construction as well as the mitigation measures identified by the BLM and cooperating agencies would be applicable during decommissioning and should be effective at reducing the potential to spread or introduce invasive plant species.

3.8.2.3 Proposed Route and Alternatives by Segment

Invasive plant species generally increase in abundance and distribution with increased ground disturbance, removal of vegetation canopy, and opportunities for transport into new areas. All of the alternatives would increase these conditions and would likely have direct and indirect effects on invasive plant species abundances and distributions. The extent of effect would depend on the level of disturbance, the current distribution of invasive species, and the vectors that are available for distribution. The discussion below focuses on the first two factors, as it is assumed that the vectors available for distribution, such as vehicle traffic, equipment activity, or wind dispersal, would be comparable for all segments and alternatives.

The Proponent-proposed EPMs and agency-identified mitigation measures, combined with reclamation of disturbed areas, are likely to be effective at reducing the risk of introduction and spread of invasive plant species. However, as Route Alternatives differ from the comparison portion of the Proposed Route[2] or other alternatives in the amount of ground disturbance that would likely occur during construction, some Route Alternatives could be more susceptible to infestations than others. In addition, some Route Alternatives involve greater disturbance within previously disturbed or altered vegetation types, where invasive species are likely already present. These include agriculture areas, disturbed/developed areas, and disturbed sagebrush and grassland areas identified during the remote sensing effort (these areas are referred to below as “previously disturbed areas”; undisturbed areas will be referred to as “previously undisturbed areas”). Although continued disturbances in previously disturbed areas could alter the distribution of existing infestations as well as create opportunities for new infestations, it is assumed that areas characterized by a higher level of cultivation and development would likely have fewer native species and “weed-free areas” than previously undisturbed areas. Therefore, construction and operation in previously disturbed areas would likely result in fewer effects on the spread or establishment of invasive species than in previously undisturbed areas. Construction and operation of

[2] The “comparison portion of the Proposed Route” refers to the portion of the Proposed Route that starts and ends at the same nodes as a Route Alternative.

the Project in previously undisturbed areas could result in new infestations within areas that previously contained few if any infestations, which would reduce the quality of native vegetation and would likely have a greater ecological effect than impacts to previously disturbed areas.

A general comparison of the alternatives is provided below based on the total acres of ground disturbance during construction as well as the acreage of disturbance that would occur to previously undisturbed areas (i.e., disturbance to natural, undisturbed habitat types; see Table D.6-2). These two factors provide an estimate of the potential for invasive plant species spread and establishment. The Proposed Routes for Segments 1E, 1W, 2, 4, 5, 7, 8, and 9 have Route Alternatives that are evaluated in this EIS, while the Proposed Routes in Segments 3, 6, and 10 do not currently have Route Alternatives. The invasive plant species known or suspected to occur within each segment are shown in Table D.8-1 of Appendix D.

Segment 1E

Segment 1E, as proposed, would link the Windstar and Aeolus Substations in south-central Wyoming with a 100.6-mile 230-kV single-circuit transmission line. Twenty acres of the expansion of Windstar and Aeolus Substations and 0.5 acre for one regeneration site are attributed to Segment 1E. Alternative 1E-A is a 16.1-mile alternative along the north end of Segment 1E, which was the Proponents' initial proposal before moving the Proposed Route at the suggestion of local landowners to avoid the more settled area around Glenrock. Alternative 1E-B is 21.4 miles longer than the Proposed Route but is being considered by the Proponents because it would avoid a Wyoming-designated sage-grouse core area to the east. The BLM has required the consideration of Alternative 1E-C, which parallels the Segment 1W 230-kV lines into the Aeolus Substation (see Appendix A, Figure A-2).

The Proposed Route in Segment 1E runs almost entirely through native vegetation (91 percent of the total length; Table D.6-1), which is composed primarily of sagebrush, dwarf shrub, and juniper. Construction of the Proposed Route in Segment 1E would result in about 1,292 acres of total ground disturbance, of which about 1,160 acres would be in previously undisturbed areas (Table D.6-2).

There are three portions of Segment 1E used to compare the various Route Alternatives to the Proposed Route, one for each of the three Route Alternatives along Segment 1E.

Alternative 1E-A would result in substantially less total ground disturbance (128 acres) than the comparison portion of the Proposed Route (215 acres) during construction. The amount of disturbance to previously undisturbed areas would also be less under Alternative 1E-A (44 acres) compared to the comparison portion of the Proposed Route (118 acres). Therefore, Alternative 1E-A would have less potential for the spread or introduction of invasive plant species than the comparison portion of the Proposed Route, because it would result in lower level of disturbance and would cross more previously disturbed vegetation types where invasive plant species have likely already been established.

Alternative 1E-B would result in substantially more total ground disturbance (777 acres) than the comparison portion of the Proposed Route (402 acres). Both routes would pass primarily through previously undisturbed area, although Alternative 1E-B would result in a greater amount of disturbance to previously undisturbed areas (711 acres) than the comparison portion of the Proposed Route (384 acres). The natural vegetation crossed by both routes consists primarily of sagebrush and dwarf shrub. Therefore, both routes have the potential for introducing invasive plant species to weed-free areas. However, given that Alternative 1E-B would result in a higher overall level of disturbance, it would have a greater potential for the spread or introduction of invasive plant species than the comparison portion of the Proposed Route.

Alternative 1E-C would result in substantially less total ground disturbance (336 acres) than the comparable portion of Proposed Route (1,011 acres). Alternative 1E-C would also result in less disturbance to previously undisturbed areas (317 acres) than the comparison portion of the Proposed Route (978 acres). Therefore, the comparison portion of the Proposed Route would have a greater potential for the spread or introduction of invasive plant species than Alternative 1E-C.

The Proposed Route along Segment 1E, as well as Alternative 1E-C, would cross the Medicine Bow-Routt NFs (see Section 3.17 – Land Use and Recreation). Construction of the Proposed Route on the Medicine Bow-Routt NFs would result in about 47 acres of total ground disturbance, of which all but less than 1 acre would occur in previously undisturbed areas. Construction of Alternative 1E-C on the Medicine Bow-Routt NFs would result in about 15 acres of total ground disturbance, with all of these impact occurring in previously undisturbed areas.

Segment 1W

Segment 1W is composed of two parts, Segment 1W(a) and 1W(c), both of which would consist of a new 230-kV line for part of their length and a reconstruction of an existing 230-kV line for the remaining part. Segment 1W(a) would be about 76.5 miles long, and would extend from the Windstar Substation to the Aeolus Substation. Segment 1W(c) would be about 70.6 miles long, and would extend from the Dave Johnston Power Plant to the Aeolus Substation. Alternative 1W-A is a 16.2-mile alternative located near the town of Glenrock, which was the Proponents' initial proposal before moving the Proposed Route at the suggestion of local landowners in order to avoid the more settled area around Glenrock. Twenty acres of the proposed expansion at the Windstar and Aeolus Substations are attributed to Segment 1W(a) and 3 acres of the expansion at the Heward Substation and 17 acres of the expansion at the Windstar and Aeolus Substations are attributed to Segment 1W(c). There are no Route Alternatives proposed south of that point (see Appendix A, Figure A-2).

Approximately 90 percent of Proposed Route along Segment 1W(a) and 83 percent along Segment 1W(c) crosses natural vegetation, consisting primarily of sagebrush (Table D.6-1). Construction of the Proposed Route for Segment 1W (1W[a] and 1W[c] combined) would result in about 1,554 acres of total ground disturbance during construction, of which 1,267 acres would be to previously undisturbed areas (Table

D.6-2). However, because this portion of the route parallels an existing transmission line, it is likely that there are established invasive plant populations in this area.

Alternative 1W-A would result in less total ground disturbance (140 acres) than the comparison portion of Proposed Route (212 acres) during construction. Alternative 1W-A would also result in fewer acres of disturbance to previously undisturbed areas (46 acres) than the comparison portion of the Proposed Route (154 acres). Therefore, Alternative 1W-A would have less potential for the spread or introduction of invasive plant species than the comparison portion of the Proposed Route.

The Proposed Route for Segments 1W(a) and 1W(c) would cross the Medicine Bow-Routt NFs (see Section 3.17 – Land Use and Recreation). Construction of the Segment 1W(a) Proposed Route on the Medicine Bow-Routt NFs would result in about 16 acres of total ground disturbance, with no impact occurring in previously undisturbed areas. Construction of the Segment 1W(c) Proposed Route on the Medicine Bow-Routt NFs would result in about 44 acres of total ground disturbance, with no impact occurring in previously undisturbed areas.

Segment 2

Segment 2, as proposed, would link the Aeolus and Creston Substations in southeast Wyoming with two 500-kV circuits on one structure. One circuit would be operated at 230 kV during the initial phase of the Project. Its total proposed length is 96.7 miles. Fifty-two acres of the expansion of the Aeolus Substation and the construction of the Creston Substation and 0.5 acre for one regeneration site are attributed to Segment 2. There are three Route Alternatives, two of which are near the community of Fort Fred Steele. Alternative 2A at 28.4 miles long is being considered by the BLM because it remains in the WWE corridor nearer the town and the state historic site, and Alternative 2B, at 6.2 miles, is closer to the community than the comparison portion of the Proposed Route and was the initially proposed route before the Proponents responded to local suggestions and relocated the Proposed Route farther to the south. Alternative 2C is a 24.4-mile alternative located north of Hanna, Wyoming. It is being evaluated at the recommendation of the Wyoming Governor's office to follow a utility corridor approved by that office for minimizing effects to sage-grouse (see Appendix A, Figure A-3).

Approximately 87 percent of the Proposed Route along Segment 2 crosses natural vegetation, consisting primarily of sagebrush, greasewood, and dwarf shrub (Table D.6-1). However, over half the segment would be within an existing utility corridor, where existing populations of invasive plant species are likely present. Construction of the Proposed Route along Segment 2 would result in about 1,550 acres of total disturbance, of which 1,355 acres would be to previously undisturbed areas (Table D.6-2).

There are three portions of Segment 2 used to compare the various Route Alternatives to the Proposed Route, one for each of the three Route Alternatives along Segment 2.

Alternative 2A would result in more total ground disturbance (450 acres) during construction than the comparison portion of the Proposed Route (398 acres). Alternative 2A would also result in more disturbance to previously undisturbed areas

(374 acres) than the comparison portion of the Proposed Route (329 acres). Therefore, Alternative 2A would have a greater potential for the spread or introduction of invasive plant species than would the comparison portion of the Proposed Route.

Alternative 2B would result in less total ground disturbance (83 acres) than the comparison portion of the Proposed Route (104 acres). The amount of disturbance to previously undisturbed areas would also be less under Alternative 2B (75 acres) than the comparison portion of the Proposed Route (94 acres). Therefore, Alternative 2B would have less potential for the spread or introduction of invasive plant species than would the comparison portion of the Proposed Route.

Alternative 2C would result in less total ground disturbance (322 acres) than the comparison portion of the Proposed Route (369 acres). However, the amount of disturbance to previously undisturbed areas would be similar between the two routes (255 acres for Alternative 2C and 257 acres for the comparison portion of the Proposed Route). Therefore, the two routes would have similar potential for the spread or introduction of invasive plant species, with the Proposed Route having slightly more risk.

Segment 3

Segment 3, as proposed, would link the Creston and Anticline Substations in southeast Wyoming with two 500-kV circuits on one structure. One circuit would be operated at 230 kV during the initial phase of the Project. Its total proposed length between those two substations is 46.7 miles. Sixty-nine acres of the construction of the Anticline and Creston Substations are attributed to Segment 3. Segment 3 would also link the Anticline and Jim Bridger Substations with a 4.3-mile 230-kV line and a 5.5-mile 345-kV line and includes the 10-acre expansion of the Jim Bridger 345-kV Substation. There are no alternatives proposed along this segment (see Appendix A, Figure A-4).

Segment 3 crosses natural vegetation for approximately 88 percent of its length, consisting primarily of sagebrush, greasewood, and dwarf shrub (Table D.6-1). Construction of Segment 3 would result in about 863 acres of total ground disturbance, of which 734 acres would correspond to disturbance to previously undisturbed areas (Table D.6-2). Segment 3 follows existing utility corridors and the I-80 corridor. Therefore, there are likely established invasive plant species along the proposed ROW.

Segment 4

Segment 4, as proposed, would link the Anticline Substation near the Jim Bridger Power Plant in southwestern Wyoming with the Populus Substation in Idaho with two 500-kV circuits on one structure. Its total proposed length is 203 miles. Eighty-nine acres of the construction of the Anticline Substation and the expansion of the Populus Substation and 1.5 acres for three regeneration sites are attributed to Segment 4. It has six Route Alternatives in the middle portion of its route but the first 52 miles to the east and the last 61 miles to the west (in Idaho) do not have any Route Alternatives. The middle section of the Proposed Route is 90.2 miles long, and its Route Alternatives vary from 85 to 102 miles long. These alternatives were proposed by the Wyoming Governor's office (4A, paralleling the existing 345-kV lines throughout); by the BLM

Kemmerer FO (4B through 4E, including edits from various cooperating agencies), with the intent to avoid impacts to cultural resources to the extent practical; and by the Proponents (4F, attempting to avoid impacts to cultural resources while still remaining north of the existing lines) (see Appendix A, Figures A-5 and A-6).

Approximately 81 percent of the Proposed Route along Segment 4 crosses natural vegetation, consisting primarily of sagebrush (Table D.6-1). Construction of the Proposed Route along Segment 4 would result in about 3,521 acres of total ground disturbance, of which 2,992 acres would correspond to disturbance to previously undisturbed areas (Table D.6-2).

Segment 4 has six alternatives, all of which can be compared to the same portion of the Proposed Route. The greatest amount of total ground disturbance would occur under Alternatives 4D (1,511 acres), followed by Alternative 4E (1,500 acres), the comparison portion of the Proposed Route (1,499 acres), Alternative 4B (1,488 acres), Alternative 4C (1,481 acres), Alternative 4F (1,327 acres), and Alternative 4A (1,289 acres). Disturbance to previously undisturbed areas would be greatest under Alternative 4D (1,330 acres), followed by Alternative 4B (1,313 acres), Alternative 4E (1,291 acres), the comparison portion of the Proposed Route (1,281 acres), Alternative 4C (1,271 acres), Alternative 4F (1,225 acres), and Alternative 4A (1,169 acres). Therefore, Alternative 4A and Alternative 4F would have less potential for the spread or introduction of invasive plant species than the other alternatives as well as the comparison portion of the Proposed Route.

The Proposed Route along Segments 4 would cross the Caribou-Targhee NF (see Section 3.17 – Land Use and Recreation). Construction of the Segment 4 Proposed Route on the Caribou-Targhee NF would result in about 117 acres of total ground disturbance, of which 112 acres would correspond to disturbance to previously undisturbed areas.

Segment 5

Segment 5, as proposed, would link the Populus and Borah Substations with a 54.6-mile single-circuit 500-kV line. Forty-four acres of the expansion of the Populus and Borah Substations are attributed to Segment 5. There are five Route Alternatives including two proposed by the BLM to avoid the Deep Creek Mountains (5A and 5B; 8 miles and 19 miles longer than the comparison portion of the Proposed Route), one preferred by Power County that crosses the Fort Hall Indian Reservation (5C; 6 miles shorter than the comparison portion of the Proposed Route), one originally proposed by the Proponents (5D; 2 miles shorter than the comparison portion of the Proposed Route but located within more agricultural lands), and one proposed by Power County as an alternative approach to the Borah Substation (5E) (see Appendix A, Figure A-7).

Approximately 67 percent of the Proposed Route along Segment 5 crosses natural vegetation, which primarily consists of sagebrush; however, approximately 21 percent of the Proposed Route along this segment crosses agriculture areas (Table D.6-1). Construction of the Proposed Route along Segment 5 would result in about 1,282 acres of total ground disturbance, of which 912 acres would correspond to disturbance to previously undisturbed areas (Table D.6-2).

There are four portions of Segment 5 used for comparison to the Route Alternatives: one for Alternatives 5A and 5B, and one for each of the remaining Route Alternatives.

Alternative 5B would result in the greatest amount of total ground disturbance during construction (842 acres), followed by Alternative 5A (751 acres), and then the comparison portion of the Proposed Route (646 acres). However, all of three of these routes would impact comparable amounts of previously undisturbed areas. Due to the greater acreage of total area affected relative to the other segments, Alternative 5B would have the greatest potential for the spread or introduction of invasive plant species compared to the other three routes considered in this area.

Alternative 5C would result in less ground disturbance during construction (538 acres) than the comparison portion of the Proposed Route (823 acres), and also less disturbances to previously undisturbed areas (258 acres and 629 acres, respectively). Therefore, Alternative 5C would have less potential for the spread or introduction of invasive plant species than the comparison portion of the Proposed Route.

Alternative 5D would result in less ground disturbance during construction (455 acres) than the comparison portion of the Proposed Route (496 acres), and also less disturbance to previously undisturbed areas (233 acres and 309 acres, respectively). Therefore, Alternative 5D would have less potential for the spread or introduction of invasive plant species than the comparison portion of the Proposed Route.

Alternative 5E would result in less total ground disturbance during construction compared to the comparable portion of the Proposed Route (104 acres and 141 acres, respectively), and would also result in less disturbance to previously undisturbed areas (37 acres and 58 acres, respectively). Therefore, Alternative 5E would have less potential for the spread or introduction of invasive plant species than the comparison portion of the Proposed Route.

Segment 6

Segment 6 is an existing transmission line linking the Borah and Midpoint Substations; it is now operated at 345 kV but would be changed to operate at 500 kV. This segment has no Route Alternatives. Existing support structures would be used and impacts would be limited to within approximately one-quarter mile from each substation to allow for moving the entry point into the substation to the new 500-kV bay. Thirty-one acres of the expansion of the Borah and Midpoint Substations are attributed to Segment 6. Changes in the two substations would allow it to be operated at 500 kV (see Appendix A, Figure A-8).

Construction of Segment 6 would result in about 65 acres of disturbance within the immediate vicinity of the Borah and Midpoint Substations, of which 16 acres would correspond to disturbances to previously undisturbed areas (Table D.6-2). Given the existing development along this route, there are likely established invasive plant species in this area. Due to the likelihood of existing invasive plant species and the minor amount of ground disturbance, Segment 6 would have a low potential for the introduction and spread of invasive plant species.

Segment 7

Segment 7, as proposed, would link the Populus and Cedar Hill Substations with a 118.1-mile single-circuit 500-kV line. Forty-two acres of the expansion of the Populus and the construction of the Cedar Hill Substations and 1 acre for two regeneration sites are attributed to Segment 7. In addition to the Proposed Route, which is principally on private lands, Route Alternatives have been proposed by the BLM to avoid the Deep Creek Mountains (7A and 7B; which are 5 miles and 11 miles longer than the comparison portion of the Proposed Route), by local landowners (7C, 7D, 7E, 7F, and 7G, which all represent minor adjustments proposed to address local issues), by local landowners to avoid private agricultural lands (7I or the State Line Route, which is 55 miles longer than the Proposed Route and would require 0.5 acre for an additional regeneration site), and by the Proponents to avoid the State Line Route (7H, which is 10 miles longer than the Proposed Route). Alternative 7J, which is a variant of the State Line Route also proposed by local landowners, would not terminate at the Cedar Hill Substation. This alternative, referred to as the Rogerson Alternative, would require a different substation be constructed near a 345-kV existing transmission line (approximately 24 miles southwest of the Cedar Hill Substation; see Appendix A, Figure A-9). The tables and discussion in this document compare 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

The Proposed Route for Segment 7 crosses mostly disturbed or developed cover types (60 percent of the total length), consisting primarily of agriculture and disturbed sagebrush and grassland areas (Table D.6-1). Therefore, it is likely that invasive plant species are present along this route. Construction of the Proposed Route along Segment 7 would result in about 2,083 acres of total ground disturbance, of which 889 acres would correspond to disturbances to previously undisturbed areas (Table D.6-2).

There are eight portions of Segment 7 used to compare the various Route Alternatives to the Proposed Route: one for Alternatives 7A and 7B, one for Alternatives 7H and 7I, one for each of the remaining Route Alternatives.

Alternative 7B would result in more total ground disturbance during construction (828 acres) than Alternative 7A (778 acres) and the comparison portion of the Proposed Route (657 acres). However, Alternative 7A would result in a greater amount of disturbance to previously undisturbed areas (511 acres) compared to Alternative 7B (476 acres) and the comparison portion of the Proposed Route (405 acres). Therefore, due to the greater acreage of disturbance to previously undisturbed areas, Alternative 7A would have a greater potential for the spread or introduction of invasive plant species than Alternative 7B, followed by the comparison portion of the Proposed Route.

Alternative 7C would result in a similar amount of total ground disturbance as the comparison portion of the Proposed Route (289 acres and 288 acres, respectively). However, the comparison portion of the Proposed Route would result in a substantially greater amount of disturbance to previously undisturbed areas (68 acres) compared to Alternative 7C (7 acres). Therefore, the comparison portion of the Proposed Route

would have a greater potential for the spread or introduction of invasive plant species than Alternative 7C.

Alternative 7D would result in more total ground disturbance during construction (131 acres) than the comparison portion of the Proposed Route (118 acres). However, Alternative 7D and the comparison portion of the Proposed Route would result in similar disturbance to previously undisturbed areas (25 acres and 24 acres, respectively). Therefore, due to the greater overall acreage of disturbance, Alternative 7D would have a slightly greater potential for the spread or introduction of invasive plant species compared to the comparison portion of the Proposed Route

Alternatives 7E would result in more total ground disturbance during construction (95 acres) than the comparison portion of the Proposed Route (76 acres); as well as a slightly greater amount of disturbance to previously undisturbed areas (56 acres and 47 acres, respectively). Therefore, Alternative 7E would have a slightly greater potential for the spread or introduction of invasive plant species.

The comparison portion of the Proposed Route would result in a slightly greater amount of total ground disturbance during construction (261 acres) than would Alternative 7F (233 acres); as well as a slightly greater amount of disturbance to previously undisturbed areas (151 acres and 143 acres, respectively). Therefore, the comparison portion of the Proposed Route would have a slightly greater potential for the spread or introduction of invasive plant species than Alternative 7F.

Alternative 7G would result in a greater amount of total ground disturbance during construction (72 acres) than the comparison portion of the Proposed Route (48 acres), but would result in similar disturbances to previously undisturbed areas (15 acres and 22 acres, respectively). Because it results in greater overall disturbances but similar disturbances to previously undisturbed areas, Alternative 7G would have a slightly greater potential for the spread or introduction of invasive plant species than the comparable portion of the Proposed Route.

Both Alternatives 7H and 7I would replace the entire Proposed Route for Segment 7. Both alternatives would be longer than the Proposed Route and impact more lands (including substantially more disturbances to previously undisturbed areas). Alternative 7I would result in the greatest amount of total ground disturbance (3,218 acres), followed by Alternative 7H (2,551 acres) and the comparison portion of the Proposed Route (2,083 acres). Alternative 7I would also result in the greatest amount of disturbance to previously undisturbed areas (2,030 acres), followed by Alternative 7H (1,696 acres) and the comparison portion of the Proposed Route (889 acres). Therefore, Alternatives 7H and 7I would have a greater potential for the spread or introduction of invasive plant species than the comparison portion of the Proposed Route.

Alternative 7J would result in a more total ground disturbance than the comparison portion of the Proposed Route (3,606 acres and 2,510 acres, respectively). Furthermore, Alternative 7J would result in a greater amount of disturbance to previously undisturbed areas (2,021 acres) than the comparison portion of the Proposed Route (963 acres). Therefore, Alternative 7J would have a greater potential for the

spread or introduction of invasive plant species than the comparison portion of the Proposed Route. However, due to the routing of Alternative 7J in relation to the Proposed Routes of Segments 7 and 9, it cannot be directly compared with the Proposed Route of Segment 7, as can the other alternatives for this segment.

Alternatives 7H, 7I, and 7J would cross the Sawtooth NF (see Section 3.17 – Land Use and Recreation). Construction of Alternative 7H on the Sawtooth NF would result in about 338 acres of total ground disturbance, of which 160 acres would correspond to disturbances to previously undisturbed areas. Construction of Alternative 7I on the Sawtooth NF would result in about 625 acres of total ground disturbance, of which 441 acres would correspond to disturbances to previously undisturbed areas. Construction of Alternative 7J on the Sawtooth NF would result in about 383 acres of total ground disturbance, of which 119 acres would correspond to disturbances to previously undisturbed areas.

Segment 8

Segment 8, as proposed, would link the Midpoint and Hemingway Substations. This 131-mile single-circuit 500-kV transmission line would stay north of the Snake River until crossing through the SRBOP parallel to an existing 500-kV transmission line before ending at the Hemingway Substation. Thirteen acres of the expansion of the Midpoint Substation and 0.5 acre for a regeneration site are attributed to Segment 8. There are five Route Alternatives: 8A, which follows the WWE corridor but crosses the Snake River and I-84 twice (while the Proposed Route would stay north of this area); 8B and 8C, which represent the old routes originally proposed by the Proponents but that have now been changed to avoid the cities of Kuna and Mayfield, respectively; 8D, which represents a small revision involving a rebuild of the existing transmission line to move both away from the National Guard Maneuver Area; and 8E, which was proposed by the BLM in order to avoid crossing the Halverson Bar non-motorized portion of the Guffey Butte-Black Butte Archaeological District (see Appendix A, Figure A-10).

The Proposed Route for Segment 8 primarily crosses disturbed or agricultural lands (67 percent of the total length; Table D.6-1). Given that it parallels an existing ROW and crosses through disturbed or developed lands, there are likely established invasive plant species present. Construction of Proposed Route along Segment 8 would result in about 2,125 acres of total ground disturbance, of which 751 acres would correspond to disturbances to previously undisturbed areas (Table D.6-2).

There are five portions of Segment 8 used to compare the various Route Alternatives to the Proposed Route, one for each of the five Route Alternatives considered.

Alternative 8A would result in a slightly greater amount of total ground disturbance during construction (829 acres) than the comparison portion of the Proposed Route (815 acres), but would result in substantially less disturbance to previously undisturbed areas (86 acres and 335 acres, respectively). Because it results in substantially less disturbance to previously undisturbed areas, Alternative 8A would have less potential for the spread or introduction of invasive plant species than the comparable portion of the Proposed Route.

Alternative 8B would result in a greater amount of total ground disturbance during construction (779 acres) than the comparison portion of the Proposed Route (754 acres), but would result in less disturbance to previously undisturbed areas (134 acres and 162 acres, respectively). Therefore, both routes would result in similar potential for the spread or introduction of invasive plant species than the comparable portion of the Proposed Route (as the difference in acreage between total disturbances and disturbances to previously undisturbed areas are similar but opposite for each route), with the comparison portion of the Proposed Route having a slightly higher risk (due to the larger amount of disturbance to previously undisturbed areas).

Alternative 8C would result in a similar amount of total ground disturbance as the comparison portion of the Proposed Route (138 acres and 139 acres, respectively). However, Alternative 8C would result in a slightly greater amount of disturbance to previously undisturbed areas (34 acres) than the comparison portion of the Proposed Route (27 acres). Therefore, Alternative 8C would have a slightly greater potential for the spread or introduction of invasive plant species than the comparison portion of the Proposed Route.

Alternative 8D would result in a greater amount of total ground disturbance during construction (143 acres) than the comparison portion of the Proposed Route (123 acres). Neither Alternative 8D nor the comparison portion of the Proposed Route would result in disturbance to previously undisturbed areas. Therefore, Alternative 8D would have a greater potential for the spread or introduction of invasive plant species than the comparison portion of the Proposed Route, based on the total ground disturbance impacts.

Alternative 8E would result in a greater amount of total ground disturbance during construction (283 acres) than the comparison portion of the Proposed Route (98 acres). Furthermore, Alternative 8E would result in a greater amount of disturbance to previously undisturbed areas (42 acres) than the comparison portion of the Proposed Route (11 acres). Therefore, Alternative 8D would have a greater potential for the spread or introduction of invasive plant species than the comparison portion of the Proposed Route, based on the total ground disturbance impacts.

Segment 9

Segment 9, as proposed, would link the Cedar Hill and Hemingway Substations with a 161.7 mile single-circuit 500-kV transmission line which skirts the Jarbidge and Owyhee Military Operating Areas to the north, then follows the WWE corridor just north of the Saylor Creek Air Force Range, passing through Owyhee County before entering into the Hemingway Substation. Fifteen acres of the construction of the Cedar Hill Substation and 1 acre for two regeneration sites are attributed to Segment 9. There are eight Route Alternatives proposed, including 9A, which was the Proponents' Proposed Route until moving to avoid the Hollister area; 9B, which is being considered by the BLM because it follows the WWE corridor and parallels existing utility corridors; 9C, which was the Proponents' Proposed Route until moving to avoid the Castleford area; and 9D and 9E, proposed by the Owyhee County Taskforce, that cross more public lands north and south of the Proposed Route, respectively, than the Proposed Route. Most of

Alternative 9D would be within the SRBOP. Alternatives 9F, 9G, and 9H were proposed to avoid crossing the non-motorized area south of C.J. Strike Reservoir. Alternatives 9G and 9H provide an alternate route location south of Alternative 8E (see Appendix A, Figure A-11).

The Proposed Route for Segment 9 primarily crosses disturbed or agricultural lands (63 percent of the total length; Table D.6-1). Construction of the Proposed Route along Segment 9 would result in about 2,671 acres of total ground disturbance, of which 889 acres would correspond to disturbances to previously undisturbed areas.

There are four portions of Segment 9 used to compare the various Route Alternatives to the Proposed Route: one for Alternatives 9D, 9E, 9F, 9G, and 9H, and one for each of the remaining Route Alternatives.

Alternative 9A would result in a greater amount of total ground disturbance during construction (133 acres) than the comparison portion of the Proposed Route (117 acres). Alternative 9A would also result in a greater amount of disturbance to previously undisturbed areas (21 acres) than the comparison portion of the Proposed Route (15 acres). Therefore, Alternative 9A would have a greater potential for the spread or introduction of invasive plant species compared to the comparison portion of the Proposed Route.

Alternative 9B would result in a similar amount of total ground disturbance during construction as the comparison portion of the Proposed Route (816 acres and 825 acres, respectively), but would result in less disturbance to previously undisturbed areas than the comparison portion of the Proposed Route (127 acres and 196 acres, respectively). Therefore, Alternative 9B would have less potential for the spread or introduction of invasive plant species than the comparison portion of the Proposed Route.

Alternative 9C would result in a greater amount of total ground disturbance during construction than the comparison portion of the Proposed Route (279 acres and 239 acres, respectively), but would result in substantially less disturbance to previously undisturbed areas than the comparison portion of the Proposed Route (25 acres and 126 acres, respectively). Therefore, due to the fewer impacts to previously undisturbed areas, Alternative 9C would have less potential for the spread or introduction of invasive plant species than the comparison portion of the Proposed Route.

The comparison portion of the Proposed Route would result in more total ground disturbance during construction (955 acres) than Alternatives 9D (816 acres) and 9G (852 acres), but less disturbance than Alternatives 9E (1,004 acres), 9F (971 acres), and 9H (979 acres). The Proposed Route would result in more disturbance to previously undisturbed areas (501 acres) than Alternatives 9D (158 acres), 9F (236 acres), 9G (141 acres), and 9H (218 acres), but less than Alternative 9E (539 acres). Therefore, Alternative 9E would have the greatest potential for the spread or introduction of invasive plant species compared to the comparison portion of the Proposed Route.

Segment 10

Segment 10, as proposed, would link the Cedar Hill and Midpoint Substations with a 33.6-mile single-circuit 500-kV line, following a WWE corridor for most of its distance. Twenty-eight acres of the expansion of the Midpoint Substation and of the construction of the Cedar Hill Substation are attributed to Segment 10. There are no Route Alternatives proposed along this segment (see Appendix A, Figure A-12).

Construction of Segment 10 would result in about 549 acres of total ground disturbance, of which 24 acres would correspond to disturbances to previously undisturbed areas. Given the existing development along this route, there are likely invasive plant species currently present.

3.8.2.4 Design Variation

A Design Variation is being considered that would consist of constructing two single-circuit lines in Segments 2 through 4 instead of a single double-circuit line (which is the design assessed above). The disturbance footprint of the two single-circuit towers is greater than that of the double-circuit tower, in part because the requested ROW between Segments 2 and 4 would be wider, but also because helicopter-assisted construction could be implemented in these areas, which would require additional fly yards. The additional ROW space and the fly yards would cause additional temporary disturbance during construction. Across Segments 2, 3, and 4, the additional disturbance during construction of the single-circuit tower alternative ranges from 25 to 30 percent greater than comparable portions of the double-circuit tower disturbance under the proposed design. The two single circuits require more ground disturbance, but would be designed and constructed to the same standards as the Proposed Action. Table D.6-4 in Appendix D lists the acreage of disturbance that would occur under the Design Variation. The additional disturbance that would occur under the Design Variation would result in the increased potential for the spread or introduction of invasive plant species compared to the Proposed Action.

3.8.2.5 Structure Variation

The proposed guyed Structure Variation would add four guy wires about 140 feet long from a point about 100 feet up in each tower to four guy anchors spaced in a square around the tower (Appendix B, Figure B-6). This would not change the amount of disturbance during construction or operation appreciably. Therefore, there is no measurable difference in the potential for the spread or introduction of invasive plant species from the use of this Structure Variation when compared to the use of self-supporting lattice towers under the Proposed Action.

3.8.2.6 Schedule Variation

The Schedule Variation uses the two single-circuit Design Variation described above but extends construction over a longer time frame. Initially, only one of the eventual two single-circuit lines would be constructed with the second to be constructed at a later date. The Schedule Variation proposes that the first single-circuit transmission line in Segments 2, 3, and 4 would be built as soon as a ROW grant is issued, but that the second line would not begin construction until late 2018. This would mean nearly 2 years would pass

between the end of construction for the first line and beginning of construction for the second line. Any staging areas and fly yards that had been used for the first stage would have been revegetated after construction was complete and would have to be cleared again. As this variation would result in ground disturbances occurring twice in the same areas, the Schedule Variation would have essentially double the impacts on ground disturbance compared to the simultaneous construction or double-circuit alternative, even though the overall project footprint would not be any greater. Therefore, the potential for the spread or introduction of invasive plant species would be about twice under this variation compared to the simultaneous construction or double-circuit alternative.

3.8.3 Mitigation Measures

The Proponents have committed to EPMs that would be implemented Project-wide to limit the potential spread or introduction of invasive plant species, as outlined in this section and in Appendix C.

The following weed-related mitigation measures were identified by the Agencies and are required on federally managed lands. The Agencies recommend that the Proponents incorporate these measures into their EPMs and apply them Project-wide:

WEED-1 The Proponents shall consult with each appropriate local land management agency (Forest Service and BLM) office or landowner to determine appropriate seed mix and commercial seed source for revegetation. The Reclamation, Revegetation, and Weed Management Plan must specify the approved seed mixes for each area (also see VEG-1).

WEED-2 Weed control and prevention measures shall adhere to all agency standards and guidelines. These measures shall be developed in consultation with local, state, and federal weed agencies; all implemented measures would follow the principle of integrated weed management.

WEED-3 Gravel and other materials used for road construction shall come from certified weed-free sources.

WEED-4 Annual post-construction monitoring and treatment of invasive plants shall continue for at least 3 years. If after 3 years post-construction conditions are not equivalent or better than pre-construction conditions, monitoring and treatment will continue until these conditions are met (also see VEG-12).

WEED-5 During operations, access roads and maintenance areas shall be surveyed annually between May 1 and September 30 (or as determined by Agency staff) for the presence of new weed introductions and existing invasive plant species. Coordinate with Agency specialists to identify the most appropriate time for survey. A weed control program would be implemented if new weeds were found, which would define how and when these invasive plants would be treated. Weeds shall be treated before their seed heads have become viable, or if heads will become viable, whole plant removal of all weeds shall occur before seed drop occurs.

WEED-6 Soil stockpiles in areas containing invasive plants shall be reseeded or revegetated as soon as feasible, or the soil replaced in or near the original

excavation. If requested by the applicable land-management agency, soil stockpiles shall be covered with plastic during the time prior to reseeding or replacement; however, plastic coverings will not be used on lands where the managing agency or landowner have requested that these piles not be covered with plastic (e.g., the Forest Service).

3.9 WETLANDS AND RIPARIAN AREAS

Wetlands are defined for regulatory purposes as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (33 CFR Part 328.3, 40 CFR Part 230.3). Wetlands are important ecological resources that perform many functions including groundwater recharge, flood flow attenuation and conveyance, erosion control, and water quality improvement. They also provide habitat for many plants and animals, including threatened or endangered species (see Sections 3.7 – Special Status Plants and 3.11 – Special Status Wildlife and Fish Species).

Riparian areas are unique vegetation communities that occur adjacent to waterways and wetlands, and provide habitat for numerous plant and animal species. They generally occupy transitional areas between aquatic and upland habitats, and may function as vegetative buffers for aquatic resources. Although riparian habitats are often combined with wetlands (as a result of their intimate relationship to the hydrological regime), riparian areas differ from wetlands in that they are generally linear, more terrestrial (less hydric), and are often dependent on a natural disturbance regime relating to flooding and stream dynamics (Naiman et al. 2005). This section includes but is not limited to waters that would be jurisdictional under Section 404 of the CWA (waters of the United States) and areas considered by each state to be “waters of the state.”

3.9.1 Affected Environment

This section describes the existing wetland and riparian areas that could be impacted by the Project. The discussion will first define the Analysis Area. It will then outline the issues that were raised during public scoping, followed by a description of the laws and regulations in place to manage wetlands and riparian areas. This section will then conclude by describing the methods used to assess impacts to wetlands and riparian areas, and a description of the existing conditions of wetlands and riparian areas crossed by the Project.

3.9.1.1 Analysis Area

The Project would cross a portion of the Intermountain West region, in southern Wyoming and Idaho, as well as a small portion of northern Nevada (under Alternative 7I). Grass and shrublands are the most common vegetation type found in this region, with only a few areas that contain forests or woodlands. Wetlands and riparian areas are limited within this region, with the most abundant types consisting of herbaceous and shrub wetlands that are associated with drainage features.

The Analysis Area used to determine wetland impacts is a minimum of 250 feet on either side of the transmission line centerline for Proposed and Alternative Routes, a minimum of 25 feet on either side of the centerlines of roads mapped for Proposed and Alternative Routes, and a minimum of 50 feet around the perimeter of other Project features such as staging areas, laydown yards, fly yards, substations, and regeneration stations. This area, based on preliminary or indicative engineering, allows for a

comparison of impacts among alternatives. Approximately 297,600 acres were mapped for the Project during the course of route and alternative development, scoping, and public involvement. Mapping was conducted on routes and alternatives that were considered but have been eliminated from detailed study. Therefore, the Analysis Area for assessing impacts to wetlands encompasses approximately 277,100 acres, of which 3,815 acres (1.4 percent) was mapped as wetland or riparian areas.

3.9.1.2 Issues to be Analyzed

Issues identified during public scoping (Tetra Tech 2009a) included the following:

- What the effects on permanent and seasonal wetlands would be;
- Whether riparian areas would be affected; and
- Whether equipment staging and/or refueling areas can be kept away from wetlands and riparian areas.

3.9.1.3 Regulatory Framework

The USACE regulates the discharge of dredge and fill material into “waters of the United States” under Section 404 of the CWA. In addition, the Swampbuster Provision of the Food Security Act of 1985 requires that landowners who receive USDA program benefits comply with wetland requirements.

The USACE jurisdiction over non-tidal waters of the United States extends to the “ordinary high water mark provided the jurisdiction is not extended by the presence of wetlands” (33 CFR Part 328.4); and under Title 40 CFR Part 230.3 (s)(1). Waters of the United States are defined earlier in this Draft EIS in Section 1.2.3 in Chapter 1.

Many wetlands are protected under the CWA as waters of the United States and special aquatic sites. Wetlands are defined by the USACE based on the presence of wetland vegetation, wetland hydrology, and hydric soils. In addition, EO 11990, Protection of Wetlands (42 *Federal Register* 26961), directs all federal agencies to minimize the destruction, loss, or degradation of wetlands, and to enhance the natural and beneficial values of wetlands. Federal regulation and management of wetlands follows a “no net loss” policy.

Under Section 404, the USACE issues a number of nationwide permits for different types of activities that result in minimal individual and cumulative adverse effects on the aquatic environment. Nationwide Permit 12 authorizes construction, maintenance, and repair of utility lines in all waters of the United States provided that there is no change in preconstruction contours. This nationwide permit also authorizes related facilities including substations (provided they do not result in the loss of more than 0.5 acre of waters of the United States), structure foundations of overhead utility lines (provided they cover the minimum size necessary), and access roads (provided the discharges do not cause the loss of greater than 0.5 acre of non-tidal waters of the United States). These limitations for Nationwide Permit 12 include all losses at a single crossing of a wetland or stream, or cumulative losses from multiple crossings of the same wetland or stream.

A pre-construction notification must be sent to the USACE if any of the following situations would occur: mechanized clearing of forested wetlands, a Section 10 permit is required under the Rivers and Harbors Act for work in navigable waters, a loss of more than 0.1 acre of jurisdictional wetlands or other waters, permanent access roads are constructed above grade for more than 500 feet, or permanent access roads are constructed of impervious materials (72 *Federal Register* 11092-11198). Compensatory mitigation would be required for all losses if they exceed 0.1 acre. Losses that exceed 0.5 acre are not authorized by Nationwide Permit 12.

There are no specific laws protecting riparian areas; however, the land management plans of federal agencies provide protections for riparian areas including BLM's no net loss of wetland/riparian habitat policy. Federal agency management goals are to maintain, restore, and improve riparian areas to protect water quality, improve water retention and groundwater recharge, provide wildlife habitat, support biodiversity, and other goals. The BLM and Forest Service evaluate the functional condition of riparian areas using a qualitative method called assessment of proper functioning condition (Pritchard 1998). "Properly functioning" means the hydrological, vegetation, and soil erosion/deposition components on a stream system are in working condition, are resilient to disturbance, and provide adequate vegetation, landform, or debris to protect water resources, habitat, and biodiversity. Proper functioning condition can be applied for both lotic (streams) and lentic (ponds, wetlands) systems. The evaluation procedures for delineating the condition of these areas are different for each system and are more clearly defined in the BLM technical documents (Burton et al. 2008; Smith 2008). The assessment of proper functioning condition should be used in conjunction with more quantitative methods; it is not a substitute for monitoring but a tool for identifying smaller scale areas (step-down process).

Depending on the National Forest, the NFS has identified Water Influence Zones (WIZs), Aquatic Influence Zones (AIZs), or Riparian Conservation Zones (RCZs), which are based on a specific width on either side of a stream depending on flow regime and do not specifically require the physical presence of mapped riparian or wetland vegetation. These areas provide a buffer between a stream or waterbody and the upland areas, and can influence water quality. The Caribou-Targhee NF has delineated about 63,000 acres of AIZ on its 1.1 million acres (Forest Service 2003e). The Sawtooth NF has delineated about 66,210 acres of AIZ on its 596,791 acres. Based on methodology provided by the Medicine Bow-Routt NFs, about 13,619 acres of WIZs on its174,300 acres has been delineated within the southern portion of the Douglas Ranger District.

3.9.1.4 Methods

The location of wetlands and riparian areas within the Analysis Area was determined based on remote sensing techniques, which consisted of acquiring Project-specific aerial images of the Analysis Area, segmentation of images into GIS polygons, classification of polygons into vegetation types (i.e., photo interpolation), and limited field verifications to ensure that photo interpolation was conducted accurately. The NWI and National Hydrography Dataset GIS databases were also referenced to assist in vegetation mapping. A more detailed description of the remote sensing mapping

methods can be found in the Vegetation and Habitat Mapping Baseline Technical Report (Tetra Tech 2009b).

To determine the acreage of impacts that could potentially occur to wetland and riparian areas, the Project's construction and operations footprints were overlaid onto the wetlands and riparian areas that were identified and mapped during the remote sensing effort (using ArcGIS). Areas where the Project's construction or operations footprints were co-located with mapped wetlands or riparian areas were considered to be a direct impact and the acreage of impact was calculated via GIS analysis. Examples of wetlands and riparian areas found along the Proposed Route and Route Alternatives are shown in Figures E.9-1 through E.9-4 in Appendix E.

The estimates of impacts determined through these methods are based on preliminary engineering. As a result, they likely overestimate the impacts that would actually occur due to Project construction and operations, because Project components (including towers, roads, equipment storage yards, fly yards, and laydown areas) would be sited outside of wetlands during final engineering design whenever possible (as is a standard engineering practice). In addition, the estimated impacts resulting from tower pads are determined via a standard circular buffer around the proposed pad location. However, construction engineers are not likely to impact the entire extent of this circular buffer when wetlands or riparian areas are present but would instead reshape the construction area around the tower pad to exclude these areas. These impact estimates are presented here as they are based on the current preliminary design of the Project. Most of the wetland and riparian area impact estimates presented within this EIS would be avoided or minimized during final engineering design.

Wetlands were identified using the vegetation mapping data, which used one of the three parameters (vegetation) required for an area to be considered a jurisdictional wetland. Therefore, the actual number and acreages of wetlands that could be jurisdictional wetlands (which would be determined during wetland delineation) may be smaller than those presented within this EIS if the area of hydric soils and/or wetland hydrology is smaller than the area of hydrophytic vegetation identified via remote sensing. More exact estimates of the area of impact to jurisdictional wetlands would be made as part of final design and CWA Section 404 permitting. Wetland delineations have not been conducted for this Project at this time but would be performed prior to construction to support CWA Section 404 permitting and to minimize Project impacts. The delineation would identify both wetland and non-wetland waters of the United States that would be affected by the Project.

As used in this EIS, the term "construction impacts" includes all areas that would be disturbed during construction. Some of these areas would remain disturbed for the life of the Project (such as the bases of transmission structures, substation foundations, and access road beds, i.e., operations impacts), while others would be restored following final construction. All of the operations impacts would be initiated during construction.

3.9.1.5 Existing Conditions

As stated earlier, the identification of areas as wetlands is preliminary and based on photo interpretation. The actual area of jurisdictional wetlands and the type of wetlands that occur within the Analysis Area would be determined during wetland delineations that would be required prior to construction. The wetland mapping study was intended to be conservative and include all potential areas of wetlands and riparian vegetation.

Wetlands and riparian vegetation occupy only a small portion of the Analysis Area. They represent about 1.2 percent of the miles crossed by the centerline of the Proposed Route and Route Alternatives (Appendix D, Table D.6-1). They occupy about 1.5 percent of the total Analysis Area. Wetlands and riparian areas are more common in some portions of the Analysis Area, such as along Segment 1W and portions of Segment 4, and less common in other areas such as Segments 8 through 10. Wetlands and riparian areas are most common in and near the mountainous portions of the Analysis Area and are scarce in southwestern Idaho and in the arid parts of Wyoming.

Four types of wetlands were mapped in the Analysis Area. For reference purposes, the Cowardin system (used by NWI to classify wetlands) will be listed when appropriate; however, this system will not be used during this analysis.

- Herbaceous wetlands (i.e., palustrine emergent, or PEM in the Cowardin system [Cowardin et al. 1979]) are dominated by erect, rooted, herbaceous species, such as cattails (*Typha* spp.), bulrushes (*Scirpus* spp.), sedges (*Carex* spp.), rushes (*Juncus* spp.), spikerushes (*Eleocharis* spp.), and various grasses and forbs. Herbaceous wetlands make up more than half of the wetlands mapped in the Analysis Area, and are most abundant on Segment 4, where they occupy large areas on private lands along the Hams Fork and Bear River in southwestern Wyoming and the Bear River in southeastern Idaho.
- Shrub wetlands (i.e., palustrine scrub-shrub or PSS in the Cowardin system [Cowardin et al. 1979]) include wetlands dominated by woody vegetation less than 20 feet tall. These wetlands are commonly dominated by species such as coyote willow (*Salix exigua*), other willows, and other shrubs such as water birch (*Betula occidentalis*) and red-osier dogwood (*Cornus sericea*). Shrub wetlands often have an understory and openings dominated by herbaceous wetland species. Shrub wetlands are the second most common type found within the Analysis Area and are found predominantly along Segments 1E through 5.
- Mixed wetlands (not defined by the Cowardin system) are areas that had a mix of shrub and herbaceous wetlands, or a mix of trees, shrub, and herbaceous; they represent areas that could not be readily assigned to a single wetland type during photo interpretation. The mixed wetlands type was slightly less common than the shrub wetlands type, and is predominantly found along Segment 4.
- Forested wetlands (i.e., palustrine forested, or PFO in the Cowardin system [Cowardin et al. 1979]) are wetlands dominated by trees. Common species include plains cottonwood (*Populus deltoides*), narrowleaf cottonwood (*Populus angustifolia*), peachleaf willow (*Salix amygdaloides*), and Russian olive

(*Elaeagnus angustifolia*). This type of wetland is relatively uncommon in the Analysis Area, and is only found along Segments 1W and 4.

In addition, four types of riparian areas were mapped within the Analysis Area:

- Herbaceous riparian areas included regions dominated by herbaceous species along perennial and intermittent streams that were not identified as wetlands during remote sensing efforts. They are abundant along Segments 1E, 4, and 7.
- Shrub riparian areas included regions dominated by species such as willows, black greasewood (*Sarcobatus vermiculatus*), rubber rabbitbrush (*Chrysothamnus nauseosus*), and other species along perennial or intermittent streams. This is the most common riparian type found within the Analysis Area; it can be found along all segments but is most common along Segment 4.
- Mixed riparian areas consisted of non-wetland areas that contained elements of the three riparian types identified above. This type is uncommon within the Analysis Area, predominantly found along Segment 4.
- Forested riparian areas included mesic regions dominated by trees or shrubs and were located along rivers or streams. These areas are typically dominated by plains cottonwood in the lowlands and by narrowleaf cottonwood, aspen (*Populus tremuloides*) and conifers in the mountains, and by shrub species such as willows, chokecherry (*Prunus virginiana*), skunkbush sumac (*Rhus trilobata*), and snowberry (*Symphoricarpos* spp.). Forested riparian areas often have an open tree canopy and an herbaceous understory of grasses and forbs. This riparian type is relatively uncommon in the Analysis Area, predominantly found along Segments 1W and 4.

3.9.2 Direct and Indirect Effects

This section is organized to present effects to wetlands from construction, then operations, followed by decommissioning activities for the proposed Project. Route Alternatives are analyzed in detail in Section 3.9.2.3. There is a Design Variation involving use of two single-circuit structures proposed by the Proponent for Segments 2, 3, and 4 (see Section 2.2 for details), which is analyzed in Section 3.9.2.4 and a Structure Variation that is analyzed in Section 3.9.2.5. The Proponents have also proposed a Schedule Variation, analyzed in Section 3.9.2.6, in which one of the two single circuits to be constructed in Segments 2, 3, and 4 and a portion of Segment 1W would be built on an extended schedule with construction beginning approximately 2.5 years after completion of the initial construction.

In May of 2011, the Proponents submitted a Framework for Compensatory Mitigation for and Monitoring of Unavoidable Impacts to Waters of the U.S. (Appendix C-6). Mitigation measures or EPMs are presented in detail within this section only if it is the first time they have been discussed in Chapter 3; all other measures are referenced or summarized. A comprehensive list of all Proponent-proposed EPMs and Agency-required mitigation measures can be found in Table 2.7-1 of Chapter 2.

Plan Amendments

Proposed amendments are summarized in Table 2.2-1 of Chapter 2 and detailed in Appendices F and G. Amendments are needed to permit the Project to cross various areas of BLM-managed and NFS lands. Effects described for areas requiring an amendment in order for the Project to be built would only occur if the amendment were approved. Amendments that alter land management designations could change future use of these areas. No amendments specific to wetlands and riparian areas are proposed for the Project and no impacts to wetlands and riparian areas resulting from approving the amendments beyond the impacts of the project are anticipated.

An amendment is proposed for the Caribou Forest Plan TES Standard 11 to allow the Project where it would disturb wetland/riparian habitat for the boreal toad, wood frog, or northern leopard frog.

3.9.2.1 No Action Alternative

Under the No Action Alternative, the Project would not be constructed or operated. No Project-related impacts would occur to wetlands or riparian areas. However, impacts would continue as a result of natural conditions (such as fire, drought, and severe weather) and/or existing development in the Analysis Area.

3.9.2.2 Effects Common to All Action Alternatives

Construction

The primary impact to wetland and riparian areas would result from the clearing of vegetation. Removal of vegetation could alter various functions provided by these areas, including their ability to serve as wildlife habitat (see Sections 3.10 – General Wildlife and Fish and 3.11 – Special Status Wildlife and Fish Species), as well as their ability to trap sediment and nutrients. Soil disturbances and removal of vegetation within a wetland or riparian area could temporarily alter the area's ability to moderate flood flow, control sediments, or facilitate surface water flow. Removal of vegetation could also increase water and soil temperatures and alter the species composition within these areas.

Increased soil disturbances can lead to invasions by exotic plant species, which can alter the composition and function of wetlands and riparian areas. Any blasting that may occur within or adjacent to a wetland could fracture the bedrock and alter the hydrology of a perched water table, thereby leading to drier conditions and impairment of revegetation efforts. Withdrawal of water for use during construction may have temporary effects on wetlands adjacent to streams, by reducing the water input that they would receive. Failure to restore disturbed areas to their preconstruction conditions (contours, hydrology, segregation and restoration of topsoil), could impede the re-establishment of wetland and riparian vegetation during revegetation efforts. A summary of the direct impacts (i.e., vegetation removal and soil disturbances) that would result from construction of the Project (broken down by segment and alternative) is provided in Table D.9-1 of Appendix D.

Although some Project-related disturbances would be temporary and confined to the construction phase, impacts would continue through the operations phase in areas

where construction sites are located within forested wetlands or riparian areas, because of the time required to restore forested habitats. Construction impacts in forested wetlands and forested riparian areas would generally involve a conversion to a different wetland type (i.e., a change to shrub or herbaceous type), rather than a loss of wetland or riparian acreage. It is likely that recovery would be fairly rapid in herbaceous and shrub wetlands, and construction in these types is not likely to cause a conversion to a different type. Impacts could result from soil compaction or alteration of surface or subsurface water movement in wetlands and riparian areas, or springs and seeps. Impacts could also result if areas that once contained wetlands or riparian areas (prior to construction) become occupied by Project facilities (such as tower pads, substations, and access roads).

To minimize the potential impacts that could occur to wetlands, the Proponents have proposed a Reclamation, Revegetation, and Weed Management Plan and are developing a SWPPP and an SPCC Plan. These plans would include measures to ensure that disturbed areas are revegetated and restored to preconstruction conditions, and that toxic substances or increased sedimentation do not impact waterbodies. These plans are discussed in more detail below and the preliminary measures that would be included in these plans are provided in Appendices C-1 and C-2.

Reclamation, Revegetation, and Weed Management Plan

The Framework Reclamation Plan for Construction Activities (Appendix C-2) provided by the Proponents addresses measures to be undertaken to ensure reclamation and revegetation of disturbed areas that are not occupied by permanent Project facilities, as well as to prevent the accidental introduction or transport of noxious weeds or exotic species along the ROW during and after construction. This Plan, as proposed, includes site-specific restoration measures, procedures for preconstruction treatment of noxious weeds and invasive plants, topsoil treatment, ROW restoration (recontouring, decompaction, and cleanup), seedbed preparation, seeding methods, preliminary seed mixes, road reclamation, monitoring, and remedial actions. Project-specific seed mixes would be developed in consultation with the public land manager or private landowner. Reclamation efforts would be scheduled for late fall to early winter, where feasible, and permitted to facilitate seed establishment when snow and rainfall are more likely. A detailed reclamation schedule will be prepared as part of the Final Reclamation Plan for each segment.

Reclamation actions would meet short- and long-term reclamation objectives by:

- Conducting preconstruction weed surveys, applying preconstruction weed control measures where appropriate, controlling weed introduction and spread during construction, and conducting postconstruction weed monitoring and control activities where needed (REC-1 to REC-15);
- Using proper soil management techniques, including stripping, stockpiling, and reapplying topsoil material at temporarily disturbed areas to restore soil horizons and establish surface conditions that would allow for rapid re-establishment of vegetation (REC-16 to REC-18);
- Re-establishing topography compatible with the surrounding landscape (REC-19);

- Establishing stable soil surface and drainage conditions, which would minimize surface erosion and sedimentation (REC-20 to REC-22);
- Re-vegetating disturbed areas with plant species adapted to site conditions to establish long-term, productive, self-maintaining plant communities compatible with existing land uses; and concurrently minimize the chances for noxious weeds and invasive plant species to replace species that are native to the area (REC-24 through REC-26);

This plan would minimize the impacts that would occur to wetlands and riparian areas by providing measures for restoring vegetation and site characteristics. As a result of this plan, the majority of impacts to wetlands would occur due to impacts related to occupancy of a wetland or riparian area by operations facilities, or through the maintenance of forested vegetation below the height of the transmission lines (addressed in more detail below, within the Operations and Maintenance discussion).

Stormwater Pollution Prevention Plan

The Proponents have developed EPMs to minimize erosion and sediment transportation to adjacent waterbodies. These measures would be included in the SWPPP, which would be finalized prior to construction. Preventing erosion and sedimentation from entering waterbodies (including wetlands) is essential, because these sediments can alter the function of wetlands or riparian areas (as described above). The following are EPMs contained within the preliminary SWPPP (Appendix C-1, Attachment B) that are applicable to wetlands and riparian areas:

SW-1 The appropriate NPDES permits for construction activities that disturb one acre or more of land will be obtained from the Department of Environmental Quality and USEPA or their designees.

SW-4 The SWPPPs will be modified as necessary to account for changing construction conditions.

SW-5 The SWPPPs will identify areas with critical erosion conditions that may require special construction activities or additional BMPs to minimize soil erosion. (Descriptions of stormwater BMPs are available at USEPA [2008]).

SW-6 Migration of construction-related sediment to all adjacent surface waterbodies will be prevented.

SW-7 Stormwater BMPs will be maintained on all disturbed lands during construction activities, as described in the SWPPP.

SW-8 Approved sediment and erosion control BMPs will be installed and maintained until disturbed areas meet final stabilization criteria.

SW-9 Temporary BMPs will be used to control erosion and sediment at staging areas (equipment storage yards, fly yards, laydown areas) and substations.

SW-10 The construction schedule may be modified to minimize construction activities in rain-soaked or muddy conditions.

SW-11 Damaged temporary erosion and sediment control structures will be repaired in accordance with the SWPPP.

SW-12 Upon completion of construction, permanent erosion and sediment BMPs will be installed along the transmission line within the ROW, at substations, and at related facilities in accordance with the SWPPPs.

Spill Prevention, Containment, and Countermeasures Plan

The Proponents have developed EPMs to minimize the possibility of accidental spills of toxic substances into or adjacent to waterbodies (including wetlands). These measures would be included in the SPCC Plan, which would be finalized prior to construction. The following are EPMs contained within the preliminary SPCC Plan (Appendix C-1, Attachment C) that are applicable to wetlands and riparian areas:

SPC-1 Construction industry standard practices and BMPs will be used for spill prevention and containment.

SPC-2 Construction spills will be promptly cleaned up and contaminated materials hauled to a disposal site that meets local jurisdictional requirements.

SPC-3 All staging areas will contain fueling areas with containment. Where fueling must be conducted along the ROW, the plan will specify BMPs.

SPC-4 If an upland spill occurs during construction, berms will be constructed with available equipment to physically contain the spill. Absorbent materials will be applied to the spill area. Contaminated materials will be excavated and temporarily placed on and covered by plastic sheeting in a containment area a minimum of 100 feet away from any wetland or waterbody, until proper disposal is arranged.

SPC-6 For spills in standing water, floating booms, skimmer pumps, and holding tanks will be used as appropriate by the contractor to recover and contain released materials on the surface of the water.

SPC-9 Materials such as fuels, other petroleum products, chemicals, and hazardous materials including wastes will be located in upland areas at least 500 feet away from streams, 400 feet for public wells, and 200 feet from private wells.

Permitting and Mitigation Requirements

As part of the Section 404 permitting process, the USACE would evaluate whether wetlands have been avoided to the extent practical and whether losses have been adequately mitigated. The permitting process would also identify additional requirements, as necessary, to comply with USACE regulations. These would include the necessity for compensatory mitigation for any permanent loss of wetland area or wetland function. Compensatory mitigation could include the creation, enhancement, or restoration of wetlands to replace the lost wetland function/acreage. Other potential options include purchasing credits from a mitigation bank or in-lieu fee programs. The

type of compensatory mitigation would be determined by the USACE as part of the Section 404 permitting process.

Compensatory mitigation involves actions taken to offset unavoidable adverse impacts to wetlands, streams and other aquatic resources authorized by CWA Section 404 permits and other USACE permits. Compensatory mitigation is a critical tool in helping the federal government meet the longstanding national goal of ‘‘no net loss’’ of wetland acreage and function. It is the Proponents’ responsibility to take all appropriate and practicable steps to avoid and minimize adverse impacts to waters of the United States.

In addition to the compensatory mitigation required by the USACE (discussed in the Operation and Maintenance section below) and the Proponents’ EPMs, the Agencies have identified the following mitigation measures to further protect wetlands and riparian areas during construction:

WET-1 Impacts on wetland and riparian areas shall be avoided unless physically or economically infeasible. Land management agencies’ plans (RMPs and Forest Plans) that have standards, guidelines, stipulations, or avoidance buffers will be adhered to. Where these do not exist, Inland Fish Strategy (INFISH) buffers for fish-bearing and nonfish-bearing waters and wetlands will be followed.

WET-2 Wetland delineations will be performed prior to construction to support CWA Section 404 permitting and to minimize Project impacts. The delineation will identify both wetland and non-wetland waters of the United States that would be affected by the Project.

In addition, the following mitigation measure has been proposed by the Agencies and adopted by the Proponents:

WET-3 Where impacts on wetlands are not avoidable, site-specific crossing plans and measures to mitigate impacts shall be submitted to the appropriate regulatory agency, as well as the land managing agency. The Proponents shall apply directly to the appropriate permitting agency (USACE and/or State agency) for approval.

Operations

During siting, routing, and construction, the Proponents committed to avoiding wetlands and riparian areas to the maximum extent practicable, minimizing impacts by reducing clearing and road width to the minimum needed for safe operation, and restoring construction disturbance. Wetland losses could be reduced by restoring the original contours and wetland area, by minimizing the area of impact during construction by use of mats or other techniques (allowing heavy equipment to pass over while protecting wetland soils below), or by avoiding or minimizing placement of structures in wetlands during final design.

However, there would still be residual impacts in some areas from Project operations and maintenance. These unavoidable impacts to wetlands and riparian areas would include permanent fill to support transmission towers, permanent 8-foot-wide roads to each tower, and safety vegetation maintenance in the ROW, including removal of trees

that could interfere with the conductors or use of the roads. Table D.9-2 in Appendix D lists the acreage of permanent impacts that would occur during operations by segment and alternative.

If permanent operations facilities are located within a wetland or riparian area, this would result in a permanent loss of wetland or riparian area. The Proponents have asserted that final Project design would avoid these areas to the extent practical.

The Proponents would use Integrated Vegetation Management on the ROW to reduce the risk of fire and maintain safe access to the line and associated facilities. In general, this would involve removing or trimming tall-growing trees so that they do not come into contact with the line. Impacts to wetlands and riparian areas would occur where trees are cut to meet wire clearance requirements (see Section 3.6.2.2). Removal of trees would result in conversion of forested wetland or forested riparian areas to shrub or herbaceous types. This vegetation management would be initiated during construction and would continue during the operations phase of the Project.

Maintenance of the access roads and work areas (blading of roads to restore surface conditions, and weed management conducted near permanent structures) could result in minor direct and indirect impacts to wetlands or riparian areas. Vehicle traffic in wetlands and riparian areas has the potential to permanently alter soil characteristics and drainage patterns unless proper precautions are taken. Indirect impacts during maintenance may include compaction of soils, alteration of drainage patterns, erosion, and sedimentation. Erosion control and sedimentation measures such as water bars, culverts, sediments basins, or perimeter control would be installed as required to minimize erosion.

Compensatory Mitigation

The USACE recognizes three mechanisms for providing compensatory mitigation. Listed in order of most favorable (preferred by the USACE) to least favorable, these include mitigation banks, in-lieu fee programs, and permittee-responsible compensatory mitigation. Both mitigation banks and in-lieu fee programs involve off-site compensation activities that are conducted by a mitigation bank sponsor or an in-lieu fee program sponsor. Permittee-responsible mitigation is the most traditional form of compensation and continues to represent the majority of compensation acreage provided each year (73 *Federal Register* 19594–19705). As its name implies, the permittee retains responsibility for ensuring that required compensation activities are completed and successful. Compensatory projects can be located at or adjacent to the impact site (i.e., on-site compensatory mitigation) or at another location generally within the same watershed as the impact site (i.e., offsite compensatory mitigation).

The USACE prefers the use of mitigation banks but has indicated that the Project does not fall within the service areas of any approved and operational mitigation banks or existing in-lieu fee programs (Johnson 2010; Joyner 2010). In addition, it is unlikely any approved mitigation banks will be operational within service areas appropriate for this Project in the foreseeable future. Therefore, it is the Proponents' responsibility to develop a suitable compensatory mitigation program. The framework of the Proponents' plan is found in Appendix C-6.

If possible, the Proponents intend to develop a Project-specific in-lieu fee program and suitable sponsor(s) to ensure adequate compensation for all Project-related aquatic impacts. The following activities are proposed to develop an in-lieu fee program and sponsor(s):

- The Proponents will work with USACE to determine the amount of mitigation required as well as the geographic service areas in which mitigation should occur;
- Potential entities/sponsor(s) for an in-lieu fee program shall be identified; and
- The Proponents will work with potential in-lieu fee entities/sponsor(s) to determine pre-plan needs (fiscal, structure, governance).

Suitable sponsors for an in-lieu development program might include national organizations such as Ducks Unlimited, Trout Unlimited, or the Rocky Mountain Elk Foundation; state organizations such as the Wyoming Wildlife Federation; or more grass roots organizations such as local land trusts.

However, if the Proponents are unable to encourage the development of an acceptable in-lieu fee program with one or more sponsors that meets the requirements of the USACE, the Proponents would propose one or more compensatory mitigation projects in a comprehensive mitigation plan. This plan would include the specifications sections and sub-plans outlined below.

1. **Objectives**—This section would discuss:
   - The resource type(s) and amounts that will be provided by the mitigation project;
   - The method of compensation (i.e., restoration, establishment, enhancement, and/or preservation); and
   - The manner in which the resource functions of the mitigation project will address the needs of the watershed, ecoregion, physiographic province, or other geographic area of interest.

2. **Site Selection**—This section would discuss the factors considered during the site selection process, such as:
   - Needs of affected watersheds,
   - On-site alternatives (where applicable), and
   - The practicability of accomplishing an ecologically self-sustaining aquatic resource at mitigation project site.

3. **Site Protection Instrument**—This section would describe measures that will be used to ensure the long-term protection of the mitigation project site; including legal arrangements and instrument, as well as site ownership.

4. **Baseline Data**—This section would discuss or include:
   - Historic and existing plant communities of the proposed mitigation site and the impact site(s);
   - Historic and existing hydrology of the proposed mitigation site and the impact site(s);

- Soil conditions of the proposed mitigation site and the impact site(s);
- Map(s) showing the locations of the impact and mitigation site(s) or the geographic coordinates for those site(s); and
- Other site characteristics appropriate to the type of resource proposed as compensation, including delineation.

5. **Determination of Credits**—This section would describe the number of credits to be provided, including a brief explanation of the rationale for this determination.

6. **Monitoring**—This section would include the following:
   - A description of parameters to be monitored in order to determine if the mitigation project is on track to meet performance standards, or if adaptive management is needed.
   - A schedule for monitoring and reporting to the responsible agency.
   - A description of the length of the monitoring period and responsible party.

7. **Financial Assurances**—This section would describe the financial assurances in-place and how these assurances are sufficient to ensure a high level of confidence that the mitigation project will be successfully completed, in accordance with its performance standards. The USACE may require additional information as necessary to determine the appropriateness, feasibility, and practicability of the mitigation project.

8. **Ecological Performance Standards**—This section would describe the ecologically-based standards that will be used to determine whether the mitigation project is achieving its objectives.

The following sub-plans would also be included:

1. **Work Plan**—This plan would describe the following:
   - Geographic boundaries of the Project;
   - Construction methods, timing, and sequence;
   - Source(s) of water, including connections to existing waters and uplands;
   - Methods for establishing the desired plant community;
   - Plans to control invasive plant species;
   - Proposed grading plan, including elevations and slopes of the substrate;
   - Soil management; and
   - Erosion control measures.

2. **Maintenance Plan**—This plan would include a description and schedule for the maintenance requirements aimed at maintaining the continued viability of the resource once initial construction is completed.

3. **Long-Term Management Plan**—This plan would include a description of how the mitigation project will be managed after performance standards have been achieved in order to ensure the long-term sustainability of the resource, including long-term financing mechanisms and the party responsible for long-term management.

4. **Adaptive Management Plan**—This plan would include a description of how the mitigation plan would be revised and implemented if changes arise. This plan would also identify the party or parties responsible for implementing adaptive management measures.

In addition, other relevant information concerning waters of the United States would be included in the mitigation plan, covering such topics as plan-form geometry, channel form (typical channel cross-sections), watershed size, design discharge, and riparian area plantings. The Agencies have identified the following mitigation measure to further protect wetlands and riparian areas during operations:

WET-4 To meet USACE requirements for CWA 404 permitting, the Proponents must submit a plan for mitigation and full compensation for all losses of waters of the United States. This plan must be approved by the USACE. The framework for this plan is included in the Draft EIS (Appendix C-6) and must be fully detailed for the Final EIS.

Decommissioning

Decommissioning of the Project could result in impacts to wetlands and riparian areas. These impacts would include increased sedimentation, erosion, soil compaction, and limited direct removal of vegetation (if some vegetation areas needed to be cleared to remove structures from the site).

3.9.2.3 Proposed Route and Alternatives by Segment

Tables D.9-1 (Construction Impacts) and D.9-2 (Operations Impacts) in Appendix D provide details of impacts to wetlands and riparian areas by ecological type for the Proposed and Alternative Routes across all segments and for the Design Variation in Segments 2 through 4. In the analysis by segment below, the impacts are summarized and compared across Route Alternatives for that segment. The quantitative analysis of impacts is based on the following conservative assumptions:

- Areas identified and mapped as wetlands from remote sensing may not be jurisdictional under Section 404 of the CWA; therefore, wetland impacts may be overstated.
- Impacts are assessed based on preliminary design and do not include the avoidance and minimization of impacts that would occur as part of final design.

Segment 1E

Segment 1E, as proposed, would link the Windstar and Aeolus Substations in south-central Wyoming with a 100.6-mile 230-kV single-circuit transmission line. Twenty acres of the expansion of Windstar and Aeolus Substations and 0.5 acre for one regeneration site are attributed to Segment 1E. Alternative 1E-A is a 16.1-mile alternative along the north end of Segment 1E, which was the Proponents' initial proposal before moving the Proposed Route at the suggestion of local landowners to avoid the more settled area around Glenrock. Alternative 1E-B is 21.4 miles longer than the Proposed Route but is being considered by the Proponents because it would avoid a Wyoming-designated sage-grouse core area to the east. The BLM has required the

consideration of Alternative 1E-C, which parallels the Segment 1W 230-kV lines into the Aeolus Substation (see Appendix A, Figure A-2).

The Analysis Area for Segment 1E consisted of approximately 27,470 acres of mapped vegetation, which included 483 acres (1.8 percent) of wetland and riparian areas. Nine acres of wetlands and riparian areas that were mapped were located on the Medicine Bow-Routt NFs. The primary types present are herbaceous and shrub wetlands and riparian areas.

The Medicine Bow-Routt NFs have provided instructions for identifying WIZs associated with many of the stream segments on the NFs. Streams, wetlands, and waterbodies are buffered by specified distances and have limited development to protect these features from impacts such as erosion, sedimentation, temperature increases, and other water quality–related issues. The Proposed Route and Route Alternatives do impact WIZs in varying degrees, from four crossings on Alternative 1E-C to eight crossings of WIZs on the Proposed Route.

Construction

The impacts from construction of the Segment 1E Proposed Route and Route Alternatives are presented in Table 3.9-1. About 3.3 acres of wetlands and 7.9 acres of riparian areas would be affected by construction along the Proposed Route. Most of the impacts would occur from construction of structure sites and access roads. Most of the wetland impacts would occur in herbaceous wetlands and most of the riparian impacts would occur in shrub and herbaceous riparian areas. Construction would affect 0.4 acre of forested wetlands (due to ROW clearing) and would affect a combined total of 2.5[1] acre of forested riparian areas. The Proposed Route would cross the WIZ of eight streams on Medicine Bow-Routt NFs and construction activities would impact 0.3 acre of wetlands and riparian areas.

As shown in Table 3.9-1, Alternative 1E-A would have more effects on wetlands and riparian areas than the comparison portion of the Proposed Route.[2] Alternative 1E-B would result in more impacts to wetlands and less impacts to riparian areas than the comparison portion of the Proposed Route. Alternative 1E-C would have fewer impacts to wetland and riparian areas than the comparison portion of the Proposed Route. Nearly all of the wetland and riparian impacts for Proposed Route would occur along the portion that compares to Alternative 1E-C.

Operations

The impacts from operations and maintenance of the Proposed Route and Route Alternatives in Segment 1E are presented in Table 3.9-1. About 0.9 acre of wetlands and 1.4 acres of riparian areas would be occupied by operations facilities and 0.4 and 1.9 acres of forested wetland and forested riparian areas, respectively, would be converted to an herbaceous or shrub community by ROW maintenance along Segment 1E. Most of the wetland impacts would occur in herbaceous wetlands and most of the

[1] Due to permit criteria, acreages are reported here rounded to tenths of an acre instead of to the nearest whole acre as done elsewhere in this EIS.
[2] The portion of the Proposed Route that starts and ends at the same nodes as the Route Alternative.

Table 3.9-1. Comparison of Wetland/Riparian Impacts for Segment 1E Proposed Route and Alternatives 1E-A, 1E-B, and 1E-C

Segment/ Alternative	Construction Impacts to Wetlands (acres)	Construction Impacts to Riparian (acres)	Operations Impacts to Wetlands (acres)		Operations Impacts to Riparian (acres)	
			Due to Operations Facilities	Due to ROW Maintenance in Forests	Due to Operations Facilities	Due to ROW Maintenance in Forests
Proposed 1E – Total Length	3.3	7.9	0.9	0.4	1.4	1.9
Proposed – Comparison Portion for Alternative 1E-A	t[1/]	1.5	–	–	t[1/]	1.3
Alternative 1E-A	2.2	2.1	0.1	1.8	0.3	1.2
Proposed – Comparison Portion for Alternative 1E-B	0.2	2.7	t[1/]	–	0.7	–
Alternative 1E-B	1.8	2.5	0.3	–	0.4	–
Proposed – Comparison Portion for Alternative 1E-C	3.3	6.4	0.9	0.4	1.3	0.6
Alternative 1E-C	1.8	1.2	0.5	t[1/]	0.3	–
1/ Value is less than 0.1 acre.						

riparian impacts would occur in herbaceous riparian areas. Less than 0.1 acre of wetlands or riparian areas would be impacted on the Medicine Bow-Routt NFs.

Segment 1W

Segment 1W is composed of two parts, Segment 1W(a) and 1W(c), both of which would consist of a new 230-kV line for part of their length and a reconstruction of an existing 230-kV line for the remaining part. Segment 1W(a) would be about 76.5 miles long, and would extend from the Windstar Substation to the Aeolus Substation. Segment 1W(c) would be about 70.6 miles long, and would extend from the Dave Johnston Power Plant to the Aeolus Substation. Alternative 1W-A is a 16.2-mile alternative located near the town of Glenrock, which was the Proponents' initial proposal before moving the Proposed Route at the suggestion of local landowners in order to avoid the more settled area around Glenrock. Twenty acres of the proposed expansion at the Windstar and Aeolus Substations are attributed to Segment 1W(a) and 3 acres of the expansion at the Heward Substation and 17 acres of the expansion at the Windstar and Aeolus Substations are attributed to Segment 1W(c). There are no Route Alternatives proposed south of that point (see Appendix A, Figure A-2).

The Analysis Area for Segment 1W(a) consisted of approximately 11,230 acres of mapped vegetation which included 209 acres (1.9 percent) of wetland and riparian areas. Three acres of wetlands and riparian areas that were mapped were located on the Medicine Bow-Routt NFs. The Analysis Area for Segment 1W(c) consisted of approximately 8,720 acres of mapped vegetation, which included 208 acres (2.4

percent) of wetland and riparian areas. Less than 1 acre of wetlands and riparian areas that were mapped were located on the Medicine Bow-Routt NFs. The primary types present are shrub and herbaceous wetlands and riparian areas.

Construction

The impacts from construction of the Segment 1W(a) Proposed Route and Route Alternative are presented in Table 3.9-2. About 3.1 acres of wetlands and 3.8 acres of riparian areas would be affected by construction of the Proposed Route 1W(a) and about 5.5 acres of wetlands and 6.8 acres of riparian areas would be affected by construction of Proposed Route 1W(c). Construction would not affect any forested wetlands on 1W(a) but would affect 2.4 acres of forested wetlands on 1W(c), and 0.4 and 2.0 acres of forested riparian areas on 1W(a) and 1W(c), respectively. Segments 1W(a) and 1W(c) would cross the WIZ of seven and two streams, respectively, on the Medicine Bow-Routt NFs.

Table 3.9-2. Comparison of Wetland/Riparian Impacts for Segment 1W(a) Proposed Route and Alternative 1W-A

Segment/ Alternative	Construction Impacts to Wetlands (acres)	Construction Impacts to Riparian (acres)	Operations Impacts to Wetlands (acres)		Operations Impacts to Riparian (acres)	
			Due to Operations Facilities	Due to ROW Maintenance in Forests	Due to Operations Facilities	Due to ROW Maintenance in Forests
Proposed 1W(a) Total Length	3.1	3.8	0.6	–	1.4	0.4
Proposed – Comparison Portion for Alternative 1W-A	t[1/]	0.7	t[1/]	–	0.3	–
Alternative 1W-A	3.6	1.5	0.3	2.9	t[1/]	1.2
Proposed 1W(c) Total Length	5.5	6.8	0.7	2.2	1.0	1.7

1/ Value is less than 0.1 acre.

Operations

The impacts from operations and maintenance of the Segment 1W Proposed Route and Route Alternatives are presented in Table 3.9-2. About 0.6 acre of wetlands and 1.4 acres of riparian areas would be occupied by operations facilities on Segment 1W(a) and about 0.7 acre of wetlands and 1.0 acres of riparian areas would be occupied by operations facilities on Segment 1W(c). Operations facilities affecting wetlands and riparian areas would include structure pads and new and improved access roads. ROW maintenance would convert 2.2 acres of forested wetland to herbaceous or shrub wetland on 1W(c), and would similarly affect 0.4 and 1.7 acres of riparian forests on 1W(a) and 1W(c), respectively. Most of the wetland impacts would occur in herbaceous and forested wetlands and in shrub and forested riparian areas.

The acreage of operations impacts to wetlands and riparian areas that would occur along Alternative 1W-A would be similar to those discussed for construction.

Segment 2

Segment 2, as proposed, would link the Aeolus and Creston Substations in southeast Wyoming with two 500-kV circuits on one structure. One circuit would be operated at

230 kV during the initial phase of the Project. Its total proposed length is 96.7 miles. Fifty-two acres of the expansion of the Aeolus Substation and the construction of the Creston Substation and 0.5 acre for one regeneration site are attributed to Segment 2. There are three Route Alternatives, two of which are near the community of Fort Fred Steele. Alternative 2A at 28.4 miles long is being considered by the BLM because it remains in the WWE corridor nearer the town and the state historic site, and Alternative 2B, at 6.2 miles, is closer to the community than the comparison portion of the Proposed Route and was the initially proposed route before the Proponents responded to local suggestions and relocated the Proposed Route farther to the south. Alternative 2C is a 24.4-mile alternative located north of Hanna, Wyoming. It is being evaluated at the recommendation of the Wyoming Governor's office to follow a utility corridor approved by that office for minimizing effects to sage-grouse (see Appendix A, Figure A-3).

The Analysis Area for Segment 2 consisted of approximately 18,030 acres of mapped vegetation, which included 240 acres (1.3 percent) of wetland and riparian areas. The primary wetland types present are herbaceous wetlands, shrub wetlands, and shrub riparian areas.

Construction

The impacts from construction of the Proposed Route and Route Alternatives in Segment 2 are presented in Table 3.9-3. About 2.5 acres of wetlands and 7.2 acres of riparian areas would be affected by construction. Most of the impacts would occur from construction of structure pads and new and improved roads. Most of the wetland impacts would occur in herbaceous wetlands and most of the riparian impacts would occur in shrub riparian areas. Construction would not affect any forested wetlands but would affect a combined total of 0.3 acre of forested riparian areas.

Both Alternatives 2A and 2B would have similar impacts to wetlands as the comparison portions of Segment 2, but would have substantially more impacts to riparian areas. Alternative 2C would not impact would not impact wetlands and would impact less riparian areas than the comparison portion of the Proposed Route.

Operations

The impacts from operations and maintenance of the Proposed Route and Route Alternatives in Segment 2 are presented in Table 3.9-3. About 0.5 acre of wetlands and 2.8 acres of riparian areas would be occupied by operations facilities. ROW maintenance would convert 0.2 acre of forested riparian to herbaceous or shrub wetland. Operations facilities affecting wetlands and riparian areas would include structure pads and new and improved access roads. Most of the wetland impacts would occur in herbaceous wetlands and shrub riparian areas.

Table 3.9-3. Comparison of Wetland/Riparian Impacts for Segment 2 Proposed Route and Alternatives 2A, 2B, and 2C

Segment/ Alternative	Construction Impacts to Wetlands (acres)	Construction Impacts to Riparian (acres)	Operations Impacts to Wetlands (acres)		Operations Impacts to Riparian (acres)	
			Due to Operations Facilities	Due to ROW Maintenance in Forests	Due to Operations Facilities	Due to ROW Maintenance in Forests
Proposed Segment 2 – Total Length	2.5	7.2	0.5	–	2.8	0.2
Proposed – Comparison Portion for Alternative 2A	2.1	1.3	0.3	–	0.3	0.2
Alternative 2A	2.3	8.0	0.5	–	0.7	4.6
Proposed – Comparison Portion for Alternative 2B	t[1/]	0.1	t[1/]	–	t[1/]	–
Alternative 2B	0.2	5.7	t[1/]	–	0.3	3.4
Proposed – Comparison Portion for Alternative 2C	0.2	1.6	t[1/]	–	0.5	0.2
Alternative 2C	–	0.1	–	–	t[1/]	–

1/ Value is les than 0.1 acre.

Segment 3

Segment 3, as proposed, would link the Creston and Anticline Substations in southeast Wyoming with two 500-kV circuits on one structure. One circuit would be operated at 230 kV during the initial phase of the Project. Its total proposed length between those two substations is 56.5 miles. Sixty-nine acres of the construction of the Anticline and Creston Substations are attributed to Segment 3. Segment 3 would also link the Anticline and Jim Bridger Substations with a 4.3-mile 230-kV line and a 5.5-mile 345-kV line and includes the 10-acre expansion of the Jim Bridger 345-kV Substation. There are no alternatives proposed along this segment (see Appendix A, Figure A-4).

The Analysis Area for Segment 3 consisted of approximately 6,993 acres of mapped vegetation, which included 134 acres (1.9 percent) of wetland and riparian areas. The primary wetland types present are herbaceous wetlands and shrub riparian areas.

Construction

The impacts from construction of the Proposed Route in Segment 3 are presented in Table 3.9-4. About 4.7 acres of wetlands and 8.0 acres of riparian areas would be affected by construction. Most of the impacts would occur from construction of structure pads and new access roads. Most of the wetland impacts would occur in herbaceous wetlands and all of the riparian impacts would occur in shrub riparian areas.

Table 3.9-4. Wetland/Riparian Impacts for Segment 3 Proposed Route

Segment/ Alternative	Construction Impacts to Wetlands (acres)	Construction Impacts to Riparian (acres)	Operations Impacts to Wetlands (acres)		Operations Impacts to Riparian (acres)	
			Due to Operations Facilities	Due to ROW Maintenance in Forests	Due to Operations Facilities	Due to ROW Maintenance in Forests
Proposed Segment 3 – Total Length	4.7	8.0	0.9	–	1.3	–

Operations

The impacts from operations and maintenance of the Proposed Route in Segment 3 are presented in Table 3.9-4. About 0.9 acre of wetlands and 1.3 acres of riparian areas would be occupied by operations facilities. Impacts from operations facilities would mostly occur from structure pads and new or improved access roads. Most of the wetland impacts would occur in herbaceous wetlands and shrub riparian areas. No impacts to forested wetlands or riparian areas would occur during operations along this segment.

Segment 4

Segment 4, as proposed, would link the Anticline Substation near the Jim Bridger Power Plant in southwestern Wyoming with the Populus Substation in Idaho with two 500-kV circuits on one structure. Its total proposed length is 203 miles. Eighty-nine acres of the construction of the Anticline Substation and the expansion of the Populus Substation and 1.5 acres for three regeneration sites are attributed to Segment 4. It has six Route Alternatives in the middle portion of its route but the first 52 miles to the east and the last 61 miles to the west (in Idaho) do not have any Route Alternatives. The middle section of the Proposed Route is 90.2 miles long, and its Route Alternatives vary from 85 to 102 miles long. These alternatives were proposed by the Wyoming Governor's office (4A, paralleling the existing 345-kV lines throughout); by the BLM Kemmerer FO (4B through 4E, including edits from various cooperating agencies), with the intent to avoid impacts to cultural resources to the extent practical; and by the Proponents (4F, attempting to avoid impacts to cultural resources while still remaining north of the existing lines) (see Appendix A, Figures A-5 and A-6).

The Analysis Area for Segment 4 consisted of approximately 52,938 acres of mapped vegetation, which included 1,416 acres (2.7 percent) of wetland and riparian areas. Approximately 9 acres of wetlands and riparian areas that were mapped were located on the Caribou-Targhee NF. The primary wetland types present are herbaceous wetlands and shrub riparian areas. This segment would make several crossings of broad irrigated and sub-irrigated valleys associated primarily with the Bear River as well as some other smaller streams. Much of the valley floor is mapped as a complex of herbaceous wetlands and riparian areas, and the length of the crossings of these complexes ranges from about 0.5 mile to several miles.

The Caribou-Targhee NF has identified AIZs associated with many of the stream segments on the NF. Streams are buffered by set distances depending on the stream

type and limit development in these buffer areas to protect streams from impacts such as erosion, sedimentation, temperature increases, and other water quality–related issues. The Proposed Route would impact AIZs on 13 streams at 52 locations.

Construction

The impacts from construction of the Proposed Route and Route Alternatives in Segment 4 are presented in Table 3.9-5. About 45.2 acres of wetlands and 20.1 acres of riparian areas would be affected by construction of the Proposed Route. Most of the impacts would occur from construction of structure pads, new access roads, and improvements made to existing access roads. Most of the wetland impacts would occur in herbaceous wetlands and most of the riparian impacts would occur in shrub riparian areas. Construction would affect 1.8 acres of forested wetlands and 1.9 acres of forested riparian areas.

Table 3.9-5. Comparison of Wetland/Riparian and AIZ Impacts for Segment 4 Proposed Route and Alternatives 4A through 4F.

Segment/ Alternative	Construction Impacts to Wetlands (acres)	Construction Impacts to Riparian (acres)	Operations Impacts to Wetlands (acres)		Operations Impacts to Riparian (acres)	
			Due to Operations Facilities	Due to ROW Maintenance in Forests	Due to Operations Facilities	Due to ROW Maintenance in Forests
Proposed Segment 4 – Total Length	45.2	20.1	9.1	1.8	3.9	1.6
Proposed – Comparison Portion for Alternatives 4A,B,C,D,E, F	10.1	6.5	2.0	0.8	0.9	0.3
Alternative 4A	28.0	27.5	4.2	0.2	2.4	2.5
Alternative 4B	21.6	21.5	2.3	–	1.6	0.6
Alternative 4C	14.9	21.4	1.6	–	1.4	0.6
Alternative 4D	18.9	21.0	2.5	–	1.6	0.6
Alternative 4E	15.3	20.8	1.8	–	1.4	0.6
Alternative 4F	16.7	26.3	2.5	0.8	1.7	2.6

Approximately 1.2 acres of wetlands and riparian areas would be impacted by construction activities on the Proposed Route on the Caribou-Targhee NF. The Proposed Route would cross the AIZ of seven streams on Caribou-Targhee NF. With the application of the SWPPP and the Reclamation, Revegetation, and Maintenance Plan, construction of Segment 4 within Caribou-Targhee NF is not expected to result in a reduction or loss of function for the AIZ streams within the Project area. Site-specific crossing plans and measures to mitigate impacts would be submitted to the Caribou-Targhee NF for approval prior to construction in these areas. Approximately 9.6 acres of AIZs on the Caribou-Targhee NF would be impacted on the Proposed Route by construction activities.

All of the alternatives would have greater impacts to wetlands and riparian areas than the comparison portions of the Proposed Route. Alternative 4A would have the most

construction-related impacts to wetland areas, while Alternatives 4A and 4F would have the most construction-related impacts to riparian areas.

Operations

The impacts from operations and maintenance of the Proposed Route and Route Alternatives in Segment 4 are presented in Table 3.9-5. About 9.1 acres of wetlands and 3.9 acres of riparian areas would be occupied by operations facilities on the Proposed Route, of which approximately 0.2 acre of impact would occur on the Caribou-Targhee NF. Operations facilities affecting wetlands and riparian areas would include structure pads and new and improved access roads. ROW maintenance would convert 1.8 acres of forested wetlands to herbaceous or shrub wetland types, and 1.5 acres of forest riparian areas to herbaceous or shrub riparian areas on the Proposed Route. Most of the operations impacts would occur in herbaceous wetlands and forested riparian areas. Approximately 3 acres of AIZs on the Caribou-Targhee NF would be impacted on the Proposed Route by operations and maintenance activities.

Segment 5

Segment 5, as proposed, would link the Populus and Borah Substations with a 54.6-mile single-circuit 500-kV line. Forty-four acres of the expansion of the Populus and Borah Substations are attributed to Segment 5. There are five Route Alternatives including two proposed by the BLM to avoid the Deep Creek Mountains (5A and 5B; 8 miles and 19 miles longer than the comparison portion of the Proposed Route), one preferred by Power County that crosses the Fort Hall Indian Reservation (5C; 6 miles shorter than the comparison portion of the Proposed Route), one originally proposed by the Proponents (5D; 2 miles shorter than the comparison portion of the Proposed Route but located within more agricultural lands), and one proposed by Power County as an alternative approach to the Borah Substation (5E) (see Appendix A, Figure A-7).

The Analysis Area for Segment 5 consisted of approximately 20,796 acres of mapped vegetation, which included 1,416 acres (2.7 percent) of wetland and riparian areas. Riparian shrub areas are the most abundant type present.

Construction

The impacts from construction of the Proposed Route and Route Alternatives in Segment 5 are presented in Table 3.9-6. About 3.8 acres of wetlands and 5.9 acres of riparian areas would be affected by construction of the Proposed Route, resulting mostly from construction of structure pads and new and improved roads. Most of the wetland impacts would occur in herbaceous and mixed wetlands and most of the riparian impacts would occur in shrub riparian areas. Construction would not affect any forested wetlands but would affect a combined total of 0.2 acre of forested riparian areas.

Alternatives 5A and 5B would have fewer wetland and riparian impacts compared to the comparison portion of the Proposed Route. Alternative 5C would impact more wetlands and riparian areas compared to the comparison portion of the Proposed Route. Alternative 5D would have more than twice as many impacts as the comparison portion

Table 3.9-6. Comparison of Wetland/Riparian Impacts for Segment 5 Proposed Route and Alternatives 5A through 5E

Segment/ Alternative	Construction Impacts to Wetlands (acres)	Construction Impacts to Riparian (acres)	Operations Impacts to Wetlands (acres)		Operations Impacts to Riparian (acres)	
			Due to Operations Facilities	Due to ROW Maintenance in Forests	Due to Operations Facilities	Due to ROW Maintenance in Forests
Proposed Segment 5 – Total Length	3.8	5.9	0.3	–	0.6	0.1
Proposed-Comparison Portion for Alternatives 5A, 5B	2.8	1.8	0.2	–	t[1/]	0.1
Alternative 5A	0.2	0.8	t[1/]	–	0.2	0.4
Alternative 5B	0.1	1.4	t[1/]	–	0.2	1.0
Proposed-Comparison Portion for Alternative 5C	1.3	2.3	t[1/]	–	0.5	–
Alternative 5C	3.5	2.7	t[1/]	–	0.1	1.3
Proposed – Comparison Portion for Alternative 5D	1.1	3.4	t[1/]	–	0.5	–
Alternative 5D	2.6	7.5	t[1/]	2.5	0.2	5.5
Proposed – Comparison Portion for Alternative 5-E	–	1.1	–	–	t[1/]	–
Alternative 5E	–	0.1	–	–	t[1/]	–

1/ Value is less than 0.1 acre.

of the Proposed Route for construction-related impacts. Alternative 5E and the comparison portion of the Proposed Route would not affect wetlands; however, 5E would have fewer impacts to riparian areas from construction than the comparison portion.

Operations

The impacts from operations and maintenance of the Segment 5 Proposed Route and Route Alternatives are presented in Table 3.9-6. About 0.3 acre of wetlands and 0.6 acre of riparian areas would be occupied by operations facilities on the Proposed Route. Impacts would mostly result from new and improved access roads. The wetland impacts would occur in herbaceous, shrub, and mixed wetlands and most of the riparian impacts would occur in herbaceous and shrub riparian areas. Operations facilities and ROW clearing would not affect any forested wetlands but would affect 0.1 acre of forested riparian areas.

Segment 6

Segment 6 is an existing transmission line linking the Borah and Midpoint Substations; it is now operated at 345 kV but would be changed to operate at 500 kV. This segment has no Route Alternatives. Existing support structures would be used and impacts would be limited to within approximately one-quarter mile from each substation to allow for moving the entry point into the substation to the new 500-kV bay. Thirty-one acres of the expansion of the Borah and Midpoint Substations are attributed to Segment 6. Changes in the two substations would allow it to be operated at 500 kV (see Appendix A, Figure A-8).

Segment 7

Segment 7, as proposed, would link the Populus and Cedar Hill Substations with a 118.1-mile single-circuit 500-kV line. Forty-two acres of the expansion of the Populus and the construction of the Cedar Hill Substations and 1 acre for two regeneration sites are attributed to Segment 7. In addition to the Proposed Route, which is principally on private lands, Route Alternatives have been proposed by the BLM to avoid the Deep Creek Mountains (7A and 7B; which are 5 miles and 11 miles longer than the comparison portion of the Proposed Route), by local landowners (7C, 7D, 7E, 7F, and 7G, which all represent minor adjustments proposed to address local issues), by local landowners to avoid private agricultural lands (7I or the State Line Route, which is 55 miles longer than the Proposed Route and would require 0.5 acre for an additional regeneration site), and by the Proponents to avoid the State Line Route (7H, which is 10 miles longer than the Proposed Route). Alternative 7J, which is a variant of the State Line Route also proposed by local landowners, would not terminate at the Cedar Hill Substation. This alternative, referred to as the Rogerson Alternative, would require a different substation be constructed near a 345-kV existing transmission line (approximately 24 miles southwest of the Cedar Hill Substation; see Appendix A, Figure A-9). The tables and discussion in this document compare 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

The Analysis Area for Segment 7 consisted of approximately 53,365 acres of mapped vegetation, which included 675 acres (1.3 percent) of wetland and riparian areas. Approximately 260 acres of wetlands and riparian areas that were mapped were located on the Sawtooth NF. The most common types present are herbaceous wetland and riparian.

The Sawtooth NF has identified RCZs associated with many of the stream segments on the NF. Streams are buffered by set distances depending on the stream type and limit development in these buffer areas to protect streams from impacts such as erosion, sedimentation, temperature increases, and other water quality–related issues. The Proposed Route and Route Alternatives would impact RCZs in varying degrees from two crossings on Alternative 7E to 194 crossings of RCZs on Alternative 7H.

Construction

The impacts from construction of the Segment 7 Proposed Route and Route Alternatives are presented in Table 3.9-7. About 3.4 acres of wetlands and 4.6 acres of riparian areas would be affected by construction. The wetland impacts would occur in herbaceous, shrub, and mixed wetlands and most of the riparian impacts would occur in herbaceous and mixed riparian areas. Of the streams on the Sawtooth NF that have identified RCZs, the Proposed Route would cross 27 of them. Approximately 22 acres of RCZs would be impacted by the Proposed Route, as presented in Table 3.9-7.

Alternative 7A would result in more impacts to wetland and riparian areas, while Alternative 7B would result in fewer impacts to wetlands and riparian areas than the comparison portion of the Proposed Route. Alternatives 7C through 7G and their corresponding portions of the Proposed Route would have no or minimal wetland and riparian impacts. Alternative 7I would have more wetland and riparian impacts than Alternative 7H, and both would have more impacts than the comparison portion of the Proposed Route. Alternative 7J would have more wetland and riparian impacts than the comparison portion of the Proposed Route; however, due to the routing of Alternative 7J in relation to the Proposed Routes of Segments 7 and 9, it cannot be directly compared with the Proposed Route of Segment 7, as can the other alternatives for this segment. Alternative 7E would have the fewest crossings of RCZs with two, whereas Alternatives 7H and 7I would have the most with 194 and 179 crossings, respectively.

Operations

The impacts from operations and maintenance of Segment 7 Proposed Route and Route Alternatives are presented in Table 3.9-7. About 0.1 acre of wetlands and 0.4 acre of riparian areas would be occupied by operations facilities along the Proposed Route of Segment 7. Operations facilities affecting wetlands and riparian areas would include structure pads and new and improved access roads. Most of the impacts would occur in shrub wetlands and herbaceous riparian areas. ROW maintenance would not affect any forested wetland or forested riparian areas; however, ROW maintenance would impact these areas along Alternatives 7A, 7H, 7I, and 7J. Operations impacts in RCZs range from 0.1 acre in Alternative 7E to 40 acres in Alternative 7I.

Table 3.9-7. Comparison of Wetland/Riparian and RCZ Impacts for Segment 7 Proposed Route and Alternatives 7A through 7J

Segment/ Alternative	Construction Impacts to Wetlands (acres)	Construction Impacts to Riparian (acres)	Construction Impacts to RCZs on Sawtooth NF (acres)	Operations Impacts to Wetlands (acres)		Operations Impacts to Riparian (acres)	
				Due to Operations Facilities	Due to ROW Maintenance in Forests	Due to Operations Facilities	Due to ROW Maintenance in Forests
Proposed Segment 7 – Total Length	3.4	4.6	22.2	0.1	–	0.4	–
Proposed – Comparison Portion for Alternative 7A,7B	1.3	2.2	–	–	–	0.1	–
Alternative 7A	2.2	2.5	19.6	0.3	–	0.3	0.4
Alternative 7B	–	1.2	19.5	–	–	0.2	–
Proposed – Comparison Portion for Alternative 7C	t[1/]	t[1/]	–	t[1/]	–	t[1/]	–
Alternative 7C	–	–	–	–	–	–	–
Proposed – Comparison Portion for Alternative 7-D	1.1	1.9	–	t[1/]	–	t[1/]	–
Alternative 7-D	1.1	1.8	–	t[1/]	–	t[1/]	–
Proposed – Comparison Portion for Alternative 7E	–	–	4.6	–	–	–	–
Alternative 7E	–	–	4.5	–	–	–	–
Proposed – Comparison Portion for Alternative 7F	0.4	t[1/]	20.8	t[1/]	–	t[1/]	–
Alternative 7F	–	t[1/]	10.3	–	–	t[1/]	–
Proposed – Comparison Portion for Alternative 7G	t[1/]	–	–	t[1/]	–	–	–
Alternative 7G	t[1/]	0.8	–	t[1/]	–	–	–
Proposed – Comparison Portion for Alternative 7H, 7I	3.4	4.6	22.2	0.1	–	0.4	–
Alternative 7H	5.4	4.5	188.5	0.4	–	0.8	1.4
Alternative 7I	12.3	13.2	168.0	1.0	3.2	2.4	3.5
Proposed – Comparison Portion 7/9 for Alt. 7J[2/]	3.6	4.6	22.2	0.1	–	0.4	–
Alternative 7J[2/]	9.5	11.0	159.2	1.1	–	2.3	1.4

1/ Value is less than 0.1 acre.

2/ Alternative 7J connects with Segment 9 approximately 25.8 miles west of the proposed Cedar Hill Substation, which is the western terminus of Segment 7 and the beginning point for Segment 9. The table above compares 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

Segment 8

Segment 8, as proposed, would link the Midpoint and Hemingway Substations. This 131-mile single-circuit 500-kV transmission line would stay north of the Snake River until crossing through the SRBOP parallel to an existing 500-kV transmission line before ending at the Hemingway Substation. Thirteen acres of the expansion of the Midpoint Substation and 0.5 acre for a regeneration site are attributed to Segment 8. There are five Route Alternatives: 8A, which follows the WWE corridor but crosses the Snake River and I-84 twice (while the Proposed Route would stay north of this area); 8B and 8C, which represent the old routes originally proposed by the Proponents but that have now been changed to avoid the cities of Kuna and Mayfield, respectively; 8D, which represents a small revision involving a rebuild of the existing transmission line to move both away from the National Guard Maneuver Area; and 8E, which was proposed by the BLM in order to avoid crossing the Halverson Bar nonmotorized portion of the Guffey Butte-Black Butte Historical Area (see Appendix A, Figure A-10).

The Analysis Area for Segment 8 consisted of approximately 30,000 acres of mapped vegetation, which included 147 acres (0.5 percent) of wetland and riparian areas. The most common types present are herbaceous wetland and shrub riparian areas.

Construction

The impacts from construction of the Segment 8 Proposed Route and Route Alternatives are presented in Table 3.9-8. About 3.3 acres of wetlands and 1.4 acres of riparian areas would be affected by construction. Most of the wetland impacts would occur in herbaceous wetlands and most of the riparian impacts would occur in herbaceous riparian areas. Construction would not affect any forested wetlands but would affect about 0.4 acre of forested riparian areas.

Table 3.9-8. Comparison of Wetland/Riparian Impacts for Segment 8 Proposed Route and Alternatives 8A through 8E

Segment/ Alternative	Construction Impacts to Wetlands (acres)	Construction Impacts to Riparian (acres)	Operations Impacts to Wetlands (acres)		Operations Impacts to Riparian (acres)	
			Due to Operations Facilities	Due to ROW Maintenance in Forests	Due to Operations Facilities	Due to ROW Maintenance in Forests
Proposed Segment 8 – Total Length	3.3	1.4	0.3	–	0.4	0.3
Proposed – Comparison Portion for Alternative 8A	1.6	0.5	0.1	–	t[1/]	0.3
Alternative 8A	0.4	6.0	0.2	–	0.2	5.5
Proposed – Comparison Portion for Alternative 8B	–	0.7	–	–	0.2	–
Alternative 8B	5.8	1.6	t[1/]	–	0.2	0.4

Table 3.9-8. Comparison of Wetland/Riparian Impacts for Segment 8 Proposed Route and Alternatives 8A through 8E (continued)

Segment/ Alternative	Construction Impacts to Wetlands (acres)	Construction Impacts to Riparian (acres)	Operations Impacts to Wetlands (acres)		Operations Impacts to Riparian (acres)	
			Due to Operations Facilities	Due to ROW Maintenance in Forests	Due to Operations Facilities	Due to ROW Maintenance in Forests
Proposed – Comparison Portion for Alternative 8C	–	0.1	–	–	t[1/]	–
Alternative 8C	–	t[1/]	–	–	t[1/]	–
Proposed – Comparison Portion for Alternative 8D	–	–	–	–	–	–
Alternative 8D	–	–	–	–	–	–
Proposed – Comparison Portion for Alternative 8E	–	–	–	–	–	–
Alternative 8E	–	0.2	–	–	–	–

1/ Value is less than 0.1 acre.

Alternative 8A would have fewer impacts to wetlands but more impacts to riparian areas than the comparison portion of the Proposed Route. Alternative 8B would have more impacts than the corresponding portion of the Proposed Route to both wetlands and riparian areas. Alternative 8C would have no impacts to wetlands and only minor impacts to riparian areas. No impacts to wetlands or riparian areas would occur along Alternative 8D and the comparison portion of the Proposed Route, while Alternative 8E would have slightly more impacts to riparian areas than the comparison portion of the Proposed Route.

Operations

The impacts from operations and maintenance of Segment 8 Proposed Route and Route Alternatives are presented in Table 3.9-8. About 0.3 acre of wetlands and 0.4 acres of riparian areas would be occupied by operations facilities along the Proposed Route. Operations facilities affecting wetlands and riparian areas would primarily include structure pads; however, some impacts would occur from new and improved access roads. Most of the impacts would occur in herbaceous wetlands and riparian areas. ROW maintenance would convert 0.3 acre of forested riparian areas to herbaceous or shrub riparian areas along the Proposed Route.

Segment 9

Segment 9, as proposed, would link the Cedar Hill and Hemingway Substations with a 161.7 mile single-circuit 500-kV transmission line which skirts the Jarbidge and Owyhee Military Operating Areas to the north, then follows the WWE corridor just north of the Saylor Creek Air Force Range, passing through Owyhee County before entering into the Hemingway Substation. Fifteen acres of the construction of the Cedar Hill Substation

and 1 acre for two regeneration sites are attributed to Segment 9. There are eight Route Alternatives proposed, including 9A, which was the Proponents' Proposed Route until moving to avoid the Hollister area; 9B, which is being considered by the BLM because it follows the WWE corridor and parallels existing utility corridors; 9C, which was the Proponents' Proposed Route until moving to avoid the Castleford area; and 9D and 9E, proposed by the Owyhee County Task Force, that cross more public lands north and south of the Proposed Route, respectively, than the Proposed Route. Most of Alternative 9D would be within the SRBOP. Alternatives 9F, 9G, and 9H were proposed to avoid crossing the nonmotorized area south of C.J. Strike Reservoir. Alternatives 9G and 9H provide an alternate route location south of Alternative 8E (see Appendix A, Figure A-11).

The Analysis Area for Segment 9 consisted of approximately 43,274 acres of mapped vegetation, which included 119 acres (0.3 percent) of wetland and riparian areas. The most common types present are shrub riparian and mixed riparian areas.

Construction

The impacts from construction of the Segment 9 Proposed Route and Route Alternatives are presented in Table 3.9-9. About 0.8 acre of wetlands and 2.4 acres of riparian areas would be affected by construction of the Proposed Route. Most of the impacts would occur from construction of structure pads and access roads. Most of the

Table 3.9-9. Comparison of Impacts for Segment 9 Proposed Route and Alternatives 9A through 9H

Segment/ Alternative	Construction Impacts to Wetlands (acres)	Construction Impacts to Riparian (acres)	Operations Impacts to Wetlands (acres)		Operations Impacts to Riparian (acres)	
			Due to Operations Facilities	Due to ROW Maintenance in Forests	Due to Operations Facilities	Due to ROW Maintenance in Forests
Proposed Segment 9 – Total Length	0.8	2.4	0.3	–	0.6	t[1/]
Proposed– Comparison Portion for Alternative 9A	0.3	t[1/]	–	–	t[1/]	–
Alternative 9A	–	0.3	–	–	t[1/]	–
Proposed– Comparison Portion for Alternative 9B	–	0.3	–	–	t[1/]	–
Alternative 9B	–	0.5	–	–	t[1/]	0.3
Proposed– Comparison Portion for Alternative 9C	–	0.2	–	–	t[1/]	–
Alternative 9C	–	–	–	–	–	–

Table 3.9-9. Comparison of Impacts for Segment 9 Proposed Route and Alternatives 9A through 9H (continued)

Segment/ Alternative	Construction Impacts to Wetlands (acres)	Construction Impacts to Riparian (acres)	Operations Impacts to Wetlands (acres)		Operations Impacts to Riparian (acres)	
			Due to Operations Facilities	Due to ROW Maintenance in Forests	Due to Operations Facilities	Due to ROW Maintenance in Forests
Proposed–Comparison Portion for Alternatives 9D through 9H	0.6	2.1	0.3	–	0.6	–
Alternative 9D	0.7	1.8	t[1/]	–	t[1/]	–
Alternative 9E	0.8	1.4	0.1	–	0.1	–
Alternative 9F	1.3	4.7	0.3	–	0.3	–
Alternative 9G	1.1	2.4	0.2	–	t[1/]	–
Alternative 9H	1.8	4.5	0.5	–	0.3	–

1/ Value is less than 0.1 acre.

wetland impacts would occur in herbaceous wetlands and most of the riparian impacts would occur in shrub and mixed riparian areas. Construction and ROW clearing would not affect any forested wetlands and only minor portions of forested riparian areas.

Alternatives 9A and 9C and the corresponding comparison portions of the Proposed Route would have little or no impacts to wetlands, but Alternative 9A would result in greater impacts to riparian areas. Alternative 9B would not impact wetlands but would impact about 0.2 acre more riparian areas than the comparison portion of the Proposed Route. Alternatives 9D through 9H would have larger impacts to wetlands than the comparison portion of the Proposed Route. Two alternatives (9D and 9E) would result in slightly less impacts to riparian areas than the comparison portion of the Proposed Route, whereas the other three alternatives (9F through 9H) would have up to twice the impact.

Operations

The impacts from construction of Segment 9 Proposed Route and Route Alternatives are presented in Table 3.9-9. About 0.3 acre of wetlands and 0.6 acre of riparian areas along the Proposed Route would be impacted during operations. Operations facilities affecting wetlands and riparian areas would include structure pads and new and improved access roads. Most of the impacts would occur to shrub wetland and shrub riparian areas. ROW maintenance would not affect forested wetland and only minor amounts of riparian areas along the Proposed Route.

Segment 10

Segment 10, as proposed, would link the Cedar Hill and Midpoint Substations with a 33.6-mile single-circuit 500-kV line, following a WWE corridor for most of its distance. Twenty-eight acres of the expansion of the Midpoint Substation and of the construction of the Cedar Hill Substation are attributed to Segment 10. There are no Route Alternatives proposed along this segment (see Appendix A, Figure A-12).

The Analysis Area for Segment 10 consisted of approximately 4,224 acres of mapped vegetation, which included 2 acres (0.04 percent) of wetland and riparian areas.

Construction/Operations

A total of 0.1 acre of shrub riparian area would be impacted by construction. There would be no direct impact from operations.

3.9.2.4 Design Variation

A Design Variation is being considered that would consist of constructing two single-circuit lines in Segments 2 through 4 instead of a single double-circuit line (which is the design assessed above). The disturbance footprint of the two single-circuit towers is greater than that of the double-circuit tower, in part because the requested ROW would be wider, but also because helicopter-assisted construction could be implemented in these areas due to the lighter weight of the towers, which would require additional fly yards. The additional ROW space and the fly yards would cause additional temporary disturbance during construction. Across Segments 2, 3, and 4, the additional disturbance of the single-circuit tower alternative would range from 35 to 40 percent (53.7 acres) greater than the double-circuit tower disturbance. The two single circuits would require more ground disturbance, but would be designed and constructed to the same standards as the Proposed Action. Impacts from ROW maintenance to forested wetlands and riparian areas would increase by about 15 percent (0.6 acres). The impacts from construction of the Segment 2, 3, and 4 Proposed Routes and Route Alternatives with impacts broken down by wetland and riparian type, are presented in Table D.9-3 of Appendix D.

3.9.2.5 Structure Variation

The proposed guyed Structure Variation would add four guy wires about 140 feet long from a point about 100 feet up in each tower to four guy anchors spaced in a square around the tower (Appendix B, Figure B-6). This would not change the amount of disturbance during construction or operations appreciably. Extra care would be needed where towers are near wetland and riparian areas in order to avoid placing guy wires in these areas. Self-supporting lattice towers would be used if wetland or riparian impacts could not be avoided with the use of the guy wires. Therefore, there is no appreciable difference in impact on wetlands from the use of this Structure Variation when compared to the use of self-supporting lattice towers.

3.9.2.6 Schedule Variation

The Schedule Variation uses the two single-circuit design variation described above but extends construction over a longer time frame. Initially only one of the eventual two single-circuit lines would be constructed with the second to be constructed at a later date. The Schedule Variation proposes that the first single-circuit transmission line in Segments 2, 3, and 4 would be built as soon as a ROW grant is issued, but that the second line would not begin construction until late 2018. This would mean nearly 2 years between the end of construction for the first line and beginning of construction for the second line. Any staging areas and fly yards that had been used for the first stage would have been re-vegetated after construction was complete and would have to

be cleared again. There would be two sets of construction disturbances adding movement, noise, and dust to the area of construction in two instances in any given area. The area of impacts to wetlands and riparian would be similar, but some areas may be disturbed twice.

3.9.3 Mitigation Measures

To minimize or avoid impacts on wetlands, the Proponents have committed to EPMs that would be implemented Project-wide as outlined in this section and in Appendix C. In addition to the compensatory mitigation required by the USACE (discussed in Section 3.9.2.2 and detailed in Appendix C-6) and the Proponents' EPMs, the Agencies have identified the following mitigation measures to further protect wetlands and riparian areas during construction and operations:

WET-1 Impacts on wetland and riparian areas shall be avoided unless physically or economically infeasible. Land management agencies' plans (RMPs and Forest Plans) that have standards, guidelines, stipulations, or avoidance buffers will be adhered to. Where these do not exist, Inland Fish Strategy (INFISH) buffers for fish-bearing and nonfish-bearing waters and wetlands will be followed.

WET-2 Wetland delineations will be performed prior to construction to support CWA Section 404 permitting and to minimize Project impacts. The delineation will identify both wetland and non-wetland waters of the United States that would be affected by the Project.

WET-4 To meet USACE requirements for CWA 404 permitting, the Proponents must submit a plan for mitigation and full compensation for all losses of waters of the United States. This plan must be approved by the USACE. The framework for this plan is included in the Draft EIS (Appendix C-6) and must be fully detailed for the Final EIS.

The following mitigation measure has been proposed by the Agencies and adopted by the Proponents:

WET-3 Where impacts on wetlands are not avoidable, site-specific crossing plans and measures to mitigate impacts shall be submitted to the appropriate regulatory agency, as well as the land managing agency. The Proponents shall apply directly to the appropriate permitting agency (USACE and/or State agency) for approval.

3.10 GENERAL WILDLIFE AND FISH

This section describes the potential impacts from the Proposed Route and Route Alternatives on the terrestrial and aquatic environments during construction, operations, and decommissioning. The Proposed Route and Alternatives would pass through multiple habitat types currently utilized by wildlife species (Appendix E, Figures E.10-1 and E.10-2). Any activities that adversely affect habitat (terrestrial or aquatic) can impact the survival and reproductive success of wildlife.

3.10.1 Affected Environment

This section analyzes the potential impacts the Project's activities could have on wildlife and fish species and their habitats in general, including common, invasive, and non-special status species found in the Analysis Area. Species listed as threatened or endangered, or that are candidates for listing or proposed for listing, under the federal ESA[1], and those species listed by the BLM or Forest Service as sensitive or are Forest Service Management Indicator Species (MIS) are addressed individually in Section 3.11 – Special Status Wildlife and Fish Species. Further discussion of the habitat types referred to in this section can be found in Section 3.6 – Vegetation Communities.

This section starts with a discussion of the Analysis Area, identifies the issues that have driven the analysis, and characterizes the existing conditions across the Proposed Route and Route Alternatives in Wyoming and Idaho (and in the small areas of Nevada and Utah that would be affected by one alternative).

3.10.1.1 Analysis Area

As explained in Section 3.6 – Vegetation Communities, a remote sensing approach, in conjunction with field surveys and existing information, was used to characterize the affected environment and to analyze impacts from the Project. The BLM and Forest Service determined that a broad Analysis Area would be needed for remote sensing imagery, which could cover the Proposed Route, Route Alternatives, and their immediate area, because analysis of existing conditions and impacts was occurring at the same time that the Proposed Route and Route Alternative were being chosen and refined. This broad Analysis Area would allow for minor route alterations to occur without resulting in altered routes entering areas that lacked data from remote sensing. In addition, the Analysis Area covers both public (federal and state) and privately held lands, allowing for an early evaluation of all lands that could be impacted, regardless of ownership. The Analysis Area was augmented several times during the spring, summer, and fall of 2008 as changes were made to the Proposed Route and Route Alternatives, and as new Route Alternatives were added in response to issues raised during scoping, agency meetings, and landowner meetings.

The Analysis Area runs generally east-west across the Intermountain West, primarily through sagebrush-dominated shrublands, most of which have been disturbed or altered. Following shrublands, the other habitat types encountered by the Proposed Route (in

[1] P.L. 93-205, December 28, 1973, 81 Stat. 884, as amended, known as the Endangered Species Act of 1973 (16 U.S.C. 35 §§1531-1544).

descending order) are: grasslands, agriculture or otherwise disturbed areas, forest and woodland, wetlands and riparian areas, and other habitat types (developed lands and other undefined habitat types).

The Analysis Area, for the purposes of terrestrial wildlife habitat, was set as a 1-mile-wide area centered on the Proposed Route, the Route Alternatives, and access roads (0.5-mile on either side of the centerline of each route or road), and a 0.5-mile buffer around all fly yards, laydown yards, staging areas, and tensioning/splicing sites (see Section 3.1 – Introduction). This distance was chosen so that indirect effects to wildlife would be captured. While ground clearing and the transmission line itself would take up only a small percentage of the Analysis Area (approximately 40,300 acres of the 16,082,500-acre Analysis Area cleared during construction, or 0.3 percent), it is necessary to utilize an Analysis Area that extends beyond the limits of direct impacts in order to capture the areas that may experience indirect impacts. Direct impacts to habitat and to species living in the immediate area of construction would occur at the actual footprint of disturbance during construction, which includes the clearing of vegetation and other activities at construction areas for each transmission structure, access roads, laydown yards, fly yards, and tensioning and splicing areas. Indirect impacts would extend beyond the location of construction and operations activities and include noise and edge effects (see Construction under Section 3.10.2.2 for a discussion of edge effects). Construction- and operations-related noise, including from helicopters, is expected to attenuate below annoyance levels in less than 0.5 mile (see Section 3.23 – Noise). This buffer would also include edge effects caused by vegetation removal. Therefore, the Analysis Area would encompass most indirect effects to wildlife.

Some species could experience indirect impacts outside this buffer due to their sensitivity to disturbance, such as big game, raptors, and sage- and sharp-tailed grouse. Grouse are addressed in Section 3.11 – Special Status Wildlife and Fish Species. The Analysis Area was expanded to include additional indirect impacts to raptors and big game. One-mile buffers around raptor nests were included in the Analysis Area in their entirety if any of these 1-mile raptor buffers overlapped with the 0.5-mile buffer around the centerline of the Proposed Route, Route Alternatives, or other Project features. In addition, mapped areas of big game winter range[2] and parturition areas (where ungulate species give birth and hide their young) as defined by state and federal agencies were included in the Analysis Area. If the centerline of the Proposed Route, Route Alternatives, or other Project features crossed through any portion of designated big game winter range or parturition areas, the entire mapped area was included in the Analysis Area. Table 3.10-1 summarizes the Analysis Area extensions.

[2] Winter range is defined as the portion of the winter range to which a wildlife species is confined during periods of heaviest snow cover (DOE and BLM 2008).

Table 3.10-1. Extended Analysis Areas for General Wildlife (species discussed in Section 3.10.1.5)

Species	Area	Justification
Raptors	One-mile buffer around known nests	On public lands, certain activities are restricted seasonally to protect breeding raptors. Timing and buffer restrictions are generally limited to active nests.
Big Game	Mapped Winter Range	On public lands, certain activities are restricted seasonally to protect large ungulates while on winter range. Restrictions are limited to areas of known concentrations of ungulates during times determined by wildlife management agency when ungulates will likely be present
	Parturition Areas	On public lands, certain activities are restricted seasonally to protect large ungulates when the females are giving birth, usually a short period in the spring. Restrictions are limited to areas of known birthing areas during times determined by wildlife management agency when female ungulates will likely be present.

A fragmentation analysis was conducted to identify the amount of habitat fragmentation that this Project may cause. Fragment sizes were assessed in the area surrounding the Proposed Route and Route Alternatives. The areas of contiguous habitat patches surrounding the Analysis Area were measured, and their average size calculated, and it was found that the average width of existing contiguous habitat patch sizes is roughly 4 miles. Therefore, the fragmentation analysis was carried out to 4 miles on either side of the Proposed Route and Route Alternatives. This distance was chosen in order to assess a large enough area to capture the currently existing level of fragmentation, without assessing too large of an area, which would mask the effects of the Project's contribution to the area's fragmentation. Habitat beyond this distance was not considered in the analysis. The general habitat/vegetation types were based on Gap Analysis Program (GAP) analysis data, as Project-specific remote sensing and field survey data were not available for the entire 4-mile distance. The fragmentation analysis took into account roads and transmission lines both jointly and separately.

The Analysis Area for fish resources is a 1-mile-wide corridor, 0.5 mile from either side of the transmission center line along the Proposed Route and Route Alternatives. In addition, the Analysis Area includes a 500-foot-wide corridor on each side of the centerline of any improved or new access roads outside of the 1-mile corridor. It includes the stream segments crossed by the Proposed Route and its Alternatives, riparian areas within the ROW, areas adjacent to these streams, and the water reaches and fish resources downstream of these crossings that could be affected by actions that occur at these crossings. It also includes other Project-related construction areas that could affect riparian habitat and runoff of materials (e.g., sediment, nutrients, toxicants, petroleum products) into both perennial and ephemeral streams.

3.10.1.2 Issues to be Analyzed

The following wildlife-related issues were brought up by the public during public scoping (Tetra Tech 2009a), were raised by federal and state agencies during scoping and

agency discussions, or are issues that must be considered as stipulated in law or regulation.

- What the effects of Project construction and operations would be on general, non-special-status wildlife, including birds, reptiles and amphibians, and large and small mammals;
- When routing the Project, whether key wildlife habitats would be avoided;
- What the effects would be on migratory bird species;
- Whether there would be a loss or fragmentation of wildlife habitat, especially for sagebrush-obligate and forest-dependent species;
- What wildlife mortality would occur during construction;
- Whether there would be a potential for disruption of breeding and reproductive activities of raptors;
- What the effects would be on big game migration;
- What the effects would be on big game and crucial big game winter range—habitat removal and disturbance during seasonal occupancy;
- What the effects would be on big game parturition areas from habitat removal and disturbance during seasonal occupancy;
- What the potential would be for avian collision during operations and what measures would be taken to minimize this risk;
- Whether noise created during transmission line operations would affect wildlife;
- What best management practices would be used during construction and operations to protect fish resources;
- How disturbed instream habitats would be protected and restored;
- What the potential would be for electrocution of large birds during operations; and
- What the impacts would be on wildlife or wildlife habitat within an NWR, State Park, State Wildlife Management Area, or SMA on federal lands specifically managed for one or more species of wildlife?

3.10.1.3 Regulatory Framework

There are multiple federal and state regulations and planning and guidance documents that address protection of big game, raptors, and migratory birds. These include the ESA, the Bald and Golden Eagle Protection Act (Eagle Act), the Migratory Bird Treaty Act (MBTA), state Wildlife Conservation Strategies, species-specific Conservation Plans, and various BLM and Forest Service land management plans. Those regulations that only apply to special status species are discussed further in Section 3.11 – Special Status Wildlife and Fish Species.

Federal Regulations

The MBTA[3] was enacted in 1918 in order to put an end to the commercial trade of migratory birds and their feathers. This Act decrees that all migratory birds and their parts (including eggs, nests, and feathers) are fully protected (USFWS 2002a). Under this Act, it is unlawful to pursue, hunt, take, capture, kill, possess, offer to or sell, barter, purchase, deliver, transport, or receive any migratory birds (including parts, nests, eggs or other product, manufactured or not). As there is no permitting scheme for the incidental take of migratory birds during otherwise lawful activities, developments must attempt to minimize potential impacts to avian species. EO 13186 (January 10, 2001; Responsibilities of Federal Agencies to Protect Migratory Birds) also directs federal agencies to, among other things, ensure that environmental analyses of federal actions required by the NEPA or other established environmental review processes evaluate the effects of actions and agency plans on migratory birds, with emphasis on species of concern. This includes developing and implementing a Memorandum of Understanding (MOU) with the USFWS promoting the conservation of migratory bird populations. In order to guide conformance to the MBTA, the BLM has drafted interim management guidance (BLM 2007d). This instruction memorandum outlines analyses that should be carried out in order to assess impacts to migratory birds, particularly Species of Conservation Concern and Game Birds Below Desired Condition. An MOU between the BLM and USFWS has also been released that describes a collaborative approach to conserving bird populations (BLM and USFWS 2010). The Forest Service has also developed an MOU with USFWS to promote the conservation of migratory birds (Forest Service and USFWS 2008).

The Eagle Act prohibits take, possession, selling, purchasing, bartering, or transporting of live or dead bald or golden eagles, or any parts, nests, or eggs of these birds. Under the Eagle Act, “take” includes pursuing, shooting, poisoning, wounding, killing, capturing, molesting, and disturbing. “Disturb” means “to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle; 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior; or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.” The USFWS has developed the National Bald Eagle Management Guidelines, which present general recommendations for activities that take place near bald eagle roosts and nests. These guidelines are not law, but are meant to help landowners and agencies avoid violating the Eagle Act, under which agencies, companies, and individuals can be prosecuted. On September 11, 2009, the USFWS published new guidelines and regulations specifying the conditions under which incidental take permits could be authorized under the Eagle Act (74 *Federal Register* 46836). The USFWS has since released some documents providing interim guidance for external partners on how to avoid violating the Eagle Act, including a document specifically for golden eagles (Pagel et al. 2010; USFWS 2010a). These documents describe suggestions for consultation with agencies, what analyses to conduct and include in documents, and survey protocols. In addition, the USFWS released a Biological Opinion (USFWS 2004a) in response to activities proposed in various BLM

[3] 16 U.S.C. §§ 703-712, July 3, 1918, as amended 1936, 1960, 1969, 1974, 1978, 1986, and 1989.

RMPs in Wyoming that describes various activities, mitigation guidelines, and measures meant to protect bald eagles, pursuant to Section 7 of the ESA (BLM 2003b). Although the bald eagle was delisted in 2007, the BLM is committed to using conservation measures in the Biological Opinion in Wyoming to prevent the re-listing of this species through their 6840 Manual – Special Status Species Management.

The BLM and Forest Service have developed MFPs/RMPs and Forest Plans, respectively, for federal lands under their management. These plans specify regulations and goals and include temporal and spatial restrictions for activities within areas managed to protect certain species. Restrictions on land use and recommendations outlined in these documents were used while planning the Project, particularly in regard to big game winter range; parturition areas; raptor nests; and State Wildlife Management Areas, SMAs, and other special land use designations. The Land Management Plans applicable to the Gateway West Project are listed in Section 2.2, Table 2.2-1. Tables that list the applicable stipulations from the various federal management plans, as well as whether or not the Project is in conformance with these stipulations, are found in the Administrative Record; plan amendments for instances where the Project would not be consistent with Forest Service standards or in conformance with BLM requirements are found in Appendix F, and a summarized list is found in Table 2.2-1.

There are multiple plan amendments proposed that, although not specifically related to wildlife, would result in alterations to current land management, such as changes to VRM class or allowing the line to occur outside of utility corridors, which could allow the permitting of additional projects in the future, further impacting wildlife. These changes in land management could occur at various locations along the Project, and they are discussed in the appropriate sections of this EIS. The impacts to wildlife of these land management changes is unknown at this point, because projects that might be proposed and developed as a result of these plan amendments cannot be predicted. However, they would presumably increase impacts to wildlife and habitat, with similar effects to this Project. Plan amendments that do relate specifically to wildlife are discussed in detail below.

State Regulations

Both Idaho and Wyoming have laws relating to hunting and fishing that include bag or possession limits for species and seasonal restrictions. In general, both states recognize wildlife and fish species that a) are fully protected and therefore not subject to hunting or fishing; b) may be fished for, hunted, trapped, or otherwise harvested under specific regulations, licensing, and timing restrictions; and c) may be harvested at any time by anyone in possession of a valid hunting or fishing license. In addition, both states have conducted surveys and have designated areas that are crucial to the survival of big game species (see Appendix E, Figures E.10-3 and E.10-4).

In both Wyoming and Idaho, there are specified hunting seasons for big and trophy game species (including deer, elk, moose, pronghorn, and mountain lion), waterfowl, upland game birds and mammals, and fish, during which these animals can be taken by hunters in possession of a valid state hunting license. Taking any of these animals outside the proper game management unit or outside the specified dates is prohibited and is punishable by law (State of Wyoming 2008; IDFG 2010). In addition, in Idaho,

game, song, insectivorous, rodent killing, and innocent birds are protected under Title 36, Chapter 11, Statute 36-1102, punishable with a fine and/or jail time (Idaho Legislature 2009). In Wyoming, no eagle may be taken, nor may the nest or eggs of any predacious or nonpredacious bird be taken or destroyed (Wyoming statutes 23-3-101, 23-3-108), punishable with a fine and/or jail time (Wyoming statute 23-6; State of Wyoming 2008).

Both Idaho and Wyoming have regulations and requirements controlling how water passage devices (culverts) are placed in streams. The Idaho Stream Channel Protection Act protects streams from modifications that would adversely impact their ability to provide habitat for fish and wildlife. The Idaho Department of Water Resources (IDWR) must approve in advance any work being done on continuously flowing streams. A permit from the IDWR is required before beginning any work that would alter a stream channel. Wyoming has the Wyoming Industrial Development Information and Siting Act, which has broad regulatory authority to site projects to avoid impacts to wildlife and require mitigation necessary to protect wildlife species. The Wyoming Department of Environmental Quality (WDEQ) has also designated water quality standards that apply on all except Indian lands in the state. These standards cover a broad range of issues, including maintaining water quality and habitat conditions for fish.

One Alternative, 7I, would cross slightly into Nevada, running parallel to and approximately 270 feet south of the Nevada-Idaho state line for 9.4 miles. Only a tiny percentage of the total impacted area would lie in Nevada if this alternative were chosen. Nevada has a Wildlife Action Plan, which identifies habitats and species of concern, that are at risk, or that need more research to be carried out (Wildlife Action Plan Team 2006). Nevada also has laws relating to hunting and fishing that include bag or possession limits and seasonal restrictions that are enforceable by law. There are also regulations for species that can be taken with the appropriate permit and in the appropriate season, species that can always be taken, and species that can never be taken (NDW 2009).

3.10.1.4 Methods

Multiple methods were used to determine the location of wildlife habitat within the Analysis Area. These included use of:

- Existing information provided by BLM FOs, Forest Service ranger districts and forest offices, and statewide wildlife databases;
- Remote sensing and interpretation, including a GIS model that assessed wildlife habitat based on the presence of vegetative communities and key habitat characteristics; and
- Limited aerial and ground field surveys in 2008 through 2010 (Tetra Tech 2009b, 2010c, 2010d).

Methods used to determine the level of potential effects to fish habitat and fish resources followed those used for water resources and wetlands (Sections 3.16 and 3.9, respectively). These included assessing the:

- Number of perennial streams crossed,

- Amount of riparian vegetation removed, and
- Amount of water removed from the system and the resulting downstream impacts.

Existing Information

The BLM and the Forest Service have developed databases and maps of wildlife habitat types and occurrences of individuals on public lands (e.g., BLM Southern Idaho Infrastructure Development Conflict Map). The state wildlife departments (WGFD, Idaho Department of Fish and Game [IDFG], and Nevada Department of Wildlife) also maintain databases on inventories of wildlife species and their habitats on both public and private lands. Those databases were consulted (in conjunction with field surveys for raptor nests; discussed below) to identify the known locations of big game habitats (winter, parturition, summer, and year-long ranges) and the known locations of raptor nests on both public and private lands. For big game winter range, areas considered were "winter range" and "crucial winter range" in Wyoming, "winter range" in Idaho, and "winter range" and "crucial winter range" in Nevada. These designations were used for this analysis because they have been named by the Agencies as being important to big game winter survival during periods of heavy snow. Also, they have use or timing stipulations associated with them that affect Project activities when within those designations (see Appendix I). General winter range has certain year-long stipulations related to it that restrict certain types of development. Crucial winter range is closed to physical access during winter, though an exception process exists for certain activities. Designated general and crucial winter range (Wyoming), winter range (Idaho), and general and crucial winter range (Nevada) will be referred to collectively in this document as "winter range." Other sources of existing information included interviews with federal and state agency personnel, review of published scientific literature, and review of BLM and Forest Service land management plans.

Remote Sensing

Because this Project would cross public and private lands in nearly equal quantities, the BLM decided to employ remote sensing for vegetation mapping and allowed for comparison of impacts without regard to ownership or access for surveys. Project-specific high-resolution aerial imagery of vegetation was obtained in 2008 and supplemented the NAIP photography (Tetra Tech 2009b). Ground truth transects were conducted during the imagery interpretation to improve the quality of the vegetation association interpretation.

The suitability of various wildlife habitat types from the vegetation mapping was assessed using GIS modeling, which combined appropriate vegetation associations with existing GIS biophysical parameters (such as organization of vegetation types, patch extent, slope, elevation, and vegetation cover/height). A detailed description of the remote sensing interpretation and subsequent habitat modeling effort can be found in the Vegetation and Habitat Baseline Technical Report (Tetra Tech 2009b).

Field Surveys

The BLM and Forest Service determined that raptor nest surveys were necessary along specific portions of the Proposed Route and Route Alternatives due to deficiencies in the existing databases of known nest locations. Aerial raptor nest surveys were conducted

in portions of the Twin Falls, Pocatello, Kemmerer, Rock Springs, and Rawlins BLM FOs from April 1 through April 28, 2008. Raptor species present in the Analysis Area are analyzed in this section regardless of whether they are sensitive or have special status. Special status raptors are also addressed in Section 3.11 – Special Status Wildlife and Fish Species. Ravens (*Corvus corax*) are included in the raptor discussion because of their importance as predators to many species and their tendency to increase along transmission lines (Engel et al. 1992). Seven previously unrecorded active raptor nests were identified: two active bald eagle nests, one golden eagle nest, one red-tailed hawk nest, one unidentified raptor nest, and two raven nests (Tetra Tech 2009a). Ground surveys for raptor nests were conducted along a portion of Segment 2 in the Rawlins FO on June 4 and 5, 2008. No active nests were discovered during the ground surveys, while one inactive golden eagle nest was observed. Field searches for northern goshawks (*Accipiter gentilis*) and flammulated owls (*Otus flammeolus*) were also carried out in June 2009 on the Caribou-Targhee NF, in accordance with the Caribou Forest Plan. Surveys for northern goshawks were also carried out in July 2010 on the Medicine Bow-Routt NFs, in accordance with the Medicine Bow Forest Plan. Neither of these surveys found any territorial birds or active nests.

Habitat Fragmentation

Habitat in the Analysis Area and its immediate vicinity has already been fragmented to some degree by roads, urban development, oil development, and agriculture. The Project was routed to follow these existing developments, including existing transmission lines, to the greatest extent practicable in order to limit the Project's impact on habitat fragmentation.

To assess the impact of fragmentation on habitat, the current level of fragmentation was compared to the expected level that would occur following construction. Fragmentation caused by roads, transmission lines, and both roads and transmission lines was analyzed. Fragmentation from transmission lines was analyzed separately to account for species that will readily pass under or over them. Some species, however, may avoid areas containing transmission lines, so these structures would contribute to fragmentation of their habitat. The levels of fragmentation (current and expected) were assessed within an 8-mile buffer centered along the Project's route. Because Project-specific remote sensing was not conducted out to this distance, regional GAP data were used for habitat types and locations. The current conditions were first assessed via GIS analysis, using existing developments (excluding transmission lines) and natural breaks in habitat types. Existing roads were shown on the ESRI "Streetmap" data layer, and other developed areas were retrieved using GAP data. These data were used to calculate road densities within the 8-mile-wide buffer. The data baselayer used to assess existing transmission lines was the ESRI "Powermap" data layer. Expected levels of fragmentation were assessed by adding the proposed roads to the existing road fragmentation data, and the expected transmission route to the existing transmission fragmentation data. All these data sets were then combined into one data layer, which represented the expected level of fragmentation from existing roads, developments, and transmission lines, plus the addition of the proposed roads and transmission lines. These data allowed the assessment of the number of fragments and the average

fragment size (pre- and post-construction), as well as the average change in patch number and size following construction of the Project.

3.10.1.5 Existing Conditions

Existing conditions are characterized in this section based on the number of miles that the centerline of the Proposed Route or Route Alternatives would cross through different habitat types and/or the number of acres that would be cleared of vegetation or otherwise impacted. Where species-specific information was available or developed (e.g., raptor nest information), distances to these locations from the Proposed Route's centerline are displayed. This section describes habitat types crossed by the Proposed Route centerline (habitat types crossed by the Route Alternatives are listed in Appendix D) as characterized by the Project-specific remote imagery analysis. The section goes on to use the data from BLM, FS, and statewide databases to determine the acres of designated big game winter range and parturition habitat impacted, and it concludes with a discussion of the number of raptor nests within the Analysis Area.

Habitat

Section 3.6 – Vegetation Communities discusses the miles crossed by vegetation type. The vegetation types as grouped in Section 3.6 will be grouped the same way in this section so that concerns about wildlife that use them as habitat can be summarized, because the General Wildlife section cannot address every species. In this section, they are referred to as "habitat types," rather than "vegetation types." The general habitat types used in this discussion are detailed below, while Table 3.10-2 summarizes the wildlife species expected to typically occur within each habitat type (not meant to represent sensitive or affected species; also see Appendix E, Figures E.10-1 and E.10-2). Impacts to these habitat types are discussed below in Sections 3.10.2.2 and 3.10.2.3, as they are relevant to each segment and the Project as a whole.

Table 3.10-2. Typical Wildlife Species in the Analysis Area by Habitat Type

Habitat Type (Vegetation Community as defined in Section 3.6)	Percent of Miles Crossed by Proposed Route and Route Alternatives[1/]	Common Species
Grassland *(both native and semi-natural)*	13	Pronghorn, coyote, swift fox, badger, white-tailed jackrabbit, thirteen-lined ground squirrel, black-tailed prairie dog, northern pocket gopher, olive-backed pocket mouse, western harvest mouse, meadow vole, mourning dove, northern harrier, Swainson's hawk, common nighthawk, horned lark, vesper sparrow, savannah sparrow, lark bunting, western meadowlark, Columbian sharp-tailed grouse, short-horned lizard, western skink, wandering garter snake, prairie rattlesnake, striped whipsnake, and racer

Table 3.10**-2.** Typical Wildlife Species in the Analysis Area by Habitat Type (continued)

Habitat Type (Vegetation Community as defined in Section 3.6)	Percent of Miles Crossed by Proposed Route and Route Alternatives[1/]	Common Species
Shrubland *(disturbed shrubland, sagebrush, saltbrush, greasewood, and other shrubland types)*	69	Mule deer, elk, pronghorn, coyote, Nuttall's cottontail, deer mouse, Wyoming ground squirrel, white-tailed prairie dog, sagebrush vole, Merriam's shrew, northern harrier, American kestrel, red-tailed hawk, Swainson's hawk, greater sage-grouse, Columbian sharp-tailed grouse, Say's phoebe, horned lark, black-billed magpie, sage thrasher, loggerhead shrike, green-tailed towhee, vesper sparrow, Brewer's sparrow, sage sparrow, Great Basin spadefoot toad, sagebrush lizard, short-horned lizard, western skink, wandering garter snake, striped whipsnake, racer, and Great Basin gopher snake
Agricultural Land (*including Conservation Reserve Program lands)*	10	White-tailed deer, mule deer, swift fox, black-tailed jackrabbit, northern pocket gopher, Great Basin pocket mouse, western harvest mouse, deer mouse, American kestrel, red-tailed hawk, ring-necked pheasant, common crow, horned lark, European starling, house finch, house sparrow, Columbian sharp-tailed grouse, common garter snake, and Great Basin gopher snake
Forest/Woodland (conifer, deciduous, juniper vegetation communities)	6	Elk, mule deer, bobcat, porcupine, bushy-tailed woodrat, masked shrew, least chipmunk, marmot, deer mouse, little brown bat, red-tailed hawk, northern goshawk, great-horned owl, common poorwill, broad-tailed hummingbird, three-toed woodpecker, northern flicker, Hammond's flycatcher, gray flycatcher, Cassin's finch, Steller's jay, pine siskin, scrub jay, pinyon jay, plumbeous vireo, red crossbill, chipping sparrow, yellow-rumped warbler, black-throated gray warbler, juniper titmouse, sagebrush lizard, short-horned lizard, western skink, Great Basin gopher snake, striped whipsnake, racer, and wandering garter snake
Wetlands, Riparian, and Water	2	Terrestrial – Mule deer, white-tailed deer, moose, beaver, muskrat, mink, red fox, western harvest mouse, meadow vole, western jumping mouse, American water shrew, Canada goose, mallard, canvasback, gadwall, northern harrier, sora, red-tailed hawk, eared grebe, marsh wren, yellow warbler, common yellowthroat, red-winged blackbird, western chorus frog, Great Basin spadefoot toad, northern leopard frog, sagebrush lizard, western skink, striped whipsnake, racer, wandering garter snake, and common garter snake Aquatic – Rainbow trout, Yellowstone cutthroat trout, brook trout, mountain whitefish, carp, Utah chub, longnose dace, Piute sculpin, yellow perch, walleye, smallmouth and largemouth bass, bluegill, and black crappie

Table 3.10**-2.** Typical Wildlife Species in the Analysis Area by Habitat Type (continued)

Habitat Type (Vegetation Community as defined in Section 3.6)	Percent of Miles Crossed by Proposed Route and Route Alternatives[1/]	Common Species
Developed/Disturbed Lands and Unmapped Areas	1	Few native species; typically house sparrow, European starling, rock pigeon, American crow

1/ Numbers may not sum to 100 due to rounding.
Sources: USFWS 1979, 1985, and 1993; Von Ahlefeldt et al. 1992; BLM 1994 and 2008a; Fisher et al. 2000; Sibley 2003; Stebbins 2003; National Park Service no date.

Shrublands are dominated by woody plants besides trees, in the Analysis Area usually sagebrush, saltbrush, or greasewood. This habitat type constitutes 69 percent of the miles crossed by the Proposed Route and all Route Alternatives. Healthy native shrublands are a very important habitat component for many species in the Interior West, such as sage thrasher (*Oreoscoptes montanus*), and clearing of vegetation and fragmenting of this habitat type poses a considerable threat to the reproduction and persistence of these species. The shrublands habitat type includes disturbed as well as native shrublands in the following analyses; most of the shrubland habitat type crossed by the Project has been disturbed or altered from its natural state. The different shrubland habitat types (described in Table 3.6-1) have been grouped together for analysis in this section, as impacts to the various shrubland habitat types from construction and operations would be similar. Wildlife species inhabiting specific types of shrubland (e.g., greater sage-grouse) are described in Section 3.11 – Special Status Wildlife and Fish Species).

Grasslands in the Analysis Area are most commonly semi-natural plant communities dominated by introduced grass species. (See Tetra Tech 2009b for a discussion of the methods used to define semi-natural and native grasslands.) Native grasslands (dominated by native species) are an important wildlife habitat type but are rare and decreasing within the Analysis Area. Approximately 11.3 miles of native grasslands are crossed by the Proposed Route and Route Alternative centerlines, which constitute less than 1 percent of the total Project length. Native grassland is found mostly along the Proposed Routes of Segment 1W(a) (5.0 miles) and Segment 9 (3.2 miles), and along Alternatives 9B and 9C (1.1 miles each). Native and disturbed grassland combined make up 13 percent of the miles crossed by the Proposed Route and Route Alternatives.

Agricultural lands are areas planted in crops. They are crossed by the Proposed Route of Segments 4, 5, 7, 8, 9, and 10 for a total of 113.1 miles along, and by Alternatives 1E-A; 1W-A; all alternatives for Segments 4, 5, and 9; and most alternatives for Segments 7 and 8. When the lengths of the Proposed Route and all Route Alternatives are added together, agricultural lands make up 10 percent of miles crossed. Section 3.18 – Agriculture discusses impacts within agricultural lands in greater detail. Agricultural lands can provide habitat for many wildlife species, but this habitat type is abundant in the Interior West. Also, the types of wildlife that tend to use agricultural lands are in

general not threatened or sensitive (e.g., mule deer, European starlings, red-winged blackbirds).

Forest/Woodland habitat types are dominated by trees (conifer, deciduous, juniper, or riparian). They are found along the Proposed Routes of Segments 1W and 1E, 2, 4, 5, and 7; and Alternatives 1E-B, 1E-C, all Segment 4 alternatives, and most alternatives for Segments 5 and 7. However, this habitat type comprises only 6 percent of the overall number of miles crossed by the centerline of the Proposed Route and Route Alternatives. Forested habitats are not common in the areas of Idaho and Wyoming that the Project would pass through. Where they exist, they provide important habitat for some wildlife species. Also, due to their relatively long time to maturity compared with more common habitat types in the area (a few years for grasslands, 20 to 40 years for shrublands), removed forest and woodland vegetation would take a longer time to recover, and effects of fragmentation would be more pronounced. This phenomenon would be even more pronounced for a mature forest, compared to a sapling or pole-sized forest. The NFs along the Proposed Route and Route Alternatives contain some areas defined as “mature forest.” The definition of mature forest varies by NF, but the criteria include tree size and age and cover type. There are certain wildlife species that use mature forests more than other habitat types, such as northern goshawk and American three-toed woodpecker. No old growth was identified along the Proposed Route and Route Alternatives (old growth is usually defined as being at least 180 years old, though the precise definition varies by region and agency).

On the Medicine Bow-Routt and Caribou-Targhee NFs, where the ROW passes through the forest/woodland habitat type in visually sensitive areas, the edges of the ROW would be “feathered,” or cut so that the edge of the ROW is not straight. This would be accomplished by removing some larger trees further into the forest than the standard width of the ROW (see description in Section 3.2 – Visual Resources).

Wetlands are areas where saturation with water is the dominant factor determining the nature of the soil and the plant species present. Wetlands, riparian areas, and open water are uncommon along most of the Proposed Route and Route Alternatives, comprising 2 percent of miles crossed by the centerlines. The highest proportions of wetlands are found along Alternatives 2B (6 percent), 4A (4 percent), and 5D (5 percent), and Segment 4 (4 percent). Wetlands are unique and provide vital habitat for many wildlife species, such as birds and amphibians, at some point in their life cycles. In addition, they perform many functions important to wildlife habitat quality such as sediment trapping, flood control, water filtering, erosion control, and nutrient retention. Due to the small amount of land taken up by wetlands and their disproportionate importance to wildlife and habitat, the federal government has adopted a “no net loss” policy in order to preserve this important habitat type. Therefore, acres of wetland disturbed by the Project would be reconstructed, rehabilitated, and/or mitigated (see Section 3.9.3 in Section 3.9 – Wetlands and Riparian Areas).

Much of the habitat crossed by the proposed Project has already been highly fragmented by existing developments. A total of approximately 143,879 fragments caused by roads and transmission lines currently exist within an 8-mile buffer (4 miles on either side of the center line) of the Proposed Route and Route Alternatives, with an average patch size of

131 acres. By habitat type, there are 57,776 patches of shrubland, 52,179 patches of grassland, 15,309 patches of agriculture/disturbed areas, 12,591 patches of forest or woodlands, and 6,024 patches of riparian vegetation. There would be a large degree of variability in the effects of fragmentation in the Analysis Area due to the large range of fragment sizes, distances between fragments, and the differences among habitat function and requirements of various species (see the discussion of fragmentation in Section 3.10.2.2). Changes to this existing state of fragmentation in the Analysis Area that would be caused by the Project are discussed below in Section 3.10.2.2.

Big Game

Common big game species present within the Analysis Area are pronghorn (*Antilocapra americana*), elk (*Cervus elaphus*), and mule deer (*Odocoileus hemionus*). Less common big game species are mountain lion (*Puma concolor*; designated a trophy species in Wyoming, per Wyoming State Statute 23-1-101), bighorn sheep (*Ovis canadensis*), moose (*Alces alces*), and white-tailed deer (*Odocoileus virginianus*). Non-forest habitat types provide the majority of the forage for big game, while the forested habitat type (which comprises a small portion of the overall habitat that would be impacted by the Project) provides hiding and thermal cover. The BLM, IDFG, and WGFD have indicated that a full analysis of Project effects on white-tailed deer is not necessary (Hebdon 2009; Fry 2010). This is because this species is typically a forage and cover habitat generalist and has larger, less defined areas for life processes (e.g., summer and winter range) than pronghorn, elk, and mule deer. They also occur infrequently in the Analysis Area.

The Analysis Area contains wintering habitat, including designated winter range, for each of the species mentioned above except for white-tailed deer (see Appendix E, Figure E.10-3). These areas are important to the health of large ungulate populations because the winters on the Wyoming steppe and in the Idaho foothills can be very harsh. The animals congregate in lower elevation and sheltered areas during harsh winter conditions to survive the storms and to seek the available forage. Similarly, the Project would cross through important parturition areas, which the various large ungulate species use to give birth and hide their young (see Appendix E, Figure E.10-4).

Mule deer winter range is crossed by each segment of the Proposed Route. The greatest proportion of mule deer winter range is along Segment 5, where 60 percent of the centerline of the Proposed Route crosses this habitat designation. The proportions of other segments' centerlines that are mule deer winter range vary from 6 to 43 percent. Designated winter range for elk and pronghorn is also crossed by many of the segments. Table D.10-1 (Appendix D) provides miles crossed by the centerlines of the Proposed Route and Route Alternatives for each big game species habitat type. There is a small amount of winter range for moose along Segment 4 (see Table 3.10-19). Winter range has not been designated for the other big game species present in the Analysis Area.

The Analysis Area also contains designated parturition areas for elk. These areas are important because female elk need secluded areas with high quality food resources and adequate hiding cover for the calf. Lactation places great energy demands on cow elk, so adequate quantity and quality of food at this time is essential. Elk calves lie motionless to hide from predators, so hiding cover is also vital for their survival. There also needs to be sufficient acreage of parturition areas so that female elk can separate

from each other enough that predators are not drawn to a particular area by a high concentration of females and calves. If these requirements of forage, hiding cover, and acreage are not met, the fitness and survival of both the females and calves could be compromised. Parturition areas for elk are crossed along Segment 4.

Small Mammals

Common non-game mammals in the Analysis Area include white-tailed prairie dog, Wyoming ground squirrel (*Spermophilus elegans*), least chipmunk (*Tamias minimus*), northern pocket gopher (*Thomomys talpoides*), bushy-tailed woodrat (*Neotoma cinerea*), olive-backed pocket mouse (*Perognathus fasciatus*), Great Basin pocket mouse (*P. parvus*), western jumping mouse (*Zapus princeps*), western harvest mouse (*Reithrodontomys megalotis*), deer mouse (*Peromyscus maniculatus*), meadow vole (*Microtus pennsylvanicus*), sagebrush vole (*Lemmiscus curtatus*), Merriam's shrew (*Sorex merriami*), masked shrew (*S. cinereus*), American water shrew (*S. palustris*), little brown bat (*Myotis lucifugus*), big brown bat (*Eptesicus fuscus*), and hoary bat (*Lasiurus cinereus*).

Small game and furbearing species that may be taken in the vicinity of the Project include cottontail rabbits (*Sylvilagus* spp.), snowshoe hare (*Lepus americanus*), badger (*Taxidea taxus*), beaver (*Castor canadensis*), bobcat (*Lynx rufus*), fox (*Vulpes* spp.), marten (*Martes americana*), mink (*Mustela vison*), muskrat (*Ondatra zibethicus*), river otter (*Lontra canadensis*), raccoon (*Procyon lotor*), ground squirrels (*Spermophilus* spp.), and weasel (*Mustela* spp.). Most small game and furbearing animals are fairly common, and their harvest is regulated by state game agencies.

Small mammals present in the Analysis Area utilize a wide variety of habitats, from open prairies with short vegetation (e.g., Wyoming ground squirrel) to forest (e.g., hoary bat), all of which are present in the Analysis Area. Some species have special habitat features that are necessary; for example, hoary bats sometimes roost in snags.

Reptiles and Amphibians

Non-sensitive common reptiles in the Analysis Area include wandering garter snake (*T. elegans vagrans*), Great Basin gopher snake (*Pituophis catenifer deserticola*), sagebrush lizard (*Sceloporus graciosus*), short-horned lizard (*Phrynosoma hernandesi*), western skink (*Plestiodon skiltonianus*), striped whipsnake (*Masticophis taeniatus*), and racer (*Coluber constrictor*). Habitat for these reptiles ranges somewhat by species. Wandering garter snake uses riparian areas. The rest of the species' habitat can be generally described as mostly dry areas with relatively open vegetation, from grasslands to open forest. Western skink and striped whipsnake are also found in talus fields and canyon rims.

Common amphibians in the Analysis Area include Great Basin spadefoot toad (*Spea intermontana*) and Pacific treefrog (*Hyla regilla*). The Great Basin spadefoot toad is usually found in arid to semi-arid open grasslands or sagebrush communities below 6,000 feet where water is available at least every few years. The Pacific treefrog can be found in a wide diversity of habitat types, from backyard swimming pools to chaparral to woodlands, but always near water.

Other reptiles and amphibians not listed here and with different habitat requirements than those discussed above may be found in the Analysis Area. Special status species are analyzed individually in Section 3.11 – Special Status Wildlife and Fish Species.

Migratory Birds

More than 230 species of birds occur regularly in the vicinity of the Proposed Route and Alternatives. Of these, nearly all are protected under the MBTA (see Table 3.10-2 for a list of common birds found within the Analysis Area). Habitat loss, especially of shrublands, in the interior western U.S., where the Project is located, is a major threat to migratory birds in Idaho and Wyoming. This has been due to inappropriate livestock grazing, invasion of exotic plants, changes in fire regime, degradation of riparian habitat, and conversion of sagebrush habitat (PIF 2004).

Birds that live in the Analysis Area are extremely diverse, exhibiting a complete range of habitat types used, habitat use flexibility, ability to adapt to disturbance and habitat changes, dietary flexibility, reaction to fragmentation, and other life history characteristics. Birds with the potential to occur in the area also range from species that are candidates for federal listing (i.e., yellow-billed cuckoo) to abundant invasive species (e.g., European starling). This huge variety makes generalizing about migratory birds and any effects that the Project may have on them as a group difficult. However, impacts that do apply to migratory birds as a group are described below, and special status species are analyzed individually in Section 3.11 – Special Status Wildlife and Fish Species.

Game birds that can be taken in the Analysis Area include pheasant, forest grouse (dusky, ruffed, and spruce), bobwhite, California quail, sharp-tailed grouse, greater sage-grouse, chukar, mourning dove, turkey, and gray partridge. Some of these birds are not protected by the MBTA. Most of these are relatively common, and their harvest is regulated by state game agencies.

Raptors

Several raptor species regularly nest in or near the Analysis Area: American kestrel (*Falco sparverius*), bald eagle (*Haliaeetus leucocephalus*), ferruginous hawk (*Buteo regalis*), rough-legged hawk (*Buteo lagopus*), osprey (*Pandion haliaetus*), golden eagle (*Aquila chrysaetos*), Cooper's hawk (*Accipiter cooperii*), sharp-shinned hawk (*Accipiter striatus*), northern goshawk, northern harrier (*Circus cyaneus*), prairie falcon (*Falco mexicanus*), red-tailed hawk (*Buteo jamaicensis*), and Swainson's hawk (*Buteo swainsoni*). An observation station on Commissary Ridge, just north of Kemmerer, Wyoming, lies along a raptor migratory route. The most common species observed there between August 27 and November 5, 2009, were (in descending order) red-tailed hawk, sharp-shinned hawk, Cooper's hawk, golden eagle, and American kestrel (Smith 2009). Other birds of prey such as the great horned owl (*Bubo virginianus*), burrowing owl (*Athene cunicularia*), short-eared owl (*Asio flammeus*), western screech-owl (*Otus kennicottii*), flammulated owl, and common raven (*Corvus corax*) also nest in or near the Analysis Area. Of these species, all but rough-legged hawk, osprey, Cooper's hawk, sharp-shinned hawk, great horned owl, short-eared owl, western screech-owl, and flammulated owl are known to nest within 1 mile of the Project. Table D.10-2 (Appendix D) lists the known nesting sites for raptors where the Proposed Route or Alternatives

would pass within a 1-mile buffer of nest sites (also see Appendix E, Figures E.10-5 and E.10-6). Table D.10-2 (Appendix D) incorporates the previously known nests (BLM and Forest Service shapefiles) and the results of the aerial and ground surveys conducted by Tetra Tech (2008).

Nests belonging to multiple raptor species are known to occur along the Proposed Route centerline. The species with the most nests in this area are ferruginous hawk and prairie falcon. There are 63 known burrowing owl nests (10 percent), 38 golden eagle nests (6 percent), 22 red-tailed hawk nests (3 percent), and 11 Swainson's hawk nests (2 percent); all remaining raptor species detected have less than ten nests each. Most of the ferruginous hawk nests are found along Segments 2 and 8, and most of the prairie falcon nests are found along Segment 8. The four raptor species that are the most common in the Analysis Area have specific habitat requirements and nesting habits. Ferruginous hawk, prairie falcon, and golden eagle are open-country birds, living in grasslands and shrublands. Ferruginous hawks build their nests on the ground, hillsides, rock outcrops, creek banks, buttes, bluffs, sagebrush, and humanmade structures in unforested areas with good visibility. Prairie falcon and golden eagle nest most commonly on cliffs or bluffs, but also in trees, manmade structures, or other sites. Red-tailed hawks also prefer open to semi-open habitats such as sagebrush shrublands, and in Wyoming are often found nesting in cottonwoods (*Populus* spp.; Preston and Beane 2009). The Forest Service and BLM, based on the best available science, are using one-mile buffers around the nests of all raptor species in order to minimize direct and indirect effects. The Proposed Route for Segment 8 lies within 1 mile of the highest number of raptor nests, 256, of any of the segments. This segment runs through the SRBOP, home to the largest concentration of nesting raptors in North America, which explains this high number of nests. On the Rawlins FO, the transmission line and/or ancillary facilities would result in 23 acres of operations disturbance within 1,200 feet of ferruginous hawk nests, and 15 acres within 825 feet of other raptor nests, which does not meet guidelines in the RMP covering this area.

Fish

A variety of aquatic habitats are crossed by the Proposed Route and Route Alternatives, including ephemeral and perennial streams, springs, irrigation canals, and stock ponds. Fish habitat is shaped by both local and upstream conditions. The habitat along the route is diverse and is suitable for both cold- and warm-water species depending on location. Quality varies by location, orientation, geographic land form, vegetation, and past and current land uses, among other factors.

Shoreline/bank vegetation, particularly large trees in the riparian areas, helps moderate temperature and supply input of organic debris in the form of leaves, terrestrial insects, and large woody debris (LWD). All of these are important components of habitat quality along the Proposed Route and Alternatives, and vary by location. Segment 4 has the greatest proportion of wetland/riparian vegetation (these two habitat types were combined for analysis), with 3 percent of its length falling in this habitat type. Segment 10 has the least amount of wetland/riparian habitat, representing less than 0.1 percent of its length. Segment 10, however, has the highest amount of open water of any segment, at 1 percent of its length. Segment 7 has the least open water, at less than 0.1 percent of its length. The major watersheds in the Analysis Area are the Platte (tributary to the

Missouri), Green (tributary to the Colorado), and Snake (tributary to the Columbia) Rivers. At least 21 native and 14 non-native species of cold- and warm-water fish are present in the drainages crossed by the Proposed Route and Route Alternatives (BLM 2006b, 2008a).

Warm-Water Species

Many non-native warm-water fish have been introduced to the Analysis Area and can be found in all three major drainages, such as common carp (*Cyprinus carpio*), yellow perch (*Perca flavescens*), walleye (*Sander vitreus*), smallmouth (*Micropterus dolomieu*) and largemouth bass (*M. salmoides*), bluegill (*Lepomis macrochirus*), and black crappie (*Pomoxis nigromaculatus*). Walleye and bluegill are native in the Platte River downstream of the Analysis Area, but are non-native within the Analysis Area (USGS 2009).

Cold-Water Species

The most common native fish along the Proposed Route and Route Alternatives (particularly in the central portion of the Project) are considered cold-water species. Many are non-game species such as dace, sculpins, and some suckers. At least seven species and sub-species of trout may be present. Rainbow trout (*Oncorhynchus mykiss*), which is non-native above Shoshone Falls but a highly popular sport species, has one of the largest distributions of any fish within the Analysis Area and is found in all three major drainages. Brook trout (*Salvelinus fontinalis*) and brown trout (*Salmo trutta*) are also non-native and also common in all three watersheds, with brook trout being more common in smaller colder steams than brown trout. Lake trout are present in Bear Lake due to artificial stocking. Bonneville cutthroat trout (*Oncorhynchus clarki utah*) are native to Bear Lake. Trout are most numerous in high-elevation forested drainages. This is likely at least in part due to the inaccessibility of these areas, resulting in low road density, less development, less disturbed riparian areas, and lower stream temperatures than lowlands, which are easier to develop. High elevation forested drainages are all more conducive to maintaining healthy populations of native trout species. Mountain whitefish (*Prosopium williamsoni*) are a common native game fish found in the Green and Snake River watersheds. Longnose dace (*Rhinichthys cataractae*) is found in the Snake and Platte Rivers (where it is native) and in the Green River (where it is introduced). Speckled dace (*R. osculus*) and mountain sucker (*Catostomus platyrhynchus*) are found in and are native to the Snake and Green Rivers. Utah sucker (*C. ardens*) and Utah chub (*Gila atraria*) are native in the Snake River and introduced in the Green River.

3.10.2 Direct and Indirect Effects

This section is organized to present effects to wildlife from construction, then operations, followed by decommissioning activities for the proposed Project. Route Alternatives are analyzed in detail below in Section 3.10.2.3. There is a Design Variation involving use of two single-circuit structures proposed by the Proponents for Segments 2, 3, and 4 (see Section 2.2 for details), which is analyzed below in Section 3.10.2.4 and a Structure Variation that is analyzed in Section 3.10.2.5. The Proponents have also proposed a Schedule Variation, analyzed in Section 3.10.2.6, in which one of the two single circuits to be constructed in Segments 2, 3, and 4 and a portion of Segment 1W would be built

on an extended schedule with construction beginning approximately 2 years after completion of the initial construction. Within each category there are sections that address effects on habitat (including fragmentation), big game, migratory birds, raptors, and fish.

Mitigation measures or EPMs are presented in detail within this section only if it is the first time they have been discussed in Chapter 3; all other measures are referenced or summarized. A comprehensive list of all Proponent-proposed EPMs and Agency-required mitigation measures can be found in Table 2.7-1 of Chapter 2.

3.10.2.1 No Action Alternative

Under the No Action Alternative, the Project would not be constructed or operated. No Project-related impacts to wildlife or fish would occur; however, impacts to wildlife or fish would continue as a result of natural events (such as fire, drought, and severe weather) and existing developments within the Analysis Area. Impacts similar to those described below may occur due to new transmission lines built instead of the Project.

3.10.2.2 Effects Common to All Action Alternatives

Construction

Habitat

A direct impact on wildlife habitat would be removal of vegetation for roads, pads for transmission towers, transmission line safety, and ancillary facilities including regeneration stations, substations, laydown yards, and fly yards. Clearing of vegetation for these Project facilities would decrease habitat quantity and quality for wildlife species, and the degree of this impact would vary depending on vegetation type and recovery time. Removal of vegetation could also lead to an increase of sedimentation in waterbodies. Construction of the Proposed Route would directly affect 17,551 acres: 9,910 acres of shrubland (most of it previously disturbed), 2,537 acres of grassland (over 95 percent non-native), 2,090 acres of agricultural land, 2,360 acres of forests and woodlands, 389 acres of disturbed or developed land, 144 acres of wetlands and riparian areas, 32 acres of open water, and 90 acres of miscellaneous and unclassified areas. Table D.6-2 in Appendix D summarizes the impact by vegetation community on wildlife habitat in the Analysis Area. Table D.10-6 (Appendix D) lists the number of acres of designated big game habitat that would be cleared during Project construction, while Table D.10-7 (Appendix D) lists the number of acres that would be cleared during construction within a 1-mile buffer of raptor nests.

In addition to the direct effects of habitat loss, the proposed Project could indirectly impact wildlife by decreasing habitat quality through habitat fragmentation. Fragmentation refers to the breaking up of contiguous areas of vegetation/habitat into smaller patches. Habitat fragment size plays a crucial role in landscape function and many ecosystem interactions, including the distribution of plants and animals, fire regime, vegetation structure, and wildlife habitat. Many wildlife species require contiguous patch sizes of suitable habitat of certain size and connectivity in order to carry out life functions such as foraging, finding a mate, and the dispersal of young to adjacent suitable habitat areas.

The Proponents have attempted to minimize fragmentation resulting from the Project by avoiding routing the line through large blocks of contiguous habitat. The primary way in which the Project would affect the degree of fragmentation is through the clearing of vegetation for the ROW and access roads. For some species, the generally 8-foot-wide permanent access roads (14 to 16 feet wide during construction) could serve as a barrier to movement, thereby isolating subpopulations and increasing the risk of local extirpation. (This would be predominantly experienced by smaller species or those less likely to move through open areas devoid of vegetation such as the pygmy rabbit, discussed in Section 3.11 – Special Status Wildlife and Fish Species). Although roads may not serve as a barrier to movement for all species, roads can reduce habitat quality by creating edge effects (discussed below). As the effects of fragmentation differ depending on the species considered, specific effects of fragmentation on individual species groups will not be addressed within this general habitat fragmentation discussion, and will instead be addressed within the species-specific discussions in this section and in Section 3.11.

The discussions of fragmentation that follow will apply to conditions taking into account roads and transmission lines jointly. As stated above, assessments of roads or transmission lines separately are disclosed in Appendix D, Tables D.10-3a and b and Tables D.10-4a and b.

Impacts resulting from fragmentation would begin with the construction of the transmission line and new access roads and would continue for the life of the Project. Habitat restoration and revegetation following construction would decrease the severity of impacts from fragmentation somewhat, for example by narrowing roads from 14 to 16 feet wide to 8 feet wide. There is some overlap of the fragmentation assessments between the starting and ending points of each segment, resulting in the fragments that are counted in the last 4 miles of one segment being counted again in the first 4 miles of the next segment. This was a result of creating an 8-mile buffer (4 miles on each side of the centerline) for each segment, and was necessary in order to compare the fragmentation resulting from each segment and its alternatives as separate units. However, this system of analysis means that the total number of fragments created per segment (reported in Appendix D, Tables D.10-5a through D.10-5b) cannot be summed in order to determine the total number of fragments created by the Proposed Route or Route Alternatives, as this would result in an overestimated value. When considering the fragmentation of habitats resulting from both roads and transmission lines, the Proposed Route (when the overlap between segments is not considered) would create an additional 23,829 fragments (resulting from segmenting existing fragments and/or creating new fragments), with a new average patch size of 96 acres. This would be a decrease in average patch size of 34 acres from current conditions. The majority of new fragments occur within the shrubland habitat type, as this is the predominant vegetation type along the Project's length. A total of 11,535 new sagebrush/shrubland fragments would be created by the Proposed Route with a reduction of approximately 44 acres per patch compared to preconstruction conditions. Approximately 6,524 new patches of grassland, 2,427 of forest/woodlands, 507 of riparian/wetlands, and 2,836 of agriculture/disturbed lands would be created, with an average reduction in patch size of approximately 19 acres in grassland, 71 acres in forest/woodlands, 7 acres in

riparian/wetlands, and 31 acres in agriculture/disturbed. A discussion of fragmentation per segment can be found in Section 3.10.2.3. The loss and fragmentation of sagebrush has been an important issue in the Snake River Plain, with almost all big sagebrush habitat being converted to cropland over the past century (Idaho Sage-grouse Advisory Committee 2006). The impact to this habitat type from Project construction could affect some sagebrush-obligate wildlife species such as the greater sage-grouse (see Section 3.11 – Special Status Wildlife and Fish Species).

An important impact of fragmentation aside from breaking up blocks of suitable habitat is an increase in edge effects. Edge effects result when two different types of habitat lie adjacent to each other. Edge effects encompass a multitude of impacts, for example affecting wildlife and habitat quality by altering nutrient flows/cycling; increasing the rate of invasion by noxious weeds, invasive wildlife species, and pathogens; lowering the carrying capacity of a habitat/patch; and disrupting meta-population dynamics (Sanders et al. 1991). Edge effects tend to be more pronounced with increasing differences in the two adjacent habitat types, for example a mature forest adjacent to a grassland. The creation of edges in forests impacts microclimatic factors such as wind, humidity, and light, and could lead to a change in plant or animal species composition within the adjacent habitat, or increase the rate of invasion by noxious weeds, invasive wildlife species, and pathogens (Murcia 1995). Compared to the interior of a forest, areas near edges receive more direct solar radiation during the day, lose more long-wave radiation at night, have lower humidity, and receive less short-wave radiation. Increased solar radiation and wind can desiccate vegetation by increasing evapotranspiration, can affect which plant species survive along the edge (typically favoring shade-intolerant species), and can impact soil characteristics. An example of changes that could occur because of this is a decline in shade-tolerant interior forest plant species such as subalpine fir (*Abies lasiocarpa*), foam flower (*Tiarella trifoliate*), and some ferns; and an increase in disturbance-related, early colonizing species such as goldenrod (*Solidago canadensis*) and western yarrow (*Achillea millefolium*). Invasive plant species that could spread due to increased sunlight and removal of established plants include Canada thistle (*Circium arvense*), diffuse knapweed (*Centaurea diffusa*), and orange hawkweed (*Hieracium aurantiacum*). (See Section 3.8 – Invasive Plant Species for more information on invasive plants in the Analysis Area.) Only 6 percent of the Project crosses the forest/woodland habitat type, so these edge effects particular to forests are expected to be minimal.

The impacts of edge effects on wildlife, both adverse and beneficial, are highly dependent on the species experiencing these impacts, and therefore creating broad generalizations regarding impacts of fragmentation and edge effects on wildlife is problematic. For instance, some species are more susceptible to predators or nest predation near edges, while predators and some grazers/browsers could benefit from increased food availability. The change in wildlife species makeup could result in greater predation on interior-adapted wildlife species if predators attracted to ecotones, such as bullfrogs (*Rana catesbeiana*), raccoons (*Procyon lotor*), or common ravens, colonize the site. Not all wildlife species are affected by fragmentation and patch size identically (Bissonette and Storch 2003; D'Eon 2007). Effects of fragmentation and edge effects on

threatened, endangered, and sensitive wildlife species are described in Section 3.11 – Special Status Wildlife and Fish Species.

Temporary (occurring during the construction period only) impacts on habitat would include the clearing/use of laydown yards or fly yards for storage and assembly of equipment and structures during construction. Areas that contained native vegetation prior to construction would be restored in accordance with the Proponents' Reclamation, Revegetation, and Weed Management Plan (mitigation measures WEED-1 through WEED-6 in Section 3.8 – Invasive Plant Species). Areas not containing native vegetation prior to construction would be successfully reseeded with native vegetation, but there would be no ongoing effort to keep surrounding non-native species from encroaching onto the disturbed area, except on federal land. This would be in accordance with EO 13112, which requires federal agencies to prevent the introduction of invasive species and to not cause or promote the introduction or spread of invasive species (see Section 3.8.1.3). All revegetation efforts would be conducted in accordance with landowners' or land management agencies' requirements. Seed mixtures for use on private lands would be prearranged with the landowner (WEED-1, OM-17). Therefore, the spread of noxious weeds due to construction of the Project is not expected to have an appreciable impact on wildlife habitat. In addition, the Proponents have proposed to reduce the construction-related impacts on habitat through dust control during construction (EPM AR-2, Appendix C-1).

Another direct effect on habitat from Project construction would be visual and noise disturbance, which would make habitat temporarily less suitable for some wildlife species. Some construction activities would raise the sound above ambient levels, with a predicted maximum instantaneous noise level of 80 to 90 A-weighted decibels (dBA) at 50 feet from the work site (see Section 3.23 – Noise). Ambient noise in forested habitats generally ranges from 25 to 44 decibels (dB; USFWS 2006b), and is usually lower in open and shrub habitats such as those found along the majority of the Proposed Route. Visual disturbance could impact some wildlife species by inducing them to temporarily leave habitat in the construction area. This could have negative impacts by causing animals to move to less suitable areas, which could result in less available or lower quality forage, loss of access to preferred nesting/breeding sites, increased exposure to predation, and increased energy expenditure. The increases in noise and visual disturbance from construction would be concurrent with the presence of humans and their activities. These impacts would end immediately once construction activities ended. To minimize disturbance impacts to wildlife from blasting, the Agencies would require the following mitigation measure on federal land and recommend the measure be implemented on all lands:

WILD-12 Any areas that may require blasting will be identified and a blasting plan will be submitted to the appropriate agency for approval. Blasting within 0.25 mile of a known sensitive wildlife resource will require review and approval by the appropriate agency.

Construction activities could inadvertently cause fires, causing a loss of habitat and impacting wildlife, potentially both in the short and long term. Because warm and dry conditions are likely throughout the summer, the risk of wildfires during construction of

the Project may be elevated. To minimize the potential for wildfires, state and federal fire prevention requirements would be followed. All construction personnel would also be trained in wildfire risk and prevention and adequate fire suppression equipment would be maintained with each construction crew. Fire prevention measures have been developed (refer to Table 2.7-1) that outline the responsibilities of Project personnel for prevention and suppression of fires and define minimum fire prevention and suppression measures that would be used during construction of the Project. Impacts from fires caused by the Project would include changes in wildlife habitat and direct mortality to some slow-moving wildlife species.

Indirect effects on habitat during the construction period would include fugitive dust dispersing from the immediate construction area and air pollution from the diesel motors used by the construction equipment. Impacts from fugitive dust and air pollution would last longer than the construction timeline. High levels of fugitive dust can impact the growth of some organisms, especially mosses and lichens, and impact drinking water. The effects of air pollution could include an increase in the acidity of rain, which could harm plants and amphibians, and contribute to global climate change. Most impacts from fugitive dust would last only until the next rain event, when the dust is washed away and diluted. The immediate impacts from air pollution caused by vehicles would decrease in a matter of hours as particles dilute in the air and settle out; however, the exhaust could combine with other effects of air pollution and cumulatively have a more lasting effect.

Shrublands

The main impact to shrubland habitat, most of which is sagebrush, from construction would be fragmentation. Unfragmented shrublands are a vital habitat characteristic for many wildlife species, but this habitat type has been degraded, fragmented, and eliminated by conversion to agriculture, livestock grazing, invasion of exotic plants, and tree succession (Rich et al. 2005). For instance, Hann et al. (1997) estimate that over 30 percent of this habitat type in the Interior Columbia Basin has been lost. The Project would further fragment this habitat type (see Tables D.10-3, D.10-4, and D.10-5, Appendix D). Areas cleared during construction could take over 20 years to recover and regain their function as wildlife habitat. The effects of this could include changes in plant and wildlife species composition, increase in invasive plants and wildlife, and decrease in reproductive success of sagebrush-obligate wildlife species such as sage thrasher, Brewer's sparrow (*Spizella breweri*), and sagebrush lizard.

Grasslands

Native grasslands in the Interior West have also experienced degradation and fragmentation and resultant loss of function as wildlife habitat. Temporary, construction-related removal of grasslands would cause temporary loss of this habitat type. However, vegetation would regrow following construction, and this habitat type would recover fairly quickly, likely within 1 to 2 years. Wildlife species that use grasslands would still experience Project-related impacts such as disturbance and increased susceptibility to predation (discussed elsewhere in this Construction section). However, the short-term loss of the amount of grassland habitat that would be disturbed during construction would likely have minimal impacts on any wildlife species, as they would move to

adjacent undisturbed grassland until disturbed areas are restored to their former state following construction.

Agriculture and Disturbed

Wildlife habitat in agricultural areas would be minimally impacted by Project construction. This is because of the abundance of this habitat type in the Analysis Area and the ability of wildlife to move to adjacent areas. Wildlife that use agricultural and disturbed areas are adaptable to disturbance, for example non-native invasive species such as European starling, species attracted to human activity such as common raven, and habitat generalists such as mule deer. Furthermore, the recovery of acres of this habitat type that would only be impacted during construction would be aided by their being replanted by farmers who want to resume earning income off of those areas. Section 3.18 – Agriculture discusses this habitat type in further detail.

Forest and Woodlands

Acres of forests and woodlands cleared during construction but allowed to recover during operations would be impacted for much longer than other habitat types. This impact would displace wildlife that use this habitat type for several generations until vegetation can recover. In addition, due to the greater potential for edge effects where this habitat type is cleared compared to the other habitat types, forest/woodlands adjacent to cleared areas would be impacted as well. Though mature forests are rare in the Analysis Area (see Section 3.6.2.2), the impacts to this forest type, such as edge effects, would be more pronounced due to the more distinct difference between mature forest and adjacent cleared areas, and the longer recovery time of this type of habitat (several decades). Wildlife species that use this habitat type, for example northern goshawk and American three-toed woodpecker, would experience habitat loss until areas regrow during Project operations, in this case, several decades.

In the areas where feathering occurs, impacts to forests would increase somewhat, perhaps by approximately 15 percent, because of the additional tree removal outside of the construction ROW. Feathering would be a one-time vegetation treatment, and this type of ROW edge would not be maintained throughout Project operations. An impact to the forest/woodland habitat type from feathering would be to reduce successional stage of the forest that gets treated due to the removal of the largest trees, thus impacting mature forest more than younger forest types. Another impact of feathering could be to lessen the severity of edge effects; instead of the cleared ROW, containing herbaceous vegetation lying adjacent to, for example, a mature forest, patches of immature forest would lie in between these two vegetation stages. Feathering could also affect the amount of trees lost to windthrow.

Wetlands

Impacts to wetlands could include soil compaction, alteration of water flow, and conversion to a different wetland type for forested wetlands, due to the time required to restore wooded habitat. The Proponents have proposed EPMs related to reclamation, revegetation, weed management, stormwater pollution, and spill containment (see Section 3.9.2.2), which are designed to minimize effects to wetlands. Due to these

measures and to mitigation that would be required by the Agencies on federal land, overall impacts to wildlife that use wetlands would likely be minimal.

The potential impacts to habitat during Project construction would affect wildlife differently, depending on the species. Due to restoration following construction, including revegetating with native plants, these effects would be minimized. However, some wildlife species are sparsely distributed and thus are more susceptible to population-level impacts from Project activities (see Section 3.11 – Special Status Wildlife and Fish Species for details on sensitive species).

Big Game

Direct impacts to big game from Project construction could include vehicle collisions, noise, habitat loss, and visual disturbance, which is a change in the viewshed of the animal that is perceived as alarming. Vegetation clearing in general is not expected to negatively impact big game due to the small amount of habitat affected compared to the large home ranges of these species, and the cleared areas would still provide forage as they recover. Vegetation clearing would alter some big game designated winter and parturition range. This could potentially harm wintering animals by removing forage that is already scarce during this time of year. On parturition range, removal of vegetation used for concealment could decrease the female's ability to isolate herself and hide the newborn, possibly decreasing the newborn's chance of survival. It would also decrease the amount of forage available while the female is lactating, which presents a considerable energy demand. Acres of construction impacts to designated big game winter and parturition ranges by species are listed in Appendix D, Table D.10-6.

In order to limit vehicular mortality to big game species, the Agencies require that the Proponents incorporate the following mitigation measure on federal land and recommend that they apply it Project-wide:

WILD-2 Vehicular speeds during construction and operations shall be limited to 25 mph on all unsurfaced access roads. Crew and vehicle travel will be restricted to designated routes while on federally designated big game winter range (except for areas within the ROW).

Noise and visual disturbance associated with increased human activity could displace big game from preferred areas. These disturbances could potentially alter migratory activities during construction. Displacement of big game from both winter and parturition areas during sensitive periods could also occur. This displacement could affect over-winter survival on winter range by causing animals to mobilize stored bodily energy reserves that are needed to survive the winter when food is scarce. This could also impact reproductive success on parturition range if females are sufficiently disturbed to not provide adequate care for young.

Spatial data on big game winter range areas have been provided by the various federal agencies, and acres of impact by segment and alternative are provided below in Section 3.10.2.3. The Proponents would follow the limited operating periods enforced by the BLM and Forest Service (see Appendix F for a comprehensive calendar of seasonal restrictions).

The Proponents have proposed to supply monitors to determine seasonal occupancy of various big game restricted areas. The Agencies reject the monitoring proposal and require that only appropriate Agency personnel may determine presence or likely presence of big game species in restricted areas. Therefore, the Agencies have identified the following measure to reduce impacts to big game:

WILD-1 Requests for exceptions from closure periods and areas must be submitted by the Proponents to the appropriate land management agency office in which the exception is requested. Established exception processes on federally managed lands must be followed. The appropriate agency, or a contractor chosen by the Proponents and approved by the agency, shall conduct any surveys and coordinate with any other agencies as necessary. Factors considered in granting the exception include animal conditions, climate and weather conditions, habitat conditions and availability, spatial considerations (e.g., travel routes and landscape connectivity), breeding activity levels, incubation or nestling stage, and timing, intensity, and duration of the proposed action. Requests must be submitted in writing no more than 2 weeks prior to the proposed commencement of the construction period, to ensure that conditions during construction are consistent with those evaluated. The authorized officer, on a case-by-case basis, may grant exceptions to seasonal stipulations, and has the authority to cancel this exception at any time.

The Project, as currently proposed, does not cross any designated pronghorn fawning areas. If the route is changed in the future so that it does cross these areas, the Proponents have proposed the following EPMs in order to minimize impacts (in addition, on federal land, WILD-1 would apply):

PGC-1 No construction May 1 to May 30 in identified areas.

PGC-2 Weekly monitoring will commence May 15 and continue until PGC-3 is met. The Proponents will provide monitoring results to the appropriate land management agency.

PGC-3 If animals are present after May 15, no construction until two consecutive weekly monitoring sessions show no animals present or until July 1 if animals are present.

To minimize the impacts to pronghorn in designated winter range, the Proponents have proposed the following EPMs (in addition, on federal land, WILD-1 would apply):

PGC-4 Weekly monitoring will commence November 15 in identified areas (see PGC-5). The Proponents will provide monitoring results to the appropriate land management agency.

PGC-5 Construction may continue past November 15 if no animals are detected, but contractor must be prepared to shut down once four or more antelope are seen in mapped habitat, and may not start work until March 1 at the earliest and if PGC-6 and 7 are met.

PGC-6 Weekly monitoring will be reinitiated, beginning February 15 and continue until PGC-7 is met. The Proponents will provide monitoring results to the appropriate land management agency.

PGC-7 If animals are present, no construction until May 1 or until two consecutive weekly monitoring sessions confirm no animals are present.

The Project, as currently proposed, does not cross any designated bighorn sheep lambing areas. If the route is changed in the future so that it does cross these areas, the Proponents have proposed the following EPMs in order to minimize impacts (in addition, on federal land, WILD-1 would apply):

PGC-8 No construction May 1 to May 30 in identified areas.

PGC-9 Weekly monitoring will commence May 15 and continue until PGC-10 is met. The Proponents will provide monitoring results to the appropriate land management agency.

PGC-10 If animals are present after May 15, no construction until two consecutive weekly monitoring sessions show no animals present or until July 1 if animals are present.

To minimize the impacts to bighorn sheep in designated winter range, the Proponents have proposed the following EPMs (in addition, on federal land, WILD-1 would apply):

PGC-11 Weekly monitoring will commence November 15 in identified areas (see PGC-12).

PGC-12 Construction may continue past November 15 if no animals are detected, but contractor must be prepared to shut down once one or more bighorn sheep are seen in mapped habitat, and may not start work until March 1 at the earliest, and if PGC-13 and 14 are met.

PGC-13 Weekly monitoring will be reinitiated beginning February 15 and continue until PGC-14 is met. The Proponents will provide monitoring results to the appropriate land management agency.

PGC-14 If animals are present, no construction until May 1, or until two consecutive weekly monitoring sessions confirm no animals are present.

The Project, as currently proposed, does not cross any designated bighorn sheep yearlong areas. If the route is changed in the future so that it does cross these areas, the Proponents have proposed the following EPMs in order to minimize impacts (in addition, on federal land, WILD-1 would apply):

PGC-15 Surface disturbance is prohibited year-round within mapped habitat.

To minimize the impacts to elk in designated calving areas, the Proponents have proposed the following EPMs (in addition, on federal land, WILD-1 would apply):

PGC-16 No construction May 1 to May 30 in identified areas.

PGC-17 Weekly monitoring will commence May 15 and continue until PGC-18 is met. The Proponents will provide monitoring results to the appropriate land management agency.

PGC-18 If animals are present after May 30, no construction until two consecutive weekly monitoring sessions show no animals present or until July 1 if animals are present.

To minimize the impacts to elk on designated winter range, the Proponents have proposed the following EPMs (in addition, on federal land, WILD-1 would apply):

PGC-19 Weekly monitoring will commence November 15 (see PGC-20).

PGC-20 Construction may continue past November 15 if no animals are detected, but contractor must be prepared to shut down once four or more elk are seen in mapped habitat, and may not start work until March 1 at the earliest, and if the following conditions are met.

PGC-21 Weekly monitoring will be reinitiated beginning February 15 and continue until PGC-22 is met. The Proponents will provide monitoring results to the appropriate land management agency.

PGC-22 If animals are present, no construction until May 1 or until two consecutive weekly monitoring sessions confirm no animals are present.

The Project, as currently proposed, does not cross any designated moose calving areas. If the route is changed in the future so that it does cross these areas, the Proponents have proposed the following EPMs in order to minimize impacts (in addition, on federal land, WILD-1 would apply):

PGC-23 No construction May 1 to May 30 in identified areas.

PGC-24 Weekly monitoring will commence May 15 and continue until PGC-25 is met. The Proponents will provide monitoring results to the appropriate land management agency.

PGC-25 If animals are present after May 30, no construction until two consecutive weekly monitoring sessions show no animals present or until July 1 if animals are present.

To minimize the impacts to moose on designated winter range, the Proponents have proposed the following EPMs (in addition, on federal land, WILD-1 would apply):

PGC-26 Weekly monitoring will commence November 15 in identified areas (see PGC-27).

PGC-27 Construction may continue past November 15 if no animals are detected, but contractor must be prepared to shut down once one or more moose are seen in mapped habitat, and may not start work until March 1 at the earliest, and if the following conditions are met.

PGC-28 Weekly monitoring will be reinitiated beginning February 15 and continue until PGC-29 is met. The Proponents will provide monitoring results to the appropriate land management agency.

PGC-29 If animals are present, no construction until May 1 or until two consecutive weekly monitoring sessions confirm no animals are present.

The Project, as currently proposed, does not cross any designated mule deer fawning areas. If the route is changed in the future so that it does cross these areas, the Proponents have proposed the following EPMs in order to minimize impacts (in addition, on federal land, WILD-1 would apply):

PGC-30 No construction May 1 to May 30 in identified areas.

PGC-31 Weekly monitoring will commence May 15 and continue until PGC-32 is met. The Proponents will provide monitoring results to the appropriate land management agency.

PGC-32 If animals are present after May 30, no construction until two consecutive weekly monitoring sessions show no animals present or until July 1 if animals are present.

To minimize the impacts to mule deer on designated winter range, the Proponents have proposed the following EPMs (in addition, on federal land, WILD-1 would apply):

PGC-33 Weekly monitoring will commence November 15 in identified areas (see PGC-34).

PGC-34 Construction may continue past November 15 if no animals are detected, but contractor must be prepared to shut down once four or more mule deer are seen in mapped habitat, and may not start work until March 1 at the earliest, and if the following conditions are met.

PGC-35 Weekly monitoring will be reinitiated beginning February 15 and continue until PGC-36 is met. The Proponents will provide monitoring results to the appropriate land management agency.

PGC-36 If animals are present, no construction until May 1 or until two consecutive weekly monitoring sessions confirm no animals are present.

Indirect effects on big game from Project construction would include fugitive dust, increased human activity, and habitat alteration. Increased unauthorized human activity along the ROW and Project-related roads could cause increased disturbance to big game. This could temporarily render habitat where activity is occurring unsuitable and could increase energetic demands on animals as they move away from the disturbance. This could be especially problematic if it occurred on designated winter range or in parturition areas during critical times of year. An increase in unauthorized human presence in the Analysis Area could also potentially lead to increased harvest of big game and an increased risk of fire, which would alter habitat for big game.

Small Mammals

Direct Project impacts to small mammals would include disturbance, injury and mortality, habitat loss and fragmentation. Potential indirect effects would include habitat alteration, change in prey or forage species, and an increase in susceptibility to predators. Impacts to small mammals during construction would not differ appreciably along the length of the transmission line, and they are not analyzed by segment below in Section 3.10.2.3.

Noise, visual, and ground-vibration disturbance would last for the time of construction in any one area, and would end immediately upon cessation of these activities. To minimize disturbance to roosting bats, the Agencies recommend the following mitigation measure on all lands:

WILD-5 Surveys will be conducted within 0.5 mile of the route prior to construction for caves, abandoned mines, and adits. If suitable bat roosts are identified, the Proponents will consult with the applicable land management agency to determine appropriate protective measures.

Injuries and mortalities to small mammals could occur due to collisions from vehicles and construction equipment and/or crushing of inhabited dens, burrows, snags, or logs, especially when young are present. The severity of injuries would vary depending on the injury type. The impacts of injuries could range from a minor injury with no noticeable effect to permanent damage, which could decrease reproductive success of an individual or increase vulnerability to predation. The impact of mortality of individuals would vary depending on the reproductive strategy of the species and the robustness of the population. Mortality of an individual could have no discernible effect on a large, quickly reproducing population, but could have an effect that lasts generations on a small, vulnerable, or slowly reproducing population. Because small mammals typically bear many young, populations are generally able to absorb reasonable amounts of mortality. Bats are an exception to this reproductive strategy, as they mostly bear only a single litter per year, produce one young at a time, and do not breed until their second year (Nagorsen and Brigham 1993). Mortality would have a greater impact on animals such as bats that reproduce slowly, or populations that are already small. The likelihood of small mammals being injured or killed would decrease with increased mobility of some species; for example, small fossorial animals such as shrews would likely be more susceptible than bats, which are very mobile.

During clearing and digging, surface and underground habitat for small mammals, including maternity dens or hibernacula for bats, could be lost, altered, or disturbed. These changes could cause habitat to become unsuitable for some species by removing hiding cover from predators or altering populations of prey or forage species. Some of these changes would be temporary, for example until grass, forb, or shrub communities grew back, while some would last for the life of the Project, for example for small mammals that require the forest or woodland habitat type. Vegetation surrounding bat roost sites may be important for maintaining a suitable internal microenvironment for bats; therefore, vegetation surrounding such structures would be retained. Habitat fragmentation would also have an impact on many small mammals. Gaps in formerly contiguous blocks of habitat could cause those areas to become unsuitable for certain species of small mammals. Increased edge effects brought about by fragmentation

could also degrade habitat for some species, potentially sufficiently so that it becomes unsuitable. As many small mammals are prey species, crossing gaps that do not contain vegetative cover could increase their chances of being preyed upon by visual predators such as raptors.

The severity and effects of all of these impacts would vary by the species of small mammal impacted.

Reptiles and Amphibians

Direct Project impacts to reptiles and amphibians would include disturbance from vehicles, personnel, and blasting; injury and mortality; and habitat loss and fragmentation. Potential indirect effects would include habitat alteration, change in prey species, and an increase in susceptibility to predators. Impacts to reptiles and amphibians during construction would not differ appreciably along the length of the route, and they are not analyzed by segment below in Section 3.10.2.3.

Noise, visual, and ground-vibration disturbance would last for the time of construction in any one area, and would end immediately upon cessation of these activities.

The severity of injuries would vary depending on the injury type. The impacts of injuries could range from a minor injury with no noticeable effect to permanent damage that could decrease reproductive success of an individual or increase vulnerability to predation. The impact of mortality of individuals would vary depending on the reproductive strategy of the species and the robustness of the population. Mortality of an individual could have no discernible effect on a large, quickly reproducing population, but could have an effect that lasts generations on a small, vulnerable, or slowly reproducing population. Most reptiles produce a moderate number of young per year (e.g., a few to a dozen, occasionally two dozen or more), do not reach maturity until their second or third year, and do not always reproduce every year (Storm and Leonard 1995). Amphibians may also not reproduce until their second year, but lay up to 1,000 eggs. Therefore, both reptiles and amphibians are moderate in their ability to recover from population perturbations such as the death of individuals, but amphibians are likely better able to recover than reptiles due to the greater number of young that they produce. A small population, however, would experience a greater impact than a large one, regardless of the species, due to the number of reproductive individuals remaining.

During clearing and digging, surface, underground, and aquatic habitat for reptiles and amphibians could be lost, altered, or disturbed. These changes could cause habitat to become unsuitable for some species by removing hiding cover from predators, altering populations of prey species, or impacting water quality. Some of these changes would be temporary, for example until grass, forb, or shrub communities grew back or until suspended sediment settled out, while some would last for the life of the Project, for example removal of forest or woodland habitat type. Habitat fragmentation would also have an impact on some reptiles and amphibians. Gaps in formerly contiguous blocks of habitat could cause those areas to become unsuitable for certain species, for example sagebrush lizard. Increased edge effects brought about by fragmentation could also degrade habitat for some species, potentially sufficiently so that it becomes unsuitable.

Crossing gaps that do not contain vegetative cover could increase the chances of reptiles and amphibians being preyed upon by visual predators such as raptors.

The severity and effects of all of these impacts would vary by the species impacted.

The Forest Plan for the Medicine Bow NF requires that "no loss or degradation of known or historic habitat for the boreal toad, wood frog, or northern leopard frog" would be allowed. The portion of the Project that would cross the Medicine Bow-Routt NFs would impact about 1 acre of wetland and riparian habitat capable of supporting amphibians, potentially including these three species. (See Section 3.11 – Special Status Wildlife and Fish Species for more details on the northern leopard frog.) Therefore, for the Medicine Bow-Routt NFs to grant a special use permit, the Project would either need to be altered so that it is consistent with the Forest Plan regarding the boreal toad, wood frog, and northern leopard frog, or the Forest Plan would need to be amended (see Appendix F-2).

Migratory Birds

There would be some direct impacts on migratory birds and game birds, including Species of Conservation Concern and Game Birds Below Desired Condition, during construction. These impacts could include collisions with construction vehicles, other equipment, or structures; direct removal of nesting habitat; destruction of nests; induced abandonment of nests due to disturbance; fugitive dust; and visual disturbance. There is unlikely to be measurable impacts to any non-sensitive migratory bird populations, but there would be some impact to individuals and habitat. (See Section 3.11 – Special Status Wildlife and Fish Species for impacts to threatened, endangered, and sensitive species.)

Some species of migratory birds in the Analysis Area could experience mortality from collision with Project structures. The transmission conductors for the Project are 1.3 inches in diameter for the 230-kV lines and 1.5 inches in diameter for the 500-kV lines. They are bundled in groups of two (230-kV) or three (500-kV) that hold the subconductors in the bundle 18 to 25 inches apart from each other. The overhead ground wire or optical ground wire is 0.5 to 0.6 inches in diameter and could be harder for the birds to see and avoid in poor visibility weather conditions than the transmission conductors. The frequency of avian collisions with structures is influenced by several factors, including the configuration and location of the structure; the species of bird; and environmental factors such as weather, topography, and habitat (APLIC and USFWS 2005). Line placement with respect to other structures and topography can influence the collision rate of avian species at a given transmission line. Collisions usually occur near water or migration corridors, and occur more often during inclement weather. The Avian Protection Plans prepared state-wide by Rocky Mountain Power for Wyoming and by both Idaho Power and Rocky Mountain Power for Idaho indicate that if collisions are documented, a site-specific evaluation will be conducted, and measures to reduce collision hazard will be implemented, such as marking the line by installing bird flight diverters or possibly removing the static line (overhead ground or optical ground wire) for a specific span (IPC 2008). In order for the intent of the Proponents' Avian Protection Plans to be met, the following measure would apply Project-wide in response to the requirements of the MBTA:

WILD-8 Flight diverters will be installed and maintained where the transmission line crosses rivers at the locations identified in Table 3.10-3. The flight diverters will be placed on at least one of the higher conductors or ground wires at each river crossing in order to reduce avian collisions. Additional locations may be identified by the Agencies.

Table 3.10-3. River Crossings Where Flight Diverters Would Be Installed in Order to Reduce the Potential for Avian Collisions

Waterbody	Segment or Alternative	Crossing Mileposts			
		First	Second	Third	Fourth
Platte River	1E	1.9	–	–	–
	Alternative 1E-A	1.9	–	–	–
	1W(a)	8.8	–	–	–
	1W(c)	0.4	–	–	–
	2	41.4	–	–	–
	Alternative 2A	22.2	–	–	–
Little Medicine Bow River	1E	84.6	–	–	–
	Alternative 1E-B	56.3	–	–	–
Medicine Bow River	2	0.9	–	–	–
Bear River	4	131.5	139.9	154.3	179.2
	Alternative 4A	73.4	139.9	–	–
	Alternative 4B	74.5	99.2	–	–
	Alternative 4C	84.3	99.2	–	–
	Alternative 4D	75.1	99.2	–	–
Bear River	Alternative 4E	84.9	99.2	–	–
	Alternative 4F	131.5	139.9	–	–
Green River	4	118.7	–	–	–
	Alternative 4A	53.4	–	–	–
	Alternatives 4B,C,D,E	0.4	–	–	–
Hams Fork River	4	105.4	–	–	–
	Alternative 4A	53.3	–	–	–
	Alternative 4F	54.6	–	–	–
	Alternatives 4B,C,D,E	118.8	–	–	–
Smiths Fork River	4	125.3	–	–	–
Snake River	5	52.8	–	–	–
	Alternative 5E	3.6	–	–	–
	Alternative 5D	16.4	–	–	–
	8	24.6	46.6	128.0	–
	Alternative 8A	25.0	–	–	–
	Alternative 8B	42.7	–	–	–
	Alternative 8E	10.2	–	–	–
	Alternative 9D	46.2	–	–	–
	Alternative 9F	46.1	–	–	–
	Alternative 9G	44.2	–	–	–
	Alternative 9H	48.5	–	–	–
	10	23.5	–	–	–

Nesting birds are particularly sensitive to disturbance, and some disturbance could lead to nest failure or abandonment. To avoid violating the MBTA, the Agencies have proposed the following mitigation measure Project-wide:

WILD-10 To the extent feasible, all vegetation clearing would be conducted prior to the onset of the avian breeding season (generally April 15 through July 31, depending on local conditions and federal land management plan requirements) in order to limit the potential impact of clearing on nesting birds. In addition, pre-construction surveys within the disturbed portion of the ROW and extending a minimum of 30 feet on either side of the ROW shall be conducted. If an active nest is found during pre-construction surveys, the nest will be identified to species, flagged, and avoided until any young have fledged. Avoidance distances are species-specific and must be approved by a USFWS-approved biologist.

In addition, to reduce the impacts to some birds from habitat removal, the Agencies have proposed the following mitigation measure:

WILD-11 Snags shall be maintained to the extent practical along the outer portions of the Project's right-of-way in order to reduce the impacts to habitat for cavity nesters.

Potential indirect effects to migratory birds could include increased non-Project-related, unauthorized human activity along the ROW and Project roads, which could add to the intensity of disturbance within the Analysis Area. This could also increase the risk of fire, which would alter migratory bird habitat. The creation of new edges along wooded or shrubland habitat types could increase brood parasitism of avian species. These habitat types experience more pronounced edge effects than grasslands and also contain elevated perches, which cowbirds use while searching for active nests (Vander Haegen and Walker 1998). Some nest predators such as common raven and black-billed magpie that are attracted to the site by human activity and habitat edges could increase nest predation on native migratory birds. Mammalian predation on bird nests could also increase due to their use of Project-related travel corridors into new areas. Edge effects could also lead to a change in plant species composition, potentially lowering the quality of bird habitat. Impacts to migratory birds are expected to be similar along each segment, and they are not addressed for each one.

Raptors

Direct impacts on raptors during construction could include collision with Project structures, electrocution, disturbance due to construction noise, fugitive dust, and visual disturbance. Raptors are particularly sensitive to disturbance during nesting and brooding, and some construction activities could cause nest failure or abandonment. In order to minimize the risk of this, the Proponents would follow timing restrictions and monitoring requirements enforced by the Agencies to reduce disturbance to nesting raptors (see Appendix I). All suggestions for analyses and survey protocols issued by USFWS (Smith 2010; USFWS 2010a) would also be adhered to. Federal, state, and local jurisdictions have requested minor changes to the Project's design and additional

changes will also likely occur prior to the Final EIS. Therefore, the BLM and cooperating agencies have identified the following mitigation measure:

WILD-3 The Project shall be designed and constructed in compliance with Avian Power Line Interaction Committee standards (APLIC 2006) in order to reduce impacts to avian species. Any changes to the Project's design, as requested by federal, state, or local jurisdictions, as well as any changes considered by the Proponents, should also be in compliance with Avian Power Line Interaction Committee standards.

In addition, the Proponents have proposed the following EPMs to apply to golden eagles:

PRC-12 A pedestrian or aerial survey of known nest locations will be conducted weekly during the appropriate seasons, beginning no more than 2 weeks prior to construction. The Proponents will provide survey results to the appropriate land management agency.

PRC-13 If nesting eagles are present, monitoring will be conducted until the young have fledged or the nest fails, at which point construction can begin.

PRC-14 If no active nests are detected during the pre-construction surveys construction will occur without further monitoring.

The Proponents also propose the following EPMs to apply to all raptor species:

PRC-18 Pre-construction surveys will be conducted during the appropriate seasonal timeframe prior to construction, to identify active nests within 0.5 of a mile of the ROW within suitable habitat. The Proponents will provide survey results to the appropriate land management agency.

PRC-19 If an active nest is found during the protocol level surveys, construction is prohibited within 0.5 mile of the nest until monitoring shows that the young have fledged or the nest fails, whichever occurs sooner. The Proponents will provide survey results to the appropriate land management agency.

PRC-20 If no active nests are detected during the pre-construction surveys construction will occur without further monitoring.

Seasonal and spatial stipulations that would apply to activities near raptor nests would be adhered to as appropriate (see Appendix I). Impacts to special Forest Service habitat designations for northern goshawk are described in Section 3.11 – Special Status Wildlife and Fish Species. In addition:

WILD-4 On federal lands, accurate monitoring, including identifying nest occupancy, shall be conducted in order to ensure that raptor nests are located in advance of any construction activities. This would be needed to ensure that all construction activities would cease in areas near active nests. Biological monitors on site would perform these surveys ahead of construction. If an occupied nest is found, the appropriate restrictions and closures would be adhered to. All encounters with nesting raptors in the

Analysis Area must be reported to the biological monitor and to appropriate agencies.

The Proponents have accepted the following Agency-proposed mitigation measure, which would apply Project-wide:

WILD-9 Pre-construction pedestrian or aerial surveys will be completed during the appropriate nesting time periods needed to identify each raptor species. The Proponents will provide survey results to the authorized officer for approval (see WILD-1).

As seasonal stipulations would apply to construction activities within buffers when nests are active, no adverse impacts to the reproductive activity of raptors are expected from disturbance (see Forest Service 2003a, 2003b).

WILD-6 As part of their annual aerial flight line maintenance activities, the Proponents would document nesting activity (by species) on any towers constructed as a result of this Project. This would occur after the first year of construction until year 10 of operations. Results would be provided to the applicable land management agency.

Raptors are vulnerable to electrocution from powerlines with conductor spacing less than the wingspan of the individual bird. For the 230-kV and the 500-kV lines that would be used for the Project, conductor spacing would vary from 19.5 feet for 230-kV H-frame structures to 36 feet for double-circuit 500-kV structures (see Appendix B for detailed drawings). The largest raptor wingspans in this area do not exceed 10 feet; therefore, there is no danger of electrocution from the transmission lines. Distribution lines that serve the substations and the regeneration sites are short and are located in areas with multiple other powerlines. The Proponents' Avian Protection Plan states that if mortalities due to electrocution are documented, changes to the distribution lines would be made in order to avoid future mortalities (such as by changing the arrangement of the powerlines or by excluding birds from certain areas). Therefore the potential for raptor electrocution would be minimal.

Raptors, like other migratory birds in the Analysis Area, could experience mortality from collision with Project structures. In the discussion on migratory birds, the safeguards from the Proponents' Avian Protection Plans are supplemented with WILD-8, requiring flight diverters at identified river crossings. Those same measures would be applicable to raptors.

Potential indirect effects to raptors could include increased non-Project-related, unauthorized human activity along the ROW and Project roads, which could add to the intensity of disturbance within the Analysis Area. Disturbance from this could render some areas temporarily unsuitable as raptor habitat. This could be especially critical during the nesting season; at this time, disturbance could be sufficient to scare a raptor from its nest or disrupt brooding or feeding. Increase human presence could also increase the risk of fire, which would alter raptor habitat and prey populations, and possibly injure eggs or chicks. Edge effects brought about by vegetation removal could

lead to a change in plant species composition, potentially lowering the quality of habitat for raptors or their prey.

Fish

A potential direct adverse impact from construction of the Project is decreased water quality from suspended sediment. High levels of suspended sediment and associated high turbidity can have adverse effects on fish behavior and physiology (e.g., blood chemistry, gill trauma, immune system resistance), and can cause mortality if levels become high enough. Salmonids have been found in some studies to avoid areas with turbidity above about 70 milligrams/liter (Lloyd et al. 1987), while other studies suggest avoidance may occur at loads of as low as 20 milligrams/liter suspended sediment and possibly even lower depending on length of exposure (Newcombe and Jensen 1996). The impacts from suspended sediment and turbidity would be limited to the period of in-stream work and a short time afterward, until sediment settled back to the bottom of the stream; however, injuries and deaths caused by turbidity could have long-term population-level effects.

Downstream sedimentation could affect spawning habitat and egg and juvenile fish survival. Sediment entering the water column can be redeposited on downstream substrates. It can settle on spawning cobble, decreasing its quality and impacting survival of eggs and juvenile fish. Most negative impacts from sedimentation would last up to a year, as spring flooding and other hydrologic events would flush out newly settled sediment. Heavy sediment loads may last longer than a year. Site-specific characteristics including flow, substrate composition, relative disturbance, and other factors could affect the duration of construction effects on sediment.

The numbers of perennial streams crossed by roads are listed below in the segment-specific discussions. The types of crossings are shown in table D.16-1 in Appendix D. The number of crossings varies by alternative. Roads would be about 14 to 16 feet wide at each stream crossing during construction. Generally, the greater the number of stream crossings, the greater the risk to fish resources would be. At each individual crossing, however, many factors could affect the severity of impacts that would occur, including fish species present, the period when the crossing occurs, and the distance to any spawning habitat. Many of the potential impacts would be reduced or eliminated at each site by complying with relevant EPMs, mitigation measures, the SWPPP, and CWA section 401 and 404 permits, if applicable. These requirements usually regulate the crossing method used, BMPs required, and timing of construction in order to minimize effects during important fish life stages (e.g., spawning). The BLM requires or recommends, depending on the FO, avoiding perennial surface waters, wetlands, and riparian areas by 500 feet. These areas were routed around to the degree feasible; however, some of these areas were unavoidable. Site-specific crossing plans will be developed for each of these areas (see TESWL-1).

Another direct effect to fish would be loss of riparian habitat. Loss of the riparian habitat type from either construction of roads across streams or removal of riparian trees for transmission line clearance, especially those within one site potential tree height (the expected height of dominant tree species at maturity under growing conditions typical in the region), can have direct and indirect impacts such as reduction of stream shading,

LWD input, and terrestrial organic input, and an increase in bank instability and erosion potential. Tree shading is important in maintaining cool stream temperatures, especially important in native trout waters. LWD is a major component of stream habitat in some systems, where it contributes to pool formation and sediment retention. Additionally, riparian trees supply an energy source both directly and indirectly through leaf litter and other forms of organic input. Tree roots help stabilize streambanks against erosion during high flows and help reduce fine sediment deposition with bank stability. As noted above, road crossings would be about 14 to 16 feet wide. Where streamside clearing is needed to span a stream (i.e., where hazard trees exist and where vegetation would be too close to wires or towers – see Appendix C-4), the riparian removal could range from up to 125 to 350 feet wide depending on the width of the ROW. There are approximately 1,615 acres of mapped riparian habitat within the Analysis Area, of which 58 would be impacted during construction. Acres of riparian vegetation expected to be removed by segment and by alternative are given below in the segment-specific discussions in Section 3.10.2.3.

Another potential direct impact to fish is improperly installed culverts. All temporary and permanent culverts would be designed and installed to ensure the free flow of water and up- and downstream passage of aquatic organisms. Construction and decommissioning of culverts would be carried out under a Construction General Permit required for stormwater operations, which includes the development of BMPs to protect surface water from stormwater runoff. BMPs to minimize sedimentation during construction would also be employed. All culverts would be inspected regularly for proper functioning. In addition, this mitigation measure would be required on federally managed lands:

FISH-1 On BLM-managed land, all culverts, whether temporary or permanent, must be designed to meet BLM Manual 9113 standards. Culverts should be located, designed, constructed, and maintained according to standards that preserve or improve streambed gradients and velocities to allow fish passage and that minimize erosion and sediment damage. On federal lands, unless the applicable management plan has specific requirements for stream crossings, use the following for culverts in channels with less than 3 percent slope:

- The minimum culvert width shall be equal to or greater than 1.5 times the active channel width.
- The culvert shall be placed level (zero percent slope).
- The bottom of the culvert shall be buried into the streambed at not less than 20 percent of the culvert height at the outlet, and not more than 40 percent of the culvert height at the inlet. Embedment does not apply to bottomless culverts.

At sites where the channel slope is greater than 3 percent, additional consideration should be given to alternate design options such as bottomless arch culverts or fords (low-water crossings). This is because of the difficulty of providing for the passage of aquatic species through culverts installed at these sites. Also, the culvert would be installed so that its slope would match the average grade of the stream immediately up- and

down-stream of the culvert site. Follow RMP guidelines where specific requirements are included. On NFS lands, Forest Plan standards and guidelines shall apply.

In order to minimize the potential for pollutants and sediment entering streams and harming aquatic resources, several procedures would be followed and permits obtained. The USEPA's CWA would be complied with, including obtaining a National Pollutant Discharge Elimination System (NPDES) permit for stormwater discharges (Title 40 CFR Parts 122 and 123) and preparing two SWPPPs, one for each state crossed. In addition, measures would be followed to protect aquatic resources (SW-1 through SW-12). See Section 3.16 – Water Resources for more information on aquatic mitigation measures and permitting.

Flow reduction in downstream systems may have adverse effects to fish resources. Stream habitat is often limited by flow amount especially during low-flow summer conditions. The estimated water usage from construction activities on a typical day for transmission line construction would be about 2,140 to 3,340 cubic feet for dust control. If this would occur over an 8-hour period, it would equal a draw of 0.07 to 0.12 cubic feet per second. Overall, this reduction in stream flow would have inconsequential effects on stream habitat and most non-sensitive fish species would not be adversely affected. However, according to the Upper Colorado Endangered Fish Recovery Program, any water withdrawal over 4,356,000 cubic feet per year, would result in a *may affect, likely to adversely affect* determination for four federally listed fish species. The Proponents have estimated total construction water use (concrete batching and dust control) at 314.6 acre-feet or 13,702,747 cubic feet. See Appendix B, Table B-10.

Another potential impact to fish habitat during construction is the risk of hazardous materials entering surface water supplies. To prevent this, the Proponents have committed to following all state requirements for containment of hazardous materials.

To reduce impacts to fish and fish habitat, the following measure would be required on federally managed lands:

FISH-2 All in-stream construction actions will be conducted when critical fish life stages can be avoided as designated by the appropriate state and federal agencies. All culverts placed in fish habitat will be suitable, as determined by the federal or state agency, for passage by all life stages present or potentially present within the stream reach. Riparian vegetation removal should be kept to a minimum along fish-bearing streams. Blasting in or adjacent to fish-bearing streams will require the state fish agency's approval prior to blasting. Channel morphology data (e.g., streambank composition, bank slope, stream substrate characteristics, stream slope, riparian vegetation characteristics) will be obtained anywhere a road will cross a stream prior to construction to be used to restore the site of the crossing to pre-Project conditions when temporary roads are decommissioned.

Aquatic invasive species could be introduced into the Analysis Area by equipment carrying propagules of an invasive species into a waterbody that does not already contain that species. The risk of this would be negligible due to the requirement that all

equipment be washed prior to arriving on-site. To avoid spreading aquatic invasive species within the Analysis Area from streams containing these species to those that do not, the following mitigation measure will apply in all wetlands and waters of the United States:

FISH-4 If an aquatic invasive species is discovered during surveys for wetlands and waters of the U.S. conducted for USACE and state permitting prior to construction, the waterbody will be flagged and noted on the construction drawings. After work is complete in that waterbody, any equipment involved in construction in that waterbody must be washed to remove any propagules of aquatic invasive species and to prevent the spread of those species to other waterbodies in the Analysis Area.

Other indirect impacts to fish from Project construction would include increased human presence. This could lead to increased habitat disturbance, potentially resulting in decreased quality of riparian vegetation and increased in-stream turbidity. Other potential results are increased harvest of fish and increased risk of fire, which would alter riparian vegetation. An indirect effect of sedimentation is a decrease in benthic macroinvertebrates, an important food source for many fish. Sediment can settle onto cobble substrate, burying these organisms.

To restore in-stream areas following construction, temporary culverts and fill material will be removed, and removed vegetation will be reseeded.

Operations

Habitat

Effects on wildlife habitat from Project operations would include habitat loss, alteration, and fragmentation. The Proposed Route would affect 5,022 acres during operations from ROW maintenance tower bases, permanent access roads, and areas encompassed by substations (Appendix D, Table D.6-3). Of these acres, 2,147 (43 percent) would be forest/woodlands, 2,075 (41 percent) shrublands, 372 would be grassland (7 percent; 95 percent of it non-native), 224 (4 percent) agriculture, 128 (3 percent) developed or disturbed habitat, 38 (0.1 percent) riparian and wetland, 8 (less than 0.1 percent) open water, and 31 (0.1 percent) unclassified or miscellaneous. Outside of the permanent ROW, vegetation would be allowed to regrow. Although this is classified as a “temporary” impact, in the case of sagebrush, for example, it would affect several generations of wildlife that depend on this habitat type, such as sage sparrows, until vegetation could grow back and regain its wildlife habitat function. Vegetation removed within the permanent ROW would be maintained every 3 to 10 years (annually in some places where vegetation grows quickly) so that only grasses, forbs, and other low-growing plants would be present during the life of the Project. Project placement and routing is preliminary at this point, and every attempt will be made to move towers or substations that are currently positioned within wetlands and riparian habitat types out of these areas prior to construction. However, some habitat removal from riparian areas would take place due to road construction and improvement, and some wetland areas that cannot be avoided (such as areas within the Bear River floodplain) would also be impacted (see details in Section 3.9 – Wetlands and Riparian Areas). Population-level

impacts to general wildlife species during operations are not expected due to the relatively small amount of habitat that would be impacted compared to most of the species' ranges, and the stable and common status of most species (see Section 3.11 – Special Status Wildlife and Fish Species for discussion of specific special status wildlife species).

The transmission line and Project roads (8 feet wide during operations) would fragment habitat. For most wildlife species, the principal cause of fragmentation would be roads. In order to maintain drivability, only low-growing vegetation would remain on these roads. Where roads lie in areas previously vegetated by woody plants, such as shrublands, woodlands, and forests, they could fragment habitat and cause edge effects in adjacent uncleared habitat. In previously disturbed, agricultural, or grassland areas (1,315 acres or 19 percent), however, habitat fragmentation from roads would likely be minimal. This is because wildlife using disturbed, agricultural, and grassland areas already live in open environments, and the low vegetation present on the road would likely not present a barrier to movement, as opposed to wildlife species that prefer areas with thick vegetative cover. Certain species may avoid roads due to vehicle disturbance, however, so that although they may be willing to cross an open area the width of a road, the presence of vehicles along the road could decrease the amount of habitat that is considered suitable by these species. Vehicles would likely use a given location along a road once per year, and all roads would be closed to the public.

Existing road densities on the Proposed Route vary from 1.3 to 2.2 miles of road per square mile. Resulting road densities after the Project is completed would vary from 2.1 to 2.7 miles of road per square mile. The impacts of fragmentation from roads would vary by species. While big game species can easily cross roads, for example, smaller or less mobile animals could experience some habitat fragmentation from the presence of roads. (See the discussion of fragmentation effects found in the previous Construction section, because these effects would continue through Project operations.) Trees adjacent to roads and the transmission line would also be trimmed to keep branches from blocking roads or coming into contact with the transmission line. This could increase the effects of fragmentation and edges somewhat. Fragmentation could also be caused by the transmission line itself. Although transmission lines are not typically considered contributors to habitat fragmentation except in forests, there is concern that some sagebrush-associated wildlife species, such as the greater sage-grouse, avoid tall structures (see grouse discussion in Section 3.11.2). Therefore, the transmission poles and line may contribute to habitat fragmentation in the sagebrush habitat type by inducing some wildlife species to avoid the area. Tables D.10-3a and b in Appendix D list the number and average patch size of fragments resulting from existing roads and compare this to the post-construction conditions along each segment and alternative. Tables D.10-4a and b in Appendix D make the same comparisons as Tables D.10-3a and b; however, they consider only transmission lines as the source of fragmentation. Tables D.10-5a and b in Appendix D compare the pre- and post-construction levels of fragmentation when roads and transmission lines are considered jointly.

Disturbance from maintenance activities associated with the Proposed Route may cause wildlife to avoid certain areas. In habitat types similar to those in the Analysis Area, deer and elk have been shown to avoid areas within 650 feet of roads, including roads used

only by four-wheelers (Rost and Bailey 1979). Therefore, although the presence of a road in itself may not cause habitat fragmentation for large species such as deer and elk due to breakup of contiguous habitat, roads may fragment habitat by disturbing animals and keeping them away from roads. In a study on roads' effects on elk, Lyon (1983) reported that with a road density of 1 mile per square mile, habitat effectiveness for elk declined by at least 25 percent. In a study in southwest Wyoming, densities of sagebrush obligates, particularly Brewer's and sage sparrows, were reduced by 39 to 60 percent within a 330-foot buffer around four unimproved, dirt roads with traffic volumes of 10 to 700 vehicles/day associated with natural gas exploration (Ingelfinger and Anderson 2004). Studies elsewhere have shown no effect to grassland birds (bobolinks and meadowlarks) at traffic volumes of 3,000 to 8,000 vehicles/day on a small local street; however, effects were detectable up to 3,940 feet away from the road when traffic volumes rose to 30,000 vehicles/day on a multilane highway (Forman et al. 2002). Most access roads would be used approximately once per year by Proponents' staff, though substations would be accessed approximately once per month. Only minimal vegetation management would be necessary over most of the route, as the naturally occurring vegetation is low-growing. Annual post-construction surveys would be carried out by the Proponents for a minimum of 3 years to ensure that reclamation is successful, or as decided by the land-managing agency (Appendix C-2).

Maintenance and operations activities could disturb wildlife, decreasing the quality of habitat. Substations would be visited approximately once per month by Proponents' staff. The rest of the transmission line would be inspected aerially approximately twice per year by helicopter, and from the ground using pickup trucks or all-terrain vehicles approximately annually. These predicted traffic loads along most roads and close to substations are well below those examined in studies documenting avoidance of areas by wildlife due to the increase in vehicular and human activities. If problems are identified during inspections, additional ground-based work would occur to fix these problems. The duration and type of work that would occur would depend on the type of problem that arises. See Appendix C-4 for more details. The Proponents would adhere to big game closure periods while conducting operations and maintenance work (see Appendix C-4). Due to their relative infrequency, these operations and maintenance visits by Project staff are not expected to result in noticeable long-term wildlife avoidance of the transmission line route or of associated facilities due to disturbance by humans and vehicles.

Another potential impact to wildlife due to Project roads is direct mortality or injury by vehicle collision. This is expected to be minimal due to the primitive nature of most of the roads, which would cause vehicles to use slow speeds, the 25 miles per hour speed limit (see WILD-2 earlier under Construction), and the open habitat types throughout the majority of the Analysis Area, allowing for high visibility of animals near roads.

Revegetation of disturbed areas not to be utilized during Project operations would occur. Some of the roads, such as temporary access roads to fly yards and staging areas, constructed or improved as part of the Project, would be decommissioned and revegetated to preconstruction conditions following construction, while others would be kept in a usable condition for the life of the Project. However, these permanent roads would be reseeded and surrounding vegetation would be allowed to regrow following

construction in order to reduce the risk of erosion while maintaining drivability. The light amount of traffic on these roads would be unlikely to compromise revegetation efforts.

Other potential impacts to wildlife habitat from Project operations are spread of noxious weeds and increased chance of fires due to vehicles and increased human presence. The spread of noxious weeds from Project operations is addressed in Section 3.8.2.2 and Appendix C-4. The Reclamation, Revegetation, and Weed Management Plan would be in place, so noxious weed spread would be minimized and would not be expected to negatively impact wildlife habitat in the analysis area. The Agencies recommend that the Proponents develop a fire prevention and control plan that would require Project personnel to carry fire-fighting equipment in their vehicles (see Section 3.22 – Public Safety), although the approximately one Project-related vehicle a year that would use most Project roads for maintenance purposes (approximately once per month at substations) is not expected to contribute significantly to the risk of wildfires in the area. In order to minimize the additional risk of fires and other impacts from unauthorized access, the Proponents would install and maintain gates (OM-6, Appendix C-4).

The Medicine Bow Forest Plan prohibits activities that would degrade the primitive character of the area. For this Project to be developed, a plan amendment would be required. If this amendment to the Forest Plan is made and the transmission line allowed, the land crossed by the Project would be allocated to MA 8.3 with an ROS classification of Roaded Natural. This could have impacts on wildlife by allowing more developments to occur in this area. Exact impacts to wildlife from this are unknown, because whether these projects would occur and what types of projects they would be are not known, but they are expected to be similar to impacts from the Gateway West Project.

Shrublands

The major impacts to the shrublands habitat type during operations would be fragmentation and habitat loss and alteration. Fragmentation of this habitat type by Project operations would decrease its effectiveness in providing habitat for native shrub-dependent wildlife species, potentially decreasing abundance and diversity of these species locally and encouraging the spread of invasive animals, plants, and pathogens. Loss of shrublands would occur where there is long-term habitat removal (i.e., not reclaimed following construction), for example at tower and access road locations. Habitat alteration would take place where shrubs are removed and only low-growing grasses and forbs are allowed to grow. These impacts could negatively affect wildlife species that depend on contiguous shrubland habitat type.

Grasslands

The primary impact to grasslands during operations would be loss of habitat. Small areas (a total of 33 acres of native grassland, or less than 0.01 percent of the Analysis Area) would be permanently lost to tower pads and other Project facilities. This is a small amount of habitat in relation to available habitat in the surrounding area. However, native grassland is an important habitat type that is declining in the Interior West, and this loss could impact some wildlife species that depend upon the native grassland habitat type and that are sensitive to habitat loss on a very local scale.

Agriculture/Disturbed Areas

Operations impacts to agricultural areas would be loss of habitat. This is unlikely to substantially impact any wildlife that use this habitat type due to the small amount of habitat affected (483 acres, or less than 0.01 percent of the Analysis Area), most of which would be restored following construction. In addition, species that use agriculture and disturbed areas are habituated to disturbance to some extent.

Forest/Woodlands

Operations impacts to forested areas and woodlands would include habitat loss and edge effects. The loss of forested areas and woodlands would be relatively minor (0.3 percent of the Analysis Area). Forested and woodland habitat adjacent to areas kept clear during Project operations would experience microclimatic changes, alterations of vegetative structure and composition, and other effects from increased solar radiation and proximity to a different habitat type.

Wetlands

Due to site restoration and mitigation, minimal impacts to wetlands are expected during Project operations. An operations impact unique to forested wetlands would be conversion to the shrub or herbaceous wetland type where they fall within the ROW maintenance corridor.

Big Game

ROW maintenance would remove thermal and hiding cover in the forest/woodland habitat type. However, the removal of the overstory could result in additional foraging habitat. This habitat loss is not likely to have a substantial impact on big game populations, as this is a minor loss relative to the amount of home range that big game species typically range over (usually hundreds of acres up to ten thousand acres). In addition, transmission line structures and access roads are not expected to limit the movement or distribution of big game species through fragmentation; big game will readily cross a double-track road or pass under a transmission line. Approximately 36 percent of the line is collocated with existing developments, so big game along a substantial portion of the Proposed Route already use similarly disturbed areas. This would decrease any potential impact from the Project on migratory movements of these animals. The Proposed Route and Route Alternatives would cross through big game winter range and calving/fawning areas, resulting in long-term loss of some habitat (see Table D.10-8 in Appendix D). This could impact big game during sensitive times of year. Loss of habitat on winter range (e.g., 46 by 41 feet, or 0.043 acre, per tower location) could remove some of the small amount of forage that is available during winter, potentially impacting over-winter survival. On parturition range, loss of vegetative cover could decrease the female's ability to isolate herself and hide the newborn, possibly decreasing the newborn's chance of survival, and decrease the amount of forage available.

An operations impact that could impact big game is increased human presence in the Analysis Area. Project-related operations activities include biannual helicopter flights over the line and approximately annual access by truck, all-terrain vehicle, and foot. See Appendix C-4 for more details on operations and maintenance activities. Vehicle,

helicopter, and human presence could impact big game animals by disturbing them and displacing them temporarily from preferred habitat areas, including from winter range and parturition areas. This displacement could cause animals to move to areas containing less quantity or quality of forage, increase exposure to predation, or affect reproductive activities. On winter range, disturbance could affect winter survival by causing animals to mobilize energy reserves that are needed to survive the winter. A decrease of energy reserves in females during the winter could also cause decreased reproductive success, by preventing pregnancy, causing fetal loss, or resulting in less fit offspring. Disturbance by humans and vehicles in the Analysis Area could also impact reproductive success if females are sufficiently disturbed to not provide adequate care for young. The Proponents would not conduct operations and maintenance activities on winter range during closure periods (see Appendix C-4). Unauthorized use of the ROW could also increase harvest of big game animals. To reduce an increase in big game harvest due to unauthorized use of Project-related roads, the Proponents would install gates or other barriers.

Small Mammals

Direct Project impacts to small mammals during operations would include disturbance, injury or mortality from vehicles, and habitat fragmentation. Potential indirect effects would include increased human presence and increased susceptibility to predation. The severity and effects of all of these impacts would vary by the species of small mammal impacted. Impacts to small mammals during operations would not differ appreciably across the length of the Project, and they are not analyzed by segment below in Section 3.10.2.3.

Noise, visual, and ground-vibration disturbance would occur during certain operations- and maintenance-related activities, and would end immediately once these activities are completed. Potential further disturbance could occur due to increased Project-related and non-Project-related human presence in the Analysis Area. This could cause small mammals to flee or hide, using up bodily energy reserves and losing foraging time. Human disturbance at any caves or mines where bats have been documented would be limited to minimize disturbance to bats.

Injuries and mortalities to small mammals could occur due to collisions from vehicles. The 25 mph speed limit would decrease this possibility by increasing the chance for small mammals to escape the path of the vehicle, though the ability of animals to get away would vary by species. The severity of injuries would vary depending on the injury type. The impacts of injuries could range from no noticeable effect for a minor injury to permanent damage to an individual, which could decrease reproductive success or increase vulnerability to predation. The impact of mortality of individuals would vary depending on the reproductive strategy of the species and the robustness of the population. Mortality of an individual could have no discernible effect on a large, quickly reproducing population (e.g., mice), but could have an effect that last generations on a small, vulnerable, or slowly reproducing population (e.g., bats).

Habitat fragmentation could impact species of small mammals that require contiguous blocks of later-seral habitat, such as sagebrush vole and Merriam's shrew. This could potentially make currently suitable habitat unsuitable for certain species. Edge effects

brought about by increased fragmentation could also render some habitat unsuitable. Gaps that do not contain vegetative cover would also make small mammals more susceptible to predation. Small mammals could also be more vulnerable to predation during Project operations due to the use of Project structures as perches by raptors. In order to minimize this risk, the mitigation measures TESWL-2 and TESWL-3 (listed in Table 2.7-1 and in Section 3.11 – Special Status Wildlife and Fish Species) would be implemented. A more detailed discussion of this phenomenon can be found in Section 3.11.2 under black-footed ferret.

Reptiles and Amphibians

Direct Project impacts to reptiles and amphibians would include disturbance, injury and mortality from vehicles, and habitat fragmentation. Potential indirect effects would include increased human presence. The severity and effects of all of these impacts would vary by the species impacted. Impacts to reptiles and amphibians during operations would not differ appreciably along the length of the route, and they are not analyzed by segment below in Section 3.10.2.3.

Noise, visual, and ground-vibration disturbance would last while personnel and vehicles are in a particular area, and would end immediately upon departure of personnel. Potential further disturbance could occur due to increased non-Project-related human presence in the Analysis Area. This could cause reptiles and amphibians to flee or hide, using up bodily energy reserves and losing foraging time.

Injuries and mortalities to reptiles and amphibians could occur due to collisions from vehicles. The 25 mph speed limit would decrease this possibility by increasing the chance for them to escape the path of the vehicle. The severity of injuries would vary depending on the injury type. The impacts of injuries could range from a minor injury with no noticeable effect to permanent damage which could decrease reproductive success of an individual or increase vulnerability to predation. The impact of mortality of individuals would vary depending on the reproductive strategy of the species and the robustness of the population. Mortality of an individual could have no discernible effect on a large, quickly reproducing population, but could have an effect that lasts generations on a small, vulnerable, or slowly reproducing population.

Habitat fragmentation could impact reptile and amphibian species that require or prefer contiguous blocks of later-seral habitat that would not be allowed to regrow during the life of the Project. Gaps in formerly contiguous blocks of habitat could cause those areas to become unsuitable for certain species, for example sagebrush lizard. Increased edge effects brought about by fragmentation could also degrade habitat for some species, potentially sufficiently so that it becomes unsuitable. Crossing gaps that do not contain vegetative cover could increase the chances of reptiles and amphibians being preyed upon by visual predators such as raptors.

Migratory Birds

Project operation is expected to have only minor impacts to most migratory bird and game bird individuals, including Species of Conservation Concern and Game Birds Below Desired Condition, because the presence of the transmission line, structures, and access roads do not present barriers to movement through fragmentation, create

excessive noise, or otherwise cause major behavior changes, for the most part. Most birds are physically and behaviorally able to cross the distance between two adjacent fragments that Project roads would create due to their ability to travel quickly (i.e., flight). Measurable impacts to non-sensitive migratory bird populations are also not expected.), but there would be some impact to individuals and habitat. (See Section 3.11 – Special Status Wildlife and Fish Species for impacts to threatened, endangered, and sensitive species.) A study on nesting success of prairie birds found decreased nest success with decreased prairie fragment size, although it did not consider two-lane paved roads without a disturbed roadside to be a barrier to movement (Herkert et al. 2003); therefore, the vegetated seldom-used permanent roads and ROW would presumably also not be considered barriers. There could be some avoidance of otherwise suitable habitat and decreased nesting success due to project operations, as predators and nest parasites such as cowbirds could use Project structures to survey for prey and find nests to parasitize.

Collisions with transmission lines and electrocutions could result in limited avian mortalities during operations. Studies conducted in other areas have shown that many different species of birds collide with powerlines (CEC 2005). However, less agile birds, such as heavy-bodied birds or birds that travel in flocks, are more likely to collide with overhead lines because they lack the ability to quickly negotiate obstacles. Aquatic bird species such as waterfowl are prone to collisions when powerlines or associated structures are situated over water, especially the grounding wires located at the top of the structures (Meyer 1978; James and Haak 1979; Beaulaurier 1981; Beaulaurier et al. 1982; Faanes 1987; CEC 1995, 2005).

The potential for collisions is expected to be greatest in the vicinity of Cokeville NWR, where waterfowl concentrations are known to occur. Placement of the lines across wetlands and water courses would constitute a hazard to waterfowl species that commonly use these habitats. Collisions are also likely to occur where the line would cross the Platte River, Medicine Bow and Little Medicine Bow Rivers, Green River south of the Seedskadee NWR, Cokeville Meadows NWR, Bear River, Snake River near American Falls, the crossing of the Snake River near Hemingway, and various other smaller river crossings. The Agencies have assumed that collision risk is low but not zero over the life of the Project and have proposed WILD-8 (in the Construction portion of Section 3.10.2.2) in addition to the commitments from the Proponents spelled out in their Avian Protection Plans to further reduce risk.

Electrocutions are not expected to cause substantial mortalities because the potential for this would exist at only three locations, for a distance of 200 to 500 feet at each occurrence (see discussion above under Construction – Raptors).

Operations and maintenance-related activities could disturb birds, potentially altering movement or migration patterns. Vegetation, road, and other maintenance would take place usually on a three- to ten-year cycle. At locations where vegetation grows very quickly, removal may occur annually. For routine maintenance, personnel would generally be in a given area for less than half a day. See Appendix C-4 for more details on operations and maintenance activities. In addition, personnel would be instructed on the protection of migratory birds and relevant federal laws (see OM-23 in Table 2.1-4).

Vegetation removal could also remove or alter nesting or foraging habitat for certain species. Disturbance to migratory birds could also be caused by unauthorized public access of Project-related roads. In order to minimize this risk, the Proponents would install gates.

Raptors

Raptor species are less likely to collide with powerlines than other avian species (Olendorff et al. 1981). Implementation of measure WILD-8 would further reduce the potential for raptor collision with conductors or ground wires. The risk for electrocution would also be minimal (see Raptors section under Construction, above).

The presence of transmission lines and roads is not expected to appreciably fragment habitat, because raptors are large, mobile, and easily able to cross roads and transmission lines. Fragmentation of habitat does, however, have the potential to impact some raptor prey populations, possibly decreasing raptor carrying capacity in an area. Increased human and vehicular presence in the Analysis Area, both by Project personnel performing operations and maintenance activities along the line, and by non-Project-related use, could increase disturbance to raptors, particularly nesting raptors. This could potentially result in disruption of reproductive activities such as nest-building and feeding of young. Operations disturbance within 1 mile of raptor nests is shown in Table D.10-9, Appendix D. Operations impacts to raptors are not expected to vary appreciably in different parts of the Analysis Area, and they are not called out in the segment-by-segment discussion. The Green River RMP has a requirement that applies to raptor nests, as follows:

> *Project components, such as permanent and high profile structures, i.e., buildings, storage tanks, powerlines, roads, well pads, etc. are prohibited within an appropriate distance of active raptor nests. The appropriate distance (usually less than ½ mile) will be determined on a case-by-case basis and may vary depending upon the species involved, natural topographic barriers, and line-of-sight distances, etc. Placement of facilities, "on" (very low profile) or below ground, and temporary disruptive activities, such as occur with pipeline construction, seismic activity, etc., could be granted exceptions within ½ mile of active raptor nests, in certain circumstances.*

Depending on what the appropriate distance is determined to be for each nest, the Project may not be in conformance with this standard, and an amendment to the RMP would be required (see Appendix F-1). The Medicine Bow Forest Plan has two Standards that apply to northern goshawk nests and fledgling areas. Standard 5 required designation of a minimum of 200 acres as post-fledgling area around selected goshawk nests that would prohibit management activities that could degrade goshawk foraging habitat. Project construction would likely occur in these areas and thus an amendment to the Forest Plan would be needed (see Appendix F-2). Impacts to raptors from these amendments could include increased disturbance and increased potential for collision with structures. Timing restrictions for activities near active raptor nests would be adhered to. Impacts to special Forest Service habitat designations for northern goshawk are described in Section 3.11 – Special Status Wildlife and Fish Species.

Fish

Loss of riparian habitat type and its associated benefits (shade, LWD, organic input, root stability) from both road presence and the clearing of trees from the transmission line's ROW would continue to occur during operations. Reduction of LWD input from ROWs, up to 350 feet wide at some locations, would occur for the life of the Project and for several decades after decommissioning until trees in the ROW grow to mature height. However the effects would be reduced somewhat from construction as shrubs would gradually regrow and be allowed to remain along much of the ROW in riparian areas. Hazard trees removed during operations would be left in place as a source of LWD.

Non-aquatic-approved herbicides that enter the streams during ROW maintenance could have adverse effects to fish resources. Within 50 feet of streams, woody vegetation management would be conducted by hand crews, but herbicides may still be used in selected locations to control noxious weeds and to meet vegetation management objectives. In general, most impacts to aquatic systems occur from direct spray of herbicides, drift when herbicides are sprayed, and leaching through soils and groundwater (Tu et al. 2001). To minimize impacts to aquatic systems, the Proponents, in addition to Agency-proposed mitigation (see Table 2.1-4), have proposed the following EPM:

OM-22 Only herbicides approved by the land-managing agency as safe to use in aquatic environments and reviewed by the Proponents for effectiveness will be used within 100 feet of sensitive aquatic resources.

Other impacts to fish from Project operations could include increased disturbance and harvest due to increased human presence and road use along the ROW. Use of the ROW could also degrade habitat quality; for example, disturbance could affect vegetation recovery following clearing and agitation of the stream bottom could result in turbidity. The presence of roads near streams could also increase erosion and increase sediment input to streams, affecting habitat quality by, for example, decreasing dissolved oxygen levels. Operations impacts to fish would be similar throughout the Analysis Area and are not discussed under each segment below except to list the number of stream crossings. Streams crossings include perennial streams crossed but not "avoid" streams. These streams will have no disturbance associated with them because they will be avoided.

Decommissioning

Impacts from decommissioning would be similar to construction impacts (discussed in Section 3.10.2.2, in the Construction section) and are not discussed separately below. Project facilities would be removed at the end of the operational life of the transmission line. Structures and foundations would be removed to below the ground surface level. They would not be removed in their entirety due to the large ground disturbance this would create. Soil and plants would be restored over the top of these underground foundation structures. Removal of Project structures following decommissioning would result in impacts to wildlife such as visual and noise disturbance, habitat disturbance and alteration, and risk of vehicle collisions. Wildlife may avoid areas of activity during the removal process. The duration of visual and noise disturbance impacts would be only as long as it would take to decommission a given area, and these impacts would end

following cessation of these activities. The impacts from habitat alteration would have a similar duration as impacts stemming from construction. Vegetation would be restored, and different habitat types would recover more quickly than others; for example, grassland would recover in one to four years, while forest recovery would take decades. The wildlife species that use these habitat types would also take different amounts of time to return to affected areas (relatively short amounts of time for grassland species and longer amounts of time for forest species).

Another potential impact is direct mortality to some wildlife species due to trampling by equipment or personnel during structure removal. Aside from the instantaneous impact to the individual injured or killed, the duration of this impact could vary depending on the effect the loss of the animal(s) has on the local population. A robust, rapidly reproducing population may not experience any impact from the loss of an individual, while a less abundant or slower-reproducing population may feel the impact of this loss for a generation or more.

Removal of Project structures following decommissioning would result in temporary impacts to fisheries. These impacts would include increased sediment runoff to streams from increased vehicle traffic and culvert removal. Increases in turbidity from sediment input into streams would be a short-term impact, and subside shortly after ground-disturbing decommissioning activities ended. Benefits would occur from revegetation of riparian areas where ROW clearing and roads had previously existed.

Benefits to wildlife and fish from decommissioning would include habitat recovery along the ROW and roads, reducing fragmentation and edge effects. There would also be decreased human disturbance due to cessation of Project-related activities after decommissioning is completed. As roads were closed and vegetation recovered, the risk of vehicle collisions would decrease.

Long-term impacts from the Project following decommissioning would likely be minimal. Nearly all disturbed areas would be restored to pre-construction conditions, and vegetation would be monitored for a minimum of 3 years, or as decided by the land-managing agency.

3.10.2.3 Proposed Route and Alternatives by Segment

The Proposed Route and Route Alternatives would travel west from eastern Wyoming to southwest Idaho across mostly shrubland and disturbed habitat types. This section describes the impacts for each of the segments of the Gateway West Project on wildlife and fish. Where there are Route Alternatives, this section discusses the relative impacts to wildlife of the various alternatives if those impacts vary from segment to segment. EPMs proposed by the Proponents and Agency mitigation measures proposed to reduce impacts are found in Section 3.10.2.2, Effects Common to All Action Alternatives.

Impacts to fish resources would increase with each perennial stream crossing. Therefore, when comparing the Proposed Route to Route Alternatives, the number of perennial stream crossings was used to help determine the impacts. In practice, however, the overall effect to fish resources would depend on what the specific stream characteristics were (e.g., size, flow, sediment type, stream slope, and bank slope and

composition) and also the fish resources at or near the crossing. While the number of crossings provides a general level of potential effects to fish resources, the actual streams crossed play a significant role. The analysis of each segment and each alternative's effects on fish, however, was not carried out in the level of detail that takes into consideration the characteristics of each stream crossing and the unique issues at each location, so only the number of stream crossings is used to assess relative impacts. All stream crossings on federal lands would be sited, designed, and constructed according to pertinent management plan requirements (see mitigation measures WQA-2 and G-1 and G-2 in Table 2.7-1), but the BLM and Forest Service have no authority to require mitigation on non-federal land.

Below is a segment-by-segment discussion of the potential impacts that could occur to wildlife resources. Where a segment has alternatives, analyses for the various resources were carried out for both the total length of the Proposed Route, and the comparison portion for each alternative. The comparison portion is the portion of the Proposed Route that starts and ends at the same nodes as the alternative, so that they can be directly compared to each other. The discussion is organized into three categories: construction, operations, and conclusions. Conclusions are presented for only segments that have alternatives to compare. The fragmentation discussion is presented in the operations portion of the discussion. Only the resources that are relevant to each category (construction or operations), or which were not adequately covered in the Effects Common to All Action Alternatives section, are addressed below.

Segment 1E

Segment 1E, as proposed, would link the Windstar and Aeolus Substations in south-central Wyoming with a 100.6-mile 230-kV single-circuit transmission line. Twenty acres of the expansion of Windstar and Aeolus Substations and 0.5 acre for one regeneration site are attributed to Segment 1E. Alternative 1E-A is a 16.1-mile alternative along the north end of Segment 1E, which was the Proponents' initial proposal before moving the Proposed Route at the suggestion of local landowners to avoid the more settled area around Glenrock. Alternative 1E-B is 21.4 miles longer than the Proposed Route but is being considered by the Proponents because it would avoid a Wyoming-designated sage-grouse core area to the east. The BLM has required the consideration of Alternative 1E-C, which parallels the Segment 1W 230-kV lines into the Aeolus Substation (see Appendix A, Figure A-2). Segment 1E would cross part of the Medicine Bow-Routt NFs in the Deer Creek Range. The most common habitat along the Proposed Route is shrubland (75 percent).

Construction

Big Game

Segment 1E would pass through habitats used by various big game species throughout the year. Approximately 573 acres of designated winter range of mule deer, pronghorn, elk, and bighorn sheep would be affected by Project construction along the Proposed Route (Table 3.10-4). Of these, 61 acres are on federal land, all administered by the BLM. There is no parturition or summer habitat identified along Segment 1E for any big game species.

Table 3.10-4. Comparison of Designated Winter Range Impacted by the Segment 1E Proposed Route and Alternatives 1E-A through 1E-C (acres)

Segment or Alternative	Length (miles)	Mule Deer		Pronghorn		Elk		Bighorn sheep		Total [1/]	
		Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal
Proposed – Total Length	100.6	406	36	403	37	105	19	37	6	**573**	**61**
Proposed – Comparison Portion for Alternative 1E-A	17.6	184	<1	147	<1	–	–	–	–	**184**	**<1**
Alternative 1E-A	16.1	125	–	114	–	–	–	–	–	**125**	–
Proposed – Comparison Portion for Alternative 1E-B	37.9	48	7	164	31	40	<1	–	–	**207**	**32**
Alternative 1E-B	59.3	277	61	235	53	207	33	–	–	**430**	**71**
Proposed – Comparison Portion for Alternative 1E-C	75.4	187	34	242	37	105	19	37	6	**354**	**59**
Alternative 1E-C	48.7	120	39	81	37	34	9	–	–	**134**	**50**

1/ Totals given have taken any overlap among winter range for different species taken into account so that the total number of acres impacted is reported.

Acreages are rounded to nearest whole acre; therefore, columns/rows may not sum exactly.

Raptors

Construction of Segment 1E would occur within 1 mile of four currently documented ferruginous hawk nests, seven golden eagle nests, one prairie falcon nest, and two northern goshawk nests. Of the nests on federal land shown in Table 3.10-5, the northern goshawk nests are on NFS lands. Surveys for northern goshawks on the

Table 3.10-5. Comparison of Raptor Nests within 1 mile of the Segment 1E Proposed Route and Alternatives 1E-A through 1E-C, Showing How Many Nests are on Federal Land

Segment or Alternative	Total Nests	Number of Nests (number on federal land)				
		Bald Eagle	Ferruginous Hawk	Golden Eagle	Prairie Falcon	Northern Goshawk
Proposed – Total Length	14 (7)	–	4 (2)	7 (3)	1	2 (2)
Proposed – Comparison Portion for Alternative 1E-A	–	–	–	–	–	–
Alternative 1E-A	1	1	–	–	–	–
Proposed – Comparison Portion for Alternative 1E-B	11 (4)	–	4 (2)	6 (2)	1	–
Alternative 1E-B	12 (5)	–	4 (3)	6 (2)	2	–
Proposed – Comparison Portion for Alternative 1E-C	14 (7)	–	4 (2)	7 (3)	1	2 (2)
Alternative 1E-C	6 (5)	–	4 (3)	–	1 (1)	1 (1)

Medicine Bow-Routt NFs during 2010 found no territorial goshawks or active goshawk nests (Tetra Tech 2010c). Table 3.10-5 compares the portion of the Proposed Route with Alternatives 1E-A through 1E-C with regard to proximity to raptor nests. The Medicine Bow Forest Plan has standards regarding the amount of vegetation that can be removed in occupied northern goshawk territories and about characteristics and size of post-fledging area that must be maintained within occupied territories. Within the Medicine Bow-Routt NFs, the Project as currently proposed would not meet these standards. The Proposed Route would impact 10 acres within 1 mile of northern goshawk nests during construction. If Alternative 1E-C is selected, 7 of these acres would not be impacted. Therefore, a plan amendment would be needed in order to develop the Project (see Appendix F-2). If the amendment occurs, this could increase impacts to goshawks by degrading their habitat. However, timing restrictions for active goshawk nests would still be adhered to (see Section 3.11.2.2, Forest Service Management Indicator Species for more details).

Fish

A total of three stream crossings are proposed for Segment 1E. Table 3.10-6 compares Segment 1E with Alternatives 1E-A through 1E-C with regard to construction impacts to fish resources. Of the riparian vegetation on federal land that would be cleared, there is less than an acre along the Proposed Route (along the comparison portion for Alternative 1E-C) that is on NFS land.

Table 3.10-6. Comparison of Stream Crossings (and the number on federal land, if any) and Acres of Riparian Clearing during Construction for the Segment 1E Proposed Route and Alternatives 1E-A through 1E-C (and amount on federal land, if any)

Segment or Alternative	Number of Stream Crossings	Acres of Riparian Habitat Cleared[1/]
Proposed – Total Length	3	8 (<1)
Proposed – Comparison Portion for Alternative 1E-A	–	2
Alternative 1E-A	–	2
Proposed – Comparison Portion for Alternative 1E-B	–	3
Alternative 1E-B	3 (3)	3 (<1)
Proposed – Comparison Portion for Alternative 1E-C	3	6 (<1)
Alternative 1E-C	–	1 (<1)

1/ Acreages are rounded to nearest whole acre.

Operations

Habitat Fragmentation

Table 3.10-7 presents the Proposed Route for Segment 1E compared to Alternatives 1E-A through 1E-C for habitat fragmentation from proposed roads and the transmission line.

Table 3.10-7. Comparison of Habitat Fragmentation from Roads and Transmission Lines by Habitat Type for the Segment 1E Proposed Route and Alternatives 1E-A through 1E-C

Segment or Alternative	Forest/ Woodlands		Shrublands		Grasslands		Riparian/ Wetland		Agriculture/ Disturbed	
	Change in Average patch size (acre) 1/	Change in Patch Count 2/	Change in Average patch size (acre) 1/	Change in Patch Count 2/	Change in Average patch size (acre) 1/	Change in Patch Count 2/	Change in Average patch size (acre) 1/	Change in Patch Count 2/	Change in Average patch size (acre) 1/	Change in Patch Count 2/
Proposed – Total Length	-416	188	-77	213	-101	369	-23	39	-24	25
Proposed – Comparison Portion for Alternative 1E-A	-261	17	-38	64	-60	198	-15	28	-29	25
Alternative 1E-A	-178	17	-50	62	-61	194	-28	25	-27	25
Proposed – Comparison Portion for Alternative 1E-B	-503	28	-105	82	-83	46	-448	8	–	–
Alternative 1E-B	-427	64	-55	74	-68	79	–	–	-15	3
Proposed – Comparison Portion for Alternative 1E-C	-438	174	-98	153	-144	171	-101	11	–	–
Alternative 1E-C	-375	113	-65	139	-177	274	-38	3	–	–

1/ The difference between average patch size following construction.
2/ The number of additional fragments created as a result of the Project.
Acreages are rounded to nearest whole acre.

Big Game

Operations impacts to big game in Segment 1E would be limited to the presence of the transmission line facilities and access roads for the life of the Project, including 110 acres of winter ranged used by pronghorn, 111 acres used by mule deer, 24 acres by elk, and 10 acres used by bighorn sheep (Table 3.10-8). Due to overlap among winter range of the different species, the total amount of winter range impacted by the Proposed Route would be 152 acres, 11 of which is on federal land, all of it administered by the BLM.

Table 3.10-8. Comparison of Acres of Designated Winter Range Impacted during Operations by the Segment 1E Proposed Route and Alternatives 1E-A through 1E-C (acres)

Segment or Alternative	Mule Deer		Pronghorn		Elk		Bighorn sheep		Total 1/	
	Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal
Proposed – Total Length	111	8	110	6	24	3	10	1	**152**	**11**
Proposed – Comparison Portion for Alternative 1E-A	47	<1	39	<1	–	–	–	–	**47**	**<1**
Alternative 1E-A	39	0	36	–	–	–	–	–	**39**	**0**

Table 3.10-8. Comparison of Acres of Designated Winter Range Impacted during Operations by Proposed Segment 1E and Alternatives 1E-A through 1E-C (acres) (continued)

Segment or Alternative	Mule Deer		Pronghorn		Elk		Bighorn sheep		Total 1/	
	Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal
Proposed – Comparison Portion for Alternative 1E-B	15	2	41	5	9	<1	–	–	**52**	**5**
Alternative 1E-B	56	14	43	11	46	7	–	–	**87**	**16**
Proposed – Comparison Portion for Alternative 1E-C	55	8	68	6	24	3	10	1	**95**	**10**
Alternative 1E-C	40	10	31	9	10	3	–	–	**44**	**13**

1/ Totals given have taken any overlap among winter range for different species taken into account so that the total number of acres impacted is reported.
Acreages are rounded to nearest whole acre; therefore, columns/rows may not sum exactly.

Where Segments 1E and 1W cross the NF, road density caused by the Project has been calculated. Table 3.10-9 shows existing road densities on NFS land and densities of roads that would exist during Project operations, by fifth-field watershed. Road densities are considered to be low when less than 0.7 miles per square mile, moderate from 0.7 to 1.7 miles per square mile, and high when above 1.7 (Wisdom et al. 2000).

Table 3.10-9. Road Densities on NFS Lands before and after Project Implementation (miles per square mile)

Route or Segment Fifth-field Watershed	Existing		With Project		
	Total Road Density	Open Road Density	New Project Roads	Total Road Density	Open Road Density 1/
Proposed Routes – 1W(a), 1W(c), 1E					
Bates Creek	1.6	1.6	1.8	3.3	1.6
Deer Creek	2.9	0.1	0.1	3.0	0.1
Alternative Route 1W-A					
Bates Creek	1.6	1.6	1.8	3.3	1.6
Deer Creek	2.9	0.1	0.1	3.0	0.1

1/ All Project roads are considered "closed," as they would be revegetated and closed to the public.
Mileages are rounded to tenths of a mile.

Conclusions

Habitat Fragmentation

The habitat type that would see the greatest number of additional patches created by the Proposed Route would be grasslands, with 369. The habitat type that would experience the greatest drop in average patch size by construction of the Proposed Route, Segment 1E is forest/woodlands, with a decrease of 416 acres. The habitat types that would be least affected by fragmentation by construction of the Proposed Route along Segment 1E are riparian/wetland and agriculture/disturbed. Alternative 1E-A would result in a similar number of patches as the comparison portion of the Proposed Route in all habitat types, but would decrease the average size of remaining patches over the Proposed

Route in shrublands, grasslands, and riparian/wetland. Average patch size would be bigger than along the comparison portion of the Proposed Route under Alternative 1E-A in forest/woodlands, and agriculture/disturbed. Alternative 1E-B would result in smaller average patch size than the comparison portion of the Proposed Route only in agriculture/disturbed. It would create more patches than the comparison portion of the Proposed Route would in forest/woodland, grassland, and agriculture/disturbed. Alternative 1E-C would cause less fragmentation than the comparison portion of the Proposed Route in all five habitat types except for grasslands. Alternative 1E-B would result in the smallest decrease in average remaining patch size as compared to the comparison portion of the Proposed Route, while Alternative 1E-A would result in the smallest increase in patch counts.

Big Game

For winter range for all four species impacted by this segment, Alternative 1E-A would decrease or have no effect on the number of acres impacted during construction and operations compared to the Proposed Route. Alternative 1E-B would either increase or have no effect on the amount impacted during construction and operations. Alternative 1E-C would decrease the amount of winter range impacted of all four species during construction and operations. The selection of Alternative 1E-C would have the least impact on big game winter range compared to the Proposed Route and the other two Route Alternatives.

Raptors

Alternative 1E-A would pass within 1 mile of a bald eagle nest that the comparison portion of the Proposed Route would not. Alternative 1E-B would pass near an additional prairie falcon nest. Alternatives 1E-A and 1E-B would both avoid the two northern goshawk nests. Alternative 1E-C would not impact the seven golden eagle nests and would pass within 1 mile of seven fewer raptor nests total than the comparison portion of the Proposed Route. Thus, selection of Alternative 1E-C would disturb the fewest nesting raptors.

Fish

The selection of Alternative 1E-A would not affect the number of stream crossings or riparian habitat cleared compared to the comparison portion of the Proposed Route. The selection of Alternative 1E-B would increase the number of crossings by three and would increase the amount of riparian habitat cleared compared to the Proposed Route. Alternative 1E-C would decrease impacts to fish and riparian habitat, eliminating three stream crossings and reducing the amount of riparian habitat that would be cleared by 5 acres. Therefore, out of the Proposed Route and the three Route Alternatives, Alternative 1E-C would likely have the least impacts on fish.

Segment 1W

Segment 1W is composed of two parts, Segment 1W(a) and 1W(c), both of which would consist of a new 230-kV line for part of their length and a reconstruction of an existing 230-kV line for the remaining part. Segment 1W(a) would be about 76.5 miles long, and would extend from the Windstar Substation to the Aeolus Substation. Segment 1W(c) would be about 70.6 miles long, and would extend from the Dave Johnson Power Plant

to the Aeolus Substation. Alternative 1W-A is a 16.2-mile alternative located near the town of Glenrock, which was the Proponents' initial proposal before moving the Proposed Route at the suggestion of local landowners in order to avoid the more settled area around Glenrock. Twenty acres of the proposed expansion at the Windstar and Aeolus Substations are attributed to Segment 1W(a) and 3 acres of the expansion at the Heward Substation and 17 acres of the expansion at the Windstar and Aeolus Substations are attributed to Segment 1W(c). There are no Route Alternatives proposed south of that point (see Appendix A, Figure A-2). The most common habitat along the Proposed Route is shrubland (74 percent for 1W[a] and 82 percent for 1W[c]).

Construction

Big Game

Segment 1W would pass through habitats used by various big game species throughout the year. The total amount of winter range that would be impacted along the Proposed Route would be 413 acres for 1W(a) and 458 acres for 1W(c). Of those acres, 65 along 1W(a) and 66 along 1W(c) are federal, all administered by the BLM. Alternative 1W(a) would impact 136 acres of winter range, 62 acres less than the comparison portion of the Proposed Route. There is no parturition or summer habitat mapped for any big game species along this segment (Table 3.10-10).

Table 3.10-10. Big Game Designated Winter Range Impacted by Segments 1W(a) and 1W(c) Proposed Routes and Alternative 1W-A During Construction (acres)

Segment or Alternative	Length (miles)	Mule Deer		Pronghorn		Elk		Total [1/]	
		Total	Federal	Total	Federal	Total	Federal	Total	Federal
Proposed – 1W(a) Total Length	76.5	389	49	285	11	38	42	**413**	**65**
Proposed – Comparison Portion for Alternative 1W-A	20.3	190	t[2/]	173	–	–	t[2/]	**198**	**t[2/]**
Alternative 1W-A	16.2	136	0	117	–	–	–	**136**	–
Proposed – 1W(c) Total Length	70.6	433	49	310	5	59	44	**458**	**66**

1/ Totals given have taken any overlap among winter range for different species taken into account so that the total number of acres impacted is reported.
2/ t = a trace amount (less than 0.1 acre)
Acreages are rounded to nearest whole acre; therefore, columns/rows may not sum exactly.

Raptors

The Proposed Route of Segment 1W would pass within 1 mile of four ferruginous hawk nests, one prairie falcon nest, and one northern goshawk nest currently documented (Table 3.10-11). Of the nests on federal land shown in Table 3.10-11, the two goshawk nests are on NFS lands. Surveys for northern goshawks on Cache NF during 2010 found no territorial goshawks or active goshawk nests (Tetra Tech 2010c). The Medicine Bow Forest Plan has standards regarding the amount of vegetation that can be removed in occupied northern goshawk territories and about characteristics and size of post-fledging area that must be maintained within occupied territories. The Project as currently proposed would not meet these standards. Within the Medicine Bow-Routt NFs, the Proposed Route of Segment 1W(a) would impact 9 acres within 1 mile of

northern goshawk nests, and the Proposed Route of Segment 1W(c) would impact 7 acres. Therefore, a plan amendment would be needed in order to develop the Project (see Appendix F-2). If the amendment occurs, this could increase impacts to goshawks by degrading their habitat. However, timing restrictions for active goshawk nests would still be adhered to (see Section 3.11.2.2, Forest Service Management Indicator Species for more details).

Table 3.10-11. Comparison of Raptor Nests within 1 mile of Segment 1W(a) and 1W(c) Proposed Routes and Alternative 1W-A, Showing How Many are on Federal Land, if any

Segment or Alternative	Total Nests	Number of Nests (number on federal land)			
		Bald Eagle	Ferruginous Hawk	Prairie Falcon	Northern Goshawk
Proposed – 1W(a) Total Length	6 (5)	–	4 (3)	1 (1)	1 (1)
Proposed – Comparison Portion for Alternative 1W-A	–	–	–	–	–
Alternative 1W-A	1	1	–	–	–
Proposed – 1W(c) Total Length	7 (5)	1	4 (3)	1 (1)	1 (1)

Fish

There would be a total of four stream crossings along the two subsegments of Segment 1W. Of the riparian vegetation cleared that is on federal land, less than an acre along the Proposed Route for Segment 1W(a) and 1W(c) is on NFS land. Table 3.10-12 compares the Proposed Route and Route Alternatives along Segment 1W in regard to construction impacts to fish resources.

Table 3.10-12. Comparison of Stream Crossings (and the number on federal land, if any) and Acres of Riparian Clearing During Construction for Proposed Segments 1W(a) and 1W(c) and Alternative 1W-A (and the amount on federal land, if any)

Segment or Alternative	Number of Stream Crossings	Acres of Riparian Habitat Cleared[1/]
Proposed – 1W(a) Total Length	2 (2)	4 (<1)
Proposed – Comparison Portion for Alternative 1W-A	–	<1
Alternative 1W-A	–	2
Proposed – 1W(c) Total Length	2 (1)	7 (1)

1/ Acreages are rounded to nearest whole acre.

Operations

Habitat Fragmentation

Table 3.10-13 presents the habitat fragmentation in Segment 1W.

Table 3.10-13. Habitat Fragmentation from Roads and Transmission Lines by Habitat Type for Segment 1W

Segment or Alternative	Forest/ Woodlands		Shrublands		Grasslands		Riparian/ Wetland		Agriculture/ Disturbed	
	Change in Average patch size (acre) 1/	Change in Patch Count 2/	Change in Average patch size (acre) 1/	Change in Patch Count 2/	Change in Average patch size (acre) 1/	Change in Patch Count 2/	Change in Average patch size (acre) 1/	Change in Patch Count 2/	Change in Average patch size (acre) 1/	Change in Patch Count 2/
Proposed – 1W(a) Total Length	-345	128	-52	199	-112	456	-16	31	-22	25
Proposed – Comparison Portion for Alternative 1W-A	-280	17	-36	63	-63	182	-15	28	-25	25
Alternative 1W-A	-182	17	-51	62	-58	194	-25	25	-25	25
Proposed – 1W(c) Total Length	-316	128	-58	193	-114	462	-24	28	-27	25

1/ The difference between average patch size following construction.
2/ The number of additional fragments created as a result of the Project.
Acreages are rounded to nearest whole acre.

Big Game

An operations impact to big game in Segment 1W would be the presence of the transmission line facilities and access roads for the life of the Project as identified in Table 3.10-14. There would be 117 acres of mule deer winter range, 84 acres of pronghorn winter range, and 11 acres of elk winter range affected long-term by the Proposed Route during operations. Due to overlap of winter ranges among these three species, the total amount of winter range that would be impacted by the Proposed Route is 123 acres by 1W(a) and 86 acres by 1W(c). Of those acres, 10 acres along the Proposed Route for 1W(a) and 12 acres along 1W(c) are federally owned, all managed by the BLM.

Table 3.10-14. Acres of Big Game Designated Winter Range Affected by Project Operations in the Proposed Routes of Segments 1W(a) and 1W(c) and Alternative 1W-A

Segment or Alternative	Mule Deer		Pronghorn		Elk		Total 1/	
	Total	Federal	Total	Federal	Total	Federal	Total	Federal
Proposed – 1W(a) Total Length	117	16	84	12	11	3	**123**	**21**
Proposed – Comparison Portion for Alternative 1W-A	42	t 2/	38	t 2/	–	–	**44**	**t 2/**
Alternative 1W-A	40	–	34	–	–	–	**40**	–
Proposed – 1W(c) Total Length	79	8	62	9	10	2	**86**	**12**

1/ Totals given have taken any overlap among winter range for different species taken into account so that the total number of acres impacted is reported.
2/ t = a trace amount (less than 0.1 acre)
Acreages are rounded to nearest whole acre; therefore, columns/rows may not sum exactly.

Conclusions

Habitat Fragmentation

Segments 1W(a) and 1W(c) would cause fragmentation of all five habitat types examined in this analysis. Along 1W(a), the biggest reduction in average patch size would be in forest/woodlands, with a reduction of 345 acres, and the greatest increase in number of patches would be in grasslands, with 456 patches. On 1W(c), the biggest reduction in average patch size would also be in forest/woodlands, with a decrease of 316 acres, and the greatest number of new patches created would be in grasslands, with 462. Selection of Alternative 1W-A would have a similar effect on fragmentation of the various habitat types as the comparison portion of the Proposed Route.

Big Game

The selection of Alternative 1W-A would affect less designated mule deer and pronghorn winter range during both construction and operations than the comparison portion of the Proposed Route. It would have no effect on the amount of elk winter range impacted. In respect to big game designated winter range along Segment 1W(a), Alternative 1W-A would have less total effects than the comparison portion of the Proposed Route.

Raptors

The selection of Alternative 1W-A would add one bald eagle nest that would be impacted; therefore, the Proposed Route would impact the fewest nesting raptors.

Fish

The selection of Alternative 1W-A would increase the amount of riparian vegetation that would be removed compared to the comparison portion of the Proposed Route. In regard to fish resources, the Proposed Route for 1W(a) and 1W(c) would have the same impacts as the alternatives.

Segment 2

Segment 2, as proposed, would link the Aeolus and Creston Substations in southeast Wyoming with two 500-kV circuits on one structure. One circuit would be operated at 230 kV during the initial phase of the Project. Its total proposed length is 96.7 miles. Fifty-two acres of the expansion of the Aeolus Substation and the construction of the Creston Substation and 0.5 acre for one regeneration site are attributed to Segment 2. There are three Route Alternatives, two of which are near the community of Fort Fred Steele. Alternative 2A at 28.4 miles long is being considered by the BLM because it remains in the WWE corridor nearer the town and the state historic site, and Alternative 2B, at 6.2 miles, is closer to the community than the comparison portion of the Proposed Route and was the initially proposed route before the Proponents responded to local suggestions and relocated the Proposed Route farther to the south. Alternative 2C is a 24.4-mile alternative located north of Hanna, Wyoming. It is being evaluated at the recommendation of the Wyoming Governor's office to follow a utility corridor approved by that office for minimizing effects to sage-grouse (see Appendix A, Figure A-3). Segment 2 lies on mostly flat topography, crossing the Continental Divide. The most common habitat type along the Proposed Route is shrubland (94 percent).

Construction

Big Game

Segment 2 would impact 1,335 acres of winter range for pronghorn, 1,201 acres for mule deer, 257 acres for elk, and 206 acres for moose. Because these habitat designations partially overlap, the Proposed Route centerline would actually impact 1,484 acres of winter range, 558 of which are federal lands administered by the BLM. Neither the Proposed Route nor the Route Alternatives pass through mapped parturition or summer habitat for any big game species. Table 3.10-15 compares Segment 2 against Alternatives 2A through 2C in regard to impacts on big game winter range.

Table 3.10-15. Comparison of Designated Winter Range Impacted by the Segment 2 Proposed Route and Alternatives 2A through 2C During Construction (acres)

Segment or Alternative	Length (miles)	Mule Deer		Pronghorn		Elk		Moose		Total 1/	
		Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal
Proposed – Total Length	96.7	1,201	443	1,335	511	257	71	206	70	**1,484**	**558**
Proposed – Comparison Portion for Alternative 2A	28.8	227	75	308	105	208	55	157	54	**398**	**121**
Alternative 2A	28.4	157	51	444	145	29	16	32	17	**444**	**145**
Proposed – Comparison Portion for Alternative 2B	7.0	104	54	104	54	–	–	44	25	**104**	**54**
Alternative 2B	6.2	57	21	80	28	–	–	2	1	**80**	**28**
Proposed – Comparison Portion for Alternative 2C	28.4	158	65	198	73	237	55	141	30	**309**	**101**
Alternative 2C	24.4	133	43	278	124	t 2/	t 2/	t 2/	t 2/	**322**	**134**

1/ Totals given have taken any overlap among winter range for different species taken into account so that the total number of acres impacted is reported.
2/ t = a trace amount (less than 0.1 acre)
Acreages are rounded to nearest whole acre; therefore, columns/rows may not sum exactly.

Raptors

The Segment 2 proposed centerline would pass within 1 mile of the currently documented locations of 2 American kestrel nests, 3 burrowing owl nests, 79 ferruginous hawk nests, 19 golden eagle nests, 2 northern harrier nests, 3 prairie falcon nests, 8 red-tailed hawk nests, and 4 Swainson's hawk nests. Table 3.10-16 presents the Proposed Route with Alternatives 2A and 2B for proximity to raptor nests.

Table 3.10-16. Comparison of Raptor Nests within 1 Mile of the Segment 2 Proposed Route and Alternatives 2A through 2C, Showing How Many are on Federal Land, if any

Segment or Alternative	Total Nests	Number of Nests (number on federal land)								
		American kestrel	Bald eagle	Burrowing owl	Ferruginous Hawk	Golden eagle	Northern harrier	Prairie falcon	Red-tailed hawk	Swainson's hawk
Proposed – Total Length	120 (43)	2 (1)	0	3 (2)	79 (31)	19 (6)	2 (1)	3 (1)	8 (1)	4
Proposed – Comparison Portion for Alternative 2A	20 (4)	–	–	–	10 (3)	6	–	–	2 (1)	2
Alternative 2A	15 (1)	1 (1)	2	–	6	4	–	–	2	–
Proposed – Comparison Portion for Alternative 2B	7 (3)	–	–	–	5 (2)	–	–	–	2 (1)	–
Alternative 2B	5		2	–	1	–	–	–	2	–
Proposed – Comparison Portion for Alternative 2C	33 (15)	–	–	–	19 (13)	7 (2)	1	–	2	4
Alternative 2C	47 (17)	2 (2)	–	–	19 (7)	10 (2)	2	4 (1)	8 (4)	2 (1)

Fish

The Proposed Route of Segment 2 would include nine stream crossings. However, none of the Route Alternatives would have stream crossings. Riparian ROW clearing along the Proposed Route would impact 7 acres during construction, 3 acres of which would be kept clear during operations. Table 3.10-17 compares the Segment 2 Proposed Route with Alternatives 2A through 2C in regard to construction impacts to fish resources. Federal land from which riparian habitat would be cleared is all administered by the BLM.

Table 3.10-17. Comparison of Acres of Permanent Riparian Clearing for Proposed Segment 2 and Alternatives 2A through 2C (and the amount on federal land, if any)

Segment or Alternative	Acres of Riparian Habitat Cleared
Proposed – Total Length	7 (1)
Proposed – Comparison Portion for Alternative 2A	1 (<1)
Alternative 2A	8 (<1)
Proposed – Comparison Portion for Alternative 2B	<1 (<1)
Alternative 2B	6
Proposed – Comparison Portion for Alternative 2C	2 (<1)
Alternative 2C	<1

Acreages are rounded to nearest whole acre.

Operations

Habitat Fragmentation

Table 3.10-18 presents the comparison portion of Segment 2 with Alternatives 2A, 2B, and 2C for habitat fragmentation from proposed roads and the transmission line.

Table 3.10-18. Comparison of Habitat Fragmentation from Roads and Transmission Lines by Habitat type for the Segment 2 Proposed Route and Alternatives 2A through 2C

Segment or Alternative	Forest/ Woodlands		Shrublands		Grasslands		Riparian/ Wetland		Agriculture/ Disturbed	
	Change in Average patch size (acre) 1/	Change in Patch Count 2/	Change in Average patch size (acre) 1/	Change in Patch Count 2/	Change in Average patch size (acre) 1/	Change in Patch Count 2/	Change in Average patch size (acre) 1/	Change in Patch Count 2/	Change in Average patch size (acre) 1/	Change in Patch Count 2/
Proposed – Total Length	–	–	-77	357	-93	45	-14	14	–	–
Proposed – Comparison Portion for Alternative 2A	–	–	-56	200	–	–	-12	11	–	–
Alternative 2A	–	–	-52	207	–	–	-12	11	–	–
Proposed – Comparison Portion for Alternative 2B	–	–	-67	72	–	–	-8	6	–	–
Alternative 2B	–	–	-66	72	–	–	-8	6	–	–
Proposed – Comparison Portion for Alternative 2C	–	–	-55	183	–	–	-31	6	–	–
Alternative 2C	–	–	-68	167	–	–	-18	1	–	–

1/ The difference between average patch size following construction.
2/ The number of additional fragments created as a result of the Project.
Acreages are rounded to nearest whole acre.

Big Game

There would be operations impacts to winter range for mule deer, pronghorn, elk, and moose by the Proposed Route for Segment 2. Due to overlap of winter range among these four species, the total amount of winter range that would be impacted by the Proposed Route is 387 acres, 139 of which are federally owned, all by the BLM. Table 3.10-19 compares Segment 2 against Alternatives 2A through 2C in regard to impacts on big game winter range.

Table 3.10-19. Acres of Big Game Designated Winter Range Affected by Project Operations of the Segment 2 Proposed Route and Alternatives 2A through 2C

Segment or Alternative	Mule Deer		Pronghorn		Elk		Moose		Total 1/	
	Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal
Proposed – Total Length	304	99	351	129	47	11	34	9	**387**	**139**
Proposed – Comparison Portion for Alternative 2A	43	14	53	17	39	9	27	7	**74**	**21**
Alternative 2A	36	11	89	28	<1	–	2	<1	**89**	**28**
Proposed – Comparison Portion for Alternative 2B	16	9	16	9	–	–	8	4	**16**	**9**

Table 3.10-19. Acres of Big Game Designated Winter Range Affected by Project Operations of the Proposed Route of Segment 2 and Alternatives 2A through 2C (continued)

Segment or Alternative	Mule Deer		Pronghorn		Elk		Moose		Total [1/]	
	Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal
Alternative 2B	12	4	18	6	–	–	1	<1	**18**	**6**
Proposed – Comparison Portion for Alternative 2C	33	12	37	13	47	11	26	5	**63**	**20**
Alternative 2C	22	8	45	20	t[2/]	t[2/]	t[2/]	t[2/]	**52**	**22**

1/ Totals given have taken any overlap among winter range for different species taken into account so that the total number of acres impacted is reported.
2/ t = a trace amount (less than 0.1 acre)
Acreages are rounded to nearest whole acre; therefore, columns/rows may not sum exactly.

Conclusions

Habitat Fragmentation

The Proposed Route would increase fragmentation over current conditions in the shrubland, grassland, and riparian/wetland habitat types, decreasing the average remaining patch size and increasing the number of patches. Forest/woodlands and agriculture/disturbed habitat types would not be fragmented. The selection of Alternative 2A, 2B, or 2C would have similar effects on habitat fragmentation as the comparison portion of the Proposed Route. Fragmentation of forest/woodlands and agriculture/disturbed would not occur under any alternative. Fragmentation of grassland would be the same regardless of which alternative is chosen. Fragmentation of shrublands and riparian/wetland would be similar regardless of which alternative is chosen.

Big Game

For mule deer, elk, and moose, the selection of any of the Route Alternatives would decrease the amount of designated winter range impacted during both construction and operations compared to the Proposed Route. For pronghorn, impacts would increase under all Route Alternatives during operations (even though construction-related impacts would be less if Alternative 2B is selected). In regard to total impacts to big game winter range for all species combined, the selection of Alternative 2C would result in the biggest decrease in operations impacts compared to the Proposed Route.

Raptors

Selection of either of the two Route Alternatives would result in fewer total raptor nests within a mile of the Project than the comparison portion of the Proposed Route. Alternative 2A would pass within 1 mile of five fewer nests than the comparison portion of the Proposed Route, while Alternative 2B would pass near two fewer nests.

Fish

Alternatives 2A and 2B would increase the amount of riparian vegetation that would be removed over the comparison portion of Segment 2, while Alternative 2C would result in a reduction in the amount cleared.

Segment 3

Segment 3, as proposed, would link the Creston and Anticline Substations in southeast Wyoming with two 500-kV circuits on one structure. One circuit would be operated at 230 kV during the initial phase of the Project. Its total proposed length between those two substations is 46.7 miles. Sixty-nine acres of the construction of the Anticline and Creston Substations are attributed to Segment 3. Segment 3 would also link the Anticline and Jim Bridger Substations with a 4.3-mile 230-kV line and a 5.5-mile 345-kV line and includes the 10-acre expansion of the Jim Bridger 345-kV Substation. There are no Route Alternatives proposed along this segment (see Appendix A, Figure A-4). Segment 3 also lies along mostly flat land and crosses the Continental Divide again. The dominant habitat type along the Proposed Route is shrubland (96 percent).

Construction

Big Game

Segment 3 would pass through habitats used by various big game species throughout the year. In addition, the Proposed Route along Segment 3 would impact 863 acres of winter range for pronghorn. It would also impact 625 acres of mule deer winter range, all of which overlaps pronghorn range, resulting in a total of 863 acres of big game winter range impacted, 415 of which are federal lands administered by the BLM. There is no parturition or summer habitat identified along Segment 3 for any big game species.

Raptors

Construction of Segment 3 would occur within 1 mile of 1 American kestrel nest, 2 burrowing owl nests (both on federal land), 9 ferruginous hawk nests (6 on federal land), 8 golden eagle nests (7 on federal land), 1 northern harrier nest (on federal land), 12 prairie falcon nests (8 on federal land), and 3 red-tailed hawk nests (3 on federal land) currently documented, for a total of 36 nests. On the Green River Management Area in the Rock Springs FO, permanent structures such as powerlines and roads are not allowed within 0.5 mile of active raptor nests; however, Segment 3 would lie within 0.5 mile of known raptor nests within this management unit. If any of these nests are active at the time of construction, an amendment to the Green River RMP would be needed (see Appendix F-1). The requested amendment would be “Allow the Gateway West Transmission Line Project within 0.5 miles of active raptor nests, with appropriate mitigation measures.” Additional mitigation would include micrositing of the route and towers and adherence to seasonal closures unless an exception is granted by the Agency. The impacts of this amendment, if accepted, would be increased disturbance to nesting raptors, potentially leading to disruption in feeding times and flushing of the adult from the nest, possibly resulting in loss of one or more young.

Fish

There are two stream crossings proposed for Segment 3 (three on BLM-managed land and three on private land), and a total of 8 acres of riparian vegetation would be cleared for construction. Of these 8 acres, 1 are on federal land, administered by the BLM. During operations, 1 acre of riparian vegetation would remain cleared (Tables D.9-1 and D.9-2 in Appendix D).

Operations

Habitat Fragmentation

The only habitat type that would be fragmented by Segment 3 is shrublands, where the average patch size would decrease by 126 acres, and 202 new patches would be created.

Big Game

Operations impacts to big game in Segment 3 would be limited to the presence of the transmission line facilities and access roads for the life of the Project. Approximately 169 acres of mule deer winter range and 219 acres of pronghorn winter range would be affected. Due to overlap of winter ranges between these two species, the total amount of winter range that would be impacted by the Proposed Route is 219 acres. Of those, 90 acres consist of federally administered lands, all by the BLM.

Segment 4

Segment 4, as proposed, would link the Anticline Substation near the Jim Bridger Power Plant in southwestern Wyoming with the Populus Substation in Idaho with two 500-kV circuits on one structure. Its total proposed length is 203 miles. Eighty-nine acres of the construction of the Anticline Substation and the expansion of the Populus Substation and 1.5 acres for three regeneration sites are attributed to Segment 4. It has six Route Alternatives in the middle portion of its route but the first 52 miles to the east and the last 61 miles to the west (in Idaho) do not have any Route Alternatives. The middle section of the Proposed Route is 90.2 miles long, and its Route Alternatives vary from 85 to 102 miles long. These Route Alternatives were proposed by the Wyoming Governor's office (4A, paralleling the existing 345-kV lines throughout); by the BLM Kemmerer FO (4B through 4E, including edits from various cooperating agencies), with the intent to minimize wildlife and visual impacts; and by the Proponents (4F, attempting to avoid impacts to cultural resources while still remaining north of the existing lines) (see Appendix A, Figures A-5 and A-6). This segment is near Seedskadee NWR, Cokeville Meadows NWR, and Bear Lake NWR, and also runs through Caribou-Targhee NFs and near Bridger National Forest. The dominant habitat type along the Proposed Route is shrubland (73 percent).

Construction

Big Game

Segment 4 as proposed would pass through habitats used by various big game species throughout the year. Two officially designated habitat types would also be impacted, winter range and parturition areas. Because there is some overlap of designated winter range for the four different species, the total amount of designated winter range impacted by the Proposed Route is 2,226 acres. Of these acres, 997 are on federal land, with 28 of those acres in the Caribou-Targhee NFs. The Proposed Route of Segment 4 would also impact 99 acres of elk parturition area, all along the comparison portion. Of these 99 acres, 69 are on federal land, administered by the BLM. Alternative 4A would affect 131 acres of elk parturition habitat, while Alternative 4F would affect 148 acres; the other Route Alternatives would not affect this type of habitat.

Table 3.10-20 compares Segment 4 against Alternatives 4A through 4F in regard to impacts on big game winter range.

Table 3.10-20. Comparison of Designated Winter Range Impacted by the Segment 4 Proposed Route and Alternatives 4A through 4F (acres)

Segment or Alternative	Length (miles)	Mule Deer		Moose		Pronghorn		Elk		Total [1/]	
		Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal
Proposed – Total Length	203.0	1,337	466	307	198	1,083	579	791	519	**2,226**	**997**
Proposed – Comparison Portion for Alternatives 4A,B,C,D,E,F	90.2	445	286	307	198	338	254	539	423	**888**	**579**
Alternative 4A	85.2	262	109	378	174	406	224	296	125	**788**	**388**
Alternative 4B	100.2	636	331	71	<1	355	99	551	296	**920**	**424**
Alternative 4C	101.6	639	296	210	68	345	132	545	261	**914**	**389**
Alternative 4D	100.8	640	324	78	4	352	100	546	281	**921**	**417**
Alternative 4E	102.2	640	300	210	68	346	133	539	255	**914**	**392**
Alternative 4F	87.5	229	65	352	208	317	180	195	79	**793**	**430**

1/ Totals given have taken any overlap among winter range for different species taken into account so that the total number of acres impacted is reported.

Acreages are rounded to nearest whole acre; therefore, columns/rows may not sum exactly.

Raptors

Segment 4 would pass within 1 mile of 51 currently documented raptor nests: 1 American kestrel, 1 bald eagle, 5 common raven, 13 ferruginous hawk, 4 golden eagle, 4 northern goshawk, 2 northern harrier, 9 prairie falcon, 11 red-tailed hawk, and 1 Swainson's hawk. The northern goshawk nests and one of each of the red-tailed hawk nests in Table 3.10-21, below, are on NFS land. Table 3.10-21 compares Segment 4 against Alternatives 4A through 4C in regard to the number of raptor nests within a mile.

Table 3.10-21. Comparison of Raptor Nests within 1 Mile of the Proposed Route and Route Alternatives, Segment 4 Proposed Route and Alternatives 4A through 4F, and How Many are on Federal Land, if any

Segment or Alternative	Total Nests	Number of Nests (number on federal land)										
		American kestrel	Bald eagle	Burrowing owl	Common raven	Ferruginous hawk [1/]	Golden eagle	Northern goshawk	Northern harrier	Prairie falcon	Red-tailed hawk	Swainson's hawk
Proposed – Total Length	51 (25)	1	1		5 (2)	13 (7)	4 (3)	4 (4)	2 (2)	9 (4)	11 (3)	1
Proposed – Comparison Portion for Alternatives 4A–F	9 (7)	1	–		–	4 (4)	–	–	–	–	3 (3)	1
Alternative 4A	12 (7)	1	–	–	–	2 (2)	4 (2)	–	–	1	3 (3)	1
Alternative 4B	19 (12)	1	–	1 (1)	2 (2)	–	6 (1)	–	–	1	6 (6)	1
Alternative 4C	19 (12)	1	–	1 (1)	2 (2)	–	6 (1)	–	–	2	6 (6)	1

Table 3.10-21. Comparison of Raptor Nests within 1 mile of the Proposed Route and Route Alternatives, Segment 4 Proposed Route and Alternatives 4A through 4F, and How Many are on Federal Land, if any (continued)

Segment or Alternative	Total Nests	Number of Nests (number on federal land)										
		American kestrel	Bald eagle	Burrowing owl	Common raven	Ferruginous hawk 1/	Golden eagle	Northern goshawk	Northern harrier	Prairie falcon	Red-tailed hawk	Swainson's hawk
Alternative 4D	19 (12)	1	–	1 (1)	2 (2)	–	6 (1)	–	–	2	6 (6)	1
Alternative 4E	19 (12)	1	–	1 (1)	2 (2)	–	6 (1)	–	–	2	6 (6)	1
Alternative 4F	11 (6)	1	–	–	–	2 (2)	4 (2)	–	–	1	2 (2)	1

1/ Numbers for Alternatives 4B through 4E are suspected ferruginous hawk nests.

Surveys for northern goshawks and flammulated owls on Medicine Bow-Routt NFs during 2010 found no territorial birds or active nests (Tetra Tech 2010d). On the Green River Management Area in the Rock Springs FO, permanent structures such as powerlines and roads are not allowed within 0.5 mile of active raptor nests; however, the Proposed Route of Segment 4, as well as all of its Route Alternatives, would lie within 0.5 mile of 40 known raptor nests within the Rock Springs FO. If any of these nests are active at the time of construction, an amendment to the Green River RMP would be needed.

Fish

A total of 18 stream crossings are proposed for Segment 4. Of the crossings that would be on federal land, 5 are on NFS lands. Construction would impact 20 acres of riparian areas along the Proposed Route, of which 6 acres would be kept clear during operations. Of the riparian vegetation on federal land that would be cleared, 0.2 acre along the Proposed Route is on NFS land. Table 3.10-22 compares the Proposed Route of Segment 4 with Alternatives 4A through 4F with regard to construction impacts to fish resources.

Table 3.10-22. Comparison of Stream Crossings (and the number on federal land, if any) and Acres of Riparian Clearing during Construction for the Segment 4 Proposed Route and Alternatives 4A through 4F (and the amount on federal land, if any)

Segment or Alternative	Number of Stream Crossings	Acres of Riparian Habitat Cleared 1/
Proposed – Total Length	18 (11)	20 (2)
Proposed – Comparison Portion for Alternatives 4A,B,C,D,E,F	3 (2)	7 (<1)
Alternative 4A	10 (5)	28 (3)
Alternative 4B	5	22 (<1)
Alternative 4C	4	21 (1)
Alternative 4D	5	21 (1)
Alternative 4E	4	21 (2)
Alternative 4F	18 (13)	26 (3)

1/ Acreages are rounded to nearest whole acre.

Operations

Habitat Fragmentation

Table 3.10-23 presents the comparison portion of Segment 4 with Alternatives 4A through 4F for habitat fragmentation from proposed roads and the transmission line.

Table 3.10-23. Comparison of Habitat Fragmentation from Roads and Transmission Lines by Habitat Type for the Segment 4 Proposed Route and Alternatives 4A through 4F

Segment or Alternative	Forest/ Woodlands		Shrublands		Grasslands		Riparian/ Wetland		Agriculture/ Disturbed	
	Change in Average patch size (acre) 1/	Change in Patch Count 2/	Change in Average patch size (acre) 1/	Change in Patch Count 2/	Change in Average patch size (acre) 1/	Change in Patch Count 2/	Change in Average patch size (acre) 1/	Change in Patch Count 2/	Change in Average patch size (acre) 1/	Change in Patch Count 2/
Proposed – Total Length	-11	119	-45	544	< -1	32	-3	39	-19	76
Proposed – Comparison Portion for Alternatives 4A,B,C,D,E	-248	32	-103	276	< -1	2	-9	10	-22	26
Alternative 4A	-35	14	-85	269	< -1	2	-16	14	-27	33
Alternative 4B	–	–	-103	317	< -1	2	-14	21	-25	22
Alternative 4C	–	–	-105	325	< -1	2	-16	23	-36	36
Alternative 4D	–	–	-102	317	< -1	2	-14	21	-25	22
Alternative 4E	–	–	-105	325	< -1	2	-16	23	-36	36
Alternative 4F	-93	27	-79	254	< -1	2	-12	11	-23	28

1/ The difference between average patch size following construction.
2/ The number of additional fragments created as a result of the Project.
Acreages are rounded to nearest whole acre.

Big Game

There would be operations occupancy along Segment 4 on winter ranges of mule deer, pronghorn, moose, and elk. Because there is some overlap among designated winter range for the four different species, the total number of acres that would be impacted by the Proposed Route during operations is 487. Operations occupancy of elk parturition range would be 24 acres along the Proposed Route (all along the comparison portion for the Route Alternatives, 16 acres of which is federally owned), 39 acres along Alternative 4A (27 acres of which is federally owned), and 46 acres along Alternative 4F (36 acres of which is federally owned). All federally managed parturition range along the Segment 4 Proposed Route and its Route Alternatives is BLM-administered.

Table 3.10-24 compares Segment 4 against Alternatives 4A through 4F in regard to impacts on big game winter range.

Table 3.10-24. Acres of Big Game Designated Winter Range Affected by Operations, Segment 4 Proposed Route and Alternatives 4A through 4F

Segment or Alternative	Mule Deer		Pronghorn		Moose		Elk		Total 1/	
	Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal
Proposed – Total Length	310	91	254	106	70	45	169	107	**487**	**196**
Proposed – Comparison Portion for Alternatives 4A,B,C,D,E,F	92	56	59	46	70	45	116	89	**183**	**118**
Alternative 4A	63	28	85	49	89	50	72	35	**175**	**94**
Alternative 4B	143	75	76	21	12	<1	121	69	**205**	**96**
Alternative 4C	138	66	76	30	41	15	114	59	**199**	**86**
Alternative 4D	149	82	77	21	12	<1	125	73	**212**	**102**
Alternative 4E	142	71	77	30	41	15	116	62	**203**	**91**
Alternative 4F	48	12	64	38	85	55	43	20	**174**	**98**

1/ Totals given have taken any overlap among winter range for different species taken into account so that the total number of acres impacted is reported.
Acreages are rounded to nearest whole acre; therefore, columns/rows may not sum exactly.

The Kemmerer RMP does not allow an average of more than 2 miles of open road per square mile on big game winter range. After the Project is built, road densities would rise above 2 miles per square mile in one big game winter range area along the Proposed Route of Segment 4 around and to the west of the town of Fontenelle, Wyoming. The current road density is 2.0 miles per square mile; during Project operations it would be 2.1 miles of open road per square mile.

Where Segment 4 crosses the Caribou-Targhee NF, the effects on road density from the Project have been calculated. Table 3.10-25 shows existing road densities on NFS land and densities of roads that would exist during Project operations, by fifth-field watershed. In the Caribou Forest Plan, roads have been rated for their risk to wildlife; all roads that the Project crosses are designated as low risk for northern goshawk, big game, and overall wildlife, except for one road that does show a risk to goshawk (Forest Service 2005). This makes it likely that Project roads in the same areas, that would be revegetated following construction, would also present a low risk to wildlife.

Table 3.10-25. Road Densities along the Proposed Route of Segment 4 on Forest Service Land before and after Project Implementation (miles per square mile)

Fifth-field watershed	Existing		With Project		
	Total Road Density	Open Road Density	New Project Roads	Total Road Density	Open Road Density 1/
Mill Creek-Ovid Creek	1.8	1.1	0.2	1.9	1.1
Trout Creek-Bear River	1.4	0.8	0.1	1.5	0.8

1/ All Project roads are considered “closed,” as they would be revegetated and closed to the public.
Mileages are rounded to tenths of a mile.

Conclusions

Habitat Fragmentation

The Proposed Route would result in increased fragmentation in all five habitat types over current levels. It would have the greatest effect in shrublands, where the average patch size would decrease by 45 acres and there would be 544 additional patches on the landscape. The smallest effect would be in grassland, where the average patch size would decrease by only 1 acre, and 32 additional patches would be created. Of the six Route Alternatives, only 4A and 4F would have an effect on fragmentation of forest/woodlands, fragmenting this habitat type less than the comparison portion of the Proposed Route. Alternatives 4A and 4F would fragment the shrublands habitat type less than the Proposed Route, while Alternatives 4B through 4E would fragment this habitat type more than the Proposed Route. Fragmentation of grasslands would be equal and minimal under the Proposed Route or any of the Route Alternatives, with no change in average patch size and an increase in patches of only two. Riparian/wetland would be fragmented more under any of the Route Alternatives compared to the Proposed Route, with Alternatives 4B through 4E more than doubling the number of patches that would be created along the comparison portion of the Proposed Route. Agriculture/disturbed would also experience similar levels of fragmentation regardless of whether the Proposed Route or any of the Route Alternatives is chosen. Alternatives 4B, 4C, 4D, and 4E would result in a higher degree of fragmentation than the Proposed Route within shrublands; however, Alternatives 4B, 4C, 4D, and 4E would avoid fragmenting forested habitat types, which take longer to recover. Regarding habitat fragmentation along Segment 4, there is no choice that would have the most favorable effect overall among the six Route Alternatives or the Proposed Route.

Big Game

For mule deer, Alternatives 4A and 4F would result in decreased construction and operations impacts to winter range compared to the Proposed Route, while Alternatives 4B through 4E would increase the amount of impacts. For moose, Alternatives 4A and 4F would increase the impacts compared to the Proposed Route, while Alternatives 4B through 4E would decrease impacts for both construction and operations. All Route Alternatives would increase the amount of pronghorn winter range impacted (except construction impacts from Alternative 4F, which would decrease). Impacts to elk winter range during operations would decrease under Alternatives 4A, 4C, and 4F and increase under Alternatives 4B or 4D. Under Alternative 4E, construction-related impacts would decrease but operations effects would not change compared to the Proposed Route. Pooling all four big game species, the alternative that would impact the fewest acres of winter range during construction is Alternative 4A, and Alternative 4F would impact the fewest acres during operations.

Raptors

Selection of Alternatives 4A through 4F would increase the number of raptor nests within 1 mile of the Project, potentially increasing the number of nesting raptors that would be disturbed and experience other impacts, compared to the Proposed Route. Alternatives 4B through 4E would have the greatest impacts, being located within 1 mile of 19 raptor nests each, while Alternative 4A would be near only 12 nests and 4F only 11 nests. The

species that would be affected under each Route Alternative vary slightly. Alternatives 4B through 4E would impact more common ravens, golden eagles, prairie falcons, and red-tailed hawks than the comparison portion of the Proposed Route. Alternatives 4A and 4F would avoid the burrowing owl nest and three of the ferruginous hawk nests, as well as impact fewer golden eagles.

Fish

All of the Route Alternatives would increase the number of stream crossings and the amount of riparian habitat cleared compared to the Proposed Route. The greatest increases in impacts compared to the Proposed Route would be under Alternatives 4A and 4F. Alternative 4F would result in the most streams crossed, and Alternative 4A would result in the greatest amount of riparian habitat being cleared. Regarding impacts on fish resources, the Proposed Route would have the least impacts.

Segment 5

Segment 5, as proposed, would link the Populus and Borah Substations with a 54.6-mile single-circuit 500-kV line. Forty-four acres of the expansion of the Populus and Borah Substations are attributed to Segment 5. There are five Route Alternatives including two proposed by the BLM to avoid the Deep Creek Mountains (5A and 5B; 8 miles and 19 miles longer than the comparison portion of the Proposed Route), one preferred by Power County that crosses the Fort Hall Indian Reservation (5C; 6 miles shorter than the comparison portion of the Proposed Route), one originally proposed by the Proponents (5D; 2 miles shorter than the comparison portion of the Proposed Route but located within more agricultural lands), and one proposed by Power County as an alternative approach to the Borah Substation (5E) (see Appendix A, Figure A-7).

Segment 5 would travel through more populated and mountainous country than the Wyoming segments, crossing the Bannock Range and Deep Creek Mountains and coming near the southern suburbs of Pocatello, Idaho. The dominant habitat type along the Proposed Route is shrubland (45 percent).

Construction

Big Game

The Segment 5 centerline would pass through habitats used by various big game species throughout the year. In addition, Segment 5 would impact 532 acres of mule deer winter range and about 1 acre of elk winter range along its 55-mile length. Of these impact acres, 110 are on federal land administered by the BLM. Table 3.10-26 compares Segment 5 against Alternatives 5A through 5E in regard to impacts on big game winter range.

Table 3.10-26. Comparison of Designated Winter Range Impacted by the Segment 5 Proposed Route and Alternatives 5A through 5E (acres)

Segment or Alternative	Total Miles	Mule Deer		Elk		Total [1/]	
		Acres	Federal	Acres	Federal	Acres	Federal
Proposed – Total Length	54.6	532	110	1	–	**532**	**110**
Proposed – Comparison Portion for Alternative 5A,B	25.3	151	52	1	–	**152**	**52**
Alternative 5A	33.7	221	58	–	–	**221**	**58**
Alternative 5B	44.4	321	73	–	–	**321**	**73**
Proposed – Comparison Portion for Alternative 5C	33.2	377	56	1	–	**378**	**56**
Alternative 5C	26.1	112	–	131	–	**176**	**0**
Proposed – Comparison Portion for Alternative 5D	19.4	311	39	–	–	**311**	**39**
Alternative 5D	17.5	279	1	–	–	**279**	**1**
Proposed – Comparison Portion for Alternative 5E	5.8	46	20	–	–	**46**	**20**
Alternative 5E	5.3	48	7	–	–	**48**	**7**

1/ Totals given have taken any overlap among winter range for different species taken into account so that the total number of acres impacted is reported.

Acreages are rounded to nearest whole acre; therefore, columns/rows may not sum exactly.

Raptors

Segment 5 would pass within 1 mile of two currently documented bald eagle nests and one burrowing owl nest (on BLM-administered land). The bald eagle nests are within 1 mile of Alternative 5D and the comparison portion for Alternative 5D. They are also within 1 mile of the comparison portion for Alternative 5E, but not Alternative 5E. Therefore, the selection of any of the Route Alternatives except 5D would avoid the two bald eagle nests and have the least impacts on nesting raptors. The burrowing owl nest is not within 1 mile of any of the Route Alternatives or comparison portions; therefore the selection of any one of the Route Alternatives would avoid this nest.

Fish

No stream crossings are planned for the Proposed Route of Segment 5. Riparian ROW clearing would impact 6 acres during construction, less than 1 acre of which would be kept clear during operations. Table 3.10-27 compares the Proposed Route of Segment 5 with Alternatives 5A through 5E in regard to construction impacts to fish resources. All of the federal land from which riparian vegetation would be removed is administered by the BLM.

Table 3.10-27. Comparison of Stream Crossings (and the number on federal land, if any) and Acres of Riparian Clearing During Construction for the Segment 5 Proposed Route and Alternatives 5A through 5E (and the amount on federal land, if any)

Segment or Alternative	Number of Stream Crossings	Acres of Riparian Habitat Cleared[1/]
Proposed – Total Length	–	6 (<1)
Proposed – Comparison Portion for Alternatives 5A,B	–	2 (<1)
Alternative 5A	3	<1 (<1)

Table 3.10-27. Comparison of Stream Crossings (and the number on federal land, if any) and Acres of Riparian Clearing During Construction for the Segment 5 Proposed Route and Alternatives 5A through 5E (and the amount on federal land, if any) (continued)

Segment or Alternative	Number of Stream Crossings	Acres of Riparian Habitat Cleared[1/]
Alternative 5B	3 (3)	1 (<1)
Proposed – Comparison Portion for Alternative 5C	–	2
Alternative 5C	–	3
Proposed – Comparison Portion for Alternative 5D	–	3
Alternative 5D	–	8
Proposed – Comparison Portion for Alternative 5E	–	1
Alternative 5E	–	<1 (<1)

1/ Acreages are rounded to nearest whole acre.

Operations

Habitat Fragmentation

Table 3.10-28 presents the comparison portion of Segment 5 with Alternatives 5A through 5E with regard to habitat fragmentation from proposed roads and the transmission line.

Table 3.10-28. Comparison of Habitat Fragmentation from Roads and Transmission Lines by Habitat Type for the Segment 5 Proposed Route and Alternatives 5A through 5E

Segment or Alternative	Forest/ Woodlands		Shrublands		Grasslands		Riparian/ Wetland		Agriculture/ Disturbed	
	Change in Average patch size (acre) [1/]	Change in Patch Count [1/]	Change in Average patch size (acre) [1/]	Change in Patch Count [2/]	Change in Average patch size (acre) 1/	Change in Patch Count [2/]	Change in Average patch size (acre) [1/]	Change in Patch Count [2/]	Change in Average patch size (acre) [1/]	Change in Patch Count [2/]
Proposed – Total Length	-9	131	-19	324	-1	84	< -1	7	-37	192
Proposed – Comparison Portion for Alternatives 5A,B	-12	107	-34	219	-1	29	< -1	3	-81	112
Alternative 5A	-14	193	-48	332	-4	89	< -1	12	-99	140
Alternative 5B	-8	197	-61	447	-3	103	< -1	12	-116	184
Proposed – Comparison Portion for Alternative 5C	-10	118	-32	253	-1	57	< -1	3	-58	136
Alternative 5C	-1	44	-18	175	-1	61	< -1	3	-31	99
Proposed – Comparison Portion for Alternative 5D	-14	70	-19	143	-1	36	< -1	2	-48	83
Alternative 5D	-15	68	-18	138	-1	37	< -1	2	-54	78
Proposed – Comparison Portion for Alternative 5E	-2	11	-10	52	< -1	26	< -1	1	-24	46
Alternative 5E	-2	11	-10	50	< -1	26	< -1	1	-24	46

1/ The difference between average patch size following construction.
2/ The number of additional fragments created as a result of the Project.
Acreages are rounded to nearest whole acre.

Big Game

Operations impacts along the Proposed Route for Segment 5 to mule deer winter range are estimated at 80 acres, and at less than 1 acre for elk winter range. Table 3.10-29 presents the amounts of deer and elk winter range impacted along the Proposed Route Segment 5 and Alternatives 5A through 5E during operations. Table 3.10-29 compares Segment 5 against Alternatives 5A through 5E in regard to impacts on big game winter range.

Table 3.10-29. Acres of Big Game Designated Winter Range Affected by Operations, Segment 5 Proposed Route and Alternatives 5A through 5E

	Mule Deer		Elk		Total 1/	
Segment or Alternative	**Total**	**Federal**	**Total**	**Federal**	**Total**	**Federal**
Proposed – Total Length	80	18	<1	–	**81**	**18**
Proposed – Comparison Portion for Alternative 5A,B	30	12	<1	–	**30**	**12**
Alternative 5A	33	12	–	–	**33**	**12**
Alternative 5B	43	13	–	–	**43**	**13**
Proposed – Comparison Portion for Alternative 5C	60	10	<1	–	**61**	**10**
Alternative 5C	14	–	15	–	**20**	–
Proposed – Comparison Portion for Alternative 5D	43	4	–	–	**43**	**4**
Alternative 5D	30	<1	–	–	**31**	**<1**
Proposed – Comparison Portion for Alternative 5E	4	<1	–	–	**4**	**<1**
Alternative 5E	5	1	–	–	**5**	**1**

1/ Totals given have taken any overlap among winter range for different species taken into account so that the total number of acres impacted is reported.

Acreages are rounded to nearest whole acre; therefore, columns/rows may not sum exactly.

Conclusion

Habitat Fragmentation

The Proposed Route would fragment all five habitat types, with agriculture/disturbed seeing the biggest decrease in average patch size, and shrubland seeing the biggest increase in number of patches. Compared to the Proposed Route, Alternative 5C would be the best option for minimizing fragmentation to forest/woodlands, shrublands, and agriculture/disturbed habitat types. Alternative 5C would also only minimally fragment grasslands and riparian/wetland, although Alternative 5D would be a very slight improvement over 5C. Alternative 5B would create the most fragmentation in general, compared to the Proposed Route and the other Route Alternatives. Selecting Alternative 5E would have little effect on the amount of fragmentation that would occur, compared to the Proposed Route.

Big Game

The Proposed Route would impact mule deer winter range but would affect very little elk winter habitat. A wide range in the amount of potential effects to big game winter range is possible from the five Route Alternatives. Paradoxically, Alternative 5C would have the least impacts to mule deer winter range (a decrease of 46 acres during operations, or a 77 percent decrease from the comparison portion of the Proposed Route), but the most impacts on elk winter range (an increase from less than an acre to 15 acres during operations). Because of the very small amount of elk winter range affected, however, Alternative 5C would result in the least total impacts to big game winter range during

construction and operations compared to the Proposed Route and the other Route Alternatives, while Alternative 5B would have the greatest impacts.

Raptors

Based on the location of the three known raptor nests along this segment, the selection of any of the Alternatives 5A, 5B, 5C, or 5E would have the least impacts because it would avoid all three nests.

Fish

Selection of Alternative 5E would result in the least impact to fish and their habitat. Alternatives 5A and 5B have three stream crossings proposed, while the Proposed Route has none, although they would decrease the amount of riparian vegetation that would be removed by a few acres. Alternatives 5C and 5D would not affect the number of streams that would be crossed, but would both increase the amount of riparian vegetation that would be cleared.

Segment 6

Segment 6 is an existing transmission line linking the Borah and Midpoint Substations; it is now operated at 345 kV but would be changed to operate at 500 kV. This segment has no Route Alternatives. Existing support structures would be used and impacts would be limited to within approximately 0.25 mile from each substation to allow for moving the entry point into the substation to the new 500-kV bay. Thirty-one acres of the expansion of the Borah and Midpoint Substations are attributed to Segment 6. Changes in the two substations would allow it to be operated at 500 kV (see Appendix A, Figure A-8).

Segment 6 would not involve any ground-disturbing activities outside the immediate vicinity (less than 0.5 mile) of the two substations it interconnects, Borah and Midpoint. It was built as a single-circuit 500-kV line but has been operated at 345 kV. Changes in the two substations would allow for it to be operated at 500 kV. This would involve some disturbance at these two locations. Modifying the Borah and Midpoint substations would cross 0.3 miles of mule deer winter range, impacting 30 acres of this habitat designation during construction and 28 acres during operations, none of it on federal land. There are no known raptor nests within 1 mile of the proposed activities for Segment 6. No stream crossings or riparian vegetation clearing are proposed during construction or operations, and no habitat fragmentation is projected to occur.

Segment 7

Segment 7, as proposed, would link the Populus and Cedar Hill Substations with a 118.1-mile single-circuit 500-kV line. Forty-two acres of the expansion of the Populus and the construction of the Cedar Hill Substations and 1 acre for two regeneration sites are attributed to Segment 7. In addition to the Proposed Route, which is principally on private lands, Route Alternatives have been proposed by the BLM to avoid the Deep Creek Mountains (7A and 7B; which are 5 miles and 11 miles longer than the comparison portion of the Proposed Route), by local landowners (7C, 7D, 7E, 7F, and 7G, which all represent minor adjustments proposed to address local issues), by local landowners to avoid private agricultural lands (7I or the State Line Route, which is 55 miles longer than the Proposed Route and would require 0.5 acre for an additional regeneration site), and by the Proponents to avoid the State Line Route (7H, which is 10

miles longer than the Proposed Route). Alternative 7J, which is a variant of the State Line Route also proposed by local landowners, would not terminate at the Cedar Hill Substation. This alternative, referred to as the Rogerson Alternative, would require a different substation be constructed near a 345-kV existing transmission line (approximately 24 miles southwest of the Cedar Hill Substation; see Appendix A, Figure A-9). The tables and discussion in this document compare 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

Construction

Big Game

Segment 7 would pass through habitats used by various big game species throughout the year. Segment 7 would impact 650 acres of winter range for mule deer along its 118-mile length. Of these 650 acres along the Proposed Route, 161 are on federal land, with less than 1 acre in the Caribou-Targhee NF. No designated winter habitat for bighorn sheep would be affected by the Proposed Route, only by Alternative 7H (with about 26 acres impacted along Alternative 7H). Alternatives 7I and 7J would impact 90 acres of elk summer range (83 of which are on federal land and less than an acre of which is on NFS land) and 19 acres of elk yearlong range in Nevada (all but 0.2 acre of which is on BLM-administered land). Alternatives 7I and 7J would also impact 34 acres of mule deer yearlong range (29 on federal land) and 3 acres of pronghorn summer range (less than an acre of which is on federal land). Table 3.10-30 compares Segment 7 against Alternatives 7A through 7J in regard to impacts on big game winter range.

Table 3.10-30 presents the Proposed Route of Segment 7 against Alternatives 7A through 7J for construction impacts to mule deer, elk, and bighorn sheep winter range.

Table 3.10-30. Comparison of Big Game Designated Winter Range Impacted during Construction by Proposed Segment 7 and Alternatives 7A through 7J (acres)

Segment or Alternative	Length (miles)	Bighorn Sheep		Mule Deer		Elk		Total [1/]	
		Total	Federal	Total	Federal	Total	Federal	Total	Federal
Proposed – Total Length	118.1	–	–	650	161	–	–	**650**	**161**
Proposed – Comparison Portion for Alternative 7A,B	35.2	–	–	221	43	–	–	**221**	**43**
Alternative 7A	38	–	–	130	40	–	–	**130**	**40**
Alternative 7B	46.4	–	–	179	49	–	–	**179**	**49**
Proposed – Comparison Portion for Alternative 7C	20.1	–	–	54	–	–	–	**54**	–
Alternative 7C	20.3	–	–	95	4	–	–	**95**	**4**

Table 3.10-30. Comparison of Big Game Designated Winter Range Impacted during Construction by Proposed Segment 7 and Alternatives 7A through 7J (acres) (continued)

Segment or Alternative	Length (miles)	Bighorn Sheep		Mule Deer		Elk		Total [1/]	
		Total	Federal	Total	Federal	Total	Federal	Total	Federal
Proposed – Comparison portion for Alternative 7D	6.2	–	–	32	–	–	–	**32**	–
Alternative 7D	6.8	–	–	32	–	–	–	**32**	–
Proposed – Comparison Portion for Alternative 7E	3.8	–	–	41	5	–	–	**41**	**5**
Alternative 7E	4.5	–	–	65	23	–	–	**65**	**23**
Proposed – Comparison Portion for Alternative 7F	10.5	–	–	140	23	–	–	**140**	**23**
Alternative 7F	10.8	–	–	160	68	–	–	**160**	**68**
Proposed – Comparison Portion for Alternative 7G	3.1	–	–	46	35	–	–	**46**	**35**
Alternative 7G	3.2	–	–	65	37	–	–	**65**	**37**
Proposed – Comparison Portion for Alternatives 7H,I	118	–	–	650	161	–	–	**650**	**161**
Alternative 7H	127.5	26	6	500	221	–	–	**520**	**225**
Alternative 7I	173.4	–	–	683	404	5	3	**683**	**404**
Proposed – Comparison Portion 7/9 for Alt. 7J [2/]	143.9	–	–	821	245	–	–	**821**	**245**
Alternative 7J [2/]	202.1	–	–	753	387	5	3	**752**	**387**

1/ Totals given have taken any overlap among winter range for different species into account so that the total number of acres impacted is reported.

2/ Alternative 7J connects with Segment 9 approximately 25.8 miles west of the proposed Cedar Hill Substation, which is the western terminus of Segment 7 and the beginning point for Segment 9. The table above compares 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

Acreages are rounded to nearest whole acre; therefore, columns/rows may not sum exactly.

Raptors

The Proposed Route for Segment 7 would pass within 1 mile of 12 currently documented nests: three of burrowing owls and nine of ferruginous hawks (Table 3.10-31). Alternative 7J would pass by the greatest number of nests, followed by Alternatives 7H and 7I.

Table 3.10-31. Comparison of Raptor Nests within 1 mile of the Proposed Route and Route Alternatives for Segment 7, and How Many are on Federal Land, if any

Segment or Alternative	Total Nests	Number of Nests (number on federal land)					
		Burrowing owl	Common Raven	Ferruginous hawk	Golden eagle	Red-tailed hawk	Swainson's hawk
Proposed – Total Length	12 (6)	3 (3)	–	9 (3)	–	–	–
Proposed – Comparison Portion for Alternatives 7A,B	–	–	–	–	–	–	–
Alternative 7A	–	–	–	–	–	–	–
Alternative 7B	–	–	–	–	–	–	–
Proposed – Comparison Portion for Alternative 7C	4 (4)	2 (2)	–	2 (2)	–	–	–
Alternative 7C	2 (2)	2 (2)	–	–	–	–	–
Proposed – Comparison Portion for Alternative 7D	1 (1)	1 (1)	–	–	–	–	–
Alternative 7D	1 (1)	1 (1)	–	–	–	–	–
Proposed – Comparison Portion for Alternative 7E	7 (1)	–	–	7 (1)	–	–	–
Alternative 7E	7 (1)	–	–	7 (1)	–	–	–
Proposed – Comparison Portion for Alternative 7F	7 (1)	–	–	7 (1)	–	–	–
Alternative 7F	7 (1)	–	–	7 (1)	–	–	–
Proposed – Comparison Portion for Alternative 7G	–	–	–	–	–	–	–
Alternative 7G	–	–	–	–	–	–	–
Proposed – Comparison Portion for Alternatives 7H,I	12 (6)	3 (3)	–	9 (3)	–	–	–
Alternative 7H	54 (31)	1 (1)	–	48 (25)	–	–	5 (5)
Alternative 7I	66 (34)	1 (1)	–	58 (30)	3 (1)	2 (2)	2
Proposed– Comparison Portion 7/9 for Alt. 7J[1/]	32 (26)	3 (3)	2 (2)	27 (21)	–	–	–
Alternative 7J [1/]	85	1 (1)	2 (2)	75 (37)	3 (1)	2 (2)	2

1/ Alternative 7J connects with Segment 9 approximately 25.8 miles west of the proposed Cedar Hill Substation, which is the western terminus of Segment 7 and the beginning point for Segment 9. The table above compares 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

Fish

A total of 18 stream crossings are proposed for the Proposed Route of Segment 7. Of those on federal land, 7 of the 11 along Alternative 7I would be on NFS land. There would be 5 acres of riparian vegetation cleared during construction of the Proposed Route, less than 1 acre of which would be kept clear during operations. Of the riparian vegetation removed that is on federal land, there is 1 acre along Alternative 71 and less than 1 acre along Alternatives 7I and 7J that lie on NFS land. Table 3.10-32 compares the Proposed Route of Segment 7 with Alternatives 7A through 7J in regard to construction impacts to fish resources.

Table 3.10-32. Comparison of Stream Crossings (and the number on federal land, if any) and Acres of Riparian Clearing During Construction for the Segment 7 Proposed Route and Alternatives 7A through 7J (and the amount on federal land, if any)

Segment or Alternative	Number of Stream Crossings	Acres of Riparian Habitat Cleared[1/]
Proposed – Total Length	18 (3)	5 (<1)
Proposed – Comparison Portion for Alternatives 7A,B	–	2
Alternative 7A	4 (2)	3 (<1)
Alternative 7B	3 (2)	1
Proposed – Comparison Portion for Alternative 7C	–	<1
Alternative 7C	1	–
Proposed – Comparison Portion for Alternative 7D	–	2 (<1)
Alternative 7D	–	2
Proposed – Comparison Portion for Alternative 7E	2 (1)	–
Alternative 7E	3	–
Proposed – Comparison Portion for Alternative 7F	8 (2)	<1
Alternative 7F	2	<1
Proposed – Comparison Portion for Alternative 7G	–	
Alternative 7G	–	<1
Proposed – Comparison Portion for Alternatives 7H,I	9 (2)	5 (<1)
Alternative 7H	12 (5)	5 (1)
Alternative 7I	23 (11)	13 (3)
Proposed – Comparison Portion 7/9 for Alt. 7J [2/]	10 (2)	5 (<1)
Alternative 7J [2/]	23 (8)	11 (2)

1/ Acreages are rounded to nearest whole acre.

2/ Alternative 7J connects with Segment 9 approximately 25.8 miles west of the proposed Cedar Hill Substation, which is the western terminus of Segment 7 and the beginning point for Segment 9. The table above compares 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

Operations

Habitat Fragmentation

Table 3.10-33 presents the comparison portion of Segment 7 with Alternatives 7A through 7J for habitat fragmentation from proposed roads and the transmission line.

Table 3.10-33. Comparison of Habitat Fragmentation from Road and Transmission Lines for the Segment 7 Proposed Route and Alternatives 7A through 7J

Segment or Alternative	Forest /Woodlands		Shrublands		Grasslands		Riparian /Wetland		Agriculture /Disturbed	
	Change in Average patch size (acre) 1/	Change in Patch Count 2/	Change in Average patch size (acre) 1/	Change in Patch Count 2/	Change in Average patch size (acre) 1/	Change in Patch Count 2/	Change in Average patch size (acre) 1/	Change in Patch Count 2/	Change in Average patch size (acre) 1/	Change in Patch Count 2/
Proposed – Total Length	-5	180	-19	551	-4	235	< -1	6	-45	290
Proposed – Comparison Portion for Alternative 7A,B	-7	125	-35	290	-2	62	< -1	3	-83	127
Alternative 7A	-6	167	-48	337	-3	114	< -1	11	-90	141
Alternative 7B	-3	133	-60	397	-3	100	< -1	11	-104	158
Proposed – Comparison Portion for Alternative 7C	< -1	10	-6	66	-6	55	–	–	-66	48
Alternative 7C	< -1	10	-9	66	-7	54	–	–	-71	48
Proposed – Comparison portion for Alternative 7D	-2	9	-13	78	-9	73	–	–	-11	16
Alternative 7D	-2	9	-13	78	-9	73	–	–	-10	16
Proposed – Comparison Portion for Alternative 7E	-5	29	-59	104	-4	60	–	–	-18	26
Alternative 7E	-5	29	-50	104	-5	60	–	–	-18	26
Proposed – Comparison Portion for Alternative 7F	-5	29	-40	106	-5	68	–	–	-30	43
Alternative 7F	-5	29	-39	106	-4	68	–	–	-30	43
Proposed – Comparison Portion for Alternative 7G	-1	10	-87	55	-2	26	–	–	-71	29
Alternative 7G	-1	10	-91	55	-2	26	–	–	-72	29
Proposed – Comparison Portion for Alternatives 7H,I	-5	180	-19	551	-4	235	< -1	6	-45	290
Alternative 7H	-3	197	-30	613	-4	224	< -1	22	-36	202
Alternative 7I	-2	196	-39	735	-3	246	< -1	22	-27	190
Proposed – Comparison Portion 7/9 for Alternative 7J 3/	-2	61	-6	320	-2	183	< -1	1	-15	180
Alternative 7J 3/	-2	198	-30	841	-3	315	< -1	24	-23	204

1/ The difference between average patch size following construction.
2/ The number of additional fragments created as a result of the Project.
3/ Alternative 7J connects with Segment 9 approximately 25.8 miles west of the proposed Cedar Hill Substation, which is the western terminus of Segment 7 and the beginning point for Segment 9. The table above compares 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

Acreages are rounded to nearest whole acre.

Big Game

Operations impacts to mule deer winter range along the Proposed Route are estimated at 77 acres. Of these acres, 19 are on federal land, a trace amount of which is on the Caribou-Targhee NF. There is no elk or bighorn sheep winter range along the Proposed Route; however, some impacts would occur along alternative routes. There would be 17 acres of operations impacts to elk summer range along Alternatives 7I and 7J (15 acres of which are federal land, administered by BLM), and 6 acres of impact to elk yearlong range (almost all of which is on federal land, administered by BLM). Alternatives 7I and 7J would also impact 5 acres of mule deer yearlong range (4 of which are on federal land, administered by BLM) and 1 acre of pronghorn summer range during operations (less than an acre of which is federal, administered by BLM). Of the acres of summer range impacted along Alternatives 7I and 7J, 15 would be on federal land, a trace amount of which is on the Sawtooth NF. Of the acres of yearlong range impacted, 10 are on federal land, all administered by the BLM. Table 3.10-34 compares Segment 7 against Alternatives 7A through 7J in regard to impacts on big game winter range.

Table 3.10-34. Acres of Big Game Designated Winter Range Affected by Operations of the Segment 7 Proposed Route and Alternatives 7A through 7J

Segment or Alternative	Mule Deer		Elk		Bighorn sheep		Total [1/]	
	Total	Federal	Total	Federal	Total	Federal	Total	Federal
Proposed – Total Length	77	19	–	–	–	–	**77**	**19**
Proposed – Comparison Portion for Alternative 7A,B	23	7	–	–	–	–	**23**	**7**
Alternative 7A	20	10	–	–	–	–	**20**	**10**
Alternative 7B	22	11	–	–	–	–	**22**	**11**
Proposed – Comparison Portion for Alternative 7C	6	0	–	–	–	–	**6**	**0**
Alternative 7C	9	<1	–	–	–	–	**9**	**<1**
Proposed – Comparison portion for Alternative 7D	4		–	–	–	–	**4**	**–**
Alternative 7D	4		–	–	–	–	**4**	**–**
Proposed – Comparison Portion for Alternative 7E	5	<1	–	–	–	–	**5**	**<1**
Alternative 7E	8	3	–	–	–	–	**8**	**3**
Proposed – Comparison Portion for Alternative 7F	18	2	–	–	–	–	**18**	**2**
Alternative 7F	22	9	–	–	–	–	**22**	**9**
Proposed – Comparison Portion for Alternative 7G	4	3	–	–	–	–	**4**	**3**
Alternative 7G	4	2	–	–	–	–	**4**	**2**
Proposed – Comparison Portion for Alternatives 7H,I	77	19	–	–	–	–	**77**	**19**
Alternative 7H	79	33	–	–	4	1	**81**	**33**
Alternative 7I	110	69	3	1	0	0	**110**	**69**
Proposed – Comparison Portion 7/9 for Alt. 7J[2/]	94	30	–	–	–	–	**94**	**30**
Alternative 7J [2/]	151	62	3	1	–	–	**154**	**63**

1/ Totals given have taken any overlap among winter range for different species taken into account so that the total number of acres impacted is reported.

2/ Alternative 7J connects with Segment 9 approximately 25.8 miles west of the proposed Cedar Hill Substation, which is the western terminus of Segment 7 and the beginning point for Segment 9. The table above compares 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

Acreages are rounded to nearest whole acre; therefore, columns/rows may not sum exactly.

Where Alternatives 7H, 7I, and 7J cross the Sawtooth NF, the effects on road density from the Project have been calculated. Table 3.10-35 shows existing road densities on NFS land and densities of roads that would exist during Project operations, by fifth-field watershed.

Table 3.10-35. Road Densities on NFS Land before and after Project Implementation (miles per square mile)

Route or Segment Fifth-field Watershed	Existing		With Project		
	Total Road Density	Open Road Density	New Project Roads	Total Road Density	Open Road Density
Alternative 7H					
Rock Creek	1.0	1.0	<0.1	1.0	1.0
Meadow Creek	1.0	1.0	0.3	1.3	1.0
Cassia Creek	0.7	0.6	<0.1	0.7	0.6
Sublett Creek-Warm Creek	1.0	1.0	<0.1	1.0	1.0
Lower Goose Creek	0.3	0.2	<0.1	0.3	0.2
Alternative 7I					
Rock Creek	1.0	1.0	<0.1	1.0	1.0
Meadow Creek	1.0	1.0	0.3	1.3	1.0
Sublett Creek-Warm Creek	1.0	1.0	<0.1	1.0	1.0
Headwaters Goose Creek	1.5	1.3	<0.1	1.5	1.3
Rock Creek	1.4	1.2	–	1.4	1.2
Cedar Draw-Snake River	2.9	2.1	0.3	3.2	2.1
Upper Deep Creek	1.0	0.8	0.6	1.7	0.8
Shoshone Creek	1.8	1.5	0.2	2.0	1.5
Alternative 7J					
Headwaters Goose Creek	1.4	1.3	–	1.5	1.3
Meadow Creek	1.0	1.0	0.3	1.3	1.0
Rock Creek 1704020901	1.0	1.0	0.1	1.0	1.0
Shoshone Creek	1.8	1.5	–	1.9	1.5
Sublett Creek-Warm Creek	1.0	1.0	0.1	1.0	1.0

1/ All Project roads are considered "closed," as they would be revegetated and closed to the public.
Mileages are rounded to tenths of a mile.

Conclusions

Habitat Fragmentation

The Proposed Route of Segment 7 would increase fragmentation in all five habitat types. The greatest increase in the number of patches would be in shrubland, while the largest decrease in average patch size would be in agriculture/disturbed.

The largest change in average patch size between the Proposed Route and an alternative is in agricultural lands along Alternative 7B (a decrease of 104 acres), and the largest change to the number of patches, in shrublands, is along Alternative 7J (an increase of 841 in the number of patches). Overall, selection of the Proposed Route or Alternatives 7D, 7E, or 7F would have the least effect on fragmentation.

Big Game

The only bighorn sheep winter range encountered along Segment 7 would be a small amount along Alternative 7H, and the only elk winter range is a small amount along Alternatives 7I and 7J. The total amount of big game winter range impacted along

Segment 7 is largely driven by mule deer range. Overall, when the Proposed Route and all 10 Route Alternatives are compared, Alternative 7H would have the least impacts on winter range during construction, with a decrease of 124 acres from the comparison portion of the Proposed Route, and Alternative 7C would have the most impacts. During operations, Alternative 7J would impact the most big game winter range.

Raptors

The selection of Alternatives 7A, 7B, 7D, 7E, 7F, or 7G would have no effect on the number of raptor nests affected by the Project. If Alternative 7C was chosen, it would avoid the two ferruginous hawk nests along the comparison portion of the Proposed Route and affect the fewest raptors in this area. The selection of Alternatives 7H or 7I would increase the number of raptor nests within 1 mile of the transmission line; 7H would be near 42 more nests and 7I near 54 more nests than the comparison portion of the Proposed Route. In total, these two Route Alternatives would also affect more raptor species than the comparison portion of the Proposed Route; combined, they would also affect golden eagle, red-tailed hawk, and Swainson's hawk. Alternatives 7H and 7I would result in impacts to the greatest number of nesting raptors, compared to the Proposed Route or Alternatives 7A through 7G. Alternative 7J would pass within 1 mile of 53 more nests than the comparison portion of the Proposed Route. This is a greater increase in the number of nests impacted than any of the other alternatives. If Alternative 7C were selected, the fewest breeding raptors would be impacted.

Fish

The number of stream crossings would increase under Alternatives 7A, 7B, 7C, 7E, 7H, 7I, and 7J, but would decrease under Alternative 7F. The amount of riparian vegetation cleared would increase under Alternatives 7A, 7G, 7I, and 7J, and would decrease under Alternative 7B. In regard to fish and habitat quality, Alternative 7I would have the greatest potential impacts, while Alternative 7F would likely have the least impacts.

Segment 8

Segment 8, as proposed, would link the Midpoint and Hemingway Substations. This 131-mile single-circuit 500-kV transmission line would stay north of the Snake River until crossing through the SRBOP parallel to an existing 500-kV transmission line before ending at the Hemingway Substation. Thirteen acres of the expansion of the Midpoint Substation and 0.5 acre for a regeneration site are attributed to Segment 8. There are five Route Alternatives: 8A, which follows the WWE corridor but crosses the Snake River and I-84 twice (while the Proposed Route would stay north of this area); 8B and 8C, which represent the old routes originally proposed by the Proponents but that have now been changed to avoid the cities of Kuna and Mayfield, respectively; 8D, which represents a small revision involving a rebuild of the existing transmission line to move both away from the National Guard Maneuver Area; and 8E, which was proposed by the BLM in order to avoid crossing the Halverson Bar nonmotorized portion of the Guffey Butte-Black Butte Archaeological District (see Appendix A, Figure A-10).

Construction

Big Game

Segment 8 as proposed would pass through habitats used by various big game species throughout the year. The Proposed Route of Segment 8 would impact 100 acres of winter range for pronghorn, 750 acres of winter range for mule deer, and 273 acres of winter range for elk along its 131-mile length. Because there are is overlap among winter ranges for these three species, the total amount of this habitat type impacted by the Proposed Route is 1,047 acres. Of these acres, 614 are on federal land, administered by BLM or Bureau of Reclamation. There is no parturition or summer habitat identified along Segment 8. Table 3.10-36 compares Segment 8 against Alternatives 8A through 8E in regard to impacts on big game winter range.

Table 3.10-36. Comparison of Big Game Designated Winter Range Impacted by the Segment 8 Proposed Route and Alternatives 8A through 8E during Construction (acres)

Segment or Alternative	Length (miles)	Mule Deer		Pronghorn		Elk		Bighorn Sheep		Total 1/	
		Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal
Proposed – Total Length	131.0	750	436	100	60	273	156	–	–	1,047	614
Proposed – Comparison Portion for Alternative 8A	51.4	654	408	–	–	–	–	–	–	654	408
Alternative 8A	53.6	296	158	–	–	–	–	–	–	296	158
Proposed – Comparison Portion for Alternative 8B	45.3	–	–	–	–	92	77	–	–	92	77
Alternative 8B	45.8	–	–	–	–	92	77	–	–	92	77
Proposed – Comparison Portion for Alternative 8C	6.5	–	–	–	–	92	77	–	–	92	77
Alternative 8C	6.4	–	–	–	–	93	27	–	–	92	27
Proposed – Comparison Portion for Alternative 8D	6.9	–	–	–	–	–	–	–	–	–	–
Alternative 8D	8.1	–	–	–	–	–	–	–	–	–	–
Proposed – Comparison Portion for Alternative 8E	7.0	–	–	–	–	–	–	–	–	–	–
Alternative 8E	18.5	–	–	–	–	–	–	16	16	16	16

1/ Totals given have taken any overlap among winter range for different species taken into account so that the total number of acres impacted is reported.

Acreages are rounded to nearest whole acre; therefore, columns/rows may not sum exactly.

Raptors

The Proposed Route of Segment 8 would pass within 1 mile of 301 currently documented nests: 43 of burrowing owls, 86 of ferruginous hawks and 172 of prairie falcon (Table 3.10-37).

Table 3.10-37. Comparison of Raptor Nests within 1 mile of Proposed Segment 8 and Alternatives 8A through 8E, and How Many are on Federal Land, if any

Segment or Alternative	Total Nests	Number of Nests (number on federal land)		
		Burrowing owl	Ferruginous hawk	Prairie falcon
Proposed – Total Length	301 (252)	43 (36)	86 (55)	172 (161)
Proposed – Comparison Portion for Alternative 8A	1	1	–	–
Alternative 8A	–	–	–	–
Proposed – Comparison Portion for Alternative 8B	283 (241)	42 (36)	69 (44)	172 (161)
Alternative 8B	52 (19)	33 (12)	19 (7)	–
Proposed – Comparison Portion for Alternative 8C	12 (4)	–	12 (4)	–
Alternative 8C	17 (5)	–	17 (5)	–
Proposed – Comparison Portion for Alternative 8D	50 (38)	14 (11)	36 (27)	–
Alternative 8D	57 (40)	17 (13)	40 (27)	–
Proposed – Comparison Portion for Alternative 8E	184 (172)	19 (18)	3 (3)	162 (151)
Alternative 8E	510 (458)	16 (16)	42 (40)	452 (402)

Fish

A total of three stream crossings are proposed for the Proposed Route of Segment 8. During construction, 1 acre of riparian vegetation would be cleared along the Proposed Route, of which less than 1 acre would be kept clear for the life of the Project. Table 3.10-38 shows how the Proposed Route compares to its five Route Alternatives in regard to construction impacts to fish resources.

Table 3.10-38. Comparison of Stream Crossings (and the number on federal land, if any) and Acres of Permanent Riparian Clearing for the Segment 8 Proposed Route and Alternatives 8A through 8E (and the amount on federal land, if any)

Segment or Alternative	Number of Stream Crossings	Acres of Riparian Habitat Cleared[1/]
Proposed – Total Length	3 (1)	1 (<1)
Proposed – Comparison Portion for Alternative 8A	2	<1 (<1)
Alternative 8A	1 (1)	6 (1)
Proposed – Comparison Portion for Alternative 8B	–	<1 (<1)
Alternative 8B	–	2 (<1)
Proposed – Comparison Portion for Alternative 8C	–	<1 (<1)
Alternative 8C	–	<1
Proposed – Comparison Portion for Alternative 8D	–	–
Alternative 8D	–	–
Proposed – Comparison Portion for Alternative 8E	–	–
Alternative 8E	–	<1

1/ Acreages are rounded to nearest whole acre.

Operations

Habitat Fragmentation

Table 3.10-39 presents the comparison portion of the Segment 8 Proposed Route with Alternatives 8A through 8E with regard to habitat fragmentation from proposed roads and the transmission line.

Table 3.10-39. Comparison of Habitat Fragmentation from Roads and Transmission Lines by Habitat Type for the Segment 8 Proposed Route and Alternatives 8A through 8E

Segment or Alternative	Forest/ Woodlands		Shrublands		Grasslands		Riparian/ Wetland		Agriculture/ Disturbed	
	Change in Average patch size (acre) 1/	Change in Patch Count 2/	Change in Average patch size (acre) 1/	Change in Patch Count 2/	Change in Average patch size (acre) 1/	Change in Patch Count 2/	Change in Average patch size (acre) 1/	Change in Patch Count 2/	Change in Average patch size (acre) 1/	Change in Patch Count 2/
Proposed – Total Length	–	–	-4	463	-2	528	< -1	10	-9	73
Proposed – Comparison Portion for Alternative 8A	–	–	-3	144	-3	168	–	–	-13	56
Alternative 8A	–	–	-2	178	-3	234	–	–	-9	75
Proposed – Comparison Portion for Alternative 8B	–	–	-4	249	-2	290	< -1	8	-6	13
Alternative 8B	–	–	-3	154	-2	181	< -1	3	-8	32
Proposed – Comparison Portion for Alternative 8C	–	–	-3	60	-2	72	–	–	-8	2
Alternative 8C	–	–	-3	60	-2	72	–	–	-8	2
Proposed – Comparison Portion for Alternative 8D	–	–	-2	49	-3	77	–	–	-2	2
Alternative 8D	–	–	-2	51	-3	81	–	–	-1	2
Proposed – Comparison Portion for Alternative 8E	–	–	-3	67	-3	87	< -1	3	-7	5
Alternative 8E	–	–	-4	128	-3	153	< -1	3	-8	8

1/ The difference between average patch size following construction.
2/ The number of additional fragments created as a result of the Project.
Acreages are rounded to nearest whole acre.

Big Game

Operations impacts along the Proposed Route for Segment 8 to big game winter range are estimated at approximately 92 acres for mule deer, 13 acres for pronghorn, and 32 acres for elk (Table 3.10-40). Due to overlap of winter ranges among these three species, the total amount of winter range that would be impacted by the Proposed Route is 129 acres. Seventy of these acres are on federal land, all administered by the BLM or Bureau of Reclamation. Table 3.10-40 compares Segment 8 against Alternatives 8A through 8E in regard to impacts on big game winter range.

Table 3.10-40. Acres of Big Game Designated Winter Range Affected by Operations, Segment 8 and Alternatives 8A through 8E

Segment or Alternative	Mule Deer		Pronghorn		Elk		Bighorn Sheep		Total [1/]	
	Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal
Proposed – Total Length	92	51	13	7	32	16	–	–	**129**	**70**
Proposed – Comparison Portion for Alternative 8A	83	49	–	–	–	–	–	–	**83**	**49**
Alternative 8A	48	18	–	–	–	–	–	–	**48**	**18**
Proposed – Comparison Portion for Alternative 8B	–	–	–	–	11	9	–	–	**11**	**9**
Alternative 8B	–	–	–	–	11	9	–	–	**11**	**9**
Proposed – Comparison Portion for Alternative 8C	–	–	–	–	11	9	–	–	**11**	**9**
Alternative 8C	–	–	–	–	15	7	–	–	**15**	**7**
Proposed – Comparison Portion for Alternative 8D	–	–	–	–	–	–	–	–	–	–
Alternative 8D	–	–	–	–	–	–	–	–	–	–
Proposed – Comparison Portion for Alternative 8E	–	–	–	–	–	–	–	–	–	–
Alternative 8E	–	–	–	–	–	–	1	1	**1**	**1**

1/ Totals given have taken any overlap among winter range for different species taken into account so that the total number of acres impacted is reported.

Acreages are rounded to nearest whole acre; therefore, columns/rows may not sum exactly.

The Proposed Route of Segment 8 would pass through pronghorn habitat in the Bennett Hills/Timmerman Hills unit of the Shoshone FO. The MFP for this area recommends that in pronghorn habitat, succulent forbs make up 15 to 20 percent of vegetation, and that 2- to 4-acre sagebrush patches with canopy cover over 20 percent and brush height over 15 inches be distributed over the landscape. Due to the relatively small amount of habitat permanently removed by the Project compared to the size of designated pronghorn areas, these recommendations are unlikely to be compromised.

Conclusion

Habitat Fragmentation

The Proposed Route would create fragmentation within all habitat types except for forest/woodlands, where there would be no effect from the Proposed Route or any of the Route Alternatives. The largest decrease in average patch size that would be caused by the Proposed Route is in agriculture/disturbed land (a decrease of 9 acres on average), and the biggest increase in patch counts would be in grasslands (528 additional patches). Most of the fragmentation impacts to riparian/wetland would be along the comparison portion for Alternative 8B, where adoption of the alternative would improve the change in patch count (from eight to three) and improve the change in average patch size from a loss of 1 acre to no change. Selection of the Route Alternatives 8C or 8D over the comparison portion of the Proposed Route would not result in a considerable difference in the level of fragmentation. Alternative 8E would increase fragmentation in all types impacted. Alternative 8A would increase fragmentation in shrublands and grasslands compared to the Proposed Route, while 8B would decrease fragmentation in all affected habitat types.

Big Game

Alternative 8A is the only alternative that would have any effect on the amount of impacts to mule deer winter range; it would bypass 358 acres of this habitat type during construction and 35 during operations compared to the Proposed Route. For pronghorn and elk winter range, which alternative is chosen would have very little effect on how much is impacted (a change in no more than 4 acres). Bighorn sheep winter range would only be impacted if Alternative 8E is chosen. Overall, the selection of Alternative 8E would result in the least number of acres of big game winter range impacted during construction and operations, only impacting one species, bighorn sheep.

Raptors

The selection of Alternative 8A would avoid one burrowing owl nest. The selection of Alternative 8B would decrease the number of nests impacted by 231, avoiding burrowing owl, ferruginous hawk, and prairie falcon nests that are within 1 mile of the comparison portion of the Proposed Route. The selection of Alternative 8C, 8D, or 8E would increase the number of raptor nests impacted. Alternative 8C lies within 1 mile of five more ferruginous hawk nests than the comparison portion of the Proposed Route. Alternative 8D lies within 1 mile of three more burrowing owl nests and four more ferruginous hawk nests than the comparison portion. Alternative 8E lies within 1 mile of three less burrowing owl nests than the comparison portion, but 39 more ferruginous hawk nests and 290 more prairie falcon nests. The selection of Alternative 8B would affect the fewest breeding raptors.

Fish

In terms of number of stream crossings, Alternative 8A would eliminate one crossing that the Proposed Route would have. All of the other Route Alternatives would have no effect on how many streams are crossed. For riparian habitat cleared, Alternatives 8A, 8B, and 8E would increase the number of acres, and Alternative 8C would decrease the number of acres slightly. Neither Alternative 8D nor its comparison portion of the Proposed Route would have impacts to fish or their habitat. In regard to fish resources, selection of either Alternative 8C would likely have the least effects, though for this segment the least impactful choice is not clear and would depend on the characteristics of the specific streams crossed and vegetation cleared.

Segment 9

Segment 9, as proposed, would link the Cedar Hill and Hemingway Substations with a 161.7 mile single-circuit 500-kV transmission line which skirts the Jarbidge and Owyhee Military Operating Areas to the north, then follows the WWE corridor just north of the Saylor Creek Air Force Range, passing through Owyhee County before entering into the Hemingway Substation. Fifteen acres of the construction of the Cedar Hill Substation and 1 acre for two regeneration sites are attributed to Segment 9. There are eight Route Alternatives proposed, including 9A, which was the Proponents' Proposed Route until moving to avoid the Hollister area; 9B, which is being considered by the BLM because it follows the WWE corridor and parallels existing utility corridors; 9C, which was the Proponents' Proposed Route until moving to avoid the Castleford area; and 9D and 9E, proposed by the Owyhee County taskforce, that cross more public lands north and south of the Proposed Route, respectively, than the Proposed Route. Most of Alternative 9D

would be within the SRBOP. Alternatives 9F, 9G, and 9H were proposed to avoid crossing the nonmotorized area south of C.J. Strike Reservoir. Alternatives 9G and 9H provide an alternate route location south of Alternative 8E (see Appendix A, Figure A-11).

Construction

Big Game

The Proposed Route of Segment 9 would impact 171 acres of winter range for mule deer, and 331 acres of winter range for pronghorn. There is no overlap among winter range of the three species, so the total amount impacted is 503 acres, 369 of which are on federal land, administered by the BLM. The Proposed Route would not affect any bighorn sheep winter range during operations, but Alternatives 9D through 9H would impact bighorn sheep winter range (Table 3.10-41). No parturition or summer habitat has been identified along Segment 9 or any of its eight Route Alternatives. Table 3.10-41 compares Segment 9 against Alternatives 9A through 9H in regard to impacts on big game winter range.

The Bruneau MFP recommends not constructing new roads or developments that would increase human presence within bighorn sheep habitat. Alternatives 9D, 9E, 9F, 9G, and 9H would not meet this recommendation.

The Bruneau MFP recommends not constructing new roads or developments that would increase human presence within bighorn sheep habitat. Alternatives 9D, 9E, 9F, 9G, and 9H would not meet this recommendation.

Table 3.10-41. Comparison of Big Game Designated Winter Range Impacted by Proposed Segment 9 and Alternatives 9A through 9H (acres)

Segment or Alternative	Total Miles	Bighorn sheep		Mule deer		Pronghorn		Total [1/]	
		Total	Federal	Total	Federal	Total	Federal	Total	Federal
Proposed – Total Length	161.7	-	–	171	84	331	285	**503**	**369**
Proposed – Comparison Portion for Alternative 9A	7.8	–	–	40	22	–	–	**40**	**22**
Alternative 9A	7.7	–	–	47	26	–	–	**47**	**26**
Proposed – Comparison Portion for Alternative 9B	49.5	–	–	–	–	–	–	–	–
Alternative 9B	53.2	–	–	–	–	–	–	–	–
Proposed – Comparison Portion for Alternative 9C	14.7	–	–	–	–	–	–	–	–
Alternative 9C	15.3	–	–	–	–	–	–	–	–
Proposed – Comparison Portion for Alternatives 9D,E,F,G,H	57.2	–	–	–	–	233	201	**233**	**201**
Alternative 9D	58.4	16	16	–	–	9	9	**25**	**25**
Alternative 9E	68.7	195	178	–	–	392	369	**413**	**388**
Alternative 9F	62.9	16	16	–	–	9	9	**25**	**25**
Alternative 9G	56.4	26	26	–	–	13	11	**39**	**37**
Alternative 9H	61.0	26	26	–	–	13	11	**39**	**37**

1/ Totals given have taken any overlap among winter range for different species taken into account so that the total number of acres impacted is reported.

Acreages are rounded to nearest whole acre; therefore, columns/rows may not sum exactly.

Raptors

Segment 9 would pass within 1 mile of 78 currently documented raptor nests: 9 of burrowing owl, 3 of common raven, 43 of ferruginous hawk, 17 of prairie falcon, and 6 of Swainson's hawk (Table 3.10-42).

Table 3.10-42. Comparison of Raptor Nests within 1 mile of the Segment 9 Proposed Route and Alternatives 9A through 9H, and the Number that are on Federal Land

Segment or Alternative	Total Nests	Number of Nests (number on federal land)					
		Burrowing owl	Common raven	Ferruginous hawk	Golden eagle	Prairie falcon	Swainson's hawk
Proposed – Total Length	78 (73)	9 (4)	3 (3)	43 (43)	–	17 (17)	6 (6)
Proposed – Comparison Portion for Alternative 9A	2 (2)	–	–	2 (2)	–	–	–
Alternative 9A	2	–	–	–	2	–	–
Proposed – Comparison Portion for Alternative 9B	32 (30)	3 (1)	–	10 (10)	–	13 (13)	6 (6)
Alternative 9B	12 (12)	1 (1)	–	4 (4)	–	7 (7)	–
Proposed – Comparison Portion for Alternative 9C	17 (16)	1	–	10 (10)	–	–	6 (6)
Alternative 9C	5 (4)	1	–	4 (4)	–	–	–
Proposed – Comparison Portion for Alternatives 9D,E, F, G, H	12 (9)	4 (1)	1 (1)	7 (7)	–	–	–
Alternative 9D	582 (520)	99 (98)	–	52 (45)	–	431 (377)	–
Alternative 9E	13 (13)	3 (3)	–	10 (10)	–		–
Alternative 9F	539 (477)	96 (95)	–	57 (50)	–	386 (332)	–
Alternative 9G	606 (560)	93 (92)	–	37 (32)	–	476 (436)	–
Alternative 9H	563 (517)	90 (89)	–	42 (37)	–	431 (391)	–

Fish

A total of three stream crossings are proposed for the Proposed Route of Segment 9. All crossings that would be on federal land are on BLM-administered land. There would be 2 acres of riparian vegetation cleared along the Proposed Route during construction, less than 1 acre of which would be kept clear during operations (Table 3.10-43). All riparian vegetation that would be cleared that is located on federal land is on BLM-administered land.

Table 3.10-43. Comparison of Perennial Stream Crossings (and the number on federal land, if any) and Acres of Permanent Riparian Clearing for Proposed Segment 9 and Alternatives 9A through 9H (and the amount on federal land, if any)

Segment or Alternative	Number of Stream Crossings	Acres of Riparian Habitat Cleared[1/]
Proposed – Total Length	3 (2)	2 (<1)
Proposed – Comparison Portion for Alternative 9A	1	<1
Alternative 9A	3 (2)	<1
Proposed – Comparison Portion for Alternative 9B	1 (1)	<1 (<1)
Alternative 9B	1 (1)	<1 (<1)
Proposed – Comparison Portion for Alternative 9C	–	<1 (<1)
Alternative 9C	–	–
Proposed – Comparison Portion for Alternatives 9D,E,F,G,H	1	2 (<1)
Alternative 9D	–	2 (<1)
Alternative 9E	4 (4)	1 (1)
Alternative 9F	–	5 (<1)
Alternative 9G	–	2 (<1)
Alternative 9H	–	5 (<1)

1/ Acreages are rounded to nearest whole acre.

Operations

Habitat Fragmentation

Table 3.10-44 presents the amount of habitat fragmentation that would occur in the Analysis Area due to the proposed transmission line and roads during Project operations. Changes in average patch size and changes in patch counts, by habitat type, are presented for the Proposed Route of Segment 9 and for Alternatives 9A through 9H.

Lines by Habitat Type for the Segment 9 Proposed Route and Alternatives 9A through 9H

Segment or Alternative	Difference in Fragmentation Levels Between Pre and Post Construction									
	Forest/ Woodlands		Shrublands		Grasslands		Riparian/ Wetland		Agriculture/ Disturbed	
	Change in Average patch size (acre)[1/]	Change in Patch Count[2/]	Change in Average patch size (acre)[1/]	Change in Patch Count[2/]	Change in Average patch size (acre)[1/]	Change in Patch Count[2/]	Change in Average patch size (acre)[1/]	Change in Patch Count[2/]	Change in Average patch size (acre)[1/]	Change in Patch Count[2/]
Proposed – Total Length	< -1	4	-6	714	-4	665	-1	20	-12	147
Proposed – Comparison Portion for Alternative 9A	–	–	-13	72	-4	42	–	–	-22	17
Alternative 9A	–	–	-13	76	-4	45	–	–	-22	17

Table 3.10-44. Comparison of Habitat Fragmentation from Roads and Transmission Lines by Habitat Type for the Segment 9 Proposed Route and Alternatives 9A through 9H (continued)

Segment or Alternative	Difference in Fragmentation Levels Between Pre and Post Construction									
	Forest/ Woodlands		Shrublands		Grasslands		Riparian/ Wetland		Agriculture/ Disturbed	
	Change in Average patch size (acre) 1/	Change in Patch Count 2/	Change in Average patch size (acre) 1/	Change in Patch Count 2/	Change in Average patch size (acre) 1/	Change in Patch Count 2/	Change in Average patch size (acre) 1/	Change in Patch Count 2/	Change in Average patch size (acre) 1/	Change in Patch Count 2/
Proposed – Comparison Portion for Alternative 9B	–	–	-8	232	-4	175	< -1	1	-10	49
Alternative 9B	–	–	-5	273	-4	245	< -1	1	-12	83
Proposed – Comparison Portion for Alternative 9C	–	–	-24	84	< -1	22	< -1	1	-23	27
Alternative 9C	–	–	-23	85	< -1	22	< -1	1	-24	32
Proposed – Comparison Portion for Alternatives 9D,E,F,G,H	–	–	-3	239	-4	312	-2	14	-7	51
Alternative 9D	–	–	-3	309	-2	332	-1	15	-4	39
Alternative 9E	–	–	-11	303	-3	313	-3	12	-3	7
Alternative 9F	–	–	-3	294	-3	357	-1	13	-6	56
Alternative 9G	–	–	-3	283	-3	345	-1	13	-5	48
Alternative 9H	–	–	-3	284	-3	346	-1	13	-5	51

1/ The difference between average patch size following construction.
2/ The number of additional fragments created as a result of the Project.
Acreages are rounded to nearest whole acre.

Big Game

Operations impacts to mule deer winter range for the Proposed Route of Segment 9 are estimated at 17 acres and to pronghorn winter range at 44 acres. The Proposed Route would not affect any bighorn sheep winter range during operations, but Alternatives 9D through 9H would impact bighorn sheep winter range (Table 3.10-45). A total of 47 acres of the operations impact by the Proposed Route would be on federal land, all administered by the BLM. Table 3.10-45 compares Segment 9 against Alternatives 9A through 9H in regard to impacts on big game winter range.

Table 3.10-45. Acres of Big Game Designated Winter Range Affected by Operations, Segment 9 Proposed Route and Alternatives 9A through 9H

Segment or Alternative	Bighorn sheep		Mule deer		Pronghorn		Total 1/	
	Total	Federal	Total	Federal	Total	Federal	Total	Federal
Proposed – Total Length	–	–	17	10	44	37	**61**	**47**
Proposed – Comparison Portion for Alternative 9A	–	–	5	3	–	–	**5**	**3**
Alternative 9A	–	–	5	3	–	–	**5**	**3**

Table 3.10-45. Acres of Big Game Designated Winter Range Affected by Operations, Segment 9 Proposed Route and Alternatives 9A through 9H (continued)

Segment or Alternative	Bighorn sheep		Mule deer		Pronghorn		Total [1/]	
	Total	Federal	Total	Federal	Total	Federal	Total	Federal
Proposed – Comparison Portion for Alternative 9B	–	–	–	–	–	–	–	–
Alternative 9B	–	–	–	–	–	–	–	–
Proposed – Comparison Portion for Alternative 9C	–	–	–	–	–	–	–	–
Alternative 9C	–	–	–	–	–	–	–	–
Proposed – Comparison Portion for Alternatives 9D,E,F,G,H	–	–	–	–	28	24	**28**	**24**
Alternative 9D	1	1	–	–	<1	<1	**2**	**2**
Alternative 9E	32	27	–	–	57	50	**64**	**55**
Alternative 9F	1	1	–	–	<1	<1	**2**	**2**
Alternative 9G	2	2	–	–	2	2	**4**	**4**
Alternative 9H	2	2	–	–	2	2	**4**	**4**

1/ Totals given have taken any overlap among winter range for different species taken into account so that the total number of acres impacted is reported.
Acreages are rounded to nearest whole acre.

Conclusion

Habitat Fragmentation

The Proposed Route would increase fragmentation in all five habitat types. The greatest decrease in average patch size along the Proposed Route would occur in agriculture/disturbed, with a decrease of 12 acres, and the greatest increase in patch count would occur in shrublands, with 714 patches created. Fragmentation of forest/woodlands would be the same regardless of which alternative is selected. Fragmentation of shrublands would be similar to the Proposed Route if Alternative 9A, 9C, or 9D is selected; Alternatives 9B and 9E would yield mixed results for numbers of miles and acres, and Alternatives 9F, 9G, and 9H would decrease fragmentation. Fragmentation of grasslands would increase under Alternatives 9A and 9B compared to the Proposed Route. Fragmentation of riparian/wetlands would be similar under Alternatives 9A, 9B, 9C and 9D, but would increase under all other alternatives.

Big Game

Bighorn sheep winter range would be encountered along Alternatives 9D, 9E, 9F, 9G, and 9H; if one of these Route Alternatives is not selected, no bighorn sheep habitat would be affected. The amount of mule deer winter range that would be affected during construction would increase by 4 acres if Alternative 9A is selected, but no alternative would affect the amount impacted during operations. Of the 44 acres of pronghorn winter range that would be affected by Segment 9 during operations, 28 would be impacted by the comparison portions for Alternatives 9D through 9H. Selection of Alternatives 9D, 9F, 9G, or 9H would decrease the amount of pronghorn winter range affected to 2 acres or less, while selection of Alternative 9E would result in an increase of 26 acres impacted. In summary, the selections that would result in the least acres of operations impacts to big game winter range are the Proposed Route or Alternatives 9A through 9C for bighorn sheep, or Alternatives 9D, 9F, 9G, or 9H for pronghorn.

Alternatives 9D or 9F would also result in the least impacts to winter range overall when all three species are combined, during both construction and operations.

Raptors

The selection of Alternative 9B or 9C would decrease the number of breeding raptors potentially affected by the Project, decreasing the number of nests within 1 mile of the transmission line by 20 and 12, respectively, so that either of these choices would result in the least impacts to breeding raptors along Segment 9. Alternative 9E would increase potential impacts to raptor nests by one. Alternatives 9D, 9F, 9G, or 9H would substantially increase the number of nests impacted: from 12 on the comparison portion of the Proposed Route to 582, 539, 606, or 563 along the Route Alternatives, respectively. The selection of Alternative 9A would affect the same number of nests as the Proposed Route, but it would impact two golden eagle nests instead of two ferruginous hawk nests. The selection of Alternative 9B would impact the fewest nests, while Alternative 9G would impact the highest number.

Fish

Alternatives 9A and 9E would increase the number of streams crossed compared to the Proposed Route. Selection of Alternatives 9C and 9E would decrease the amount of riparian habitat removed, while Alternatives 9A, 9F, 9G, and 9H would cause a increase.

Segment 10

Segment 10, as proposed, would link the Cedar Hill and Midpoint Substations with a 33.6-mile single-circuit 500-kV line, following a WWE corridor for most of its distance. Twenty-eight acres of the expansion of the Midpoint Substation and of the construction of the Cedar Hill Substation are attributed to Segment 10. There are no Route Alternatives proposed along this segment (see Appendix A, Figure A-12). This short segment traverses mostly developed land near Twin Falls, Idaho; 91 percent of the Proposed Route would cross disturbed or developed land or agriculture.

Construction

Big Game

Segment 10 would pass through habitat types used by various big game species throughout the year. In addition, Segment 10 would impact 146 acres of designated winter range for mule deer along its 33.6-mile length. Of these 146 acres, 123 are on federal land, administered by the BLM. There is no parturition or summer habitat identified along Segment 10 for any big game species.

Raptors

Construction of Segment 10 would take place within 1 mile of two burrowing owl nests. One of these nests is on BLM-administered land, and the other is on private land.

Fish

There would be no stream crossings along Segment 10, and less than 1 acre of riparian vegetation would be cleared during construction but revegetated during operations. No riparian vegetation on federal land would be impacted by Segment 10.

Operations

Habitat Fragmentation

The levels of fragmentation resulting from road and transmission lines along Segment 10 are listed below in Table 3.10-46. No Route Alternatives have been assessed for Segment 10.

Table 3.10-46. Comparison of Habitat Fragmentation from Roads and Transmission Lines by Habitat Type for the Segment 10 Proposed Route

Segment or Alternative	Forest/ Woodlands		Shrublands		Grasslands		Riparian/ Wetland		Agriculture/ Disturbed	
	Change in Average patch size (acre) [1/]	Change in Patch Count [2/]	Change in Average patch size (acre) [1/]	Change in Patch Count [2/]	Change in Average patch size (acre) [1/]	Change in Patch Count [2/]	Change in Average patch size (acre) [1/]	Change in Patch Count [2/]	Change in Average patch size (acre) [1/]	Change in Patch Count [2/]
Proposed – Total Length	< -1	4	-2	63	-8	89	< -1	1	-40	64

Acreages are rounded to nearest whole acre.

Segment 10 would cause habitat fragmentation in all five habitat types analyzed, creating a total of 221 additional patches. The biggest decrease in average patch size, 40 acres, would be in agriculture/disturbed, and the greatest number of new patches created would be in grasslands, with 89.

Big Game

During operations, Segment 10 would impact 31 acres of mule deer winter range, 16 acres of which is federally administered, all by the BLM.

3.10.2.4 Design Variation

A Design Variation is being considered that would consist of constructing two single-circuit lines in Segments 2 through 4 instead of a single double-circuit line (which is the design assessed above). The disturbance footprint of the two single-circuit towers is greater than that of the double-circuit tower, in part because the requested ROW would be wider, but also because helicopter-assisted construction could be implemented in these areas due to the lighter weight of the towers, which would require additional fly yards. The additional ROW space and the fly yards would cause additional temporary disturbance during construction. Across Segments 2, 3, and 4, the additional disturbance of the single-circuit tower variation ranges from 25 to 30 percent greater than comparable portions of the double-circuit tower disturbance under the proposed design, and so would have more impacts to, for example, big game range (Appendix D, Table D.10-10). The two single circuits require more ground disturbance, but would be designed and constructed to the same standards as the Proposed Action.

The wider ROW is unlikely to have a substantially different impact on habitat fragmentation than the proposed design. The number of raptor nests within 1 mile is determined using the centerline of the route, so those numbers would also not change for the Design Variation. The amount of riparian vegetation that would be cleared during construction would increase under the Design Variation for most segments and

alternatives (see Table D.9-3 in Appendix D). An advantage of the Design Variation is that H-frame structures could be substituted if needed for site-specific mitigation. This would increase the options available to prevent or limit raptor use of the transmission line and pole structures. The use of helicopters for the Design Variation would cause increased disturbance to wildlife due to noise. High winds created by propellers could also disturb wildlife, potentially blowing birds off nests. Mitigation measures such as timing restrictions (daily and seasonal) and spatial restrictions (based on both location and elevation) could minimize these impacts.

3.10.2.5 Structure Variation

The proposed guyed Structure Variation would add four guy wires about 140 feet long from a point about 100 feet up in each tower to four guy anchors spaced in a square around the tower (Appendix B, Figure B-6). This would not change the amount of disturbance during construction or operations appreciably. Extra care would be needed where towers are near known concentrations of birds to avoid placing guy wires in these areas. Self-supporting lattice towers would be used if avian collision impacts could be avoided by doing so. Therefore, there would be no appreciable difference in impacts on birds from the use of this Structure Variation when compared to the use of self-supporting lattice towers. These guy wires would be thick (about 1 inch in diameter). In addition, the Agencies have recommended that the following measure be applied:

WILD-7 On federal lands, guy wires should be marked with bird deterrent devices to avoid avian collisions with structures on public lands (I.M. 2010-022).

In coordination with the Proponents' Avian Protection Plan, the BLM would require that flight diverters also be installed where the line crosses certain rivers located on federal lands (see Table 3.10-3), and recommends that they be installed on state and private lands.

The Kemmerer RMP prohibits new, permanent high-profile structures relying on guy wires for support in occupied sagebrush obligate habitats. Exceptions to this can be made if NEPA analysis shows little or no impact to sagebrush obligate species. If the Structure Variation of this Project is adopted, mitigation measure TESWL-22 would be implemented, which states that, "No structures that require guy-wires will be used in obligate sagebrush occupied habitat within the area managed under the Kemmerer Resource Management Plan."

3.10.2.6 Schedule Variation

The Schedule Variation uses the two single-circuit design variation described above but extends construction over a longer timeframe. Initially only one of the eventual two single-circuit lines would be constructed with the second to be constructed at a later date. The Schedule Variation proposes that the first single-circuit transmission line in Segments 2, 3, and 4 would be built as soon as a ROW grant is issued, but that the second line would not begin construction until late 2018. This would mean nearly 2 years between the end of construction for the first line and beginning of construction for the second line. Any staging areas and fly yards that had been used for the first stage would have been revegetated after construction was complete and would be cleared again if necessary. There would be two sets of construction disturbances adding

movement, noise, and dust to the area of construction in two instances in any given area.

The Schedule Variation would therefore have essentially double the adverse indirect impacts on adjacent habitat and populations as the simultaneous construction or double-circuit alternative, even though acreage of direct habitat disturbance overall would not be any greater.

3.10.3 Mitigation Measures

To minimize or avoid impacts on general wildlife resources, the Proponents have committed to EPMs that would be implemented Project-wide as outlined in this section and in Appendix C.

The following mitigation measures identified by the Agencies are required on federally managed lands. The Agencies recommend that the Proponents incorporate the measures into their EPMs and apply them Project-wide.

WILD-1 Requests for exceptions from closure periods and areas must be submitted by the Proponents to the appropriate land management agency office in which the exception is requested. Established exception processes on federally managed lands must be followed. The appropriate agency, or a contractor chosen by the Proponents and approved by the agency, shall conduct any surveys and coordinate with any other agencies as necessary. Factors considered in granting the exception include animal conditions, climate and weather conditions, habitat conditions and availability, spatial considerations (e.g., travel routes and landscape connectivity), breeding activity levels, incubation or nestling stage, and timing, intensity, and duration of the proposed action. Requests must be submitted in writing no more than 2 weeks prior to the proposed commencement of the construction period, to ensure that conditions during construction are consistent with those evaluated. The authorized officer, on a case-by-case basis, may grant exceptions to seasonal stipulations, and has the authority to cancel this exception at any time.

WILD-2 Vehicular speeds during construction and operations shall be limited to 25 mph on all unsurfaced access roads. Crew and vehicle travel will be restricted to designated routes while on federally designated big game winter range (except for areas within the ROW).

WILD-4 On federal lands, accurate monitoring, including identifying nest occupancy, shall be conducted in order to ensure that raptor nests are located in advance of any construction activities. This would be needed to ensure that all construction activities would cease in areas near active nests. Biological monitors on site would perform these surveys ahead of construction. If an occupied nest is found, the appropriate restrictions and closures would be adhered to. All encounters with nesting raptors in the Analysis Area must be reported to the biological monitor and to appropriate agencies.

WILD-5 Surveys will be conducted within 0.5 mile of the route prior to construction for caves, abandoned mines, and adits. If suitable bat roosts are identified, the Proponents will consult with the applicable land management agency to determine appropriate protective measures.

WILD-6 As part of their annual aerial flight line maintenance activities, the Proponents will document nesting activity (by species) on any towers constructed as a result of this Project. This would occur after the first year of construction until year 10 of operations. Results would be provided to the applicable land management agency.

WILD-12 Any areas that may require blasting will be identified and a blasting plan will be submitted to the appropriate agency for approval. Blasting within 0.25 mile of a known sensitive wildlife resource will require review and approval by the appropriate agency.

The Proponents have accepted the following Agency-proposed mitigation measure:

WILD-9 Pre-construction pedestrian or aerial surveys will be completed during the appropriate nesting time periods needed to identify each raptor species. The Proponents will provide survey results to the authorized officer for approval (see WILD-1).

To protect big game species from disturbance during sensitive times of year, the Proponents have proposed to recognize the limited operating periods enforced by the BLM and have proposed to apply them Project-wide.

To protect fish, the following measures would be required on federally managed lands:

FISH-1 On BLM-managed land, all culverts, whether temporary or permanent, must be designed to meet BLM Manual 9113 standards. Culverts should be located, designed, constructed, and maintained according to standards that preserve or improve streambed gradients and velocities to allow fish passage and that minimize erosion and sediment damage. On federal lands, unless the applicable management plan has specific requirements for stream crossings, use the following for culverts in channels with less than 3 percent slope:

- The minimum culvert width shall be equal to or greater than 1.5 times the active channel width.
- The culvert shall be placed level (zero percent slope).
- The bottom of the culvert shall be buried into the streambed at not less than 20 percent of the culvert height at the outlet, and not more than 40 percent of the culvert height at the inlet. Embedment does not apply to bottomless culverts.

At sites where the channel slope is greater than 3 percent, additional consideration should be given to alternate design options such as bottomless arch culverts or fords (low-water crossings). This is because of

the difficulty of providing for the passage of aquatic species through culverts installed at these sites. Also, the culvert would be installed so that its slope would match the average grade of the stream immediately up- and down-stream of the culvert site. Follow RMP guidelines where specific requirements are included. On NFS lands, Forest Plan standards and guidelines shall apply.

FISH-2 All in-stream construction actions will be conducted when critical fish life stages can be avoided as designated by the appropriate state and federal agencies. All culverts placed in fish habitat will be suitable, as determined by the federal or state agency, to pass all life stages present or potentially present within the stream reach. Riparian vegetation removal should be kept to the minimum along fish bearing streams. Blasting in or adjacent to fish-bearing streams will require the state fish agency approval prior to blasting. Channel morphology data (e.g., streambank composition, bank slope, stream substrate characteristics, stream slope, riparian vegetation characteristics) will be obtained anywhere a road will cross a stream prior to construction and be used to restore the site of the crossing to pre-Project conditions when temporary roads are decommissioned.

To protect fish habitat in all wetlands and waters of the United States, the following mitigation measure would apply:

FISH-4 If an aquatic invasive species is discovered during surveys for wetlands and waters of the U.S. conducted for USACE and state permitting prior to construction, the waterbody will be flagged and noted on the construction drawings. After work is complete in that waterbody, any equipment involved in construction in that waterbody must be washed to remove any propagules of aquatic invasive species and to prevent the spread of those species to other water bodies in the Analysis Area.

To avoid potential impacts on avian species due to collision with conductors, the following measure would apply Project-wide in response to the requirements of the MBTA:

WILD-8 Flight diverters will be installed and maintained where the transmission line crosses rivers at the locations identified in Table 3.10-3. The flight diverters will be placed on at least one of the higher conductors or ground wires at each river crossing in order to reduce avian collisions. Additional locations may be identified by the Agencies.

To reduce impacts to migratory birds, the Agencies have also recommended that the following measures be applied:

WILD-3 The Project shall be designed and constructed in compliance with Avian Power Line Interaction Committee standards (APLIC 2006) in order to reduce impacts to avian species. Any changes to the Project's design, as requested by federal, state, or local jurisdictions, as well as any changes

considered by the Proponents should also be in compliance with Avian Power Line Interaction Committee standards.

WILD-7 On federal lands, guy wires should be marked with bird deterrent devices to avoid avian collisions with structures on public lands (I.M. 2010-022).

WILD-10 To the extent feasible, all vegetation clearing would be conducted prior to the onset of the avian breeding season (generally April 15 through July 31, depending on local conditions and federal land management plan requirements) in order to limit the potential impact of clearing on nesting birds. In addition, pre-construction surveys within the disturbed portion of the ROW and extending a minimum of 30 feet on either side of the ROW shall be conducted. If an active nest is found during pre-construction surveys, the nest will be identified to species, flagged, and avoided until any young have fledged. Avoidance distances are species-specific and must be approved by a USFWS-approved biologist.

WILD-11 Snags shall be maintained to the extent practical along the outer portions of the Project's ROW in order to reduce the impacts to habitat for cavity nesters.

3.11 SPECIAL STATUS WILDLIFE AND FISH SPECIES

The Proposed Route and its Route Alternatives would pass through multiple habitats that could potentially support special status species. These species include threatened and endangered species listed under the ESA, candidate species and those formally proposed for ESA listing, those listed by the Forest Service and BLM as sensitive, and Forest Service MIS. For discussion purposes, these categories of special status wildlife and fish species will be referred to collectively as TES wildlife or TES fish species. TES plant species are discussed in Section 3.7 – Special Status Plants. Other species, including those petitioned for listing under the ESA but not included in any TES category as specified above, are considered in Section 3.10 – General Wildlife and Fish.

3.11.1 Affected Environment

This section describes the existing environmental conditions for TES wildlife or fish species that could be impacted by the Project. The discussion will first define the Analysis Area. It will then outline the issues that were raised during public scoping, followed by a description of the laws and regulations in place to manage TES species. This section will then conclude by describing the methods used to assess TES habitats, and a description of the existing conditions of the Analysis Area and the TES species potentially present within this area.

3.11.1.1 Analysis Area

The Project would cross a portion of the Intermountain West region, in southern Wyoming and Idaho, as well as a small portion of northern Nevada (under Alternative 7I). Elevation, slope, aspect, average seasonal temperatures, and annual precipitation exhibit a wide range across the more than one-thousand miles crossed by the Project. This diversity in conditions currently supports a wide range of habitat types; therefore, the Analysis Area consists of a wide range of habitat types. The primary habitat types found within the Analysis Area include shrublands, grasslands, forest/woodlands, and wetland/riparian areas (see Section 3.6 – Vegetation Communities). Shrublands are the most common habitat type found within the general region of the Project. It is the dominant type throughout the Wyoming and Nevada portions of the Project, and is common within the Idaho portions. Grasslands occur in both Wyoming and Idaho, but are most abundant along Segments 8, 9, and 10 within Idaho. Nearly all of the grasslands crossed by the Project are semi-natural plant communities, dominated by introduced grass species. Forest and woodlands are limited in the portion of the states crossed by the Project; the majority of the forest/woodlands crossed by the Project occur near Segments 1, 4, 5, and 7, where the Project would cross areas of high elevation in the Laramie Mountains of Wyoming, and the Wasatch, Portneuf, and Deep Creek Mountains in Idaho. Wetlands and riparian vegetation are present, but are not common in the general region of the Project (see Section 3.9 – Wetlands and Riparian Areas).

The Analysis Area for fish and wildlife was designed to capture the current conditions of the habitats that could be impacted by the Project's construction and operation, and included the habitat types described above. The Analysis Area for fish resources

closely follows that described in Section 3.16 – Water Resources, and Section 3.9 – Wetlands and Riparian Areas. It includes the stream segments crossed by the Proposed Route and its Alternatives, wetland and riparian areas adjacent to these streams, and the water reaches and fish resources located directly downstream of these crossings (on average about 2 miles). It also includes access roads, and other Project-related construction areas that could affect riparian habitat. A detailed discussion of how impacts to wetland and riparian areas were calculated can be found in Section 3.9 – Wetlands and Riparian Areas, as well as 3.6 – Vegetation Communities.

The Analysis Area for the purposes of wildlife habitat mapping was set as a 1,000-foot-wide area centered on the Proposed Route and Route Alternatives (500-foot-wide on either side of the centerline of each route), as well as a 50-foot-wide area along any roads located outside the 1,000-foot route-centered area, which was based on the available data obtained from remote sensing (see Section 3.11.1.4). While most of this Analysis Area would not be directly impacted by the Project, information gathered for this larger area allows for an understanding of the context in which the impacts would occur and allows an assessment of indirect effects.

The 1,000-foot-wide Analysis Area used for wildlife assessments needed to be augmented several times due to changes made in the Proposed Route, as well as the addition of new Route Alternatives that were added in response to issues raised during scoping, agency meetings, and landowner meetings. This augmented Analysis Area currently encompasses all Project components, including the entire Project ROW, all access roads and ancillary facilities, as well as all staging areas and fly yards. In addition, data on some TES wildlife and fish species are currently available for broad areas adjacent to, but outside of the original Analysis Area; therefore, the Analysis Area for some TES species was expanded to include this known information. Table 3.11-1 summarizes these known data, as well as their spatial extent and the extent that they added to the original Analysis Area.

Table 3.11-1. Expanded Analysis Area for Selected Species with Available Data

Species	Type of Additional Habitat Data Either Available or Used Outside of the Analysis Area	Description (references provided when available or relevant)
Black-footed ferret (*Mustela nigripes*)	Non-block-cleared areas	Potential prairie dog colony areas that meet USFWS criteria as potential black-footed ferret habitat (USFWS 1989). Data extent is statewide (i.e., data are available and were used for the entire extent of each state).
Bonytail chub (*Gila elegans)*	All Colorado River drainage located downstream from the Analysis Area	As required by the tiered Biological Opinion (BO) on water withdrawals from the Colorado River watersheds.
Canada lynx (*Lynx canadensis*)	Lynx Analysis Units (LAU) and Linkage Habitat	LAUs are areas identified by the Forest Service that have substantial lynx habitat, are delineated at the scale required for a female home range (Forest Service 2007c), and considered by the USFWS in its proposed rule for expansion of critical habitat for the lynx. Data extent is state wide. Lynx linkage habitats are areas designated linkage habitat by an interagency / intergovernmental panel (Forest Service 2007c). Data extent is state wide.

Table 3.11-1. Expanded Analysis Area for Selected Species with Available Data (continued)

Species	Type of Additional Habitat Data Either Available or Used Outside of the Analysis Area	Description (references provided when available or relevant)
Colorado pikeminnow (*Ptychocheilus lucius*)	All Colorado River drainage located downstream from the Analysis Area	As required by the tiered BO on water withdrawals from the Colorado River watersheds.
Columbian sharp-tailed grouse (*Tympanuchus phasianellus columbianus*)	Distance from leks: 0.25 mile	BLM "no surface occupancy" land use designation across Wyoming, as designated within the various BLM RMPs at the time of initial Project design (2008).
	Distance from leks: 0.6 mile	Based on current "no surface occupancy" requirements.
	Distance from leks: 2 miles	Based on the average distance (or more) that nesting and brood rearing usually occurs in relation to leks (Giesen and Connelly 1993; Meints 1991; UDNR 2002).
Gray wolf (*Canis lupus*)	Known locations of wolf packs	Known locations of wolf packs mapped by the Idaho Natural Heritage Program and the Wyoming Natural Diversity Database (WYNDD). Data extent is statewide.
Grizzly bear (*Ursus arctos horribilis*)	Primary Conservation Area (PCA)	Minimum seasonal habitat components necessary to support grizzly bear populations, as part of the 1993 Grizzly Bear Recovery Plan.
	Distinct Population Segment (DPS)	Boundary of the grizzly bear's Yellowstone Distinct Population Segment.
Greater sage-grouse (*Centrocercus urophasianus*)	Distance from leks: 0.25 mile	Based on the BLM "no surface occupancy" land use designation applicable across Wyoming, as designated within the various BLM RMPs at the time of initial Project design (2008).
	Distance from leks: 0.6 mile	Based on the assumption made at the time of initial Project design (2008) that the "no surface occupancy" requirement would increase from 0.25 mile to 0.6 mile. As of this date, the BLM "no surface occupancy" restriction has been increased to 0.6 mile.
	Distance from leks: 1 mile	The Proponents chose to also assess impacts to leks at a distance of 1 mile, given the uncertainty regarding regulatory requirements for greater sage-grouse lek avoidance.
	Distance from leks: 2 miles	Based on Conservation Plan for the Greater Sage-grouse in Idaho (Connelly et al. 2000).
	Distance from leks: 3 miles	The Proponents chose to also assess leks at a distance of 3 miles, given the uncertainty regarding potential lek disturbances at varying distances.
	Distance from leks: 4 miles	As required by Wyoming Governor Executive Order 2011-5, and on the requirements of the BLM Instructional Memorandum (BLM 2009c).
	Key habitat	Areas mapped by Idaho Department of Fish and Game (IDFG) as crucial to the protection of greater sage-grouse. Data extent is statewide (see Figure E.11-3).
	Core areas	Areas mapped by the Wyoming Game and Fish Department (WGFD) as important habitat for greater sage-grouse. Data extent is statewide (see Figure E.11-2).

Table 3.11-1. Expanded Analysis Area for Selected Species with Available Data (continued)

Species	Type of Additional Habitat Data Either Available or Used Outside of the Analysis Area	Description (references provided when available or relevant)
Greater sage-grouse (*Centrocercus urophasianus*) (cont'd)	11-mile buffer around the Project (22-mile-wide analysis corridor	Based on the requirements of the BLM Instructional Memorandum (BLM 2009c), and the Framework for Sage-Grouse Impacts Analysis for Interstate Transmission Lines (BLM 2011a).
Humpback chub (*Gila cypha*)	All Colorado River drainage located downstream from the Analysis Area	As required by the tiered BO on water withdrawals from the Colorado River watersheds.
Interior least tern (*Sterna antillarum*)	All Platte River drainage located downstream from the Analysis Area	As required by the tiered BO on water withdrawals from the Platte River watersheds.
Pallid sturgeon (*Scaphirhynchus albus*)	All Platte River drainage located downstream from the Analysis Area	As required by the tiered BO on water withdrawals from the Platte River watersheds.
Piping plover (*Charadrius melodus*)	All Platte River drainage located downstream from the Analysis Area	As required by the tiered BO on water withdrawals from the Platte River watersheds.
Pygmy rabbit (*Brachylagus idahoensis*)	Known occurrences within Idaho and Wyoming	Areas of known occurrences mapped by the BLM for Idaho and Wyoming. Data extent is statewide.
Razorback sucker (*Xyrauchen texanus*)	All Colorado River drainage located downstream from the Analysis Area	As required by the tiered BO on water withdrawals from the Colorado River watersheds.
Wyoming pocket gopher (*Thomomys clusius*)	Model of possible gopher presences within Wyoming based on historical data	Database maintained by the WYNDD (published on December 17, 2008). Data extent is statewide.
Whooping crane (*Grus americana*)	All Platte River drainage located downstream from the Analysis Area	As required by the tiered BO on water withdrawals from the Platte River watersheds.

The Analysis Area used to assess the effects of habitat fragmentation was set as an 8-mile-wide buffer around the Project's centerline (see Section 3.10.1.1). An 8-mile-wide buffer was chosen to assess a large enough area to capture the current and existing level of fragmentation, without assessing too large of an area, which would mask the effects of the Project's contribution to the area's fragmentation.

3.11.1.2 Issues

Issues identified during Project scoping (Tetra Tech 2009a) included the following:

- The effects of Project activities on species federally listed as threatened, endangered, proposed, or candidates under the ESA;
- The effects of Project activities on species listed as sensitive by the BLM or Forest Service;
- The effects of Project activities on Forest Service MIS;
- The need to consult various agencies and conservation groups; and
- The need to comply with existing conservation plans.

3.11.1.3 Regulatory Framework

Regulations that address and govern impacts to TES species include the ESA and various land-management plans from the BLM, Forest Service, and state agencies. Following is a discussion of the relevant regulations.

Federal Regulations

The ESA was enacted in 1973. This law established a regulatory system to protect species that are at risk of extinction. Species listed under the ESA are protected from any action that would constitute a "take," which is defined as harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, collecting, or attempting to engage in any such conduct. Many states have developed threatened and endangered species lists that differ from the federal list regulated by the ESA; however, none of the states crossed by the Project have developed a separate list that contains regulatory authority beyond the ESA list for wildlife. (The state of Nevada, which is crossed by one of the Route Alternatives, has developed a list of state fully protected plant species under state regulatory statute 527.270; see Section 3.7 – Special Status Plants.)

The ESA requires, under Section 7 of the Act, that "Each Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency (hereinafter in this section referred to as an ''agency action'') is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with affected States, to be critical (16 U.S.C. 35 §1531-1544)." Another process, called conferencing, may be conducted for species proposed for or candidates for listing under the ESA, where the lead federal agency feels that the proposed action is likely to jeopardize the species. Since the BLM does not generally consider applications for proposals that would likely jeopardize a species, as a general rule the BLM does not engage in formal conferencing for proposed or candidate species. However, the Proponents have requested that the BLM confer with the USFWS on the greater sage-grouse. Species that have been petitioned for listing have no legal status and will not be included in consultation or conferencing.

The Upper Colorado Endangered Fish Recovery Program was established in 1988, and serves as conservation measures to minimize adverse effects to the endangered fishes and their critical habitat caused by the Project's water depletions. Under this program, any amount of water removed from the Colorado River system is considered to be a depletion of water, and amounts greater than 0.1 acre-feet/year require formal consultation with the USFWS for downstream impacts to threatened and endangered species. To streamline the process, the USFWS will issue a tiered BO based on the amount of the depletion. *De minimis* depletions (less than 0.1 acre-feet/year) require no depletion fee and would result in a "*no effect"* determination for the Colorado pikeminnow, razorback sucker, humpback chub, and bonytail chub[1] under the ESA. Small depletions (projects that would withdrawal between 0.1 and 100 acre-feet/year)

[1] These river species are identified in this section; however, their impacts have been previously addressed in the tiered BO and will be referred to as such in this document.

require no depletion fee, but would result in a "*may affect, likely to adversely affect*" determination. Any depletions greater than 100 acre-feet/year require a one-time depletion fee (for which this Project qualifies) and would also result in a "*may affect, likely to adversely affect*" determination. However, the USFWS has indicated that if the entirety of this depletion is drawn from existing industrial water rights (i.e., if the Proponents purchase existing water rights and only draw water in accordance with these existing water rights), this would constitute a historical withdrawal (Kantola 2010). Withdrawals of this nature would still require formal consultation with the USFWS, but would result in a "no effect" determination, and would not require a depletion fee (Kantola 2010). If the entirety of water withdrawals cannot come from existing rights, then depletion impacts can be offset by accomplishment of activities necessary to recover the endangered fishes as specified under the Recovery Implementation Program Recovery Action Plan and the one-time contribution to the Recovery Program for new depletions greater than 100 acre-feet/year (i.e., the depletion fee).

The Platte River Recovery Implementation Program (PRRIP), established in 1997, implements actions designed to assist in the conservation and recovery of the target species and their associated habitats along the central and lower Platte River in Nebraska through a basin-wide cooperative approach agreed to by the states of Wyoming, Nebraska, and Colorado, as well as the U.S. Department of the Interior. The PRRIP addresses the adverse impacts of existing and certain new water-related activities on the Platte River target species and associated habitats, and provides ESA compliance for effects to the target species. Targeted wildlife/fish species covered by this program include the least tern, pallid sturgeon, piping plover, and the whooping crane, as well as ESA-designated critical habitat for the whooping crane. The State of Wyoming is in compliance with its obligations under the PRRIP. The Wyoming State Engineer's Office is responsible for determining if a water withdrawal is an existing or new water withdrawal and what level of withdrawal it constituted. The level of withdrawal for a temporary industrial use would depend on the amount of depletion, and the existing conditions of the river at the time of the depletion. Furthermore, if the entirety of the withdrawal was taken from existing rights (i.e., if the Proponents purchase existing water rights and only draw water in accordance with these existing water rights) then this would constitute an existing depletion as it relates to the Wyoming State Engineer's Depletion Report (Hoobles 2010). For federal actions and projects participating in the PRRIP, the PRRIP Final EIS and the June 16, 2006, programmatic BO serve as the description of the environmental baseline and environmental consequences for the effects of the federal actions on the listed target species. Under this BO, any depletions from the Platte River system less than 0.1 acre-feet/year would result in a "no effect" determination for the targeted species; while depletions greater than 0.1 acre-feet/year would result in a "may affect, likely to adversely affect" determination for the targeted species, and a "may affect, not likely to adversely modify critical habitat" determination for ESA-designated critical habitat (McKee 2010).

The BLM and Forest Service have developed land-management plans for the various FOs and NFs under each of their jurisdictions that detail land-management goals and objectives, specify permissible and prohibited activities by geographic designation, and provide BMPs and stipulations required for activities in that NF or BLM District's

jurisdiction. They include temporal and spatial restrictions for any activities within areas inhabited by TES species. Tables that list the applicable stipulations from the management plans as well as whether or not the Project is in compliance with these stipulations can be found in the Administrative Record; proposed plan amendments for instances where the Project would not be in compliance with Forest Service standards or BLM requirements can be found in Appendix F as well as in a summarized list found in Table 2.2-1 in Chapter 2. A list of all state and federally imposed seasonal restrictions can be found in Appendix I; the Project would comply with all agency timing restrictions unless an exception is granted by the Agencies.

Both the Forest Service and the BLM have established a list of species they consider at risk on lands they manage. The Project would cross two Forest Service Regions (Region 2 and 4), each of which contains a separate sensitive species list. The Regional Foresters sensitive species lists include plant and animal species for which population viability is a concern within NFS lands. BLM sensitive species, per BLM Manual 6840, are managed under the special status species policy. The objectives of the BLM special status species policy, per BLM Manual 6840.02A and .02B, are to: 1) conserve and/or recover ESA-listed species and the ecosystems on which they depend so that ESA protections are no longer needed for these species; and 2) to initiate proactive conservation measures that reduce or eliminate threats to BLM sensitive species to minimize the likelihood of and need for listing of these species under the ESA.

The FSM defines MIS as “plant and animal species, communities, or special habitats selected for emphasis in planning, and which are monitored during forest plan implementation to assess the effects of management activities on their populations and the populations of other species with similar habitat needs which they may represent” (Forest Service 1991a). Each NF designates its own list of MIS. The Medicine Bow Forest Plan has designated eight MIS, including the American marten (*Martes americana*), common trout, golden-crowned kinglet (*Regulus satrapa*), Lincoln’s sparrow (*Melospiza lincolnii*), northern goshawk (*Accipter gentilis*), snowshoe hare (*Lepus americanus*), three-toed woodpecker (*Picoides dorsalis*), and Wilson’s warbler (*Wilsonia pusilla*; Forest Service 2003b). The Sawtooth Forest Plan has designated three MIS species, including the bull trout (*Salvelinus confluentus*), greater sage-grouse, and the pileated woodpecker (*Dryocopus pileatus*). The Columbian sharp-tailed grouse, greater sage-grouse, and northern goshawk have been designated as MIS by the Caribou Forest Plan (Forest Service 1997).

There are other federal regulations in addition to those discussed above; such as the Eagle Act, which prohibits wounding, killing, molesting, or disturbing eagles, even if the harm to the eagle is the result of otherwise legal activities (16 U.S.C. § 668a-d), and the MBTA, which decrees that all migratory birds and their parts (including eggs, nests, and feathers) are fully protected (USFWS 2002b). Species covered under these two regulations will be addressed in Section 3.10 – General Wildlife and Fish, because this section (3.11) discusses only those species covered under the ESA, those listed by the Forest Service or BLM as sensitive, Forest Service MIS, and any official state-listed game and fish species.

State Regulations

Comprehensive Wildlife Conservation Strategies

Although none of the states crossed by the Project have enacted a state-level endangered species act that designates official state-listed game and fish species, the IDFG, Nevada Department of Wildlife, and WGFD have published Comprehensive Wildlife Conservation Strategies (CWCS) aimed at encouraging land-management activities that conserve and enhance wildlife habitat (IDFG 2005; WGFD 2005; NAU 2009); however, note that the WGFD finalized their "CWCS" on January 2011 and renamed this plan to the State Wildlife Action Plan (SWAP) These State Conservation Strategies/Plans were established to create a conservation plan to conserve the states' Species of Greatest Conservation Need (SGCN) and to provide a common framework that would enable conservation partners (federal, state, and private) to jointly implement a long-term approach for the benefit of SGCN. These Conservation Strategies are not regulatory documents, are not intended to be prescriptive, and the species identified are not equivalent to an official state listing as threatened, endangered, or fully protected; however, these Conservation Strategies do define SGCN, identify the key habitats for each SGCN and the regions within the state where they can be found, recommend actions to improve the population status and habitat conditions of SGCN, and describe an approach for long-term monitoring. In general, the species included within the SGCN lists are those that have demonstrated a conservation need (due to population or habitat parameters) or where demographic data are lacking. The Idaho CWCS establishes 229 SGCN; these include 126 vertebrate species and 103 invertebrates (IDFG 2005). The Nevada CWCS establishes 263 SGCN; these include 189 vertebrate species and 74 invertebrates (NAU 2009). The Wyoming CWCS establishes 278 SGCN; these include 191 vertebrate species and 87 invertebrates (WGFD 2005).

Sage-grouse Local Working Groups

The purpose of the Sage-grouse Local Working Groups (in all states crossed by the Project) is to provide guidance that agencies, businesses, and individuals should consider when performing actions in sage-grouse habitats. These working groups have no legal authority to bind any agency, business, and individual to any specific action.

Idaho Sage-grouse Local Working Groups

There are approximately seven Sage-grouse Working Groups in Idaho, whose jurisdiction would be crossed by the transmission line: East Idaho Uplands, Big Desert, South Magic Valley, North Magic Valley, Jarbidge, Mountain Home, and Owyhee. Only the Jarbidge and Owyhee Working Group have released their Conservation Plans; the remaining five are currently drafting their plans.

In areas in Idaho where the Local Working Groups have not finalized their plan, the Conservation Plan for the Greater Sage-grouse in Idaho would apply. Unlike the Local Working Groups, this state plan identifies threats at a broad statewide-scale, while also providing a toolbox of finer-scale conservation measures that the Local Working Groups can use and/or adopt. The main goal of the Conservation Plan for the Greater Sage-grouse in Idaho is to maintain, improve, and where possible, increase sage-grouse populations and habitats in Idaho, while considering the predictability and long-term sustainability of a variety of other land uses (IDFG 2006). During preparation of the

state plan, an independent science panel evaluated and ranked 19 potential threats to sage-grouse in the state, and found that the top three included 1) wildfire, 2) infrastructure development (e.g., transmission, energy development, communications towers, roads etc.), and 3) conversion of lands to annual grasslands.

The mission statement of the Jarbidge Working Group is to "work toward the improvement of sage-grouse habitat and identify and address multiple-use factors affecting sage-grouse populations." Similarly, the goal of the Owyhee Working Group is to put into place a framework that would guide management efforts aimed at improving sage-grouse populations and reverse recent declines of sage-grouse populations. The declines are attributed in these two Working Group plans to decreases in habitat quantity and quality (in part due to increased wildfires, fragmentation, invasive species, and encroachment by western juniper), as well as losses of sage-grouse due to hunting and predation. Habitat management priorities identified by these Working Groups include noxious weed control, fire management aimed at increasing the interval between fires, and various habitat protection and enhancement measures.

Recommendations from these Working Groups include the following:

- Revegetation with native grass, shrub, and forb species following disturbance in sagebrush habitats;
- Cleaning vehicles and equipment to minimize the spread of noxious weeds prior to entering other areas;
- Mapping locations of known active and historical sage-grouse habitat; and
- Conducting predator control studies.

Wyoming Sage-grouse Local Working Groups

There are three conservation areas crossed by the Project that have Wyoming Local Sage-grouse Working Groups in Wyoming (from east to west): Bates Hole/Shirley Basin, South-central, and Southwest. According to the Wyoming Local Sage-grouse Working Group Charter, the goal of these working groups is to "develop and facilitate implementation of local conservation plans for the benefit of sage-grouse, their habitats, and whenever feasible, other species that use sagebrush habitats." Each of these three Working Groups has released a Conservation Plan detailing the natural history, threats, and mitigation measures for sage-grouse in each conservation area. Local Working Groups determine (at the time of their plans publication) that the primary threats to sage-grouse in Wyoming are impacts to vegetation (i.e., grazing and invasive plants) and the development of natural resource (such as oil and gas). Conservation measures suggested by the Working Groups include the following:

- Washing equipment and vehicles to prevent invasive plants spreading to new areas;
- Developing and implementing livestock grazing strategies to promote healthy sagebrush; and
- Conducting surveys for sage-grouse breeding activity before surface disturbance during the breeding season within suitable sagebrush habitat within 0.5 mile of the proposed activities.

Timing and seasonal restrictions suggested by the Working Groups to minimize impacts to sage-grouse include:

- Avoiding human activity and disturbance within 0.25 mile of leks between 8:00 p.m. and 8:00 a.m. from March 1 to May 15;
- No aboveground facilities within 0.25 mile of active sage-grouse strutting grounds, and installing raptor perch deterrents on tall structures within 0.5 mile of any sage-grouse lek; and
- Restricting surface-disturbing and disruptive activities in suitable sage-grouse nesting and brood rearing habitat within 2 miles of an occupied lek, or in identified sage-grouse nesting and early brood rearing habitat outside the 2-mile buffer from March 15 through July 15, and within identified sage-grouse winter habitat from November 15 until March 14 (seasonal stipulations for winter concentration areas can be applied on a case-by-case basis).

Nevada Sage-grouse Local Working Groups

One Route Alternative (Alternative 7I) would pass through the state of Nevada, along its northeastern border. The Northeastern Nevada Stewardship Group has established a Sagebrush Ecosystem Conservation Strategy for this region, which outlines specific measures to protect sage-grouse that are similar to those discussed above for the Idaho and Wyoming Local Working Groups. The Northeastern Nevada Stewardship Group's Sagebrush Ecosystem Conservation Strategy differs from the States' Sage-Grouse Conservation Strategy, in that the Northeastern Nevada Stewardship Group's strategy is a watershed-based ecosystem conservation strategy, while the states' strategy primarily focuses on greater sage-grouse conservation. While the two strategies share common goals and considerable overlap in process, they remain separate approaches. The Northeastern Nevada Stewardship Group has incorporated some of the statewide strategy for greater sage-grouse conservation, but recommends implementing greater sage-grouse conservation through watershed/ecosystem management.

The primary goal of the states' strategy is to "Create healthy, self-sustaining sage-grouse populations well distributed throughout the species historical range by maintaining and restoring ecologically diverse, sustainable, and contiguous sagebrush ecosystems and by implementing scientifically-sound management practices." The primary goal of the Northeastern Nevada Stewardship Group strategy is to "Manage watersheds, basins, and sub-basins in a manner that restores or enhances (as appropriate) the ecological processes necessary to maintain proper functioning ecosystems, inclusive of greater sage-grouse."

3.11.1.4 Methods

The identification and characterization of TES species within the Analysis Area was completed through a review of available literature, federal and state databases, consultation with federal and state biologists, and the completion of limited biological surveys and remote habitat assessments.

Literature and Agency Database Review

Preliminary investigations included review of information and literature obtained from the USFWS, WGFD, IDFG, Forest Service, and BLM. The Forest Service, BLM, and state wildlife agencies work closely together to develop, maintain, and update a database of known wildlife occurrences and habitats; however, these data are not considered comprehensive and cannot be used exclusively to determine the location of wildlife species or their habitats. Additional information was obtained from independent literature searches, examination of aerial photographs, and queries of GIS databases: including the IDFG's Natural Heritage Program, the WYNDD, and other databases maintained by the BLM, Forest Service, IDFG, and WGFD regarding known and potential locations of TES species and their habitats within the Analysis Area. These data were used to develop the list of special status species of concern that could potentially be present within the Analysis Area.

Biological Field Surveys

The BLM determined that greater sage-grouse and raptor nest surveys were necessary at limited locations along the Proposed Route and Route Alternatives, prior to the publication of an EIS. BLM biologists identified specific areas within the Project's segments that had a high potential for greater sage-grouse occurrence, but where very little data regarding possible lek locations existed (Tetra Tech 2008). Due to Columbian sharp-tailed grouse exhibiting similar breeding habits as greater sage-grouse (e.g., male breeding displays at leks during comparable breeding seasons) and overlapping range, Columbian sharp-tailed grouse lek surveys were conducted concurrently with greater sage-grouse lek surveys. Surveys were conducted for both greater sage-grouse and Columbian sharp-tailed grouse during April 2008. The BLM also determined that raptor nest surveys were necessary along specific portions of the Proposed Route and Route Alternatives. Raptor nest surveys were conducted by aerial survey methods concurrent with sage and sharp-tailed grouse surveys. Additionally, ground-nesting raptor surveys were conducted during the appropriate survey window in the late spring/early summer of 2008. A detailed discussion of the methods and results of these surveys can be found in the Greater Sage-grouse and Columbian Sharp-tailed Grouse Aerial Survey and Raptor Nest Aerial and Ground Surveys Report (Tetra Tech 2008). Locations of leks and raptor nests detected in these surveys were added to the GIS database developed for this Project, and were used in this analysis of effects.

The Forest Service determined that surveys would be required, prior to the publication of an EIS, for the northern goshawk and flammulated owl (*Otus flammeolus*) within the Caribou-Targhee NF and for the northern goshawk on the Medicine Bow-Routt NFs, because current data on nest locations within the Analysis Area are not considered complete. No additional nests for either species, beyond those already identified within existing database, were located during the surveys. Existing nests that were located during these surveys were determined to be inactive. A detailed discussion of the methods and results of these surveys can be found in the Northern Goshawk and Flammulated Owl Surveys Reports (Tetra Tech 2010c, 2010d).

The EPMs proposed by the Proponents state that preconstruction surveys would be completed within specific areas along the Project's Proposed Route for certain species.

Surveys the year prior to construction would be conducted, using protocols approved by state and federal agencies, for the following TES species:

- bald eagle (*Haliaeetus leucocephalus*);
- black-footed ferret;
- burrowing owl (*Athene cunicularia*);
- Columbian sharp-tailed grouse;
- ferruginous hawk (*Buteo regalis*);
- flammulated owl;
- greater sage-grouse;
- mountain plover (*Charadrius montanus*);
- northern goshawk;
- pygmy rabbit;
- three-toed woodpecker;
- white-tailed prairie dog (*Cynomys leucurus*);
- Wyoming pocket gopher; and
- any species that becomes listed under the ESA between now and the beginning of construction and could occur within the Analysis Area.

Preconstruction survey results would be provided to the applicable land-management agency. In addition, the Agencies have identified the following mitigation measure:

TESWL-4 In the event that an ESA-listed species is discovered during surveys, construction would cease, the USFWS would be notified, and Section 7 consultation would be initiated. In addition, the transmission line or structures would be relocated to minimize direct impacts to newly discovered ESA species, to the extent practical.

Vegetation and Habitat Mapping Methods

The Project has been proposed for an area with substantial public lands managed with the intent of conserving and improving wildlife populations and stopping or reversing population declines of sensitive species. Therefore, there are some data available regarding wildlife occurrences on these public lands. Similar data are not consistently available for private lands. The proportion of private and public lands that would be crossed by the Project is roughly equal; therefore, there is a discontinuity between the level of detail and available data along the Project's route regarding wildlife habitat. This means that existing databases regarding known wildlife occurrences could not be used exclusively to determine impacts to TES wildlife species. In addition, landowner permission is required prior to surveying private lands, and many private landowners have declined access to their lands for surveys. This means that exhaustive field surveys for TES wildlife species could not be conducted along the entire length of the Project. Therefore, the BLM determined that a remote sensing approach, augmented with some field surveys as well as known wildlife data maintained by federal, state, and private entities, would be appropriate for gathering information on wildlife habitat

crossed by this Project for seven species (i.e., the burrowing owl, Columbian sharp-tailed grouse, mountain plover, northern leopard frog, prairie dog, pygmy rabbit, and yellow-billed cuckoo). A more detailed description of the vegetation-habitat mapping methods and the results can be found in the Vegetation and Habitat Baseline Technical Report (Tetra Tech 2009b).

Remote sensing mapping methods similar to those used during this Project to map habitats for the seven wildlife species discussed above have been routinely used by various government and private entities to map vegetation and habitat types (more details regarding the species habitats mapped and how they were mapped can be found in the "Habitat Assessment" sub-section below as well as within Tetra Tech 2009b). The exact methods of these efforts vary; however, in general they all consist of acquisition of aerial images, segmentation of images into polygons, identification of polygons (photo interpolation), and field verifications. For example, the NPS used similar methods (including aerial image segmentation, field verifications, and photo interpolation) to identify the vegetation types found within the 18 million-acre Wrangell-St. Elias National Park and Preserve (Stumpf 2007). They determined that their remote sensing and field verification methods were sufficient to provide data that would conform to NPS standards, were compatible with other Inventory and Monitoring Program of the NPS mapping programs, and provided information required for the design of programs within the National Parks (Stumpf 2007). Recently, the NPS used the results of this remote sensing effort (Stumpf 2007) to assess the impacts of a project that proposes to reconstruct nine off-road-vehicle trails within the Nabesna portion of the Wrangell-St. Elias National Park and Preserve (NPS 2010b). In addition, the U.S. Geological Survey (USGS) Gap Analysis Program (GAP) is a spatial database that is routinely used by both government and private entities to identify the locations and extent of vegetative communities and wildlife species during initial project design and analysis (USGS 2005). The GAP analysis differs from the methods used in this Project in that the GAP maps are based on satellite imagery (USGS 2004), whereas the remote sensing used during this Project utilized lower altitude aerial images taken of the Analysis Area, and are of a finer scale/detail (Tetra Tech 2009b). In addition, habitat for some of the species considered within this EIS have been mapped in portions of the U.S. using similar methods as were employed here, such as habitat for the American marten (Vasquez and Spicer 2005), grouse species (Homer et al. 1993), and pygmy rabbit (Rachlow and Svancara 2006).

The habitat mapping conducted for this Project was based on remote sensing image interpretation and ground-based surveys to confirm the vegetation types identified through image interpretation in the Analysis Area (see Section 3.6 – Vegetation Communities). Vegetation typing was further refined using a GIS model for percent cover, slope, and aspect to determine suitable habitat for a group of seven TES species with the potential to occur within the Analysis Area.

The seven species selected for habitat mapping include the burrowing owl, Columbian sharp-tailed grouse, mountain plover, northern leopard frog (*Rana pipiens*), pygmy rabbit, white-tailed prairie dog, and yellow-billed cuckoo (*Coccyzus americanus*). These species were selected in coordination with biologists working with the Proponents as

well as the state and federal agency staff biologists. These species were selected because there is literature available regarding their habitat preferences in at least some of their life stages, and that literature could be used to define the remote sensing variables to assess, including vegetation type, percent cover, slope, and aspect.

Habitat Assessment

The habitat modeling effort is summarized briefly in the following sections. (A detailed description of this effort can be found within the Vegetation and Habitat Baseline Technical Report [Tetra Tech 2009b].)

The location and types of vegetation present within the Analysis Area were determined through remote sensing. The suitability of these vegetative types for TES habitat was assessed using GIS modeling, which combined appropriate NVCS vegetation alliances, known species ranges identified by agencies and/or the University of Wyoming, and existing GIS biophysical parameters (i.e., slope and elevation). For the purpose of this analysis, suitable habitat is defined as those areas that satisfy the habitat attributes of vegetation type, slope, and elevation limitations identified for each species. The outer boundaries of these mapped suitable habitats were clipped to the known ranges of each species' current range (based on data from the IDFG and WYNDD). These suitable habitat maps can be used to define areas that support several macro-feature habitat components and can predict where each targeted species may potentially occur.

To determine the acreage of impacts that could potentially occur to each species habitat, the Project's construction and operations footprint were overlaid onto known or mapped suitable habitat for each species. Areas where the Project's construction or operations footprints are co-located with suitable habitats were considered to be a direct impact to TES wildlife species habitats. Impacts to various vegetation types were calculated in a similar way, and are discussed in detail within Section 3.6 – Vegetation Communities.

The habitat parameters used for modeling suitable habitat for the seven targeted species are described in the following paragraphs.

Burrowing Owl

Habitat parameters that were incorporated into the burrowing owl GIS habitat model include vegetation type and slope. The vegetation types of shrub-steppe, grasslands, and disturbed shrublands / grasslands were selected using the NVCS vegetation alliance GIS coverage. Areas with slope less than 15 percent (Rich 1986) were identified through slope classification of the National Elevation Database.

Columbian Sharp-Tailed Grouse

The habitat parameters incorporated into the Columbian sharp-tailed grouse habitat model include vegetation type. During summer months, this species inhabits area containing relatively dense herbaceous and shrub cover. In the winter, Columbian sharp-tailed grouse use forest habitat, particularly riparian areas, and feed on aspen, serviceberry, and choke cherry up to 4 miles from leks (WGFD 2005). To incorporate both winter and summer habitat into the model for the Columbian sharp-tailed grouse, the NVCS vegetation alliance GIS coverage was used to select all shrub-steppe and

grassland alliances within at least 497 feet (151.5 meters) from mountain shrub or riparian alliances (Marks and Marks 1988).

Mountain Plover

The habitat parameters incorporated into the mountain plover GIS habitat model include vegetation type and slope. The NVCS vegetation alliance GIS coverage was used to select xeric (i.e., dry habitat) shrubland and grassland alliances. Areas with slope less than 8.7 percent (Smith and Keinath 2004) were identified through slope classification of the National Elevation Database.

Northern Leopard Frog

Habitat parameters incorporated into the northern leopard frog GIS habitat model include wetland/vegetation type and elevation. The appropriate wetland/vegetation type for the northern leopard frog was identified via the NVCS vegetation alliance GIS coverage. Elevation data was derived from the National Elevation Database. All wetland areas below 9,720 feet (2,960 meters) in elevation were considered in the model (Bull 2005; Groves et al. 1997; WGFD 2005).

Prairie Dog

Habitat parameters included in the white-tailed prairie dog GIS habitat model include vegetation type, slope, and elevation. Vegetation types of shrub-steppe and mixed-grass and shortgrass prairie were selected using the NVCS vegetation alliance GIS coverage. Areas with the appropriate slope and elevation were identified through slope and elevation classification of the National Elevation Database. Areas with elevation between 3,773 to 10,499 feet (1,150 to 3,200 meters; Seglund et al. 2004; WGFD 2005) and slope less than 30 percent (Seglund et al. 2004; WGFD 2005) were selected for suitable habitat.

Prairie dog colonies were mapped through aerial photo interpretation techniques with color aerial photography (Project-specific and NAIP imagery) of the Analysis Area. Prairie dog colonies and complexes (at least two prairie dog colonies within about 4.3 miles of each other) were mapped according to the Black-Footed Ferret Survey Guidelines for Compliance with the ESA (USFWS 1989). White-tailed prairie dog complexes of greater than 200 acres and black-tailed prairie dog *Cynomys ludovicianus*) complexes of greater than 80 acres were mapped (USFWS 1989). The white-tailed prairie dog occurs in the western two-thirds of Wyoming; therefore, colonies identified within this species range were considered white-tailed prairie dog colonies. The black-tailed prairie dog occurs in the eastern third of Wyoming; therefore, colonies identified within this species range were considered black-tailed prairie dog colonies. The boundary of each prairie dog complex was digitized into GIS polygons and the total acreage of each complex determined.

Existing white-tailed and black-tailed prairie dogs were mapped during this modeling effort (in addition to add suitable habitat, as was mapped for the other targeted species), because both of these species are recognized as keystone species (i.e., a species that has a disproportionate effect on its environment relative to its abundance). They provide a prey base to many avian, mammalian, and reptilian predators and their burrows provide habitat features for many species, including TES species such as the

black-footed ferret, mountain plover, and burrowing owl. For example, the abundance and distribution of the black-footed ferret (a federally listed endangered species) is related to the abundance and distribution of prairie dogs, because the black-footed ferret relies on large occupied prairie dog colonies for suitable habitat and preys almost exclusively on prairie dogs.

Pygmy Rabbit

Habitat parameters that were incorporated into the pygmy rabbit GIS habitat model include vegetation type and slope. The NVCS vegetation alliance GIS coverage was used to select sagebrush (both disturbed and undisturbed) habitat types. Areas with percent slope of less than 15 percent were identified through slope classification of the National Elevation Database.

Pygmy rabbits are closely associated with deep loose soil types; however, when soil types were incorporated into the Project-specific models, the results created omission errors (areas of known pygmy rabbit habitat being classified as unsuitable habitat). This is likely due to the fact that available soil data is mapped within a 1 square kilometer spatial scale, and this coarse spatial scale misses some suitable habitats that occur at a smaller spatial scale. Rachlow and Svancara (2006) modeled pygmy rabbit habitat within Idaho using soil type/depth as a model parameter, and also came to the conclusion that the soil data resulted in omission errors, with 12.5 percent of the known rabbit locations occurring outside of mapped rabbit habitat. Therefore, although soil type/depth is an important component of pygmy rabbit habitat selection, the use of soil type/depth in habitat models underestimates the total suitable habitat available. The model, as currently designed, more closely fits to known occurrences of pygmy rabbits than if it contained a soil type/depth parameter.

Yellow-Billed Cuckoo

Habitat parameters that were incorporated in the yellow-billed cuckoo GIS habitat model include vegetation type. Vegetation types of forested wetlands and riparian areas were selected using the NVCS alliance map.

Greater Sage-Grouse

Habitat for the greater sage-grouse was originally included in the remote sensing analysis. The original intent of this effort was to use this Project-specific remote sensing analysis to determine the quantitative impacts (i.e., acres of impacts) that would occur to greater sage-grouse habitats. However, an interagency group consisting of the BLM, USFWS, IDFG, and WGFD decided that the remote sensing data was insufficient to address direct and indirect project-related impacts. The group developed a four component Analysis Framework of Interstate Transmission Lines that could be used to analyze potential impacts to greater sage-grouse in this Draft EIS (found in its entirety in Appendix J). With the USFWS as a Cooperating Agency, informal consultation requirements of the Endangered Species Act would be met. Because the States of Idaho and Wyoming are Cooperating Agencies, coordination with state game and fish agencies will continue to occur as well.

The framework developed by this group is composed of four key elements (BLM 2011a; Appendix J). The first four components of the framework are the Impacts Analysis itself

including: (1) analysis of indirect and direct impacts that may threaten long-term persistence of the sage-grouse; (2) quantity of interim and permanent loss of habitat services outside of Core Areas/Key Habitats; (3) direct loss of birds and populations; and (4) mitigation appropriate to offset identified impacts. The role and specific analysis to be conducted of each of the four elements in the overall framework is as follows:

(1) Evaluation of Direct and Indirect Impacts – This portion of the Impacts Assessment addresses Project-related habitat impacts that bear directly on listing factors considered by the USFWS when evaluating the need to provide full listing protection under the ESA. An analysis of sage-grouse populations that attend leks within 18 kilometers (11 miles) of the project is a critical component of an impacts analysis for the species, as sage-grouse that attend leks up to 18 kilometers from the project may be indirectly affected by the loss of habitat functionality during other seasons of the year (Connelly et.al. 2000). In addition, the construction of a transmission project or other linear facility may pose barriers on daily or seasonal migration patterns or avoidance of important daily or seasonal habitats once used extensively by local sage-grouse populations. Impacts to greater sage-grouse are discussed in Section 3.11.2.2.

(2) Habitat Equivalency Analysis (HEA) – An HEA is a method of quantifying the permanent or interim loss of habitat services from Project-related impacts (measured as a loss of habitat services from pre-disturbance conditions) and is used to scale compensatory mitigation requirements to potential Project related impacts (King 1997; Dunford et al. 2004; Kohler and Dodge 2006; NOAA 2006, 2009). An HEA provides a scientific-based, peer-reviewed method of scaling compensatory mitigation requirements, and has been used by federal regulatory agencies including the USFWS and NOAA.

An HEA is not meant to be an impacts analysis in and of itself; rather, it is one part of an overall wildlife impacts analysis that objectively determines Project-related habitat impacts (i.e., habitat services lost) and helps inform the type/extent of mitigation necessary to offset loss of habitat services. The Project-specific HEA model would be run for the Proposed Route and all Route Alternatives. The model would determine the habitat services provided by greater sage-grouse habitats during three phases of the Project (Baseline Conditions, Construction, and Reclamation/Operation). Ultimately, the results of the HEA will be used to develop a compensatory mitigation plan for both temporary and permanent impacts to greater sage-grouse and their habitats. Note that the total impact analysis for the greater sage-grouse will take into account the values determined via the HEA, as well as a qualitative assessments of potential impacts that cannot be directly quantified using this model. Therefore, the HEA should only be viewed as one of the many tools used in the total greater sage-grouse impact assessment.

The HEA is currently being developed by the BLM in close coordination with agency biologists from the USFWS, WGFD, IDFG, Nevada Department of Wildlife, and the Proponents. Although the HEA has not been finalized to date, the agencies have agreed to some of the parameters that would be incorporated into the HEA model. Following is a list of parameters that have been approved by the agencies:

- Duration of Model (i.e., length of time from the Baseline to the end of the Reclamation/Operation phase): 100 years.

Additional parameters will need to be determined by this interagency group prior to conducting the HEA. These additional parameters include the following:

- What quality values to assign to the Baseline habitat conditions, based on best available data;
- Spatial Extent of the Model; and
- What base habitat layer to use for the analysis (e.g., Regional Gap Analysis Program [ReGAP], LANDFIRE, SAGEMAP).

Although the HEA model was not finalized by the publication of this Draft EIS, a quantitative assessment of direct impacts is included in this document. This preliminary analysis used ReGAP as the habitat base-layer and covers the current range of the greater sage-grouse. All areas designated as sagebrush habitats within the ReGAP database, which occurred within the range of the greater sage-grouse, were considered as potential habitat. The Project's disturbance layer was then overlaid onto this area to predict the acreage of direct disturbances that could occur to greater sage-grouse habitats. Indirect impacts are qualitatively assessed in this Draft EIS. The results of the HEA (which will be available for the Final EIS) will add to the information provided by the preliminary impact analysis by assessing the habitat services lost by these impacts as well as help inform the mitigation that will be required by the various agencies. Once the HEA has been completed, and the habitat services lost due to Project-related impacts are determined, a compensatory mitigation plan could be developed for these impacts (see Step 4 in the Framework's strategy).

(3) Addressing Direct Loss of Birds – While HEAs address impacts in terms of habitat acreage and/or dollars associated with what is essentially an economic analysis, the "currency" of measurement under the ESA is the number of individuals in a population. This piece of the overall sage-grouse Impacts Assessment Framework is an important contribution to the rangewide jeopardy analysis conducted as part of the informal conferencing process for this candidate species. Additionally, addressing impacts to populations provides key information needed to complete any potential future formal Section 7 consultation that would be required if the greater sage-grouse is ultimately listed under ESA during Project development.

(4) Mitigation – Until an impacts analysis has been conducted in coordination with agency biologists—leading to an adequate understanding of impacts to sage-grouse populations and habitat—the issue of mitigation cannot be addressed. As stated above, the HEA is one of the tools in the Framework that will assist in quantifying Project-related impacts to greater sage-grouse (i.e., habitat services lost), and ultimately, the results of the HEA will be used to inform the development of a compensatory mitigation plan for both temporary and permanent impacts to greater sage-grouse and their habitats across the entire Project area.

Calculating Density of Disturbance within Key Habitat – Once the Alternatives analysis is complete and a preferred alternative has been selected, an additional site-specific evaluation of density of disturbance within Key Habitats/Core Areas may be conducted. The purpose of this evaluation is to evaluate opportunities to minimize density of disturbance within Key Habitats/Core Areas that are outside the designated disturbance

corridor identified in the Wyoming Governor's EO 2011-5; and restore and/or enhance important sage-grouse habitat as a part of Project-related mitigation. These site-specific habitat evaluations will also enable the BLM to: 1) demonstrate compliance with the Greater Sage-Grouse Habitat Management Policy on Wyoming BLM Administered Public Lands including Federal Mineral Estate (IM WY-2010-012 [BLM 2009c]); and 2) demonstrate consistency with the Greater Sage-Grouse Core Area Protection, Wyoming Governor's EO 2011-5[2].

The overall goal of the sage-grouse Key Habitat/Core Area Strategy within both Wyoming and Idaho is to limit the density and duration of disturbances and restrict activities within Key/Core Areas to a level sufficient to ensure the long-term conservation and management of greater sage-grouse within each State. The BLM's management goal for these areas is to limit disturbances to no more than a 5 percent loss of habitat, and no more than an average of one disturbance per 640 areas (BLM 2011a). As stated above, the BLM must determine the density of disturbances within Wyoming designated greater sage-grouse Core areas to demonstrate 1) compliance with BLM (2009c); and 2) consistency with the Wyoming Governor's EO 2011-5. To accomplish this, the BLM has developed a density disturbance calculation (DDC) tool, which is used to measure the percent disturbance within Core/Key areas affected by a proposed project.

Note that the DDC is not a part of the general impact analysis and is instead a tool developed by the BLM to evaluate opportunities to: 1) minimize the density of disturbance within Core/Key areas that are outside the designated disturbance corridor identified in the Wyoming Governor's EO 2011-5; and 2) restore and/or enhance important sage-grouse habitat as a part of project-related mitigation. The DDC analysis is necessary to demonstrate project compliance with Wyoming BLM Greater Sage-Grouse Habitat Management Policy (BLM 2009c) and the Wyoming Governor's EO 2011-5.

A DDC will be conducted for the Project in compliance with the BLM's *Framework for Sage-grouse Impacts Analysis for Interstate Transmission Lines* (BLM 2011a; Appendix J). This framework states that the DDC needs to be conducted "once the alternative analysis is completed and a preferred alternative has been selected." A preferred alternative has not yet been selected and therefore this analysis cannot be conducted at this time; however, the analysis will likely be included in the Final EIS. A brief summary of the methods that would be used during this analysis are provided below; however, see BLM (2011a) and Appendix J for a full description of the methods involved in a DDC.

- A 4-mile buffer will be created around the outer Project boundary (i.e., the Project's ROW), and all occupied greater sage-grouse leks located within Core/Key areas as well as Idaho R1, R2, and R3 habitats will be identified (based on state agency databases). These leks will be defined as "affected leks."

[2] Note that this EO has undergone multiple revisions in the last 3 years, and that the process continues to evolve. The BLM will continue to work with the Wyoming Governor as well as the state wildlife agency to ensure a cohesive methodology for the protection of the greater sage-grouse.

- A 4-mile buffer will be created around the perimeter of each affected lek identified during the previous step.
- The area within the boundary of the affected leks and the 4-mile Project-boundary will then be merged.
- This overall area will then be clipped to the extent of the Core/Key areas as well as Idaho R1, R2, and R3 habitats in order to create the DDC analysis area.
- The extent of existing disturbances within the DDC analysis area (e.g., transmission lines, distribution lines, wind developments, oil/gas wells, communication towers, pipelines, roads, fires, and so on) as well as proposed disturbances with approved permits will be determined via agency databases and aerial photographs.
- The percentage of existing disturbances within the DDC analysis area will be determined by dividing the existing disturbances by the total area within the DDC analysis area, and then multiplied by 100. Subtracting the percentage of existing disturbances from 5 percent established the new allowable disturbances that could occur within the DDC analysis area.
- The extent of Project-related disturbances will then be overlaid onto the DDC analysis area to determine the acreage of Project-related disturbances that would occur. This amount will then be compared to the amount of new allowable disturbances determined by the previous step.
- Percent disturbances will be analyzed for the entire DDC analysis area as a whole, as well as for each individual affected lek within the DDC analysis area.
- It is assumed that the BLM's DDC tool (an ArcGIS tool) will automatically sum up the number of disturbances within the DDC analysis area, and determine how many occur on average within 640 acres.

3.11.1.5 Existing Conditions

This section discusses the TES species that could potentially be present within the Analysis Area. It is broken into three parts: 1) threatened, endangered, proposed, or candidate species under the ESA; 2) Forest Service and BLM sensitive species; and 3) Forest Service MIS. The potential impacts that could occur to these species as a result of Project related activities are addressed in Section 3.11.2.

Threatened, Endangered, Proposed or Candidate Species under the ESA

The threatened, endangered, proposed, or candidate species listed under the ESA that could potentially be present within or in close proximity of the Analysis Area are listed in Appendix D, Table D.11-1. This list was discussed and evaluated in Level 1[3] meetings in Wyoming on May and November 2008, and in Idaho on April 2008. This list has been updated since the 2008 meetings, due to updates made to the federal list of species since this date. This list may contain some species that are present within the general portion of the states crossed by the Project; however, their distribution does not overlap with, or habitat for these species is not present within, the Analysis Area.

[3] Level 1 meetings are quarterly meetings among USFWS, BLM, state wildlife departments, Forest Service, and biologists that provide Project updates and allow for technical discussion and agreements on protocols.

Although no threatened, endangered, proposed, or candidate fish species listed under the ESA are present within or in close proximity to the Analysis Area (including areas directly downstream of Project-related stream crossings), several ESA fish species are present in downstream areas located outside of the Analysis Area (when considering the entire length of a stream, which can extend hundreds of miles and pass through multiple states). The ESA fish species that are located outside of the Analysis Area, but which still need to be considered within this analysis because they could be affected by water withdrawal from the Colorado or Platte River systems (as defined by the Upper Colorado Endangered Fish Recovery Program for the Colorado River system as well as the PRRIP for the Platte River system) are listed in Appendix D, Table D.11-1 (see Sections 3.11.1.3 and 3.11.2.2). In addition, the Proposed Route would not cross through ESA-designated critical habitat; however, Alternative 9E would cross through a portion of critical habitat for the bull trout.

The following contains a discussion of each of the threatened, endangered, proposed, or candidate species that were determined to have distribution or suitable habitat within the Analysis Area, or were identified during agency coordination meetings as a species that needed to be addressed in detail within this EIS.

Threatened, Endangered, Proposed, or Candidate Wildlife Species under the ESA

Black-Footed Ferret (*Endangered*)

The black-footed ferret was first designated as “endangered” by the Bureau of Sport Fisheries and Wildlife in 1966. The species was listed as “threatened with extinction” (endangered) on March 11, 1967. The reduction in the availability of their principal prey species, in combination with other factors such as secondary poisoning from toxicants ingested by prairie dogs (upon which they are reliant for survival), resulted in the near extinction of the black-footed ferret in the wild by the early 1970s (USFWS 2003).

The black-footed ferret was believed to be extinct throughout North America until a small relic population was discovered in a prairie dog colony west of Meeteetse, Wyoming, in 1981. Canine distemper and sylvatic plague killed the majority of that population in 1986 and 1987 (WGFD 2005). The 18 surviving ferrets were captured and became the founder population for captive breeding efforts initiated by the WGFD. These efforts were successful and have provided ferrets for reintroduction at nine sites in the western United States and Mexico. Currently only two reintroduced populations have been established that no longer require releases of captive-raised ferrets; one in western South Dakota and the other near Medicine Bow in southeastern Wyoming (WGFD 2005). The entire known population of ferrets in the wild is therefore considered a nonessential, experimental population.

Black-footed ferrets are highly dependent upon prairie dog colonies for food, shelter, and dens; therefore, the ranges of these species coincide (USFWS 2003). Historically, black-footed ferrets have been reported in association with the black-tailed prairie dog, white-tailed prairie dog, and Gunnison’s prairie dog (*Cynomys gunnisoni*) towns (USFWS 2003). Substantial reductions in both prairie dog numbers and distribution have occurred during the last century due to the conversion of native prairie to farmland, widespread poisoning of prairie dogs, and outbreaks of sylvatic plague. Sylvatic plague

is an exotic disease to which prairie dogs have little or no immunity and to which the black-footed ferrets are also highly susceptible (USFWS 2003).

The Rawlins FO is home to the first site of the reintroduced black-footed ferret population in the country. It is the only known population in Wyoming that is still extant. This population is located in Carbon County in the Shirley Basin, and was historically occupied by ferrets.

On February 2, 2004, the USFWS indicated that ferret surveys are no longer necessary in black-tailed prairie dog towns statewide or in white-tailed prairie dog towns except non-block cleared areas (USFWS 2004). However, USFWS also stated that the clearance from surveys must not be interpreted to mean that the area is free of all value to black-footed ferrets, and coordination with USFWS is necessary to ensure that the most recent information is accessed. This clearance from the need for surveys does not provide insight into an area's value for recovery of the species through future reintroduction efforts. Thus, while an action proposed in a cleared area needs no survey and is not likely to result in take of individuals, the action could have an adverse effect upon the value of a prairie dog town as a future reintroduction site and should be evaluated to determine the significance of that effect.

Approximately 2,204,851 acres of suitable habitat have been mapped for the black-footed ferret within Wyoming (non-block-cleared areas: USFWS 1989). The Proposed Route would cross black-footed ferret habitat along Segments 2, 3, and 4. Out of the total combined length of 356.1 miles for Segments 2, 3, and 4, the Proposed Route would cross approximately 73.9 miles of suitable black-footed ferret habitat (see Table D.11-3 in Appendix D).

Canada Lynx (*Threatened*)

On July 8, 1998, the USFWS proposed to list Canada lynx as a threatened species under the ESA. The Forest Service and BLM responded to the proposal by establishing a team of international experts in lynx ecology to collect and summarize scientific data. This resulted in the publication *Ecology and Conservation of Lynx in the United States* (Ruggiero et al. 1999). Based on the information gained through this study, the USFWS listed the Canada lynx as threatened, effective April 24, 2000 (65 *Federal Register* 16051-16086). The USFWS published a revision of the critical habitat designation for the lynx on February 25, 2009 (74 *Federal Register* 36). This designation does not include areas near or within the Analysis Area.

Lynx habitat is found generally at middle to upper elevations. Their habitat includes primarily cool, moist subalpine fir (*Abies lasiocarpa*) and Engelmann spruce (*Picea engelmannii*) forests, and moist lodgepole pine (*Pinus contorta*) forests. Cool, moist forests of Douglas-fir (*Pseudotsuga menziesii*), grand fir (*Abies grandis*), Western larch (*Larix occidentalis*), and aspen contribute to lynx habitat where intermingled with, or adjacent to, Engelmann spruce (*Picea engelmannii*) or lodgepole pine (*Pinus contorta*). Lynx tend to have very large home ranges, varying from about 15,000 to 30,000 acres or 10 to 20 square miles. Lynx are highly mobile, with characteristic long-distance movements in excess of 60 miles. Studies have shown that they prefer contiguous forests and avoid large openings unless shrubs and trees provide enough hiding cover

(Ruggiero et al. 1999). Lynx may also use lowland shrub habitats periodically, while dispersing between suitable high-elevation forest habitats, or while snowshoe hare populations are low in forest habitats and populations of shrub-dependent prey species (e.g., sage-grouse or jackrabbit) are high in shrub habitats adjacent to forested areas (Ruediger et al. 2000).

Snowshoe hares are the primary prey of lynx, making up anywhere from 35 to 97 percent of the diet (Ruggiero et al. 1999); therefore, any action that impacts snowshoe hares can have consequences to lynx. In addition, other small mammal species, such as red squirrels, may be an important alternate prey, especially when hare populations are low (Ruggiero et al. 1999).

The majority of the Analysis Area consists of unsuitable habitat for the Canada lynx; however, the centerline of Segment 4 bisects a small portion of two areas designated as Lynx Analysis Units (LAUs). An LAU is described as core habitat and is considered occupied habitat (Forest Service 2007c). The centerline of the Proposed Route would cross 10.3 miles of this core LAU area, along Segment 4. Alternative 4F would cross 4.5 miles of LAU areas, while the other Route Alternatives (4A to 4E) would avoid the LAU entirely (Table D.11-3 in Appendix D). The portions of the LAU crossed by the Proposed Route or Alternative 4F are south of the Bridger NF, which itself represents the southern extent of the recently updated designated critical habitat for Lynx (74 *Federal Register* 63343-63366). These areas are shown in Figure E.11-1. Table 3.11-2 displays the total size of these two LAUs, as well as the acreage of forested habitat within each LAU.

Table 3.11-2. Total Size of Lynx Analysis Units Crossed by the Project

Total Size (acres)	Total Forested Habitat in LAU (acres)
18,776	15,659
21,030	15,753

In addition, the Project would cross two areas that have been designated as lynx linkage habitat by an interagency / intergovernmental panel, for a total of 9.0 miles (Forest Service 2007c); both crossings are located south of the Caribou-Targhee NF, along Segment 4, and occur in shrub habitats.

Columbia Spotted Frog (*Candidate; Forest Service Sensitive*)

In May of 1989, the USFWS received a petition to list the Columbia spotted frog (*Rana luteiventris*) under the ESA. In May 1993, the USFWS released their 12-month petition finding in which they stated that the Columbia spotted frog consisted of five distinct population segments: 1) the main population (Alaska, British Columbia, Alberta, Wyoming, Montana, north and central Idaho, eastern Washington, and northeastern Oregon); 2) the Great Basin (southern Idaho and Nevada); 3) the West Coast (western Washington, Oregon, Idaho, and Nevada); 4) the Wasatch Front, Utah; and 5) the West Desert, Utah. All of the distinct population segments, except for the main population, were classified as candidate species by this May 1993 12-month petition finding.

Columbia spotted frogs are found near bodies of slow-moving water including lakes, ponds, sluggish streams, and marshes. During the summer they may disperse into

upland forests, grasslands, and shrublands; however, these upland habitats must still be closely associated with moist vegetated areas. Aquatic habitat for the spotted frog consists of the littoral zone of emergent vegetation, including willows, grasses and sedges, and submerged aquatic plants. The spotted frog over-winters in or immediately adjacent to permanent waterbodies that remain above freezing temperatures and are well oxygenated, such as streams, springs, and spring-fed lakes.

General associations of Colombia spotted frogs with NWI classifications have been made in several studies (Patla and Keinath 2005). The NWI classifications that are associated with Colombia spotted frogs occurrences include palustrine wetlands with shrub-scrub, emergent, aquatic bottom, and intermittent riverine streambed sites; and water regimes include seasonally flooded, semi-permanently flooded, and saturated areas.

In Idaho, the species mainly occurs in northern Idaho with separate isolated populations in Owyhee County. In Wyoming, it is found in Bighorn, Sheridan, Johnson, Teton, Sublette, Fremont, and Lincoln Counties. In Nevada, it is found in Elko and Eureka Counties, usually at elevations between 5,600 and 8,700 feet. In the Analysis Area, only the isolated populations in Owyhee County, Idaho and Elko County, Nevada are considered a portion of the Great Basin distinct population.

Suitable habitat for the Columbia spotted frog was considered to be all wetland habitats located within Owyhee, Bighorn, Sheridan, Johnson, Teton, Sublette, Fremont, Lincoln, Elko, and Eureka Counties (however, the Project would only cross through Owyhee, Lincoln, and Elko Counties). Suitable wetland habitat for the Columbia spotted frog would be crossed by Segments 4, 8, and 9. Out of the total combined length of 495.7 miles for Segments 4, 8, and 9, the Proposed Route would cross approximately 2.1 miles of suitable Columbia spotted frog habitat (Table D.11-3 in Appendix D).

Gray Wolf (*Nonessential Experimental Population–Wyoming; Endangered-Idaho; Forest Service Sensitive*)

The gray wolf is designated as a nonessential experimental population by the USFWS in Wyoming. The “nonessential experimental population” status is defined as “a reintroduced population believed not to be essential for the survival of the species, but important for its full recovery and eventual removal from the endangered and threatened list. These populations are treated as "threatened" species except that the Act's Section 7 regulations (requiring consultation to reduce adverse impacts from federal actions) do not apply (except when the species occurs within National Parks or NWRs) and critical habitat cannot be designated.

The gray wolf was removed from listing as a threatened or endangered species In Idaho, effective May 4, 2009; however, on August 5, 2010, federal Judge Donald Molloy ruled that the delisting was not in compliance with the ESA. Therefore, the gray wolf was re-listed as endangered in Idaho. However, Congress overturned Judge Molloy’s ruling in 2011, and again removed the gray wolf from the ESA list in Idaho on April 2011.

Wolves are considered habitat generalists and do not require a specific habitat type for survival. Habitat for wolves is largely based on the density of prey species found within a

given area. Wolves have been expanding within portions of Idaho and Wyoming since the reintroduction effort that began in 1995 and 1996. The established Northern Rocky Mountain population recovery goal of 30 breeding pairs of wolves well distributed throughout Idaho, Montana, and Wyoming for 3 consecutive years was achieved in December 2002. In 2003, the USFWS adopted regulations that reclassified, or downlisted, wolves from endangered to threatened in Idaho north of I-90; however, in early 2005, a federal court judge remanded these regulations. Consequently, wolves north of I-90 remained classified as fully endangered. In February 2007, the USFWS proposed a delisting rule that would provide two alternate tracks to delisting. On March 28, 2008, the USFWS designated and removed the Northern Rocky Mountain gray wolf from listing under the ESA (73 *Federal Register* 10514-10560). However, in July 2008, a federal judge issued an injunction to suspend the removal of wolves in the Northern Rocky Mountains from the federal ESA list. A number of environmental groups have challenged the USFWS' delisting decision. On March 6, 2009, Secretary Salazar confirmed the USFWS decision to delist the wolf in all states except Wyoming.

The gray wolf population in the Northern Rocky Mountains of Montana, Idaho, and Wyoming continues to increase its distribution and abundance (USFWS et al. 2008). Estimates of wolf numbers at the end of 2007 were 830 wolves in the Central Idaho Recovery Area, 453 in the Greater Yellowstone Recovery Area (GYRA), and 230 in the Northwest Montana Recovery Area for a total minimum estimate of 1,513 wolves (USFWS et al. 2008). By state boundaries, there were an estimated 422 wolves in Montana, 732 wolves in Idaho, and 359 in Wyoming. 2007 was the eighth year in which 30 or more breeding pairs were documented and well distributed within the three-state area (USFWS et al. 2008). The total gray wolf population in Wyoming increased approximately 15 percent from 311 wolves in 2006 to 359 wolves in 2007 (Jimenez et al. 2008). The Idaho wolf population has continued to expand in both numbers and packs since initial reintroductions in 1995 (Nadeau et al. 2008). By the end of 2007, 83 wolf packs were documented in Idaho, including 17 newly documented packs and a minimum of 489 wolves (Nadeau et al. 2008). Recovery areas are established by the USFWS to restore gray wolf populations in the Northern Rocky Mountains of Idaho, Montana, and Wyoming. Wolves are naturally recovering in the Northwest Montana Recovery Area, while wolves were reintroduced into the Central Idaho Recovery Area and the GYRA.

As the gray wolf is considered a habitat generalist, and does not require a specific habitat type for survival, gray wolves could potentially be present along any portion of the line regardless of habitat type, with the exception of where the transmission line passes through areas of heavy agricultural use. The closest they have been documented to the Project is along the Proposed Route near Cokeville (Segment 4), in 2003. However, the BLM's Kemmerer FO has indicated that a pack was detected on Dempsey Ridge (also near Segment 4) in 2010 (this is likely the same pack, due to the close proximity of Cokeville to Dempsey Ridge). See Appendix E, Figure E.11-1 for identified wolf packs in the vicinity of the Project.

The Proposed Route and Route Alternatives are located in the Central Idaho Recovery Area and GYRA for the gray wolf. No critical habitat has been designated within Idaho and Wyoming (43 [47] *Federal Register* 9607-9615).

Greater Sage-Grouse[4] (*Candidate; MIS; Forest Service Sensitive; BLM Sensitive*)

The greater sage-grouse was first considered for protection under the ESA in 2005. After reviewing the best available scientific and commercial information the USFWS concluded, on January 2005, that listing the greater sage-grouse was not warranted. However, on February 2008, the USFWS announced that the greater sage-grouse would receive an additional review to determine if the species warrants protection under the ESA. The USFWS has stated that the new status review would take into consideration relevant information that had become available since 2005 (73 *Federal Register* 75176-75244). On March 5, 2010, the USFWS determined that listing the greater sage-grouse was warranted but precluded by higher priority species, thereby deeming the greater sage-grouse as a candidate species.

The greater sage-grouse is a sagebrush obligate species, found in foothills, plains, and mountain slopes where sagebrush is present, or in mixtures of sagebrush, aspen, and open meadows. Sagebrush cover, height, and vegetative vertical structure are more important factors for suitable greater sage-grouse habitats than is the presence of particular sagebrush plant species.

Greater sage-grouse habitat use varies by season. Breeding and brood rearing habitat (i.e., summer habitat) is characterized by 10 to 25 percent sagebrush cover with an abundant grass and forb understory of greater than 15 percent cover (Connelly et al. 2000). The grass component is important in secluding nest sites, and forbs are important as browse for greater sage-grouse and providing habitat for protein rich insects necessary for chick growth. These habitats include a variety of sagebrush habitats that are capable of supporting a continued source of succulent forbs and insects. They may also include higher elevations where forbs are still present, as well as agricultural fields, lower-elevation meadows, moist grassy areas, and riparian areas adjacent to sage-brush communities. Winter habitat consists of relatively large areas of sagebrush with 10 to 30 percent canopy cover that provide cover and forage for grouse above the snow (Connelly et al. 2000). Greater sage-grouse are capable of traveling long distances between seasonal habitats when necessary. For example, populations may travel up to 50 miles from summer to winter range (Leonard et al. 2000).

Greater sage-grouse are landscape species[5], and are widely distributed throughout sagebrush-dominated habitats in southern Idaho, northern Nevada, and throughout Wyoming. The State of Wyoming has established areas designated as core habitat and the State of Idaho has established key habitats, both of which are considered crucial habitat for the greater sage-grouse. These areas were delineated around high concentrations of leks and other suitable habitat features frequented by this species. Currently, there are about 15,297,867 acres of designated core habitat in Wyoming, and about 9,373,592 acres of key habitats in Idaho. Appendix E, Figures E.11-2 and E.11-3 shows the locations of Core/Key habitats in relation to the Project. The Proposed Route

[4] Note that the level of information presented within this document for the greater sage-grouse is at times more detailed than that presented for other species due to the potential impacts present for the greater sage-grouse, and the elevated level of concern expressed by federal and state agencies regarding this species.

[5] Landscape species use large, diverse areas and can have a substantial impact on the structure and function of natural ecosystems.

would pass through both Wyoming's core and Idaho's key habitat for a total of 235.3 miles (Table 3.11-3).

In addition to key habitats, the state of Idaho has designated R1, R2, and R3 habitats. R1 habitats are defined as perennial native and non-native grasslands with high restoration potential. R2 habitats are defined as annual grass dominated areas (either shrubland or grassland) with low restoration potential. R3 habitats are defined as conifer encroachment areas with high restoration potential. The state of Idaho has designated about 3,481,909 acres of R1 habitats, 826,281 acres of R2, and 527,821 acres of R3 habitats in Idaho. The Proposed Route would pass through 54.0 miles of R1 habitats, 17.2 miles of R2 habitats, and 5.1 miles of R3 habitats (Table 3.11-3; also see Table D.11-11 in Appendix D, which lists this same information but for the Proposed Route and Route Alternatives).

Table 3.11-3. Miles of Agency Designated Greater Sage-Grouse Habitat Crossed by the Proposed Route's Centerline

Segment Number	Segment Total Length (miles)[1/]	Core Areas Crossed (miles)[1/]	Key Areas Crossed (miles)[1/]	R1 Habitats Crossed (miles)[1/]	R2 Habitats Crossed (miles)[1/]	R3 Habitats Crossed (miles)[1/]
1E	100.6	37.2	-	-	-	-
1W(a)	76.5	34.0	-	-	-	-
1W(c)	70.6	24.8	-	-	-	-
2	96.7	44.5	-	-	-	-
3	56.5	-	-	-	-	-
4	203.0	43.8	14.2	-	-	-
5	54.6	-	-	-	-	-
6	0.5	-	-	0.3	-	-
7	118.1	-	11.9	16.5	-	5.1
8	131.0	-	13.2	21.2	11.3	-
9	161.7	-	11.5	10.0	-	-
10	33.6	-	0.1	6.1	5.9	-
Total Miles	**1,103.4**	**184.4**	**50.9**	**54.0**	**17.2**	**5.1**

1/ Mileages are rounded to the nearest tenth; therefore, columns may not sum exactly.

If Alternative 7I is selected, the Project would cross through Nevada for about 9.4 miles. Unlike Wyoming and Idaho, Nevada has not designated jurisdictional greater sage-grouse habitats within the state. However, during this analysis, all habitats in Nevada that are crossed by Alternative 7I will be considered as important habitats for greater sage-grouse.

There are approximately 2,124 known greater sage-grouse leks within the state of Idaho (consisting of 854 occupied, 98 unoccupied, and 1,172 undetermined status leks), and 2,257 leks within Wyoming (consisting of 1,871 occupied, 285 unoccupied, and 101 undetermined status leks). The number of leks located statewide in Nevada is uncertain; however, Table D.11-9 lists the number of leks located within various distances from the Project, including along Alternative 7 (i.e., the only route that crosses into Nevada). The term "occupied" is defined differently by the IDFG and WGFD. In Idaho, the IDFG define occupied leks as any lek that has been active during at least 1 breeding season within the prior 5 years; in Wyoming the WGFD define occupied leks as those that have been visited by males within the last 10 years. For the sake of this

analysis, all leks in Nevada will be considered as occupied due to the limited length that Alternative 7I would cross this state.

The Proposed Route would pass within 0.6 mile of 8 leks that are either occupied or have an undetermined management status (Table 3.11-4), and within 2 miles of 66 leks with these same management statuses (also see Table D.11-9 in Appendix D, which lists this same information but includes Route Alternatives as well). This value increases to 511 leks when considering a distance of 11 miles from the Proposed Route.

Table 3.11-4. Number of Greater Sage-Grouse Leks within Specified Distances of the Proposed Route's Centerline

Segment Number	Segment Length (miles)	Leks within 0.25 mile	Leks within 0.6 mile	Leks within 1 mile	Leks within 2 miles	Leks within 3 miles	Leks within 4 miles	Leks within 11 miles
Occupied Leks								
1E	100.6	-	-	1	5	8	11	55
1W(a)	76.5	-	-	1	4	5	10	45
1W(c)	70.6	-	-	-	2	7	10	40
2	96.7	-	1	8	21	29	38	137
3	56.5	-	-	-	1	3	4	62
4	203.0	-	1	5	14	26	32	89
5	54.6	1	1	1	1	1	1	2
6	0.5	-	-	-	-	-	-	-
7	118.1	-	2	2	3	4	6	39
8	131.0	-	-	-	-	1	1	17
9	161.7	-	-	-	1	1	7	53
10	33.6	-	-	-	-	-	1	24
Total Proposed[1/]	**1,103.4**	**1**	**4**	**17**	**48**	**77**	**105**	**353**
Leks with Undetermined Status								
1E	100.6	-	1	3	3	3	5	9
1W(a)	76.5	-	1	1	2	2	2	7
1W(c)	70.6	-	-	1	2	2	2	6
2	96.7	-	-	-	-	1	2	10
3	56.5	-	-	-	-	-	-	3
4	203.0	-	-	2	5	5	6	20
5	54.6	-	-	-	-	-	-	3
6	0.5	-	-	-	-	-	-	7
7	118.1	-	-	3	3	7	10	31
8	131.0	-	-	-	-	3	7	39
9	161.7	-	1	1	2	7	13	69
10	33.6	1	2	3	5	8	9	26
Total Proposed[1/]	**1,103.4**	**1**	**4**	**12**	**18**	**32**	**50**	**158**

Table 3.11-4. Number of Greater Sage-Grouse Leks within Specified Distances of the Proposed Route's Centerline (continued)

Segment Number	Segment Length (miles)	Leks within 0.25 mile	Leks within 0.6 mile	Leks within 1 mile	Leks within 2 miles	Leks within 3 miles	Leks within 4 miles	Leks within 11 miles
Unoccupied Leks (i.e., leks that have not been active within the last 5 years in Idaho or the last 10 years in Wyoming)								
1E	100.6	-	1	1	2	3	6	17
1W(a)	76.5	-	-	-	-	-	-	4
1W(c)	70.6	-	-	-	-	-	-	4
2	96.7	-	-	1	2	4	9	21
3	56.5	-	-	-	-	-	1	10
4	203.0	-	-	-	-	-	1	18
5	54.6	-	-	-	-	-	-	-
6	0.5	-	-	-	-	-	-	-
7	118.1	-	-	-	-	1	1	6
8	131.0	-	-	1	1	2	2	2
9	161.7	-	-	-	2	4	5	15
10	33.6	-	-	-	-	1	1	5
Total Proposed[1/]	**1,103.4**	**0**	**1**	**3**	**7**	**13**	**22**	**67**

1/ There is some overlap between the number of leks located along one Segment compared to another (e.g., a lek located 2 miles from the end of Segment 4 may also be located within 2 miles of Segment 5); therefore, the values reported for each Segment separately in this table cannot be summed to get the total number of leks located along the Proposed Route as a whole.

Based on the preliminary analysis (i.e., the results of the HEA are still pending), suitable greater sage-grouse habitat occurs along all segments, and the Proposed Route would cross through approximately 677.3 miles of suitable sage-grouse habitat (see Appendix D, Table D.11-3).

Grizzly Bear (*Threatened; Forest Service Sensitive*)

In July 1975, the grizzly bear (*Ursus arctos horribilis*) was designated as threatened in the conterminous United States under the ESA. Populations of these bears have increased due to protective measures required under the ESA. The Yellowstone Distinct Population Segment (DPS) has increased from estimates as low as 136 individuals (when this population was first listed in 1975) to more than 500 animals as of 2006; population increases have occurred at a rate of 4 to 7 percent annually. Therefore, on March of 2007, the USFWS announced that the grizzly bear's Yellowstone DPS had recovered and subsequently dropped their status as threatened under the ESA. In 2009, Montana District Court Judge Donald W. Molloy ruled that existing regulatory mechanisms outside the ESA were inadequate to protect the grizzly bears, and that the USFWS failed to adequately consider the impacts of global warming and other factors on food sources for the grizzly, before delisting the Yellowstone DPS. Therefore, the Yellowstone DPS has been relisted as a threatened species under the ESA as of March 26, 2010.

Grizzly bears are habitat generalists; however, they are found most often in mountainous habitats, away from human developments. The primary factors that determine the suitability of habitat and the number of bears that the habitat can support is overall habitat productivity, availability of food, and the level and types of human activities present. Food types utilized by the Yellowstone DPS grizzly bears depend on the season of year, and

can range from ungulates, spawning cutthroat trout, seeds of whitebark pine (*Pinus albicaulis*), and army cutworm moths (USFWS 2007a). In fact, impacts to the whitebark pine due to global warming and infestation by pine beetles was one of the primary reasons for Judge Donald W. Molloy's ruling to relist the Yellowstone DPS.

The Primary Conservation Area (PCA) for the grizzly bear was established by the Final Conservation Strategy for the Grizzly Bear in the Greater Yellowstone Area, and the 1993 Grizzly Bear Recovery Plan. The PCA contains the minimum seasonal habitat components necessary to support grizzly bear populations. The PCA encompasses 9,209 square miles (5,893,760 acres) within three states: southern Idaho, southwest Montana, and Northwest Wyoming (USFWS 2007a). In addition, the USFWS has designated the boundaries of the Yellowstone DPS and the acreage of suitable habitat within the DPS (USFWS 2007a).

Yellowstone grizzly bears continue to increase their range and distribution annually, and grizzly bears in the Yellowstone area now occupy habitats that they have been absent from for decades. Approximately 84 to 90 percent of females with cubs occupy the PCA and the remaining females with cubs have expanded beyond the portion of PCA within the DPS boundaries. Grizzly bears now occupy 68 percent of suitable habitats located within the DPS boundaries and may soon occupy the remainder of available suitable habitat (USFWS 2007a).

The Proposed Route along Segments 3 and 4 would pass through approximately 176.2 miles of land within the range of the Yellowstone DPS (the total combined length of Segments 3 and 4 equals approximately 259.5 miles). The Project would cross the Yellowstone DPS along the southernmost edge of the DPS boundary, adjacent to Highway 80, Highway 30, and the town of Kemmerer; however, the Project (Proposed Route and Route Alternatives) would not pass through the PCA or though areas identified by the USFWS as suitable grizzly bear habitats.

In addition to crossing through the Yellowstone DPS, whitebark pine (an important food source for the grizzly bear) occurs in the upper treeline areas along the Segment 4 Proposed Route and Route Alternatives (within the Kemmerer FO), though the full extent of the stands has not yet been mapped (Means 2010a; Guyon 2009). The Project would cross through two known stands of whitebark pine along Segment 4, including one on Commissary Ridge and one on Dempsey Ridge. Commissary Ridge consists of a 250-acre stand, the entire extent of which the Project would cross. The extent of the population on Dempsey Ridge is unknown but is estimated to be over 100 acres (Means 2010b), so it is not possible to determine to what extent the Project would cross this stand. These stands, which are on the range margins of whitebark pine, are the southernmost stands in Wyoming and the southernmost east of the Rocky Mountains. The BLM is currently conducting a whitebark pine and limber pine mapping effort and more detailed information will be incorporated into the Final EIS as it becomes available. In addition, more information regarding the location of whitebark pine in relation to the Project area would be determined during preconstruction surveys and timber cruises. The Agencies have proposed measures to mitigate the potential impacts to whitebark pine (TESPL-1 and TESPL-6).

Idaho Ground Squirrel (Northern – Threatened / Southern – Candidate)

In January 1989, the USFWS determined that the northern Idaho ground squirrel (*Spermophilus brunneus brunneus*) qualified as a category 1 candidate species. In February 1996, the USFWS ceased using category designations and included the northern Idaho ground squirrel as a candidate species. In April 2000, the USFWS listed the northern Idaho ground squirrel as threatened, while the southern Idaho ground squirrel (*Spermophilus brunneus endemicus*) remains listed as a candidate species (65 *Federal Register* 17778-17786).

Research suggests that this ground squirrel prefers native cover such as big sagebrush, bitterbrush, and a variety of native forbs and grasses; however, some nonnative features may enhance their survival, including alfalfa fields, haystacks, and fence lines. Habitat for the northern Idaho ground squirrel occurs at elevations ranging from 3,000 to 5,400 feet, surrounded by forests. Populations are typically associated with shallow rocky soils in xeric meadows surrounded by ponderosa pine and Douglas-fir forests.

Idaho ground squirrels are only found in west-central Idaho within Adams and Valley Counties (USFWS 2003). The southern subspecies of the Idaho ground squirrel is found at lower elevations within hilly areas and grasslands. These areas are often dominated by annual grassland with relict big sagebrush and bunch grasses. Recent surveys indicate that the southern Idaho ground squirrel occurs in about 38 square miles in Idaho extending from Emmett northwest to Weiser and the surrounding area of Squaw Butte, Midvale Hill, and over to the Henley Basin in Gem, Payette, and Washington Counties. Its range is bounded on the south by the Payette River, on the west by the Snake River, and on the northeast by lava flows with little soil. Currently, the distribution of the species is patchy, with areas of localized abundance and large areas of apparently suitable habitat that are unoccupied or sparsely occupied. The areas of localized abundance are typically concentrated around human-altered landscapes such as golf courses and row crop or farmed fields (particularly alfalfa and clover). The Project does not cross either of these species' current distributions.

Interior least tern (*Endangered*)

The interior least tern was listed as endangered on May 28, 1985. Interior least terns breed in isolated areas along the Missouri, Mississippi, Ohio, Red, and Rio Grande River systems. Their winter range is uncertain, but probably includes coastal areas of Central and South America. In the U.S. terns use barren to sparsely vegetated sandbars along rivers, sand and gravel pits, or lake and reservoir shorelines from late April to August. The Project does not cross historical or current distribution for this species; however, they may be found in downstream locations along the Platte River (see discussion of the PRRIP in Section 3.11.1.3).

Mountain Plover (*ESA Proposed*; *Forest Service Sensitive; BLM Sensitive*)

The mountain plover was proposed for listing as a threatened species under the ESA in 1999. On September 2003 the USFWS withdrew the listing after determining that the threats to the species were not as "significant" as earlier believed. Following a lawsuit over this determination, the USFWS overturned their decision effective as of June 30,

2010, and restored the mountain plovers' status as a proposed species. The final determination regarding its status is due in May 2011.

The mountain plover inhabits low, open habitats such as arid shortgrass and mixed grass prairies, xeric shrubland communities, heavily grazed areas, prairie dog colonies, and tilled agricultural fields. Grasslands used are often dominated by blue grama (*Bouteloua gracilis*), buffalo grass (*Buchloe dactyloides*), or western wheat grass (*Agropyron smithii*). Shrubland communities are often dominated by saltbush and sagebrush types. Consistent habitat characteristics are flat topography, short vegetation, and high bare-ground cover. Due to habitat features of short vegetation and bare ground, habitat often occurs in areas of disturbance such as fire, heavy grazing, presence of burrowing animals, or anthropogenic factors. Surface water or wet soils are rarely found in the vicinity of nesting plovers.

The mountain plover does not occur in Idaho. In Wyoming, suitable habitat is abundant, and this species occurs and breeds throughout most of the state. Suitable habitat for the mountain plover was mapped where the species' range occurs within the Analysis Area (as described in Section 3.11.1.4). Habitat for the mountain plover exists within Segments 1E, 1W(a), 1W(c), 2, 3, and 4. Out of the total combined length of 603.9 miles for Segments 1E, 1W(a), 1W(c), 2, 3, and 4, the Proposed Route would cross approximately 350.4 miles of suitable mountain plover habitat (Table D.11-3 in Appendix D).

Northern Leopard Frog (*ESA Proposed; Forest Service Sensitive; BLM Sensitive*)

The northern leopard frog is currently being evaluated by the USFWS to determine if the species requires protection under the ESA throughout its 19 western states range. The listing was petitioned in June 2006.

The northern leopard frog has been found in the northern portion of the United States, from the New England states to Washington and Oregon. It has also been observed in the Rocky Mountain states as far south as New Mexico, Utah, Nevada, and northern Arizona. The northern leopard frog's habitat consists of swampy, cattail marshes on the plains, beaver ponds in the foothills, and the cool, moist montane zones near timberlines up to 11,000 feet in elevation. The northern leopard frog is common throughout most of Wyoming.

While leopard frogs were once very common, their populations are currently undergoing a decline. No single factor has been identified as the cause for the reduction in leopard frog populations, but there are several contributing factors such as disease (i.e., red-leg, chytrid), introduced species (i.e., bullfrogs, fish, crayfish), use of toxic chemicals (i.e., atrazine, rotenone), and habitat loss/alteration/fragmentation. Habitat changes and other factors may be adversely affecting this species, but lack of data precludes identification of specific problems and development of management recommendations. Population status, distribution, and habitat data for areas near the Project Area are lacking for this species (WGFD no date). Northern leopard frogs are apparently extirpated from the Targhee NF of western Wyoming and adjacent Idaho (Koch and Peterson 1995). Northern leopard frogs are severely reduced in the Laramie Basin of Wyoming but may still be common in other parts of the state (WGFD no date).

Suitable habitat for the northern leopard frog was mapped where the species range overlaps the Analysis Area (as described in Section 3.11.1.4). All segments could provide habitat for the northern leopard frog. The Project would cross a combined total of 17.0 miles of northern leopard frog habitat (Table D.11-3 in Appendix D).

Piping Plover (*Threatened*)

The piping plover was federally listed as threatened, except in the Great Lakes watershed where it was listed as endangered, in 1986. Its range during the breeding season includes south-central Canada, northeastern Montana, North and South Dakota, and Nebraska (Elliott-Smith and Haig 2004). There is no designated critical habitat for piping plovers near the Analysis Area; the nearest critical habitat is located over 100 miles away, in eastern Montana (67 *Federal Register* 57638).

Breeding habitat for this species is wide, sparsely vegetated, open sandy beaches at alkali lakes, reservoirs, rivers, and, less commonly, freshwater lakes, dry alkali lakes, and sandpits (Elliott-Smith and Haig 2004). The piping plover's diet is made up of freshwater and marine invertebrates washed up on shore and benthic invertebrates (Elliott-Smith and Haig 2004). Threats to piping plovers include human disturbance, development of beaches, increases in mammalian and avian predators in response to disturbance, and changes in hydrology (Elliott-Smith and Haig 2004). The Project does not cross historical or current distribution for this species; however, the piping plover may be found in downstream locations along the Platte River (see discussion of the PRRIP in Section 3.11.1.3).

Whooping Crane (*Endangered*)

Whooping cranes were listed as endangered in 1970, with critical habitat designated in 1978. There are approximately 340 birds living in the wild, with the only self-sustaining population nesting in the Northwest Territories of Canada and wintering along the Gulf of Mexico at Aransas NWR in Texas (CWS and USFWS 2005). Collisions of cranes with powerlines contribute substantially to whooping crane mortality during migration; however, this population does not migrate through or stop over in the Analysis Area (CWS and USFWS 2005). Some birds and eggs were introduced at Grays Lake NWR in Idaho in an attempt to establish an additional, separate population, but this did not succeed and as of 2002 there are no birds at this location (CWS and USFWS 2005). The Project does not cross historical or current distribution for this species; however, whooping cranes may be found in downstream locations along the Platte River (see discussion of the PRRIP in Section 3.11.1.3).

Wyoming Toad (*Endangered*)

The Wyoming toad (*Bufo baxteri*) was listed by the USFWS as endangered in 1984 (73 *Federal Register* 58261-58262). The toad was believed to have gone extinct in 1987, although toads were later found at Mortenson Lake southwest of Laramie. Reintroduction attempts have occurred within Albany County, Wyoming. The toad was historically found only in the Laramie Basin within 30 miles of Laramie, Wyoming. By the early 1990s, a captured breeding program was commenced in an attempt to save the endangered toad from extinction, but no known wild reproduction has occurred since 1991. This species formerly inhabited floodplains, ponds, and small seepage

lakes in the shortgrass communities of the Laramie Basin. The Project does not cross historical or current distribution for this species.

Yellow-Billed Cuckoo (*Candidate; Forest Service Sensitive; BLM Sensitive*)

In February 1998, the USFWS received a petition to list the western yellow-billed cuckoo under the ESA. In July 2001, the USFWS determined that the yellow-billed cuckoo qualified as a candidate species in the western continental United States under the ESA. It is considered a BLM sensitive species east of the continental divide. The threats currently facing the yellow-billed cuckoo include habitat loss, cattle grazing, and pesticide application.

Yellow-billed cuckoos breed in large blocks of riparian habitats. In Idaho, Wyoming, and most of the west, this usually consists of mature or late successional cottonwood stands with a dense understory of willow (*Salix* spp.) or dogwood (*Cornus* spp.). Dense understory foliage is important in nest site selection, whereas cottonwood trees (*Populus* spp.) are important for foraging. Nesting pairs require a minimum of approximately 5 acres of prime riparian habitat (Reynolds and Hinckley 2005).

In Idaho, historical records of yellow-billed cuckoos include the Snake River valley in the southeastern and southwestern portion of the state; however, recent observations (2003 to 2005) were restricted to the southeastern portion of the state only (Reynolds and Hinckley 2005). Suitable habitat along the Snake River in southeastern Idaho occurs sporadically from American Falls Reservoir, upstream to Palisades Dam, and from the confluence of the Henry's Fork and the South Fork of the Snake River upstream to St. Anthony (Reynolds and Hinckley 2005; USFWS 2007b). Habitat is also limited in Wyoming, occurring mainly along the Bighorn, Powder, Laramie, Cheyenne, and North Platte River drainages (Bennet and Keinath 2001).

Suitable habitat for the yellow-billed cuckoo was mapped where the species range overlaps the Analysis Area (as described in Section 3.11.1.4). Habitat for the yellow-billed cuckoo would be crossed by the centerline of the Proposed Route within Segments 1W(a), 5, and 8. Out of the total combined length of 262.1 miles for Segments 1W(a), 5, and 8, the Proposed Route would cross less than 0.1 mile of suitable yellow-billed cuckoo habitat (see Table D.11-3 in Appendix D).

Threatened, Endangered, Proposed, or Candidate Invertebrate Species under the ESA

Five invertebrate species listed under the ESA and one recently delisted invertebrate species are present within the Analysis Area. For the most part the distribution of these species is limited to aquatic habitats within the Snake and Bruneau River Systems. Most of these invertebrate species have been impacted due to the past and current exploration and development of the Snake River ecosystem, which has transformed these river systems from free-flowing cold-water systems to more slow-moving warmer systems.

Banbury Springs Limpet (*Endangered*)

The Banbury Springs limpet (*Lanx* spp.*)* was listed as endangered under the ESA in January 1992. This species requires cold, clear, well-oxygenated water with swift

currents. The Banbury Springs limpet is found on smooth basalt, boulders, or cobble-sized grounds ranging from 2 to 20 inches deep, but it avoids areas with green algae. Currently, this species is only known to exist at four cold-spring locations that are isolated from each other: Thousand Springs, Box Canyon Springs, Briggs Springs, and Banbury Springs (USFWS 1995).

The 1995 recovery plan for the Banbury Springs limpet designated river mile (RM) 584.8 to 589.3 of the Snake River as a recovery area for this species (USFWS 1995). The recovery area is located within the Analysis Area; however, the transmission line would not cross this species recovery area (including the Project's Proposed Route and Route Alternatives). In addition, there are no current plans to cross this area with access roads.

Bliss Rapids Snail (*Threatened*)

The Bliss Rapids snail (*Taylorconcha serpenticola*) was listed as endangered under the ESA in January 1992. The USFWS announced on June 6, 2007, that they had determined that a petition to delist the species may be warranted and that they would conduct a status review of the Bliss Rapids snail. This species resides on the sides and undersides of rocks in free-flowing and cold-water springs in the middle Snake River, in Idaho. It prefers relatively clean and rocky substrates, where it grazes on algae and diatoms at night. Current distribution of this snail within the Snake River consists of disjointed populations located primarily within the Hagerman reach and the tailwaters of the Bliss and Lower Salmon Dams (USFWS 1995).

The 1995 recovery plan for the Bliss Rapids snail designated RM 547 to 585 of the Snake River as a recovery area for this species (USFWS 1995). The transmission line would span this species recovery area along Segment 8 (Proposed Route), as well as Alternative 8A (at RM 573.5). The habitat adjacent to this spanning consists of forested riparian habitat. There are no current plans to cross this species recovery area with access roads.

Bruneau Hot Springsnail (*Endangered*)

The Bruneau hot springsnail (*Pyrgulopsis bruneauensis*) was listed as endangered under the ESA in January 1993. The USFWS was ordered to reconsider its determination by the courts, and reconfirmed this species endangered status in June 1998.

The Bruneau hot springsnail occurs in thermal springs along an approximately 5-mile reach of the Bruneau River and in Hot Creek. The Bruneau hot springsnail inhabits small, geothermal spring runs and seeps, typically on basalt bedrock. Temperatures in these waters range from 15.7 to 36.9 degrees Celsius. Substrates usually comprise gravel and silt but individuals are also found on sand, mud, and algal film. Macrophytes are usually absent from occupied habitat.

A recovery plan was finalized in December 2003. This recovery plan defines the recovery area for the Bruneau hot springsnail as the portion of the Bruneau River between the southern boundary of Section 12, Township 8 South, Range 6 East and the northern boundary of Section 35, Township 7 South, Range 6 East, of Owyhee County, Idaho (Myler et al. 2007). This species recovery area is found within the Analysis Area;

however, the transmission line would not cross this species recovery area (the Proposed Route or Route Alternatives). In addition, there are no current plans to cross this area with access roads.

Jackson Lake Springsnail (*formerly the Idaho Springsnail; Delisted*)

The Jackson Lake springsnail was listed as endangered under the ESA in 1992. Due to genetic studies, this species has been grouped with a new species (*Pyrgulopsis robusta*), which is distributed within Idaho, Oregon, Washington, and Wyoming. Due to the new evidence that this species (as grouped) has a wider distribution than previously known, the Jackson Lake springsnail was delisted in September 2007.

The Jackson Lake springsnail is found in the middle Snake River, Idaho. It occupies various substrates in lake and river habitats of the middle Snake River, where it feeds on diatoms. It is primarily found within the free-flowing mainstem of the Snake River, between the headwaters of the C.J. Strike Reservoir to Bancroft Springs (USFWS 1995).

The 1995 recovery plan for the Jackson Lake springsnail designated RM 518 to 553 of the Snake River as a recovery area for this species (USFWS 1995). The transmission line would span this species recovery area along Segment 8 of the Proposed Route, as well as Alternative 8A (at RM 541.5). The habitat adjacent to this spanning consists of a mixture of shrublands and irrigated farmlands. There are no current plans to cross this species recovery area with access roads.

Snake River Physa Snail (*Endangered*)

The Snake River physa snail (*Haitia {Physa} natricina*) was listed as endangered under the ESA in January 1992. The Snake River physa snail is found within the mainstem of the middle Snake River of southern Idaho. It is believed to be confined to the Snake River, inhabiting areas of swift current on the undersides of large cobbles and boulder-sized rocks. Individuals have been found in relatively undisturbed areas with gravel, boulder, or cobble substrates and a low percentage of epiphytic algae or macrophytes. Within the Snake River system, current populations are suspected to occur within the Hagerman and King reaches, as well as the area immediately downstream of the Minidoka Dam (USFWS 1995).

The 1995 recovery plan for the Snake River physa designated RM 553 to 675 of the Snake River as a recovery area for this species (USFWS 1995). The transmission line would span this species recovery area in multiple places: along Segment 8 (Proposed Route) and Alternative 8A at RM 573.5, and along Segment 10 (Proposed Route) at RM 624.0. The transmission line spanning that would occur along Segment 8 and 8A would be adjacent to forested riparian habitat. The spanning that would occur along Segment 10 would be adjacent to sagebrush habitat. There are no current plans to cross this species recovery area with access roads.

Utah Valvata Snail (*Endangered*)

The Utah valvata snail (*Valvata utahensis*) was listed as endangered under the ESA in December 1992. In July 2009, the USFWS announced a 12-month finding to delist the Utah valvata snail, based on current findings that this species is more widespread and

occurs in a greater variety of habitats within the Snake River than known at the time of 1992 listing.

This species is found primarily in the Snake River of Idaho, and prefers habitats which contain small pebbles, gravels, cobbles embedded in silt, and submerged aquatic vegetation but is found predominantly in silt substrates. The Utah valvata snail is known to range in the Snake River from RM 582 to the confluence of the South Fork and Henrys Fork, Snake River (RM 837). The species is also known from portions of Box Canyon Creek and the Big Wood River in southern Idaho. It can be found in both free-flowing river mainstems and cold-water springs (USFWS 1995).

The 1995 recovery plan for the Utah valvata snail designated RM 572 to 709 of the Snake River as a recovery area for this species (USFWS 1995). The transmission line would span this species recovery area in multiple places; along Segment 8 and Alternative 8A at RM 573.5, and along Segment 10 at RM 624.0. The transmission line spanning that would occur along Segment 8 and 8A would be adjacent to forested riparian habitat. The spanning that would occur along Segment 10 would be adjacent to sagebrush habitat. There are no current plans to cross this species recovery area with access roads.

Threatened, Endangered, Proposed, or Candidate Fish Species under the ESA

A total of five fish species listed under the ESA are present in downstream areas outside of Analysis Area. The ESA species present in downstream areas outside of Analysis Area include four fish species found in the Colorado River system and one in the Platte River system. In addition, ESA listed critical habitat for the bull trout is located within the Analysis Area, and would be crossed by the Project.

Colorado Pikeminnow (*Endangered*)

The Colorado pikeminnow (formerly Colorado squawfish) was listed under the Preservation Act of 1966, and has since become listed as endangered by the USFWS under the ESA. This fish is the largest minnow in North America and one of the largest in the world. Colorado pikeminnow occur in the warm, swift waters of the big rivers of the Colorado Basin. Adults are migratory and inhabit pools and eddies just outside the main current. Young can be found in backwater areas. Colorado pikeminnow are adapted to rivers with seasonally variable flow, high silt loads, and turbulence. These fish can tolerate a broad range of temperatures from 35°C in the summer to lower than 10°C in winter. Historically, this species was found in the Colorado River and major tributaries in Arizona, New Mexico, Utah, Colorado, and Wyoming. Populations also exist in the Colorado, Green, Yampa, Gunnison, and San Juan Rivers, tributaries of the Colorado River (SJRB 2010). The Project does not cross the current distribution of this species; however, they may be found in downstream locations along the Colorado River (see discussion of the Upper Colorado Endangered Fish Recovery Program in Section 3.11.1.3).

Razorback Sucker (*Endangered*)

The razorback sucker was listed as endangered by the USFWS on October 23, 1991. The razorback sucker occurs in medium to large rivers with swift turbulent waters, as well as slow backwater areas where it feeds on benthic fauna and flora, detritus, and

plankton. This fish was historically found throughout the Colorado River Basin. Most wild fish are now found in Lake Mohave, which represents the largest population within the lower basin. A few adults have also been found in Lake Mead and Lake Havasu. In the upper basin, they can be found in un-impounded waters of the Green, Yampa, and mainstem of the Colorado (SJRB 2010). Although adults reproduce in reservoirs, young do not survive due to a lack of suitable food items and predation by nonnative fishes. The Project does not cross the current distribution of this species; however, they may be found in downstream locations along the Colorado River (see discussion of the Upper Colorado Endangered Fish Recovery Program in Section 3.11.1.3).

Humpback Chub (*Endangered*)

The humpback chub was listed as endangered by the USFWS on March 3, 1967. The humpback chub have been associated with a variety of habitats ranging from pools with turbulent to little or no current; substrates of silt, sand, boulder, or bedrock; and depth ranging from about 3.3 feet (1 meter) to as deep as 49 feet (15 meters). The historical distribution of the humpback chub includes portions of the mainstem Colorado River and four of its tributaries: the Green, Yampa, White, and Little Colorado Rivers. Currently, there are two populations near the Colorado/Utah border, one at Westwater Canyon in Utah and one in an area called Black Rocks, in Colorado. Smaller numbers have been found in the Yampa and Green Rivers in Dinosaur National Monument, Desolation and Gray Canyons on the Green River in Utah, Cataract Canyon on the Colorado River in Utah and the Colorado River in Arizona (USFWS 2010b). The Project does not cross the current distribution of this species; however, they may be found in downstream locations along the Colorado River (see discussion of the Upper Colorado Endangered Fish Recovery Program in Section 3.11.1.3).

Bonytail Chub (*Endangered*)

Bonytail chub were listed as endangered by the USFWS in 1980. Bonytail chub are considered mainstream river species, preferring pools and eddies of warm, often heavily silted, swift moving rivers. However, they do occur in reservoir habitats as well. These fish were once common in portions of the upper and lower Colorado River basins. Now the bonytail chub is the rarest of the endangered fish species in the Colorado River basin. Recent surveys indicate that it is presently found only in Lake Mohave along the Arizona and Nevada border (USFWS 2010c). The Project does not cross the current distribution of this species; however, they may be found in downstream locations along the Colorado River (see discussion of the Upper Colorado Endangered Fish Recovery Program in Section 3.11.1.3).

Pallid Sturgeon (*Endangered*)

The Pallid sturgeon was listed as endangered by the USFWS on September 6, 1990. Their preferred habitat has a diversity of depths and velocities formed by braided channels, sand bars, sand flats and gravel bars. The largest remaining populations of pallid sturgeon appear to be in the upper Missouri River above Ft. Peck Reservoir in Montana; in the Missouri and Yellowstone Rivers above Garrison Reservoir in North Dakota and Montana, respectively; in the Mississippi River below St. Louis, Missouri to the Old River Control Structure in Louisiana; and below the Old River Control Structure in the Atchafalaya and Red Rivers of Louisiana (USFWS 2001). The Project does not

cross historical or current distribution for this species; however, they may be found in downstream locations along the Platte River (see discussion of the PRRIP in Section 3.11.1.3).

Bull Trout (*ESA Critical Habitat*)

On January 14, 2010, the USFWS proposed revising the designation of critical habitat for the bull trout. In total, approximately 22,679 miles of streams and 533,426 acres of reservoirs or lakes were proposed for the revised critical habitat designation within Washington, Oregon, Nevada, Idaho, and Montana. On October 18, 2010, the USFWS made a determination regarding this proposed critical habitat (effective on November 17, 2010), and designated a total of 19,729 miles of streams and a total of about 488,252 acres of reservoirs or lakes as critical habitat for the bull trout. The transmission line would span a portion of this newly designated critical habitat along Alternative 9E (near Node 9n); however, no road crossings would occur across bull trout critical habitat. The transmission line crossing would occur once along the Bruneau River, located approximately 10 miles south of where this river joins C.J. Strike Reservoir. Vegetation adjacent to the crossing was defined as “Wetland and Riparian” during Project-specific remote sensing, with adjacent areas defined as “Disturbed Sagebrush” (Tetra Tech 2010).

BLM and Forest Service Sensitive Species

The Regional Foresters sensitive species list includes plant and animal species for which population viability is a concern on lands managed by the Forest Service. BLM sensitive species, per BLM Manual 6840, are managed under the special status species policy, which is to conserve BLM listed species and their ecosystems, and to ensure that actions taken by the BLM are consistent with the conservation of special status species and do not contribute to the listing of any species under the ESA. Species lists for the NFs and BLM FOs crossed by the Project were consulted to determine which species should be analyzed.

The habitat requirements and pertinent life history traits of all BLM and Forest Service sensitive species with the potential to occur near the Analysis Area are discussed in Table D.11-2 and Table D.11-1 of Appendix D. Table D.11-2 is limited to non-ESA species, while Table D.11-1 includes sensitive species that are also listed as threatened or endangered under the ESA, or those that are candidates or proposed for listing (e.g., greater sage-grouse, gray wolf, yellow-billed cuckoo, Columbia spotted frog).

Most of the BLM and Forest Service sensitive species that could potentially occur within the Analysis Area (see Tables D.11-1 and D.11-2 of Appendix D) will be addressed by grouping them based on their habitat requirements or life history traits. It is reasonable to lump these species because quantitative data for each species are not available, habitat requirements are similar for each group, and the potential impacts that could occur are similar (see impact discussion in Section 3.11.2); therefore, a group discussion will accurately capture potential impacts for most of these species, while reducing redundancy in the impact analysis. However, some of the BLM and Forest Service sensitive species will be addressed individually due to increased concern regarding the effects of potential impacts, or when quantitative data (in the form of known occurrences or Project-specific habitat modeling) are available. Of the BLM and

Forest Service sensitive species that could potentially occur within the Analysis Area (Tables D.11-1 and D.11-2 of Appendix D), a detailed discussion and individual analysis of potential impacts (impacts are discussed in Section 3.11.2) is limited to five species of mammals, and three species of birds, while the remaining species are discussed by habitat grouping. Note that some of the BLM and Forest Service sensitive species are discussed within the preceding ESA section, due to their additional status as threatened, endangered, proposed, or candidate species under the ESA.

BLM and Forest Service Sensitive Wildlife Species

Bald Eagle (*Forest Service Sensitive; BLM Sensitive)*

In 1963, the lower 48 states were home to barely 400 nesting pairs of bald eagles. After decades of conservation effort, the populations have recovered to approximately 10,000 nesting pairs, a 25-fold increase in the last 40 years. The bald eagle was officially declared recovered and removed from the threatened and endangered species list in June 2007. As of April 2007, the USFWS documented 216 bald eagle territories within Idaho, 95 within Wyoming, and 2 in Nevada. Bald eagles continue to be protected by the Eagle Act and the MBTA; both federal laws prohibit “taking” – killing, selling, disturbing, or otherwise harming eagles, their nests, or eggs (see Section 3.10 – General Wildlife and Fish).

Bald eagles are strongly associated with aquatic environments and often occupy riparian or lacustrine areas (i.e., rivers and lakes). Nesting and roosting occur in large trees or snags with open crowns that are typically found within 2 miles of a large, permanent waterbody. Bald eagles are opportunistic feeders, which feed on a wide variety of prey. Fish are most commonly taken, but mammals, reptiles, amphibians, and birds can also serve as prey, and carrion is frequently used during the winter.

As forested areas are limited in the general region crossed by the Project, the Analysis Area provides only limited nesting habitat for the bald eagle; however, it does contain some nesting and overwintering habitat along Segments 1E, 1W(a), 1W(c), 5, and 10 (as well as some of the Route Alternatives along Segments 8 and 9). Out of the total combined length of 335.8 miles for Segments 1E, 1W(a), 1W(c), 5, and 10, the Proposed Route would cross approximately 11.5 miles of potential bald eagle overwintering habitat (Table D.11-4 in Appendix D). In addition, there is a single active bald eagle nest located within 1 mile of Segment 1W(c), one along Segment 4, and two nests along Segment 5 (Table D.10-2 in Appendix D). The Proposed Route would cross 5.5 miles of habitat located within 1 mile of active bald eagle nests (Table D.11-4 in Appendix D).

Black-Tailed Prairie Dog (*Forest Service Sensitive; BLM Sensitive*)

In 2000, the USFWS listed the black-tailed prairie dog on the candidate list of threatened and endangered species. This species was later removed from this list in August 2004 after an updated evaluation of the best available scientific information led the USFWS to determine that the black-tailed prairie dog was not likely to become an endangered species within the foreseeable future. Then on December 2, 2008, the USFWS announced a 90-day finding on a petition to list the black-tailed prairie dog as threatened or endangered under the ESA (73 *Federal Register* 10514-10560). The USFWS stated that the petition presents substantial scientific or commercial information

indicating that listing the black-tailed prairie dog may be warranted. Therefore, a status review was initiated to determine if this species warranted listing. However, on December 3, 2009, the USFWS announced that listing the black-tailed prairie dog as either threatened or endangered is not warranted at this time (74 *Federal Register* 63343-63366).

The black-tailed prairie dog lives in burrows within dry prairies that contain short grass. The burrow entrance leads to a tunnel that goes down about 3 to 10 feet and then straightens out to a horizontal tunnel that runs about 10 to 15 feet. The black-tailed prairie dog is considered a keystone species for grassland habitats. The black-footed ferret, swift fox (*Vulpes velox*), golden eagle (*Aquila chrysaetos*), and ferruginous hawk utilize prairie dogs as a food source; while the mountain plover and burrowing owl depend on burrow habitats created by prairie dogs. Numerous other species share habitat with prairie dogs, and rely on them to varying degrees (73 *Federal Register* 73211-73219).

Historically, black-tailed prairie dogs generally occurred in large colonies that often contained thousands of individuals, covered hundreds or thousands of acres, and extended for many miles (73 *Federal Register* 73211-73219). Currently, most colonies are much smaller. Colonial behavior can increase the transmission of disease that can impact their populations (73 *Federal Register* 73211-73219). Sylvatic plague is a disease that can spread from prairie dog to prairie dog through the exchange of infected fleas or by contact between infected mammals. Black-tailed prairie dogs can be very susceptible to the sylvatic plague, and this disease has been a factor in the reduction of prairie dog abundance.

Wyoming historically had about 16,000,000 acres of black-tailed prairie dog habitat; however, current estimates indicate that there are only 229,607 acres of suitable prairie dog habitat remaining in Wyoming (73 *Federal Register* 73211-73219). As described in Section 3.11.1.4, the suspected locations of black-tailed prairie dog colonies/complexes were mapped with the use of aerial photography (Tetra Tech 2009b; Figure E.11-4, Appendix E). Black-tailed prairie dog colonies/complexes occur along Segments 1E, 1W(a), and 1W(c). Out of the total combined length of 247.6 miles for Segments 1E, 1W(a), and 1W(c), the Proposed Route would cross approximately 59.6 miles of suspected black-tailed prairie dog colonies and complexes (Table D.11-4 in Appendix D, Figure E.11-4).

Burrowing Owl (*Forest Service Sensitive; BLM Sensitive*)

Burrowing owls occur in a wide variety of arid and semiarid environments. They occur in areas with well-drained soils, level to gentle slopes, and short vegetation with a high percentage of bare ground, which allows for visibility of predator and prey species. They prefer open prairie, grassland, desert, and shrub-steppe habitats, and may also inhabit agricultural areas, overgrazed pastures, golf courses, and airfields. Given their reliance on short vegetation, they are commonly found in association with high-intensity grazers, such as domestic livestock, prairie dogs, and ground squirrels.

Burrowing owls do not dig their own burrows. Instead, they use the burrows of other animals such as badgers (*Taxidea taxus*), prairie dogs, ground squirrels, marmots

(*Marmota* spp.), and coyotes (*Canis latrans*), and are therefore associated with the presence of these burrowing species. The density of burrows is important as some burrows are used for nesting, while others (classified as "satellite" burrows) are used as cover for juvenile and adult owls, prey cache sites, and roosts from which the male may guard the nest burrow. They often nest in burrows near active prairie dog towns. A unique behavior of burrowing owls is that males often line nest burrows with dried manure from cows, horses (*Equus caballus*), or bison (*Bos bison*), which is believed to attract high-calorie prey to the female and nestlings without risk or energy expenditure.

The burrowing owl home range often contains a mosaic of short vegetation for nesting habitat interspersed within taller vegetation for hunting. Tall vegetation may provide the cover necessary to host large populations of rodents, which are then susceptible to predation as they traverse open areas in the mosaic. Very low vegetation and sites with exposed soils are habitat for grasshoppers, which is another important prey item for burrowing owls.

In Idaho, burrowing owls are patchily distributed throughout the southern half of the state. In Wyoming, they occur and breed throughout most of the state with highest concentrations in the south and east. They can be found throughout most of Nevada, with the exception of the most southern portion of this state. Suitable habitat for the burrowing owl was mapped where the species range overlaps the Analysis Area (as described in Section 3.11.1.4). Habitat for the burrowing owl exists within all segments. The Proposed Route would cross approximately 737.6 miles of suitable habitat (Table D.11-4 in Appendix D). Table D.10-2, in Appendix D, lists the number of active burrowing owl nests that would be located along various portions of the Proposed Route..

Columbian Sharp-Tailed Grouse (*MIS; Forest Service Sensitive; BLM Sensitive*)

The Columbian sharp-tailed grouse occurs in grasslands, sagebrush-grassland, meadow-steppe, mountain shrub, agricultural fields and riparian habitats. Vegetation types include communities of sagebrush-bunchgrass, serviceberry (*Amelanchier alnifolia*), snowberry (*Symphoricarpos albus*), chokecherry (*Prunus virginiana*), Gambel oak (*Quercus gambelii*), and willow riparian habitats. Breeding habitat is dominated by relatively dense herbaceous cover and shrubs, with the majority of nesting and brood activities occurring within 2 miles of leks (UDNR 2002; Meints 1991). Brood rearing habitat contains a mosaic of dense shrubs and grasses with rich forbs and insect foods. Winter habitat consists of riparian areas or deciduous trees and shrubs for feeding, roosting, and escape cover. Spring/summer home range includes breeding, nesting, and brood rearing habitat usually within a several mile-wide area.

In Idaho, Columbian sharp-tailed grouse occur mainly in the southeastern portion of the state with smaller areas in south–central Idaho along the Nevada border and in an isolated portion of western Idaho. There is also a robust population south of Grace, Idaho, on the west end of Segment 4. In Wyoming, the species occurs in a small area in the south-central portion of the state; however, the WGFD have stated the Project would not impact this species within Wyoming (Fry 2009).

Suitable habitat for the Columbian sharp-tailed grouse was mapped where the species range overlaps the Analysis Area (as described in Section 3.11.1.4). Habitat for the Columbian sharp-tailed grouse exists within Segments 4, 5, 6, 7, and 9. Out of the total combined length of 537.9 miles for Segments 4, 5, 6, 7, and 9, the Proposed Route would cross approximately 190.6 miles of suitable habitat (Table D.11-4 in Appendix D).

The Proposed Route would pass within 0.6 mile of 4 Columbian sharp-tailed grouse leks that are either occupied or have an undetermined lek status (Table 3.11-5; also see Table D.11-10 in Appendix D, which lists this same information but includes Route Alternatives as well). This value increases to 32 leks when considering a distance of 2 miles from the Proposed Route. The term "occupied" is defined differently by the IDFG and WGFD. In Idaho, the IDFG define occupied leks as any lek that has been active during at least 1 breeding season within the prior 5 years; in Wyoming the WGFD define occupied leks as those that have been visited by males within the last 10 years. For the sake of this analysis, all leks in Nevada will be considered as occupied due to the limited length that Alternative 7I would cross this state.

Table 3.11-5. Number of Columbian Sharp-Tailed Grouse Leks within Specified Distances of the Proposed Route's Centerline

Segment Number	Segment Length (miles)	Leks within 0.25 mile	Leks within 0.6 mile	Leks within 2 miles
Occupied Leks				
4	203.0	0	1	9
5	54.6	0	1	4
7	118.1	0	2	10
Leks with Undetermined Activity Status				
4	203.0	0	0	4
5	54.6	0	0	1
7	118.1	0	0	4
Unoccupied Leks (i.e., leks that have not been active within the last 5 years in Idaho or the last 10 years in Wyoming)				
4	203.0	0	0	2
5	54.6	0	0	3
7	118.1	0	0	4

Preble's Meadow Jumping Mouse (*Forest Service Sensitive; BLM Sensitive*)

On May 13, 1998, the USFWS designated the Preble's meadow jumping mouse (*Zapus hudonius preblei*) as threatened in its entire range; and on June 23, 2003, critical habitat for this species was designated. On February 2, 2005, the USFWS issued a 12-Month finding on a petition to delist the Preble's meadow jumping mouse and proposed to remove the mouse from the federal list of threatened and endangered species. On July 10, 2008, the USFWS removed ESA protections for Preble's meadow jumping mouse populations, delisted their critical habitat in Wyoming, and amended the listing for the mouse to indicate that the subspecies remains protected as a threatened species in the Colorado portion of its range (USFWS 2008c).

Preble's meadow jumping mouse habitat consists of dense, well-developed wetland and riparian areas and the adjoining uplands, with the uplands containing undisturbed shrub cover. Although they typically inhabit stream-side areas, this species has been

observed to hibernate, forage, and escape flooding by entering adjacent upland areas. Hibernation occurs underground or beneath logs or other similar shelters. Studies show that the Preble's meadow jumping mouse is capable of traveling more than 0.5 mile in a single night.

The Preble's meadow jumping mouse is suspected to occur in wetland and riparian areas found within the far eastern portion of the Analysis Area (WGFD no date; Keinath 2001). For the sake of this analysis, habitat for this species is considered to be all wetland and riparian areas within the eastern portion of the Wyoming segments (i.e., Segments 1E, 1W, and 2). Out of the total combined length of 344.3 miles for Segments 1E, 1W(a), 1W(c), and 2, the Proposed Route would cross approximately 6.3 miles of jumping mouse habitat. The closest known occurrence of a Preble's meadow jumping mouse near the Analysis Area was one female from 1991 that was located approximately 1.5 miles southwest of Segment 1E; however, it is not a confirmed record (WYNDD 2008).

Pygmy Rabbit (*Forest Service Sensitive; BLM Sensitive*)

In January 2008, the USFWS announced a 90-day finding on a petition to list the pygmy rabbit as threatened or endangered under the ESA. On October 1, 2010, the USFWS concluded that the pygmy rabbit does not warrant protection under ESA in California, Nevada, Oregon, Idaho, Utah, Wyoming, or Montana.

The pygmy rabbit occurs within the Great Basin region, including southern Idaho and Nevada (NatureServe 2009), where it is limited to the high plains between 4,900 and 7,900 feet in elevation (Roberts 2003). The pygmy rabbit is a sagebrush obligate species that is closely associated with large, dense stands of big sagebrush that grow in deep loose soils. They are found in alluvial fans, swales in a rolling landscape, large flat valleys, at the foot of mountains, along creek and drainage bottoms, or other landscape features where soil may have accumulated to greater depths. They are generally found on flatter ground, but can occur in areas with moderate slopes. During winter, pygmy rabbits in southwestern Wyoming selectively use dense and structurally diverse stands of sagebrush that accumulated a relatively large amount of snow. These sub-snow environments provide access to a relatively constant supply of food and protection from predators and thermal extremes.

The pygmy rabbit digs its own burrows, although it will sometimes occupy holes in rock crevices or burrows made by other animals. Pygmy rabbit burrows typically have three or more entrances, and are occupied by a single rabbit. Rabbits travel through extensive runways that interlace through the sagebrush thickets. Male home range size is usually 20.2 hectares or smaller, and female home ranges are smaller than males. The pygmy rabbit is most active during twilight hours, but they can be active at any time.

Pygmy rabbits occur in stands of tall, dense sagebrush with deep sandy soils. Various subspecies of sagebrush are used, including Wyoming (*Artemisia tridentata wyomingensis*), mountain (*A. t. vaseyana*), and Great Basin (*A. t. tridentata*). Other shrub species may be co-dominant or present, including bitterbrush (*Purshia tridentata*), rabbitbrush (*Chrysothamnus* spp.), greasewood (*Sarcobatus vermiculatus*), winterfat (*Eurotia lanata*), and juniper (*Juniperus* spp.). However, sagebrush comprises the

majority of their diet throughout the year. Pygmy rabbits occur in shrub stands with a tall dense canopy and a similarly dense understory, selecting for heavy vertical structure. The absolute cover and height of sagebrush varies by locality, but in virtually all cases, they occur in stands with the greatest relative cover and height compared to the surrounding area. Pygmy rabbits may occupy and develop burrows in "mima mounds" (mounds of soil several feet high and approximately 20 to 30 feet in diameter) with taller and denser sage, which are dotted in a landscape of shorter and thinner shrubs, with harder soils. On 1:24,000 aerial photos these mounds can be seen as a pattern of darker dots, extending over many miles of landscape; and from the ground, the mounds appear as lenses of darker taller sage. In southwest Idaho in the mahogany (*Cercocarpus ledifolius*) savannah, the mounding of the soil is present but not as clear. A dotted pattern is not always visible on 1:24,000 aerial photographs, although careful examination can show subtle and dim dotting. In southwest Idaho, another habitat is areas where low sage (*Artemisia arbuscula*) and big sage intermingle, where the big sage may form islands within the low sage matrix.

Suitable habitat for the pygmy rabbit was mapped where the species range overlaps the Analysis Area (as described in Section 3.11.1.4). Habitat for the pygmy rabbit exists within all segments except for Segments1E, 1W(a), and 1W(c). The Proposed Route would cross 486.4 miles of suitable pygmy rabbit habitat (Table D.11-4 in Appendix D).

White-Tailed Prairie Dog (*Forest Service Sensitive; BLM Sensitive*)

In May of 2008, the USFWS concluded that a 12-month status review for the white-tailed prairie dog was necessary. The status review would include analysis of whether the white-tailed prairie dog warrants listing as threatened or endangered under the ESA. On June 1, 2010, the USFWS completed its status review of the white-tailed prairie dog and determined that it does not warrant protection as a threatened or endangered species under the ESA (75 *Federal Register* 104).

The white-tailed prairie dog occurs in shrub-steppe and short-grass prairie ecosystems, in stands of open shrub canopy with abundant grasses and forbs. They are typically found at elevations between 3,726 to 10,368 feet (WGFD 2005). The white-tailed prairie dog occurs on drier sites and higher elevations than the black-tailed prairie dog; and unlike the black-tailed prairie dog, commonly used habitat includes a low shrub component. White-tailed prairie dogs identify predators visually; therefore, they typically occur in areas that contain short shrub and herbaceous vegetation. However, unlike the black-tailed prairie dog, they do not clip taller vegetation to suppress plant growth. Percent plant cover and vegetative height is likely more important to white-tailed prairie dog habitat selection than plant species composition. The white-tailed prairie dog feeds primarily on forbs and grasses. They obtain most of their water requirements through consumption of vegetation, and they can become water-stressed if sufficient succulent vegetation is not available. The white-tailed prairie dog forms loose colonies. They are active above ground during the spring and summer and hibernate during the fall and winter.

The white-tailed prairie dog does not occur in Idaho or Nevada. In Wyoming, it primarily inhabits the western two-thirds of the state. Suitable habitat for the white-tailed prairie dog was mapped where the species' range overlaps the Analysis Area (as described in

Section 3.11.1.4). Habitat for the white-tailed prairie dog would be crossed by Segments 1E, 1W(a), 1W(c), 2, 3, and 4. Out of the total combined length of 603.8 miles for Segments 1E, 1W(a), 1W(c), 2, 3, and 4, the Proposed Route would cross approximately 334.7 miles of suitable white-tailed prairie dog habitat. Twenty-two white-tailed prairie dog colonies were mapped along the Proposed Route (the three colonies identified along Segments 1W(a) and 1W(c) are the same colonies) (see Table 3.11-6; Figure E.11-4, Appendix E).

Table 3.11-6. Number of White-tailed Prairie Dog Colonies along the Proposed Route and Its Alternatives within the Analysis Area

Segment Number	Segment or Alternative	White-Tailed Prairie Dog Colonies
1E	Proposed – Total Length	1
	Proposed – Comparison Portion for Alternative 1E-B	1
	Alternative 1E-B	0
	Proposed – Comparison Portion for Alternative 1E-C	1
	Alternative 1E-C	1
1W(a)	Proposed – Total Length	3
1W(c)	Proposed – Total Length	3
2	Proposed – Total Length	3
3	Proposed – Total Length	8
4	Proposed – Total Length	7
	Proposed – Comparison Portion for Alternatives 4A,B,C,D,E,F	2
	Alternative 4A	3
	Alternative 4B	2
	Alternative 4C	2
	Alternative 4D	2
	Alternative 4E	2
	Alternative 4F	3

Wyoming Pocket Gopher (*Forest Service Sensitive; BLM Sensitive*)

In September 2007, USFWS received a petition to list the Wyoming pocket gopher as an endangered or threatened species under the ESA. On February 10, 2009, the USFWS published a 90-day finding on this petition, in which they stated that substantial scientific or commercial information is available that indicates listing may be warranted. However, on April 15, 2010 the USFWS determined that listing the Wyoming pocket gopher as either endangered or threatened was not warranted (75 *Federal Register* 72 [2010-04-15]).

Limited information is available regarding the habitat requirements of Wyoming pocket gophers. The species seems to prefer loose, gravelly, upland soils with gentle slopes, often where greasewood is growing (Keinath and Beauvais 2006). Recent studies indicate that occupied habitat is generally defined by sites with 50 to 80 percent bare ground and limited litter and grass cover (Griscom et al. 2010). This species' range is relatively limited (known to occur only in Carbon and Sweetwater Counties, Wyoming). As the Wyoming pocket gopher is a fossorial species (i.e., a species that burrows as nests belowground but forages aboveground), and populations are assumed to be small, few observations have ever been made. The actual status of the Wyoming pocket gopher population is unknown due to the paucity of data. However, based on the results of recent surveys conducted by the WYNDD (Griscom et al. 2010), the

USFWS has determined that the Wyoming pocket gopher currently inhabits its known range in a pattern that approximates its historical distribution (USFWS 2010d).

The known distribution of the Wyoming pocket gopher is restricted to the south-central portion of the Wyoming, as it is only known to inhabit an area along the Carbon and Sweetwater County lines. The closest known occurrence of a Wyoming pocket gopher near the Project was from 1976, and was located approximately 0.5 mile north of Segment 3 (WYNDD 2008). Suitable habitat for the Wyoming pocket gopher has been mapped by the WYNDD (WYNDD 2008), and these data were used to assess the locations of habitat that could be impacted by this Project. The Proposed Route would cross this agency-mapped suitable habitat along Segments 2, 3, and 4. Out of the total combined length of 356.1 miles for Segments 2, 3, and 4, the Proposed Route would cross approximately 80.7 miles of agency-mapped suitable habitat for the Wyoming pocket gopher.

BLM and Forest Service Sensitive Species Fish Species

A total of 16 fish species found along the length of the Project were noted as being sensitive (Appendix D, Table D.11-2). Six were trout taxa; three were suckers, two were sculpin, and five were minnow species (including four chubs and one dace). In general, trout species are found in clear cold-water systems including small streams, large rivers, and lakes depending on species distribution. The Yellowstone cutthroat trout (*Oncorhychus clarki bouvieri*) is found at various locations in the Snake, Bighorn River, and Yellowstone River drainage systems in Montana, Wyoming, Idaho, Nevada, and Utah, and are present along the Project in Idaho in Marsh Creek along Segment 4, various portions of the Snake River, and in various creeks along Alternatives 7H and 7I (IDFG 2007; Gresswell 2009). The Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*) is found in the Colorado River drainage located above the Grand Canyon (including the Green River). The Bonneville cutthroat trout (*Oncorhynchus clarki utah*) is endemic to the Bonneville basin, and is found within clear rivers and streams within Bear River drainage. The redband trout (*Oncorhynchus mykiss gairdneri*), westslope cutthroat trout (*Oncorhynchus clarki lewisi*), and fine-spotted cutthroat trout are widely distributed; however, the Project would only cross their distribution along the Snake River drainage.

Two of the three sucker species are not restricted to cold-water streams and are often found in larger rivers. These two species (flannelmouth sucker [*Catostomus latipinnis*] and bluehead sucker [*Catostomus discobolus*]) are found only in specific drainages. The other sucker (mountain sucker [*Catostomus platyrhynchus*]) is most often found in cool flowing water, small to medium size streams, and is more widely distributed.

Of the two chub species, the northern leatherside chub (*Lepidomeda copei*) is present in cool-water streams of Bear, Snake, as well as Colorado and Green River drainages, while the roundtail chub (*Gila robusta*) is found mostly in larger rivers of the Colorado River drainage. While the sturgeon chub (*Macrhybopsis gelida*) is primarily present in large highly turbid river systems in the eastern Wyoming along the route, the lake chub (*Couesius plumbeus*) occupies varied habitat depending on location from large lakes and rivers in more northern regions of its distribution to small first-order streams in

Great Plains areas, all with cool shallow gravel or sandy bottom areas in central Wyoming along the route.

Of the other minnow species, the finescale dace (*Phoxinus neogaeus*) has an affinity for small sluggish spring-fed streams, often with beaver ponds or spring fed bogs with cool water and high amounts of LWD, and likely has distribution east of the Project in eastern Wyoming. The Shoshone sculpin (*Cottus greenei*) is only present in springs and a few small streams in the Hagerman Valley along the Snake River in south-central Idaho. The other sculpin, Wood River sculpin (*Cottus leiopomus*), is only found in the Wood River drainage of central Idaho, typically in clear cool small mountain streams, mostly just north of where the Shoshone sculpin is found.

Forest Service Management Indicator Species

The Forest Service MIS are species whose response to land-management activities or projects can be used to predict the likely response of other species with similar habitat requirements. The proposed Project would cross two NFs (the Medicine Bow-Routt and the Caribou-Targhee NF); while the Sawtooth NF would be crossed by a Route Alternative (Alternative 7I). Each of these NFs has designated their own list of MIS. The Medicine Bow Forest Plan has designated eight species as MIS including the American marten, common trout, golden-crowned kinglet, Lincoln's sparrow, northern goshawk, snowshoe hare, three-toed woodpecker, and Wilson's warbler. The Caribou Forest Plan has designated three MIS species including the Columbian sharp-tailed grouse, greater sage-grouse, and northern goshawk. The Sawtooth Forest Plan has designated three MIS species including the bull trout, greater sage-grouse, and the pileated woodpecker. Of the 12 Forest Service MIS (the northern goshawk and greater sage-grouse are on multiple lists), 10 have the potential to occur within the Analysis Area, based on the presence of habitat or co-location of the Project with the species range. Neither the bull trout nor the pileated woodpecker is likely to occur within the Analysis Area. In Idaho, bull trout occur in the East Fork, West Fork, and headwater tributaries above 7,200 feet elevation within the Jarbidge Wilderness Area (outside of the Analysis Area). The pileated woodpecker is not found within Wyoming. In Idaho, year-long habitat for the pileated woodpecker is found within the northern half of Idaho; however, this habitat is located north of the Analysis Area. The Columbian sharp-tailed grouse, greater sage-grouse, and various common trout species are addressed in detail above, within the ESA and Sensitive Species sections. The remaining MIS species will be discussed in this section.

American Marten (Medicine Bow Forest Plan MIS)

The American marten is associated with mature or late successional mesic conifer or mixed conifer forests that contain coarse woody debris, have intermediation canopy closures between 30 to 70 percent, and are adjacent to riparian areas (Vasquez et al. 2005). They are highly sensitive to forest fragmentation, with martens generally avoiding areas containing greater than 25 percent non-forested lands. Home ranges can vary, and range from 0.5 to 3.0 square miles for males, with female home ranges varying in size from approximately one-third to half the size of males (Vasquez et al. 2005). The population of martens fluctuates widely from year to year, and is correlated with prey abundance; however, long-term population trends for the American marten

are currently unknown. The Forest Service designated the American marten as a MIS due to their dependence on mature or late-successional forest habitats. This species is sensitive to developments within mature or late-successional forests that reduce canopy cover, remove coarse woody debris, reduce the recruitment of coarse woody debris, or increase road densities within these forest habitats. The location of this species within the Analysis Area is unknown; however, the closest known occurrence of an American marten near the Analysis Area is located approximately 25 miles north of Segment 8, within Boise County, Idaho. It is assumed that this species could occur within forested portions of the Analysis Area. Forested habitats occur along Segments 1E, 1W, 4, 5, and 7 (see Appendix D, Table D.6-1).

Golden-Crowned Kinglet (Medicine Bow Forest Plan MIS)

The golden-crowned kinglet inhabits dense, coniferous forests, especially where spruce or firs are present. The average home range sizes or requirements for this species are currently unknown. Population trends for the golden-crowned kinglet have varied widely over time, but have shown a decline in both Idaho and Wyoming between 2000 and 2006 (Sauer et al. 2008). The greatest threat to this species would likely be loss of forest habitat. Golden-crowned kinglets have been observed within the Analysis Area of Segment 1W, along on the border of Natrona and Converse Counties, Wyoming. It is assumed that this species could occur within forested portions of the Analysis Area. Forested habitats occur along Segments 1E, 1W, 4, 5, and 7 (see Appendix D, Table D.6-1).

Lincoln's Sparrow (Medicine Bow Forest Plan MIS)

Information regarding the Lincoln's sparrow habitat requirements is limited, but based on what is known, they seem to prefer riparian willow habitats at elevations between 6,725 and 7,414 feet. Wide population fluctuations are normal for this species, and can be caused by multiple factors including excessive rain, drought, changes in habitat, and natural disturbances (Stephens et al. 2003). Population trends for the Lincoln's sparrow have shown a nationwide increase in size by 2.3 percent between the years 1966 to 2000; however, data are not sufficient to determine the population trends for this species in Wyoming (Stephens et al. 2003). The Lincoln's sparrow breeds in the northern states, and over-winters along the west coast and southern states. Spring migration can vary, but on average, it begins in middle to late April, peaks in May, and ends in late May. Breeding grounds are left in early September (Stephens et al. 2003). The Lincoln's sparrow was designated as an MIS because it is susceptible to grazing and other disturbing activities within riparian areas. It is assumed that this species could occur within riparian/wetland portions of the Analysis Area; which occur within all segments crossed by the Project (see Appendix D, Table D.6-1).

Northern Goshawk (Caribou and Medicine Bow Forest Plan MIS)

The northern goshawk is a habitat generalist and can be found in both coniferous and deciduous forests, woodlands, or along treelines adjacent to open habitats. During nesting, they prefer mature forest habitats. Home ranges vary in size depending on the abundance of habitat and prey, but they can range from 570 to 3,500 hectares (Kennedy 2003). The current data available (from the Breeding Bird Survey and the Christmas Bird Count) are inadequate to estimate the population trends of this species

within Wyoming or Idaho (Kennedy 2003). Threats to this species include habitat alteration, direct human disturbances, pesticides, and harvesting for falconry.

The northern goshawk is known to occur in and near the Analysis Area, and is considered a year-round resident of the area. There are six known northern goshawks nests that occur within 1 mile of the Project: two along Segment 1E (one of these nests is also within 1 mile of Segments 1W(a) and 1W(c)), and four along Segment 4 (see Appendix D, Table D.10-2). The two nests along Segment 1E are located on the Medicine Bow-Routt NFs, and the four nests along Segment 4 are located on the Caribou-Targhee NF.

Snowshoe Hare (Medicine Bow Forest Plan MIS)

The snowshoe hare inhabits dense woodlands/forests which experience a deep winter snow accumulation. Optimum densities of woody shrubs and small trees range from 4,600 to 33,210 stems per hectare. Koeler (1990) suggested that snowshoe hares avoid clear-cuts and very young stands, while Conroy et al. (1979) found that they typically inhabit areas that contain a mosaic of forest ages and openings. Occupied habitat typically contains dense protective understory vegetation composed of edible shrubs and trees (Ruediger et al. 2000). The average snowshoe home range sizes vary from 5 to 10 hectares; however, they have been to disperse for distances of up to 12 miles (Ruediger et al. 2000). The population densities of snowshoe hares are highly dependent on the populations of their primary predator, the lynx, and can range from 0 to 2.7 hares per hectare (Ellsworth and Reynolds 2006). Threats to this species include changes to the distribution and characteristics of subalpine forests. This includes the effects of global climate change, silviculture practices, wildfire suppression, habitat loss, and hunting. The location of this species within the Analysis Area is unknown; however, the closest known occurrence of snowshoe hares near the Analysis Area is located approximately 10 miles north of Segment 8, within Gooding County, Idaho. It is assumed that this species could occur within forested portions of the Analysis Area. Forested habitats occur along Segments 1E, 1W, 4, 5, and 7 (see Appendix D, Table D.6-1).

Three-Toed Woodpecker (Medicine Bow Forest Plan MIS)

The three-toed woodpecker inhabits mature or late-successional forests dominated by spruce and fir as well as lodgepole pine. These birds will also exploit recently burned forests, as these recent burns can provide a rich food source. Home range sizes are highly uncertain, but some studies have found home ranges as large as 304 hectares (Wiggins 2004). Home range sizes are likely dependent on the abundance of food sources. Population trends for this species are uncertain due to its low abundance and the difficulty in conducting accurate surveys for this species; however, according to Breeding Bird Survey data, populations in Wyoming likely increased by 4.7 percent between 1980 and 2003, but this increase is not statistically significant and highly uncertain (Wiggins 2004; Sauer et al. 2008). Although this species is not threatened on a range-wide scale, the Forest Service is concerned about its future due to its dependence on mature or late-successional forests, as well as natural forest disturbances such as fire. The location of this species within the Analysis Area is unknown; however, the closest known occurrence of the three-toed woodpecker near

the Analysis Area is located approximately 12 miles west of Segment 1W(a), within Natrona County, Wyoming. It is assumed that this species could occur within forested portions of the Analysis Area. Forested habitats occur along Segments 1E, 1W, 4, 5, and 7 (see Appendix D, Table D.6-1).

Wilson's Warbler (Medicine Bow Forest Plan MIS)

The Wilson's warbler is a high-altitude riparian species that inhabits mesic shrub communities or willow woodlands located near the edges of beaver ponds, lakes, riparian areas, fens, bogs, and overgrown clear-cuts. Population trends for this species show that it is stable to declining range-wide, and stable to increasing in the NFs found within the Rocky Mountain Region (Johnson and Anderson 2003). This species breeds near the Analysis Area, and its densities are highest between late April and May, with egg-laying occurring in June to July (Johnson and Anderson 2003). The greatest threat to this species range-wide is likely the loss of riparian habitat. The location of this species within the Analysis Area is unknown; however, the closest known occurrence of the Wilson's warbler near the Analysis Area is located approximately 3.3 miles north of Alternative 7H. It is assumed that this species could occur within riparian/wetland portions of the Analysis Area, which occur within all segments crossed by the Project (see Appendix D, Table D.6-1).

3.11.2 Direct and Indirect Effects

The following sections discuss both construction and operational effects of the Project on TES species. Federal ESA species are discussed first, then Forest Service and BLM sensitive species, followed by Forest Service MIS. Tables D.11-5 and D.11-6 (in Appendix D) identify the acres of construction impacts to suitable habitat for the federal ESA listed species, as well as BLM and Forest Service sensitive species, where quantitative species specific data were available; while Tables D.11-7 and D.11-8 (in Appendix D) display this same information for operations impacts. A segment-by-segment disclosure of impacts, which differentiates among effects that would occur where Route Alternatives are proposed, is found in Section 3.11.2.3. Section 3.11.2.3 is primarily a list of habitat impact values and a brief discussion of which alternative per segment would result in the least impacts to TES species, where quantitative species specific data are available.

Mitigation measures or EPMs are presented in detail within this section only if it is the first time they have been discussed in Chapter 3; all other measures are referenced or summarized. A comprehensive list of all Proponent-proposed EPMs and Agency-required mitigation measures can be found in Table 2.7-1 of Chapter 2.

<u>Plan Amendments</u>

Tables that list the applicable stipulations from the various federal management plans as well as whether or not the Project is in compliance with these stipulations can be found in the Administrative Record; proposed plan amendments for instances where the Project would not be in compliance with Forest Service standards or BLM requirements can be found in Appendix F, as well as a summarized list found in Table 2.2-1. As shown in Table 2.2-1, there are multiple plan amendments proposed that, although not specifically related to TES wildlife, would result in alterations to current land

management (such as changes to VRMs, or allowing the line to occur outside the existing/designated utility corridors). These amendments could allow the permitting of this Project in areas that are currently managed in such a way as to exclude projects of this type. Impacts to wildlife and their associated habitats that could result from the permitting and subsequent construction of this Project are disclosed in the following sections. Any plan amendments that are related specifically to a TES wildlife species will be discussed in detail, within the appropriate species section.

The proposed plan amendments to TES wildlife management direction are presented below:

- Medicine Bow Forest Plan: Proposed Segments 1E, 1W, Alternative 1E-C – TES Standard 4 provides protection for northern goshawk nests by protecting 30 acres of dense vegetation surrounding each of 3 selected nests. The proposed amendment would allow the Gateway West Transmission Line Project and will require Medicine Bow National Forest timing restrictions for northern goshawks will be followed.
- Medicine Bow Forest Plan: Proposed Segments 1E, 1W, Alternative 1E-C – TES Standard 5 provides protection for northern goshawk post fledgling areas (PFAs) inclusive of the selected 30-acre nest sites and a minimum of 200 acres. Management of the PFAs prohibits activities that could degrade foraging habitat. The proposed amendment would allow the Gateway West Transmission Line Project and will require that the Medicine Bow National Forest timing restrictions for northern goshawks will be followed.
- Medicine Bow Forest Plan: Proposed Segments 1E, 1W, Alternative 1E-C – TES Standard 11 allows no loss or degradation of known or historic habitat for the boreal toad, wood frog, or northern leopard frog. The proposed amendment would allow the Gateway West Transmission Line Project and will require mitigation measures, to be approved by the Medicine Bow Forest, applied to prevent impacts to the boreal toad, wood frog, or northern leopard frog.
- Green River RMP: Segment 4 of the Proposed Route, Alternative 4B, 4C, 4D, 4E – The RMP prohibits aboveground facilities within 0.25 mile of sage-grouse leks. The proposed amendment would allow the Gateway West Transmission Line Project within 0.25 mile of sage-grouse leks, this would include the construction of access and maintenance roads for the Project, with appropriate mitigation measures.
- Green River RMP: Proposed Segments 3 and 4, Alternatives 4B, 4C, 4D, 4E – The RMP prohibits high-profile structures within 0.5 mile of raptor nests. The proposed amendment would permit the Gateway West Transmission Line Project as a one-time allowance for the construction and placement of Project transmission lines and towers within 0.5 mile of active raptor nests, with appropriate mitigation measures.
- Caribou Forest Plan: Proposed Segment 4 – Management Standards and Guidelines for goshawk nesting territories limit disturbance to foraging areas around nests to less than 40 acres. As the Gateway West Transmission Line

Project would exceed this acreage of disturbance, an amendment is proposed to allow the Project with appropriate mitigation.

3.11.2.1 No Action Alternative

Under the No Action Alternative, the Project would not be constructed or operated. No Project-related impacts to TES species would occur; however, impacts would continue as a result of natural events (such as fire, drought, and severe weather) and existing developments within the Analysis Area.

3.11.2.2 Effects Common to All Action Alternatives

This section discusses the effects that would occur to TES species, regardless of whether the Proposed Route or Route Alternatives are selected (a discussion of impacts related to Proposed Route segments and Route Alternatives can be found in Section 3.11.2.3). The Proponents have proposed species-specific EPMs to offset or reduce these potential impacts to TES species. They have proposed these measures for Project-wide implementation (as opposed to specific measures for federal, state, and private lands), because they feel that Project-wide measures are easier to administer and explain to construction personnel. Many of these EPMs are sufficient to protect sensitive resource and could be applied Project wide; however, in some cases the Agencies have determined that these EPMs are not sufficient or are not in compliance with agency stipulations, and therefore have required or recommended additional mitigation measures (presented below and in Section 3.11.3). Mitigation measures or EPMs are presented in detail within this section only if it is the first time they have been discussed in Chapter 3; all other measures are referenced or summarized. A comprehensive list of all EPMs and agency required mitigation measures can be found in Table 2.1-4 of Chapter 2.

A list of all state and federally imposed seasonal restrictions can be found in Appendix I; the Project would be required to comply with all agency timing restrictions unless an exception is granted by the Agencies.

Tables that lists the applicable stipulations from the various federal management plans as well as whether or not the Project is in compliance with these stipulations can be found in the Administrative Record; proposed plan amendments for instances where the Project would not be in compliance with Forest Service standards or BLM requirements can be found in Appendix F, as well as a summarized list found in Table 2.2-1. As shown in Table 2.2-1, there are multiple plan amendments proposed that, although not specifically related to TES wildlife, would result in alterations to current land management (such as changes to VRMs, or allowing the line to occur outside of existing/designated utility corridors). These amendments could allow the permitting of this Project in areas that are currently managed in such a way as to exclude projects of this type. Impacts to wildlife and their associated habitats that could result from the permitting and subsequent construction of this Project are disclosed in the following sections. Any plan amendments that are related specifically to a TES wildlife species will be discussed in detail below, within the appropriate species section.

Note that a threat determination call is made for each species discussed within this section where threat determinations are appropriate. Threat determination language for

species listed as threatened or endangered under the ESA follow standard ESA language. Threat determination language used for all other species is consistent with the language required by the Forest Service. This Project would cross two Forest Service regions: Region 2 (R2, which includes the Medicine Bow-Routt NFs), and Region 4 (R4, which includes the Caribou-Targhee and Sawtooth NFs). Each of these regions has different threat determination language that they require for impact discussions regarding sensitive species and ESA proposed/candidate species. The purpose and meaning of each region's language is essentially the same, but the exact text that is legally required differs slightly[6]. For species that are listed as sensitive in both regions, both threat determination languages will be provided. For species that are listed as sensitive in only one region, only that region's language will be used.

Threatened, Endangered, Proposed, or Candidate Species under the ESA

Federal ESA Wildlife Species

Black-footed ferret (*Endangered, Nonessential experimental population*)

Construction-related Impacts

There are no known populations of black-footed ferrets in the Analysis Area; however, surveys for ferrets have not been conducted within the entire area. Black-footed ferrets from the Shirley Basin 10J population could occur within the Analysis Area; however, this population is not protected from unintentional take. If there are any ferrets in the area, then the Project could potentially result in direct mortality, or have direct adverse impacts on their habitat, as well as adverse impacts to their primary prey source, the prairie dog. (Impacts to prairie dogs are discussed separately in the Black- and White-Tailed Prairie Dog portion of this document.) Temporary, construction-related habitat removal would include temporary roads, laydown areas, and fly yards, all of which would be restored following construction in accordance with the Proponent's Framework Reclamation Plan for Construction Activities (see Appendix C-2). The acreage of impact to suitable habitat by line segment and alternative is listed in Table D.11-5 (Appendix D) and is discussed in Section 3.11.2.3. Construction-related noise and dust disturbance would also occur, which could potentially make habitat temporarily unsuitable for black-footed ferrets; however, the Proponents have developed measures within their Traffic and Transportation Management Plan (Appendix C-1, Attachment A) to control dust near construction activities. This plan also includes measures to control traffic (both existing and construction related) near construction activities, to reduce the likelihood of vehicular related mortality of wildlife during construction (the potential impact of noise, dust, and traffic related wildlife mortality, as well as the measures proposed to limit this potential impact, are applicable to all wildlife species addressed within this document[7]).

To avoid impacting ferrets, the Proponents have proposed the following species-specific EPMs:

[6] For example, for an action that could impact a species but would not jeopardize the continued existence of the species, Region 2's required language is "May adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend towards federal listing." Region 4's required language is "May impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability."

[7] To reduce text, this and other impacts that state "applicable to all wildlife species addressed within this document" will not be discussed in detail again for every species.

PMC-1 No surface disturbance would occur in black-footed ferret non-block-cleared areas that are part of a white-tailed prairie dog complex that is greater than 200 acres and identified by USFWS as a potential black-footed ferret reintroduction area (USFWS 1989) until cleared by species-specific presence/absence protocol level surveys.

PMC-2 Pre-construction presence/absence surveys (USFWS 1989) would be conducted in suitable habitat within mapped non-block-cleared areas, as necessary. Results of surveys would be valid for a 12-month period.

PMC-3 In the event that black footed ferrets are documented, construction would cease within the vicinity of the documented occurrence and the USFWS would be notified. In addition, the transmission line or structures would be relocated to minimize direct impacts to prairie dog colonies to the extent possible.

However, the Agencies have determined that these measures do not address the potential for ferret presence in black-tailed prairie-dog colonies. Therefore, the Agencies have identified the following mitigation measure as a means to substantially reduce potential impacts; this measure is required on all lands (regardless of land ownership) to comply with ESA requirements:

TESWL-5 Preconstruction surveys must be conducted for the black-tailed prairie dog (in addition to those already proposed for the white-tailed prairie dog and the black-footed ferret) in Segments 1E and 1W. If prairie dogs or their habitat are documented, then surveys for black-footed ferrets must occur. If ferrets are found, construction in that area must halt and consultation with the USFWS be initiated.

If black-tailed prairie dogs are discovered during construction, all construction activities must cease and survey for the black-footed ferret shall be conducted. If ferrets are found, construction in that area must halt and consultation with the USFWS be initiated.

Even if there are no ferrets present in the area during construction, there is still the potential for reducing habitat quality, and therefore reducing the likely success of future ferret re-introduction.

As discussed earlier, impact values reported within this document are based on indicative engineering. To ensure that the final engineering design is routed to avoid known or newly discovered locations of colonies well as other structures/locations occupied by sensitive species, the Agencies have identified the following mitigation measure (this measure is applicable to all sensitive species that utilize specific structures/locations):

TESWL-8 A wildlife biologist will accompany site engineers during the final engineering design, in order to verify and flag the location of any known occupied structures (e.g., nests, burrows, colonies, maternity dens, hibernacula) utilized by sensitive species. This will include, but not be limited to, known burrowing owl burrows (including artificial

burrows that have been constructed as part of research/restoration efforts), prairie dog colonies, TES snake hibernacula, and raptor nests, which could be impacted by the Project based on the indicative engineering design. The final engineering design will be routed to avoid direct impact to these occupied structures to the extent practical.

Operations-related Impacts

Permanent loss of habitat for TES species would primarily be associated with areas that are occupied by access roads, transmission pole structures, and substations; as other Project-related disturbances would be revegetated in accordance with the Framework Reclamation Plan for Construction Activities (see Appendix C-2). Permanent loss of potential habitat would be limited due to the initial scope of impact to black-footed ferret habitat (see Tables D.11-5 and D.11-7 in Appendix D) and the efforts proposed to restore and revegetate disturbed habitats that are not occupied by these permanent structures (see Appendix C-2). However, revegetation in arid landscapes can take many years to reestablish to pre-disturbance conditions; therefore, revegetated shrublands would still have lower shrub cover than undisturbed areas for decades. In addition, revegetated areas are more susceptible to invasion or spread of invasive plant species, and the presence of invasive plant species can reduce habitat quality for species that rely on native vegetation; however, the Proponent's Framework Reclamation Plan outlines a program for monitoring these areas and prescriptions for preventing the establishment of noxious weeds (see Section 3.6 – Vegetation Communities). The potential impacts of habitat loss, revegetation, and invasive plant species, as well as the measures taken to minimize these effects would be applicable to all species addressed within this document.

Routine maintenance would continue along the transmission line and its associated facilities for the life of the Project (see Chapter 2 as well as Appendix B for a full description of the typical operations and maintenance activities that would occur). The presence of workers along the transmission line, as well as maintenance activities, could result in disturbances to adjacent wildlife. In addition, increased use of the area by vehicles would increase the risk of vehicular related wildlife mortality. The Proponents have proposed EPMs OM-1 through OM-31, within their Plan for Operations, Maintenance, and Emergency Response (see Appendix C-4), to limit the impact to wildlife species due to the operation and maintenance of the Project. (The potential impacts of Project maintenance and the measures taken to minimize these impacts would be applicable to all species addressed within this document.)

The construction of new Project-related roads could create new access to areas previously inaccessible to the public (a road density analysis, including densities on NFs, is presented in Section 3.10.2.3). If these roads are used by the public illegally, then increased disturbances may occur to wildlife species that utilize adjacent habitats; this could include an increase in direct mortality from poaching, hunting, fishing, or collecting. However, the Proponents have developed a Traffic and Transportation Management Plan (Appendix C-1, Attachment A) that includes measures to prevent unauthorized vehicular use of the new access roads, as well as setting speed limits on access roads for Project workers to limit the potential for direct vehicular impacts with wildlife. This would limit the disturbance to wildlife species that could result from use of

these roads, by limiting unauthorized use and establishing speed limits for authorized use (the potential impacts of increased human access and the measures taken to minimize these effects would be applicable to all species addressed within this document).

Construction and operations activities could inadvertently cause fires, resulting in a loss of habitat as well as an increased opportunity for the spread of invasive plant species, which could potentially result in both short- and long-term impacts. Because warm and dry conditions are likely throughout the summer, the risk of wildfires during construction and operations of the Project during this season may be elevated. To minimize the potential for wildfires, state and federal fire prevention requirements would be followed. All Project personnel would be trained in wildfire risk prevention and each construction crew would carry adequate fire suppression equipment. Fire prevention measures have been developed (refer to Table 2.7-1) that outline the responsibilities of Project personnel for prevention and suppression of fires, and define minimum fire prevention and suppression measures that would be used during construction and operations of the Project (the potential impacts of altered fire regimes and the measures taken to minimize these impacts would be applicable to all terrestrial species addressed within this document).

It is possible that the transmission line and its structures could become an attractant to raptor and ravens for nesting and perching habitats. The numbers of ravens and raptors that use existing transmission lines for perching habitat can become quite substantial. For example, a study conducted along a 500-kV transmission line that spanned from south-central Idaho to south-central Oregon found approximately 2,100 ravens at a single roost that spanned approximately 4 miles of the line and 15 towers (Engel et al. 1992). Although the presence of this 500-kV transmission line likely resulted in an increase in the number of ravens within the roosts, Engel et al. (1992) concluded that each of the major roosts found during the study were situated in an area where ravens had roosted communally before the line was constructed. The potential increase in raptor and raven numbers along the Project could result in an increase in harassment and predation rates on prey species (such as the black-footed ferret) that live in shrub and grassland habitats (Stahlecker 1978; Ellis 1984; Ellis 1985; Steenhof et al. 1993; Manzer and Hannon 2005; Coates and Delehanty 2010). The extent that these impacts could occur depends on the hunting range of predatory avian species. For example, non-breeding pairs of ravens have been documented to travel an average of 4.3 miles (6.9 kilometers) (up to 38.8 miles [62.5 kilometers]) in Idaho from roost sites to food sources and 16.8 miles (27 kilometers) in Michigan (ranging from 0.5 to 91.3 miles [0.8 to 147.0 kilometers]), with breeding pairs often traveling up to 0.8 mile (1.3 kilometer) while hunting (Boarman and Heinrick 1999). Golden eagle hunting ranges vary by season and location, but are typically very large (e.g., they can be around 161.6 square miles [260 square kilometers]).

The effect of increased raptor and raven predation rates on prey species would be most prominent where the Project is located in areas that do not contain other tall structures, such as existing transmission lines or trees. Approximately 36 percent (394.1 miles) of the Proposed Route is located adjacent to (within 1 mile of) existing transmission lines, which already serve as nesting and perching habitats for raptors and ravens. In these

areas, the Project would cumulatively add to the numbers of raptors and ravens that are already utilizing existing transmission lines in the general area. In the remaining areas where the Project would not be co-located with existing lines or other tall structures (such as portions of the line that cross through forested habitats), it would create new nesting and perching opportunities. Of the 708.8 miles of the Proposed Route that are not located within 1 mile of an existing line, about 485.8 miles are located within non-forested habitats (or 44 percent of the Proposed Route's length). It is in these areas that the effects of potential consolidation of raptor and raven populations on prey species would be most substantial (the risk of increased predation pressures by raptors and ravens would be applicable to all raptor/raven prey species that occur in open shrubland and grassland habitats). To reduce the effects of the Project on raptor/raven predation pressures, the Agencies would require the following mitigation measures:

TESWL-2 The Proponents shall work with the applicable land-management agencies to develop a survey protocol that would be conducted in conjunction with annual operations and maintenance surveys (as outlined in the Proponents' Avian Protection Plans). The goal of these raptor-raven surveys shall be to identify whether populations of raptors and ravens are consolidating along the Project, and will be done during the appropriate time of year. These surveys shall be conducted, at a minimum, along portions of the line that are located within 1 mile of identified concentrations of sensitive raptor and raven prey species (including the black-footed ferret, burrowing owl, grouse species, mountain plover, prairie dogs, and pygmy rabbit). The Proponents and applicable land-management agencies shall work together to identify measures to limit predation rates on sensitive species within areas where raptor and raven populations are considered to be consolidating (limited to areas near sensitive species).

TESWL-3 H-frame structures shall be equipped with anti-perch devices to reduce raven and raptor use, and limit predation opportunities on special status prey species.

The Project would not likely serve as a barrier to the black-footed ferret's movement, but could result in a hazard to this species, due to increases in the predation rate and the level of predatory harassment near the line (discussed above).

Conclusion

While surveys have not been conducted within the entire Analysis Area, the only known black-footed ferret population in Wyoming is the experimental Shirley Basin population, which is not located within the Analysis Area. Any impacts on prairie dogs (the primary prey source for black-footed ferrets) or their habitat from the Project could reduce habitat for future re-introductions of ferrets; however, the Project is not likely to contribute to a trend towards federal listing or loss of viability for either species of prairie dog (see BLM and Forest Service sensitive species section, below). If ferrets are present near the Project, the presence of the transmission towers could increase predation pressures on this species. Proponent-proposed EPM and agency-required mitigation measures would be implemented to limit the potential impact of the Project on

this species. Based on the potential for impacts and the implementation of EPMs and mitigation measures, the Project may affect, but is not likely to adversely affect, the black-footed ferret.

Canada Lynx (*Threatened*)

Construction-related Impacts

The potential effects of Project construction on the Canada lynx include disturbance of movement pattern, as well as loss or modification of habitat. The Proponents have not proposed species-specific EPMs for the Canada lynx. However, due to the Canada lynx's large home range (which ranges from 10 to 20 square miles) and high mobility, it is possible that lynx would not be present during construction, or that they would avoid portions of their home range that contain construction activities. If they are present, and avoid portions of their home range that contain construction activities, this could result in a temporary shift in the lynx's movement patterns.

Of the 2,204,851 acres of lynx core habitat (LAU) found within Wyoming, and about 39,806 acres found in the two LAUs crossed by the Project (see Table 3.11-2), about 302 acres would be disturbed along the Proposed Route during construction (149 acres by direct Project facilities, with the remaining disturbances a result of ROW clearing in forested areas). All areas disturbed during construction (with the exception of areas used as permanent access roads, substation footprints, and pole structure bases) would be revegetated following construction in accordance with the Framework Reclamation Plan (see Appendix C-2). However, the Proponents would not allow trees or large woody vegetation to grow up under the transmission lines, resulting in a linear band that would be clear of trees for the life of the Project. The width of this permanently deforested band would depend on which tower and circuit type is used for that particular forest crossing (ranging from 125 to 300 feet wide). Details on ROW clearing are found in Section 3.6.2.3.

Lynx linkage habitat consists of areas that provide landscape connectivity between blocks of primary lynx habitat. Linkage areas occur both within and between geographic areas where blocks of lynx habitat are separated by intervening areas of non-lynx habitat such as basins, valleys, or agricultural lands. Shrub-steppe habitats that contain low human and/or road densities and may also provide important linkage habitat between the lynx's primary forest habitat (Ruediger et al. 2000); therefore, impacts to previously undisturbed shrub-steppe communities and linkage habitat may affect the lynx's ability to move between patches of primary habitat. Linkage habitat has been identified in Idaho, Montana, Utah, and Wyoming by an interagency/ intergovernmental panel (Forest Service 2007c). The Project would cross two paths that have been designated as lynx linkage habitat for a total of 9 miles (Forest Service 2007c); both are located south of the Caribou-Targhee NF along Segment 4 (see Appendix E, Figure E.11-1). One of these linkage paths connects the southern portion of the Caribou-Targhee NF to the northeastern border of Utah; the second linkage path connects the portion of the lynx core habitat that would be impacted by the Project to the northeastern border of Utah. Lynx would likely not utilize these linkage habitats during construction activities due to the presence of construction machinery and noise; resulting in a temporary adverse impact to the utility of these linkage habitats. Long-

term impacts on the ability of these areas to serve as linkage habitats would be low due to the limited degree of habitat disturbance, lack of major active roads constructed through these habitats as a result of the Project, limited expected human presence in these areas during operation, and the restoration and revegetation efforts proposed (see the Framework Reclamation Plan for Construction Activities [Appendix C-2]). However, restoration in shrub-steppe habitats could take decades to restore conditions to preconstruction levels, and access roads could allow some illegal human access to these areas (even with the measures proposed to limit this illegal use; see the Traffic and Transportation Management Plan in Appendix C-1, Attachment A); indicating that some effects to linkage habitats could continue beyond the construction phase, to an unquantifiable degree.

Snowshoe hares are the primary prey of lynx; therefore, an assessment of impacts on the Canada lynx must take into account potential impacts to the snowshoe hare. Impacts to the snowshoe hare are analysis under the “Forest Service Management Indicator Species” section. As discussed within this separate snowshoe hare section, impacts to the snowshoe hare would likely be limited, and would result in negligible effects to lynx populations. Impacts to other small mammal species, which could potential serve as prey for the lynx, are assessed in Section 3.10 – General Wildlife and Fish. As discussed in Section 3.10, impact to other small mammals (such as the red squirrel) are unlikely to result in population level impacts, and are therefore, unlikely to impact the lynx food supply.

Operations-related Impacts

Permanent loss of about 233 acres of lynx habitat would occur due to Project structures (see Appendix D, Table D.11-7). Approximately 35 acres would be permanently occupied by Project facilities, with the remaining acreage consisting of forested areas permanently cleared within the ROW. As discussed above, the Project could have some limited impacts to the movement of the Canada lynx, due to long-term impacts to forested habitats and a reduction of shrub densities along linkage habitat, but to an unquantifiable degree.

It has been suggested that the Canada lynx is generally tolerant of human presences (Staples 1995; Roe et al. 1999; Mowat et al. 2000; Ruediger et al. 2000), indicating that the limited presence of humans during Project operation is unlikely to impact this species. Furthermore, studies have shown that moderately used roads (such as snowmobile trails and logging roads) do not appear to affect habitat use (McKelvey et al. 2000; Ruediger et al. 2000), indicating that the presence of Project-related access roads are unlikely to reduce lynx use of areas, or result in isolation of populations.

Conclusion

The Project would result in the loss of some LAU habitat, and would cross two lynx linkage habitats. However, the Project is not expected to substantially impact the lynx’s prey base or result in long-term impedance to movement. Therefore the Project’s construction and operation may affect, but is not likely to adversely affect, the Canada lynx.

Columbia Spotted Frog (*Candidate; Forest Service Sensitive*)

Construction-related Impacts

The potential effects of Project construction on the Columbia spotted frog include modification or loss to habitat (including alterations to the microclimates of these areas) and direct mortality. To date, the Proponents have not proposed species-specific EPMs for the Columbia spotted frog; however, the Agencies have developed mitigation measures to protect all aquatic- and riparian-dependent species (discussed in more detail below).

Wetlands and riparian areas are the primary habitat for the Columbia spotted frog. Habitats suitable for the Columbia spotted frog are not abundant within the Analysis Area, and the few wetland and riparian areas that are proposed for crossing by the transmission line would be spanned, thereby avoiding direct impacts on these potentially sensitive areas (see Section 3.9 – Wetlands and Riparian Areas). The acreage of impact to suitable habitat by line segment and alternative is listed in Table D.11-5 (Appendix D) and discussed in Section 3.11.2.3. All areas disturbed during construction (with the exception of areas used as permanent access roads, substation footprints, and pole structure bases) would be revegetated following construction in accordance with the Framework Reclamation Plan (see Appendix C-2). However, these EPMs are aimed primarily at reestablishing herbaceous or shrub cover, reestablishing original site configurations, and preventing erosion, but do not specifically address impacts to wetlands or riparian areas, or the reestablishment of stream/wetland shade vegetation and/or LWD. Therefore, the Agencies have recommended the implementation of additional mitigation measures, which are discussed below.

There is a very low possibility that the transmission line structures would be placed in riparian habitat; instead, it is common engineering practice to span riparian habitat with the conductors and place the towers outside riparian habitat. However, the Proponents may propose one or more access roads that cross riparian habitat. Disturbances within these areas could result in direct mortality of frogs during the clearing and construction of the stream/waterbody crossing. In addition, increased sedimentation could result, which if at high enough levels could impact tadpoles and eggs present at both at the crossing location itself and immediately downstream. Sedimentation could bury frog eggs and/or damage tadpole gills, resulting in mortality. Sedimentation would be controlled through implementation of the Proponents' SPCC Plan (Appendix C-1, Attachment C). In addition, the possibility of a spill of toxic materials into waterbodies would be limited due to the implementation of the Proponents' SWPPP (Appendix C-1, Attachment B; these measures would be applicable to all species that inhabit wetlands or waterbodies). Even with the implementation of these preventive and protective measures, the crossing of waterbodies by access roads should be avoided to the extent feasible; in addition, all necessary crossing should occur outside of forested riparian areas to reduce the amount of riparian vegetation that would need to be cleared.

The Agencies have identified mitigation measures VEG-6 and WET-1 through WET-4 to reduce impacts to riparian/wetland habitats, FISH-4 to prevent the establishment of aquatic invasive species in these habitats, and mitigation measures WQA-1 through WQA-4 to reduce potential impacts to waterbodies resulting from road crossings. They

have recommended that these measures be applied Project-wide. For instances where impacts to riparian and wetland areas are unavoidable, the Agencies have identified the following mitigation measure, which would be required on all federally managed lands to further reduce potential impacts to the Columbia spotted frog and other species that depend on riparian/wetland habitats:

TESWL-1 For the protection of aquatic- and riparian-/wetland-dependent species, surface disturbing and disruptive activities must be avoided in the following areas: 1) identified 100-year floodplains; 2) areas within 500 feet of perennial waters, springs, wells, and wetlands; and 3) areas within 100 feet of the inner gorge of ephemeral channels on federally managed lands.

Where it is not possible to avoid wetland and riparian habitat, crossing-specific plans must be developed. These plans shall: 1) demonstrate that vegetation removal is minimized; 2) show how sediment would be controlled during construction and operation within wetland and riparian areas; 3) attempt to intersect the wetland or riparian habitat at its edge; and 4) provide measures to restore habitat and ensure conservation of riparian microclimates. This plan must be submitted to the appropriate land-management agency and approved prior to construction of any portion of the Project within sensitive riparian habitat.

Operations-related Impacts

As stated earlier, permanent habitat loss would be associated with access roads, transmission pole structures, and substations; however, these facilities/structures would be located outside of riparian/wetland areas whenever possible. Table D.11-7 in Appendix D lists the permanent operations impacts that would occur to this species habitat; the impacts by segment and alternative are discussed in detail in Section 3.11.2.3.

The transmission line would not serve as a barrier or hazard to the Columbia spotted frog, as long as the EPMs and mitigation measures identified above are implemented so that riparian and wetland microclimates are not altered in such a way as to prevent the movement of the Columbia spotted frog. However, any roads that are constructed within riparian habitats could result in a barrier to movement to the Columbia spotted frog, and could fragment habitat resulting in further loss of suitable habitat due to edge effects. (See Table D.10-3 of Appendix D for the level of fragmentation that would occur due to proposed access roads, and Section 3.10.2.2 for a general discussion of habitat fragmentation.)

Conclusion

The Project would span riparian and wetland areas to the extent practical. In areas where they cannot be avoided, EPM and mitigation measures would be applied to limit potential impacts to riparian and wetland dependent species. Based on the potential for impacts and the implementation of EPMs and mitigation measures, the Project's construction and operation may impact individuals or habitat, but is not likely to contribute to a trend toward federal listing or cause a loss of viability for the Columbia spotted frog (R4 language). For the same reasons, the Project may adversely impact

individuals, but is not likely to result in a loss of viability in the Planning Area, nor cause a trend towards federal listing (R2 language).

Gray Wolf (*Nonessential Experimental Population–Wyoming; Forest Service Sensitive*)

Construction-related Impacts
Because the gray wolf is considered a habitat generalist and does not require a specific habitat type for survival, gray wolves could potentially be present along any portion of the line. However, as the Project would not impact habitats that are unique to the general area or are specifically required by wolves for survival, habitat loss resulting from the Project's construction would not have a measurable effect on this species. As discussed for the Canada lynx, the gray wolf has a large home range; and as such, it is possible that wolves would not be present during construction. However, if wolves are present during construction, they would likely avoid the area, resulting in a temporary shift in wolf movement patterns.

Operations-related Impacts
The transmission line and its associated structures would not likely serve as a barrier or hazard to the gray wolf; and the operation of the Project is not likely to have a measurable adverse impact to the gray wolf.

Conclusion
The Project would impact habitats that could be utilized by wolves; however, the Project would not impact habitats that are unique to the general area or are specifically required by wolves for survival. If wolves are present near the Project during construction, then they may avoid areas where active construction occurs. Therefore, the Project's construction and operation may affect, but is not likely to adversely affect, the gray wolf.

Greater Sage-Grouse (*Candidate; MIS; Forest Service Sensitive; BLM Sensitive*)

The USFWS's *12-Month Findings for Petitions to List the Greater Sage-Grouse as Threatened or Endangered* (2010e) listed the following as potential impacts to the greater sage-grouse resulting from powerlines: 1) collisions/electrocutions, 2) consolidation of predatory birds along powerlines, 3) lower recruitment rates near lines, 4) habitat fragmentation, 5) degradation of habitat due to spread of invasive plant species, 6) impacts resulting from the line's electromagnetic fields, and 7) direct loss of habitat. Additional impacts related to construction and operations of the line, as well as associated infrastructure, could include short-term disturbances due to construction and long-term disturbances during operations, increased road access allowing poaching in previously inaccessible locations, and changes to habitat structure resulting from altered fire regimes. Note that many of the general impacts that could occur to this species are addressed in the black-footed ferret section as "impacts that would occur to all species addressed" (e.g., the effects of fire, poaching, and invasive weeds).

Construction-related Impacts
The greater sage-grouse is a ground nester and generally broods, rears young, and winters near their mating grounds (although some birds can migrate up to 50 or 60 miles). Because it is a ground nester, the species is very sensitive to ground-clearing activities that would occur during Project construction. To limit the potential disturbance to this species, one of the Proponents' primary goals while routing the Project was to

avoid all leks by at least 0.25 mile (in accordance the BLM RMP requirements for “no surface occupancy,” which was in place at the time of initial Project design in 2008). However, the centerline of the Project would come within 0.25 mile of a lek with an “undetermined” management status along Segment 10 and within 0.25 mile of a lek with an “occupied” management status along Segment 5 (see Table 3.11-4). In addition, the Proponents attempted to avoid leks by 0.6 mile to the extent possible, based on the assumption made at the time of initial Project design (2008) that the “no surface occupancy” requirement would increase from 0.25 mile to 0.6 mile (as of this date, the BLM “no surface occupancy” restriction has been increased to 0.6 mile). However, not all leks could be avoided by this distance (see Table 3.11-4) due to the need to avoid other sensitive resources (e.g., high-altitude mountain habitats that contain species listed under the ESA, or sensitive cultural resources that are protected by the various SHPOs).

Agency-established timing restrictions would be utilized during the breeding seasons to minimize direct impacts to this species (discussed in more detail below). In addition, the Agencies have identified mitigation measure WILD-10, which would require that all vegetation clearing be conducted prior to the onset of the avian breeding season, to limit the potential impact of clearing on nesting birds.

Loss of habitat would occur due to direct removal of vegetation, introduction of noxious weeds, fragmentation, edge effects, and altered fire regimes (see further discussion in Section 3.10.2). In addition, construction-related noise and dust disturbance would occur during construction, which could potentially make habitat temporarily unsuitable for this species; however, the Proponents have developed measures within their Traffic and Transportation Management Plan (Appendix C-1, Attachment A) to control dust near construction activities and agency-required timing restrictions would be implemented to limit the impacts of noise on birds during sensitive periods. Birds could experience direct mortality if construction equipment drives over nests or strikes birds that are crossing roads, or if birds are hiding in shrub cover that is removed/cleared. However, the Proponents have developed EPMs in their Plan for Operations, Maintenance, and Emergency Response, as well as their Traffic and Transportation Management Plan (see Appendix C) to limit the potential risk of direct vehicular impacts with wildlife. In addition, the risk of direct mortality would be limited due to the utilization of agency required timing restrictions for construction near known breeding grounds (restricting construction to periods outside of the typical breeding season for habitats located within certain distances of leks). However, because some breeding/nesting habitat could still be impacted during the breeding season even with the implementation of these timing restrictions (e.g., in areas far enough from leks that they are not affected by these timing restrictions), some direct impacts to birds as well as their breeding habitat could still occur. If nesting birds are disturbed, this could result in increased mortality of chicks through both crushing by construction equipment, as well as abandonment by their parents. In addition, flight responses and disturbance could increase the energy costs of both parents and chicks, thereby adding additional stresses on birds located adjacent to construction activities. However, Project compliance with the agency timing restriction would limit disturbance or displacement of brooding birds as well as impacts to chicks, by limiting impacts to areas outside of

agency-designated breeding habitats during the breeding season. In addition, as discussed above, mitigation measure WILD-10 would require that all vegetation clearing be conducted prior to the onset of the avian breeding season, to limit the potential impact of clearing on nesting birds, thereby reducing this risk.

Staging areas, fly yards, and the temporary construction areas, not needed for permanent maintenance at each transmission tower pad, would be revegetated following construction in accordance with the Framework Reclamation Plan (see Appendix C-2). However, as stated earlier revegetation in arid landscapes can take many decades to restore to preconstruction conditions; therefore, all direct impacts to habitat within these arid shrublands would be considered long-term, even with the implementation of active revegetation efforts.

The Proponents have provided six EPMs as part of their Project description to help avoid, minimize, and mitigate for direct and indirect impacts on greater sage-grouse. These measures are detailed within the Greater Sage-Grouse Avoidance, Minimization, and Mitigation Measures Plan (Appendix C-5). These EPMs are:

PAC-7 All greater sage-grouse leks determined to be within 1 mile of the centerline of the Project would be surveyed using protocols, which have been approved by federal and state agencies, during the breeding season immediately prior to construction to determine whether the lek is active. The Proponents will provide survey results to the appropriate land-management agency.

PAC-8 There would be no construction activities through Idaho's Key and Restoration greater sage-grouse habitats and Wyoming's Core habitats within 1 mile of active leks from March 1 to May 15 between 6 p.m. and 9 a.m. Off-limit areas would be marked so that workers in the area are aware of these sensitive areas.

PAC-9 If no lek activity has been observed by April 25, construction activities may proceed.

PAC-10 Surface disturbance would be prohibited year-round within 0.25 mile of previously documented leks.

PAC-11 Notification would also be placed in areas frequented by on-site personnel (such as break rooms) to advertise the importance of complying with these restrictions.

PAC-12 Temporal and spatial restrictions do not apply when lek or nesting and brood rearing habitat is separated from Project activities by other forms of human disturbance (e.g., agriculture, highways) or by line of sight barriers).

As the Proponents have not specified what protocols would be used during pre-construction surveys (see PAC-7), the Agencies have identified TESWL-10.

TESWL-10 Proponents shall provide the Agencies a list of the protocols that the Proponents would use during greater sage-grouse and sharp-tailed grouse pre-construction surveys.

Some of the EPMs proposed by the Proponents include suggested modifications to federal land-management agencies construction timing/seasonal restrictions (state agencies may develop additional restriction on state and private lands; see Appendix I). However, the federal agencies have established procedures for granting exceptions to their stipulations and restrictions, on a case-by-case basis. Therefore, the Agencies do not accept the Proponents' approach to developing an exception to the agencies stipulations and restrictions, and any agency-established exception processes would be followed when requesting an exception. As stated earlier, all agency timing and seasonal restrictions will be followed, unless an exception is granted. The Agencies have developed mitigation measure TESWL-16 for any exceptions to stipulations and restrictions that are approved during the established exception process. In the event an exception is granted, the Agencies would require that monitoring is conducted on federally managed lands to determine lek occupancy, and to ensure that all construction activities cease in active areas. Adherence to the agency stipulations and restrictions would reduce the impacts that the Project's construction could have on the greater sage-grouse.

TESWL-16 Requests for exceptions from greater sage-grouse closure periods and areas must be submitted by the Proponents to the appropriate land-management agency office in which the exception is requested. Established exception processes on federally managed lands must be followed. See WILD-1.

The Agencies have also identified the following mitigation measures, which are required as part of recent published BLM Instructional Memorandums.

TESWL-14 Surface disturbance shall be avoided within 0.6 to 4 miles of occupied or undetermined greater sage-grouse leks from March 15 to July 15 in all portions of the Project except for Nevada. In Nevada, surface disturbance shall be avoided within view of or within 0.3 mile of all leks from March 1 to May 15; and within areas designated by Nevada as greater sage-grouse brood rearing areas from May 15 to August 15.

TESWL-15 There shall be no surface occupancy (NSO) within 0.6 mile of the perimeter of occupied greater sage-grouse leks. "No surface occupancy," as used here, means no surface facilities, including roads, shall be placed within the NSO area. Other activities may be authorized with the application of appropriate seasonal stipulations, provided the resource's protected area is not adversely affected.

No areas that have been officially designated as sage-grouse "Winter Concentration Areas"[8] are known to occur within the Project area; however, if areas that would be

[8] Note that each state (Idaho, Wyoming, and Nevada) may have a slightly different term for "Winter Concentration Area"; therefore, the term "Winter Concentration Area" refer to any area officially designated by the state as crucial to the survival of sage-grouse during the winter.

impacted by the Project are or become designated as Winter Concentration Areas, then the following measure would apply:

TESWL-19 There shall be no surface disturbances within areas designated as Winter Concentration Areas for the greater sage-grouse from November 1 through March 15.

The Project, as currently designed, may not be in compliance with a requirement found in the BLM's RMP for the Green River Management Area, regarding distances between disturbances and leks. The Green River RMP states that:

> *Aboveground facilities (powerlines, storage tanks fences, etc.) are prohibited on or within 1/4 mile of grouse breeding grounds (leks). Placement of facilities, 'on' (very low profile) or below ground, and temporary disruptive activities, such as occur with pipeline construction, seismic activity, etc., could be granted exceptions within 1/4 mile of leks, in certain circumstances.*

An existing access road located within 0.25 mile of a lek would be improved within the Green River Management Area. As a result, the Project may not be in compliance with the Green River RMP. If an exception is not granted for this lek, the Project would either need to be altered so that it is in compliance with the Green River RMP, or the RMP would need to be amended. However, as no tall structures would be located within 0.25 mile of this lek, disturbances would be limited to road improvements, and mitigation as well as seasonal timing restrictions would be applied to limit impacts, it is possible that an exception would be granted.

The Project, as currently designed, may not be in compliance with a requirement found in the Kemmerer RMP regarding the management of the Rock Creek/Tunp area. The Kemmerer RMP states:

> *Manage the Rock Creek/Tunp area of significant resource concern within the objective of preserving and enhancing the critical wildlife habitats and cultural values that occur within the area…No net loss of habitat function allowed from any construction activity within the boundaries of the management area. Successful re-establishment or improvement of habitats could offset any new disturbance areas.*

The Project would cross through the Rock Creek/Tunp management area if Alternatives 4A, 4C, 4E, or 4F are chosen, and construction of the line could result in a net loss of sagebrush habitats in this area. Therefore, the Kemmerer FO would require the following mitigation measure if Alternatives 4A, 4C, 4E, or 4F are selected and a plan amendment to the Kemmerer RMP is approved.

TESWL-23 If the Kemmerer RMP is amended to allow Alternatives 4A, 4C, 4E, or 4F to be selected, existing fences within 1 mile of the portion of the Gateway West Project located on lands managed by the Kemmerer RMP shall be modified with FireFly Grouse Flight diverters (or a similar product) in order to prevent greater sage-grouse mortalities. Additional site-specific reclamation, such as transplanting sagebrush seedlings within previous disturbed habitats, may also be required to off-set the

net loss of sagebrush habitats within the Rock Creek/Tunp management area.

Fences located in sage-brush habitats have been identified as a major cause of mortality for greater sage-grouse, due to these low-flying birds colliding with and becoming entangled within these fences (Stevens 2011); therefore, measures that limit this potential risk could result in a reduction in current greater sage-grouse mortality levels within an area. Therefore, the Agencies and the Proponents may consider applying mitigation measure TESWL-23 Project wide (see the discussion on potential compensatory mitigation located within the following section).

The acreage of impact to suitable habitat by line segment and alternative, based on the preliminary assessment, is listed in Table D.11-5 (Appendix D) and discussed in Section 3.11.2.3. In addition, the acres of impact to Agency-designated greater sage-grouse habitats are listed in Table D.11-14 (in Appendix D). An HEA analysis is currently being conducted, which would assess the habitat services lost by these impacts (see Section 3.11.1.4).

Operations-related Impacts

Table D.11-7 in Appendix D lists the permanent operations impacts, based on the preliminary assessment, that would occur to greater sage-grouse habitat; the impacts by segment and alternative are discussed in detail in Section 3.11.2.3. Due to a lack of available data on the extent and magnitude of indirect impacts that could occur to greater sage-grouse from transmission lines (e.g., the presence of tall structures; UTNR 2010), indirect impacts are assessed in a qualitative manner within this EIS.

Indirect effects to the greater sage-grouse from the Project operations include increased disturbance and poaching along the ROW due to an increase in human activity and access created by the new roads; displacement of greater sage-grouse by species that may benefit from the installation of the powerline; an increase in predation by raptors and ravens (due to an increase in potential perch sites); alteration to habitat due to changes in fire regimes or weed presence/extent; and a potential avoidance of tall transmission structures that could result in an increase in habitat loss and fragmentation (the effects of altered fire regimes and weed presence/extent are discussed in detail within the black-footed ferret section as “impacts that would occur to all species addressed”). Potential direct impacts from Project operations include the effects of the electromagnetic field on sage-grouse and collisions with Project structures.

As was described for the black-footed ferret, the presence of the transmission line could increase both the predation rate and the level of predatory harassment experienced by the greater sage-grouse by increasing or consolidating populations of raptors and ravens along the Project’s route. This effect would be greatest in areas where other tall structures, including distribution and transmission lines, do not currently exist. The distance that these effects could extend from the transmission lines (if they are used as roosting habitat by predatory avian species) depends on the hunting range of the predatory avian species. For example, non-breeding pairs of ravens have been documented to travel an average of 4.3 miles (6.9 kilometers) (up to 38.8 miles [62.5 kilometers]) in Idaho from roost sites to food sources and 16.8 miles (27 kilometers) in Michigan (ranging from 0.5 to 91.3 miles [0.8 to 147.0 kilometers]), with breeding pairs

often traveling up to 0.8 mile (1.3 kilometer) while hunting (Boarman and Heinrick 1999). Golden eagle hunting ranges vary by season and location, but are typically very large (e.g., they can be around 161.6 square miles [260 square kilometers]). To limit the potential risk of increased predation pressures on sensitive prey species, the Agencies have identified TESWL-2 and TESWL-3.

There is a potential risk of avian collisions with transmission lines or other Project-related structures due to the Project's construction and operations, which could result in elevated mortality rates for some avian species. A variety of factors influence avian transmission line collisions: configuration and location of transmission lines; the tendency of specific species to collide with transmission lines; and environmental factors such as weather, topography, and habitat (APLIC and USFWS 2005). Line placement with respect to other structures and topography can influence the collision rate of avian species at a given transmission line. Collisions usually occur near water or migration corridors, and occur more often during inclement weather. Less agile birds, such as heavy-bodied birds or birds that travel in flocks, are more likely to collide with overhead lines because they lack the ability to quickly negotiate obstacles. The risk of greater sage-grouse collisions with transmission structures is very low, due to this species' flight behaviors, which generally involve short, low flights. However, mortalities of greater sage-grouse resulting from collisions have been reported, including three mortalities in Utah (Borell 1939), two mortalities in Idaho (Beck et al. 2006), and two in California (Gardner 2009 as cited in USFW 2010e). Therefore, some greater sage-grouse mortalities resulting from collisions may occur. The presence of guy wires (thin wires that are sometimes used to support tall structures) can increase the risk of avian collisions. The Proponents have developed Avian Protection Plans (see the Proponents' Web sites), which would be implemented to reduce potential risk of avian mortalities. These plans are in compliance with Avian Power Line Interaction Committee (APLIC) suggested practices (see Section 3.10 – General Wildlife and Fish), and includes measures that would be taken if avian mortalities are discovered, and modification and/or additions to the line that can be done if elevated mortalities of avian species are discovered. In addition, the Agencies have identified mitigation measure WILD-7, which would require the use of flight diverters on all guy wires to limit the potential risk of collisions for the greater sage-grouse. Furthermore, the Agencies have identified mitigation measure WILD-3 to ensure that any modifications to the line also be in compliance with APLIC standards.

The BLM's Kemmerer FO has identified the following mitigation measure to further reduce the risk of greater sage-grouse collisions with guy wires on lands they manage:

TESWL-22 No structures that require guy wires would be used in occupied sagebrush obligate habitats within the area managed under the Kemmerer Resource Management Plan.

The risk of greater sage-grouse mortalities occurring as a result of electrocutions is very low. The spacing between phases of the Project's transmission lines is much larger than the wing spans for all avian species. Therefore, electrocution due to the transmission line is not a hazard for the greater sage-grouse. However, the distribution lines that serve the substations could provide an electrocution hazard to the greater

sage-grouse, although this hazard would be minimal due to the limited number of places where new distribution lines would be constructed (at the Creston, Bridger, and Cedar Hill Substations), the short distances that these distribution lines would travel (between 200 to 500 feet), and the fact that these distribution lines would be constructed in accordance with APLIC guidelines (i.e., designed to prevent avian electrocutions).

There are concerns that the greater sage-grouse would avoid areas that contain tall structures, and could be displaced or cease occupying areas near such structures (Braun 2002; Manville 2004; Pitman et al. 2005; Pruett et al. 2008). Many recommendations have been proposed in the current literature as to how to minimize this potential impact. The most commonly cited document (Connelly et al. 2000) recommends that tall structures not be built within 3 kilometers (approximately 1.9 miles) of grouse leks. However, currently there is no anticipation that this avoidance distance will be recommended or required for this proposed Project. Furthermore, as was discussed earlier, leks could not be entirely avoided by this distance due to other Project-related constraints, such as avoiding sensitive resources such as high-altitude mountain habitats that contain species listed under the ESA, or sensitive cultural resources.

Peer reviewed science that demonstrates an avoidance or non-avoidance of tall structures by the greater sage-grouse is either limited, or nonexistent in the current literature. This lack of evidence is related to a lack of peer-reviewed and controlled studies that can differentiate between the impacts related to tall structures and those related to other components of human developments (e.g., noise, human presence), as opposed to a true lack of evidence (UDNR 2010). Although peer reviewed science that demonstrated a clear avoidance of tall structures is lacking for the greater sage-grouse, studies conducted on species that have similar life history traits to the greater sage-grouse (e.g., the lesser and greater prairie-chickens) have shown that use of habitat is reduced when these habitats are located near tall structures (Pitman et al. 2005; Pruett et al. 2008). The possible mechanisms for this reduced use near tall structures could include many factors such as a reduction in shrub cover near disturbances, a potential inherent fear of tall structures by grouse, increased predation rates near these structures, or a reduced recruitment in poor quality habitats due to disturbances resulting in a decline in attendance over time. Pruett et al. (2008) found that lesser and greater prairie-chickens avoided powerlines by at least 330 feet; however, the presence of state highways did not have a statistically significant impact on their distribution and range. Therefore, if the greater sage-grouse has similar responses to disturbances as the lesser and greater prairie-chickens, it is possible that the vegetative clearing for the permanent access roads would not result in habitat fragmentation for sage-grouse species, but that the presence of the transmission structures and line would serve as a form of habitat fragmentation and a barrier to movement. If the response of the greater sage-grouse to transmission lines is similar to those recorded by Pruett et al. (2008) for the lesser and greater prairie-chickens, then edge effects resulting from newly fragmented habitats could extend approximately 330 feet into habitat patches. This would further reduce the available habitat for the greater sage-grouse and possibly isolate subpopulations (see Tables D.10-3 through D.10-5 of Appendix D for the level of fragmentation that would occur due to both the transmission line and the proposed

access roads). However, because the lesser and greater prairie-chickens have different morphology, behavior, seasonal habitat use patterns, and distributions compared to the greater sage-grouse, caution needs to be taken when applying data on the lesser and greater prairie-chickens to the greater sage-grouse (UDNR 2010).

Greater sage-grouse may also avoid areas adjacent to transmission lines due to the presence of an increased electromagnetic field near the line (Balmori and Hallberg 2007, Naugle et al. 2010). Increased electromagnetic fields have been shown to alter the behavior and physiology of avian species (Fernie and Reynolds 2005). Avian species vary in their sensitivity to an altered electromagnetic field; however, current data are lacking regarding its effects on the greater sage-grouse. Section 3.21 – Electrical Environment discusses the strength of the electromagnetic field at varying distances from the Project. The potential impacts of an increased electromagnetic field would be applicable to all avian species addressed within this document; the sensitivity of the various avian species addressed in this document to an increased electromagnetic field is uncertain, with the exception of raptor species, which have been shown to have a low sensitivity to increased electromagnetic fields (Fernie and Reynolds 2005).

Because data regarding avoidance of habitats by the greater sage-grouse due to transmission lines are limited, the Proponents have conducted an independent desktop analysis regarding the longevity of sage-grouse leks adjacent to existing transmission lines in Idaho, to provide additional information regarding this issue (the results of this independent analysis are presented in Appendix C-5). During this desktop analysis, the Proponents were unable to find evidence of lek abandonment or a decrease in lek attendance (within their study area) that can be correlated with distance to existing transmission lines or the number of years since the transmission line was installed. However, the Proponents' desktop analysis is only one study and has not been peer reviewed; it therefore does not provide enough evidence to definitively say that lek abandonment or a decrease in lek attendance will not occur due to this Project. The Proponents' desktop analysis is only presented within this EIS to add additional data to the assessment and discussion of potential impacts. However, the results of this independent desktop analysis are similar to those found by Johnson et al. (2010). Johnson et al. (2010) was also unable to find a relationship between lek counts and the distance between leks and powerlines, but they were able to find evidence of declining lek use at distances up to 18 kilometers (11 miles) from highways and communication towers.

Compensatory mitigation for impacts to greater sage-grouse and their habitats will likely be necessary due to the current declines in their population rates range-wide, the current concerns regarding their status, the magnitude of potential impacts that the Project could have on their habitats, and the impact that their potential ESA listing could have on the economic stability of Wyoming's oil and gas industry. The Proponents have proposed compensatory mitigation for impacts to greater sage-grouse habitat (see Appendix C-5); however, this mitigation plan has been rejected by the federal and state agencies. The agencies have stated that compensatory mitigation cannot be developed until a quantitative assessment of potential impacts has been finalized, because the magnitude of direct and indirect impacts needs to be disclosed for the agencies to determine the level and type of mitigation that would be required. Below is a list of

some of the compensatory mitigation measures that may be considered by the Proponents and the agencies, once a comprehensive quantitative assessment of the Project related impacts that cannot be avoided or minimized is determined (e.g., after the HEA analysis is conducted and a quantitative assessment of the habitat services lost is complete):

- Establishing Conservation Easements;
- Conduct off-site habitat restoration (e.g., sagebrush plantings, conifer removal, forb and grass plantings to increase diversity; or removal of invasive plants);
- Marking existing fences with flight diverters or removal of existing fences;
- Investing in grazing management plans to benefit sage-brush establishment (i.e., compensating landowners for developing grazing management plans that provide greater benefits to sage grouse);
- Reinitiate habitat restoration in areas where other projects/land-managers restoration efforts have failed;
- Burying existing distribution lines that are owned by private landowners (i.e., non-power company lines, such as those that deliver power to private land owners water tanks);

This is not a comprehensive list of the mitigation measures that could be considered. The Proponents and agencies will continue to work together in order to develop measures to mitigate potential impacts that could occur to greater sage-grouse once minimization and avoidance measures have been implemented. Once the HEA has been finalized, a quantitative assessment of the habitat services lost as a result from the Project's construction and operations will be available. Compensatory mitigation will be developed, in coordination with the Proponents and the regulatory agencies, based in part on this assessment. The results of the DDC (which would be available for the Final EIS) would also contribute to the development of the final compensatory mitigation plan by identifying opportunities to minimize the density of disturbances within Core/Key areas.

Based on guidance found in the BLM's Framework for Sage-Grouse Impacts Analysis for Interstate Transmission Lines (BLM 2011a), the final compensatory mitigation plan will need to address the direct loss of birds (equivalent to "take" for an ESA listed species). To accomplish this, it is expected that the Proponents will work closely with the USFWS and state agencies to develop an approach to address loss of birds from Project-related impacts as well as replacement of any lost birds.

Conclusion

Given the extent of the direct and indirect impact on greater sage-grouse and their habitat, as well as the lack of a compensatory mitigation plan that is currently acceptable to both the Proponents and the state and federal agencies, the Project's construction and operations may impact individuals or habitat, and is likely to contribute to a trend toward federal listing or loss of viability for the greater sage-grouse (R4 language). For the same reasons, the Project may adversely impact individuals and is likely to result in a loss of viability in the Planning Area, or cause a trend towards federal listing (R2 language). This threat determination would be revisited once the

compensatory mitigation plan has been developed. It is assumed that the final plan would result in a determination of "not likely to contribute to a trend toward federal listing or loss of viability for the greater sage-grouse." The final compensatory mitigation plan would be included as part of the Final EIS.

Grizzly Bear (*Threatened; Forest Service Sensitive*)

Construction-related Impacts

The Proposed Route would impact a total of about 2,561 acres of land within the range of the Yellowstone DPS; however, no lands would be impacted within the grizzly bear PCA or within areas identified by the USFWS as suitable grizzly bear habitats. The majority of impacts that would occur within the DPS boundary would occur adjacent to Highway 80, Highway 30, and the town of Kemmerer. As was discussed for the gray wolf, due to the limited habitat requirements of the grizzly bear, direct impacts to lands resulting from the Project's construction would not have a measurable effect on this species. However, if bears are present during construction, then construction activities could result in avoidance of the area and/or displacement of bears into adjacent areas. In addition, whitebark pine (an important food source for the grizzly bear) occurs in the upper treeline areas along the Segment 4 Proposed Route and Route Alternatives (within the Kemmerer FO), though the full extent of the stands has not yet been mapped (Means 2010a; Guyon 2009). The extent of these stands and the potential impacts that could occur is currently unknown (see Section 3.7 – Special Status Plants); however, the BLM is currently conducting a whitebark pine and limber pine mapping effort and more detailed information will be incorporated into the Final EIS as it becomes available. In addition, more information regarding the location of whitebark pine in relation to the Project area would be determined during preconstruction surveys and timber cruises. The Agencies have proposed measures to mitigate the potential impacts to whitebark pine (TESPL-1 and TESPL-6). Impacts to whitebark pine stands and individual trees would be avoided to the extent practical, which would limit the impact to potential bear habitat and food sources.

Operations-related Impacts

The transmission line and its associated structures would not likely serve as a barrier or hazard to the grizzly bear; and the operations of the Project are not likely to have a measurable adverse impact to the grizzly bear.

Conclusion

If grizzly bears are present near the Project, then they may avoid areas where construction occurs, which could result in displacement of bears to adjacent habitats. The Project would impact habitats that could be utilized by grizzly bears; however, the Project would avoid impacts to whitebark pine to the extent practical (see mitigation measures TESPL-1 and TESPL-6). Therefore, the Project's construction and operations may affect, but are not likely to adversely affect, the grizzly bear.

Idaho Ground Squirrel (*Northern – Threatened / Southern – Candidate*)

Construction and Operations-related Impacts
No habitat for the northern or southern Idaho ground squirrel exists within the Analysis Area; therefore, Project construction and operations would have no effect on either of these ground squirrel species.

Conclusion
The Project would have no effect on the Idaho ground squirrel, as no habitat for the northern or southern Idaho ground squirrel exists within the Analysis Area

Mountain Plover (*ESA Proposed; Forest Service Sensitive; BLM Sensitive*)

Construction-related Impacts
The potential effects of Project construction on the mountain plover include direct mortality, disturbance, and loss or modification of habitat. In addition, construction-related noise and dust disturbance would also occur, which could potentially make habitat temporarily unsuitable for this species. The mountain plover is a ground nester and is therefore highly sensitive to ground-clearing activities that would occur during Project construction. To limit the potential impacts that could occur to the mountain plover, the Proponents have proposed the following EPMs:

PAC-19 Preconstruction protocol level surveys (USFWS 2002b) will be conducted during the appropriate seasonal timeframe prior to construction in suitable habitat, to identify active nests within 0.25 mile of the ROW. If no nests are found, construction can commence. The Proponents will provide survey results to the appropriate land-management agency.

PAC-20 If an active nest is found during the protocol level surveys, monitoring will be conducted until the young have fledged or the nest fails, whichever occurs sooner, and no surface-disturbing activities will occur within 0.25 mile of the nest while the nest is active.

PAC-21 If no active nests are discovered during the preconstruction surveys (USFWS 2002b), construction will be permitted for the remainder of the nesting season without further monitoring.

Given the EPMs recommended by the Proponents, the likelihood of direct mortality or nest abandonment is negligible. However, some loss of mountain plover habitat would still occur during Project construction. The Agencies have identified mitigation measure WILD-10, which would require that all vegetation clearing be conducted prior to the onset of the avian breeding season, to limit the potential impact of clearing on nesting birds. The acreage of impact to suitable habitat by line segment and alternative is listed in Table D.11-5 of Appendix D and discussed in Section 3.11.2.3.

Some of the EPMs proposed by the Proponents include suggested modifications to federal land-management agencies construction timing/seasonal restrictions. (State agencies may develop additional restriction on state and private lands; see Appendix I.) However, these agencies have established procedures for granting exceptions to their stipulations and restrictions, based on a case-by-case basis. Therefore, the Agencies do not accept the Proponents' approach to developing an exception to the agencies

seasonal constraint; the agencies require that all established exception processes be followed when requesting an exception. As stated earlier, all agency timing and seasonal restrictions will be followed, unless an exception is granted. The Agencies have developed mitigation measure TESWL-12 for any exceptions to seasonal constraints that are approved during the established exception process. In the event an exception is granted, the Agencies would require that monitoring is conducted on federally managed lands to determine mountain plover activity, and to ensure that all construction activities cease in active areas. Adherence to the agency seasonal timing restrictions would reduce the impacts that the Project's construction could have on the mountain plover.

TESWL-12 Requests for exceptions from mountain plover closure periods and areas must be submitted by the Proponents to the appropriate land-management agency office in which the exception is requested. Established exception processes on federally managed lands must be followed (see WILD-1).

Operations-related Impacts

Table D.11-7 of Appendix D lists the permanent operations impacts that would occur to this species. The impacts by segment and alternative are discussed in detail in Section 3.11.2.3.

There is a potential risk of avian collisions with transmission lines or other Project-related structures due to the Project construction and operations, which could result in elevated mortality rates for some avian species (as was discussed for the greater sage-grouse). The mountain plover's potential to collide with transmission lines is uncertain; however, it is a ground nester that hunts ground-dwelling invertebrates, indicating that it is unlikely to collide with transmission lines except possibly during migration (when generally flying at heights higher than would be expected during breeding or hunting). The Proponents have developed Avian Protection Plans (see the Proponents' Web sites), which would be implemented to reduce potential risk of avian mortalities. These plans are in compliance with APLIC suggested practices (see Section 3.10 – General Wildlife and Fish); they include measures to be taken if avian mortalities are discovered, and modification and/or additions to the line that can be done if elevated mortalities of avian species are discovered. While the transmission line and its structures could pose some collision risk, they would not serve as a barrier to this species' movement. In addition, the Agencies have identified mitigation measure WILD-7, which would require the use of flight diverters on all guy wires to limit the potential risk of collisions for the mountain plover.

As was described for the black-footed ferret, the presence of the transmission line could increase both the predation rate and the level of predatory harassment experienced by the mountain plover, by increasing or consolidating populations of raptors and ravens along the Project's route. This could result in an increase in mortality and a reduction of use near the Project. This effect would be greatest in open habitat types where other tall structures, including distribution and transmission lines, do not currently exist. To limit the potential risk of increased predation pressures on sensitive prey species, the Agencies have identified TESWL-2 and TESWL-3.

Conclusion
The Project would impact mountain plover habitat and could result in increased predation pressures; however, EPMs and mitigation measures would be applied to limit the potential impact of the Project on this species. Based on the potential for impacts and the implementation of EPMs and mitigation measures, the Project's construction and operations may impact individuals or habitat, but are not likely to contribute to a trend toward federal listing or cause a loss of viability for the mountain plover (R4 language). For the same reasons, the Project may adversely impact individuals, but is not likely to result in a loss of viability in the Planning Area, nor cause a trend towards federal listing (R2 language). If this proposed species becomes listed prior to the completion of the Project, the provisional threat call would be "may affect, not likely to adversely affect."

Northern Leopard Frog (*ESA Proposed; Forest Service Sensitive; BLM Sensitive*)

Construction-related Impacts
The potential effects of Project construction on the northern leopard frog are similar to those discussed for other riparian-/wetland-dependent species (such as the Columbia spotted frog), and include modifications or impacts to habitat (including alterations to the microclimates of these areas) and direct mortality. To date, the Proponents have not proposed species-specific protection measures for this species; however, the Agencies have developed mitigation measures to protect all aquatic- and riparian-dependent species (discussed in more detail below).

The acreage of impact to suitable habitat, by line segment and alternative for the northern leopard frog is listed within Table D.11-5 of Appendix D and discussed in detail in Section 3.11.2.3. All areas disturbed during construction (with the exception of areas used as permanent access roads, substation footprints, and pole structure bases) would be revegetated following construction in accordance with the Framework Reclamation Plan. However, as was discussed for the Columbia spotted frog, revegetation efforts are aimed primarily at reestablishing herbaceous or shrub cover, reestablishing original site configurations, and preventing erosion, but do not specifically address impacts to riparian zones, or the reestablishment of stream/wetland shade vegetation and/or LWD. Therefore, the Agencies have identified mitigation measures VEG-6, WET-1 through WET-4, TESWL-1, FISH-4, and WQA-1 through WAQ-4 to reduce impacts to riparian/wetland habitats, and have recommended that they be applied Project-wide.

The Medicine Bow Forest Plan requires that "no loss or degradation of known or historical habitat for the boreal toad, wood frog, or northern leopard frog" be allowed. However, the portion of the Project that would cross the Medicine Bow-Routt NFs would impact about 1 acre of mapped northern leopard frog habitat (impacted along Segments 1E and 1W[a]). Therefore, for this NF to grant a ROW permit, the Project would either need to be altered so that it is in compliance with the Forest Plan regarding the boreal toad, wood frog, and northern leopard frog, or the Forest Plan would need to be amended (see Appendix F).

Operations-related Impacts
Operations impacts to the northern leopard frog are similar to those discussed for other wetland- and riparian-dependent species. Permanent habitat loss would primarily be

associated with access roads, transmission pole structures, and substations. For the most part, these would be located outside of wetland and riparian zones. Table D.11-7 of Appendix D lists the operations impacts that would occur to habitat for this species. The impacts by segment and alternative are discussed in detail in Section 3.11.2.3.

The transmission line and its associated structures would not serve as a barrier or hazard to this species; as long as the EPMs and mitigation measures identified above are implemented so that riparian and wetland microclimates are not altered in such a way as to prevent the movement of this species. However, any roads that are constructed within riparian habitats could result in a barrier to movement and could fragment habitat. (See Table D.10-3 of Appendix D for the level of fragmentation that would occur due to proposed access roads.)

Conclusion

The Project would span riparian and wetland areas to the extent practical. Where such areas cannot be avoided, EPM and mitigation measures would be applied to limit potential impacts to riparian- and wetland-dependent species. Based on the potential for impacts and the implementation of EPMs and mitigation measures, the Project may adversely impact individuals, but is not likely to result in a loss of viability in the Planning Area, nor cause a trend towards federal listing (R2 language). If this proposed species becomes listed prior to the completion of the Project, the provisional threat call would be "may affect, not likely to adversely affect."

Piping Plover (*Threatened*), Interior Least Tern (*Endangered*), and Whooping Crane (*Endangered*)

Construction and Operations-related Impacts

The piping plover, least tern, and whooping crane are located well downstream of any Project-related activity. Project-related actions that may affect local conditions (e.g., change in riparian habitat, sediment, accidental toxicant spills) would have no effect on these downstream habitats because the system where these species reside would be unchanged from local conditions. However, the Project would use water for dust control at about 14,700 to 23,000 gallons per day during construction (see Section 3.16 – Water Resources). While no direct effects to these listed bird species would result from Project-related actions, the tiered BO of the USFWS on the Platte River system indicates that any depletion from this system would result in a "may affect, likely to adversely affect" determination for these species, and a "may affect, not likely to adversely modify critical habitat" determination for the ESA-designated critical habitat (see discussion of the PRRIP in Section 3.11.1.3). The Proponents intend to draw this water from existing developed industrial water rights (i.e., purchasing existing water rights and only drawing water in accordance with these existing water rights); therefore, if the entirety of this water use was diverted from existing rights, with no water depletion, then the Project would have no effect on the aforementioned species. However, at this time it is uncertain if the Proponents would be able to purchase enough existing water rights to cover the Project's needs, and as such, all of the water withdrawal may not come from existing rights. Therefore the Project would result in a "may affect, likely to adversely affect" determination for the piping plover, least tern, and whooping crane and

a “may affect, not likely to adversely modify critical habitat” determination for whooping crane designated critical habitat.

Conclusion
As it is possible that the Project would not be able to purchase enough existing water rights to cover the extent of estimated water withdrawals from the Platte River system, the Project may affect and is likely to adversely affect the piping plover, least tern, and whooping crane, and may affect, not likely to adversely modify critical habitat for whooping crane designated critical habitat.

Wyoming Toad (*Endangered*)

Construction and Operations-related Impacts
No habitat for the Wyoming toad exists within the Analysis Area and the Project does not cross any historical or current distributions; therefore, construction and operations would have no effect on this listed species.

Conclusion
The Project would have no effect on the Wyoming toad, because habitat for this species does not exist within the Analysis Area.

Yellow-Billed Cuckoo (*Candidate; Forest Service Sensitive*)

Construction-related Impacts
The potential effects of Project construction on the yellow-billed cuckoo include loss or modification of habitat, disturbance due to construction activities, and direct mortality. The Proponents have not proposed species-specific EPMs for the yellow-billed cuckoo; however, the Agencies have developed mitigation measures to protect all aquatic- and riparian-dependent species (discussed in more detail below)

Habitat for the yellow-billed cuckoo consists of riparian zones that contain mature or late-successional cottonwood stands with dense understories of willow and dogwood. Suitable habitat for the yellow-billed cuckoo has been mapped within the Analysis Area (see Section 3.11.1.4). Habitats suitable for the yellow-billed cuckoo are not abundant within the Analysis Area as much of the remaining cottonwood riparian zones are too narrow in width to support the yellow-billed cuckoo. The acreage of impact to suitable habitat by line segment and alternative is listed in Table D.11-5 (Appendix D) and discussed in Section 3.11.2.3. As was discussed for the Columbia spotted frog, revegetation efforts are aimed primarily at reestablishing herbaceous or shrub cover, reestablishing original site configurations, and preventing erosion, but do not specifically address impacts to riparian zones, or the reestablishment of stream/wetland shade vegetation and/or LWD. Therefore, the Agencies recommend the implementation of additional mitigation measures, which are discussed below.

As was discussed for the Columbia spotted frog, there is a very low possibility that the transmission line structures would be placed in riparian habitat; however, the Proponents may propose one or more access roads that cross riparian habitat. To the extent feasible, such crossings should be avoided. If unavoidable, the Agencies have identified mitigation measures VEG-6, WET-1 through WET-4, TESWL-1 to reduce impacts to riparian habitats, and recommends that they be applied Project-wide.

Impacts to nesting birds would be minimized through implementation of mitigation measure WILD-10, while impacts to snag habitats would be minimized through the implementation of mitigation measure WILD-11. In addition, the following mitigation measure is required to comply with the ESA and would be applied Project-wide, regardless of land ownership:

TESWL-13 A preconstruction survey for the yellow-billed cuckoo must be conducted at any proposed crossing of suitable habitat. If birds are detected within 1 mile of the centerline (within existing habitat), construction must not occur until the young have fledged or the nest is abandoned. The crossing-specific plan must contain proposed monitoring measures to ensure compliance with this measure.

Operations-related Impacts

As stated earlier, permanent habitat loss would be associated with access roads and tower bases; however, these facilities/structures would be located outside of riparian/wetland areas whenever possible. Any roads that are constructed within riparian habitats could fragment riparian habitat, resulting in further loss of suitable habitat due to edge effects (see Table D.10-3 of Appendix D for the level of fragmentation that would occur due to proposed access roads and Section 3.10.2.2 for a general discussion of habitat fragmentation). Table D.11-7 in Appendix D lists the permanent operations impacts that would occur to this species; the impacts by segment and alternative are discussed in detail in Section 3.11.2.3.

Additional impacts resulting from the Project's operations would include the potential for collisions with transmission lines or structures (as was discussed for the greater sage-grouse). A variety of factors influences avian transmission line collisions: configuration and location of transmission lines; the tendency of specific species to collide with transmission lines; and environmental factors such as weather, topography, and habitat (APLIC and USFWS 2005). Line placement with respect to other structures and topography can influence the collision rate of avian species at a given transmission line. Collisions usually occur near water or migration corridors, and occur more often during inclement weather. Less agile birds, such as heavy-bodied birds or birds that travel in flocks, are more likely to collide with overhead lines as they lack the ability to quickly negotiate obstacles. The yellow-billed cuckoo's tendency to collide with transmission structures is uncertain; however, it is likely limited due to their preference for dense riparian habitats, which indicates that they are adapted to negotiating around obstacles while in flight, and would not typically fly into open areas where conductors or transmission towers would be located. To reduce the risk of collision with conductors that cross riparian areas, the Proponents have proposed the option of installing flight diverters in specific locations (see the Avian Protection Plans on the Proponents' Web sites). The types of flight diverters that are currently under consideration within the Proponents' Avian Protection Plans include a bird flight diverter type that consists of a rubber coil wrapped around the wires and held in place by the Heliformed rod gripping section; a target type (Cat. ID 41701) that consist of a hanging orange target that is attached to the conductor (up to 2.5 inches diameter) by means of a jaw clamp; and a FireFly (Cat. ID 46619) that consist of a hanging fluorescent 3-in-1 color flapper that glows in the dark. The FireFly flight diverter is attached to the conductor (up to 2.5

inches diameter) by means of a jaw clamp. To further reduce the potential for yellow-billed cuckoo collision with conductors, the Agencies have identified mitigation measure WILD-8, which specifies which river crossings would require bird flight diverters (see Table 3.10-3 for a list of the areas requiring flight diverters). In addition, the Agencies have identified mitigation measure WILD-7, which would require the use of flight diverters on all guy wires. Although the transmission line and its structures would cause some risk of collisions, they would not serve as a barrier to movement for the yellow-billed cuckoo.

Conclusion

The Project would span riparian and wetland areas to the extent practical. Where such areas cannot be avoided, EPMs and mitigation measures would be applied to limit potential impacts to riparian and wetland dependent species. Based on the potential for impacts and the implementation of EPMs and mitigation measures, the Project's construction and operations may impact individuals or habitat, but are not likely to contribute to a trend toward federal listing or cause a loss of viability for the yellow-billed cuckoo (R4 language). For the same reasons, the Project may adversely impact individuals but is not likely to result in a loss of viability in the Planning Area, nor cause a trend towards federal listing (R2 language).

Federal ESA Invertebrate Species

There are five federally listed and one recently delisted aquatic invertebrate species found within the Analysis Area that could be affected by the Project's construction and operations: the Utah valvata snail (Endangered); Bliss Rapids snail (Threatened); Jackson Lake springsnail (delisted); Banbury Springs limpet (Endangered); Snake River physa snail (Endangered); and Bruneau hot springsnail (Endangered). However, the transmission line would span the recovery area of only four of these six species (Bliss Rapids snail, Jackson Lake springsnail, Snake River physa snail, and Utah valvata snail), and no roads are currently proposed across these areas.

Construction-related Impacts

The potential effects of Project construction on these aquatic invertebrates would be similar to those discussed for the Columbia spotted frog, and could include impacts or modification of habitat as well as direct mortality. However, direct impacts to these species are unlikely because no road crossings are currently proposed through ESA-listed aquatic invertebrate habitats, and the transmission line itself would only span habitats for the Bliss Rapids snail, Jackson Lake springsnail, Snake River physa snail, and Utah valvata snail. Transmission poles would not likely be constructed within river or spring habitats, as avoiding placing poles within these areas is a standard engineering practice. In addition, no river crossing by roads are proposed directly upstream of these habitats during wet conditions; therefore, there are no Project-related upstream actions that would impact habitats for these listed aquatic invertebrates. However, the spanning of these river habitats by the transmission line could result in some loss of forested riparian vegetation due to the ROW clearing (see Section 3.6 – Vegetation Communities), which could result in a potential increase in temperatures and soil erosion in forested habitats. The transmission line could span these species habitats along three segments of the Snake River: at RM 541.5, RM 573.5, and RM 624.0. However, the spanning at RM 573.5 (an area that supports the Bliss Rapids

snail, Snake River physa snail, and Utah valvata snail) is the only one that would occur within forested habitats, while the other two would occur along shrublands or agricultural areas, where tree heights and vegetative cover would not be impacted. The ROW maintenance that would occur along the spanning of RM 573.5 would remove trees from the ROW, which could have localized impacts to stream temperatures (erosion would be controlled per measures discussed in the following paragraphs). Because stream temperature is constantly striving to gain equilibrium with air temperature, influences of direct solar radiance can be substantial, and the removal of forested vegetation can increase the amount of solar radiation the reaches a stream's surface. However, even though gaps in canopy cover can result in an immediate increase in stream temperature, stream temperatures do not continue to increase at an accelerated rate as canopy cover resumes downstream (Danehy 2005). Vegetation removal associated with the transmission line's crossings in forested settings is expected to be minimal and localized, with no substantial contribution to increasing stream temperatures in downstream portions of the recovery area.

To date, the Proponents have not proposed species-specific EPMs for these aquatic invertebrates, but have proposed measures to restore shrub and herbaceous vegetation, and reduce erosion. As was discussed for the Columbia spotted frog, revegetation efforts are aimed primarily at reestablishing herbaceous or shrub cover, reestablishing original site configurations, and preventing erosion, but do not specifically address impacts to riparian zones, or the reestablishment of stream/wetland shade vegetation and/or LWD. Therefore, the Agencies recommend the implementation of additional mitigation measures, which are discussed below.

Sedimentation to waterbodies adjacent to construction areas would be controlled through implementation of the Proponents' SPCC Plan (Appendix C-1, Attachment C); as would the prevention of accidental spills of toxic materials into waterbodies by requiring that toxic materials such as oil and fuel be keep at varying distances, required by the various land-management agencies, away from waterbodies and wetlands. Mitigation measures VEG-6, and WET-1 through WET-4 (as identified by the Agencies) would reduce impacts to riparian habitats due to loss of vegetation. If impacts are unavoidable, the Agencies have identified TESWL-1 to further reduce potential impact to wetland- and riparian-dependent species.

Road crossings of rivers and springs would be avoided to the extent practical in all areas, and no road crossings are currently proposed for ESA-listed aquatic invertebrate species habitats. However, if on-site construction conditions change and a road crossing is needed across these habitats, crossings could result in direct mortality due to crushing of snails by construction equipment, and would result in a short-term increase in sedimentation, which could impact these species through burial of eggs, or mortality of their algae food supplies. These effects would impact species living both at the point where sedimentation increased (at the road crossing) and at points farther downstream, thereby affecting species whose recovery area may not be crossed by the Project (such as the Banbury Springs limpet or the Bruneau hot springsnail). To limit the potential impact of road crossings on aquatic resources, the Agencies have identified mitigation measures WQA-1 through WQA-4, which establish requirements

regarding road crossing designs and implementation. However, as stated earlier, no crossings of these species habitats by roads are currently proposed.

Operations-related Impacts

Permanent loss of habitat during Project operations would be minimal due to the limited scope of initial impact and the restoration efforts aimed at restoring and revegetating riparian/wetland habitats following construction. Permanent loss of ESA-listed aquatic invertebrate habitat would be associated with the ROW maintenance adjacent to waterbody crossings in forested habitats (along the Snake River RM 573.5), as no road crossing are currently proposed.

Clearing of vegetation and weed control near riparian crossings would be conducted primarily via mechanical methods; however, some herbicides may be used. If herbicides are used inappropriately near waterbodies, they can enter the water column through direct contact, spray drift, or leaching through the soils or groundwater, and can adversely impact aquatic life. To prevent adverse impact to aquatic life resulting from potential herbicide use, the Proponents have proposed the following EPM (which would be applicable to all aquatic species, not just listed invertebrate species):

OM-22 Only herbicides approved by the land-managing agency as safe to use in aquatic environments and reviewed by the Proponents for effectiveness will be used within 100 feet of sensitive aquatic resources.

Once installed, the transmission line and pole structures would not serve as a barrier or hazard to ESA-listed aquatic invertebrates, as the line and its associated structures would not directly impede their aquatic habitats. Currently, no road crossings or their associated culverts are proposed through these habitats; however, if a road crossing becomes necessary due to design changes, they would not serve as a barrier or hazard as long as the culverts are designed and installed correctly. However, poorly designed culverts could result in fragmentation of habitats and isolation of upstream and downstream populations. Therefore, all culverts (both temporary and permanent) would be designed and installed to ensure the continued free flow of water, as well as to allow both the upstream and downstream movement of aquatic organisms (the number of culverts that would be installed per segment is shown in Table D.16-1 of Appendix D). The Proponents would conduct construction and decommissioning of culverts under a Construction General Permit required for stormwater operations, which includes the development of BMPs to protect surface water from stormwater runoff. BMPs would also be employed to minimize sedimentation to waterbodies due to construction activities. All culverts that are not necessary for operation of the Project would be removed in accordance with the Proponents' Traffic and Transportation Plan (TR-19, see Appendix C-1, Attachment A). In addition, culverts would be inspected regularly (permanent culverts inspected annually during operation) to make sure that they are not plugged and are functioning properly. The Proponents' responsibility for inspecting culverts, as well as conducting all necessary repairs, would continue as long as the culverts are present within the watershed (this would continue for the life of the Project for permanent culverts). The BLM and Forest Service have specific requirements regarding culvert design and installation on lands they manage. The Proponents would consult with the Forest Service and BLM prior to construction, regarding design, layout,

and decommissioning requirements for each temporary and permanent culvert that would located on federal lands. All culverts located on federal lands would be constructed in accordance with the applicable federal agency's management plan standards. In all other areas where more restrictive regulations are not in place, the culvert specifications outlined in Appendix B would be used. To further reduce the risk to aquatic organisms created by the use of culverts, the Agencies have identified mitigation measures FISH-1, FISH-2, WQA-2, WQA-3, and WQA-4 to ensure culverts are designed and installed properly, and have recommended that they be applied Project-wide. Again, no road crossings or culverts are currently proposed through ESA-listed aquatic invertebrate habitats; however, these BMPs, mitigation measures, and construction design requirements would ensure that culverts would not impede the movement of, or fragment aquatic habitats for, these listed aquatic invertebrates or other aquatic organisms, if road crossing layouts are changed in the future[9].

Conclusion

No road crossings are proposed within habitats that support listed aquatic invertebrate species; however, ROW maintenance in forested riparian habitats would be conducted along a portion of the Snake River that supports the Bliss Rapids snail, Snake River physa snail, and Utah valvata snail (RM 573.5). EPMs and mitigation measures would be applied to limit potential impacts to riparian- and wetland-dependent species. Based on impacts related to ROW maintenance and the implementation of EPMs and mitigation measures, the Project may affect, but is not likely to adversely affect, these listed aquatic invertebrate species.

Federal ESA Fisheries Species

Colorado River Drainage Fish Species (*Endangered*)

Construction- and Operations-related Impacts

The Colorado pikeminnow, razorback sucker, humpback chub, and bonytail chub are all located in the Colorado River system, but well downstream of any Project-related activities. Project-related impacts that may affect local conditions (e.g., change in riparian habitat, sediment, accidental toxicant spills) would have no effect on these downstream habitats because the system where these species reside would be unchanged from local conditions. However, under the Upper Colorado Endangered Fish Recovery Program, any amount of water removed from the Colorado River system is considered to be a depletion of water. The Project would use water for dust control and concrete with an estimated total of 102.5 million gallons (314.6 acre-feet) for both substation and transmission line construction (see Section 3.16 – Water Resources). While no direct or adverse effects to any of these listed fish species would result from Project-related actions, the tiered BO of the USFWS on the Colorado River system indicates that any depletion from this system greater than 0.1 acre-feet/year would result in a "may affect, likely to adversely affect" determination for the aforementioned species. The Proponents intend to draw this water from existing developed industrial water rights (i.e., purchasing existing water rights and only draw water in accordance with these existing water rights); therefore, if the entirety of this water use was diverted

[9] If road crossing locations are changed so that ESA-listed aquatic invertebrate habitats are impacted, consultation with the USFWS would need to be re-initiated (see discussion in the BA).

from existing rights, with no water depletion, then the Project would have no effect on the aforementioned species. However, at this time it is uncertain if the Proponents would be able to purchase enough existing water rights to cover the Project's needs, and as such, all of the water withdrawal may not come from existing rights. Therefore, the Project would result in a "may affect, likely to adversely affect" determination for these species.

The following mitigation measure is required to comply with the USFWS tiered BO on the Colorado River water withdrawals, and would be applied Project-wide regardless of land ownership. The Proponents have adopted this mitigation measure and have indicated that they will incorporate it into their EPMs and work plan.

TESWL-17 A payment of a one-time fee, based on a fee schedule provided by the USFWS, shall be made based on the amount of water used during construction of any segments that cross the Colorado River system.

Conclusion
Because it is possible that the Project would not be able to purchase enough existing water rights to cover the extent of estimated water withdrawals from the Colorado River system, the Project may affect and is likely to adversely affect the Colorado pikeminnow, razorback sucker, humpback chub, and bonytail chub.

Platte River Drainage Fish Species (*Endangered*)

Construction- and Operations-related Impacts
The pallid sturgeon is located in the Platte River drainage, but well downstream of any Project-related activities. As was discussed for the Colorado River drainage species, Project-related impacts that may affect local conditions (e.g., change in riparian habitat, sediment, accidental toxicant spills) would have no effect on these downstream habitats because the system where these species reside would be unchanged from local conditions. However, under the PRRIP, water removed from the Platte River system is considered to be a depletion of water and can be considered to have an effect on this species. The Project would use water for dust control and concrete with an estimated total of 102.5 million gallons (314.6 acre-feet) for both substation and transmission line construction (see Section 3.16 – Water Resources). While no direct or adverse effects to this listed fish species would result from Project-related actions, the tiered BO of the USFWS on the Platte River system indicates that any depletion from this systems greater than 0.1 acre-feet/year would result in a "may affect, likely to adversely affect" determination for this species. As was discussed for the Colorado fish species, the Proponents intend to draw this water from existing developed industrial water rights (i.e., purchasing existing water rights and only draw water in accordance with these existing water rights); therefore, if the entirety of this water use was diverted from existing rights, with no water depletion, then the Project would have no effect on this species. However, at this time it is uncertain if the Proponents would be able to purchase enough existing water rights to cover the Project's needs, and as such, all of the water withdrawal may not come from existing rights. Therefore, the Project would result in a "may affect, likely to adversely affect" determination for the pallid sturgeon.

Conclusion
As it is possible that the Project would not be able to purchase enough existing water rights to cover the extent of estimated water withdrawals from the Platte River system, the Project may affect and is likely to adversely affect the pallid sturgeon.

Bull Trout (*ESA Critical Habitat*)

Construction- and Operations-related Impacts
No critical habitat for the bull trout would be crossed by the Proposed Route; however, the transmission line along Alternative 9E (near Node 9n) would span newly proposed bull trout critical habitat. This habitat is located along the Bruneau River, approximately 10 miles south of where this river joins C.J. Strike Reservoir. No road crossings would occur along this critical habitat. In addition, no road crossings would occur directly up or downstream of this spanning of critical habitat. Vegetation adjacent to the area where the transmission line would span this critical habitat has been defined as “Wetland and Riparian” during Project-specific remote sensing, with adjacent areas defined as “Disturbed Sagebrush” (Tetra Tech 2010); therefore, no forested habitat would be impacted and stream temperatures would not be measurably impacted. With the implementation of BMPs outlined in Appendix C, potential impacts from turbidity would be minimal, and short-term.

Conclusion
The Project will not cross critical habitat for the bull trout; however, Alternative 9E would cross a section of newly proposed critical habitat. This crossing would consist of a spanning of the river by the transmission line, with no road crossings proposed. Therefore, the Project would not adversely modify critical habitat for the bull trout.

BLM and Forest Service Sensitive Species

This section addresses potential impacts to BLM and Forest Service sensitive species. As stated earlier, a detailed discussion and individual analysis of potential impacts is limited to five species of mammals and three species of birds. Impacts to the remaining species potentially present within the Analysis Area will be addressed by grouping these species based on their habitat preferences or life history traits, and then discussing the likely impacts to these groups as a whole.

BLM and Forest Service Sensitive Wildlife Species

Bald Eagle (*Forest Service Sensitive; BLM Sensitive*)

Construction-related Impacts
The potential effects of Project construction on the bald eagle include disturbance, loss or modification of habitat, and direct mortality (as discussed earlier, the Bald and Golden Eagle Protection Act and applicable permits are discussed in Section 3.10 – General Wildlife and Fish).

The acreage of impact to nest and winter habitat by line segment and alternative is listed in Table D.11-6 (Appendix D) and discussed in Section 3.11.2.3. Nesting sites are vulnerable to construction disturbances because the adult eagles may abandon the nest during periods of high human activity, resulting in mortality of eggs or nestlings.

The Proponents have proposed the following EPMs to protect bald eagle nesting sites:

PRC-1 A pedestrian or aerial survey of known nest locations within a 1-mile buffer of active Project facilities will be conducted no more than 2 weeks prior to construction. The Proponents will provide survey results to the appropriate land-management agency.

PRC-2 If nesting bald eagles are present, the USFWS will be notified and monitoring will be conducted until the young have fledged or the nest fails, at which point construction can begin.

PRC-3 If no nesting activity has been initiated by April 1, construction will be permitted for the remainder of the nesting season without further monitoring.

In addition, the Proponents have proposed the following EPM to limit the impact on bald eagle wintering roosts:

PRC-4 If roosting activity has been initiated, then no construction will be initiated within the prescribed buffer; however, if no roosting activity has been initiated by January 1, then construction will be permitted for the remainder of the roosting season without further monitoring.

Some of the EPMs proposed by the Proponents include suggested modifications to federal land-management agencies construction timing/seasonal restrictions. (State agencies may develop additional restrictions on state and private lands; see Appendix I.) However, these agencies have established procedures for granting exceptions to their stipulations and restrictions, on a case-by-case basis. Therefore, the Agencies do not accept the Proponents' approach to developing an exception to the agencies seasonal constraint; the agencies require that all established exception processes be followed when requesting an exception. As stated earlier, all agency timing and seasonal restrictions will be followed, unless an exception is granted. The Agencies have developed mitigation measure TESWL-6 for any exceptions to bald eagle seasonal constraints that are approved during the established exception process. In the event an exception is granted, the Agencies would require that monitoring is conducted on federally managed lands to determine nest activity and locations of eagles, and to ensure that all construction activities cease in areas near these active locations. Adherence to the agency seasonal timing restrictions would reduce the impacts that the Project's construction could have on the bald eagle.

TESWL-6 Requests for exceptions from bald eagle closure periods and areas must be submitted by the Proponents to the appropriate land-management agency office in which the exception is requested. Established exception processes on federally managed lands must be followed (see WILD-1).

As discussed earlier, impact values reported within this document are based on indicative engineering. To ensure that the final engineering design is routed to avoid known or newly discovered locations of raptor nests as well as other structures

occupied by sensitive species, the Agencies have identified mitigation measure TESWL-8.

Impacts to nesting birds would be minimized through implementation of mitigation measure WILD-10, while impacts to snag habitats would be minimized through the implementation of mitigation measure WILD-11.

Operations-related Impacts
Table D.11-8 in Appendix D lists the permanent operations impacts that would occur to bald eagle habitat; the impacts by segment and alternative are discussed in detail in Section 3.11.2.3.

The Project's operations could result in a potential for collisions with Project structures, resulting in elevated mortality rates (as was discussed for the greater sage-grouse). Bald eagle mortalities associated with collisions are not typically found during postconstruction mortality monitoring conducted at wind farms, indicating that bald eagles are not prone to colliding with objects (from stationary objects such as those created by this Project, or by moving objects such as the turbine blades of a wind farm; Olendorff et al. 1981). However, one bald eagle mortality (resulting from a collision with a turbine blade) was recently discovered, indicating that collisions can occur for this species (Manville 2010). Measures would be taken during the design and construction of the Project to minimize the risk of avian collisions. River crossings listed in the BLM mitigation measure WILD-8 would be marked with bird flight diverters, reducing potential collision hazard (see Table 3.10-3 for a list of the areas requiring flight diverters). In addition, the Agencies have identified mitigation measure WILD-7, which would require the use of flight diverters on all guy wires. Because of these measures, the transmission line and its structures would not likely serve as a risk or barrier to this species' movement.

Although bald eagles are less likely to collide with powerlines than some other avian species (Olendorff et al. 1981), they are vulnerable to mortality resulting from electrocution by powerlines. Birds are electrocuted when they make contact between two energized conductors or between an energized conductor and any grounded hardware. This is unlikely to occur along the transmission line because the spacing between phases of the Project's transmission lines is much larger than the wing spans for all avian species likely present along the Project; therefore, electrocution due to the transmission line is not a hazard for bald eagles. However, the distribution lines that serve the substations could provide an electrocution hazard to bald eagles, although this hazard would be minimal due to the limited number of places where new distribution lines would be constructed (at the Creston, Anticline, and Cedar Hill Substations), the short distances that these distribution lines would travel (between 200 to 500 feet), and the fact that these distribution lines would be constructed in accordance with APLIC guidelines (i.e., designed to prevent avian electrocutions). In addition, the Proponents have developed Avian Protection Plans (see the Proponents' Web sites), which would be implemented to reduce potential risk of avian electrocution. These plans are in compliance with APLIC suggested practices (see Section 3.10 – General Wildlife and Fish), and include measures to be taken if avian mortalities are discovered, and modification and/or additions to the line that can be made to prevent the use of the line

by avian species. Furthermore, the Agencies have identified mitigation measure WILD-3, to ensure that any modifications to the line are also in compliance with APLIC standards. These measures would reduce the risk of raptor wingspans coming in contact with both lines, or between the lines and conductors, along the distribution lines.

As described in the operations section for the black-footed ferret, the presence of the transmission line and its structures could serve as nesting and perching habitat for raptor species. This could be a beneficial impact to the bald eagle due to the increase in potential perching habitat.

Conclusion

The Project would impact habitats near nests and roosting habitats. However, the Proponent-proposed EPM and agency-required mitigation measures would be implemented to limit the potential impact on this species. Based on the potential for impacts and the implementation of EPMs and mitigation measures, the Project's construction and operation may impact individuals or habitat, but is not likely to contribute to a trend toward federal listing or cause a loss of viability for the bald eagle (R4 language). For the same reasons, the Project may adversely impact individuals, but is not likely to result in a loss of viability in the Planning Area, nor cause a trend towards federal listing (R2 language).

Black-Tailed and White-Tailed Prairie Dog (*Forest Service Sensitive; BLM Sensitive*)

Construction-related Impacts

The potential effects of Project construction on the white- and black-tailed prairie dog include direct mortality, disturbance, and loss or modification of habitat. Prairie dogs and/or their burrows could be crushed by construction equipment and foraging habitat could be impacted during construction. Impacts by segment are found in Table D.11-6 in Appendix D and are discussed in Section 3.11.2.3. Construction-related noise and dust disturbance would also occur during construction, which could potentially make habitat temporarily unsuitable for these prairie dog species. The Proponents have not provided any species-specific EPMs for prairie dogs, although surveys for prairie dog colonies would occur in support of black-footed ferret surveys in non-block-cleared areas. Occupied habitat identified during these surveys would be avoided to the extent practical.

As discussed earlier, impact values reported within this document are based on indicative engineering. To ensure that the final engineering design is routed to avoid known locations of prairie dog towns/colonies as well as other structures occupied by sensitive species, the Agencies have identified mitigation measure TESWL-8.

Operations-related Impacts

The Project's operations would result in some permanent loss of prairie dog habitat. Table D.11-8 in Appendix D lists the permanent operations impacts that would occur to prairie dog habitat; the impacts by segment and alternative are discussed in detail in Section 3.11.2.3.

As was described for the black-footed ferret; once the transmission line is in place, operations impacts to either species of prairie dog would include a possible increase in predation pressure where the Project provides new perching opportunities for raven and

raptor species. This effect would be greatest in areas where other tall structures, including distribution and transmission lines, do not currently exist. An increase in the numbers of predatory bird species, or a consolidation of their populations along transmission lines, could result in an increase in prairie dog mortalities within these areas, as well as a possible increase in harassment of this prey species. This could result in prairie dogs avoiding or abandoning habitat adjacent to areas along the line, due to the presence of tall structures and the potential consolidation of raptor and raven populations. To limit the potential risk of increased predation pressures on sensitive prey species, the Agencies have identified TESWL-2 and TESWL-3.

Conclusion

The Project would impact prairie dog habitat, and could result in increased predation pressures; however, mitigation measures would be applied to limit the potential impact of the Project on this species. Based on the potential for impacts and the implementation of mitigation measures, the Project may adversely impact individuals, but is not likely to result in a loss of viability in the Planning Area, nor cause a trend towards federal listing (R2 language).

Burrowing Owl (*Forest Service Sensitive; BLM Sensitive*)

Construction-related Impacts

The potential effects of Project construction on the burrowing owl include direct mortality, disturbance, and loss or modification of habitat. In addition, as the burrowing owl is a burrow nester it is highly sensitive to ground-clearing activities. The acreage of impact to suitable habitat by line segment and alternative is listed in Table D.11-6 (Appendix D) and discussed in Section 3.11.2.3. To limit potential mortality and disturbance to the burrowing owl due to ground-clearing activities, the Proponents have proposed the following EPM:

PRC-5 Within 30 days prior to construction, protocol level surveys (CDOW 2007) will be conducted in suitable or occupied habitat. Active burrows will be mapped electronically and flagged in the field to determine if transmission line features can avoid burrows. If avoidance is not feasible, construction will not begin until August 16. The Proponents will provide survey results to the appropriate land-management agency.

In addition, the Agencies have identified mitigation measure WILD-10, which would require that all vegetation clearing be conducted prior to the onset of the avian breeding season, to limit the potential impact of clearing on nesting birds.

The Proponent-proposed EPM PRC-5 includes suggested modifications to federal land-management agencies construction timing restrictions (State agencies may develop additional restriction on state and private lands; see Appendix I). However, these agencies have established a procedure for granting exceptions to the stipulations and restrictions, on a case-by-case basis. Therefore, the Agencies do not accept the Proponents' approach to developing an exception to the agencies' seasonal constraint; the agencies require that all established exception processes be followed when requesting an exception. The Agencies have developed mitigation measure TESWL-7 for any exceptions to seasonal constraints that are approved during the established

exception process. In the event an exception is granted, the BLM would require that monitoring is conducted on federally managed lands to determine burrowing owl activity, and to ensure that all construction activities cease in areas near these active locations. Adherence to the agency seasonal timing restrictions would reduce the impacts that the Project's construction could have on the burrowing owl.

TESWL-7 Requests for exceptions from burrowing owl closure periods and areas must be submitted by the Proponents to the appropriate land-management agency office in which the exception is requested. Established exception processes on federally managed lands must be followed (see WILD-1).

Because the burrowing owl does not dig its own burrows, and instead utilizes the abandoned burrows of other burrowing species, any impacts to these other burrowing species could impact the burrowing owl. Therefore, any impacts on prairie dogs (a species that creates burrows that the burrowing owl utilizes) could reduce habitat for future burrowing owl re-introductions; however, the Project is not likely to contribute to a trend toward federal listing or loss of viability for either species of prairie dog (see the impact discussion in the black-tailed and white-tailed prairie dog section).

As discussed earlier, impact values reported within this document are based on indicative engineering. To ensure that the final engineering design is routed to avoid known locations of burrowing owl burrows as well as other structures occupied by sensitive species, the Agencies have identified mitigation measure TESWL-8.

The Project may not be in compliance with a requirement found in the BLM's RMP for the Green River Management Area, regarding raptor nests. The Green River RMP states that:

> *Project components, such as permanent and high profile structures, i.e., buildings, storage tanks, powerlines, roads, well pads, etc. are prohibited within an appropriate distance of active raptor nests. The appropriate distance (usually less than 1/2 mile) will be determined on a case-by-case basis and may vary depending upon the species involved, natural topographic barriers, and line-of-sight distances, etc. Placement of facilities, "on" (very low profile) or below ground, and temporary disruptive activities, such as occur with pipeline construction, seismic activity, etc., could be granted exceptions within 1/2 mile of active raptor nests, in certain circumstances.*

Within the Green River Management Area, the Project would cross within 0.5 mile of known burrowing owl burrows. As a result, the Project may not be in compliance with the Green River RMP. If an exception is not granted for this burrow, the Project would either need to be altered so that it is in compliance with the Green River RMP, or the RMP would need to be amended. However, Project-related disturbances to this burrow are not likely because PRC-5 would ensure that construction near this burrow would not occur until August 16; it is therefore possible that an exception would be granted.

Operations-related Impacts
Table D.11-8 in Appendix D lists the permanent operations impacts that would occur to burrowing owl habitat; the impacts by segment and alternative are discussed in detail in Section 3.11.2.3.

As was described for the black-footed ferret, once the transmission line is in place, operations impacts to the burrowing owl would include a possible increase in predation pressure where the Project provides new perching opportunities for raven and raptor species. This effect would be greatest in areas where other tall structures, including distribution and transmission lines, do not currently exist. An increase in the number of predatory bird species, or a consolidation of their populations along transmission lines, would result in an increase in owl mortalities within these areas, as well as a possible increase in harassment to this prey species. To limit the potential risk of increased predation pressures on sensitive prey species, the Agencies have identified TESWL-2 and TESWL-3.

Another potential impact often associated with linear projects is the disruption and isolation of populations; however, the transmission line itself is not expected to serve as a barrier to movement. In addition, the risk of collisions with transmission structures is very low for the burrowing owl due to its flight behaviors, which are limited to short, low flights. However, roads could potentially serve as a barrier, and could fragment populations and habitat. (See Table D.10-3 of Appendix D for the level of fragmentation that would occur due to proposed access roads, and Section 3.10.2.2 for a general discussion of fragmentation.)

Conclusion
The Project would impact burrowing owl habitat, and could result in increased predation pressures; however, EPMs and mitigation measures would be applied to limit the potential impact of the Project on this species. Based on the potential for impacts and the implementation of EPMs and mitigation measures, the Project may adversely impact individuals, but is not likely to result in a loss of viability in the Planning Area, nor cause a trend towards federal listing (R2 language).

Columbian Sharp-Tailed Grouse (*MIS; Forest Service Sensitive; BLM Sensitive*)

Construction-related Impacts
The potential effects of Project construction on the Columbian sharp-tailed grouse include direct mortality, disturbance, and loss or modification of habitat. The sharp-tailed grouse broods, rears young, and winters within a short distance of the mating grounds; however, dispersal of females from the leks after mating, and locations of brooding, rearing, and wintering activities relative to the lek location are not well known.

As the Columbian sharp-tailed grouse is a ground nester, it is very sensitive to ground-clearing activities that would occur during Project construction. Therefore, the Proposed Route for the Project was designed to avoid all leks by at least 0.25 mile in accordance the BLM RMP requirements for “no surface occupancy” that were in place at the time of initial Project design in 2008; however, the centerline of Alternatives 7C, 7H, and 7I would come within 0.25 miles of one lek each (see Table D.11-10 in Appendix D). In addition, leks were avoided by 0.6 mile to the extent possible, based on the assumption

made at the time of initial Project design (2008) that the "no surface occupancy" requirement would increase from 0.25 mile to 0.6 mile (as of this date, the BLM "no surface occupancy" restriction has been increased to 0.6 mile). However, the Proposed Route and Route Alternatives could not avoid all leks by this distance (see Tables 3.11-4 and Table D.11-10 in Appendix D), due to the need to avoid other sensitive resources (e.g., sensitive cultural resources that are protected by the various SHPOs, or high altitude mountain habitats that contain species listed under the ESA).

Loss of habitat would occur due to direct removal of vegetation, introduction of noxious weeds, fragmentation, edge effects, and potential from altered fire regimes (see further discussion in Section 3.10.2.2). In addition, construction-related noise and dust disturbance would occur, which could potentially make habitat temporarily unsuitable for the Columbian sharp-tailed grouse. Birds could experience direct mortality if construction equipment drives over nests or birds that are hidden in shrub cover. However, as discussed for the black-footed ferret, the Proponents have developed EPMs in their Plan for Operations, Maintenance, and Emergency Response, as well as their Traffic and Transportation Management Plan (see Appendix C) to limit the potential risk of direct vehicular impacts with wildlife. To limit the potential impact to the Columbian sharp-tailed grouse during Project construction, the Proponents have proposed the following EPMs:

PAC-1 All previously identified Columbian sharp-tailed grouse leks within 1 mile of the centerline of the Project will be surveyed during the breeding season (March 15 to June 15) prior to construction to determine if the lek is active. If no lek activity is observed by April 15th, no further restrictions apply for that year. Measures PAC-2, -3, and -4 will not apply if lek is not active. The Proponents will provide survey results to the appropriate land-management agency.

PAC-2 Surface disturbance will be prohibited year-round within 0.25 mile of previously documented leks.

PAC-3 No surface disturbance from 0.25 mile to 0.65 mile of a known active lek from March 1 to June 30. If no lek activity is observed by April 15th, no further restrictions apply for that year. If lek activity is observed, surface disturbance from 0.25 mile to 0.65 mile may not occur until after June 30.

PAC-4 Surface disturbance occurring more than 0.65 mile from the lek may occur at any time.

PAC-5 Notification will be placed in areas frequented by on-site personnel (such as break rooms) to advertise the importance of complying with these restrictions.

As the Proponents have not specified what protocols would be used during pre-construction surveys, the Agencies have identified TESWL-10.

Some of the EPMs proposed by the Proponents include suggested modifications to federal land-management agencies construction timing/seasonal restrictions. (State agencies may develop additional restriction on state and private lands; see Appendix I.)

However, these agencies have established a procedure for granting exceptions to their stipulations and restrictions, on a case-by-case basis. Therefore, the Agencies do not accept the Proponents' approach to developing an exception to the agencies' seasonal constraint; the agencies require that all established exception processes be followed when requesting an exception. As stated earlier, all agency timing and seasonal restrictions will be followed, unless an exception is granted. The Agencies have developed mitigation measure TESWL-9 for any exceptions to seasonal constraints that are approved during the established exception process. If an exception is granted, the Agencies would require that monitoring is conducted on federally managed lands to determine lek occupancy, and to ensure that all construction activities cease in areas near active leks. Adherence to the agency seasonal timing restrictions would reduce the impacts that the Project's construction could have on the Columbia sharp-tailed grouse.

TESWL-9 Requests for exceptions from Columbian sharp-tailed grouse closure periods and areas must be submitted by the Proponents to the appropriate land-management agency office in which the exception is requested. Established exception processes on federally managed lands must be followed (see WILD-1).

The Agencies have identified TESWL-11 to limit the potential impact of the Projects construction of sharp-tailed grouse leks.

TESWL-11 In areas where sharp-tailed grouse leks occur in proximity to greater sage-grouse leks, surface disturbance shall be avoided within 4 miles of occupied or undetermined greater sage-grouse leks from March 1 to July 15. In areas where sharp-tailed grouse leks occur in isolation from greater sage-grouse leks, surface disturbance shall be avoided within 1.2 miles of occupied or undetermined sharp-tailed grouse leks from March 15 to July 15.

The risk of direct mortality would be limited due to the utilization of agency timing restrictions for construction near known breeding grounds (restricting construction to periods outside of the typical breeding season for habitats located within certain distances of leks). However, as some breeding/nesting habitat would still be impacted during the breeding season (in areas far enough from leks that they are not affected by timing restrictions), some direct impacts to birds as well as their breeding habitat could occur. This would result in increased mortality of chicks through both crushing by construction equipment, as well as abandonment by their parents. In addition, flight responses and disturbance would increase the energy costs of both parents and chicks, thereby, adding additional stresses on birds located adjacent to construction activities. However, Project compliance with the agency timing restriction would limit disturbance or displacement of brooding birds as well as impacts to chicks located in breeding habitat around leks, by limiting impacts to only areas outside of agency-designated breeding habitats during the breeding season (thereby reducing the risk of crushing nests or chicks). However, the Agencies have identified mitigation measure WILD-10, which requires that all vegetation clearing be conducted prior to the onset of the avian

breeding season to limit the potential impact of clearing on nesting birds, thereby reducing this risk.

Even with the implementation of the EPMs and mitigation measures listed above, some loss of sharp-tailed grouse habitat would occur during Project construction. The acreage of construction-related impact by line segment and alternative is found in Table D.11-6 in Appendix D and discussed in detail in Section 3.11.2.3. As discussed earlier, all disturbed areas such as the staging areas, fly yards, and the temporary construction areas that are not needed for permanent maintenance would be revegetated following construction in accordance with the Framework Reclamation Plan (see Appendix C-2). However, revegetation in arid landscapes can take many decades to restore to preconstruction conditions, so these impacts would be long-term.

Operations-related Impacts
Table D.11-8 in Appendix D lists the permanent operations impacts that would occur to Columbian sharp-tailed grouse habitat; the impacts by segment and alternative are discussed in detail in Section 3.11.2.3.

The Proponents have proposed the following EPM to reduce impacts of the Project's operation on the Columbian sharp-tailed grouse:

PAC-6 Operation and maintenance activities will be scheduled to avoid working within 0.65 mile of previously documented leks from March 15 to July 15.

This measure is equivalent to the recommendations made in the *Guidelines for Management of Columbian Sharp-Tailed Grouse Habitats* (Giesen and Connelly 1993).

As was described for the black-footed ferret, the presence of the transmission line could increase both the predation rate and the level of predatory harassment experienced by sharp-tailed grouse by increasing or consolidating populations of raptors and ravens along the Project's route. This could result in an increase in mortality and a reduction of use near the Project. This effect would be greatest in areas where other tall structures, including distribution and transmission lines, do not currently exist. To limit the potential risk of increased predation pressures on sensitive prey species, the Agencies have identified TESWL-2 and TESWL-3.

The potential impact to the Columbian sharp-tailed grouse related to collisions and electrocutions, as well as the measures that would be taken to reduce this risk, would be similar to that discussed above for the greater sage-grouse.

There are concerns that the sharp-tailed grouse might avoid areas with tall structures, and would therefore be displaced or cease occupying areas near the Project. Sharp-tailed grouse have been found to be somewhat tolerant of disturbances and tall structures, and were found to display on traditional lek sites after the construction of structures such as houses (Baydack et al. 1987). However, only limited studies have been conducted on this species, and the results of lek abandonment studies conducted on similar species (lesser and greater prairie-chicken) have demonstrated that use may become reduced near tall structures (Pitman et al. 2005; Pruett et al. 2008). The possible mechanisms for this reduced use near tall structures could include many factors such as a reduction in shrub cover near disturbances, a potential inherent fear of

tall structures by grouse, increased predation rates near these structures, or a reduced recruitment in poor quality habitats due to disturbances. Pruett et al. (2008) found that lesser and greater prairie-chickens avoided transmission powerlines by at least 330 feet; however, the presence of state highways did not have a statistically significant impact on their distribution and range. Therefore, it is possible that the vegetative clearing for the permanent access roads would not result in habitat fragmentation for grouse species, but that the presence of the transmission structures and line would serve as a form of habitat fragmentation and a barrier to movement. If the response of the Columbian sharp-tailed grouse to transmission lines is similar to those recorded by Pruett et al. (2008) for the lesser and greater prairie-chicken, then edge effects resulting from newly fragmented habitats could extend approximately 330 feet into habitat patches. This would further reduce the available habitat for the Columbian sharp-tailed grouse and possibly isolate subpopulations. (See Tables D.10-3 through D.10-5 of Appendix D for the level of fragmentation that would occur due to both the transmission line and the proposed access roads.)

Conclusion

The Project would impact sharp-tailed grouse habitat, and could result in increased predation pressures; however, EPMs and mitigation measures would be applied to limit the potential impact of the Project on this species. Based on the potential for impacts and the implementation of EPMs and mitigation measures, the Project's construction and operation may impact individuals or habitat, but is not likely to contribute to a trend toward federal listing or cause a loss of viability for the sharp-tailed grouse (R4 language). For the same reasons, the Project may adversely impact individuals, but is not likely to result in a loss of viability in the Planning Area, nor cause a trend towards federal listing (R2 language).

Preble's Meadow Jumping Mouse (*Forest Service Sensitive; BLM Sensitive*)

Construction-related Impacts

The potential effects of Project construction on the Preble's meadow jumping mouse are similar to those discussed for other riparian-/wetland-dependent species, and include modification or impacts to habitat (including alterations to the microclimates of these areas) and direct mortality. To date, the Proponents have not proposed species-specific protection measures for this species or for riparian habitats; however, the Agencies have developed mitigation measures to protect all aquatic- and riparian-dependent species (discussed in more detail below).

The acreage of impact to suitable habitat, by line segment and alternative is listed within Table D.11-6 of Appendix D and discussed in detail in Section 3.11.2.3. All areas disturbed during construction (with the exception of areas used as permanent access roads, substation footprints, and pole structure bases) would be revegetated following construction in accordance with the Framework Reclamation Plan. However, as was discussed for the Columbia spotted frog, revegetation efforts are aimed primarily at reestablishing herbaceous or shrub cover, reestablishing original site configurations, and preventing erosion, but do not specifically address impacts to riparian zones, or the reestablishment of stream/wetland shade vegetation and/or LWD. Therefore, the Agencies have identified mitigation measures VEG-6, WET-1 through WET-4, and

TESWL-1 to reduce impacts to riparian habitats, and have recommended that they be applied Project-wide.

Operations-related Impacts
Operations impacts to this species are similar to those discussed for other wetland- and riparian-dependent species. Permanent habitat loss would primarily be associated with access roads, transmission pole structures, and substations. For the most part, these would be located outside of wetland and riparian zones. Table D.11-8 of Appendix D lists the operations impacts that would occur to this species. The impacts by segment and alternative are discussed in detail in Section 3.11.2.3.

The transmission line and its associated structures would not serve as a barrier or hazard to the Preble's meadow jumping mouse, as long as the EPMs and mitigation measures identified above are implemented so that riparian and wetland microclimates are not altered in such a way as to prevent the movement of this species. However, any roads that are constructed within riparian habitats could result in a barrier to movement and could fragment habitat. (See Table D.10-3 of Appendix D for the level of fragmentation that would occur due to proposed access roads.)

Conclusion
The Project would span riparian and wetland areas to the extent practical. In areas where they cannot be avoided, EPM and mitigation measures would be applied to limit potential impacts to riparian- and wetland-dependent species. Based on the potential for impacts and the implementation of EPMs and mitigation measures, the Project may adversely impact individuals, but is not likely to result in a loss of viability in the Planning Area, nor cause a trend towards federal listing (R2 language).

Pygmy Rabbit (*Forest Service Sensitive; BLM Sensitive*)

Construction-related Impacts
The potential effects of Project construction on the pygmy rabbit include direct mortality, disturbance, and loss or modification of habitat. In addition, construction-related noise and dust disturbance would also occur, which could potentially make habitat temporarily unsuitable for the pygmy rabbit. To limit the potential impact to the pygmy rabbit, the Proponents have proposed the following EPMs:

PMC-4 The year prior to construction, protocol-level surveys (Ulmschneider 2004) would be conducted in suitable habitat (defined by both Project-specific mapping conducted in 2008, and agency habitat mapping) within 300 feet of, and including the ROW. Survey results shall be provided to the appropriate land-management agency. (A distance of 300 feet was chosen because burrow systems have been found to extend to approximately 300 feet [Bradfield 1974].)

PMC-5 During the protocol-level surveys, any areas of occupied habitat will be mapped with a GPS unit. No surface disturbances of active burrows will occur.

PMC-6 Where feasible and if needed, the transmission line would be micro-sited to avoid occupied habitat.

PMC-7 Within 30 days prior to construction, previously occupied habitat would be re-visited to document presence using protocol-level surveys (Ulmschneider 2004). Occupied habitat would be re-mapped electronically and flagged in the field to allow additional micro-siting to avoid the occupied habitat to the extent possible.

Even with the implementation of the mitigation measure and EPMs listed above, some loss of pygmy rabbit habitat would occur during Project construction and possible mortality of individual rabbits or burrow damage could occur if micro-siting were not feasible. The acreage of impact to suitable habitat, by line segment and alternative, is listed within Table D.11-6 of Appendix D, and is discussed in detail in Section 3.11.2.3.

As discussed earlier, impact values reported within this document are based on indicative engineering. To ensure that the final engineering design is routed to avoid known or newly discovered locations of rabbit burrows as well as other structures occupied by sensitive species, the Agencies have identified mitigation measure TESWL-8.

Operations-related Impacts
Table D.11-8 of Appendix D lists the permanent operations impacts that would occur to this species. The impacts by segment and alternative are discussed in detail in Section 3.11.2.3.

As was described for the black-footed ferret, the presence of the transmission line could increase both the predation rate and the level of predatory harassment experienced by pygmy rabbits, by increasing or consolidating populations of raptors and ravens along the Project's route. This could result in an increase in mortality and a reduction of use near the Project. This effect could be greatest in areas where other tall structures, including distribution and transmission lines, do not currently exist. To limit the potential risk of increased predation pressures on sensitive prey species, the Agencies have identified TESWL-2 and TESWL-3.

The Project itself would not likely serve as a barrier to movement for this species, but could result in a hazard, due to increase in the predation rate and the level of predatory harassment near the line.

Conclusion

The Project would impact pygmy rabbit habitat, and could result in increased predation pressures; however, EPMs and mitigation measures would be applied to limit the potential impact of the Project on this species. Based on the potential for impacts and the implementation of EPMs and mitigation measures, the Project's construction and operation may impact individuals or habitat, but is not likely to contribute to a trend toward federal listing or cause a loss of viability for the pygmy rabbit (R4 language).

Wyoming Pocket Gopher (*Forest Service Sensitive; BLM Sensitive*)

Construction-related Impacts
The potential effects of Project construction on the Wyoming pocket gopher include direct mortality, disturbance, and loss or modification of habitat. Quantifying this potential effect is problematic because the distribution of this species and the location of

its habitat are uncertain. The closest known occurrence of a Wyoming pocket gopher near the Analysis Area was from 1976, and was located approximately 0.5 mile north from Segment 3 (WYNDD 2008). The Proponents have proposed the following species-specific EPMs for the Wyoming pocket gopher, to reduce or limit the impact to this species from Project-related activities:

PMC-8 Protocol level surveys (Keinath and Beauvais 2006) would be conducted within suitable habitat in Segments 2, 3, and 4, in order to determine species presence in areas that could be impacted by Project components. Proponents will provide survey results to the appropriate land-management agency.

PMC-9 All ground disturbances would be avoided where the Wyoming pocket gopher is documented.

Even with the implementation of the EPMs listed above, some loss of Wyoming pocket gopher habitat could occur during Project construction. The WYNDD has mapped the likely locations of suitable habitat for the Wyoming pocket gopher. Table D.11-6 (Appendix D) lists the construction-related impacts that would occur to this mapped suitable habitat. By implementing EPM PMC-8, additional data regarding the location of this species and its habitat would be gained prior to construction, and EPM PMC-9 would avoid direct disturbance to these areas.

Operations-related Impacts

Table D.11-8 of Appendix D lists the permanent operations impacts that would occur to this species. The impacts by segment and alternative are discussed in detail in Section 3.11.2.3.

The Proponents have proposed the following EPM to reduce the impacts of Project operation on the Wyoming pocket gopher:

PMC-10 Previously documented occurrences of the Wyoming pocket gopher would be avoided during operation and maintenance activities.

If the Wyoming pocket gopher is present near the Project, the transmission line and its associated structures are not expected to serve as a barrier to movement or a hazard to this species. However, roads could potentially serve as barriers, and could fragment populations of Wyoming pocket gopher if they bisect populations. (See Table D.10-3 of Appendix D for the level of fragmentation that would occur due to proposed access roads).

Conclusion

The Project could impact this species if it is present near construction areas; however, EPMs would be applied to determine the location of this species and limit the potential impact of the Project on this species. Based on the potential for impacts and the implementation of EPMs, the Project may adversely impact individuals, but is not likely to result in a loss of viability in the Planning Area, nor cause a trend towards federal listing (R2 language).

BLM and Forest Service Sensitive Fish Species

Sensitive Trout Taxa (Redband trout, Westslope Cutthroat Trout, Yellowstone Cutthroat Trout, Colorado River Cutthroat Trout, Bonneville Cutthroat Trout, Fine-Spotted Trout) (Forest Service Sensitive; BLM Sensitive; see Table D.11-2 of Appendix D)

Construction-related Impacts

The potential effects of the Project's construction on all trout taxa would be similar, as the life history and habitat requirements are generally similar among these fish. These species generally require clear, cold water for rearing, clean gravel for spawning in the spring, and a diverse habitat structure when present in streams. Therefore they are sensitive to the same general impacts that could result from Project activities. Any differences in impacts would primarily occur due to each species distribution in relation to the Project.

Habitat for the Yellowstone cutthroat trout would be crossed by the Project within the Snake River drainage above Shoshone Falls; in addition, Alternative 7H and 7I would cross through Cassia Creek and Trout Creek, which contains one of the last remaining Yellowstone cutthroat populations in this region. Habitat for the Colorado River cutthroat trout would be crossed along the Green River. Habitat for the Bonneville cutthroat trout would be crossed along the Bear River drainage. Habitat for the redband trout, westslope cutthroat trout, and fine-spotted trout would be crossed along the various rivers and streams found within the Snake River drainage.

The Project's effects that were discussed in Section 3.10 – General Wildlife and Fish would apply to these trout taxa. As discussed earlier, road crossings would result in the greatest impact to aquatic resources; the number of stream crossings by roads is listed in Table D.16-1 of Appendix D. (Note that the potential network of access roads is preliminary at this time and would be revised as engineering is completed; therefore, the exact location of crossings are unknown at this time.) Impacts from road crossings would include increased sediment to streams from areas where roads cross streams (possibly causing local displacement of fish), reduced benthic food organisms, reduced spawning gravel quality, reduced organic input (reducing the availability of potential food supplies), and a future loss of LWD (resulting in reduced stream habitat quality). Along forested areas, a reduction of riparian vegetation and trees may cause a slight localized increase in temperature (immeasurable on most perennial streams) as stream temperature dynamics in forested settings can be strongly regulated by shade. These impacts would be greatest along small, slow-moving waterbodies. Removal of vegetation and direct solar radiance can result in high local temperature increases. As stream temperature is constantly striving to gain equilibrium with air temperature, influences of direct solar radiance can be substantial. However, even though gaps in canopy cover can result in an immediate increase in stream temperature, stream temperatures do not continue to increase at an accelerated rate as canopy cover resumes downstream (Danehy 2005).

Vegetation removal associated with crossings in forested settings is expected to be minimal and localized with no substantial contribution to increasing stream temperatures. However, the majority of the Analysis Area consists of low grassland and shrub environments; therefore, the majority of stream crossings would occur outside of

forested areas. Minimal research has been conducted regarding the effects of riparian vegetation removal on stream temperatures in shrub-steppe ecosystems. Disregarding the influence of groundwater or low-order tributaries, temperatures of streams in shrub-steppe systems can be expected to be generally higher than those of forested systems due to a lack of canopy cover. Furthermore, existing canopy cover likely has a limiting effect on shrub-steppe systems due to its minimal contribution of shade, as shrub canopy cover is typically concentrated only along the edges of a stream (i.e., when the sun is directly overhead it is imparting maximum solar radiance directly onto the middle / deeper portions of the stream). Based on this, riparian vegetation removal in shrub-steppe systems is likely to be insignificant to stream temperature.

To limit the potential impact of road crossings on aquatic resources, the Agencies have identified mitigation measures FISH-1 and FISH-2, as well as WQA-1 through WQA-4, which establish requirements regarding road crossing designs and implementation. They have also developed FISH-4 to prevent the establishment of aquatic invasive species in aquatic habitats. Furthermore, the Agencies have identified FISH-3 to ensure that water withdrawals would not result in direct impacts to fish located adjacent to the withdrawal.

FISH-3 When taking water from TES fish-bearing streams for road and facility construction and maintenance activities, intake hoses shall be screened with the most appropriate mesh size (generally 3/32 of an inch), or as determined through coordination with NMFS and/or USFWS.

No species-specific EPMs have been proposed for any fish species. However, for these fish species and the other species listed in the sections below, most of the potential adverse effects would be reduced through the EPMs and the agencies' required mitigation identified in Section 3.6 – Vegetation Communities, Section 3.8 – Invasive Plant Species, Section 3.9 – Wetlands and Riparian Areas, and Section 3.16 – Water Resources, as well as proper coordination with resource agencies on any construction work conducted in and near streams.

Operations-related Impacts

Culvert installation could impede fish passage if not properly designed and installed. Therefore, all culverts (both temporary and permanent) would be designed and installed to ensure the continued free flow of water, as well as to allow both the upstream and downstream movement of aquatic organisms. (See the discussion on culvert installation requirements found in the ESA aquatic invertebrate species section above.) To further reduce the risk to aquatic organisms created by the use of culverts, the Agencies have identified mitigation measures FISH-1 and FISH-2, as well as WQA-2 through WQA-4 to ensure culverts are designed and installed properly, and have recommended that they be applied Project-wide.

Reduction of habitat quality from loss of LWD, reduced shade, and reduced input of organic matter including insects would continue locally as the ROW would remain cleared in some areas (see Section 3.6 – Vegetation Communities). Road crossings would also remain cleared of vegetation. Roads would continue to contribute sediment to streams, but at a lesser rate than during construction. Clearing of vegetation and weed control near riparian crossings would be conducted primarily via mechanical

methods; however, some herbicides may be used. If herbicides are used inappropriately near waterbodies, they can enter the water column through direct contact, spray drift, or leaching through the soils or groundwater, and can adversely impact aquatic life. To prevent adverse impact to aquatic life resulting from potential herbicide use, the Proponents have proposed EPM OM-22, which would be applicable to all fish and aquatic species, not just sensitive trout species.

With the EPMs and mitigation measures identified above, as well as within Section 3.6 – Vegetation Communities, Section 3.8 – Invasive Plant Species, Section 3.9 – Wetlands and Riparian Areas, and Section 3.16 – Water Resources, the effects to local fish stocks should be minor.

Conclusion

The construction of the Project would reduce instream habitat through road and transmission line construction, and short- and long-term loss of riparian vegetation could reduce habitat quality for sensitive trout. All stream crossings in forested areas would be avoided to the extent practical, and EPM / mitigation measures would be implemented to limit potential impacts to aquatic resources. Based on the potential for impacts and the implementation of EPMs and mitigation measures, the Project's construction and operation may impact individuals or habitat, but is not likely to contribute to a trend toward federal listing or cause a loss of viability for these sensitive trout species (R4 language). For the same reasons, the Project may adversely impact individuals, but is not likely to result in a loss of viability in the Planning Area, nor cause a trend towards federal listing (R2 language).

Shoshone and Wood River Sculpins (*Forest Service Sensitive; BLM Sensitive*)

Construction-related Impacts

These two species are found near the same region of south-central Idaho but in slightly differing habitats. The Shoshone sculpin is primarily found in cool water springs (e.g., water temperature of 14°C) along the north side of the Snake River, although they may be present in small streams that lead to the Snake River in this region as well. The Wood River sculpin is found farther north in the Wood River system, typically at higher elevations. Habitat for both of these species could be crossed by the Proposed Route or Route Alternatives, but it is not clear if the Project would actually cross a location where they could be present because of their limited site-specific distribution information, and the fact that the exact location of road crossings are unknown at this time. However, both species are known to prefer cool water, so actions that can increase water temperature (such as ROW clearing and road construction) could be a detriment to their habitat. However, this portion of the transmission line is generally not wooded so reduction of shade trees from construction appears unlikely; therefore, there would be limited effects on temperature. Also, for Shoshone sculpin, their reliance on springs indicates that they rely on stream habitat that is temperature-controlled by groundwater, which is less affected by local cover; therefore, Project-related effects resulting from temperature increases on habitat appear unlikely. Because of limited riparian vegetation to be removed near their habitat in this region, little or no effect on organic stream input would occur.

The sensitivity of these species to turbidity and changes in water quality is uncertain (as this has not been well studied), but their sensitivity and the impact of the Project on these species due to potential water quality issues would likely be similar to those discussed for the sensitive trout taxa. In addition, the mitigation measures discussed for trout species would be applicable for all aquatic organisms.

Operations-related Impacts
Operations impacts for these two species would be similar to those identified for the sensitive trout taxa.

Conclusion
The construction of the Project could potentially reduce in-stream habitat quality through road and transmission line construction. All stream crossings in forested areas would be avoided to the extent practical, and EPM / mitigation measures would be implemented to limit potential impacts to aquatic resources. Based on the potential for impacts and the implementation of EPMs and mitigation measures, the Project's construction and operation may impact individuals or habitat, but is not likely to contribute to a trend toward federal listing or cause a loss of viability for these sensitive sculpin species (R4 language).

Minnows: Roundtail, Northern Leatherside, Lake and Sturgeon Chubs and Finescale Dace (*Forest Service Sensitive; BLM Sensitive*)

Construction-related Impacts
These minnows are all generally small, mostly cool-water fish, that are found most often in streams and rivers; they vary in location along the Proposed Route and Route Alternatives by species. The roundtail chub is found only in the Colorado drainage (on the eastern portion of the Project) including the Green River, which is crossed by the Proposed Route and Route Alternatives. The northern leatherside chub is a small fish found in the Bear, Snake, and Colorado River drainages within medium-size streams (including Good Creek and Raft River). The other three species are found in the eastern portion of the route, with the lake chub and sturgeon chub in portions of the North Platte River located in the Analysis Area, and the finescale dace also located in the North Platte River but likely outside of the Analysis Area.

The roundtail chub tends to occur in medium to larger rivers, often in more turbid water. It is not restricted to exclusively cool-water conditions; therefore, effects of loss of riparian habitat on stream temperatures would have no effect on this species. As they are often found in turbid waters, potential short-term increases in turbidity would also have no effect on this species. However, this species is dependent on LWD; therefore, the loss of riparian vegetation located directly adjacent to the stream crossing could have localized impacts to this species. These impacts would be limited by the presence of LWD that would originate from trees located directly upstream of the crossing, but adjacent LWD input would not completely eliminate this impact.

The northern leatherside chub tends to occur in medium-sized rivers that contain low water velocities, intermediate depths, and a low level of turbidity (UDWR 2009). They can tolerate a wide range of temperatures, but are typically associated with streams that contain healthy riparian vegetation and intact streambanks. Therefore, potential

impacts to steam temperatures resulting from vegetation removal would have little or no effect on this species, but the loss of riparian vegetation and the potential short-term increases in turbidity could impact this species. Impacts would be similar to those discussed for trout species.

Sturgeon chub tend to occur in medium to large rivers. They are more common in warm water than the other minnows of concern in the Analysis Area and also differ by preferring turbid water conditions. Thus, modification of riparian conditions or slight additions of turbidity from construction should have no adverse effect to this fish.

Lake chub and finescale dace are more often found in small spring-fed streams in this region. Should the route cross streams where these species are present, effects would be similar to those discussed for trout species, except for loss of riparian cover effects on temperature, which would be less for these species. In addition, their habitat use of spring-fed streams would make changes in temperature from riparian vegetation removal even more unlikely. As noted for trout species, effects would also be inconsequential due to the small area affected per stream crossing.

The mitigation measures discussed for trout species would be applicable for all aquatic organisms.

Operations-related Impacts
Operations impacts for these two species would be similar to those identified for the sensitive trout taxa.

Conclusion
The construction of the Project could potentially reduce in-stream habitat quality through road and transmission line construction. Impacts for some species would also include local temperature increase and loss of LWD input. All stream crossings in forested areas would be avoided to the extent practical, and EPM / mitigation measures would be implemented to limit potential impacts to aquatic resources. Based on the potential for impacts and the implementation of EPMs and mitigation measures, the Project's construction and operation may impact individuals or habitat, but is not likely to contribute to a trend toward federal listing or cause a loss of viability for these sensitive minnow species (R4 language). For the same reasons, the Project may adversely impact individuals, but is not likely to result in a loss of viability in the Planning Area, nor cause a trend towards federal listing (R2 language).

Bluehead, Flannelmouth, and Mountain Suckers (*Forest Service Sensitive; BLM Sensitive*)

Construction-related Impacts
Bluehead and flannelmouth suckers tend to occupy larger streams, although the flannelmouth sucker may be present in smaller streams. Both feed primarily on stream bottoms. The flannelmouth is restricted to the Colorado River basin and may be in some of the larger streams crossed by the Proposed Route and/or Route Alternatives (see Table D.11-2 in Appendix D). The bluehead sucker is found in several drainages including the Colorado and upper Snake Rivers. This species is typically found in turbid or muddy waters. Neither species is restricted to cold-water systems. Unlike trout, sediment runoff is unlikely to have any effect on these species as they are adapted to

larger turbid waters. Loss of riparian habitat may reduce organic input to the stream systems they occupy, but these effects would be slight and unsubstantial. The mountain sucker prefers clear, cool, small- to medium-sized rivers and would be commonly present in the central portion of the route (western Wyoming to eastern Idaho) where these conditions occur. While they prefer cooler conditions, they are moderately tolerant of warmer conditions. Also they are often associated with cover in streams. In many ways construction effects to this sucker species would be similar to those for trout, although effects to spawning would be less, as this species would be less sensitive to changes in stream temperatures. Overall, loss of cover and organic input where riparian vegetation is removed and slight increases in turbidity would have slightly adverse effects in localized areas of their habitat, but overall effects to the species would be inconsequential.

The mitigation measures discussed for trout species would be applicable for all aquatic organisms.

Operations-related Impacts
Operations impacts for these three species would be similar to those identified for the sensitive trout taxa.

Conclusion
The construction of the Project and its operation and maintenance would potentially reduce riparian organic input quantity. All stream crossings in forested areas would be avoided to the extent practical, and EPM / mitigation measures would be implemented to limit potential impacts to aquatic resources. Based on the potential for impacts and the implementation of EPMs and mitigation measures, the Project may adversely impact individuals, but is not likely to result in a loss of viability in the Planning Area, nor cause a trend towards federal listing (R2 language).

BLM and Forest Service Sensitive Species Discussed as Groups

The remaining BLM and Forest Service sensitive species with the potential to occur within the Analysis Area are discussed here. They have been grouped based on their habitat preferences. To enhance the readability of this section, the scientific names of the species listed in this section will not be presented here, but can be found within Table D.11-2 of Appendix D.

<u>Shrub-Steppe/Mixed Grass Prairie Species</u>

The BLM or Forest Service sensitive mammalian species that inhabit shrub-steppe / mixed grass prairie habitat types and could potentially occur within the Analysis Area include the American marten, black-tailed prairie dog, dark kangaroo mouse, Idaho pocket gopher, kit fox, Merriam's ground squirrel, pygmy rabbit, Piute ground squirrel, swift fox, white tailed prairie dog, Wyoming ground squirrel, and Wyoming pocket gopher (see Table D.11-2 in Appendix D).

The BLM or Forest Service sensitive avian species that inhabit shrub-steppe / mixed grass prairie habitat types and could potentially occur within the Analysis Area include the Baird's sparrow, black rosy-finch, black throated sparrow, bobolink, Brewer's sparrow, burrowing owl, chestnut-collared longspur, Columbian sharp-tailed grouse, ferruginous hawk, greater sage-grouse, grasshopper sparrow, loggerhead shrike, long-

billed curlew, McCown's longspur, mountain plover, northern harrier, prairie falcon, sage sparrow, sage thrasher, short-eared owl, Swainson's hawk, vesper sparrow, Wilson's warbler, and the yellow-breasted chat (see Table D.11-2 in Appendix D).

The BLM or Forest Service sensitive reptilian species that inhabit shrub-steppe / mixed grass prairie habitat types and could potentially occur within the Analysis Area include the longnose snake, midget faded rattlesnake, Mojave black collared lizard, and the short-horned lizard (see Table D.11-2 in Appendix D).

Construction-related Impacts

Impacts to these shrub-steppe/mixed grass species would be similar to those discussed for other species that occur in these habitat types (such as the black-footed ferret, prairie dog, and burrowing owl) and would include direct mortality, disturbance, and loss or modification of habitat. Table D.6-2 of Appendix D lists the acres of temporary disturbances to shrub-steppe and grassland habitats that would occur due to Project construction. As discussed earlier, all disturbed areas such as the staging areas, fly yards, and the temporary construction areas that are not needed for permanent maintenance would be revegetated following construction in accordance with the Framework Reclamation Plan (see Appendix C-2). However, revegetation in arid landscapes can take many decades to restore to preconstruction conditions, so these impacts would be long-term.

Construction-related noise and dust disturbance could potentially make currently occupied habitat temporarily unsuitable for these species, and result in abandonment of habitats. If avian species abandon nests due to these construction disturbances or if nests are destroyed during construction, then mortality of chicks would occur. To limit the potential impact of clearing on nesting birds found in shrub-steppe / mixed grass prairie habitat types, the Agencies have identified mitigation measure WILD-10, which requires that all vegetation clearing be conducted prior to the onset of the avian breeding season.

The Proponents have proposed specific EPMs to limit the potential impact to the ferruginous hawk, which is one of the shrub-steppe / mixed grass prairie dependent species. Species-specific EPMs for the burrowing owl, Columbian sharp-tailed grouse, greater sage-grouse, and mountain plover were presented earlier (within their respective sections). The EPMs proposed specifically for the ferruginous hawk are:

PRC-6 A pre-construction pedestrian or aerial survey will be conducted two weeks prior to construction, to identify active nests within 1 mile of the ROW.

PRC-7 If an active nest is present, monitoring will be conducted until the young have fledged or the nest fails, whichever occurs sooner, and no surface-disturbing activities will occur within 1 mile of the nest while the nest is active. Monitors will observe the nests from an appropriate distance to avoid disturbing birds.

PRC-8 If no active nests are detected during the pre-construction surveys construction will occur without further monitoring.

Some of the EPMs proposed by the Proponents include conducting activities near nests at certain times based on survey results instead of on federal land-management agencies construction timing/seasonal restrictions (state agencies may develop additional restriction on state and private lands; see Appendix I). However, the federal agencies have established procedures for granting exceptions to their stipulations and restrictions, on a case-by-case basis. Therefore, the Agencies do not accept the Proponents' approach to developing an exception to the agencies stipulations and restrictions, and any agency-established exception processes would be followed when requesting an exception. As stated earlier, all agency timing and seasonal restrictions will be followed, unless an exception is granted. The Agencies have developed mitigation measure TESWL-20 for any exceptions to stipulations and restrictions that are approved during the established exception process for the ferruginous hawk. If an exception is granted, the Agencies would require that monitoring is conducted on federally managed lands to determine lek occupancy, and to ensure that all construction activities cease in active areas (as outlined in the Proponent's proposed PRC-7 EPM). Adherence to the agency stipulations and restrictions would reduce the impacts that the Project's construction could have on this species.

TESWL-20 Requests for exceptions from ferruginous hawk closure periods and areas must be submitted by the Proponents to the appropriate land-management agency office in which the exception is requested. Established exception processes on federally managed lands must be followed (see WILD-1).

In addition, the Medicine Bow Forest Plan has a set timing restriction when no construction activities are allowed within 0.5 mile of any ferruginous hawk nests that have been active within the last 5 years (from March 1 to July 31), and early entry into these areas is not allowed, regardless of nest activity changes during a single year. Therefore, an exception would not be allowed and these EPMs will not be applied on the Medicine Bow-Routt NFs; all Forest Service seasonal timing restrictions will be adhered to, regardless of nest activity.

If monitoring is conducted (as discussed under PRC-7), it would need to be done in such a way as to prevent abandonment of the nest, as continued monitoring visits to an active nest can disturb nesting birds. Coordination with agencies would be required to determine the appropriate protocols that must be followed to prevent disturbance during monitoring. In addition, monitoring and preconstruction surveys for this and all sensitive species would need to be conducted during the appropriate time of year (these measures would be required for monitoring of all raptor species' nests).

As was discussed for the burrowing owl, the Project may not be in compliance with a requirement found in the BLM's RMP for the Green River Management Area, regarding raptor nests. The Green River RMP states that:

> *Project components, such as permanent and high profile structures, i.e., buildings, storage tanks, powerlines, roads, well pads, etc. are prohibited within an appropriate distance of active raptor nests. The appropriate distance (usually less than 1/2 mile) will be determined on a case-by-case basis and may vary depending upon the species involved, natural topographic barriers,*

> *and line-of-sight distances, etc. Placement of facilities, "on" (very low profile) or below ground, and temporary disruptive activities, such as occur with pipeline construction, seismic activity, etc., could be granted exceptions within 1/2 mile of active raptor nests, in certain circumstances."*

Within the Green River Management Area, the Project would cross within 0.5 mile of 11 known ferruginous hawk nests. As a result, the Project may not be in compliance with the Green River RMP. If an exception is not granted for these nests, the Project would either need to be altered so that it is in compliance with the Green River RMP, or the RMP would need to be amended.

In addition, the Project may not be in compliance with a requirement found in the Kemmerer RMP, regarding tall structures and sagebrush obligate species. The Kemmerer RMP states:

> *Wildlife Management – Avoid new, permanent high-profile structures (higher than 12 feet) within 1 mile of occupied sagebrush obligate habitats unless anti-perch devices are installed. Prohibit new, permanent high-profile structures relying on guy wires for support in these habitats. Exceptions can be made if NEPA analysis shows little or no impact to sagebrush obligate species.*

As structures that rely on guy wires could be used during construction, the Project is not in compliance with the Kemmerer RMP. The Agencies have identified mitigation measure WILD-7, which would require the use of flight diverters on all guy wires to limit the potential for avian collisions. As a result, an exception may be granted; otherwise, the Project would either need to be altered so that it is in compliance with the Kemmerer RMP, or the RMP would need to be amended.

To avoid destroying den sites and injuring or killing individual midget faded rattlesnakes, the Agencies have identified the following mitigation measure:

TESWL-18 Preconstruction surveys for occupied or potential midget faded rattlesnake hibernacula (i.e., rock outcrops with south to east aspect) will be conducted.

As discussed earlier, impact values reported within this document are based on indicative engineering. To ensure that the final engineering design is routed to avoid known or newly discovered structures occupied by sensitive species, the Agencies have identified mitigation measure TESWL-8.

Operations-related Impacts

Table D.6-3 of Appendix D lists the acres of permanent disturbance to shrub-steppe and grassland habitats that would occur due to Project operation. As discussed earlier, permanent loss of potential habitat would be limited due to the efforts proposed to restore and revegetate disturbed habitat following construction (see Appendix C-2).

In addition, once the transmission line is in place, operations impacts to these species could include a possible increase in predation pressure where the Project provides new perching opportunities for raven and raptor species. This effect would only occur to

species that are preyed upon by ravens and raptor species, and would be greatest in areas where other tall structures, including distribution and transmission lines, do not currently exist. An increase in the number of predatory bird species, or a consolidation of their populations along transmission lines, could result in an increase in mortality of prey species within these areas, as well as a possible increase in harassment to prey species. To limit the potential risk of increased predation pressures on sensitive prey species, the Agencies have identified TESWL-2 and TESWL-3.

Impacts to avian shrub-steppe/mixed grass prairie species would also include the risk of collisions with transmission structures and lines (as was discussed for the greater sage-grouse). To reduce the potential for avian collision with conductors, the Agencies have identified mitigation measure WILD-8, which specifies which areas would require bird flight diverters. (See Table 3.10-3 for a list of the areas requiring flight diverters.) The Agencies have also identified mitigation measure WILD-7, which would require the use of flight diverters on all guy wires. In addition, the Proponents have developed Avian Protection Plans (see the Proponents Web sites) that would be implemented to reduce potential risk of avian electrocution. These plans are in compliance with APLIC suggested practices (see Section 3.10 – General Wildlife and Fish), and include measures to be taken if avian mortalities are discovered, and modification and/or additions to the line that can prevent the use of the line by avian species if elevated mortalities of avian species are discovered.

Habitat loss within any habitat type has the potential to result in fragmentation of populations and edge effects. However, due to the limited scope of permanent disturbance that would occur within shrub habitats, fragmentation and edge effects would not likely impact most of the shrub-dependent TES wildlife species considered (with some exceptions; see below). The transmission line itself would span shrub habitats, and no vegetative maintenance of shrub vegetation would be expected to occur below the line. In addition, access roads would be maintained at a width of 8 feet (with herbaceous vegetation likely present along the roads), which would likely not result in the isolation of populations for most shrub-dependent species. However, there are some exceptions to these assumptions, such as the greater sage-grouse and Columbian sharp-tailed grouse, which would likely experience adverse effects of fragmentation and edge effects resulting from the presence of the Project within shrub habitats. (See discussion on impacts to the greater sage-grouse and Columbian sharp-tailed grouse.) Tables D.10-3 through D.10-5 of Appendix D display the level of fragmentation that would occur due to proposed access roads as well as the transmission line itself. (Also see Section 3.10.2.2 for a general discussion of habitat fragmentation.)

Conclusion

The Project would impact shrub-steppe/mixed grass habitats, and could result in increased predation pressures and fragmentation; however, EPMs and mitigation measures would be applied to limit the potential impact of the Project on species that inhabit these habitats. Based on the potential for impacts and the implementation of EPMs and mitigation measures, the Project's construction and operation may impact individuals or habitat, but is not likely to contribute to a trend toward federal listing or cause a loss of viability for shrub-steppe/mixed grass species (R4 language). For the

same reasons, the Project may adversely impact individuals, but is not likely to result in a loss of viability in the Planning Area, nor cause a trend towards federal listing (R2 language).

Forest Species

The BLM or Forest Service sensitive mammalian species that inhabit forest habitat types and could potentially occur within the Analysis Area include the cliff chipmunk, hoary bat, silver-haired bat, and the snowshoe hare (see Table D.11-2 in Appendix D).

The BLM or Forest Service sensitive avian species that inhabit forest habitat types and could potentially occur within the Analysis Area include the boreal owl, Calliope hummingbird, flammulated owl, great gray owl, Hammond's flycatcher, juniper titmouse, Lewis's woodpecker, long-eared owl, mountain quail, northern goshawk, olive-sided flycatcher, pinyon jay, red-naped sapsucker, three-toed woodpecker, Virginia's warbler, and Williamsons sapsucker (see Table D.11-2 in Appendix D).

Construction-related Impacts

Impacts to these forest species would be similar to those discussed for other species that occur in these habitat types and would include direct mortality, disturbance, and loss or modification of habitat. The Project has been routed to avoid forest habitats to the greatest extent practical; however, some forested habitats would be impacted by both forest clearing and vegetation ROW maintenance (see Section 3.6 – Vegetation Communities). Table D.6-2 of Appendix D lists the acres of disturbance to forest habitats that would occur due to construction. These construction disturbances to forested habitats would result in both loss of habitat and disturbance to wildlife species present within adjacent habitats. If avian species abandon nests due to these construction disturbances, then mortality of chicks could occur. To limit the potential impact of clearing on nesting birds found in forested habitat types, the Agencies have identified mitigation measure WILD-10, which would require that all vegetation clearing would be conducted prior to the onset of the avian breeding season. Impacts to snag habitat would be minimized through the implementation of mitigation measure WILD-11.

Revegetation efforts would be conducted in all disturbed forested areas that do not need to be kept clear of trees during Project maintenance (see Section 3.6 - Vegetation Communities); however, as revegetation and/or restoration of disturbed forested habitats could take decades, habitat loss due to construction in forest areas would be a long-term impact.

Typically, forest-dependent species are highly susceptible to habitat fragmentation and edge effects. Although the Project was routed to avoid forested areas to the extent practical, some habitat loss and fragmentation would still occur. This habitat fragmentation and the resulting edge effects would further reduce the amount of available habitat for species that utilize forests, beyond just the direct loss of habitat due to clearing and vegetative maintenance. As seen in Table D.10-5b in Appendix D, forest would be most impacted by fragmentation along the Proposed Route by Segments 1E (with an additional 188 patches created, and an average loss of patch size of 416 acres along the Proposed Route), Segment 1W(a) (with an additional 128 patches created, and an average loss of patch size of 345 acres along the Proposed

Route), Segment 1W(c) (with an additional 128 patches created, and an average loss of patch size of 316 acres along the Proposed Route), and Segment 7 (with an additional 180 patches created, and an average loss of patch size of 5 acres along the Proposed Route).

Some forest-dependent species only occur in mature forests, and are uncommon or absent from younger forests. The extent of mature forests within the Analysis Area is likely limited; however, they could occur. Section 3.6 – Vegetation Communities discusses what constitutes a mature forest and their potential extent within the Analysis Area, as well as the potential impacts that could occur to these forest types.

The Proponents have proposed specific EPMs to limit the potential impact to the flammulated owl (which is one of the forest-dependent species). The EPMs proposed specifically for the flammulated owl are:

PRC-9 Preconstruction protocol level surveys (Forest Service 1993, 2008b) will be conducted during the appropriate seasonal timeframe prior to construction in suitable habitat, to identify active nests within 0.25 of a mile of the ROW. Proponents will provide survey results to the appropriate land-management agency.

PRC-10 If an active nest is found during the protocol level surveys, construction is prohibited within 0.25 mile of the nest until monitoring shows that the young have fledged or the nest fails, whichever occurs sooner.

PRC-11 If no active nests are detected during the preconstruction protocol surveys, construction would occur without further monitoring.

Species-specific EPMs for the northern goshawk are presented in the MIS species section below.

As discussed earlier, impact values reported within this document are based on indicative engineering. To ensure that the final engineering design is routed to avoid known or newly discovered structures occupied by sensitive species, the Agencies have identified mitigation measure TESWL-8.

Operations-related Impacts

Operations impacts to forest species would include loss of habitat from permanent vegetation maintenance in forested habitats (see Section 3.6 - Vegetation Communities), as well as avoidance of edge habitats. Table D.6-3 of Appendix D lists the acres of permanent disturbance to forest habitats that would occur due to Project operation. In addition, any new roads created by the Project could result in increased hunting pressures on forested species; however, construction of roads would be avoided within forested habitats to the extent practical. The Agencies have identified VEG-3 to limit the impact of roads on forest habitats, as well as VEG-6 to ensure the proper revegetation of impacted forested habitats located outside of the permanent maintenance area. However, as revegetation and/or restoration of disturbed forest habitats could take decades, impacts to forest species would be long-term.

Impacts to avian species that inhabit forest would also include the risk of collisions with transmission structures and lines (as was discussed for the yellow-billed cuckoo). To reduce the potential for collision with conductors, the Agencies have identified mitigation measure WILD-8, which specifies which river crossings would require bird flight diverters. (See Table 3.10-3 for a list of the areas requiring flight diverters.) In addition, the Agencies have identified mitigation measure WILD-7, which would require the use of flight diverters on all guy wires. The Proponents have developed Avian Protection Plans (see the Proponents' Web sites), which would be implemented to reduce potential risk of avian electrocution. These plans are in compliance with APLIC suggested practices (see Section 3.10 – General Wildlife and Fish), and include measures to be taken if avian mortalities are discovered, and modification and/or additions to the line that can prevent the use of the line by avian species if elevated mortalities of avian species are discovered.

Conclusion

The Project would impact forest habitats, and could result in increased hunting pressures and fragmentation; however, EPMs and mitigation measures would be applied to limit the potential impact of the Project on species that inhabit these habitats. Based on the potential for impacts and the implementation of EPMs and mitigation measures, the Project's construction and operation may impact individuals or habitat, but is not likely to contribute to a trend toward federal listing or cause a loss of viability for forest species (R4 language). For the same reasons, the Project may adversely impact individuals, but is not likely to result in a loss of viability in the Planning Area, nor cause a trend towards federal listing (R2 language).

Wetland/Riparian Species

The BLM or Forest Service sensitive mammalian species that inhabit wetland and/or riparian habitat types and could potentially occur within the Analysis Area include the Preble's meadow jumping mouse, Preble's shrew, and the river otter (see Table D.11-2 in Appendix D).

The BLM or Forest Service sensitive avian species that inhabit wetland and/or riparian habitat types and could potentially occur within the Analysis Area include the American bittern, American white pelican, bald eagle, black tern, least bittern, long-billed curlew, northern harrier, peregrine falcon, purple martin, sandhill crane, snowy plover, trumpeter swan, white faced ibis, willow flycatcher, and yellow-billed cuckoo (see Table D.11-2 in Appendix D).

The BLM or Forest Service sensitive amphibian and reptilian species that inhabit wetland and/or riparian habitat types and could potentially occur within the Analysis Area include the common garter snake, western ground snake, boreal toad, great basin spadefoot, northern leopard frog, spotted frog, and woodhouse toad (see Table D.11-2 in Appendix D).

Construction-related Impacts

Impacts to these wetland/riparian species would be similar to those discussed for other species that depend upon these habitat types (such as the yellow-billed cuckoo or the

Columbia spotted frog) and include direct mortality, disturbance, and loss or modification of habitat.

The Project was routed to avoid wetland and riparian areas to the extent practical; therefore, these areas are not abundant within the Analysis Area. However, because this Project is approximately 1,103 miles long and crosses through multiple watersheds, some riparian and wetland habitat could not be avoided (see Section 3.9 – Wetlands and Riparian Areas). Impacts to wetland and riparian areas, which would occur due to construction activities, are listed in Table D.9-1 of Appendix D. To limit the potential impact to vegetation clearing in these areas, the Proponents would implement their Framework Reclamation Plan (see Appendix C-2). However, as was discussed for the Columbia spotted frog, revegetation efforts are aimed primarily at reestablishing herbaceous or shrub cover, reestablishing original site configurations, and preventing erosion, but do not specifically address impacts to wetland or riparian zones, or the reestablishment of stream/wetland shade vegetation and/or LWD. Therefore, the Agencies have identified mitigation measures VEG-6, WET-1 through WET-4, TESWL-1, FISH-4, and WQA-1 through WAQ-4 to reduce impacts to wetland and riparian habitats, and have recommended that they be applied Project-wide. However, as revegetation and/or restoration of disturbed forested riparian habitats could take decades, impacts to forest-riparian areas would be long-term.

In addition to direct habitat loss, construction-related noise and dust disturbance could potentially make currently occupied habitat temporarily unsuitable for these species, and result in abandonment of habitats. If avian species abandon nests due to construction disturbances, then mortality of chicks would occur. To limit the potential impact of clearing on nesting birds found in wetland and riparian areas, the Agencies have identified mitigation measure WILD-10, which requires that all vegetation clearing be conducted prior to the onset of the avian breeding season. Impacts to snag habitat would be minimized through the implementation of mitigation measure WILD-11.

Typically, wetland- and forested riparian-dependent species are highly susceptible to habitat fragmentation and edge effects. Although the Project was routed to avoid these areas to the extent practical, some habitat loss and fragmentation would still occur. This habitat fragmentation and the resulting edge effects would further reduce the amount of available habitat for species that utilize these areas, beyond just the direct loss of habitat due to clearing and vegetative maintenance. Tables D.10-3 through D.10-5 of Appendix D display the level of fragmentation that would occur due to proposed access roads and transmission lines.

As discussed earlier, impact values reported within this document are based on indicative engineering. To ensure that the final engineering design is routed to avoid known or newly discovered structures occupied by sensitive species, the Agencies have identified mitigation measure TESWL-8.

Operations-related Impacts

Permanent habitat loss would primarily be associated with access roads; however, for the most part roads would be located outside of riparian zones. Table D.9-2 in Appendix D lists the operations impacts that would occur to riparian habitats.

Impacts to avian wetland/riparian species would also include the risk of collisions with transmission structures and lines (as was discussed for the yellow-billed cuckoo). To reduce the potential for avian collision with conductors, the Agencies have identified mitigation measure WILD-8, which specifies which areas would require bird flight diverters (see Table 3.10-3 for a list of the areas requiring flight diverters). The Agencies have also identified mitigation measure WILD-7, which would require the use of flight diverters on all guy wires. In addition, the Proponents have developed Avian Protection Plans (see the Proponents' Web sites), which would be implemented to reduce potential risk of avian electrocution. These plans are in compliance with APLIC suggested practices (see Section 3.10 – General Wildlife and Fish), and include measures to be taken if avian mortalities are discovered, and modifications and/or additions to the line that can prevent the use of the line by avian species if elevated mortalities of avian species are discovered.

Conclusion

The Project would impact wetland and riparian habitats, and could result in increased predation pressures and fragmentation; however, EPMs and mitigation measures would be applied to limit the potential impact of the Project on species that inhabit these habitats. Based on the potential for impacts and the implementation of EPMs and mitigation measures, the Project's construction and operation may impact individuals or habitat, but is not likely to contribute to a trend toward federal listing or cause a loss of viability for forest species (R4 language). For the same reasons, the Project may adversely impact individuals, but is not likely to result in a loss of viability in the Planning Area, nor cause a trend towards federal listing (R2 language).

Rock, Caves, and Cliff Species

The BLM or Forest Service sensitive species that inhabit rock-, cave-, or cliff-habitat types and could potentially occur within the Analysis Area include the big brown bat, Brazilian free-tailed bat, California myotis, spotted bat, Townsend's big-eared bat, fringed myotis, little brown myotis, long-eared myotis, long-legged myotis, pallid bat, small-footed myotis, western pipistrelle, Yuma myotis, and bighorn sheep (desert and California bighorn sheep; see Table D.11-2 in Appendix D). Some species that utilize rock, cave, or cliff habitats for portions of this life have been discussed in previous habitat summary sections (e.g., the midget faded rattlesnake[10] utilizes rock outcrops for hibernacula and maternity den sites); however, the species discussed under this section are those primarily associated with and/or are specialized for caves or rock habitats that have substantial slopes (i.e., rock or cliff habitats).

Construction-related Impacts

The bat species listed above utilize rock and cliff faces or caves as roosting habitat, as well as buildings and tunnels. Although the locations of caves near the Analysis Area are not explicitly known, it is likely that caves are located near or within the Analysis Area. In Wyoming and southeast Idaho (Segments 1 through 4), there are limestone sedimentary formations that could be suitable for caves, given the right hydrologic regime. In the Snake River Plain of Idaho (Segments 5 through 10), there are vast areas of very recent sheet flow basalt. Prominent features within these basalts are

[10] This species is discussed under the Shrub-Steppe section.

large, often open vertical fractures, as well as lava tubes, that can be many feet in diameter and from several feet to up to several hundred feet long. In addition to cave and rock habitats, these BLM and Forest Service sensitive bat species utilize riparian and grasslands for foraging habitats, which are abundant throughout the Analysis Area.

As the construction of the Project would not directly impact cliff faces or caves, impacts to cave- and cliff-dwelling bat species would be minimal. However, possible impacts could occur if construction-related noise occurs adjacent to occupied structures. In addition, impacts to forested habitats could potentially impact tree day roosting habitats. Additionally, these species may forage for insects in grasslands, riparian areas, and wetlands; however, due to the abundance of grassland habitats in the Analysis Area, and the limited impacts that would occur to riparian and wetland habitats, Project-related effects to bat foraging habitats would be minimal.

Limited winter habitat for bighorn sheep (steep rocky areas) would be impacted along Segments 7 and 9 (see Tables D.10-1, D.10-6, and D.10-8 in Appendix D). Potential impacts to bighorn sheep from Project construction would include vehicle collisions, noise, fugitive dust, habitat loss and alteration, and visual disturbance. Vegetation clearing is not expected to negatively impact big game due to the small amount of habitat affected compared to the large home ranges of this species, and the stimulation of forage growth that vegetation clearing could induce. The Agencies have identified WILD-2 and WILD-1 to limit the potential impacts to big game by establishing speed limits for vehicles, and requiring adherence to time restrictions on construction within winter habitats (see further discussion in Section 3.10.2.2).

As discussed earlier, impact values reported within this document are based on indicative engineering. To ensure that the final engineering design is routed to avoid known or newly discovered structures occupied by sensitive species, the Agencies have identified mitigation measure TESWL-8.

Operations-related Impacts

The Project's operations would have only minimal impacts to cave- and cliff-dwelling bat species, resulting from limited impacts to foraging habitats from permanent Project facilities/components (such as access roads and towers).

The Project's transmission line structures and access roads are not expected to limit the movement or distribution of bighorn sheep because they are likely to readily cross a double-track road or pass under a transmission line. Vehicle use of the roads would be very low; only one vehicle per year is expected in most areas for maintenance activities by Project personnel. To prevent an increase in big game harvest due to unauthorized use of Project-related roads, the Proponents would install gates.

Conclusion

The Project would not directly impact cave or cliff faces habitats, but could have indirect impacts (related to noise) on species that depend on these habitats. In addition, the Project would have limited impacts to winter habitat for bighorn sheep. Based on the potential for impacts and the implementation of EPMs, the Project's construction and operation may impact individuals or habitat, but is not likely to contribute to a trend toward federal listing or cause a loss of viability for the species that inhabit rock, cave,

or cliff habitats (R4 language). For the same reasons, the Project may adversely impact individuals, but is not likely to result in a loss of viability in the Planning Area, nor cause a trend towards federal listing (R2 language).

Invertebrates (Mollusks)

The BLM or Forest Service sensitive aquatic invertebrate species that could potentially occur within the Analysis Area include the California floater, Columbia pebble snail, and shortface lanx (see Table D.11-2 in Appendix D).

Construction-related Impacts

Construction-related impacts to BLM and Forest Service sensitive aquatic invertebrate species would be similar to those discussed previously for the federally listed aquatic invertebrate species.

Impacts to aquatic invertebrate species would be limited, as the transmission line would span aquatic habitats and transmission poles would not be constructed within these habitats. However, construction of access roads and any disturbance to riparian areas during construction could reduce riparian vegetation along the waterbodies; this could increase the temperatures of these waters, resulting in adverse impacts to aquatic species. Table D.9-1 in Appendix D lists the direct construction-related impacts that would occur to riparian habitats.

All areas disturbed during construction (with the exception of areas used as permanent access roads, substation footprints, and pole structure bases) would be revegetated following construction in accordance with the Framework Reclamation Plan. However, as was discussed for the Columbia spotted frog, revegetation efforts are aimed primarily at reestablishing herbaceous or shrub cover, reestablishing original site configurations, and preventing erosion, but do not specifically address impacts to riparian zones, or the reestablishment of stream/wetland shade vegetation and/or LWD. Therefore, the Agencies have identified mitigation measures VEG-6, WET-1 through WET-4, TESWL-1, FISH-4, and WQA-1 through WAQ-4 to reduce impacts to riparian habitats, and have recommended that they be applied Project-wide.

Road crossings of rivers and springs would be avoided to the extent practical; however, any construction of a road crossing would result in a short-term increase in sedimentation, which could impact these species through burial of eggs, or mortality of their alga food supplies. These effects would impact species living both at the point where sedimentation increased (at the road crossing) and at points farther downstream, thereby affecting species that inhabit areas not directly crossed by the Project. In addition, general construction activities adjacent to river systems could result in an increase in short-term sediment loads, due to loss of vegetation and increased runoff. Sedimentation would be controlled through implementation of the Proponents' SPCC Plan (Appendix C-1, Attachment C). In addition, the possibility of a spill of toxic materials into waterbodies would be limited due to the implementation of the Proponents' SWPPP (Appendix C-1, Attachment B).

Operations-related Impacts

Table D.9-2 in Appendix D lists the operations impacts that would occur to riparian habitats. As has been discussed earlier, revegetation efforts outlined in the Proponents'

Framework Reclamation Plan do not specifically address impacts to riparian zones, or the reestablishment of stream/wetland shade vegetation and/or LWD. Therefore, the Agencies have identified mitigation measures VEG-6, WET-1 through WET-4, TESWL-1 to reduce impacts to riparian habitats, and have recommended that they be applied Project-wide. However, as revegetation and/or restoration of disturbed forested riparian habitats could take decades, impacts to species that depend on contiguous riparian habitat (such as these aquatic invertebrates) would be long-term.

Once installed, the transmission line and its associated structures would not serve as a barrier or hazard to aquatic invertebrates, as the line and its associated structures would not cross through their aquatic habitats. In addition, any culverts associated with roads would not serve as a barrier or hazard as long as they are designed and installed correctly; however, poorly designed culverts could result in fragmentation of habitats and isolation of upstream and downstream populations. Therefore, all culverts (both temporary and permanent) would be designed and installed to ensure the continued free flow of water, as well as to allow both the upstream and downstream movement of aquatic organisms (see the discussion on culvert installation requirements found in the ESA aquatic invertebrate species section above). To further reduce the risk to aquatic organisms created by the use of culverts, the Agencies have identified mitigation measures FISH-1 and FISH-2, as well as WQA-2 through WAQ-4, to ensure culverts are designed and installed properly, and have recommended that they be applied Project-wide.

Conclusion

The Project would impact aquatic habitats; however, EPMs and mitigation measures would be applied to limit the potential impact of the Project on aquatic invertebrates. Based on the potential for impacts and the implementation of EPMs and mitigation measures, the Project's construction and operation may impact individuals or habitat, but is not likely to contribute to a trend toward federal listing or cause a loss of viability for aquatic invertebrates (R4 language). For the same reasons, the Project may adversely impact individuals, but is not likely to result in a loss of viability in the Planning Area, nor cause a trend towards federal listing (R2 language).

Invertebrate (Insects)

The BLM or Forest Service sensitive invertebrate insect species that could potentially occur within the Analysis Area include the Bruneau dunes tiger beetle, blind cave leiodid beetle, Mattoni's blue, and the St. Anthony sand dunes tiger beetle (see Table D.11-2 in Appendix D).

Construction-related Impacts

Habitat preferences for Bruneau dunes tiger beetle, blind cave leiodid beetle, and St. Anthony sand dunes tiger beetle are limited to sand dune habitats (for the Bruneau dunes tiger beetle and the St. Anthony sand dunes tiger beetle) and lava tube caves (for the blind cave leiodid beetle). No direct impacts to sand dune or lava tube habitats are expected due to Project construction; therefore, no indirect impacts to these species are anticipated.

The Mattoni's blue in is endemic to Nevada, and is known to occur in Pilot-Thousand Springs, Long-Ruby Valleys, and Bruneau watersheds in Elko County. It is dependent on slender buckwheat (*Eriogonum microthecum laxiflorum*) in that females lay eggs on young flowers, and the larvae feed on pollen and developing seeds (WildEarth 2010). Slender buckwheat grows in mountain habitats above approximately 4,900 feet in elevation. Alternative 7I would impact habitats near the Pilot-Thousand Springs watershed, at elevations capable of supporting slender buckwheat (see Table D.6-2 in Appendix D for acres of impact along this alternative). As the distribution of Mattoni's blue is uncertain, it is possible that it occurs within habitats adjacent to the Pilot-Thousand Springs watershed; therefore, any disturbance to grassland habitats along Alternative 7I could result in the temporary loss of Mattoni's blue larva, as well as limit the abundance of this host plant species on a short-term basis. However, based on the Nevada Natural Heritage database, there are no known occurrences of slender buckwheat within 0.5 mile of the Analysis Area.

Operations-related Impacts

Project operations would have no effect on the Bruneau dunes tiger beetle, blind cave leiodid beetle, and St. Anthony sand dunes tiger beetle, as no suitable habitat for these species would be impacted.

As disturbance in grassland habitats would be allowed to revegetate following construction, with the exception of areas encompassed by permanent Project facilities, long-term impacts to the abundance of Mattoni's blue's host plant (slender buckwheat) would be limited if this host plant species is present within the Analysis Area.

Conclusion

The Project's construction and operations would have no effect on Bruneau dunes tiger beetle, blind cave leiodid beetle, and St. Anthony sand dunes tiger beetle, as no habitats for these species are expected to be directly or indirectly impacted.

The Project would impact habitats that could support the Mattoni's blue's host plant (slender buckwheat); however, impacts would be considered short-term as grassland habitats (located outside of permanent Project facilities) would be allowed to revegetate following construction. Therefore, the Project's construction and operations may impact individuals or habitat, but are not likely to contribute to a trend toward federal listing or cause a loss of viability for the Mattoni's blue.

Forest Service Management Indicator Species

This section addresses potential impacts to Forest Service MIS. As stated earlier, there are 10 MIS that could occur within the Analysis Area, based on presence of suitable habitat or the co-location of the Project within the species range. This includes the American marten, Columbian sharp-tailed grouse, common trout, greater sage-grouse, golden-crowned kinglet, Lincoln's sparrow, northern goshawk, snowshoe hare, three-toed woodpecker, and Wilson's warbler. Impacts to the Columbian sharp-tailed grouse, greater sage-grouse, and the various common trout species are addressed above in the ESA and Sensitive Species sections. The remaining MIS will be discussed here.

American Marten (Medicine Bow Forest Plan MIS; Forest Service Sensitive)

Construction-related Impacts

There are no known occurrences of the American marten within the Analysis Area; therefore, it is possible that this species is not present and would not be affected. However, if it is present, then potential impacts to the American marten would include disturbance due to construction activities and loss or modification of habitat. The American marten is dependent on forested habitats, and the Project has been routed to avoid forest habitats to the greatest extent practical; however, some forested habitats would be impacted by both forest clearing and vegetation maintenance (see Section 3.6 – Vegetation Communities). Table D-6.2 of Appendix D lists the acres of disturbance to forest habitats that would occur due to construction.

As discussed earlier, the American marten is typically associated with mature forests. The extent of mature forests within the Analysis Area is likely limited; however, they could occur. Section 3.6 – Vegetation Communities discusses what constitutes a mature forest and their potential extent within the Analysis Area, as well as the potential impacts that could occur to these forest types.

Operations-related Impacts

Operations impacts to the American marten would include loss of habitat from permanent vegetation maintenance in forested habitats (see Section 3.6 – Vegetation Communities), as well as avoidance of edge habitats. Table D.6-3 of Appendix D lists the acres of permanent disturbance to forest habitats that would occur due to Project operation. In addition, any new roads created by the Project could result in increased hunting pressures (from poaching) on the American marten; however, construction of roads would be avoided within forested habitats to the extent practical. In addition, as discussed for the black-footed ferret, the Proponents have developed a Traffic and Transportation Management Plan (Appendix C-1, Attachment A) that includes measures to prevent unauthorized use of new access roads. The Agencies have identified VEG-3 to limit the impact of roads on forest habitats, as well as VEG-6 to ensure the proper revegetation of impacted forested habitats located outside of the permanent maintenance area. However, as revegetation and/or restoration of disturbed forest habitats could take decades, impacts to forest-dependent species would be long-term.

The American marten is highly sensitive to habitat fragmentation. As a result, habitat loss would extend beyond just the forested habitat that is directly removed during construction and/or maintained clear of trees during operations. Edge effects would reduce the size of patches that the American marten would inhabit. Tables D.10-3a through D.10-5b in Appendix D lists the levels of habitat fragmentation that would occur to forested habitats.

Conclusion

If the American marten is present within or near the Analysis Area, then some negative impacts from the Project's construction and operation would likely occur due to habitat loss, fragmentation of habitats, increased access for hunters, and disturbance due to construction. However, mitigation measures aimed at limited road disturbances in forested habitats and successful revegetation of forested habitats would limit these

impacts. Therefore, the Project is not expected to impact the viability of the American marten.

Golden-Crowned Kinglet (Medicine Bow Forest Plan MIS)

Construction-related Impacts
The golden-crowned kinglet has been observed within the Analysis Area and would likely be affected by the Project to some degree. Impact to this forest-dependent species would include disturbance, and loss or modification of habitat. As was discussed for the American marten, the Project has been routed to avoid forest habitats to the greatest extent practical; however, some forested habitats would be impacted by both forest clearing and vegetation maintenance. To limit the potential impact of clearing on nesting birds, the Agencies have identified mitigation measure WILD-10, which requires that all vegetation clearing would be conducted prior to the onset of the avian breeding season. Impacts to snag habitat would be minimized through the implementation of mitigation measure WILD-11. Table D.6-2 of Appendix D lists the acres of disturbance to forest habitats that would occur due to construction.

Operations-related Impacts
Some permanent habitat loss would occur due to forest clearing and vegetation maintenance (see Section 3.6 – Vegetation Communities). Table D.6-3 of Appendix D lists the acres of permanent disturbance to forest habitats that would occur due to Project operation. Impacts to golden-crowned kinglet would also include the risk of collisions with transmission structures and lines, similar to those discussed for the yellow-billed cuckoo. To reduce the potential for golden-crowned kinglet collision with Project components, the Agencies have identified mitigation measure WILD-8, which specifies the areas that would require bird flight diverters (see Table 3.10-3 for a list of the areas requiring flight diverters). The Agencies have also identified WILD-7, which would require the use of flight diverters on all guy wires, and VEG-6, which would ensure the proper revegetation of impacted forested habitats outside of the permanent maintenance area. However, as revegetation and/or restoration of disturbed forest habitats could take decades, impacts to forest-dependent species would be long-term.

Conclusion
Because the golden-crowned kinglet is present within the Analysis Area, some negative impacts would likely occur to this species, due to the loss of habitat and possibility of collisions with transmission structures/lines. However, these impacts would be limited due to the mitigation measures proposed. Therefore, the Project is not expected to impact the viability of the golden-crowned kinglet.

Lincoln's Sparrow (Medicine Bow Forest Plan MIS)

Construction-related Impacts
There are no known occurrences of the Lincoln's sparrow within the Analysis Area; therefore, it is possible that this species is not present and would not be affected. However, if it is present, then impacts to the Lincoln's sparrow would be similar to those discussed for the yellow-billed cuckoo, and could include loss or modification of habitat, disturbance due to construction activities, and direct mortality.

Habitat for the Lincoln's sparrow consists of riparian areas, which are not abundant within the Analysis Area. Impacts to riparian areas from construction activities are listed in Table D.9-1 of Appendix D. To limit the potential impact to vegetation clearing in these areas, the Proponents would implement their Framework Reclamation Plan. However, as was discussed for the Columbia spotted frog, revegetation efforts are aimed primarily at reestablishing herbaceous or shrub cover, reestablishing original site configurations, and preventing erosion, but do not specifically address impacts to riparian zones, or the reestablishment of stream/wetland shade vegetation and/or LWD. Therefore, the Agencies have identified mitigation measures VEG-6, WET-1 through WET-4, and TESWL-1 to reduce impacts to riparian habitats, and have recommended that they are applied project-wide. However, as revegetation and/or restoration of disturbed forested riparian habitats could take decades, impacts to forest riparian-dependent species would be long-term. In addition, the Agencies have identified mitigation measure WILD-10, which would require that all vegetation clearing would be conducted prior to the onset of the avian breeding season to limit the potential impact of clearing on nesting birds found in forested habitat types. Impacts to snag habitat would be minimized through the implementation of mitigation measure WILD-11.

Operations-related Impacts

Permanent habitat loss would primarily be associated with access roads. For the most part, these would be located outside of riparian zones. Table D.9-2 of Appendix D lists the operations impacts that would occur to riparian habitats.

Impacts to Lincoln's sparrow would also include the risk of collisions with transmission structures and lines, similar to those discussed for the yellow-billed cuckoo; however, this species flies close to the ground, which would reduce the likelihood of collisions with Project components. To further reduce the potential for Lincoln's sparrow collision with conductors, the Agencies have identified mitigation measure WILD-8, which specifies which areas would require bird flight diverters. (See Table 3.10-3 for a list of the areas requiring flight diverters). In addition, the Agencies have identified mitigation measure WILD-7, which would require the use of flight diverters on all guy wires.

Conclusion

If the Lincoln's sparrow is present within or near the Analysis Area, then some negative impacts from the Project's construction and operation would likely occur, due to the loss of habitat and low possibility of co-locations with transmission structures/lines. However, these impacts would be limited due to the mitigation measures proposed. Therefore, the Project is not expected to impact the viability of the Lincoln's sparrow.

Northern Goshawk (Caribou and Medicine Bow Forest Plan MIS; Forest Service Sensitive; BLM Sensitive)

Construction-related Impacts

The northern goshawk is located within the Analysis Area and would likely be affected by the Project to some degree. Impacts to the northern goshawk would be similar to those discussed for the bald eagle, and could include direct mortality, disturbance, and loss or modification of habitat. Nesting sites are vulnerable to construction disturbances because the adult goshawks may abandon the nest during periods of high human activity, resulting in mortality of eggs or nestlings.

There are six known northern goshawks nests that occur within one mile of the Project: two along Segment 1E (one of these nests is also within 1 mile of Segments 1W[a] and 1W[c]), and four along Segment 4 (see Appendix D, Table D.10-2). The two nests along Segment 1E are located on the Medicine Bow-Routt NFs, and the four nests along Segment 4 are located in the Caribou-Targhee NF. The acreages of construction impacts that would occur within 1 mile of a northern goshawk nest are listed in Table D.10-6 (in Appendix D). To limit the potential impact to the northern goshawk, the Proponents have proposed the following EPMs:

PRC-15 Preconstruction pedestrian surveys (USFS 1993, 2008b) will be conducted during the appropriate seasonal timeframe prior to construction in suitable habitat, to identify active nests within 0.5 mile of the ROW within suitable habitat. Proponents will provide survey results to the appropriate land-management agency.

PRC-16 If an active nest is found during the protocol-level surveys, construction is prohibited within 0.25 mile of the nest until monitoring shows that the young have fledged or the nest fails, whichever occurs sooner, and no surface-disturbing activities will occur within 0.5 mile of the nest while the nest is active.

PRC-17 If no active nests are detected during the pre-construction surveys, construction would occur without further monitoring.

Some of the EPMs proposed by the Proponents include conducting activities near nests at certain times based on survey results instead of on federal land-management agencies construction timing/seasonal restrictions (state agencies may develop additional restriction on state and private lands; see Appendix I). However, the federal agencies have established procedures for granting exceptions to their stipulations and restrictions, on a case-by-case basis. Therefore, the Agencies do not accept the Proponents' approach to developing an exception to the agencies stipulations and restrictions, and any agency-established exception processes would be followed when requesting an exception. As stated earlier, all agency timing and seasonal restrictions will be followed, unless an exception is granted. The Agencies have developed mitigation measure TESWL-21 for any exceptions to stipulations and restrictions that are approved during the established exception process for the northern goshawk. In the event an exception is granted, the Agencies would require that monitoring is conducted on federally managed lands to determine lek occupancy, and to ensure that all construction activities cease in active areas (as outlined in the Proponents' proposed PRC-16 EPM). Adherence to the agency stipulations and restrictions would reduce the impacts that the Project's construction could have on this species.

TESWL-21 Requests for exceptions from northern goshawk closure periods and areas must be submitted by the Proponents to the appropriate land-management agency office in which the exception is requested. Established exception processes on federally managed lands must be followed (See WILD-1).

In addition, the Medicine Bow Forest Plan has a set timing restriction when no construction activities are allowed within 0.25 mile of any northern goshawk nests that has been active within the last 5 years (from April 1 to August 30), and early entry into these areas is not allowed regardless of nest activity changes during a single year. Therefore, no exceptions would be granted on NFS lands and these EPMs will not be applied on NFS lands; all Forest Service seasonal timing restrictions will be adhered to, regardless of nest activity.

The Medicine Bow and Caribou Forest Plans have standards and guidelines regarding the northern goshawk that the Project would not comply with (as currently designed). These are as follows:

- **Medicine Bow Forest Plan Standard:** "Within each occupied northern goshawk territory, select three nests and protect 30 acres of dense vegetation surrounding each, defining the boundaries of each area based on habitat quality. If fewer than three nests are found within an occupied territory, substitute 30-acre areas with characteristics of nesting habitat."
- **Medicine Bow Forest Plan Standard:** "Within each occupied northern goshawk territory, designate a northern goshawk post-fledging area of a minimum of 200 acres that includes the three 30-acre nest sites selected. The large tree component within the post-fledging area should include snags, down dead wood, and clumps of trees with interlocking crowns. Within the post-fledging area, prohibit management activities that may degrade goshawk foraging habitat."
- **Caribou Forest Plan Guideline:** Foraging areas on the Caribou-Targhee NF are defined as greater than 5,400 acres areas around nests. Disturbances within these areas that result in new canopy openings must be limited to less than 40 acres.

A historical goshawk nest site on the Medicine Bow-Routt NFs (located between Segments 1W[a] and 1W[c]) was determined to no longer be active during Project-specific surveys (Tetra Tech 2010c); however, these surveys also indicate that the area is still occupied by northern goshawks. Although no active goshawk nests were found near the Project on the Medicine Bow-Routt NFs, surveys have not been completed along all segments that cross this NF (i.e., Segment 1E and Alternative 1E-C). In addition, construction of the Project on the Medicine Bow-Routt NFs would result in loss of suitable goshawk foraging habitat near the historical goshawk nest (within the post-fledging area); this would include about 10 acres of forested habitat impacted within 1 mile of historical nests along Segment 1E, 9 acres along Segment 1W(a), and 7 acres along Segment 1W(c) on the Medicine Bow-Routt NFs. The initial clearing, as well as ROW maintenance, would also remove snags from the immediate footprint of the Project's ROW, thereby further reducing habitat for the northern goshawk (impacts to snag habitat would be minimized through the implementation of mitigation measure WILD-11). In addition, shrub habitats would be impacted near the historical goshawk nest, which may currently serve as hunting habitats for this species. Therefore, the Project is not in compliance with the Medicine Bow Forest Plan goshawk standards. For the Forest Service to grant a ROW permit, the Project would either need to be altered so that it is in compliance with the Medicine Bow Forest Plan standards

regarding the northern goshawk, or the Forest Plan would need to be amended (see Table 2.2-1). In addition, approximately 82 acres of goshawk habitat would be impacted within the 5,400 acres of foraging area on the Caribou-Targhee NF. Because this is greater than the limit of 40 acres, the Project is not in compliance with the Caribou Forest Plan's goshawk guideline; however, plan amendments are not required for guidelines. By not meeting the Caribou Forest Plan's goshawk guideline, the Project could reduce the availability of goshawk habitat within the general area.

As discussed earlier, impact values reported within this document are based on indicative engineering. To ensure that the final engineering design is routed to avoid known locations of raptor nests as well as other structures occupied by sensitive species, the Agencies have identified mitigation measure TESWL-8.

Operations-related Impacts

Table D.11-8 in Appendix D lists the permanent operations impacts that would occur to northern goshawk habitats.

The Project's operations could result in a potential for collisions with transmission lines or structures, resulting in elevated mortality rates for the northern goshawk. To limit this potential effect, the Agencies have identified mitigation measure WILD-8, which requires bird flight diverters to be utilized at locations along the transmission line (see Table 3.10-3 for a list of the areas requiring flight diverters). These areas correspond to locations where avian collisions would be most likely to occur due to site-specific conditions such as terrain or habitat. In addition, the Agencies have identified mitigation measure WILD-7, which would require the use of flight diverters on all guy wires.

In addition to collisions with transmission line and structures, raptors are vulnerable to mortality from electrocution by powerlines. Birds are electrocuted when they make contact between two energized conductors or between an energized conductor and any grounded hardware. The spacing between phases of the transmission lines is much larger than the bird wing spans for all species. Therefore, electrocution due to the transmission line is not a hazard for the northern goshawk. However, the distribution lines that serve the substations could provide an electrocution hazard to northern goshawks, although this hazard would be minimal due to the limited number of places where new distribution lines would be constructed (at the Creston, Bridger, and Cedar Hill Substations), the short distances that these distribution lines would travel (between 200 to 500 feet), and the fact that these distribution lines would be constructed in accordance with APLIC guidelines (i.e., designed to prevent avian electrocutions). In addition, the Proponents have developed Avian Protection Plans (see their Web sites), which would be implemented to reduce potential risk of avian electrocution. These plans are in compliance with APLIC suggested practices (see Section 3.10 – General Wildlife and Fish), and include measures to be taken if avian mortalities are discovered, and modifications and/or additions to the line that can prevent the use of the line by avian species. This would reduce the risk of raptor wingspans coming in contact with both lines, or between the lines and conductors.

Conclusion

Some negative impacts would likely occur to the northern goshawk, due to the location of nests adjacent to the Project, potential for disturbance during construction, loss of

habitat, and the possibility of collisions and electrocutions resulting from the Project's operation. However, these impacts would be limited due to the timing restrictions on construction activities, mitigation measures WILD-7 and WILD-8, and the measures proposed in the Avian Protection Plans. Therefore, the Project is not expected to impact the viability of the northern goshawk.

Snowshoe Hare (Medicine Bow Forest Plan MIS)

Construction-related Impacts

There are no known occurrences of the snowshoe hare within the Analysis Area; therefore, it is possible that this species is not present and would not be affected. However, if it is present, impacts to the snowshoe hare would be similar to those discussed for the pygmy rabbit, and could include disturbance, and loss or modification of habitat. Unlike the pygmy rabbit, however, the snowshoe hare inhabits forest environments, which are not common in the Analysis Area. The Project has been routed to avoid forest habitats to the greatest extent practical; however, some forested habitats would be impacted by both forest clearing and vegetation maintenance (see Section 3.6 – Vegetation Communities). Table D.6-2 of Appendix D lists the acres of disturbance to forest habitats that would occur due to construction. These construction disturbances to forested habitats would result in both loss of habitat and disturbance to wildlife species present within adjacent habitats.

Operations-related Impacts

Operations impacts to the snowshoe hare would include loss of habitat from permanent vegetation maintenance in forested habitats (see Section 3.6 - Vegetation Communities), as well as a possible avoidance of edge habitats created by the clearing of forests for ROW maintenance and road paths. Table D.6-3 of Appendix D lists the acres of permanent disturbance to forest habitats that would occur due to Project operation. In addition, any new roads created by the Project could result in increased hunting pressures; however, construction of roads would be avoided within forested habitats to the extent practical. In addition, as discussed for the black-footed ferret, the Proponents have developed a Traffic and Transportation Management Plan (Appendix C-1, Attachment A) that includes measures to prevent unauthorized use of new access roads. The Agencies have identified VEG-3 to limit the impact of roads on forest habitats, as well as VEG-6 to ensure the proper revegetation of impacted forested habitats located outside of the permanent maintenance area. However, as revegetation and/or restoration of disturbed forest habitats could take decades, impacts to forest-dependent species would be long-term.

Unlike the impacts to the pygmy rabbit (which inhabits shrub and grassland habitats), the snowshoe hare inhabits forested environments; therefore, the presence of the transmission line in not likely to increase the number of perch sites for raptor or raven species, or increase the natural predation rate experienced by this species. In addition, the Project is unlikely to serve as a barrier to movement by this species.

Conclusion

If the snowshoe hare is present within or near the Analysis Area, then some negative impacts from the Project's construction and operations would likely occur due to habitat loss, fragmentation of habitats, increased access for hunters, and disturbance due to

construction. However, mitigation measures aimed at limited road disturbances in forested habitats and successful revegetation of forested habitats would limit these impacts. Therefore, the Project is not expected to impact the viability of the snowshoe hare.

Three-Toed Woodpecker (Medicine Bow Forest Plan MIS; Forest Service Sensitive; BLM Sensitive)

Construction-related Impacts

There are no known occurrences of the three-toed woodpecker within the Analysis Area; therefore, it is possible that this species is not present and would not be affected. However, if it is present, then potential impacts to the three-toed woodpecker would include disturbance due to construction activities and loss or modification of habitat. The three-toed woodpecker is dependent on forested habitats, and the Project has been routed to avoid forest habitats to the greatest extent practical; however, some forested habitats would be impacted by both forest clearing and vegetation maintenance (see Section 3.6 – Vegetation Communities). Table D.6-2 of Appendix D lists the acres of disturbance to forest habitats that would occur due to construction. If woodpeckers are present within these impacted habitats, or if these habitats could serve as potential nesting or foraging habitats in the future, then the Project would result in some loss of woodpecker habitat. Construction activities could also disturb woodpeckers from adjacent habitats, if they are present during these activities. The Agencies have identified mitigation measure WILD-10, which requires that all vegetation clearing be conducted prior to the onset of the avian breeding season to limit the potential impact of clearing on nesting birds found in forested habitat types,. Impacts to snag habitat would be minimized through the implementation of mitigation measure WILD-11.

As discussed earlier, the three-toed woodpecker is typically associated with mature forests. The extent of mature forests within the Analysis Area is likely limited; however, they could occur. Section 3.6 – Vegetation Communities discusses what constitutes a mature forest and their potential extent within the Analysis Area, as well as the potential impacts that could occur to these forest types.

To limit the potential impacts to the three-toed woodpecker, the Proponents have proposed the following EPMs:

PAC-22 Pre-construction protocol level surveys will be conducted during the appropriate seasonal timeframe prior to construction in suitable habitat, to identify active nests within the ROW.

PAC-23 If an auditory response is received and an active nest is found, monitoring will be conducted until the young have fledged or the nest fails, whichever occurs sooner, and no surface-disturbing activities will occur within 0.25 mile of the nest while the nest is active. The Proponents will provide survey results to the appropriate land-management agency.

PAC-24 If no nests are discovered during pre-construction protocol level surveys, construction would be permitted for the remainder of the nesting season without further monitoring.

Operations-related Impacts
The Project would result in some permanent loss of forest habitat (see Table D.6-3 of Appendix D) resulting from vegetation removal and maintenance. The Agencies have identified VEG-6 to ensure the proper revegetation of impacted forested habitats outside of the permanent maintenance area. However, as revegetation and/or restoration of disturbed forest habitats could take decades, impacts to any forest-dependent species would be long-term.

Because the Project would not alter the local fire regime, no impacts to the three-toed woodpecker's food supplies would occur due to the Project's operation.

Conclusion
If the three-toed woodpecker is present within or near the Analysis Area, then some negative impacts from the Project's construction and operation would likely occur, due to the loss of habitat. However, these impacts would be limited due to mitigation measures proposed to restore impacted forest habitats, and the species-specific EPM proposed for this species. Therefore, the Project is not expected to impact the viability of the three-toed woodpecker.

Wilson's Warbler (Medicine Bow Forest Plan MIS)

The Wilson's warbler is known to occur very near the Analysis Area (within 3.3 miles). Potential impacts to the Wilson's warbler would be the same as those described above for the Lincoln's sparrow, as they inhabit similar areas and have similar life history traits (see discussion for the Lincoln's sparrow). The Project is not expected to impact the viability of the Wilson's warbler, due to the EPMs and mitigation measures proposed.

Decommissioning (for all TES species)

All Project facilities that are not utilized for purposes other than the Gateway West Project would be removed at the end of the operational life of the transmission line (e.g., some substations and access roads are utilized for purposes other than this Project, and would therefore remain after the life of this Project). Structures and foundations would be removed to below the ground surface level. They would not be removed in their entirety due to the large ground disturbance this would create. Soil and plants would be restored over the top of these underground foundation surfaces. All revegetation efforts would meet the requirements of the Federal Seed Act and applicable Idaho and Wyoming laws regarding seeds and noxious weeds. The BLM and Forest Service would be given the option of entering into an agreement with the Proponents where the applicable agency would reclaim the portion of roads located on federal land, and the costs of this effort would be reimbursed by the Proponents.

Decommissioning of the Project could result in both temporary adverse effects and long-term beneficial effects to TES wildlife species. Temporary adverse effects would include disturbances to wildlife resulting from the presence of workers and construction equipment necessary for the removal of Project components, increased sedimentation to waterbodies created during road decommissioning or culvert removal, temporary loss of habitat if some vegetation needs to be cleared to remove Project components or temporarily widen roads, and the possibility of direct mortality during decommissioning actions. The extent of adverse impacts would be similar to those discussed for Project construction, and the mitigation measures discussed for construction would be required during

decommissioning. Long-term beneficial effects would include the removal of tall structures (towers) from grouse habitats, and the decommissioning of Project facilities and access roads, both of which could increase the connectivity and size of wildlife habitat. Due to the potential for both adverse and beneficial effects to TES wildlife species, consultation with the USFWS would need to be initiated prior to decommissioning.

3.11.2.3 Proposed Route and Route Alternatives by Segment

Segment 1E

Segment 1E, as proposed, would link the Windstar and Aeolus Substations in south-central Wyoming with a 100.6-mile 230-kV single-circuit transmission line. Twenty acres of the expansion of Windstar and Aeolus Substations and 0.5 acre for one regeneration site are attributed to Segment 1E. Alternative 1E-A is a 16.1-mile alternative along the north end of Segment 1E, which was the Proponents' initial proposal before moving the Proposed Route at the suggestion of local landowners to avoid the more settled area around Glenrock. Alternative 1E-B is 21.4 miles longer than the Proposed Route but is being considered by the Proponents because it would avoid a Wyoming-designated sage-grouse core area to the east. The BLM has required the consideration of Alternative 1E-C, which parallels the Segment 1W 230-kV lines into the Aeolus Substation (see Appendix A, Figure A-2). The most common habitat found along Segment 1E is shrubland (see Section 3.6 – Vegetation Communities).

Of the TES species where quantitative species-specific data are available (see Tables D.11-3 and D.11-4 in Appendix D), the bald eagle, black-tailed prairie dog, burrowing owl, greater sage-grouse, mountain plover, northern goshawk, northern leopard frog, Preble's jumping mouse, and the white-tailed prairie dog could occur along Segment 1E. Tables D.11-3 through D.11-8 in Appendix D list the impacts to habitat for each species found along Segment 1E and its Route Alternatives.

The Proposed Route would impact approximately 16 acres of habitat within 1 mile of two northern goshawk nests (Tables D.10-2 and D.11-6 in Appendix D). The number of nests that occur within 1 mile would drop to a single nest under Alternative 1E-C, with approximately 6 acres of habitat impacted (a 10-acre reduction in impacts compared to the Proposed Route). Alternatives 1E-A and 1E-B do not correspond to the same area along the Proposed Route where impacts would occur, and no additional impacts would occur along these Route Alternatives (i.e., these routes would not increase or decrease impacts to this species compared to the Proposed Route).

Tables 3.11-7a–g display a comparison of the impacts to habitat for the species in which the various Route Alternatives in Segment 1E would have a differential effect, where quantitative data were available, and where the data were detailed enough that the discussion was best summarized in table format. Alternative 1E-A would result in fewer impacts to the black-tailed prairie dog, burrowing owl, greater sage-grouse, mountain plover, and white-tailed prairie dog habitat than the comparison portion of the Proposed Route (i.e., the portion of the Proposed Route that starts and ends at the same nodes as the Route Alternative); however, Alternative 1E-A would increase the acreage of construction impacts to the bald eagle, northern leopard frog, and Preble's jumping mouse habitat. Alternative 1E-B would increase the acreage of impacts to burrowing owl, greater sage-grouse, mountain plover, northern leopard frog, Preble's

jumping mouse, and white-tailed prairie dog habitat. Alternative 1E-C would result in fewer acres of impacts to burrowing owl, greater sage-grouse, mountain plover, northern leopard frog, Preble's jumping mouse, and white-tailed prairie dog habitat. None of the Segment 1E Route Alternatives are capable of avoiding all impacts to these species habitats, as some habitat for these species would be impacted in areas of the Proposed Route that do not currently contain a Route Alternative.

The acreage of impacts to the northern leopard frog and Preble's meadow jumping mouse habitat are minor between the Route Alternatives and the comparison portion of the Proposed Route; however, because habitats for these species (wetlands and riparian areas) are rare within the general area, even minor differences in the acreage of impacts can have a substantial effect on the availability of habitat. (Table D.9-1 in Appendix D lists the total impacts to all wetland habitats along each segment and Route Alternative; Section 3.9 discusses the distribution of wetlands and riparian areas within the general area.)

The Proposed Route along Segment 1E, as well as Alternative 1E-C, would cross the Medicine Bow-Routt NFs (see Section 3.17 – Land Use and Recreation). The Proposed Route would impact about 1 acre of burrowing owl habitat, 30 acres of greater sage-grouse habitat, 5 acres of mountain plover habitat, 10 acres of northern goshawk habitat, less than 1 acre of northern leopard frog and Preble's meadow jumping mouse habitat, and 8 acres of white-tailed prairie dog habitat on the Medicine Bow-Routt NFs. Alternative 1E-C would impact about 9 acres of greater sage-grouse habitat, 5 acres of mountain plover habitat, 3 acres of northern goshawk habitat, less than 1 acre of northern leopard frog and Preble's meadow jumping mouse habitat, and 11 acres of white-tailed prairie dog habitat on the Medicine Bow-Routt NFs.

Tables 3.11-7a–g. Alternative Comparison Tables for Segment 1E

Table 3.11-7a. Acres of Suitable Bald Eagle Habitat (1-mile buffer around winter roosts) Impacted during Construction and Operations of Segment 1E

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
1E Proposed – Total Length	22	7
1E Proposed – Comparison Portion for Alternative 1E-A	22	7
Alternative 1E-A	53	17
1E Proposed – Comparison Portion for Alternative 1E-B	0	0
Alternative 1E-B	0	0
1E Proposed – Comparison Portion for Alternative 1E-C	0	0
Alternative 1E-C	0	0

Acreages are rounded to the nearest acre.

Table 3.11-7b. Acres of Suitable Black-tailed Prairie Dog Habitat Impacted during Construction and Operations of Segment 1E

Alternatives	Construction Impacts [1/] (acres)	Operations Impacts (acres)
1E Proposed – Total Length	240	53
1E Proposed – Comparison Portion for Alternative 1E-A	226	49
Alternative 1E-A	94	27
1E Proposed – Comparison Portion for Alternative 1E-B	0	0
Alternative 1E-B	0	0
1E Proposed – Comparison Portion for Alternative 1E-C	0	0
Alternative 1E-C	0	0

Acreages are rounded to the nearest acre.
1/ Includes both colonies and complexes, as reported in the Appendix D tables.

Table 3.11-7c. Acres of Suitable Burrowing Owl Habitat Impacted during Construction and Operations of Segment 1E

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
1E Proposed – Total Length	795	191
1E Proposed – Comparison Portion for Alternative 1E-A	189	44
Alternative 1E-A	108	34
1E Proposed – Comparison Portion for Alternative 1E-B	340	78
Alternative 1E-B	538	120
1E Proposed – Comparison Portion for Alternative 1E-C	597	145
Alternative 1E-C	223	63

Acreages are rounded to the nearest acre.

Table 3.11-7d. Acres of Suitable Greater Sage-Grouse Habitat Impacted during Construction and Operations of Segment 1E

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
1E Proposed – Total Length	731	186
1E Proposed – Comparison Portion for Alternative 1E-A	122	29
Alternative 1E-A	58	18
1E Proposed – Comparison Portion for Alternative 1E-B	301	68
Alternative 1E-B	496	109
1E Proposed – Comparison Portion for Alternative 1E-C	588	150
Alternative 1E-C	231	70

Acreages are rounded to the nearest acre.

Table 3.11-7e. Acres of Suitable Mountain Plover Habitat Impacted during Construction and Operations of Segment 1E

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
1E Proposed – Total Length	791	192
1E Proposed – Comparison Portion for Alternative 1E-A	163	37
Alternative 1E-A	88	27
1E Proposed – Comparison Portion for Alternative 1E-B	350	78
Alternative 1E-B	556	116
1E Proposed - Comparison Portion for Alternative 1E-C	607	149
Alternative 1E-C	236	73

Acreages are otherwise rounded to the nearest acre.

Table 3.11-7f. Acres of Northern Leopard Frog and Preble's Meadow Jumping Mouse Habitat Impacted during Construction and Operations of Segment 1E

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
1E Proposed – Total Length	9	2
1E Proposed – Comparison Portion for Alternative 1E-A	<1	t
Alternative 1E-A	2	0
1E Proposed – Comparison Portion for Alternative 1E-B	3	1
Alternative 1E-B	4	1
1E Proposed – Comparison Portion for Alternative 1E-C	9	2
Alternative 1E-C	3	<1

Acreages are otherwise rounded to the nearest acre.

Table 3.11-7g. Acres of Suitable White-Tailed Prairie Dog Habitat Impacted during Construction and Operations of Segment 1E		
Alternatives	**Construction Impacts (acres)**	**Operations Impacts (acres)**
1E Proposed – Total Length	833	198
1E Proposed – Comparison Portion for Alternative 1E-A	140	30
Alternative 1E-A	67	21
1E Proposed – Comparison Portion for Alternative 1E-B	365	82
Alternative 1E-B	594	127
1E Proposed – Comparison Portion for Alternative 1E-C	658	158
Alternative 1E-C	267	75

Acreages are otherwise rounded to the nearest acre.

Segment 1W

Segment 1W is composed of two parts, Segment 1W(a) and 1W(c), both of which would consist of a new 230-kV line for part of their length and a reconstruction of an existing 230-kV line for the remaining part. Segment 1W(a) would be about 76.5 miles long, and would extend from the Windstar Substation to the Aeolus Substation. Segment 1W(c) would be about 70.6 miles long, and would extend from the Dave Johnston Power Plant to the Aeolus Substation. Alternative 1W-A is a 16.2-mile alternative located near the town of Glenrock, which was the Proponents' initial proposal before moving the Proposed Route at the suggestion of local landowners in order to avoid the more settled area around Glenrock. Twenty acres of the proposed expansion at the Windstar and Aeolus Substations are attributed to Segment 1W(a) and 3 acres of the expansion at the Difficulty Substation and 17 acres of the expansion at the Windstar and Aeolus Substations are attributed to Segment 1W(c). There are no Route Alternatives proposed south of that point (see Appendix A, Figure A-2). The most common habitat along Segment 1W is shrubland (see Section 3.6 – Vegetation Communities).

Of the TES species where quantitative species specific data are available, the bald eagle, black-tailed prairie dog, burrowing owl, greater sage-grouse, mountain plover, northern goshawk, northern leopard frog, Preble's meadow jumping mouse, white-tailed prairie dog, and the yellow-billed cuckoo could occur along Segment 1W. Tables D.11-5 through D.11-8 in Appendix D list the impacts to habitat for each species quantitatively assessed along Segment 1W and its Route Alternative.

The Proposed Route in Segment 1W(a) would cross through a small portion of yellow-billed cuckoo habitat for less than 0.1 mile (Table D.11-3 in Appendix D). Less than 1 acre of yellow-billed cuckoo habitat would be impacted during construction (Table D.11-5 in Appendix D). This portion of yellow-billed cuckoo habitat impacted along the Proposed Route would be located outside of areas that contain Route Alternatives; therefore, the selection of a Route Alternative would not result in the avoidance of impacts to the yellow-billed cuckoo along this segment. Furthermore, no yellow-billed cuckoo habitat would be crossed by the Route Alternative proposed along this segment.

The Proposed Route would impact approximately 11 acres of habitat within 1 mile of a single northern goshawk nest along Segment 1W(a) and Segment 1W(c). (This nest is also located within 1 mile of Segment 1E.) Selection of Alternative 1W-A would not

result in the avoidance or an increase in impacts to areas near known northern goshawk nests.

Tables 3.11-8a–g display a comparison of the impacts to habitat for the species in which the various Route Alternatives in Segment 1W would have a differential effect, where quantitative data were available, and where the data were detailed enough that the discussion was best summarized in table format. Alternative 1W-A would result in fewer impacts to black-tailed prairie dog, burrowing owl, greater sage-grouse, mountain plover, and white-tailed prairie dog habitat than the comparison portion of Segment 1W; however, it would cause more impacts to bald eagle[11], northern leopard frog, and Preble's meadow jumping mouse habitat. As some habitat for these species would be impacted in areas of the Proposed Route that do not currently contain a Route Alternative, selection of Alternative 1W-A would not result in a complete avoidance of impacts to any of these species' habitats.

The acreage of impacts to the northern leopard frog and Preble's meadow jumping mouse habitat are minor between Alternative 1W-A and the comparison portion of the Proposed Route, with about 1 acre of difference between impacts resulting from the two routes. However, because habitats for these species (wetlands and riparian areas) are rare within the general area, even minor differences in the acreage of impacts can have a substantial effect on the availability of habitat. (Table D.9-1 in Appendix D lists the total impacts to all wetland habitats along each segment and Route Alternative; Section 3.9 discusses the distribution of wetlands and riparian areas within the general area.)

The Proposed Route along Segments 1W(a) and 1W(c) would cross the Medicine Bow-Routt NFs (see Section 3.17 – Land Use and Recreation). Segment 1W(a) would impact less than 1 acre of burrowing owl habitat, about 12 acres of greater sage-grouse habitat, 5 acres of mountain plover habitat, 9 acres of northern goshawk habitat, less than 1 acre of northern leopard frog habitat, and 14 acres of white-tailed prairie dog habitat on the Medicine Bow-Routt NFs. Segment 1W(c) would impact about 26 acres of greater sage-grouse habitat, 9 acres of mountain plover habitat, 7 acres of northern goshawk habitat, and 17 acres of white-tailed prairie dog habitat on the Medicine Bow-Routt NFs.

Tables 3.11-8a–g. Alternative Comparison Tables for Segment 1W

Table 3.11-8a. Acres of Suitable Bald Eagle Habitat (1 mile Buffer Around Winter Roosts) Impacted during Construction and Operations of Segment 1W

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
1W(a) Proposed – Total Length	14	4
1W(a) Proposed – Comparison Portion for Alternative 1W-A	14	4
Alternative 1W-A	47	13
1W(c) Proposed – Total Length	72	14

Acreages are rounded to the nearest acre.

[11] In addition, Segment 1W(c) and Alternative 1W-A would lie within 1 mile of a bald eagle nest.

Table 3.11-8b. Acres of Suitable Black-Tailed Prairie Dog Habitat Impacted during Construction and Operations of Segment 1W

Alternatives	Construction Impacts [1/] (acres)	Operations Impacts (acres)
1W(a) Proposed – Total Length	240	57
1W(a) Proposed – Comparison Portion for Alternative 1W-A	219	50
Alternative 1W-A	126	38
1W(c) Proposed – Total Length	168	22

Acreages are rounded to the nearest acre.
1/ includes both colonies and complexes, as reported in the Appendix D tables.

Table 3.11-8c. Acres of Suitable Burrowing Owl Habitat Impacted during Construction and Operations of Segment 1W

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
1W(a) Proposed – Total Length	463	126
1W(a) Proposed – Comparison Portion for Alternative 1W-A	179	38
Alternative 1W-A	119	35
1W(c) Proposed – Total Length	616	104

Acreages are rounded to the nearest acre.

Table 3.11-8d. Acres of Suitable Greater Sage-Grouse Habitat Impacted during Construction and Operations of Segment 1W

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
1W(a) Proposed – Total Length	379	119
1W(a) Proposed – Comparison Portion for Alternative 1W-A	96	22
Alternative 1W-A	48	14
1W(c) Proposed – Total Length	486	95

Acreages are rounded to the nearest acre.

Table 3.11-8e. Acres of Suitable Mountain Plover Habitat Impacted during Construction and Operations of Segment 1W

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
1W(a) Proposed – Total Length	408	120
1W(a) Proposed – Comparison Portion for Alternative 1W-A	133	28
Alternative 1W-A	90	26
1W(c) Proposed – Total Length	615	98

Acreages are rounded to the nearest acre.

Table 3.11-8f. Acres of Suitable Northern Leopard Frog and Preble's Meadow Jumping Mouse Habitat Impacted during Construction and Operations of Segment 1W

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
1W(a) Proposed – Total Length	7	2
1W(a) Proposed – Comparison Portion for Alternative 1W-A	<1	t[1/]
Alternative 1W-A	2	t[1/]
1W(c) Proposed – Total Length	12	2

1/ "t" indicates values <0.1. Acreages are otherwise rounded to the nearest acre.

Table 3.11-8g. Acres of Suitable White-Tailed Prairie Dog Habitat Impacted during Construction and Operation of Segment 1W

Alternatives	Construction Impacts (acres)	Operations Impacts (acres))
1W(a) Proposed – Total Length	430	119
1W(a) Proposed – Comparison Portion for Alternative 1W-A	93	19
Alternative 1W-A	70	19
1W(c) Proposed – Total Length	641	111

Acreages are rounded to the nearest acre.

Segment 2

Segment 2, as proposed, would link the Aeolus and Creston Substations in southeast Wyoming with two 500-kV circuits on one structure. One circuit would be operated at 230 kV during the initial phase of the Project. Its total proposed length is 96.7 miles. Fifty-two acres of the expansion of the Aeolus Substation and the construction of the Creston Substation and 0.5 acre for one regeneration site are attributed to Segment 2. There are three Route Alternatives, two of which are near the community of Fort Fred Steele. Alternative 2A at 28.4 miles long is being considered by the BLM because it remains in the WWE corridor nearer the town and the state historic site, and Alternative 2B, at 6.2 miles, is closer to the community than the comparison portion of the Proposed Route and was the initially proposed route before the Proponents responded to local suggestions and relocated the Proposed Route farther to the south. Alternative 2C is a 24.4-mile alternative located north of Hanna, Wyoming. It is being evaluated at the recommendation of the Wyoming Governor's office to follow a utility corridor approved by that office for minimizing effects to sage-grouse (see Appendix A, Figure A-3). The most common habitat type along Segment 2 is shrubland (see Section 3.6 – Vegetation Communities).

Of the TES species where quantitative species-specific data are available, the bald eagle, black-footed ferret, burrowing owl, greater sage-grouse, mountain plover, northern leopard frog, Preble's meadow jumping mouse, pygmy rabbit, white-tailed prairie dog, and Wyoming pocket gopher could occur along Segment 2. Tables D.11-5 through D.11-8 in Appendix D list the impacts to habitat for each species quantitatively assessed along Segment 2 and its Route Alternatives.

The Proposed Route would impact about 232 acres of black-footed ferret habitat. These impacts would occur along portions of the route where Route Alternatives have not been proposed. In addition, the Route Alternatives would not impact additional habitat for this species. Therefore, selection of any of the current Route Alternatives along Segment 2 would not have an effect on the amount of habitat for this species that would be impacted.

Tables 3.11-9a–h display a comparison of the impacts to habitat for the species in which the various Route Alternatives in Segment 2 would have a differential effect, where quantitative data were available, and where the data were detailed enough that the discussion was best summarized in table format. Alternative 2A would result in an increase in impacts to all of the species assessed (Tables D.11-5 through D.11-8 in Appendix D). Alternative 2B would result in an increase in impacts to the bald eagle, mountain plover, northern leopard frog, Preble's meadow jumping mouse, and Wyoming

pocket gopher habitat than the comparison portion of Segment 2; however, it would result in fewer impacts to the burrowing owl, greater sage-grouse, pygmy rabbit, and white-tailed prairie dog habitat. Alternative 2C would result in an increase in impacts to burrowing owl, pygmy rabbit, and white-tailed prairie dog habitat, with fewer impacts to mountain plover, northern leopard frog, greater sage-grouse, and Preble's meadow jumping mouse habitat. As some habitat for these species would be impacted in areas of the Proposed Route that do not currently contain a Route Alternative, selection of an alternative would not result in a complete avoidance of impacts to any of these species' habitats.

For Alternatives 2A and 2B, the increase in impacts to bald eagle and Wyoming pocket gopher habitat would be substantial, indicating that these Route Alternatives would impact substantially more habitat for these two species than the comparison portion of the Proposed Route. Alternative 2B would also result in a substantial increase in impacts to northern leopard frog and Preble's meadow jumping mouse habitat, while Alternative 2C would substantially reduce impacts to these two species' habitats.

Tables 3.11-9a–h. Alternative Comparison Tables for Segment 2

Table 3.11-9a. Acres of Suitable Bald Eagle Habitat (1 mile Buffer Around Nests) Impacted during Construction and Operations of Segment 2

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
Proposed – Total Length	<1	t[1/]
Proposed – Comparison Portion for Alternative 2A	<1	t[1/]
Alternative 2A	26	7
Proposed – Comparison Portion for Alternative 2B	<1	t[1/]
Alternative 2B	28	6
Proposed – Comparison Portion for Alternative 2C	0	0
Alternative 2C	0	0

1/ "t" indicates values <0.1. Acreages are otherwise rounded to the nearest acre.

Table 3.11-9b. Acres of Suitable Burrowing Owl Habitat Impacted during Construction and Operations of Segment 2

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
Proposed – Total Length	1,113	288
Proposed – Comparison Portion for Alternative 2A	236	45
Alternative 2A	340	67
Proposed – Comparison Portion for Alternative 2B	70	12
Alternative 2B	44	11
Proposed – Comparison Portion for Alternative 2C	219	45
Alternative 2C	262	42

Acreages are rounded to the nearest acre.

Table 3.11-9c. Acres of Suitable Greater Sage-Grouse Habitat Impacted during Construction and Operations of Segment 2

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
Proposed – Total Length	1,336	365
Proposed – Comparison Portion for Alternative 2A	311	63
Alternative 2A	365	78
Proposed – Comparison Portion for Alternative 2B	81	14
Alternative 2B	59	14
Proposed – Comparison Portion for Alternative 2C	312	69
Alternative 2C	295	51

Acreages are rounded to the nearest acre.

Table 3.11-9d. Acres of Suitable Mountain Plover Habitat Impacted during Construction and Operations of Segment 2

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
Proposed – Total Length	1390	307
Proposed – Comparison Portion for Alternative 2A	331	52
Alternative 2A	384	68
Proposed Comparison Portion for Alternative 2B	88	11
Alternative 2B	59	16
Proposed – Comparison Portion for Alternative 2C	331	49
Alternative 2C	316	32

“Acreages are rounded to the nearest acre.

Table 3.11-9e. Acres of Suitable Northern Leopard Frog and Preble’s Meadow Jumping Mouse Habitat Impacted during Construction and Operations of Segment 2

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
Proposed – Total Length	12	4
Proposed – Comparison Portion for Alternative 2A	3	<1
Alternative 2A	6	1
Proposed – Comparison Portion for Alternative 2B	<1	t
Alternative 2B	5	<1
Proposed – Comparison Portion for Alternative 2C	2	<1
Alternative 2C	<1	t

Acreages are rounded to the nearest acre.

Table 3.11-9f. Acres of Suitable Pygmy Rabbit Habitat Impacted during Construction and Operations of Segment 2

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
Proposed – Total Length	880	193
Proposed – Comparison Portion for Alternative 2A	225	43
Alternative 2A	314	63
Proposed – Comparison Portion for Alternative 2B	63	11
Alternative 2B	38	9
Proposed – Comparison Portion for Alternative 2C	222	45
Alternative 2C	263	43

Acreages are rounded to the nearest acre.

Table 3.11-9g. Acres of Suitable White-Tailed Prairie Dog Habitat Impacted during Construction and Operations of Segment 2		
Alternatives	**Construction Impacts (acres)**	**Operations Impacts (acres)**
Proposed – Total Length	1,225	310
Proposed – Comparison Portion for Alternative 2A	260	50
Alternative 2A	349	69
Proposed – Comparison Portion for Alternative 2B	81	14
Alternative 2B	44	11
Proposed – Comparison Portion for Alternative 2C	259	54
Alternative 2C	287	46

Acreages are rounded to the nearest acre.

Table 3.11-9h. Acres of Suitable Wyoming Pocket Gopher Habitat Impacted during Construction and Operations of Segment 2		
Alternatives	**Construction Impacts (acres)**	**Operations Impacts (acres)**
Proposed – Total Length	419	86
Proposed – Comparison Portion for Alternative 2A	<1	t[1/]
Alternative 2A	1	6
Proposed – Comparison Portion for Alternative 2B	<1	t[1/]
Alternative 2B	20	6
Proposed – Comparison Portion for Alternative 2C	0	0
Alternative 2C	0	0

1/ "t" indicates values <0.1. Acreages are otherwise rounded to the nearest acre.

Segment 3

Segment 3, as proposed, would link the Creston and Anticline Substations in southeast Wyoming with two 500-kV circuits on one structure. One circuit would be operated at 230 kV during the initial phase of the Project. Its total proposed length between those two substations is 46.7 miles. Sixty-nine acres of the construction of the Anticline and Creston Substations are attributed to Segment 3. Segment 3 would also link the Anticline and Jim Bridger Substations with a 4.3-mile 230-kV line and a 5.5-mile 345-kV line and includes the 10-acre expansion of the Jim Bridger 345-kV Substation. There are no Route Alternatives proposed along this segment (see Appendix A, Figure A-4).

Of the TES species where quantitative species-specific data are available, the black-footed ferret, burrowing owl, greater sage-grouse, grizzly bear, mountain plover, northern leopard frog, pygmy rabbit, white-tailed prairie dog, and the Wyoming pocket gopher could occur along Segment 3.

Construction of Segment 3 would impact approximately 222 acres of black-footed ferret habitat, 601 acres of burrowing owl habitat, 694 acres of greater sage-grouse habitat, 611 acres of grizzly bear habitat (only consists of lands within the DPS boundary), 737 acres of mountain plover habitat, 14 acres of northern leopard frog, 539 acres of pygmy rabbit habitat, 612 acres of white-tailed prairie dog habitat, and 586 acres of Wyoming pocket gopher habitat (Tables D.11-5 through D.11-8 in Appendix D).

Segment 4

Segment 4, as proposed, would link the Anticline Substation near the Jim Bridger Power Plant in southwestern Wyoming with the Populus Substation in Idaho with two 500-kV circuits on one structure. Its total proposed length is 203 miles. Eighty-nine acres of the construction of the Anticline Substation and the expansion of the Populus Substation and 1.5 acres for three regeneration sites are attributed to Segment 4. It has six Route Alternatives in the middle portion of its route but the first 52 miles to the east and the last 61 miles to the west (in Idaho) do not have any Route Alternatives. The middle section of the Proposed Route is 90.2 miles long, and its Route Alternatives vary from 85 to 102 miles long. These alternatives were proposed by the Wyoming Governor's office (4A, paralleling the existing 345-kV lines throughout); by the BLM Kemmerer FO (4B through 4E, including edits from various cooperating agencies), with the intent to avoid impacts to cultural resources to the extent practical; and by the Proponents (4F, attempting to avoid impacts to cultural resources while still remaining north of the existing lines) (see Appendix A, Figures A-5 and A-6). The most common habitat type along Segment 4 is shrubland (see Section 3.6 – Vegetation Communities).

Of the TES species where quantitative species-specific data are available, the bald eagle, black-footed ferret, burrowing owl, Canada lynx, Columbian sharp-tailed grouse, Columbia spotted frog, greater sage-grouse, grizzly bear, mountain plover, northern goshawk, northern leopard frog, pygmy rabbit, white-tailed prairie dog, and the Wyoming pocket gopher could occur along Segment 4. Tables D.11-5 through D.11-8 in Appendix D list the impacts to habitat for each species quantitatively assessed along Segment 4 and its Route Alternatives.

Construction of Segment 4 would impact about 18 and 38 acres of habitat for the bald eagle (within 1 mile of nests) and northern goshawk (within 1 mile of nests), respectively. No habitat for these species would be impacted along the six Route Alternatives, or along the comparison portion of the Proposed Route.

Construction of Segment 4 would impact about 119 acres of Wyoming pocket gopher habitat. No habitat would be impacted along the six Route Alternatives, or along the comparison portion of the Proposed Route.

Construction of Segment 4 would impact about 302 acres of Canada lynx habitat. If Alternative 4F is chosen, about 181 acres of this impact would be avoided. The remaining five Route Alternatives (Alternatives 4A through 4E) would not impact lynx habitat, and would completely avoid the 302 acres of impacts that would occur along the Proposed Route (Table D.11-5 in Appendix D).

Tables 3.11-10a–j display a comparison of the impacts to habitat for the species in which the various Route Alternatives in Segment 4 would have a differential effect, where quantitative data were available, and where the data were detailed enough that the discussion was best summarized in table format. In general, selection of a Route Alternative along Segment 4 would result in an increase in impacts to the assessed species. An increase in impacts during construction would occur to habitat for the Columbian sharp-tailed grouse, Columbia spotted frog, greater sage-grouse, northern leopard frog, pygmy rabbit, and white-tailed prairie dog under each of the six Route

Alternatives over the comparison portion of the Proposed Route. The burrowing owl, black-footed ferret, grizzly bear, and mountain plover are the only species that would experience fewer impacts under certain Route Alternatives. Impact to burrowing owl habitat would be reduced under Alternative 4A, while impacts to black-footed ferret habitat would be reduced under Alternatives 4A and 4F. Impacts to grizzly bear habitat would be reduced under all Route Alternatives except for 4F (which would impact similar acreage as the Proposed Route). The mountain plover is the only species assessed that would experience fewer impacts under all six of the Route Alternatives compared to the comparison portion of Segment 4.

For all Route Alternatives, the increase in impacts to Columbia spotted frog, and northern leopard frog habitat would be substantial, indicating that these Route Alternatives would impact substantially more habitat than the comparison portion of the Proposed Route. As was discussed for Segment 1W, because habitat for these species (riparian/wetland areas that can support these species) is limited within the general area, even minor differences in the acreage of impacts can have a substantial effect on the availability of habitat for this species. In addition, Alternatives 4B, 4C, and 4D would substantially increase impacts to burrowing owl habitat, while Alternatives 4B through 4E would substantially reduce impacts to habitat for the grizzly bear; however, as noted earlier, these impacts to bear habitat only consist of areas that fall within the DPS boundary and not the PCA or areas that have been designated as suitable bear habitat by the USFWS.

The Proposed Route along Segment 4 would cross the Caribou-Targhee NF (see Section 3.17 – Land Use and Recreation). Segment 4 would impact about 13 acres of burrowing owl habitat, 116 acres of Columbian sharp-tailed grouse habitat, 38 acres of northern goshawk habitat, 1 acre of northern leopard frog habitat, and 4 acres of pygmy rabbit habitat on the Caribou-Targhee NF.

The roads analysis for the Caribou NF travel plan categorizes roads regarding their level of risk to wildlife species (Forest Service 2005). Of the roads crossed or used by the Project on the Caribou-Targhee NF, Road 20401 has a low risk for goshawk, leopard toad, boreal toad, peregrine falcon, and overall wildlife. Roads 20404, 20425, 20438, 20463, 20466, and 21000 have a low risk for all categories assessed. Therefore, it is likely that the new roads, which would be revegetated and closed to the public following construction, would have a low risk to wildlife species as well.

Tables 3.11-10a–j. Alternative Comparison Tables for Segment 4

Table 3.11-10a. Acres of Suitable Black-Footed Ferret Habitat Impacted during Construction and Operations of Segment 4

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
Proposed – Total Length	549	113
Proposed – Comparison Portion for Alternatives 4A,B,C,D,E,F	408	85
Alternative 4A	328	72
Alternative 4B	443	111
Alternative 4C	443	111
Alternative 4D	443	111
Alternative 4E	443	111
Alternative 4F	321	72

Acreages are rounded to the nearest acre.

Table 3.11-10b. Acres of Suitable Burrowing Owl Habitat Impacted during Construction and Operations of Segment 4

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
Proposed – Total Length	1,536	353
Proposed – Comparison Portion for Alternatives 4A,B,C,D,E,F	697	143
Alternative 4A	683	151
Alternative 4B	1,019	248
Alternative 4C	1,068	253
Alternative 4D	994	241
Alternative 4E	1,029	244
Alternative 4F	710	158

Acreages are rounded to the nearest acre.

Table 3.11-10c. Acres of Suitable Columbian Sharp-Tailed Grouse Habitat Impacted during Construction and Operation of Segment 4

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
Proposed – Total Length	861	192
Proposed-Comparison Portion for Alternatives 4A,B,C,D,E,F	83	16
Alternative 4A	84	17
Alternative 4B	119	25
Alternative 4C	118	25
Alternative 4D	119	26
Alternative 4E	115	24
Alternative 4F	86	18

Acreages are rounded to the nearest acre.

Table 3.11-10d. Acres of Suitable Columbia Spotted Frog Habitat Impacted during Construction and Operation of Segment 4

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
Proposed – Total Length	9	2
Proposed – Comparison Portion for Alternatives 4A,B,C,D,E,F	9	2
Alternative 4A	52	6
Alternative 4B	36	3
Alternative 4C	28	2
Alternative 4D	32	3
Alternative 4E	28	2
Alternative 4F	35	3

Acreages are rounded to the nearest acre.

Table 3.11-10e. Acres of Suitable Greater Sage-Grouse Habitat Impacted during Construction and Operation of Segment 4

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
Proposed – Total Length	2,073	486
Proposed – Comparison Portion for Alternatives 4A,B,C,D,E,F	973	203
Alternative 4A	1,020	232
Alternative 4B	1,240	295
Alternative 4C	1,203	284
Alternative 4D	1,241	297
Alternative 4E	1,198	283
Alternative 4F	1,004	227

Acreages are rounded to the nearest acre.

Table 3.11-10f. Acres of Suitable Grizzly Bear Habitat (DPS boundary) Impacted during Construction and Operation of Segment 4

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
Proposed – Total Length	1,949	449
Proposed – Comparison Portion for Alternatives 4A,B,C,D,E,F	1,085	232
Alternative 4A	1,043	234
Alternative 4B	287	64
Alternative 4C	423	90
Alternative 4D	301	65
Alternative 4E	424	90
Alternative 4F	1,087	246

Acreages are rounded to the nearest acre.

Table 3.11-10g. Acres of Suitable Mountain Plover Habitat Impacted during Construction and Operation of Segment 4

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
Proposed – Total Length	1,125	260
Proposed – Comparison Portion for Alternatives 4A,B,C,D,E,F	605	119
Alternative 4A	502	109
Alternative 4B	575	139
Alternative 4C	575	139
Alternative 4D	576	139
Alternative 4E	576	139
Alternative 4F	496	109

Acreages are rounded to the nearest acre.

Table 3.11-10h. Acres of Suitable Northern Leopard Frog Impacted during Construction and Operation of Segment 4

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
Proposed – Total Length	66	14
Proposed – Comparison Portion for Alternatives 4A,B,C,D,E,F	16	3
Alternative 4A	59	7
Alternative 4B	48	4
Alternative 4C	40	3
Alternative 4D	44	5
Alternative 4E	40	4
Alternative 4F	43	4

Acreages are rounded to the nearest acre.

Table 3.11-10i. Acres of Suitable Pygmy Rabbit Habitat Impacted during Construction and Operation of Segment 4

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
Proposed – Total Length	1,506	365
Proposed – Comparison Portion for Alternatives 4A,B,C,D,E,F	850	186
Alternative 4A	912	215
Alternative 4B	1,044	265
Alternative 4C	1,062	261
Alternative 4D	1,011	258
Alternative 4E	1,022	252
Alternative 4F	939	223

Acreages are rounded to the nearest acre.

Table 3.11-10j. Acres of Suitable White-Tailed Prairie Dog Habitat Impacted during Construction and Operation of Segment 4		
Alternatives	**Construction Impacts (acres)**	**Operations Impacts (acres)**
Proposed – Total Length	1,585	358
Proposed – Comparison Portion for Alternatives 4A,B,C,D,E,F	957	207
Alternative 4A	1,092	245
Alternative 4B	1,282	311
Alternative 4C	1,326	313
Alternative 4D	1,291	314
Alternative 4E	1,325	312
Alternative 4F	1,073	244

Acreages are rounded to the nearest acre.

Segment 5

Segment 5, as proposed, would link the Populus and Borah Substations with a 54.6-mile single-circuit 500-kV line. Forty-four acres of the expansion of the Populus and Borah Substations are attributed to Segment 5. There are five Route Alternatives including two proposed by the BLM to avoid the Deep Creek Mountains (5A and 5B, 8 miles and 19 miles longer than the comparison portion of the Proposed Route), one preferred by Power County that crosses the Fort Hall Indian Reservation (5C, 6 miles shorter than the comparison portion of the Proposed Route), one originally proposed by the Proponents (5D, 2 miles shorter than the comparison portion of the Proposed Route but located within more agricultural lands), and one proposed by Power County as an alternative approach to the Borah Substation (5E) (see Appendix A, Figure A-7). The most common habitat type along Segment 5 is shrubland (see Section 3.6 – Vegetation Communities).

Of the TES species where quantitative species-specific data are available, the bald eagle, burrowing owl, Columbian sharp-tailed grouse, greater sage-grouse, northern leopard frog, pygmy rabbit, and the yellow-billed cuckoo could potentially occur along Segment 5. Tables D.11-5 through D.11-8 in Appendix D list the acres of impacts to habitat for each species quantitatively assessed along Segment 5 and its Route Alternatives.

The Proposed Route would cross approximately 1.6 miles of habitat within 1 mile of two active bald eagle nests along Segment 5 (Table D.11-4 in Appendix D). This would result in a construction impact to approximately 28 acres of habitat. Alternatives 5A through 5C would not have an impact to bald eagle habitat as the habitat impacted along the Proposed Route occurs in an area not encompassed by these three Route Alternatives (Table D.11-6 in Appendix D). Alternative 5D is proposed as a Route Alternative to the portion of the Proposed Route where the 28 acres of impacts would occur. Selection of Alternative 5D would result in 21 acres of impact (a 7-acre reduction in impacts compared to the Proposed Route). Impacts to habitats within 1 mile of nests would be almost entirely avoided along Segment 5 if Alternative 5E were selected (Table D.11-6 in Appendix D).

Tables 3.11-11a–f display a comparison of the impacts to habitat for the species in which the various Route Alternatives in Segment 5 would have a differential effect,

where quantitative data were available, and where the data were detailed enough that the discussion was best summarized in table format. Unlike many of the other Project segments, there is no distinct trend regarding which Route Alternative along Segment 5 would result in either an increase or decrease in the acreage of impacts to TES habitat, with the exception of Alternative 5E (which would decrease impacts to all species that have available quantitative data). Alternatives 5A and 5B would result in an increase (over the comparison portion of the Proposed Route) in impacts to burrowing owl, Columbian sharp-tailed grouse, greater sage-grouse, and pygmy rabbit habitat; however, it would result in fewer impacts to northern leopard frog habitat. Alternative 5C would increase impacts to burrowing owl, northern leopard frog, pygmy rabbit, and yellow-billed cuckoo habitat, but would result in fewer impacts to Columbian sharp-tailed grouse and greater sage-grouse habitat. Alternative 5D would increase impacts to burrowing owl and yellow-billed cuckoo habitat, but would result in fewer impacts to Columbian sharp-tailed grouse, greater sage-grouse, and pygmy rabbit habitat. Because some habitat for these species would be impacted in areas of the Proposed Route that do not currently contain a Route Alternative, selection of any of the Route Alternatives would not result in a complete avoidance of impacts to any of these species' habitats.

The differences in acreage of impacts to northern leopard frog and yellow-billed cuckoo habitats are minor between most of Route Alternatives (typically differing by only a few acres), with the exception of Alternative 5D, which would result in substantially more impacts to yellow-billed cuckoo habitat compared to the comparison portion of the Proposed Route (from zero acres to 9 acres). Because habitats for these two species are rare within the general area, even minor differences in the acreage of impacts can have a substantial effect on the availability of habitat (Table D.9-1 in Appendix D lists the total impacts to all wetland habitats along each segment and Route Alternative; Section 3.9 – Wetlands and Riparian Areas discusses the distribution of wetlands within the general area).

Tables 3.11-11a–f. Alternative Comparison Tables for Segment 5

Table 3.11-10a. Acres of Suitable Burrowing Owl Habitat Impacted during Construction and Operations of Segment 5

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
Proposed – Total Length	469	87
Proposed – Comparison Portion for Alternatives 5A,B	190	26
Alternative 5A	264	31
Alternative 5B	369	45
Proposed – Comparison Portion for Alternative 5C	239	28
Alternative 5C	287	32
Proposed – Comparison Portion for Alternative 5D	153	26
Alternative 5D	174	34
Proposed – Comparison Portion for Alternative 5E	72	18
Alternative 5E	45	16

Acreages are rounded to the nearest acre.

Table 3.11-11b. Acres of Suitable Columbian Sharp-Tailed Grouse Habitat Impacted during Construction and Operation of Segment 5

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
Proposed – Total Length	891	163
Proposed – Comparison Portion for Alternatives 5A,B	427	72
Alternative 5A	546	84
Alternative 5B	673	96
Proposed – Comparison Portion for Alternative 5C	575	92
Alternative 5C	430	55
Proposed – Comparison Portion for Alternative 5D	352	56
Alternative 5D	323	47
Proposed – Comparison Portion for Alternative 5E	91	18
Alternative 5E	60	17

Acreages are rounded to the nearest acre.

Table 3.11-11c. Acres of Suitable Greater Sage-Grouse Habitat Impacted during Construction and Operation of Segment 5

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
Proposed – Total Length	100	100
Proposed – Comparison Portion for Alternatives 5A,B	34	34
Alternative 5A	44	44
Alternative 5B	50	50
Proposed – Comparison Portion for Alternative 5C	42	42
Alternative 5C	30	30
Proposed – Comparison Portion for Alternative 5D	35	35
Alternative 5D	23	23
Proposed – Comparison Portion for Alternative 5E	17	17
Alternative 5E	16	16

Acreages are rounded to the nearest acre.

Table 3.11-11d. Acres of Suitable Northern Leopard Frog Habitat Impacted during Construction and Operations of Segment 5

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
Proposed – Total Length	11	2
Proposed – Comparison Portion for Alternatives 5A,B	5	<1
Alternative 5A	<1	<1
Alternative 5B	<1	<1
Proposed – Comparison Portion for Alternative 5C	4	<1
Alternative 5C	5	<1
Proposed – Comparison Portion for Alternative 5D	6	2
Alternative 5D	6	2
Proposed – Comparison Portion for Alternative 5E	3	1
Alternative 5E	2	1

1/ "t" indicates values <0.1. Acreages are otherwise rounded to the nearest acre.

Table 3.11-11e. Acres of Suitable Pygmy Rabbit Habitat Impacted during Construction and Operations of Segment 5

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
Proposed – Total Length	338	77
Proposed – Comparison Portion for Alternatives 5A,B	103	18
Alternative 5A	164	20
Alternative 5B	186	25
Proposed – Comparison Portion for Alternative 5C	152	23
Alternative 5C	226	27
Proposed – Comparison Portion for Alternative 5D	123	25
Alternative 5D	107	26
Proposed – Comparison Portion for Alternative 5E	59	16
Alternative 5E	45	16

Acreages are rounded to the nearest acre.

Table 3.11-11f. Acres of Suitable Yellow-Billed Cuckoo Habitat Impacted during Construction and Operations of Segment 5

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
Proposed – Total Length	<1	<1
Proposed – Comparison Portion for Alternatives 5A,B	<1	<1
Alternative 5A	<1	<1
Alternative 5B	<1	<1
Proposed – Comparison Portion for Alternative 5C	4	–
Alternative 5C	1	1
Proposed – Comparison Portion for Alternative 5D	–	–
Alternative 5D	9	8
Proposed – Comparison Portion for Alternative 5E	–	–
Alternative 5E	–	–

1/ "t" indicates values <0.1. Acreages are otherwise rounded to the nearest acre.

Segment 6

Segment 6 is an existing transmission line linking the Borah and Midpoint Substations; it is now operated at 345 kV but would be changed to operate at 500 kV. This segment has no Route Alternatives. Existing support structures would be used and impacts would be limited to within approximately one-quarter mile from each substation to allow for moving the entry point into the substation to the new 500-kV bay. Thirty-one acres of the expansion of the Borah and Midpoint Substations are attributed to Segment 6. Changes in the two substations would allow it to be operated at 500 kV (see Appendix A, Figure A-8).

Ground-disturbing activities along this segment would be limited to the immediate vicinity of the Borah and Midpoint Substations. Although these areas have already been disturbed by the past construction and operation of these substations, some wildlife may utilize adjacent habitats, and as such modifications made to these substations could temporarily disturb adjacent wildlife.

Of the TES species where quantitative species-specific data are available, habitat for the burrowing owl, Columbian sharp-tailed grouse, greater sage-grouse, northern leopard frog, and pygmy rabbit could occur along Segment 6. Modifications made to

the substations along Segment 6 would impact approximately 42 acres of burrowing owl habitat, 16 acres of Columbian sharp-tailed grouse habitat, 42 acres of greater sage-grouse habitat, 2 acres of northern leopard frog habitat, and 42 acres of pygmy rabbit habitat (Tables D.11-5 through D.11-8 in Appendix D).

Segment 7

Segment 7, as proposed, would link the Populus and Cedar Hill Substations with a 118.1-mile single-circuit 500-kV line. Forty-two acres of the expansion of the Populus and the construction of the Cedar Hill Substations and 1 acre for two regeneration sites are attributed to Segment 7. In addition to the Proposed Route, which is principally on private lands, Route Alternatives have been proposed by the BLM to avoid the Deep Creek Mountains (7A and 7B; which are 5 miles and 11 miles longer than the comparison portion of the Proposed Route), by local landowners (7C, 7D, 7E, 7F, and 7G, which all represent minor adjustments proposed to address local issues), by local landowners to avoid private agricultural lands (7I or the State Line Route, which is 55 miles longer than the Proposed Route and would require 0.5 acre for an additional regeneration site), and by the Proponents to avoid the State Line Route (7H, which is 10 miles longer than the Proposed Route). Alternative 7J, which is a variant of the State Line Route also proposed by local landowners, would not terminate at the Cedar Hill Substation. This alternative, referred to as the Rogerson Alternative, would require a different substation be constructed near a 345-kV existing transmission line (approximately 24 miles southwest of the Cedar Hill Substation; see Appendix A, Figure A-9). The tables and discussion in this document compare 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only. The most common habitat type along Segment 7 is agriculture (see Section 3.6 – Vegetation Communities).

Of the TES species for which quantitative species-specific data are available, the burrowing owl, Columbian sharp-tailed grouse, greater sage-grouse, northern leopard frog, pygmy rabbit, and the yellow-billed cuckoo could occur along Segment 7. Tables D11-3 through D.11-6 in Appendix D list the impacts to habitat for each species quantitatively assessed along Segment 7 and its Route Alternatives.

Tables 3.11-12a–f display a comparison of the impacts to habitat for the species in which the various Route Alternatives in Segment 7 would have a differential effect, where quantitative data were available, and where the data were detailed enough that the discussion was best summarized in table format. Alternatives 7A, 7D, 7E, 7H, 7I, and 7J would increase impacts to habitat (over the comparison portion of the Proposed Route) for all species assessed that occur along these routes (except for Alternative 7D, which would result in a 4-acre reduction in impacts to greater sage-grouse habitat, and Alternatives 7H and 7J, which would result in a minor reduction in yellow-billed cuckoo impacts). Alternative 7B would increase impacts to habitat for all species assessed that occur along these routes, except for the northern leopard frog and yellow-billed cuckoo, which would experience fewer impacts under this alternative compared to the comparison portion of the Proposed Route. Alternative 7C would increase impacts to burrowing owl, Columbian sharp-tailed grouse, and pygmy rabbit habitat, but would

result in fewer impacts to greater sage-grouse and northern leopard frog habitat. Alternative 7F would increase impacts to greater sage-grouse habitat, but would result in fewer impacts to burrowing owl and pygmy rabbit habitat. Alternative 7G would increase impact to burrowing owl, Columbian sharp-tailed grouse, northern leopard frog, and pygmy rabbit habitat, but result in fewer impacts to greater sage-grouse habitat. As some habitat for these species would be impacted in areas of the Proposed Route that do not currently contain a Route Alternative, selection of a Route Alternative would not result in a complete avoidance of impacts to any of these species' habitats found along this segment.

Some of the alternatives would substantially increase impacts over the comparison portion of the Proposed Route. Alternatives 7H, 7I, and 7J would substantially increase the impacts that would occur to greater sage-grouse habitats over those of the comparison portion of the Proposed Route. Alternatives 7H and 7I would substantially increase the impacts that would occur to Columbia sharp-tailed grouse and pygmy rabbit habitat. Alternative 7I would result in 6 acres of impacts to yellow-billed cuckoo habitat whereas the comparison portion of the Proposed Route as well Alternative 7J (which is coincident with much of Alterative 7I) would impact less than 1 acre of habitat. This substantial impact to yellow-billed cuckoo habitat along Alternative 7I is largely due to one tower pad and the ROW clearing of a forested wetland/riparian area along a portion of Alternative 7I that is located after Alternatives 7I and 7J diverge.

Alternatives 7H, 7I, and 7J would cross the Sawtooth NF (see Section 3.17 – Land Use). Alternative 7H would impact about 2 acres of burrowing owl habitat, 102 acres of Columbian sharp-tailed grouse habitat, 11 acres of greater sage-grouse habitat, 36 acres of pygmy rabbit habitat, 2 acres of northern leopard frog habitat, and less than 0.1 acre of yellow-billed cuckoo habitat on the Sawtooth NF. Alternative 7I would impact about 47 acres of burrowing owl habitat, 443 acres of Columbian sharp-tailed grouse habitat, 401 acres of greater sage-grouse habitat, 163 acres of pygmy rabbit habitat, 6 acres of northern goshawk habitat, less than 1 acre of northern leopard frog habitat, and about 2 acres of yellow-billed cuckoo habitat on the Sawtooth NF. Finally, Alternative 7J would impact approximately 27 acres of burrowing owl habitat, 251 acres of Columbian sharp-tailed grouse habitat, 112 acres of greater sage-grouse habitat, 74 acres of pygmy rabbit habitat, 0.2 acre of northern leopard frog habitat, and less than 0.1 acre of yellow-billed cuckoo habitat located on the Sawtooth NF.

Tables 3.11-12a–f. Alternative Comparison Tables for Segment 7

Table 3.11-12a. Acres of Suitable Burrowing Owl Habitat Impacted during Construction and Operations of Segment 7

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
Proposed – Total Length	1,025	134
Proposed – Comparison Portion for Alternatives 7A,B	311	25
Alternative 7A	337	37
Alternative 7B	456	47
Proposed – Comparison Portion for Alternative 7C	223	29
Alternative 7C	263	24
Proposed – Comparison Portion for Alternative 7D	66	8
Alternative 7D	79	10
Proposed – Comparison Portion for Alternative 7E	25	2
Alternative 7E	26	3
Proposed – Comparison Portion for Alternative 7F	89	12
Alternative 7F	85	12
Proposed – Comparison Portion for Alternative 7G	30	3
Alternative 7G	46	3
Proposed – Comparison Portion for Alternatives 7H,I	1,025	134
Alternative 7H	1,174	182
Alternative 7I	1,395	218
Proposed – Comparison Portion for Alternative 7J[1/]	1,330	176
Alternative 7J	1,830	273

Acreages are rounded to the nearest acre.

1/ Alternative 7J connects with Segment 9 approximately 25.8 miles west of the proposed Cedar Hill Substation, which is the western terminus of Segment 7 and the beginning point for Segment 9. The table above compares 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

Table 3.11-12b. Acres of Suitable Columbian Sharp-Tailed Grouse Habitat Impacted during Construction and Operations of Segment 7

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
Proposed – Total Length	1,067	141
Proposed – Comparison Portion for Alternatives 7A,B	493	45
Alternative 7A	592	90
Alternative 7B	735	96
Proposed – Comparison Portion for Alternative 7C	232	30
Alternative 7C	278	26
Proposed – Comparison Portion for Alternative 7D	28	1
Alternative 7D	40	3
Proposed – Comparison Portion for Alternative 7E	0	0
Alternative 7E	0	0
Proposed – Comparison Portion for Alternative 7F	0	0
Alternative 7F	0	0
Proposed – Comparison Portion for Alternative 7G	41	4
Alternative 7G	56	3
Proposed – Comparison Portion for Alternatives 7H,I	1,067	141
Alternative 7H	1,444	237
Alternative 7I	1,893	322
Proposed – Comparison Portion for Alternative 7J[1/]	1,092	143
Alternative 7J	2,068	366

Acreages are rounded to the nearest acre.

1/ Alternative 7J connects with Segment 9 approximately 25.8 miles west of the proposed Cedar Hill Substation, which is the western terminus of Segment 7 and the beginning point for Segment 9. The table above compares 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

Table 3.11-12c. Acres of Suitable Greater Sage-Grouse Habitat Impacted during Construction and Operation of Segment 7

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
Proposed – Total Length	579	96
Proposed – Comparison Portion for Alternatives 7A,B	139	14
Alternative 7A	269	44
Alternative 7B	341	51
Proposed – Comparison Portion for Alternative 7C	105	14
Alternative 7C	77	8
Proposed – Comparison Portion for Alternative 7D	42	4
Alternative 7D	36	4
Proposed – Comparison Portion for Alternative 7E	44	4
Alternative 7E	51	7
Proposed – Comparison Portion for Alternative 7F	102	13
Alternative 7F	121	15
Proposed – Comparison Portion for Alternative 7G	28	3
Alternative 7G	12	0
Proposed – Comparison Portion for Alternatives 7H,I	579	96
Alternative 7H	1,346	227
Alternative 7I	1,658	291
Proposed – Comparison Portion for Alternative 7J[1/]	805	126
Alternative 7J	2,110	335

Acreages are rounded to the nearest acre.

1/ Alternative 7J connects with Segment 9 approximately 25.8 miles west of the proposed Cedar Hill Substation, which is the western terminus of Segment 7 and the beginning point for Segment 9. The table above compares 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

Table 3.11-12d. Acres of Suitable Northern Leopard Frog Habitat Impacted during Construction and Operations of Segment 7

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
Proposed – Total Length	8	<1
Proposed – Comparison Portion for Alternatives 7A,B	4	<1
Alternative 7A	4	<1
Alternative 7B	1	<1
Proposed – Comparison Portion for Alternative 7C	t[1/]	t[1/]
Alternative 7C	0	0
Proposed – Comparison Portion for Alternative 7D	3	t[1/]
Alternative 7D	3	t[1/]
Proposed – Comparison Portion for Alternative 7E	0	0
Alternative 7E	0	0
Proposed – Comparison Portion for Alternative 7F	<1	t[1/]
Alternative 7F	t[1/]	t[1/]
Proposed – Comparison Portion for Alternative 7G	t[1/]	t[1/]
Alternative 7G	<1	t[1/]
Proposed – Comparison Portion for Alternatives 7H,I	8	<1
Alternative 7H	9	1
Alternative 7I	15	2
Proposed – Comparison Portion for Alternative 7J[2/]	9	<1
Alternative 7J	16	2

1/ "t" indicates values <0.1. Acreages are otherwise rounded to the nearest acre.

2/ Alternative 7J connects with Segment 9 approximately 25.8 miles west of the proposed Cedar Hill Substation, which is the western terminus of Segment 7 and the beginning point for Segment 9. The table above compares 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

Table 3.11-12e. Acres of Suitable Pygmy Rabbit Habitat Impacted during Construction and Operations of Segment 7

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
Proposed – Total Length	606	93
Proposed – Comparison Portion for Alternatives 7A,B	140	11
Alternative 7A	226	26
Alternative 7B	240	28
Proposed – Comparison Portion for Alternative 7C	149	22
Alternative 7C	205	19
Proposed – Comparison Portion for Alternative 7D	56	7
Alternative 7D	71	9
Proposed – Comparison Portion for Alternative 7E	25	2
Alternative 7E	26	3
Proposed – Comparison Portion for Alternative 7F	65	8
Alternative 7F	60	8
Proposed – Comparison Portion for Alternative 7G	30	3
Alternative 7G	45	3
Proposed – Comparison Portion for Alternatives 7H,I	606	93
Alternative 7H	1,053	170
Alternative 7I	1,429	251
Proposed – Comparison Portion for Alternative 7J[1/]	910	135
Alternative 7J	1,925	298

Acreages are rounded to the nearest acre.

1/ Alternative 7J connects with Segment 9 approximately 25.8 miles west of the proposed Cedar Hill Substation, which is the western terminus of Segment 7 and the beginning point for Segment 9. The table above compares 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

Table 3.11-12f. Acres of Suitable Yellow-Billed Cuckoo Habitat Impacted during Construction and Operations of Segment 7

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
Proposed – Total Length	<1	t[1/]
Proposed – Comparison Portion for Alternatives 7A,B	t[1/]	t[1/]
Alternative 7A	<1	<1
Alternative 7B		
Proposed – Comparison Portion for Alternative 7C		
Alternative 7C		
Proposed – Comparison Portion for Alternative 7D	<1	t[1/]
Alternative 7D	<1	t[1/]
Proposed – Comparison Portion for Alternative 7E		
Alternative 7E		
Proposed – Comparison Portion for Alternative 7F		
Alternative 7F		
Proposed – Comparison Portion for Alternative 7G		
Alternative 7G		
Proposed – Comparison Portion for Alternatives 7H,I	<1	t[1/]
Alternative 7H	t[1/]	t[1/]
Alternative 7I	6	5
Proposed – Comparison Portion for Alternative 7J[2/]	<1	t[1/]
Alternative 7J	t[1/]	t[1/]

1/ "t" indicates values <0.1. Acreages are otherwise rounded to the nearest acre.

2/ Alternative 7J connects with Segment 9 approximately 25.8 miles west of the proposed Cedar Hill Substation, which is the western terminus of Segment 7 and the beginning point for Segment 9. The table above compares 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

Segment 8

Segment 8, as proposed, would link the Midpoint and Hemingway Substations. This 131-mile single-circuit 500-kV transmission line would stay north of the Snake River until crossing through the SRBOP parallel to an existing 500-kV transmission line before ending at the Hemingway Substation. Thirteen acres of the expansion of the Midpoint Substation and 0.5 acre for a regeneration site are attributed to Segment 8. There are five Route Alternatives: 8A, which follows the WWE corridor but crosses the Snake River and I-84 twice (while the Proposed Route would stay north of this area); 8B and 8C, which represent the old routes originally proposed by the Proponents but that have now been changed to avoid the cities of Kuna and Mayfield, respectively; 8D, which represents a small revision involving a rebuild of the existing transmission line to move both away from the National Guard Maneuver Area; and 8E, which was proposed by the BLM in order to avoid crossing the Halverson Bar nonmotorized portion of the Guffey Butte-Black Butte Historical Area (see Appendix A, Figure A-10). The most common habitat type along Segment 8 is disturbed grasslands and shrublands (see Section 3.6 – Vegetation Communities).

Of the TES species where quantitative species-specific data are available, the burrowing owl, Columbia spotted frog, greater sage-grouse, northern leopard frog, pygmy rabbit, and the yellow-billed cuckoo could occur along Segment 8. Tables D.11-5 through D.11-8 in Appendix D list the impacts to habitat for each species quantitatively assessed along Segment 8 and its Route Alternatives.

The Proposed Route would result in less than 0.1 acre of impact to Columbia spotted frog habitat, while Alternative 8B would increase impacts to about 7 acres of habitat. Alternative 8E would impact about 0.2 acre of Columbian spotted frog habitat; no other Route Alternative along this segment would impact Columbia spotted frog habitat.

Tables 3.11-13a–e display a comparison of the impacts to habitat for the species in which the various Route Alternatives in Segment 8 would have a differential effect, where quantitative data were available, and where the data were detailed enough that the discussion was best summarized in table format. Alternative 8E would result in an increase (over the comparison portion of the Proposed Route) in impacts for all species assessed that occur along this route. Alternative 8A would result in an increase in impacts to burrowing owl habitat, but fewer impacts to pygmy rabbit, greater sage-grouse, and northern leopard frog habitat. Alternative 8B would result in increased impacts to northern leopard frog and yellow-billed cuckoo habitat, but fewer impacts to burrowing owl, greater sage-grouse, and pygmy rabbit habitat. Alternative 8C would result in fewer impacts to burrowing owl, greater sage-grouse, and pygmy rabbit. For the most part, Alternative 8D is proposed for areas that do not cross habitat for the assessed species, and that correspond to portions of the Proposed Route that do not cross habitat for the assessed species. However, Alternative 8D would result in increased impacts to burrowing owl and pygmy rabbit habitat, but decreased impacts to greater sage-grouse habitats. None of the Route Alternatives avoid all impacts to these species habitats, as some habitat for these species would be impacted in areas of the Proposed Route that do not currently contain a Route Alternative.

Alternative 8B would substantially increase the impacts that would occur to Columbia spotted frog and northern leopard frog habitats over those of the comparison portion of the Proposed Route.

Tables 3.11-13a–e. Alternative Comparison Tables for Segment 8

Table 3.11-13a. Acres of Suitable Burrowing Owl Habitat Impacted during Construction and Operations of Segment 8

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
Proposed – Total Length	1,797	213
Proposed – Comparison Portion for Alternative 8A	591	77
Alternative 8A	594	80
Proposed – Comparison Portion for Alternative 8B	665	77
Alternative 8B	495	54
Proposed – Comparison Portion for Alternative 8C	135	15
Alternative 8C	107	15
Proposed – Comparison Portion for Alternative 8D	118	16
Alternative 8D	126	12
Proposed – Comparison Portion for Alternative 8E	76	8
Alternative 8E	268	25

"Acreages are otherwise rounded to the nearest acre.

Table 3.11-13b. Acres of Suitable Greater Sage-Grouse Habitat Impacted during Construction and Operation of Segment 8

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
Proposed – Total Length	1,174	144
Proposed – Comparison Portion for Alternative 8A	472	65
Alternative 8A	404	59
Proposed – Comparison Portion for Alternative 8B	364	44
Alternative 8B	287	34
Proposed – Comparison Portion for Alternative 8C	61	9
Alternative 8C	55	8
Proposed – Comparison Portion for Alternative 8D	43	7
Alternative 8D	43	4
Proposed – Comparison Portion for Alternative 8E	34	4
Alternative 8E	170	14

Acreages are otherwise rounded to the nearest acre.

Table 3.11-13c. Acres of Suitable Northern Leopard Frog Habitat Impacted during Construction and Operations of Segment 8

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
Proposed – Total Length	6	<1
Proposed – Comparison Portion for Alternative 8A	3	<1
Alternative 8A	2	<1
Proposed – Comparison Portion for Alternative 8B	<1	<1
Alternative 8B	8	<1
Proposed – Comparison Portion for Alternative 8C	<1	t[1/]
Alternative 8C	<1	t[1/]
Proposed – Comparison Portion for Alternative 8D	t[1/]	0
Alternative 8D	t[1/]	0
Proposed – Comparison Portion for Alternative 8E	0	0
Alternative 8E	t[1/]	0

1/ "t" indicates values <0.1. Acreages are otherwise rounded to the nearest acre.

Table 3.11-13d. Acres of Suitable Pygmy Rabbit Habitat Impacted during Construction and Operations of Segment 8

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
Proposed – Total Length	1,768	209
Proposed – Comparison Portion for Alternative 8A	584	76
Alternative 8A	509	71
Proposed – Comparison Portion for Alternative 8B	647	75
Alternative 8B	470	53
Proposed – Comparison Portion for Alternative 8C	135	15
Alternative 8C	97	15
Proposed – Comparison Portion for Alternative 8D	118	16
Alternative 8D	126	12
Proposed – Comparison Portion for Alternative 8E	76	8
Alternative 8E	268	25

Acreages are rounded to the nearest acre.

Table 3.11-13e. Acres of Suitable Yellow-Billed Cuckoo Habitat Impacted during Construction and Operations of Segment 8

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
Proposed – Total Length	<1	<1
Proposed – Comparison Portion for Alternative 8A	<1	<1
Alternative 8A	<1	t[1/]
Proposed – Comparison Portion for Alternative 8B		
Alternative 8B	<1	<1
Proposed – Comparison Portion for Alternative 8C		
Alternative 8C		
Proposed – Comparison Portion for Alternative 8D		
Alternative 8D		
Proposed – Comparison Portion for Alternative 8E		
Alternative 8E		

1/ "t" indicates values <0.1. Acreages are otherwise rounded to the nearest acre.

Segment 9

Segment 9, as proposed, would link the Cedar Hill and Hemingway Substations with a 161.7-mile single-circuit 500-kV transmission line which skirts the Jarbidge and Owyhee Military Operating Areas to the north, then follows the WWE corridor just north of the Saylor Creek Air Force Range, passing through Owyhee County before entering into the Hemingway Substation. Fifteen acres of the construction of the Cedar Hill Substation and 1 acre for two regeneration sites are attributed to Segment 9. There are eight Route Alternatives proposed, including 9A, which was the Proponents' Proposed Route until moving to avoid the Hollister area; 9B, which is being considered by the BLM because it follows the WWE corridor and parallels existing utility corridors; 9C, which was the Proponents' Proposed Route until moving to avoid the Castleford area; and 9D and 9E, proposed by the Owyhee County Taskforce, that cross more public lands north and south of the Proposed Route, respectively, than the Proposed Route. Most of Alternative 9D would be within the SRBOP. Alternatives 9F, 9G, and 9H were proposed to avoid crossing the nonmotorized area south of C.J. Strike Reservoir. Alternatives 9G and 9H provide an alternate route location south of Alternative 8E (see Appendix A,

Figure A-11). The most common habitat type along Segment 9 is disturbed or developed lands (see Section 3.6 – Vegetation Communities).

Of the TES species where quantitative species-specific data are available, the burrowing owl, Columbian sharp-tailed grouse, Columbia spotted frog, greater sage-grouse, northern leopard frog, pygmy rabbit, and the yellow-billed cuckoo could potentially occur along Segment 9. Tables D.11-5 through D.11-8 in Appendix D list the impacts to habitat for each species quantitatively assessed along Segment 9 and its Route Alternatives.

Approximately 26 acres of Columbian sharp-tailed grouse habitat would be impacted during construction of the Proposed Route. No Columbian sharp-tailed grouse habitat occurs along the Route Alternatives, or along the comparison portion of the Proposed Route. Therefore, selection of a Route Alternative would not have an effect on impacts to Columbian sharp-tailed grouse habitat.

Approximately 4 acres of Columbia spotted frog habitat would be impacted during construction of the Proposed Route. Selection of Alternative 9B would avoid less than 0.1 acre of this impact. Alternative 9D would almost completely avoid these 4 acres of impacts (reducing them to less than 0.1 acre of impacts). Alternative 9E would reduce impacts to Columbia spotted frog habitat by half (to 2 acres impacted).

Tables 3.11-14a–f display a comparison of the impacts to habitat for the species in which the various Route Alternatives in Segment 9 would have a differential effect, where quantitative data were available, and where the data were detailed enough that the discussion was best summarized in table format. Selection of Alternative 9A would increase impacts to habitat for the burrowing owl, greater sage-grouse, and pygmy rabbit compared to the comparison portion of the Proposed Route. Alternative 9B would result in increased impacts to northern leopard frog habitat, but fewer impacts to burrowing owl, greater sage-grouse, and pygmy rabbit habitat. Alternative 9C would result in fewer impacts to burrowing owl, greater sage-grouse, northern leopard frog, and pygmy rabbit habitat. Alternative 9D would result in an increase in impacts to burrowing owl and pygmy rabbit habitat, but fewer impacts to greater sage-grouse and northern leopard frog habitat. Alternative 9E would result in an increase in impacts to burrowing owl, greater sage-grouse, and pygmy rabbit habitat, but fewer impacts to northern leopard grog habitat. Alternatives 9F, 9G, and 9H would result in an increase in impacts for all species assessed that occur along these routes, except for the greater sage-grouse (each of these alternatives would result in fewer impacts to habitat) and the Columbia spotted frog (a decrease in impacts from 4 acres along the comparison portion of the Proposed Route to less than 1 acre along Alternative 9G).

The increase in impacts that would occur if Alternative 9B is selected would be substantial for the northern leopard frog, while the decrease in impacts would be substantial for the burrowing owl. Construction of Alternatives 9D and 9E would result in a substantial increase in impacts to pygmy rabbit habitat.

Tables 3.11-14a–f. Alternative Comparison Tables for Segment 9

Table 3.11-14a. Acres of Suitable Burrowing Owl Habitat Impacted during Construction and Operations of Segment 9

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
Proposed – Total Length	2,083	291
Proposed – Comparison Portion for Alternative 9A	100	13
Alternative 9A	111	16
Proposed – Comparison Portion for Alternative 9B	743	116
Alternative 9B	593	70
Proposed – Comparison Portion for Alternative 9C	221	23
Alternative 9C	189	25
Proposed – Comparison Portion for Alternatives 9D,E,F,G,H	649	76
Alternative 9D	733	71
Alternative 9E	844	112
Alternative 9F	783	76
Alternative 9G	763	74
Alternative 9H	794	79

Acreages are rounded to the nearest acre.

Table 3.11-14b. Acres of Suitable Columbia Spotted Frog Habitat Impacted during Construction and Operation of Segment 9

Alternatives	Construction Impacts (acres)	Operations Impacts (acres)
Proposed – Total Length	4	<1
Proposed – Comparison Portion for Alternative 9A	0	0
Alternative 9A	0	0
Proposed – Comparison Portion for Alternative 9B	t[1/]	0
Alternative 9B	0	0
Proposed – Comparison Portion for Alternative 9C	0	0
Alternative 9C	0	0
Proposed – Comparison Portion for Alternatives 9D,E,F,G,H	4	<1
Alternative 9D	t[1/]	0
Alternative 9E	2	t[1/]
Alternative 9F	5	<1
Alternative 9G	<1	<1
Alternative 9H	5	<1

1/ "t" indicates values <0.1. Acreages are otherwise rounded to the nearest acre.

Table 3.11-14c. Acres of Suitable Greater Sage-Grouse Habitat Impacted during Construction and Operations of Segment 9		
Alternatives	**Construction Impacts (acres)**	**Operations Impacts (acres)**
Proposed – Total Length	1,547	209
Proposed – Comparison Portion for Alternative 9A	64	7
Alternative 9A	88	10
Proposed – Comparison Portion for Alternative 9B	580	84
Alternative 9B	340	40
Proposed – Comparison Portion for Alternative 9C	207	24
Alternative 9C	146	18
Proposed – Comparison Portion for Alternatives 9D,E,F,G,H	451	54
Alternative 9D	394	38
Alternative 9E	711	86
Alternative 9F	442	44
Alternative 9G	418	39
Alternative 9H	445	45

Acreages are rounded to the nearest acre.

Table 3.11-14d. Acres of Suitable Northern Leopard Frog Impacted during Construction and Operation of Segment 9		
Alternatives	**Construction Impacts (acres)**	**Operations Impacts (acres)**
Proposed – Total Length	5	1
Proposed – Comparison Portion for Alternative 9A	<1	t[1/]
Alternative 9A	<1	<1
Proposed – Comparison Portion for Alternative 9B	<1	t[1/]
Alternative 9B	4	<1
Proposed – Comparison Portion for Alternative 9C	<1	0
Alternative 9C	0	0
Proposed – Comparison Portion for Alternatives 9D,E,F,G,H	4	<1
Alternative 9D	3	t[1/]
Alternative 9E	2	<1
Alternative 9F	9	<1
Alternative 9G	5	<1
Alternative 9H	10	<1

"t" indicates values <0.1. Acreages are otherwise rounded to the nearest acre.

Table 3.11-14e. Acres of Suitable Pygmy Rabbit Habitat Impacted during Construction and Operation of Segment 9		
Alternatives	**Construction Impacts (acres)**	**Operations Impacts (acres)**
Proposed – Total Length	1,778	251
Proposed – Comparison Portion for Alternative 9A	100	13
Alternative 9A	111	16
Proposed – Comparison Portion for Alternative 9B	702	110
Alternative 9B	549	66
Proposed – Comparison Portion for Alternative 9C	180	17
Alternative 9C	164	23
Proposed – Comparison Portion for Alternatives 9D,E,F,G,H	413	46
Alternative 9D	720	70
Alternative 9E	820	107
Alternative 9F	737	70
Alternative 9G	728	71
Alternative 9H	725	71

"t" indicates values <0.1. Acreages are otherwise rounded to the nearest acre.

Table 3.11-14f. Acres of Suitable Yellow-Billed Cuckoo Habitat Impacted during Construction and Operation of Segment 9		
Alternatives	**Construction Impacts (acres)**	**Operations Impacts (acres)**
Proposed – Total Length	t[1/]	t[1/]
Proposed – Comparison Portion for Alternative 9A		
Alternative 9A		
Proposed – Comparison Portion for Alternative 9B		
Alternative 9B		
Proposed – Comparison Portion for Alternative 9C		
Alternative 9C		
Proposed – Comparison Portion for Alternatives 9D,E,F,G,H		
Alternative 9D	t[1/]	t[1/]
Alternative 9E		
Alternative 9F	t[1/]	t[1/]
Alternative 9G	t[1/]	t[1/]
Alternative 9H	t[1/]	t[1/]

"t" indicates values <0.1. Acreages are otherwise rounded to the nearest acre.

Segment 10

Segment 10, as proposed, would link the Cedar Hill and Midpoint Substations with a 33.6-mile single-circuit 500-kV line, following a WWE corridor for most of its distance. Twenty-eight acres of the expansion of the Midpoint Substation and of the construction of the Cedar Hill Substation are attributed to Segment 10. There are no Route Alternatives proposed along this segment (see Appendix A, Figure A-12). Most of the lands crossed by the segment consist of developed lands (see Section 3.6 – Vegetation Communities

Of the TES species where quantitative species-specific data are available, the bald eagle, burrowing owl, greater sage-grouse, northern leopard frog, and pygmy rabbit could potentially occur along Segment 10. There are no Route Alternatives proposed

along Segment 10. Tables D.11-5 through D.11-8 in Appendix D list the impacts to habitat for each species found within Segment 10.

Construction of Segment 10 would impact approximately 254 acres of burrowing owl habitat, 109 acres of greater sage-grouse habitat, 3 acres of northern leopard frog habitat, and 253 acres of pygmy rabbit habitat. Although Segment 10 would cross less than 0.1 mile of habitat located within 1 mile of a bald eagle winter roost, no direct habitat loss would occur, as this habitat would be spanned.

3.11.2.4 Design Variation

A Design Variation is being considered that would consist of constructing two single-circuit lines in Segments 2 through 4 instead of a single double-circuit line (which is the design assessed above). The disturbance footprint of the two single-circuit towers is greater than that of the double-circuit tower, in part because the requested ROW would be wider, but also because helicopter-assisted construction could be implemented in these areas due to the lighter weight of the towers, which would require additional fly yards. The additional ROW space and the fly yards would cause additional temporary disturbance during construction. Across Segments 2, 3, and 4, the additional disturbance of the single-circuit tower alternative ranges from 25 to 30 percent greater than the comparable portions of the double-circuit tower disturbance under the proposed design. The two single circuits require more ground disturbance, but would be designed and constructed to the same standards as the Proposed Action.

Tables D.11-12 and D.11-13 (in Appendix D) list the acres of impacts that would occur, due to the Design Variation, to habitats for ESA wildlife species as well as BLM and Forest Service Sensitive Species with available quantitative data.

An advantage of the Design Variation is that H-frame structures could be substituted if needed for site-specific mitigation. This would increase the options available to prevent or limit raptor use of the transmission line and pole structures.

3.11.2.5 Structure Variation

The proposed guyed Structure Variation would add four guy wires about 140 feet long from a point about 100 feet up in each tower to four guy anchors spaced in a square around the tower (Appendix B, Figure B-6). This would not change the amount of disturbance during construction or operations appreciably; however, these guy wires could add to the potential for avian collisions, especially during low visibility conditions. Extra care would be needed where towers are located near known concentrations of birds to avoid placing guy wires in these areas. As stated in the Proponents' Avian Protection Plan, any guy wires where mortality from collisions has been documented would be equipped with bird flight diverters. In addition, the Agencies have identified WILD-7, which states that all guy wires shall be marked with bird deterrent devices to avoid avian collisions with structures on public lands. Therefore, there would be not be an appreciable difference in impacts to birds from the use of this Structure Variation when compared to the use of self-supporting lattice towers.

3.11.2.6 Schedule Variation

The Schedule Variation uses the two single-circuit design variation described above but extends construction over a longer timeframe. Initially, only one of the eventual two single-circuit lines would be constructed with the second to be constructed at a later date. The Schedule Variation proposes that the first single-circuit transmission line in Segments 2, 3, and 4 would be built as soon as the ROW grant is issued, but that the second line would not begin construction until late 2018. This would mean nearly 2 years between the end of construction for the first line and beginning of construction for the second line. Any staging areas and fly yards that had been used for the first stage would have been revegetated after construction was complete and would have to be cleared again. There would be two sets of construction disturbances adding movement, noise, and dust to the area of construction in two instances in any given area. The Schedule Variation would therefore have essentially double the adverse indirect impacts on adjacent habitats and populations as the simultaneous construction or double-circuit alternative, even though direct habitat disturbance overall would not be any greater.

3.11.3 Mitigation Measures

3.11.3.1 Measures Required on Federal Lands

To minimize or avoid impacts to TES wildlife or fish species, the Proponents have committed to EPMs that would be implemented Project-wide as outlined in Appendix C. The following mitigation measures were identified by the Agencies and are required on federally managed lands. The Agencies recommended that the Proponents incorporate these measures into their EPMs and apply them Project-wide.

<u>Raptor and Raven Prey Species</u>

TESWL-2 The Proponents shall work with the applicable land-management agencies to develop a survey protocol that would be conducted in conjunction with annual operations and maintenance surveys (as outlined in the Proponents' Avian Protection Plans). The goal of these raptor-raven surveys shall be to identify whether populations of raptors and ravens are consolidating along the Project, and will be done during the appropriate time of year. These surveys shall be conducted, at a minimum, along portions of the line that are located within 1 mile of identified concentrations of sensitive raptor and raven prey species (including the black-footed ferret, mountain plover, burrowing owl, grouse species, as well as white- and black-tailed prairie dogs). The Proponents and applicable land-management agencies shall work together to identify measures to limit predation rates on sensitive species within areas where raptor and raven populations are considered to be consolidating (limited to areas near sensitive species).

TESWL-3 H-frame structures shall be equipped with anti-perch devices to reduce raven and raptor use, and limit predation opportunities on special status prey species.

Riparian- and Aquatic-dependent Species

TESWL-1 For the protection of aquatic- and riparian-/wetland-dependent species, surface disturbing and disruptive activities must be avoided in the following areas: 1) identified 100-year floodplains; 2) areas within 500 feet of perennial waters, springs, wells, and wetlands; and 3) areas within 100 feet of the inner gorge of ephemeral channels on federally managed lands.

Where it is not possible to avoid wetland and riparian habitat, crossing-specific plans must be developed. These plans shall: 1) demonstrate that vegetation removal is minimized; 2) show how sediment would be controlled during construction and operation within wetland and riparian areas; 3) attempt to intersect the wetland or riparian habitat at its edge; and 4) provide measures to restore habitat and ensure conservation of riparian microclimates. This plan must be submitted to the appropriate land-management agency and approved prior to construction of any portion of the Project within sensitive riparian habitat.

Greater Sage-Grouse and Columbian Sharp-tailed Grouse

TESWL-10 Proponents shall provide the Agencies a list of the protocols that the Proponents would use during greater sage-grouse and sharp-tailed grouse pre-construction surveys. The Agencies shall either approve these protocols, or suggest alternative protocols to be used.

TESWL-11 In areas where sharp-tailed grouse leks occur in proximity to greater sage-grouse leks, surface disturbance shall be avoided within 4 miles of occupied or undetermined greater sage-grouse leks from March 1 to June 30. In areas where sharp-tailed grouse leks occur in isolation from greater sage-grouse leks, surface disturbance shall be avoided within 1.2 miles of occupied or undetermined sharp-tailed grouse leks from March 15 to July 15.

TESWL-14 Surface disturbance shall be avoided within 0.6 to 4 miles of occupied or undetermined greater sage-grouse leks from March 15 to July 15 in all portions of the Project except for Nevada. In Nevada, surface disturbance shall be avoided within view of or within 0.3 mile of all leks from March 1 to May 15; and within areas designated by Nevada as greater sage-grouse brood rearing areas from May 15 to August 15.

TESWL-15 There shall be no surface occupancy within 0.6 mile of the perimeter of occupied greater sage-grouse leks. “No surface occupancy,” as used here, means no surface facilities, including roads, shall be placed within the NSO area. Other activities may be authorized with the application of appropriate seasonal stipulations, provided the resources protected area is not adversely affected.

TESWL-19 There shall be no surface disturbances within areas designated as Winter Concentration Areas for the greater sage-grouse from November 1 through March 15.

TESWL-22 No structures that require guy wires would be used in occupied sagebrush obligate habitats within the area managed under the Kemmerer Resource Management Plan.

TESWL-23 If the Kemmerer RMP is amended to allow Alternative 4A, 4C, 4E, or 4F to be selected, existing fences within one mile of the portion of the Gateway West Project located on lands managed by the Kemmerer RMP shall be modified with FireFly Grouse Flight diverters (or a similar product) to prevent greater sage-grouse mortalities. Additional site-specific reclamation, such as transplanting sagebrush seedlings within previous disturbed habitats, may also be required to off-set the net loss of sagebrush habitats within the Rock Creek/Tunp management area.

Midget Faded Rattlesnake

TESWL-18 Preconstruction surveys for occupied or potential midget faded rattlesnake hibernacula (i.e., rock outcrops with south to east aspect) will be conducted.

Aquatic Organisms

FISH-3 When taking water from TES fish-bearing streams for road and facility construction and maintenance activities, intake hoses shall be screened with the most appropriate mesh size (generally 3/32 of an inch), or as determined through coordination with NMFS and/or USFWS.

3.11.3.2 ESA-related Measures Required on All Lands

The following mitigation measures are required to comply with the ESA and would be applied Project-wide, regardless of land ownership:

TESWL-4 In the event that an ESA-listed species is discovered, construction would cease, the USFWS would be notified, and Section 7 consultation would be initiated. In addition, the transmission line or structures would be relocated to minimize direct impacts to newly discovered ESA species, to the extent practical.

Black-Footed Ferret

TESWL-5 Preconstruction surveys must be conducted for the black-tailed prairie dog (in addition to those already proposed for the white-tailed prairie dog and the black-footed ferret) in Segments 1E and 1W. If prairie dogs or their habitats are documented, then surveys for black-footed ferrets must occur. If ferrets are found, construction in that area must halt and consultation with the USFWS be initiated.

If black-tailed prairie dogs are discovered during construction, all construction activities must cease and survey for the black-footed ferret shall be conducted. If ferrets are found, construction in that area must halt and consultation with the USFWS would be re-initiated.

Yellow-billed Cuckoo

TESWL-13 A preconstruction survey for the yellow-billed cuckoo must be conducted at any proposed crossing of suitable habitat. If birds are detected within 1 mile of the centerline (within existing habitat), construction must not occur until the young have fledged or the nest is abandoned. The crossing-specific plan must contain proposed monitoring measures to ensure compliance with this measure.

3.11.3.3 Measure Related to the USFWS Tiered BO on the Colorado River

The following mitigation measure is required to comply with the USFWS tiered BO on the Colorado River water withdrawals and would be applied Project-wide regardless of land ownership.

TESWL-17 A payment of a one-time fee, based on a fee schedule provided by the USFWS, shall be made based on the amount of water used during construction of any segments that cross the Colorado River system.

3.11.3.4 Measures Related to Agency Timing Restrictions

The Agencies have developed mitigation measures TESWL-6, -7, -9, -12, -16, -20, and -21 for any exceptions to agency seasonal constraints that are approved during the established exception process. If an exception is granted, the Agencies would require that monitoring be conducted to determine the location of each species. For any of these species that are located on private or state lands, the Agencies recommend that survey plans and monitoring reports be provided to the applicable state agency (if requested or desired by these state agencies) or the USFWS (in the case of the bald eagle).

TESWL-6 Requests for exceptions from bald eagle closure periods and areas must be submitted by the Proponents to the appropriate land-management agency office in which the exception is requested. Established exception processes on federally managed lands must be followed (see WILD-1).

TESWL-7 Requests for exceptions from burrowing owl closure periods and areas must be submitted by the Proponents to the appropriate land-management agency office in which the exception is requested. Established exception processes on federally managed lands must be followed (see WILD-1).

TESWL-9 Requests for exceptions from Columbian sharp-tailed grouse closure periods and areas must be submitted by the Proponents to the appropriate land-management agency office in which the exception is

requested. Established exception processes on federally managed lands must be followed (see WILD-1).

TESWL-12 Requests for exceptions from mountain plover closure periods and areas must be submitted by the Proponents to the appropriate land-management agency office in which the exception is requested. Established exception processes on federally managed lands must be followed (see WILD-1).

TESWL-16 Requests for exceptions from greater sage-grouse closure periods and areas must be submitted by the Proponents to the appropriate land-management agency office in which the exception is requested. Established exception processes on federally managed lands must be followed (see WILD-1).

TESWL-20 Requests for exceptions from ferruginous hawk closure periods and areas must be submitted by the Proponents to the appropriate land-management agency office in which the exception is requested. Established exception processes on federally managed lands must be followed (see WILD-1).

TESWL-21 Requests for exceptions from northern goshawk closure periods and areas must be submitted by the Proponents to the appropriate land-management agency office in which the exception is requested. Established exception processes on federally managed lands must be followed (see WILD-1).

3.11.3.5 Measure Related to Final Routing

The Agencies have developed mitigation measure TESWL-8, which shall be required on federally managed lands, to ensure that the final engineering design is routed to avoid the known locations of structures occupied by sensitive species. The Agencies recommended that the Proponents incorporate this measure into their EPMs and apply it Project-wide.

TESWL-8 A wildlife biologist will accompany site engineers during the final engineering design, in order to verify and flag the location of any known occupied structures (e.g., nests, burrows, colonies, maternity dens, hibernacula) utilized by sensitive species. This will include, but not be limited to, known burrowing owl burrows (including artificial burrows that have been constructed as part of research/restoration efforts), prairie dog colonies, and raptor nests, which could be impacted by the Project based on the indicative engineering design. The final engineering design will be routed in order to avoid direct impact to these occupied structures to the extent practical.

3.12 MINERALS

This section addresses potential impacts to mineral resources from the Proposed Route and Route Alternatives during construction, operations, and decommissioning. The primary reason to define impacts to minerals is to reduce, minimize, or mitigate effects to minerals from Project construction and operations. This section analyzes the potential impacts on exploitable mineral resources including oil, gas, geothermal, coal, trona, precious and semiprecious stones, metals, salt, sand, gravel, and clay. Related geological-type sections include Section 3.13 – Paleontological Resources, Section 3.14 – Geologic Hazards, and Section 3.15 – Soils.

3.12.1 Affected Environment

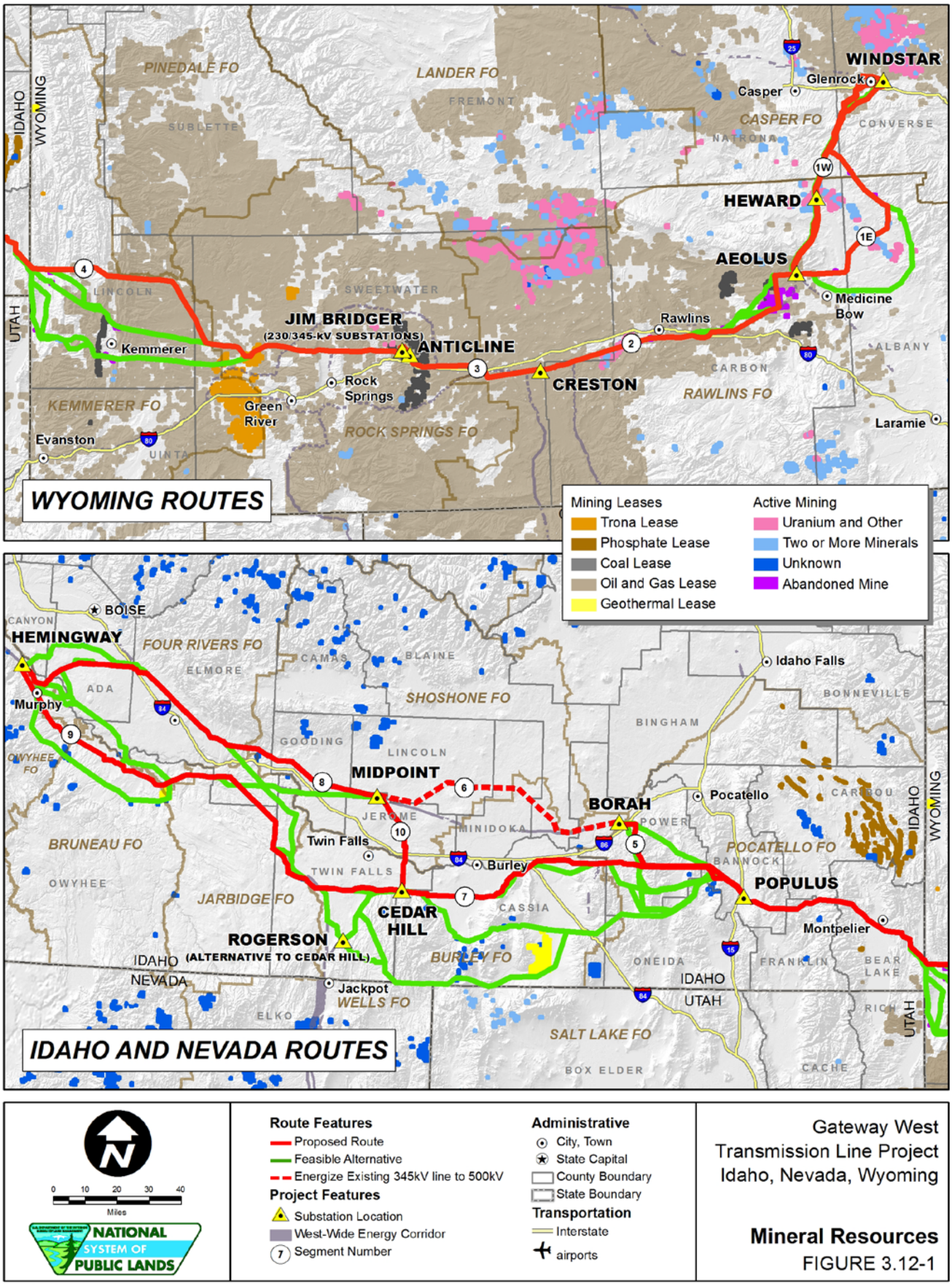
This section discusses those aspects of the geologic environment that could be impacted by the Project. It starts with a discussion of the Analysis Area considered, identifies the issues that have driven the analysis, and characterizes the existing conditions across the Proposed Action in Wyoming and Idaho.

3.12.1.1 Analysis Area

The Analysis Area includes the geologic formations crossed by the Proposed and Alternative Routes, substations, and temporary construction areas, in Wyoming, Idaho, and Nevada. The geology of southern Wyoming (Segments 1 through 4) includes large expanses of sedimentary deposits that contain economical deposits of coal, trona, phosphate, uranium, and other locatable, leasable, and saleable minerals. The state has an extensive history of mining, including many currently active mines. In addition, Wyoming currently contains extensive oil and gas wells and leases. Figure 3.12-1 shows mineral resources in Wyoming and Idaho.

Southern Idaho and the small part of the Analysis Area in northern Nevada lack the significant mineral resources found in southern Wyoming. Several phosphate mines in Caribou County, located north of the Analysis Area, are the only large-scale mining operations in southern Idaho. Phosphate and vanadium resources are currently being explored in the mountains west of Paris, Idaho, in Bear Lake County near Segment 4 but no active mining is occurring. Other mining claims exist for locatable minerals in the mountains of southern Idaho, and development of future mining projects is possible. These include current gold mining exploration in southern Cassia County within the Alternative 7I Analysis Area. The area south of Oakley, Idaho, near Alternative 7H also contains several decorative stone enterprises. Oakley Stone, a micaceous quartzite that breaks into blocks or flat stones, is a regionally recognized popular building stone. Otherwise, there are currently no active locatable mining projects within the Idaho and Nevada portions of the Analysis Area.

As the routes progress west into the Snake River Valley of southern Idaho (Segments 5 through 10), basalt bedrock predominates. The predominant mineral resources here consist of saleable (also known as industrial) minerals, such as sand and gravel, road base, fill, or building stones. The basalt does not contain economic quantities of metallic or energy-related mineral deposits.


WYOMING ROUTES
IDAHO AND NEVADA ROUTES
WINDSTAR
Glenrock
Casper
CASPER FO
CONVERSE
NATRONA
HEWARD
AEOLUS
Medicine Bow
Rawlins
ALBANY
CARBON
RAWLINS FO
Laramie
CRESTON
ANTICLINE
JIM BRIDGER
(230/345-kV SUBSTATIONS)
Rock Springs
Green River
ROCK SPRINGS FO
Kemmerer
KEMMERER FO
Evanston
UINTA
LINCOLN
SWEETWATER
PINEDALE FO
LANDER FO
FREMONT
SUBLETTE
IDAHO
WYOMING
UTAH
Mining Leases
Trona Lease
Phosphate Lease
Coal Lease
Oil and Gas Lease
Geothermal Lease
Active Mining
Uranium and Other
Two or More Minerals
Unknown
Abandoned Mine
BOISE
HEMINGWAY
CANYON
FOUR RIVERS FO
ELMORE
ADA
Murphy
OWYHEE FO
BRUNEAU FO
OWYHEE
JARBIDGE FO
CAMAS
BLAINE
SHOSHONE FO
GOODING
LINCOLN
MIDPOINT
JEROME
MINIDOKA
Twin Falls
TWIN FALLS
Burley
CEDAR HILL
ROGERSON
(ALTERNATIVE TO CEDAR HILL)
IDAHO
NEVADA
Jackpot
WELLS FO
ELKO
BURLEY FO
CASSIA
BORAH
POWER
Pocatello
BANNOCK
POCATELLO FO
POPULUS
Idaho Falls
BONNEVILLE
BINGHAM
CARIBOU
Montpelier
ONEIDA
FRANKLIN
BEAR LAKE
RICH
UTAH
SALT LAKE FO
BOX ELDER
CACHE
Route Features
Proposed Route
Feasible Alternative
Energize Existing 345kV line to 500kV
Project Features
Substation Location
West-Wide Energy Corridor
Segment Number
Administrative
City, Town
State Capital
County Boundary
State Boundary
Transportation
Interstate
airports
0 10 20 30 40
Miles
NATIONAL SYSTEM OF PUBLIC LANDS
Gateway West
Transmission Line Project
Idaho, Nevada, Wyoming
Mineral Resources
FIGURE 3.12-1

Most of southern Idaho contains the potential for geothermal resources within the deep aquifers (DOE 2003a). U.S. Geothermal operates a 10 MW geothermal power plant on private and leased land within the Segment 7 Analysis Area in southern Cassia County (U.S. Geothermal 2007). IDWR lists over 1,000 geothermal wells in southern Idaho, many of which are used for building heating, greenhouses, and aquaculture (IDWR 2009).

The Analysis Area for minerals was defined in a GIS file by buffering the centerlines of the Proposed Route and Route Alternatives out 0.5 mile on either side of the centerlines. This distance was used because the 0.5 mile distance would incorporate most disturbances associated with the Project and these disturbances could affect mineral exploration or mining operations.

3.12.1.2 Issues to be Analyzed

The following mineral-related comments were offered by the public during public scoping (Tetra Tech 2009a), raised by federal and state agencies during scoping and agency discussions, or are issues that must be considered as stipulated in law or regulation:

- The effect that underground mining could have on possible subsidence-related hazards for the transmission line (this issue is discussed in Section 3.14 – Geologic Hazards);
- The effect the Project could have on the ability to explore or extract mineral deposits or affect mineral leases;
- The effect the Project could have on oil and natural gas wells and leases; and
- The effect the Project could have on geothermal resources.

3.12.1.3 Regulatory Framework

On federal land, BLM serves as the primary land management agency. The BLM classifies mineral products as locatable, leaseable, or saleable, and each category is administered by different programs. Locatable minerals include both metallic minerals (e.g., gold, silver, lead, copper, zinc, and nickel), nonmetallic minerals (e.g., fluorspar, mica, certain limestones, uranium, gypsum, clay, heavy minerals in placer form, and gemstones), and certain uncommon variety minerals. It is difficult to prepare a complete list of locatable minerals because the history of the law has resulted in a definition of minerals that includes economics. Mining of locatable minerals on public land is a right protected by the General Mining Act of 1872. The Act specifies that all citizens of the United States 18 years or over have the right to locate a lode or placer mining claim on federal lands open to mineral entry. Potential locatable mineral deposits may be claimed by filing a mining claim with the BLM, the federal land management agency.

Since 1920, the BLM has leased certain minerals, such as oil and gas, oil shale, geothermal resources, potash, sodium, native asphalt, solid and semisolid bitumen, bituminous rock, phosphate, and coal, on public and other federal lands. These lands include areas managed by the BLM and the Forest Service. BLM can also lease these

minerals on certain private lands, provided that the mineral rights are owned by the federal government. Most of the minerals leased under this program are used to make fertilizer, as feed stock, or for energy development. In some areas where the federal government has acquired the land, BLM leases base and precious metals under this program. The regulations that govern mineral leasing are found in 43 CFR Parts 3000 to 3590.

Saleable minerals include some of the most basic natural resources, such as sand, gravel, soil, rock, and building stone, used for common construction uses. Since July 23, 1955, common varieties of saleable minerals were removed from the General Mining Law and placed under the Materials Act of 1947, as amended. BLM sells mineral materials to the public at fair market value but gives them free to states, counties, or other government entities for public projects. Disposals of saleable minerals from BLM-managed lands are regulated by 43 CFR Part 3600. Mineral activities must comply with NEPA, ESA, and other laws.

Mineral management on NFS land is governed under 36 CFR 228 and FSM 2810. Mineral development on NFS land requires consistency with the management objectives set out in the applicable Forest Plan. Forest Plan direction provides a framework for mineral operations using BMPs. Areas may be withdrawn from mineral activity if the activity might conflict with other management objectives.

The State Board of Land Commissioners through the Idaho Department of Lands (IDL) administers mineral leases on approximately 3 million acres of state land, as well as the beds of navigable waters, which were granted to the state in trust at statehood in 1890. The state leases minerals to generate revenue for the owning endowment fund, such as Public Schools, or for the general fund when public trust lands are involved. Leases are issued for metals and other mineral commodities, oil and gas and geothermal resources on both land and navigable waters. In Wyoming, the Land Quality Division administers and enforces all statutes and regulations on land disturbances dealing with mining and reclamation within the State of Wyoming. The Land Quality Division has the authority to require permitting and licensing of all operator actions of surface and underground mine facilities. The Land Quality Division's authority derives from the Federal Surface Mining Reclamation and Control Act and the Wyoming Environmental Quality Act.

The environmental requirements for mining, including environmental permitting for mine operation and post-mining reclamation are administered through state and federal programs via the EPA, Idaho Department of Environmental Quality (IDEQ), and WDEQ.

3.12.1.4 Methods

Data for mineral resources were obtained from the GeoCommunicator database, a website sponsored by the BLM and Forest Service. The GeoCommunicator database contains available information on the location of mineral claims and leases for locatable, leasable, and saleable minerals. The locations of individual active oil and gas wells were obtained from a database maintained by the Wyoming Oil and Gas Commission.

In February 2011, the GeoCommunicator database was taken offline for updating. Minerals information for the newest alternatives (7J, 8E, 9G, 9G, and 9H) was evaluated

using BLM's LR-2000 database, which contains the same mineral information as GeoCommunicator. It differs in not being a GIS-supported database. No mineral claims or leases were identified for the new alternatives. The effects analysis was conducted using readily available data and GIS files derived from preliminary centerline and component design for the proposed and alternative routes including ROW, access roads, staging areas, and fly yards (see Section 3.1 for details on development of these files). In all cases, after analysis of impacts was complete and where impacts were identified, Proponent-proposed measures to reduce impacts were reviewed for sufficiency. Where those measures were determined to be insufficient, additional measures were identified.

To assess the impacts to mineral claims and leases, the centerlines of the Proposed Route and Route Alternatives in each segment were overlaid on the GeoCommunicator GIS data file and the area (in acres) was determined and expressed as a percentage of the Analysis Area for the segment. To disclose overall impacts by segment, the area containing mineral claims, leases, or saleable mineral permits was identified along the Proposed Route, as well as where Route Alternatives were proposed. The area of mineral impacts was then compared for each segment by alternative. BLM's LR-2000 database was also checked for individual mining claims to see whether the mineral product could be identified.

To assess the impacts to active oil and gas wells, the centerlines of the Proposed Route and Route Alternatives in each segment were overlaid on the Wyoming Oil and Gas Commission GIS data file and the number of wells within the Analysis Area was noted by segment. To compare the number of wells within a segment, the number of wells was counted by alternative.

Aerial photographs and USGS topographic maps of the Proposed Route and Route Alternatives were reviewed for all of the segments. Mining-related features were noted within 1,000 feet on either side of the route centerlines. The mining features were described according to route segment milepost and the number of feet in distance perpendicular to the centerline. Based on the locations of mineral resources obtained from the GIS databases and map reconnaissance, some of the larger mine operators were also consulted on whether specific route locations would affect mining operations or whether mining operations would affect the transmission line.

3.12.1.5 Existing Conditions

Based on the methods described in Section 3.12.1.4, Table 3.12-1 was developed. It presents the number of oil and gas wells and the total acreage of mineral claims, leases, or saleable mineral permits within the Analysis Area. Table 3.12-2 shows the mineral facilities observed in the aerial photograph and USGS topographic map reconnaissance.

<u>Coal</u>

Wyoming is the top producer of coal in the United States. In 2008, Wyoming coal mines produced approximately 468 million tons of coal, which accounted for nearly 39 percent of the coal produced in the United States (WGS 2010a). In southern Wyoming, coal occurs in generally north-south-trending formations and is mined from open pits and underground; however, coal leases occupy a very small percentage of the Analysis

Table 3.12-1. Mineral Resources Within the Analysis Area (percent of area)

Segment Number	Total Analysis Area (Acres)[1/]	Active Oil and Gas Wells (Number)	Oil and Gas Leases (percent)	Trona Leases (percent)	Coal Leases (percent)	Geothermal Leases (percent)	Uranium and Other Leases (percent)	Unknown Mineral Claims [2/] (percent)	Two or More Minerals Claims [3/] (percent)	Saleable Minerals [4/] (percent)
1	177,572	51	2	–	–	–	2	–	5	<1
2	90,043	74	20	–	1	–	4	–	2	–
3	35,635	95	33	–	10	–	–	–	–	–
4	262,621	155	21	1	1	–	–	–	1	<1
5	101,596	–	–	–	–	–	–	–	–	–
6	1,304	–	–	–	–	–	–	–	–	–
7	292,396	–	–	–	–	<1	–	1	–	<1
8	159,253	–	–	–	–	–	–	<1	–	<1
9	229,434	–	–	–	–	1	–	1	–	<1
10	21,877	–	–	–	–	–	–	–	–	<1

1/ Numbers are rounded to the nearest acre.
2/ Unknown Mineral Claim is a locatable mineral claim where the target mineral was not identified.
3/ Two or More Mineral Claims are for locatable minerals where more than one target mineral is identified.
4/ Saleable Minerals as defined in Section 3.12.1.3 are common construction materials (sand and gravel, fill, etc.).

Table 3.12-2. Mining Activities Within 1,000 Feet of Transmission Line Routes, Observed From Aerial Photograph Reconnaissance and Topographic Maps

Segment Number	Alternative (status)	Milepost Location	Land Use/Feature Type	Mineral Product	Location
1E	Proposed – Total Length	47.1-48.6	Active Mining Claim	Unknown	Crossed
	Proposed – Total Length	54.2-55.6	Active Mining Claim	Unknown	Crossed
	Proposed – Total Length	80.6	Oil Springs Oil/Gas Well	Oil/Gas	400 feet S
	Alternative 1E-A	2.6-4.9	Former Oil Tank Farm	Oil	Crossed
	Alternative 1E-A	43.8	Gravel Pit	Gravel	740 feet E
1W(a)	Proposed – Total Length	2.1	Gravel Pit	Gravel	Crossed
	Proposed – Total Length	7.3	Glenrock South Oil/Gas Well	Oil/Gas	200 feet N
	Proposed – Total Length	21.2-21.8	Active Mining Claim	Unknown	Crossed
	Proposed – Total Length	40.6-42.0	Active Mining Claim	Unknown	Crossed
	Proposed – Total Length	43.8-46.3	Active Mining Claim	Unknown	Crossed
1W(c)	Proposed – Total Length	19.9-20.5	Active Mining Claim	Unknown	Crossed
	Proposed – Total Length	39.2-41.4	Active Mining Claim	Unknown	Crossed
	Proposed – Total Length	42.4-45.0	Active Mining Claims	Unknown	Crossed
2	Proposed – Total Length	5.8	WC Oil/Gas Well	Oil/Gas	Crossed
	Proposed – Total Length	10.2-11.2	Active Coal Lease	Coal	Crossed
	Proposed – Total Length	12.4-14.5	Strip Mine	Unknown	Crossed
	Proposed – Total Length	40.4-40.8	Gravel Pit	Gravel	Crossed
	Proposed – Total Length	41.1-41.6	Mining/Gravel Pits	Gravel	Crossed
	Proposed – Total Length	65.7-66.3	Active Mining Claim	Unknown	Crossed
	Proposed – Total Length	67.2-68.3	Active Mining Claim	Unknown	Crossed
	Proposed – Total Length	68.8-69.1	Active Mining Claim	Unknown	Crossed
	Proposed – Total Length	70.0-71.1	Active Mining Claim	Unknown	Crossed
	Proposed – Total Length	82.6-95.4	Oil/Gas Wells	Oil/Gas	Crossed
	Proposed – Total Length	85.1	Echo Springs Oil/Gas Well	Oil/Gas	250 feet N
	Proposed – Total Length	86.7	Echo Springs Oil/Gas Well	Oil/Gas	470 feet N
	Proposed – Total Length	88.1	Echo Springs Oil/Gas Well	Oil/Gas	316 feet N
	Proposed – Total Length	88.7	Echo Springs Oil/Gas Well	Oil/Gas	550 feet S

Table 3.12-2. Mining Activities Within 1,000 Feet of Transmission Line Routes, Observed From Aerial Photograph Reconnaissance and Topographic Maps (continued)

Segment Number	Alternative (status)	Milepost Location	Land Use/Feature Type	Mineral Product	Location
2 (cont.)	Proposed – Total Length	89.2	Echo Springs Oil/Gas Well	Oil/Gas	450 feet S
	Proposed – Total Length	89.7	Echo Springs Oil/Gas Well	Oil/Gas	210 feet N
	Proposed – Total Length	90.2	Echo Springs Oil/Gas Well	Oil/Gas	420 feet S
	Proposed – Total Length	90.5	Echo Springs Oil/Gas Well	Oil/Gas	370 feet N
	Proposed – Total Length	90.9	Echo Springs Oil/Gas Well	Oil/Gas	280 feet S
	Proposed – Total Length	91.3	Echo Springs Oil/Gas Well	Oil/Gas	340 feet N
	Proposed – Total Length	92.8	Echo Springs Oil/Gas Well	Oil/Gas	300 feet S
	Proposed – Total Length	94.5	Tierney Oil/Gas Well	Oil/Gas	280 feet S
	Proposed – Total Length	95.4	Tierney Oil/Gas Well	Oil/Gas	300 feet S
	Alternative 2A	21.4-21.6	Gravel Pit	Gravel	987 feet S
	Alternative 2B	1.8	Gravel Pit	Gravel	250 feet SE
	Alternative 2C	3.0-8.3	Seminole II Mine	Coal	Crossed
	Alternative 2C	3.0-3.2	Active Coal Lease	Coal	Crossed
	Alternative 2C	3.7-4.5	Mining Surface Reclamation	Coal	Crossed
	Alternative 2C	4.5-4.8	Active Coal Lease	Coal	Crossed
	Alternative 2C	10.3-10.6	Mining Surface Reclamation	Coal	Crossed
3	Segment 3 (Proposed)	1.5	Tierney Oil/Gas Well	Oil/Gas	360 feet S
	Segment 3 (Proposed)	1.6	Wamsutter Oil/Gas Well	Oil/Gas	530 feet N
	Segment 3 (Proposed)	2.8	Frewen Oil/Gas Well	Oil/Gas	200 feet S
	Segment 3 (Proposed)	4.1	Frewen Oil/Gas Well	Oil/Gas	520 feet S
	Segment 3 (Proposed)	5.1-5.2	Oil/Gas Well Buildings	Oil/Gas	Crossed
	Segment 3 (Proposed)	5.7	Frewen Oil/Gas Well	Oil/Gas	250 feet N
	Segment 3 (Proposed)	7.6	Desert Springs Oil/Gas Well	Oil/Gas	260 feet S
	Segment 3 (Proposed)	27.7	Arch Oil Oil/Gas Well	Oil/Gas	375 feet S
	Segment 3 (Proposed)	30.4	Table Rock Oil/Gas Well	Oil/Gas	360 feet S
	Segment 3 (Proposed)	32.1	Patrick Draw Oil Field	Oil/Gas	Crossed
	Segment 3 (Proposed)	35.1	Desert Springs Oil/Gas Well	Oil/Gas	270 feet S
	Segment 3 (Proposed)	40.9-41.4	Active Coal Lease	Coal	Crossed
	Segment 3 (Proposed)	42.0-43.1	Active Coal Lease	Coal	Crossed
4	Proposed – Total Length	3.9-4.4	Active Coal Lease	Coal	Crossed
	Proposed – Total Length	10.1	Gravel Pit	Gravel	1,000 feet S

Table 3.12-2. Mining Activities Within 1,000 Feet of Transmission Line Routes, Observed From Aerial Photograph Reconnaissance and Topographic Maps (continued)

Segment Number	Alternative (status)	Milepost Location	Land Use/Feature Type	Mineral Product	Location
4 (cont.)	Proposed – Total Length	47.3-48.6	Elkol Strip Mine	Coal	Crossed
	Proposed – Total Length	71.4-81.2	Oil/Gas Wells	Oil/Gas	340 feet N
	Proposed – Total Length	73	Whiskey Butte Oil/Gas Well	Oil/Gas	550 fee N
	Proposed – Total Length	74	Whiskey Butte Oil/Gas Well	Oil/Gas	500 feet N
	Proposed – Total Length	74	Whiskey Butte Oil/Gas Well	Oil/Gas	450 feet S
	Proposed – Total Length	75	Whiskey Butte Oil/Gas Well	Oil/Gas	350 feet N
	Proposed – Total Length	75	Whiskey Butte Oil/Gas Well	Oil/Gas	400 feet S
	Proposed – Total Length	76	Whiskey Butte Oil/Gas Well	Oil/Gas	470 feet S
	Proposed – Total Length	76	Whiskey Butte Oil/Gas Well	Oil/Gas	375 feet N
	Proposed – Total Length	76	Whiskey Butte Oil/Gas Well	Oil/Gas	350 feet N
	Proposed – Total Length	77	Whiskey Butte Oil/Gas Well	Oil/Gas	515 feet S
	Proposed – Total Length	76	Whiskey Butte Oil/Gas Well	Oil/Gas	440 feet S
	Proposed – Total Length	81	Cow Hollow Oil/Gas Well	Oil/Gas	300 feet S
	Proposed – Total Length	81	Cow Hollow Oil/Gas Well	Oil/Gas	430 feet S
	Proposed – Total Length	150-150.5	Gravel Pit	Gravel	500 feet N
	Proposed – Total Length	159.9	Gravel Pit	Gravel	125 feet E
	Proposed – Total Length	160.6	Gravel Pit	Gravel	950 feet E
	Proposed – Total Length	179.8	Mining/Excavation Area	Unknown	Crossed
	Alternative 4A	19.3-29.1	Oil/Gas Wells	Oil/Gas	340 feet N
	Alternative 4A	21	Whiskey Butte Oil/Gas Well	Oil/Gas	550 feet N
	Alternative 4A	22	Whiskey Butte Oil/Gas Well	Oil/Gas	500 feet N
	Alternative 4A	22	Whiskey Butte Oil/Gas Well	Oil/Gas	450 feet S
	Alternative 4A	22	Whiskey Butte Oil/Gas Well	Oil/Gas	350 feet N
	Alternative 4A	23	Whiskey Butte Oil/Gas Well	Oil/Gas	400 feet S
	Alternative 4A	23	Whiskey Butte Oil/Gas Well	Oil/Gas	470 feet S
	Alternative 4A	24	Whiskey Butte Oil/Gas Well	Oil/Gas	375 feet N
	Alternative 4A	24	Whiskey Butte Oil/Gas Well	Oil/Gas	350 feet N
	Alternative 4A	24	Whiskey Butte Oil/Gas Well	Oil/Gas	440 feet S
	Alternative 4A	25	Whiskey Butte Oil/Gas Well	Oil/Gas	515 feet S
	Alternative 4A	29	Cow Hollow Oil/Gas Well	Oil/Gas	300 feet N
	Alternative 4A	29	Cow Hollow Oil/Gas Well	Oil/Gas	430 feet S

Table 3.12-2. Mining Activities Within 1,000 Feet of Transmission Line Routes, Observed From Aerial Photograph Reconnaissance and Topographic Maps (continued)

Segment Number	Alternative (status)	Milepost Location	Land Use/Feature Type	Mineral Product	Location
4 (cont.)	Alternative 4A/4F	48.6	Active Coal Lease	Coal	430 feet W
	Alternative 4B	15.6	Bruff Oil/Gas Well	Oil/Gas	520 feet N
	Alternative 4B	16	Fabian Ditch Oil/Gas Well	Oil/Gas	Crossed
	Alternative 4B	16.8	Fabian Ditch Oil/Gas Well	Oil/Gas	440 feet N
	Alternative 4B	17	Fabian Ditch Oil/Gas Well	Oil/Gas	390 feet S
	Alternative 4B	17.4	Fabian Ditch Oil/Gas Well	Oil/Gas	335 feet N
	Alternative 4B	17.6	Fabian Ditch Oil/Gas Well	Oil/Gas	330 feet S
	Alternative 4B	18.9	Fabian Ditch Oil/Gas Well	Oil/Gas	25 feet S
	Alternative 4B	18.2	Bruff Oil/Gas Well	Oil/Gas	520 feet N
	Alternative 4B	21.2	Wilson Ranch Oil/Gas Well	Oil/Gas	450 feet N
	Alternative 4B	21.6	Wilson Ranch Oil/Gas Well	Oil/Gas	150 feet S
	Alternative 4B	22.6	WC Oil/Gas Well	Oil/Gas	370 feet S
	Alternative 4B	47.4	Mine	Unknown	1,000 feet S
	Alternative 4B	47.9-48.7	Active Coal Lease	Coal	Crossed
	Alternative 4B	63.0-64.7	Active Mining Claim	Unknown	Crossed
	Alternative 4C	15.6	Bruff Oil/Gas Well	Oil/Gas	520 feet N
	Alternative 4C	16	Fabian Ditch Oil/Gas Well	Oil/Gas	Crossed
	Alternative 4C	16.8	Fabian Ditch Oil/Gas Well	Oil/Gas	440 feet N
	Alternative 4C	17	Fabian Ditch Oil/Gas Well	Oil/Gas	390 feet S
	Alternative 4C	17.4	Fabian Ditch Oil/Gas Well	Oil/Gas	335 feet N
	Alternative 4C	17.6	Fabian Ditch Oil/Gas Well	Oil/Gas	330 feet S
	Alternative 4C	18.9	Fabian Ditch Oil/Gas Well	Oil/Gas	25 feet S
	Alternative 4C	18.2	Bruff Oil/Gas Well	Oil/Gas	520 feet N
	Alternative 4C	21.2	Wilson Ranch Oil/Gas Well	Oil/Gas	450 feet N
	Alternative 4C	21.6	Wilson Ranch Oil/Gas Well	Oil/Gas	150 feet S
	Alternative 4C	22.6	WC Oil/Gas Well	Oil/Gas	370 feet S
	Alternative 4C	47.4	Mine	Unknown	1,000 feet S
	Alternative 4C	63.0-64.7	Active Mining Claim	Unknown	Crossed
	Alternative 4C	78.3	Gravel Pit	Gravel	Crossed
	Alternative 4D	15.6	Bruff Oil/Gas Well	Oil/Gas	520 feet N
	Alternative 4D	16	Fabian Ditch Oil/Gas Well	Oil/Gas	Crossed

Table 3.12-2. Mining Activities Within 1,000 Feet of Transmission Line Routes, Observed From Aerial Photograph Reconnaissance and Topographic Maps (continued)

Segment Number	Alternative (status)	Milepost Location	Land Use/Feature Type	Mineral Product	Location
4 (cont.)	Alternative 4D	16.8	Fabian Ditch Oil/Gas Well	Oil/Gas	440 feet N
	Alternative 4D	17	Fabian Ditch Oil/Gas Well	Oil/Gas	390 feet S
	Alternative 4D	17.4	Fabian Ditch Oil/Gas Well	Oil/Gas	335 feet N
	Alternative 4D	17.6	Fabian Ditch Oil/Gas Well	Oil/Gas	330 feet S
	Alternative 4D	18.9	Fabian Ditch Oil/Gas Well	Oil/Gas	25 feet S
	Alternative 4D	18.2	Bruff Oil/Gas Well	Oil/Gas	470 feet N
	Alternative 4D	21.2	Wilson Ranch Oil/Gas Well	Oil/Gas	450 feet N
	Alternative 4D	21.6	Wilson Ranch Oil/Gas Well	Oil/Gas	150 feet S
	Alternative 4D	22.6	WC Oil/Gas Well	Oil/Gas	370 feet S
	Alternative 4D	47.4	Mine	Unknown	1,000 feet S
	Alternative 4D	56.3	Mine	Unknown	Crossed
	Alternative 4D	63.6-65.3	Active Mining Claim	Unknown	Crossed
	Alternative 4E	15.6	Bruff Oil/Gas Well	Oil/Gas	520 feet N
	Alternative 4E	16	Fabian Ditch Oil/Gas Well	Oil/Gas	Crossed
	Alternative 4E	16.8	Fabian Ditch Oil/Gas Well	Oil/Gas	440 feet N
	Alternative 4E	17	Fabian Ditch Oil/Gas Well	Oil/Gas	390 feet S
	Alternative 4E	17.4	Fabian Ditch Oil/Gas Well	Oil/Gas	335 feet N
	Alternative 4E	17.6	Fabian Ditch Oil/Gas Well	Oil/Gas	330 feet S
	Alternative 4E	18.9	Fabian Ditch Oil/Gas Well	Oil/Gas	25 feet S
	Alternative 4E	18.2	Bruff Oil/Gas Well	Oil/Gas	470 feet N
	Alternative 4E	21.2	Wilson Ranch Oil/Gas Well	Oil/Gas	450 feet N
	Alternative 4E	21.6	Wilson Ranch Oil/Gas Well	Oil/Gas	150 feet S
	Alternative 4E	22.6	WC Oil/Gas Well	Oil/Gas	370 feet S
	Alternative 4E	47.4	Mine	Unknown	1,000 feet S
	Alternative 4E	56.3	Mine	Unknown	Crossed
	Alternative 4E	63.6-65.3	Active Mining Claim	Unknown	Crossed
	Alternative 4E	78.9	Gravel Pits	Gravel	Crossed
5	Proposed – Total Length	51.4	Borrow Pits	Sand/Gravel	300 feet W
8	Proposed – Total Length	21.9-22.0	Gravel Pit	Gravel	250 feet S
	Proposed – Total Length	106.6-107.1	Active Mining Claim	Unknown	Crossed
	Proposed – Total Length	114.4-114.7	Gravel Pit	Gravel	200 feet S

Table 3.12-2. Mining Activities Within 1,000 Feet of Transmission Line Routes, Observed From Aerial Photograph Reconnaissance and Topographic Maps (continued)

Segment Number	Alternative (status)	Milepost Location	Land Use/Feature Type	Mineral Product	Location
8 (cont.)	Proposed – Total Length	120.1-120.3	Gravel Pit	Gravel	Crossed
9	Proposed – Total Length	4.4-4.7	Gravel Pit	Gravel	450 feet S
	Proposed – Total Length	14.6-14.8	Gravel Pits	Gravel	Crossed
	Proposed – Total Length	33.1-33.3	Active Mining Claim	Unknown	Crossed
	Proposed – Total Length	112.1	Gravel Pit	Gravel	Crossed
	Proposed – Total Length	144.0-145.1	Active Mining Claim	Unknown	200 feet W
	Alternative 9A	32.4	Gravel Pit	Gravel	400 feet S

1/ Some or all alternatives in Segments 5, 6, 7, 8, 9, and 10 do not contain mining activities. Alternatives without mining activities do not appear in this table.

Area in Segments 2, 3, and 4 (1 to 3 percent). Figure 3.12-1 presents the location of coal and trona mineral leases within the Project area.

Trona

Southwest Wyoming contains one of the largest deposits of trona in the world. WGS (2010a) indicates that the Green River Basin of southwest Wyoming produces approximately 11 million tons per year, which is 95 percent of the U.S. output. The Analysis Area contains trona leases of more than 3,300 acres in Segment 4, which represents about 1 percent of the Segment 4 Analysis Area.

Geothermal

The potential for geothermal development exists across southern Idaho (Segments 5 through 10) (IDWR 2009). The Analysis Area contains land leased for geothermal energy exploration or development in Segments 7 and 9. The amount of the Analysis Area leased for geothermal development in these segments is less than 1 percent. Figure 3.12-1 shows the location of the geothermal leases.

Oil and Natural Gas

According to the Wyoming Oil and Gas Commission (2009), in 2009 operators extracted 51.4 million barrels of oil and 2.54 trillion cubic feet of natural gas. Exploration is being conducted over large portions of Wyoming. Known oil and gas fields are present in Segments 1 through 4. There are 355 active oil and gas wells on nearly 100,000 acres of leased land in the Segments 1 through 4 Analysis Areas. The locations of oil and gas leases are shown on Figure 3.12-1.

Uranium

WGS (2010a) indicates that Wyoming has been the leading source of uranium mining in the United States since 1995, and contains the nation's largest reserves. Uranium is extracted using mainly in situ leaching methods. A total of 6 percent of the Segment 1 Analysis Area and 16 percent of Segment 2 is located within land claimed for uranium mining.

Locatable Minerals

The GeoCommunicator database includes locatable mineral claims. The claims are not always attributed to a specific mineral.

There are thousands of acres of unspecified mineral claims or leases in the Analysis Areas of Segments 1, 2, 4, 7, 8, and 9, including 15 percent of Segment 1, 7 percent of Segment 2, and 9 percent of Segment 7. Locatable mineral claims in Segments 4, 8, and 9 represent 2 percent or less of the Analysis Areas. Information from BLM's LR-2000 mining database indicated that all of the claims in Segments 1 and 2 were by companies associated with uranium production. The claims in Segment 7 were for gold exploration. The target minerals for claims in Segments 4, 8, and 9 could not be determined. The locations of mining claims (including uranium) are shown on Figure 3.12-1.

Saleable Minerals

Saleable minerals are common minerals or earth deposits that are purchased from federal agencies, usually on a per ton basis. Saleable minerals presented in the GeoCommunicator database within the Analysis Area include clay, pumice or cinders, gravel, sand and gravel, shale, fill material, crushed stone, riprap, and specialty stone. The Wyoming Geological Survey website (WGS 2010b) indicates that over 16 million tons of construction aggregate was produced in Wyoming in 2008. The Idaho Geological Survey indicates mining revenues of about $1.1 billion for 2009, with about 9 percent of that amount (slightly less than $100 million) for saleable minerals (IGS 2010). Although saleable minerals were identified in Segments 1, 4, 7, 8, 9, and 10, they represent less than 1 percent of any segment Analysis Area.

3.12.2 Direct and Indirect Effects

This section is organized to present effects to mineral resources from construction, then operations, followed by decommissioning activities for the proposed Project. Route Alternatives are analyzed in detail in Section 3.12.2.3. There is a Design Variation involving use of two single-circuit structures proposed by the Proponent for Segments 2, 3, and 4 (see Section 2.2 for details), which is analyzed in Section 3.12.2.4 and a Structure Variation that is analyzed in Section 3.12.2.5. The Proponents have also proposed a Schedule Variation, analyzed in Section 3.12.2.6, in which one of the two single circuits to be constructed in Segments 2, 3, and 4 and a portion of Segment 1W would be built on an extended schedule with construction beginning approximately 2.5 years after completion of the initial construction.

Mitigation measures or EPMs are presented in detail within this section only if it is the first time they have been discussed in Chapter 3; all other measures are referenced or summarized. A comprehensive list of all Proponent-proposed EPMs and Agency-required mitigation measures can be found in Table 2.7-1 of Chapter 2.

Plan Amendments

Proposed amendments are summarized in Table 2.2-1 of Chapter 2 and detailed in Appendices F and G. Amendments are needed to permit the Project to cross various areas of BLM-managed and NFS lands. Effects described for areas requiring an amendment in order for the Project to be built would only occur if the amendment were approved. Amendments that alter land management designations could change future use of these areas. No amendments specific to minerals are proposed for the Project and no impacts to minerals resulting from approving the amendments beyond the impacts of the Project are anticipated.

3.12.2.1 No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed or operated. No Project-related impacts to mineral resources would occur.

3.12.2.2 Effects Common to All Action Alternatives

Construction

The presence of existing mineral claims and leases could interfere with plans to construct the Gateway West Project. As part of the pre-construction process, the Proponents would have to identify mineral claims and leases and either negotiate permission to use the land surface in these areas or re-locate the transmission line to avoid existing claims and leases. Where access to mineral resources may be restricted, the Proponents would provide compensation for damage, access rights, and easements with mine owners, claimants, and lease holders. If necessary, the Proponents would provide mine operators with mine access across the Project area during construction.

The construction of the Gateway West Project could restrict exploration of mineral resources during the 2-year construction period. Construction activities could also restrict mining companies' ability to access land for mining or exploration. Construction of the Project would result in the need for saleable minerals, including fill material for grade changes, sand and gravel for concrete production, gravel for road beds, and similar uses. The use of saleable minerals would provide an economic benefit to local mineral providers but would also result in consumption of materials that would not be available for other uses.

The Project would cross areas in southern Wyoming that are assumed to contain unknown abandoned mines. Construction blasting in areas of shallow bedrock could cause subsidence in mined areas or damage to mine features, including water wells. Previously mined areas could have contaminated soil or groundwater. In coal-mining areas, methane may accumulate in abandoned mines. Depending on bedrock fracturing, bedding planes, and similar open pathways, methane could migrate into other voids in bedrock, which could pose a problem with blasting in those areas. The effects of blasting are assessed in Section 3.14 – Geologic Hazards. In Segments 2, 3, and 4 where abandoned underground mines are known to occur, the Agencies have identified the following mitigation measure to minimize possible deleterious impacts on the project from abandoned mines during construction:

MN-1 A geotechnical investigation will be conducted by the Proponents in areas where abandoned underground mines are known to occur to determine the presence of methane and the likelihood of subsidence.

The Agencies have identified the following mitigation measure as a means to substantially reduce impact to mining facilities. The Agencies suggest that the Proponents incorporate this measure into their EPMs and apply it Project-wide.

MN-2 An accounting of damages will be conducted by the Proponents to current operators to determine the potential loss of mineral resources. There may be mining claims under the 1872 Mining Law that would have precedence over the Project. Similarly, federal and state mineral lease agreements provide rights to lessees that could interfere with the Gateway West Project. The Proponents will resolve mineral claim and lease agreements prior to Project initiation, as with site access agreements on private property.

Active oil and gas wells are present in the Analysis Area. As part of the siting process, the Wyoming Oil and Gas Commission GIS database was reviewed for location of active oil or gas wells. A 250-foot buffer was drawn around every active oil and gas well and the route centerline was located to avoid the 250-foot buffers. Prior to construction, the Proponents would call each state's utility locating services so that buried utilities, including oil and gas gathering lines and pipelines, could be avoided.

Operations

During the operations period, the Project could restrict mining companies from obtaining new mining claims or leases within the transmission line ROW. The operations area is smaller than the construction disturbance area but the time interval is much longer: 50 years for operations compared to about 2 years for construction. The Scoping Report (Tetra Tech 2009a) indicated concern that the high-voltage transmission lines would restrict access to drill rigs conducting exploration or repair of oil or gas wells. Project operations would remove acreage that would not be available for mining for the life of the Project. However, the Project would only impact a small fraction of the total resource area available.

Decommissioning

Project decommissioning would disturb an area roughly equivalent to the construction disturbance area and the time of disturbance would be approximately 2 to 3 years, including the time to remove Project structures, plus another growing season for reclamation. Loss of access could occur to mineral claims or leases adjacent to the decommissioning disturbance area. However, when decommissioning is complete, mineral access due to Project activities would return to the pre-Project conditions not considering changes to land ownership or land use that may have occurred during the life of the Project.

3.12.2.3 Proposed Route and Alternatives by Segment

This section evaluates the Proposed Route and details the differences between the Proposed Route and the Route Alternatives with respect to impacts to mineral claims and leases. Tables 3.12-3 and 3.12-4 present the mineral claims and leases present within the Project construction and operations disturbance areas. Table 3.12-5 presents the number of active oil or gas wells within the construction and operations disturbance areas.

Segment 1E

Segment 1E, as proposed, would link the Windstar and Aeolus Substations in south-central Wyoming with a 100.6-mile 230-kV single-circuit transmission line. Twenty acres of the expansion of Windstar and Aeolus Substations and 0.5 acre for one regeneration site are attributed to Segment 1E. Alternative 1E-A is a 16.1-mile alternative along the north end of Segment 1E, which was the Proponents' initial proposal before moving the Proposed Route at the suggestion of local landowners to avoid the more settled area around Glenrock. Alternative 1E-B is 21.4 miles longer than the Proposed Route but is being considered by the Proponents because it would avoid a Wyoming-designated sage-grouse core area to the east. The BLM has required the consideration of Alternative 1E-C, which parallels the Segment 1W 230-kV lines into the Aeolus Substation (see Appendix A, Figure A-2).

Table 3.12-3. Acres of Active Claims, Leases, or Saleable Mineral Areas within Construction Disturbance Areas

Segment Number[1/]	Alternative (status)	Total Acreage[2/]	Oil and Gas Lease	Coal Lease	Trona	Geothermal	Saleable Minerals	Mineral Not Specified	Uranium and Other	Two or More Minerals	Total Mineral Acreage[3/]
1E[4/]	Proposed – Total Length	1,096	31	–	–	–	–	–	133	67	60
	Proposed – Comparison Portion for Alternative 1E-A	213	16	–	–	–	–	–	–	–	16
	Alternative 1E-A	124	12	–	–	–	–	–	–	–	12
	Proposed – Comparison Portion for Alternative 1E-B	393	6	–	–	–	–	–	132	51	30
	Alternative 1E-B	729	5	–	–	–	–	–	1	–	5
	Proposed – Comparison Portion for Alternative 1E-C	832	16	–	–	–	–	–	133	51	40
	Alternative 1E-C	311	21	–	–	–	–	–	50	22	34
1W(a)[4/]	Proposed – Total Length	623	60	–	–	–	–	–	15	142	86
	Proposed – Comparison Portion for Alternative 1W-A	210	28	–	–	–	–	–	–	–	28
	Alternative 1W-A	136	6	–	–	–	–	–	–	–	6
1W(c)[4/]	Proposed – Total Length	817	35	–	–	–	–	–	64	371	85
2	Proposed – Total Length	1,544	373	11	–	–	2	–	355	133	396
	Proposed – Comparison Portion for Alternative 2A	398	83	–	–	–	–	–	–	–	83
	Alternative 2A	446	92	–	–	–	–	–	–	–	92
	Proposed – Comparison Portion for Alternative 2B	104	54	–	–	–	–	–	–	–	54
	Alternative 2B	80	34	–	–	–	–	–	–	–	34
	Proposed – Comparison Portion for Alternative 2C	369	46	11	–	–	–	–	–	–	57
	Alternative 2C	322	61	8	–	–	–	–	–	–	63
3	Segment 3 (Proposed)	863	317	15	–	–	–	–	–	–	317

Table 3.12-3. Acres of Active Claims, Leases, or Saleable Mineral Areas within Construction Disturbance Areas (continued)

Segment Number	Alternative (status)	Total Acreage[1/]	Oil and Gas Lease	Coal Lease	Trona	Geothermal	Saleable Minerals	Mineral Not Specified	Uranium and Other	Two or More Minerals	Total Mineral Acreage
4	Proposed – Total Length	2,846	472	15	33	–	3	–	–	–	502
	Proposed – Comparison Portion for Alternatives 4A, B, C, D, E, F	1,234	300	–	3	–	<1	–	–	–	303
	Alternative 4A	1,250	250	–	4	–	2	–	–	–	254
	Alternative 4B	1,484	473	11	37	–	<1	–	–	20	516
	Alternative 4C	1,478	395	11	37	–	<1	–	–	20	438
	Alternative 4D	1,505	520	11	37	–	<1	–	–	20	564
	Alternative 4E	1,495	448	11	37	–	<1	–	–	20	492
	Alternative 4F	1,260	229	–	5	–	2	–	–	–	234
7	Alternative 7H	2,118	–	–	–	–	8	11	–	–	22
	Alternative 7I	2,735	–	–	–	32	<1	406	–	–	95
	Alternative 7J	3,180	–	–	–	32	<1	406	–	–	95
	Proposed – Comparison Portion for Alt. 7J[5/]	2,231	–	–	–	–	3	–	–	–	3
8	Alternative 8B	779	–	–	–	–	2	–	–	–	2
	Alternative 8E	286	–	–	–	–	–	–	–	–	–
9	Proposed – Total Length	2,670	–	–	–	–	4	2	–	–	10
	Proposed – Comparison Portion for Alternative 9B	825	–	–	–	–	–	2	–	–	2
	Alternative 9B	816	–	–	–	–	–	1	–	–	3
	Proposed – Comparison Portion for Alternative 9C	239	–	–	–	–	–	2	–	–	2
	Alternative 9C	279	–	–	–	–	–	2	–	–	2
	Alternative 9D	815	–	–	–	–	4	–	–	–	4
	Alternative 9E	1,004	–	–	–	51	–	84	–	–	135

Table 3.12-3. Acres of Active Claims, Leases, or Saleable Mineral Areas within Construction Disturbance Areas (continued)

Segment Number	Alternative (status)	Total Acreage[1/]	Oil and Gas Lease	Coal Lease	Trona	Geothermal	Saleable Minerals	Mineral Not Specified	Uranium and Other	Two or More Minerals	Total Mineral Acreage
9	Alternative 9F	971	–	–	–	–	4	–	–	–	4
	Alternative 9G	848	–	–	–	–	4	–	–	–	4
	Alternative 9H	979	–	–	–	–	4	–	–	–	4

1/ Some or all alternatives in Segments 5, 7, 8, 9, and 10 do not contain minerals. Alternatives without minerals do not appear in this table. (No active claims, leases, or saleabl area were found for Segments 5, 6 and 10.)
2/ Numbers in table are rounded to nearest acre; columns or rows may not sum exactly due to rounding.
3/ Due to multiple claim owners or leases, and overlapping mineral interests, the total area of all claims and leases can be much less than the sum of the individual categories. provides the most realistic estimate of the actual affected acreage.
4/ The difference between total mineral acreage for Segments 1E, 1W(a), and 1W(c) is because all impacts from construction support such as laydown, staging, and fly yards ar against 1W(c) and not double-counted against Segments 1E or 1W(a).
5/ Alternative 7J connects with Segment 9 approximately 25.8 miles west of the proposed Cedar Hill Substation, which is the western terminus of Segment 7 and the beginning Segment 9. The table above compares 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 1 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

Table 3.12-4. Acres of Active Claims, Leases, or Saleable Mineral Areas within Operations Disturbance Areas

Segment Number[1/]	Alternative (status)	Total Acreage[2/]	Oil and Gas Lease	Coal Lease	Trona	Geothermal	Saleable Minerals	Mineral Not Specified	Uranium and Other	Two or More Minerals	Total Mineral Acreage
1E	Proposed – Total Length	283	6	–	–	–	–	–	12	16	12
	Proposed – Comparison Portion for Alternative 1E-A	51	5	–	–	–	–	–	–	–	5
	Alternative 1E-A	39	7	–	–	–	–	–	–	–	7
	Proposed – Comparison Portion for Alternative 1E-B	91	1	–	–	–	–	–	12	11	5
	Alternative 1E-B	164	1	–	–	–	–	–	<1	–	1
	Proposed – Comparison Portion for Alternative 1E-C	218	2	–	–	–	–	–	12	11	6
	Alternative 1E-C	92	4	–	–	–	–	–	15	10	8
1W(a)	Proposed – Total Length	182	20	–	–	–	–	–	4	39	27
	Proposed – Comparison Portion for Alternative 1W-A	47	6	–	–	–	–	–	–	–	6
	Alternative 1W-A	40	2	–	–	–	–	–	–	–	2
1W(c)	Proposed – Total Length	144	5	–	–	–	–	–	14	104	19
2	Proposed – Total Length	401	95	3	–	–	1	–	112	41	102
	Proposed – Comparison Portion for Alternative 2A	74	16	–	–	–	–	–	–	–	16
	Alternative 2A	90	21	–	–	–	–	–	–	–	21
	Proposed – Comparison Portion for Alternative 2B	16	9	–	–	–	–	–	–	–	9
	Alternative 2B	18	7	–	–	–	–	–	–	–	7
	Proposed – Comparison Portion for Alternative 2C	77	10	3	–	–	–	–	–	–	13
	Alternative 2C	52	12	1	–	–	–	–	–	–	13
3	Proposed – Total Length	219	77	4	–	–	–	–	–	–	77

Table 3.12-4. Acres of Active Claims, Leases, or Saleable Mineral Areas within Operations Disturbance Areas (continued)

Segment Number	Alternative (status)	Total Acreage[2/]	Oil and Gas Lease	Coal Lease	Trona	Geothermal	Saleable Minerals	Mineral Not Specified	Uranium and Other	Two or More Minerals	Total Mineral Acreage[3/]
4	Proposed – Total Length	651	100	3	6	–	1	–	–	–	105
	Proposed – Comparison Portion for Alternatives 4A, B, C, D, E, F	262	63	–	1	–	<1	–	–	–	64
	Alternative 4A	277	56	–	1	–	1	–	–	–	58
	Alternative 4B	348	116	4	10	–	<1	–	–	6	128
	Alternative 4C	341	96	4	10	–	<1	–	–	6	108
	Alternative 4D	355	131	4	10	–	<1	–	–	6	144
	Alternative 4E	345	110	4	10	–	<1	–	–	6	122
	Alternative 4F	280	53	–	2	–	1	–	–	–	54
7	Alternative 7H	340	–	–	–	–	<1	1	–	–	1
	Alternative 7I	451	–	–	–	4	<1	60	–	–	12
	Alternative 7J[4/]	512	–	–	–	4	<1	60	–	–	12
	Proposed – Comparison Portion for Alt. 7J[4/]	294	–	–	–	–	1	–	–	–	1
8	Alternative 8B	69	–	–	–	–	<1	–	–	–	<1
	Alternative 8E	27	–	–	–	–	–	–	–	–	–
9	Proposed – Total Length	359	–	–	–	–	1	<1	–	–	2
	Proposed – Comparison Portion for Alternative 9B	121	–	–	–	–	–	<1	–	–	<1
	Alternative 9B	85	–	–	–	–	–	<1	–	–	<1
	Proposed – Comparison Portion for Alternative 9C	26	–	–	–	–	–	<1	–	–	<1
	Alternative 9C	31	–	–	–	–	–	<1	–	–	<1
	Alternative 9D	80	–	–	–	–	<1	–	–	–	<1
	Alternative 9E	135	–	–	–	13	–	–	–	–	13

Table 3.12-4. Acres of Active Claims, Leases, or Saleable Mineral Areas within Operations Disturbance Areas (continued)

Segment Number	Alternative (status)	Total Acreage[2/]	Oil and Gas Lease	Coal Lease	Trona	Geothermal	Saleable Minerals	Mineral Not Specified	Uranium and Other	Two or More Minerals	Total Mineral Acreage[3/]
9	Alternative 9F	93	–	–	–	–	<1	–	–	–	<1
	Alternative 9G	93	–	–	–	–	<1	–	–	–	<1
	Alternative 9H	93	–	–	–	–	<1	–	–	–	<1

1/ Some or all alternatives in Segments 5, 6, 7, 8, 9, and 10 do not contain minerals. Alternatives without minerals do not appear in this table.
2/ Numbers in table are rounded to nearest acre; columns or rows may not sum exactly due to rounding.
3/ Due to multiple claim owners or leases, and overlapping mineral interests, the total area of all claims and leases can be much less than the sum of the individual categories provides the most realistic estimate of the actual affected acreage.
4/ Alternative 7J connects with Segment 9 approximately 25.8 miles west of the proposed Cedar Hill Substation, which is the western terminus of Segment 7 and the beginnin Segment 9. The table above compares 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

Table 3.12-5. Number of Active Oil and Gas Wells within the Analysis Area, Construction Disturbance Area, and Operations Disturbance Area

Segment Number[1/]	Alternative (status)	Wells in Analysis Area	Wells in Construction Area	Wells in Operations Area	Wells in Two-Circuit Design Variation
1E	Proposed – Total Length	33	–	–	–
	Proposed – Comparison Portion for Alternative 1E-A	32	–	–	–
	Alternative 1E-A	2	–	–	–
	Proposed – Comparison Portion for Alternative 1E-B	1	–	–	–
	Alternative 1E-B	5	–	–	–
	Proposed – Comparison Portion for Alternative 1E-C	1	–	–	–
	Alternative 1E-C	–	–	–	–
1W(a)	Proposed – Total Length	13	–	–	–
	Proposed – Comparison Portion for Alternative 1W-A	13	–	–	–
	Alternative 1W-A	13	–	–	–
1W(c)	Proposed – Total Length	–	–	–	–
2	Proposed – Total Length	72	4	1	6
	Proposed – Comparison Portion for Alternative 2A	–	–	–	–
	Alternative 2A	–	–	–	–
	Proposed – Comparison Portion for Alternative 2B	–	–	–	–
	Alternative 2B	–	–	–	–
	Proposed – Comparison Portion for Alternative 2C	–	–	–	–
	Alternative 2C	–	–	–	–
3	Proposed	62	–	–	–
4	Proposed – Total Length	36	–	–	–
	Proposed – Comparison Portion for Alternatives 4A, B, C, D, E, F	28	–	–	–
	Alternative 4A	82	–	–	1
	Alternative 4B	48	1	–	1
	Alternative 4C	48	1	–	1
	Alternative 4D	47	1	–	1
	Alternative 4E	47	1	–	1
	Alternative 4F	81	–	–	1

1/ There are no known active oil and gas wells within the Analysis Areas of Segments 5 through 10.

About 60 acres of mineral leases or claims (5 percent of route) would be located within the construction disturbance area. The BLM LR-2000 mining database indicates the claims are for uranium. Oil and gas leases would also be present. However, no active oil or gas wells would be located within the construction or operations disturbance areas. Agreements would be required with existing leaseholders and mining and exploration could be restricted during construction of the transmission lines. During decommissioning, the disturbance area is assumed to be similar while transmission line structures are removed. During operations, the affected area would be reduced to approximately 12 acres; however, the time that resources are not available would be longer. This applies to all segments. Alternative 1E-A on balance between construction and operations would be similar to the comparison portion of the Proposed Route.[1]

Alternative 1E-B would offer an advantage from a mineral perspective as it would avoid all except 5 acres (construction) and 1 acre (operations) of uranium, oil, and gas leases. Alternative 1E-C would follow the same route as the southern half of the Proposed Route for Segment 1W and have similar affected areas during construction and operations. It would have more impact to minerals than the comparison portion of the Proposed Route. The alignment with the least impact would be the comparison portion of the Proposed Route for Segment 1E in combination with Alternative 1E-B. Note that the effects of decommissioning would be similar to construction because the same area is required for decommissioning as during construction. This, as noted in Section 3.12.2.2, is common to all segments and alternatives.

Segment 1W

Segment 1W is composed of two parts, Segment 1W(a) and 1W(c), both of which would consist of a new 230-kV line for part of their length and a reconstruction of an existing 230-kV line for the remaining part. Segment 1W(a) would be about 76.5 miles long, and would extend from the Windstar Substation to the Aeolus Substation. Segment 1W(c) would be about 70.6 miles long, and would extend from the Dave Johnston Power Plant to the Aeolus Substation. Alternative 1W-A is a 16.2-mile alternative located near the town of Glenrock, which was the Proponents' initial proposal before moving the Proposed Route at the suggestion of local landowners in order to avoid the more settled area around Glenrock. Twenty acres of the proposed expansion at the Windstar and Aeolus Substations are attributed to Segment 1W(a) and 3 acres of the expansion at the Heward Substation and 17 acres of the expansion at the Windstar and Aeolus Substations are attributed to Segment 1W(c). There are no Route Alternatives proposed south of that point (see Appendix A, Figure A-2).

The mineral effects in Segment 1W(a) would be slightly more than those seen in Segment 1E, 27 acres within the construction area and 63 acres in the operations area. However, as noted in Table 3.12-3, Segment 1W(c) would contain much more affected mineral acreage than Segment 1E. This is because the mineral effects in all of the staging, laydown, and fly yards associated with these parallel lines are counted only with Segment 1W(c) to avoid double-counting. The predominant minerals affected

[1] The "comparison portion of the Proposed Route" refers to the portion of the Proposed Route that starts and ends at the same nodes as a Route Alternative.

would be uranium claims and oil and gas leases. No active oil or gas wells would be located within construction or operations disturbance areas. Alternative 1W-A would have somewhat less effect on minerals than the comparison portion of the Proposed Route.

Segment 2

Segment 2, as proposed, would link the Aeolus and Creston Substations in southeast Wyoming with two 500-kV circuits on one structure. One circuit would be operated at 230 kV during the initial phase of the Project. Its total proposed length is 96.7 miles. Fifty-two acres of the expansion of the Aeolus Substation and the construction of the Creston Substation and 0.5 acre for one regeneration site are attributed to Segment 2. There are three Route Alternatives, two of which are near the community of Fort Fred Steele. Alternative 2A at 28.4 miles long is being considered by the BLM because it remains in the WWE corridor nearer the town and the state historic site, and Alternative 2B, at 6.2 miles, is closer to the community than the comparison portion of the Proposed Route and was the initially proposed route before the Proponents responded to local suggestions and relocated the Proposed Route farther to the south. Alternative 2C is a 24.4-mile alternative located north of Hanna, Wyoming. It is being evaluated at the recommendation of the Wyoming Governor's office to follow a utility corridor approved by that office for minimizing effects to sage-grouse (see Appendix A, Figure A-3).

Segment 2 would affect oil and gas, two or more minerals (uranium and coal), and one saleable mineral deposit. Approximately 396 acres would be affected during construction and decommissioning (26 percent of route). Four existing oil or gas wells would be present within the construction disturbance acreage. One existing oil or gas well would be also located within the operations disturbance area. It would be located approximately 6 miles west of Aeolus Substation and about 450 feet north of the transmission line. The affected acreage during operations would be about 102 acres. Alternative 2B would have slightly less effect on minerals than the comparison portion of the Proposed Route. The effects would be slightly greater for Alternatives 2A and 2C. Alternative 2A would affect 9 acres (construction) and 5 acres (operations) more than the comparison portion of the Proposed Route. For Alternative 2B, the effects would be less by 20 acres and 2 acres, respectively. Alternative 2C would affect 6 more construction acres than the comparison portion of the Proposed Route; however, the affected acreage would be equal for operations. Overall, the Proposed Route for Segment 2 in combination with Alternative 2B would have the least potential impact on minerals.

Segment 3

Segment 3, as proposed, would link the Creston and Anticline Substations in southeast Wyoming with two 500-kV circuits on one structure. One circuit would be operated at 230 kV during the initial phase of the Project. Its total proposed length between those two substations is 46.7 miles. Sixty-nine acres of the construction of the Anticline and Creston Substations are attributed to Segment 3. Segment 3 would also link the Anticline and Jim Bridger Substations with a 4.3-mile 230-kV line and a 5.5-mile 345-kV

line and includes the 10-acre expansion of the Jim Bridger 345-kV Substation. There are no alternatives proposed along this segment (see Appendix A, Figure A-4).

A total of 317 acres of mineral interests would be affected in the Segment 3 construction disturbance area. The affected area would consist almost entirely of oil and gas leases, with only about 15 acres of coal leases. The operations area would contain 77 acres of affected area. Despite the high percentage of oil and gas leases, no oil or gas wells would be located within the disturbance areas.

Segment 4

Segment 4, as proposed, would link the Anticline Substation near the Jim Bridger Power Plant in southwestern Wyoming with the Populus Substation in Idaho with two 500-kV circuits on one structure. Its total proposed length is 203 miles. Eighty-nine acres of the construction of the Anticline Substation and the expansion of the Populus Substation and 1.5 acres for three regeneration sites are attributed to Segment 4. It has six Route Alternatives in the middle portion of its route but the first 52 miles to the east and the last 61 miles to the west (in Idaho) do not have any Route Alternatives. The middle section of the Proposed Route is 90.2 miles long, and its Route Alternatives vary from 85 to 102 miles long. These alternatives were proposed by the Wyoming Governor's office (4A, paralleling the existing 345-kV lines throughout); by the BLM Kemmerer FO (4B through 4E, including edits from various cooperating agencies), with the intent to avoid impacts to cultural resources to the extent practical; and by the Proponents (4F, attempting to avoid impacts to cultural resources while still remaining north of the existing lines) (see Appendix A, Figures A-5 and A-6).

The construction-related affected area containing minerals in Segment 4 would be 502 acres. Minerals would consist mainly of oil and gas, but also trona, coal, and saleable minerals. The operations effects would comprise 105 acres. Alternatives 4A and 4F would have less mineral effect than the comparison portion of the Proposed Route. Alternative 4A would contain 47 acres (construction) and 6 acres (operations) less affected area than the comparison portion of the Proposed Route. For Alternative 4F, the areas would be 69 acres and 10 acres less, respectively. On the other hand, Alternatives 4B, 4C, 4D, and 4E would contain greater mineral impacts than their respective comparison portions. In construction areas, the Route Alternatives would contain from 135 to 261 acres more affected area than the Proposed Route; for operations, there would be 44 to 80 acres more. One active oil or gas well would be located within the construction disturbance area for Segment 4. One well, affecting Alternatives 4B through 4E, would be located on the footprint of a proposed new road. No oil or gas wells would be located within the operations disturbance area of the Proposed Route. Overall, the Proposed Route for Segment 4 in combination with Alternative 4F would have the least potential impact on minerals.

Segment 5

Segment 5, as proposed, would link the Populus and Borah Substations with a 54.6-mile single-circuit 500-kV line. Forty-four acres of the expansion of the Populus and Borah Substations are attributed to Segment 5. There are five Route Alternatives including two proposed by the BLM to avoid the Deep Creek Mountains (5A and 5B; 8 miles and 19 miles longer than the comparison portion of the Proposed Route), one

preferred by Power County that crosses the Fort Hall Indian Reservation (5C; 6 miles shorter than the comparison portion of the Proposed Route), one originally proposed by the Proponents (5D; 2 miles shorter than the comparison portion of the Proposed Route but located within more agricultural lands), and one proposed by Power County as an alternative approach to the Borah Substation (5E) (see Appendix A, Figure A-7).

As stated in the Section 3.12.1.5 (Existing Conditions), most of the minerals in the Project area would be located in Segments 1 through 4 in southern Wyoming. Therefore, Segments 5 through 10 in southern Idaho would contain much fewer mineral impacts. No mineral claims or leases were detected in Segment 5 or alternatives.

Segment 6

Segment 6 is an existing transmission line linking the Borah and Midpoint Substations; it is now operated at 345 kV but would be changed to operate at 500 kV. This segment has no Route Alternatives. Existing support structures would be used and impacts would be limited to within approximately 0.25 mile from each substation to allow for moving the entry point into the substation to the new 500-kV bay. Thirty-one acres of the expansion of the Borah and Midpoint Substations are attributed to Segment 6. Changes in the two substations would allow it to be operated at 500 kV (see Appendix A, Figure A-8).

Segment 7

Segment 7, as proposed, would link the Populus and Cedar Hill Substations with a 118.1-mile single-circuit 500-kV line. Forty-two acres of the expansion of the Populus and the construction of the Cedar Hill Substations and 1 acre for two regeneration sites are attributed to Segment 7. In addition to the Proposed Route, which is principally on private lands, Route Alternatives have been proposed by the BLM to avoid the Deep Creek Mountains (7A and 7B; which are 5 miles and 11 miles longer than the comparison portion of the Proposed Route), by local landowners (7C, 7D, 7E, 7F, and 7G, which all represent minor adjustments proposed to address local issues), by local landowners to avoid private agricultural lands (7I or the State Line Route, which is 55 miles longer than the Proposed Route and would require 0.5 acre for an additional regeneration site), and by the Proponents to avoid the State Line Route (7H, which is 10 miles longer than the Proposed Route). Alternative 7J, which is a variant of the State Line Route also proposed by local landowners, would not terminate at the Cedar Hill Substation. This alternative, referred to as the Rogerson Alternative, would require a different substation be constructed near a 345-kV existing transmission line (approximately 24 miles southwest of the Cedar Hill Substation; see Appendix A, Figure A-9). The discussion in this document compares 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

The mineral effects from Segment 7 would be low. The Proposed Route for Segment 7 would not affect minerals. Alternative 7H contains 22 acres with mineral resources within the construction area and 1 acre in the operations area. These consist of unknown mineral claims and saleable commodities. Known mineral resources near Alternative 7H include Oakley Stone, a popular building stone. Alternatives 7I and 7J

would contain 95 acres of mineral claims in the construction disturbance area and 12 acres in the operations area. Otis Capital Resources has multiple claims in this area for a gold deposit they are exploring. Alternatives 7I and 7J would also pass through 32 acres (construction) and 4 acres (operations) of U.S. Geothermal's geothermal lease area in the Raft River Valley. Based on the mineral claims and leases, Alternatives 7H, 7I, and 7J would have a greater effect on minerals than the comparison portion of the Proposed Route, with Alternative 7I having the most potential impact on minerals. Alternative 7J would be coincident to 7I along much of its route and the mineral impacts would be the same. There would be no additional impacts to minerals in the new portion of the route.

Segment 8

Segment 8, as proposed, would link the Midpoint and Hemingway Substations. This 131-mile single-circuit 500-kV transmission line would stay north of the Snake River until crossing through the SRBOP parallel to an existing 500-kV transmission line before ending at the Hemingway Substation. Thirteen acres of the expansion of the Midpoint Substation and 0.5 acre for a regeneration site are attributed to Segment 8. There are five Route Alternatives: 8A, which follows the WWE corridor but crosses the Snake River and I-84 twice (while the Proposed Route would stay north of this area); 8B and 8C, which represent the old routes originally proposed by the Proponents but that have now been changed to avoid the cities of Kuna and Mayfield, respectively; 8D, which represents a small revision involving a rebuild of the existing transmission line to move both away from the National Guard Maneuver Area; and 8E, which was proposed by the BLM in order to avoid crossing the Halverson Bar non-motorized portion of the Guffey Butte-Black Butte Archaeological District (see Appendix A, Figure A-10).

The potential mineral effects in Segment 8 would be low. The only mineral locally identified consisted of a cinder pit in Alternative 8B, with 2 affected acres in the construction disturbance area and less than 1 acre in the operations area. There would also be several mining claims of unknown minerals within 0.5 mile of Alternative 8B (outside of disturbance areas). Therefore, avoiding Alternative 8B would avoid potential conflicts with known minerals or mineral leases.

Segment 9

Segment 9, as proposed, would link the Cedar Hill and Hemingway Substations with a 161.7 mile single-circuit 500-kV transmission line which skirts the Jarbidge and Owyhee Military Operating Areas to the north, then follows the WWE corridor just north of the Saylor Creek Air Force Range, passing through Owyhee County before entering into the Hemingway Substation. Fifteen acres of the construction of the Cedar Hill Substation and 1 acre for two regeneration sites are attributed to Segment 9. There are eight Route Alternatives proposed, including 9A, which was the Proponents' Proposed Route until moving to avoid the Hollister area; 9B, which is being considered by the BLM because it follows the WWE corridor and parallels existing utility corridors; 9C, which was the Proponents' Proposed Route until moving to avoid the Castleford area; and 9D and 9E, proposed by the Owyhee County taskforce, that cross more public lands north and south of the Proposed Route, respectively, than the Proposed Route. Most of Alternative 9D would be within the SRBOP. Alternatives 9F, 9G, and 9H were proposed

to avoid crossing the nonmotorized area south of C.J. Strike Reservoir. Alternatives 9G and 9H provide an alternate route location south of Alternative 8E (see Appendix A, Figure A-11).

The Proposed Route for Segment 9 would contain approximately 10 acres of mineral effects in the construction area and approximately 2 acres in the operations area, consisting of unknown mineral claims and commodities. The Segment 9 alternatives would all have similar acreages to the Proposed Route except Alternative 9E, which would affect claims or leases on 135 acres (construction) and 13 acres (operations). Minerals would consist of several unknown mineral claims in the Owyhee Mountains and a geothermal lease located on the east end of the alternative. Therefore, avoiding Alternative 9E would greatly reduce the potential conflicts with minerals. The Proposed Route and the other alternatives would have much less impact and be similar to each other, so a distinction is not warranted based on mineral impacts.

Segment 10

Segment 10, as proposed, would link the Cedar Hill and Midpoint Substations with a 33.6-mile single-circuit 500-kV line, following a WWE corridor for most of its distance. Twenty-eight acres of the expansion of the Midpoint Substation and of the construction of the Cedar Hill Substation are attributed to Segment 10. There are no Route Alternatives proposed along this segment (see Appendix A, Figure A-12).

No mineral effects were identified in Segment 10.

3.12.2.4 Design Variation

A Design Variation is being considered that would consist of constructing two single-circuit lines in Segments 2 through 4 instead of a single double-circuit line (which is the design assessed above). The disturbance footprint of the two single-circuit towers is greater than that of the double-circuit tower, in part because the requested ROW would be wider, but also because helicopter-assisted construction could be implemented in these areas due to the lighter weight of the towers, which would require additional fly yards. The additional ROW space and the fly yards would cause additional temporary disturbance during construction. Across Segments 2, 3, and 4, the additional disturbance of the single-circuit tower alternative ranges from 25 to 30 percent greater than the comparable portions of the double-circuit tower disturbance under the proposed design. The two single circuits require more ground disturbance, but would be designed and constructed to the same standards as the Proposed Action.

Table 3.12-6 presents the disturbance acreage for the two single-circuit lines. Although the effects are greater, the relative advantages and disadvantages of the alternatives remain the same as described in Section 3.12.3.3 for the respective Proposed Routes and Route Alternatives. Notably, Alternatives 4B, 4C, 4D, and 4E contain more potential mineral effects than the Proposed Route for Segment 4, and Alternatives 4A and 4F contain less. Alternative 4F would have the lowest overall impact relative to the Design Variation.

Table 3.12-6 Acres of Active Claims, Commodities, or Mineral Leases within Two Single Circuit Design Variation (Construction)

Segment Number	Alternative (status)	Total Acreage[1/]	Oil and Gas Lease	Coal Lease	Trona	Geothermal	Saleable Minerals	Mineral Not Specified	Uranium and Other	Two or More Minerals	Total Mineral Acreage[2,3/]
2	Proposed – Total Length	1,096	462	12	–	–	2	–	446	271	500
	Proposed – Comparison Portion for Alternative 2A	520	94	–	–	–	–	–	–	–	94
	Alternative 2A	570	102	–	–	–	–	–	–	–	102
	Proposed – Comparison Portion for Alternative 2B	144	61	–	–	–	–	–	–	–	61
	Alternative 2B	114	38	–	–	–	–	–	–	–	38
	Proposed – Comparison Portion for Alternative 2C	489	52	12	–	–	–	–	–	–	64
	Alternative 2C	417	69	11	–	–	–	–	–	–	74
3	Proposed – Total Length	1,081	401	17	–	–	–	–	–	–	401
4	Proposed – Total Length	3,706	569	17	50	–	4	–	–	–	613
	Proposed – Comparison Portion for Alternatives 4A,B,C,D,E,F	1,601	348	–	16	–	<1	–	–	–	364
	Alternative 4A	1,634	305	–	17	–	2	–	–	–	322
	Alternative 4B	1,935	597	12	53	–	–	–	–	22	656
	Alternative 4C	1,931	508	12	53	–	–	–	–	22	567
	Alternative 4D	1,946	660	12	54	–	<1	–	–	22	720
	Alternative 4E	1,937	579	12	54	–	<1	–	–	22	639
	Alternative 4F	1,946	269	–	18	–	2	–	–	–	286

1/ Compares to total acreage shown on Table 3.12-3. Note that numbers in table are rounded to nearest acre; therefore, rows or columns may not sum exactly due to rounding.
2/ Compares to total mineral acreage shown on Table 3.12-3.
3/ Due to multiple claim owners or leases and overlapping mineral interests, the total area of all claims and leases can be much less than the sum of the individual categories. The total provides the most realistic estimate of the actual affected acreage.

3.12.2.5 Structure Variation

The proposed guyed Structure Variation would add four guy wires about 140 feet long from a point about 100 feet up in each tower to four guy anchors spaced in a square around the tower (Appendix B, Figure B-6). This would not change the amount of disturbance during construction or operations appreciably. The use of guyed structures for part of the single-circuit 500-kV segments would not change impacts on minerals.

3.12.2.6 Schedule Variation

The Schedule Variation uses the two single-circuit Design Variation described above but extends construction over a longer timeframe. Initially only one of the eventual two single-circuit lines would be constructed with the second to be constructed at a later date. The Schedule Variation proposes that the first single-circuit transmission line in Segments 2, 3, and 4 would be built as soon as a ROW grant is issued, but that the second line would not begin construction until late 2018. This would mean nearly 2 years between the end of construction for the first line and beginning of construction for the second line. Any staging areas and fly yards that had been used for the first stage would have been revegetated after construction was complete and would have to be cleared again. There would be two sets of construction disturbances adding movement, noise, and dust to the area of construction in two instances in any given area.

In the short term, the potential for mineral effects would be reduced when compared to the Proposed Action and Design Variation due to the fewer number of structures erected. However, in the future any short-term reduction in mineral effects would be lost with construction of the second line and the total impact would be greater as noted in Section 3.12.2.

3.12.3 Mitigation Measures

The following mitigation measures identified by the Agencies are required on federally managed lands. The Agencies recommend that the Proponents incorporate the measures into their EPMs and apply them Project-wide.

MN-1 A geotechnical investigation will be conducted by the Proponents in areas where abandoned underground mines are known to occur to determine the presence of methane and the likelihood of subsidence.

MN-2 An accounting of damages will be conducted by the Proponents to current operators to determine the potential loss of mineral resources. There may be mining claims under the 1872 Mining Law that would have precedence over the Project. Similarly, federal and state mineral lease agreements provide rights to lessees that could interfere with the Gateway West Project. The Proponents will resolve mineral claim and lease agreements prior to Project initiation, as with site access agreements on private property.

3.13 PALEONTOLOGICAL RESOURCES

This section addresses the potential impacts from the Proposed Route and Route Alternatives on the known paleontological resources during construction, operation, and decommissioning. The Proposed Route and Route Alternatives pass through areas where paleontological resources are known to exist. The routes, their potential impacts, and mitigation methods to minimize or eliminate impacts are discussed in this section.

3.13.1 Affected Environment

This section describes the mapped geology and known paleontological resources near the Proposed Action. It also describes and compares potential impacts of the Proposed Action and Action Alternatives to paleontological resources. Fossils are important scientific and educational resources because of their use in: 1) documenting the presence and evolutionary history of particular groups of now extinct organisms, 2) reconstructing the environments in which these organisms lived, and 3) determining the relative ages of the strata in which they occur. Fossils are also important in determining the geologic events that resulted in the deposition of the sediments in which they were buried.

3.13.1.1 Analysis Area

The Project area in Wyoming and Idaho consists of predominantly north-south trending mountain ranges separated by structural basins. The eastern portion of the Project (Segments 1 and 2) would be located within the Laramie Mountains and the Shirley Mountains, which consist predominantly of Precambrian granite and gneisses. Moving west in Wyoming, the Project would cross major structural basins created during the Laramide Orogeny, including the Hanna Basin in Carbon County (Segment 2), and the Greater Green River Basin in Sweetwater County (Segments 3 and 4). West of the Green River Basin in western Wyoming, the broad Laramide basins are bounded by the fold and thrust belt of the Sevier Orogeny present along the Idaho-Wyoming border in Segments 4 and 5. In eastern Idaho, the geology transitions from older, compressional thrust fault blocks to the younger, extensional block faulted terrain of the Basin and Range Province. The mountain ranges in southeastern Idaho consist of sedimentary rock. West of Borah Substation (Segments 6 through 10), the routes fall within the Snake River Plain, a broad structural valley which cuts off the Basin and Range Province. The Snake River Plain is dominated by flood basalts, thinly covered with silty, aeolian deposits and interlain with minor clastic sediments. Some of the southern alternatives (Segments 7 and 9) remain within the Basin and Range mountain ranges similar to those in southeast Idaho. The block-faulted ranges of southern and southwestern Idaho have more volcanic features than ranges in the eastern portion of the state. There are no known fossil-bearing formations in northern Nevada where Alternative 7I occurs.

For the purposes of paleontological record searches, a 1-mile-wide corridor (0.5 mile on either side of the centerline) was used. This allowed the delineation of important fossil-bearing formations in most areas that could be affected by the construction of the Project. There may be some access roads located outside the 1-mile corridor that could also affect fossil-bearing formations. These would be examined on a case-by-case basis as they are identified.

3.13.1.2 Issues to be Analyzed

Issues raised by members of the public during public scoping (Tetra Tech 2009a) included the following:

- Whether a full inventory of potentially affected paleontological resources would be carried out,
- Whether fossils would be damaged during construction, and
- Whether fossils would be removed or destroyed by increased access to protected areas.

3.13.1.3 Regulatory Framework

Paleontological resources are recognized as nonrenewable scientific resources and are afforded protection by federal statutes and policies. The BLM has a system of rating the sensitivity of geologic units known as the Potential Fossil Yield Classification (BLM 2008f). This classification system was originally developed by the Forest Service's Paleontology Center of Excellence and the Region 2 (Forest Service) Paleontology Initiative in 1996. Modifications were made by the BLM's Paleontological Resources staff in subsequent years. For consistency, the BLM system was used throughout the Project. The five levels are:

1 Very low – not likely that a geologic unit has recognizable fossil remains.
2 Low – not likely to contain vertebrate fossils or scientifically significant nonvertebrate fossils
3 Moderate or unknown - various significance, abundance, and predictable occurrence or unknown fossil potential
4 High – high occurrence of significant fossils
5 Very High – highly fossiliferous and predictable or significant fossils that are at risk of adverse impacts or degradation

Sensitivity ratings for levels 3, 4, and 5 can be further subdivided (using the letters A and B) based on the amount of soil cover generally present on a formation. For example, a subdivision of 3A has less soil cover than 3B. BLM Sensitivity ratings for the geologic units in Wyoming are shown in Table 3.13-1. BLM Sensitivity ratings for the geologic units in Idaho are shown in Table 3.13-2.

Table 3.13-1. BLM Sensitivity Ratings for Geologic Units Encountered in Wyoming

Period	Formation	Sensitivity Rating
Quaternary sediments	Alluvium, colluvium, playa and other lacustrine deposits, dune sand and loess, gravel, pediment, and fan deposits	2
Quaternary landslide debris	The formations involved in Quaternary landslides could be of almost any age, but the disturbances caused by the landslide in most cases preclude recovery of meaningful paleontological resources that might have existed.	1
Pleistocene and/or Pliocene	Terrace gravel	2
Pliocene and Miocene	Salt Lake Formation	3
Upper Miocene	combined formations	5
Miocene	combined formations	3

Table 3.13-1. BLM Sensitivity Ratings for Geologic Units Encountered in Wyoming (continued)

Period	Formation	Sensitivity Rating
Lower Miocene and Upper Oligocene	combined formations	5
Oligocene	White River Group	5
Eocene	Fowkes Formation	3
	Wasatch Formation	5
	Wagon Bed Formation	5
	Bridger Formation	5
	Green River Formation	5
	Wind River Formation	5
Paleocene	Hanna Formation	5
	Fort Union Formation	3
Cretaceous and Paleocene	Evanston Formation	3
	Ferris Formation	5
Cretaceous	Adaville Formation	3
	Almond Formation	3
	Fox Hills Sandstone	3
	Lewis Shale	3
	Lance Formation	3
	Mesaverde Group	3
	Blair Formation	3
	Medicine Bow Formation	3
	Niobrara Formation	5
	Baxter Shale	3
	Frontier Formation	3
	Cody Shale	3
	Steele Shale	3
	Gannett Group	3
	Mowry Shale	3
	Thermopolis Shale	3
	Hilliard Shale	3
	Smiths Formation	3
	Thomas Fork Formation	3
	Cokeville Formation	3
	Quely Formation	3
	Sage Junction Formation	3
	Bear River Formation	3
	Aspen Formation	3
	Cloverly Formation	3
Jurassic	Morrison Formation	3
	Sundance Formation	3 – 5
	Stump Formation	3

Table 3.13-1. BLM Sensitivity Ratings for Geologic Units Encountered in Wyoming (continued)

Period	Formation	Sensitivity Rating
Jurassic	Twin Creek Limestone	3
	Preuss Sandstone	3
	Nugget Sandstone	3
Triassic	Ankareh Formation	3
	Chugwater Formation	3
	Thaynes Limestone	3
	Woodside Shale	3
	Dinwoody Formation	3
Permian	Goose Egg Formation	2
	Phosphoria Formation	3
Permian and Pennsylvanian	Casper Formation	3
	Tensleep Sandstone	2
	Wells Formation	3
Pennsylvanian	Amsden Formation	2 – 3
Mississippian	Madison Limestone	3
Devonian	Darby Formation	2 – 3
Ordovician	Bighorn Dolomite	2 – 3
Cambrian	Gallatin Limestone	2 – 3
	Gros Ventre Formation	2 – 3
	Flathead Sandstone	2 – 3
Precambrian	Archean Granitic Rocks	1
	Granite Gneiss	1

Source: Geologic units: USGS 1994; sensitivity ratings: Wyoming Bureau of Land Management

Table 3.13-2. BLM Sensitivity Ratings for Geologic Units Encountered in Idaho

Period	Formation	Sensitivity Rating
Quaternary sediments	Alluvium, colluvium, playa and other lacustrine deposits, dune sand and loess, gravel, pediment, and fan deposits	3
Quaternary/Tertiary Volcanics	Trio Hill Basalt	2
	Dorsey Butte Basalt	2
	Montini volcanic complex	2
	Conservancy Flats volcanic complex	2
	Nahas Ranch Basalt (upper and lower units)	2
	Basalt of Otter Massacre Site	2
	Basaltic Tuff of Red Trails	2
Holocene and Pleistocene	Playa deposits	3
Pleistocene	Bonneville Flood deposits	3
	Malad Basalt	3
	Fluvial deposits	3
	Cave accumulations	4

Table 3.13-2. BLM Sensitivity Ratings for Geologic Units Encountered in Idaho (continued)

Period	Formation	Sensitivity Rating
Pliocene through Pleistocene	Marsh Valley Formation	3
Pliocene	Tuana Gravels	3
	Glenns Ferry Formation	5
Miocene	Chalk Hills Formation	5
	Poison Creek Formation	5
Miocene through Oligocene	Starlight Formation	4
Miocene through Eocene	Salt Lake Formation	3
Cretaceous	Granite of Silver City Batholith	1
Jurassic	Twin Creek Limestone	3
Triassic through Jurassic	Nugget Sandstone	3
Triassic	Thaynes Limestone	5
Permian	Phosphoria Formation	5
Permian and Pennsylvanian	Oquirrh Group	3
Carboniferous undifferentiated	Manning Canyon Shale	3
Mississippian	Laketown Dolomite	3
	Humbug Formation	3
	Lodgepole Limestone	3
	Great Blue Limestone	3
Devonian	Water Canyon Formation	3
	Bierdneau Formation	3
	Hyrum Dolomite	3
Ordovician	Fish Haven Dolomite	3
	Swan Peak Quartzite	3
	Garden City Formation	3
Cambrian through Ordovician	Saint Charles Formation	3
Cambrian	Nounan Limestone	3
	Worm Creek Quartzite Member	4
Proterozoic	Brigham Quartzite	3
	Granite Gneiss	1
	Archaen Granitic Rocks	1

Source: in part from Idaho BLM records, and in part from estimates.

Federal protection for significant paleontological resources applies to federally owned or managed lands. Federal legislative protection for paleontological resources began with the Antiquities Act of 1906 (P.L. 59-209; 16 U.S.C. § 431 *et seq*.; 34 Stat. 225), which requires protection of historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest on federal land. The Antiquities Act of 1906 forbids disturbance of any object of antiquity on federal land without a permit issued by the responsible managing agency. This act also establishes criminal sanctions for unauthorized appropriation or destruction of antiquities. The Federal Highways Act of

1958 clarified that the Antiquities Act applied to paleontological resources and authorized the use of funds appropriated under the Federal-Aid Highways Act of 1956 to be used for paleontological salvage in compliance with the Antiquities Act and any applicable state laws.

In addition to the Antiquities Act, other federal statutes protect fossils. The Historic Sites Act of 1935 (P.L. 74-292; 49 Stat. 666; 16 U.S.C. § 461 *et seq*.) declares it national policy to preserve objects of historical significance for public use and gives the Secretary of the Interior broad powers to execute this policy, including criminal sanctions. NEPA (P.L. 91-190; 31 Stat. 852; 42 U.S.C. §§ 4321-4327) requires that important natural aspects of the nation's heritage be considered in assessing the environmental consequences of any proposed project. The FLPMA (P.L. 94-579; 90 Stat. 2743; U.S.C. § 1701-1782) requires that public lands be managed in a manner that protects the quality of their scientific values. The most explicit protection for paleontological resources was enacted in 2009. The Paleontological Resources Preservation Act of 2009 regulates who may collect fossils on public lands and where such fossils must be curated.

3.13.1.4 Methods

Paleontological record searches were commissioned from the primary paleontological repositories in Wyoming and Idaho. For the Wyoming portion, the records of the Geological Museum of the University of Wyoming in Laramie were utilized. The records of the Idaho Museum of Natural History, Pocatello, Idaho, were employed for the Idaho portion. The Proposed Route and Route Alternatives for Gateway West were mapped on segments of USGS 7.5-minute topographic maps. These segments of topographic maps were then compared to the paleontological locality maps in the Idaho and Wyoming repositories. The information obtained from the record searches was supplemented by confidential documents provided by the BLM Idaho State Office, geologic maps, paleontological literature, and by discussions with specialists in the paleontology of those two regions. These specialists included staff of the Hagerman Fossil Beds and the Fossil Butte National Monuments.

The following references were used to prepare the summaries of known fossil localities by segment, as presented in Section 3.13.1.5. Wyoming geologic maps utilized include Love and Christiansen (1985) and USGS (1994). The state of Idaho does not have equivalent geologic mapping. The information in the digital version of the geology of the state by Johnson and Raines (1996) was supplemented by numerous other maps. These include 30- x 60-minute and similar smaller-scale maps published by Covington and Weaver (1990), Jenks et al. (1998), Long and Link (2007), Link and Stanford (1999), Bonnichsen and Godchaux (2006a), Scott (1982), and Kauffman et al. (2005). Fifteen-minute and 7.5-minute geologic maps employed include Bonnichsen and Godchaux (2006b), Carr and Trimble (1976), DeVecchio et al. (2003), Gillerman and Kauffman (2005), Kauffman and Orthberg (2004, 2005), Malde and Powers (1972), Matthews et al. (2006), Miller et al. (2008), Mytton et al. (1990), Pierce et al. (1983), Orthberg and Breckenridge (2004a, b, c), Orthberg and Kauffman (2005), Pope et al. (2001), Smith (1982), Stearns (1938), Trimble and Carr (1976), and Williams et al. (1990a, 1990b).

To identify potential effects to paleontological resources, the geologic formations shown in Tables 3.13-1 and 3.13-2 were plotted on a map, and a GIS analysis was used to compare the locations of the geologic formations against the centerlines of the Proposed Route and Route Alternatives in each segment. In some cases, geologic formations were reported in the literature that did not appear on the BLM lists. In those cases, an estimate of fossil sensitivity was made, based on rock type, or whether the sources used mentioned potential for paleontological resources. The distance (in miles) the routes traversed across each geologic formation were multiplied by the sensitivity ratings shown in Tables 3.13-1 and 3.13-2. To disclose the risk to paleontological resources by segment, the route mileage through each geologic formation was multiplied by its sensitivity rating to determine the paleontology risk factor. These risk factors were totaled within each segment of the Proposed Route and Route Alternatives and compared (Appendix D, Table D.13-1). The routes with the highest risk factors would have the greatest potential for effects on paleontology resources. The risk factors were then compared for each segment by alternative.

The total mileage of routes within highly or very highly sensitive formations was also reviewed. To complete this evaluation, the total mileage of each Proposed Route and Route Alternative containing formations with sensitivity ratings of 4 or 5 was evaluated as presented in Table 3.13-3. The total mileage of high or very high sensitivity formations was then compared.

3.13.1.5 Existing Conditions

From east to west, the Project begins within the Great Plains Physiographic Province near Glenrock, Wyoming, and immediately passes into the Southern Rocky Mountain Province, represented by the Laramie Range (the first two-thirds of Segment 1E and the first half of Segment 1W). It traverses the length of the Wyoming Basin and then crosses the Middle Rocky Mountain Province (portions of Segment 4). This province straddles the Wyoming-Idaho border region. Next, the route passes into the Basin and Range Province (Segments 4 and 5) and then into the Snake River Plain, which is part of the Columbia Plateau Province (Segments 7, 8, 9, and 10). The rocks of the Wyoming portion are almost entirely sedimentary, whereas those of the Idaho portion include massive amounts of basalt and other igneous rocks.

Fossil-bearing formations that the Wyoming portion of the Project crosses are listed in Table 3.13-1. One of the most important formations, the Green River Formation, has an international reputation for the exquisite animal and plant fossils quarried from its oil shale layers. Fossil Butte National Monument explores the riches of this formation. The Idaho portion of the Project crosses the potentially fossiliferous formations listed in Table 3.13-2. Among these, the Glenns Ferry Formation is especially well known for the numerous vertebrate fossils it has produced. The Hagerman Fossil Beds National Monument is devoted to fossils from this formation. The Hagerman Fossil Beds National Monument has been designated as a National Natural Landmark. It is internationally significant for its late Pliocene epoch (3 to 4 million years ago) fossil deposits, and over 220 species of plants and animal fossils have been identified.

Known Localities by Proposed Route Segment

Segment 1E, including Alternatives 1E-A, 1E-B, and 1E-C, and Segments 1W(a) and 1W(c), including Alternative 1W-A, are illustrated in Figure A-2. Three recorded paleontological localities were found within the buffer of the Proposed Route near the Aeolus Substation. These are in the Frontier Formation and have produced teeth of sharks, rays, and crocodiles. The NFS lands in Wyoming have a “very low” sensitivity ranking of 1 with no known or likely localities.

The Proposed Route for Segment 2 and Alternatives 2A and 2B are illustrated in Figure A-3 in Appendix A. A large number of recorded localities (approximately 40) lie within the ROW and buffer of the Proposed Route just where it leaves the junction of Segments 1E and 1W. These are in the Hanna Formation (Paleocene) and have produced gars and other fish, crocodiles, lizards, turtles, multituberculates, marsupials, primates, pantolestids, oxyclaenids, phenacodontids, mioclaenids, hyopsodontids, cimolestids, leptictids, arctocyonids, periptychids, pantolambdids, viverrarvids, palaeorictids, and a primitive horse as well as reworked Cretaceous shark teeth. Eight more recorded localities were found farther west on the Proposed Route. Some are from the Wasatch Formation (Eocene) and produced unidentified reptile and mammal remains. Others are from the Fort Union Formation (Paleocene) and produced fish, amphibian, lizard, crocodile, champsosaur, multituberculate, pantolestid, arctocyonid, oxyclaenid, condylarth, mioclaenid, hyopsodontid, primate, pantolestid, cimolestid, and leptictid remains. No recorded localities were found within the ROW or buffer of Alternative 2A.

Figure A-4 in Appendix A illustrates the Segment 3 Proposed Route. Three recorded localities were found near the west end of the Proposed Route. One is in the Wasatch Formation (Eocene) and has produced gar teeth. Two more are in the Fort Union Formation (Paleocene) and have produced gar, turtle, crocodile, insectivoran, primate, arctocyonid, oxyclaenid, pantolestid, and phencodontid remains.

In an area of overlap between Subsegment 3P and Subsegment 4P lies a locality in the Almond Formation (Cretaceous). It has produced oysters, clams, snails, and shark teeth.

The Wyoming portions of the Segment 4 Proposed Route and Alternatives 4A, 4B, 4C, 4D, 4E, and 4F are mapped in Figure A-5 in Appendix A, and the Idaho portion in Figure A-6. No recorded localities were found along the Proposed Route. In the eastern portion common to Alternatives 4B through 4E (between 4b and 4b.1), a concentration of localities have been recorded. Eleven localities occur within the ROW or buffer, and more than 22 occur within a mile of the midline of the ROW. They are from the Bridger Formation and have produced remains of gar, snakes, lizards, turtles, crocodiles, marsupials, insectivorans, rodents, primates, uintatheres, tapiroids, horses, hyaenodonts, and tillodonts.

Figure A-7 in Appendix A illustrates the Segment 5 Proposed Route and Alternatives 5A, 5B, 5C, and 5D. One recorded locality was found within the buffer of the Proposed Route near its eastern end. The only records describe gravels producing bone. However, fossiliferous Miocene and Pleistocene gravels have been reported in the immediate area.

Segment 6 is illustrated in Figure A-8 in Appendix A. Segment 6 connects the Borah and Midpoint Substations. The existing 345-kV line would be energized at 500 kV using existing structures and conductor. The search area for Segment 6 was only 0.5 mile, which represents the estimated disturbance area near the substations.

Figure A-9 in Appendix A depicts the Segment 7 Proposed Route and Route Alternatives 7A, 7B, 7C, 7D, 7E, 7F, 7G, 7H, 7I, and 7J. Only one recorded locality was noted. Pleistocene gravels with bone occur adjacent to the buffer near Rockland.

The Segment 8 Proposed Route and Route Alternatives 8A, 8B, 8C, 8D, and 8E are illustrated in Figure A-10 in Appendix A. No recorded localities were encountered for Segment 8, but one lies within the buffer of Alternative 8A. The Glenns Ferry Formation (Pliocene) contains the potential for significant vertebrate fossils in the vicinity of Alternative 8A. The Hagerman Fossil Beds National Monument (see description below), located south of Alternative 8A and north of Alternative 9B, has been established to preserve the fossil richness in this area.

Figure A-11 in Appendix A shows the Segment 9 Proposed Route and Alternatives 9A, 9B, 9C, 9D, 9E, 9F, 9G, and 9H. No recorded localities were encountered for Segment 9 but several lie within the buffer of Alternative 9A. One is of Miocene age, but the others are from the Glenns Ferry Formation (Pliocene), and produced unspecified vertebrate fossils.

The Proposed Route for Segment 10 is illustrated in Figure A-12 in Appendix A. No recorded localities occur within the buffer of Segment 10 but fossiliferous gravels lie adjacent to that segment.

The Proposed Route and Route Alternatives have been designed to avoid areas designated by the BLM as ACECs. The Proposed Route and Route Alternatives do approach two major federal paleontological preserves.

Description of Fossil Butte National Monument (including Privately Held Quarry Sites)

Fossil Butte National Monument was authorized in 1972. It lies 9 miles west of Kemmerer in Lincoln County, Wyoming. It is dedicated to the paleontology and geology of the Eocene Green River and Wasatch formations in the area of ancient Fossil Lake. The monument preserves 13 square miles (34 square kilometers) of the 900-square-mile (2,330 square kilometer) Fossil Lake. There are two commercial quarries east of the park, two southeast of the park, and eight south of the park. The definitive book on the fossils of the Green River Formation is that of Grande (1984). The Green River Formation contains the best preserved and best documented Eocene freshwater ecosystem known. Alternative 4A passes 5.5 miles north of the monument and Alternatives 4B and 4C pass within a mile of the southern boundary.

Description of Hagerman Fossil Beds National Monument

Hagerman Fossil Beds National Monument was authorized in 1988. It is dedicated to the paleontology and geology of the Glenns Ferry Formation (Pliocene) along the western side of the Snake River just west of Hagerman, Idaho. It occupies approximately 6.8 square miles (17.6 square kilometers). The primary fossil-producing sedimentary unit is the Glenns Ferry Formation. The Hagerman Fossil Beds are the discovery site for the Hagerman Horse, the oldest known representative of the modern

horse genus Equus, which includes horses, donkeys, and zebras. The Hagerman Horse is the state fossil of Idaho. In addition, the list of species collected from this formation within the monument includes 36 plant species, 4 ostracode, 37 mollusk, 2 crustacean, 18 fish, 5 amphibian, 8 reptile, 28 bird, and 53 mammal species. The Glenns Ferry Formation is crossed by many segments of the route, and many of the organisms might be expected to occur within those sediments. Alternative 8A passes within 1,500 feet of the northeastern corner of the monument; it crosses mostly Tuana Gravel with some Glenns Ferry Formation in that area. Alternative 8A passes within 1,500 feet of the northern boundary of the monument and Alternative 9B passes about the same distance from the southern boundary; the geology there is mostly Glenns Ferry Formation with Chalk Hills Formation exposed in one drainage. The closest approaches of the Proposed Route (Segments 8 and 9) are about 5 miles to the northeast and southwest of the monument in that area.

3.13.2 Direct and Indirect Effects

This section is organized to present effects to paleontology from construction, then operations, followed by decommissioning activities for the proposed Project. Route Alternatives are analyzed in detail below in Section 3.13.2.3. There is a Design Variation involving use of two single-circuit structures proposed by the Proponents for Segments 2, 3, and 4 (see Section 2.2 for details), which is analyzed below in Section 3.13.2.4 and a Structure Variation that is analyzed in Section 3.13.2.5. The Proponents have also proposed a Schedule Variation, analyzed in Section 3.13.2.6, in which one of the two single circuits to be constructed in Segments 2, 3, and 4 and a portion of Segment 1W would be built on an extended schedule with construction beginning approximately 2.5 years after completion of the initial construction.

Mitigation measures or EPMs are presented in detail within this section only if it is the first time they have been discussed in Chapter 3; all other measures are referenced or summarized. A comprehensive list of all Proponent-proposed EPMs and Agency-required mitigation measures can be found in Table 2.2-2 of Chapter 2.

<u>Plan Amendments</u>

Proposed amendments are summarized in Table 2.2-1 of Chapter 2 and detailed in Appendices F and G. Amendments are needed to permit the Project to cross various areas of BLM-managed and NFS lands. Effects described for areas requiring an amendment in order for the Project to be built would only occur if the amendment were approved. Amendments that alter land management designations could change future use of these areas. No amendments specific to paleontological resources are proposed for the Project and no impacts to paleontological resources resulting from approving the amendments beyond the impacts of the Project are anticipated.

3.13.2.1 No Action Alternative

No direct or indirect effects to paleontological resources by transmission lines or associated facilities would occur, because the proposed Project would not be constructed.

3.13.2.2 Effects Common to All Action Alternatives

Construction

Direct effects due to construction common to the Proposed Route and Route Alternatives include the possible damage to paleontological specimens and possible loss of associated data. The scientific information provided by fossils is maximized by discovery of fossil specimens preserved in place within the host geologic formations. Construction disturbance activities could result in the discovery of isolated fossil specimens. Further examination in the vicinity of these isolated finds could result in significant fossil discoveries. However, excavation or blasting in fossil-bearing rock formations is more likely to damage intact fossils and reduce the scientific value of the paleontological resource. The likelihood of recovering scientifically important fossil specimens using heavy construction equipment is low. Therefore, use of construction equipment and blasting could have direct negative effects on paleontological resources.

Construction impacts include excavations for the tower foundations and construction of access roads, staging areas, laydown yards, substations, and regen sites. Transmission line tower foundations would consist of drilled piers, 4 to 6 feet in diameter and 15 to 20 feet deep. Blasting may be necessary in bedrock areas not suitable for excavation by standard drilled pier augering. The construction impacts from installation of other features would likely be less than the impacts from the tower excavations because other ground-disturbing activities would be much shallower.

Based on the calculated paleontology risk factors, Segments 4 and 9 have the highest risks, with risk factors of 785 and 550, respectively. Segments 2, 7, and 8 have moderate risk factors of 360, 369, and 375, respectively. The extent of soil cover throughout the Proposed Route and Route Alternatives is not known at this time, though estimates to shallow bedrock are found in Table 3.15-1 (Section 3.15 – Soils). This table indicates that 38 percent of the Segment 4 Analysis Area contains shallow bedrock. Shallow bedrock underlies about 43 percent of Segment 9. Shallow bedrock is present in Segments 2, 7, and 9 at amounts ranging from 0 to 16 percent. Routes with soil cover would protect paleontological resources. Indirect effects due to construction include the unauthorized collecting or destruction of paleontological specimens due to increased access.

To mitigate impacts to paleontological resources, the Proponents intend to cease work until the appropriate person has been notified in situations where fossil materials are discovered. The following EPMs, which are included in Appendix C-1, Attachment D, have been developed by the Proponents and they are committed to implementing them during all applicable construction activities.

CUL-1 All work conducted under the Cultural Resources and Paleontological Monitoring and Mitigation Plan will be performed by qualified paleontologists and archeologists with trained assistants.

CUL-2 An Unanticipated Discovery Plan will be included as part of the Cultural Resources and Paleontological Monitoring and Mitigation Plan. This plan will specify what steps will be taken if a subsurface cultural resource or fossil is discovered during construction, including stopping construction in the vicinity of the find, notification of the appropriate land management

agency, identification of a qualified archeologist or paleontologist to conduct an evaluation of the find, and the development of an approved data recovery program or other mitigation measures.

CUL-3 The Cultural Resources and Paleontological Monitoring and Mitigation Plan will include provisions for the preparation and curation of any fossil collections from federal lands and for the preparation of a final report based on the data recovered for activities on federal lands.

CUL-9 If significant fossil materials are discovered during Project construction, all surface-disturbing activities in the vicinity of the find will cease until notification to proceed is given by the authorized officer. The site will be protected to reduce the risk of damage to fossils and context. Appropriate measures to mitigate adverse effects to significant paleontological resources will be determined by the authorized officer.

To further reduce the impacts on paleontological resources during construction, the Agencies have identified the following mitigation measures where construction is on federal lands, and on state, Indian Reservation, or private lands where requested by the land management agency or landowner.

PALEO-1 The Proponents shall prepare a Paleontological Monitoring Plan for the Project, focusing on Segments 4, 7, 8, and 9 where the potential for adverse impacts is the greatest. This plan shall be submitted to appropriate agencies for review and approval prior to commencing construction. The plan will specify that:

- Monitoring of excavation and grading in sensitive sediments, especially access roads and tower sites, must occur when construction is near or in those geologic formations.
- Monitoring of excavations in sensitive sediments, screening the excavated spoils, and processing of bulk sediment samples for microvertebrate fossils must occur where there is a significant potential for data recovery from those spoils.
- Monitoring must be performed by a qualified paleontologist and in consultation with a designated paleontologist in each state, NF, or BLM district. The Authorized Officer will designate the appropriate paleontologist depending on project location.

PALEO-2 Where fossil-bearing sediments are exposed by construction, the sediments must be covered with a minimum 4-inch layer of soil where feasible to reduce unauthorized removal or disturbance of resources.

PALEO-3 Areas with Fossil Potential Classification sensitivity rankings of 3, 4, or 5 on NFS lands will be surveyed and posted.

Operations

No direct effects to paleontological resources due to operations are foreseen. Possible indirect effects would be the unauthorized collecting or destruction of paleontological specimens due to increased access.

Decommissioning

Very limited effects due to decommissioning are foreseen because the activities would occur within the same footprint as construction. Assuming that concrete footings would not be removed from the ground, only exposed outcrops could be affected. It is possible that a few fossils exposed at the surface could be damaged by vehicles involved in decommissioning.

3.13.2.3 Proposed Route and Alternatives by Segment

Numerous geologic units of moderate to high paleontological sensitivity would be crossed by the centerline of the Project's Proposed Route and Route Alternatives. Therefore, construction of this set of transmission lines, along with the associated access roads, has the potential to impact paleontological resources.

The nature of the paleontological resources in a given rock unit is important. For example, augering has different impacts on resources that consist of numerous isolated teeth or small bones in relatively loose alluvium versus resources that consist of complete skeletons in relatively indurated sediments (e.g., parts of the Green River Formation). Much more information and many more intact specimens can be recovered from the auger tailings from the alluvium containing isolated teeth or small bones than in tailing from the Green River Formation. The comparison of alternatives is also complicated by the possibilities of making minor adjustments in the siting of given structures to avoid discrete resources. Records searches have indicated a few known areas of locality concentrations within the ROW. Table 3.13-3 presents the paleontological risk factors by Proposed Route and Route Alternative.

Segment 1E

Segment 1E, as proposed, would link the Windstar and Aeolus Substations in south-central Wyoming with a 100.6-mile 230-kV single-circuit transmission line. Twenty acres of the expansion of Windstar and Aeolus Substations and 0.5 acre for one regeneration site are attributed to Segment 1E. Alternative 1E-A is a 16.1-mile alternative along the north end of Segment 1E, which was the Proponents' initial proposal before moving the Proposed Route at the suggestion of local landowners to avoid the more settled area around Glenrock. Alternative 1E-B is 21.4 miles longer than the Proposed Route but is being considered by the Proponents because it would avoid a Wyoming-designated sage-grouse core area to the east. The BLM has required the consideration of Alternative 1E-C, which parallels the Segment 1W 230-kV lines into the Aeolus Substation (see Appendix A, Figure A-2).

Approximately 22 miles of the Segment 1E Proposed Route pass through areas of bedrock with a very high potential fossil yield. Another 24 miles would pass through areas with bedrock having a very low potential fossil yield. As mentioned above, the precise amount of impacts the Project would create depends on the amount of soil cover at the various road and tower sites, and on the precise nature and amount of ground modification at those sites. These details are unknown at this time. These limitations apply equally to the following Proposed Route and Route Alternative descriptions.

Table 3.13-3. Paleontology Risk Factor of Proposed and Alternative Routes

Segment	Route	Miles Crossed [1/]	Paleontology Risk Factor[2/]	Highly Sensitive Miles Crossed [3/]
Wyoming Portion				
1E	Proposed – Total Length	100.6	281.6	21.7
	Proposed – Comparison portion for Alternative 1E-A	17.6	51.4	–
	Alternative 1E-A	16.1	45.2	–
	Proposed – Comparison portion for Alternative 1E-B	37.9	109.7	6.9
	Alternative 1E-B	59.3	172.7	12.5
	Proposed – Comparison portion for Alternative 1E-C	75.4	213.4	21.7
	Alternative 1E-C	48.7	169.4	23.0
1W(a)	Proposed – Total Length	76.5	250.8	20.6
	Proposed – Comparison portion for Alternative 1W-A	20.3	55.4	–
	Alternative 1W-A	16.2	47.4	–
1W(c)	Proposed – Total Length	70.6	234.2	25.3
2	Proposed – Total Length	96.7	360.3	41.8
	Proposed – Comparison portion for Alternative 2A	28.8	99.4	8.0
	Alternative 2A	28.4	105.3	11.6
	Proposed – Comparison portion for Alternative 2B	7.0	26.1	2.8
	Alternative 2B	6.2	23.9	3.5
	Proposed – Comparison portion for Alternative 2C	28.4	121.1	18.0
	Alternative 2C	24.4	108.4	17.8
3	Proposed – Total Length	56.4	215.3	27.6
4	Proposed – Total Length	203.0	785.1	100.2
	Proposed – Comparison portion for Alternatives 4A,B,C,D,E,F	90.2	350.6	48.8
	Alternative 4A	85.2	324.4	44.4
	Alternative 4B	100.2	402.9	57.6
	Alternative 4C	101.6	397.3	54.9
	Alternative 4D	100.8	408.6	59.5
	Alternative 4E	102.2	403.0	56.9
	Alternative 4F	87.5	354.7	52.4
5	Proposed – Total Length	54.6	162.9	4.7
	Proposed – Comparison portion for Alternatives 5A,B	25.3	80.1	4.2

Table 3.13-3. Paleontology Risk Factor of Proposed and Alternative Routes (continued)

Segment	Route	Miles Crossed[1/]	Paleontology Risk Factor[2/]	Highly Sensitive Miles Crossed [3/]
5	Alternative 5A	33.7	107.6	3.3
	Alternative 5B	44.4	145.8	6.3
	Proposed – Comparison portion for Alternative 5C	33.2	101.6	2.1
	Alternative 5C	26.1	84.6	6.4
	Proposed – Comparison portion for Alternative 5D	19.4	52.9	0.3
	Alternative 5D	17.5	61.9	10.0
	Proposed – Comparison portion for Alternative 5E	5.8	11.7	–
	Alternative 5E	5.3	10.9	–
6	Proposed – Total Length	0.5	1.0	–
7	Proposed – Total Length	118.1	368.9	14.7
	Proposed – Comparison portion for Alternatives 7A,B	35.2	108.4	2.5
	Alternative 7A	38.0	120.3	3.3
	Alternative 7B	46.4	152.2	6.5
	Proposed – Comparison portion for Alternative 7C	20.1	61.3	1.0
	Alternative 7C	20.3	69.4	8.6
	Proposed – Comparison portion for Alternative 7D	6.2	18.6	–
	Alternative 7D	6.8	20.3	–
	Proposed – Comparison portion for Alternative 7E	3.8	11.5	–
	Alternative 7E	4.5	13.4	–
	Proposed – Comparison portion for Alternative 7F	10.5	31.5	–
	Alternative 7F	10.8	32.3	–
	Proposed – Comparison portion for Alternative 7G	3.1	9.4	–
	Alternative 7G	3.2	9.7	–
	Proposed – Comparison portion for Alternatives 7H,I	118.1	366.1	14.7
	Alternative 7H	127.5	409.5	13.6
	Alternative 7I	173.4	561.0	21.0
	Proposed – Comparison portion 7/9 for Alternative 7J[4/]	143.9	438.1	14.7
	Alternative 7J[4/]	202.1	647.2	21.0
8	Proposed – Total Length	131.0	369.4	23.1
	Proposed – Comparison portion for Alternative 8A	51.4	139.5	8.3

Table 3.13-3. Paleontology Risk Factor of Proposed and Alternative Routes (continued)

Segment	Route	Miles Crossed[1/]	Paleontology Risk Factor[2/]	Highly Sensitive Miles Crossed [3/]
8 (cont.)	Alternative 8A	53.6	152.5	8.7
	Proposed – Comparison portion for Alternative 8B	45.3	143.2	14.5
	Alternative 8B	45.8	123.8	–
	Proposed – Comparison portion for Alternative 8C	6.5	19.6	–
	Alternative 8C	6.4	19.2	–
	Proposed – Comparison portion for Alternative 8D	6.9	13.9	–
	Alternative 8D	8.1	18.7	0.7
	Proposed – Comparison portion for Alternative 8E	7.0	20.0	1.6
	Alternative 8E	18.5	39.4	0.9
9	Proposed – Total Length	161.7	539.0	38.7
	Proposed – Comparison portion for Alternative 9A	7.8	18.9	–
	Alternative 9A	7.7	19.4	–
	Proposed – Comparison portion for Alternative 9B	49.5	155.9	8.4
	Alternative 9B	53.2	189.9	14.7
	Proposed – Comparison portion for Alternative 9C	14.7	37.2	–
	Alternative 9C	15.3	38.5	0.3
	Proposed – Comparison portion for Alternatives 9D,E,F,G,H	57.2	207.6	19.8
	Alternative 9D	58.4	163.7	10.4
	Alternative 9E	68.7	231.6	18.3
	Alternative 9F	63.2	180.4	10.7
	Alternative 9G	56.4	153.8	8.4
	Alternative 9H	61.2	170.5	8.8
10	Proposed – Total Length	33.6	71.5	–

1/ Mileages are rounded to the nearest tenth of a mile; therefore, rows may not sum exactly due to rounding.
2/ The paleontology risk factor is a product of the length of the segment or alternative multiplied by the BLM sensitivity rating of the individual rock formations crossed.
3/ The highly sensitive miles crossed is the mileage per segment of route crossing rock formations with sensitivity ratings of 4 or 5.
4/ Alternative 7J connects with Segment 9 approximately 25.8 miles west of the proposed Cedar Hill Substation, which is the western terminus of Segment 7 and the beginning point for Segment 9. The table above compares 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

Alternative 1E-A would be 16.1 miles long, and would not pass through areas of bedrock with significant fossil yield. Alternative 1E-B would be 59.3 miles long. Approximately 12.5 miles of Alternative 1E-B would pass through bedrock with a very high potential fossil yield and approximately 14 miles would pass through areas with a very low potential fossil yield. The comparison portion of the Proposed Route for Alternative 1E-B would be 37.9 miles long, of which approximately 7 miles would pass through areas with a very high potential fossil yield and approximately 4 miles through areas with a very low potential fossil yield. The comparison portion of the Proposed Route would have a lower paleontology risk factor than Alternative 1E-B and pass through about one-half the miles of highly sensitive rock formations. Alternative 1E-C would have a lower risk factor than the comparison portion of Segment 1E, mostly due to the shorter distance. However, Alternative 1E-C would cross 1.3 miles more highly sensitive formations.

Segment 1W

Segment 1W is composed of two parts, Segment 1W(a) and 1W(c), both of which would consist of a new 230-kV line for part of their length and a reconstruction of an existing 230-kV line for the remaining part. Segment 1W(a) would be about 76.5 miles long, and would extend from the Windstar Substation to the Aeolus Substation. Segment 1W(c) would be about 70.6 miles long, and would extend from the Dave Johnson Power Plant to the Aeolus Substation. Alternative 1W-A is a 16.2-mile alternative located near the town of Glenrock, which was the Proponents' initial proposal before moving the Proposed Route at the suggestion of local landowners in order to avoid the more settled area around Glenrock. Twenty acres of the proposed expansion at the Windstar and Aeolus Substations are attributed to Segment 1W(a) and 3 acres of the expansion at the Difficulty Substation and 17 acres of the expansion at the Windstar and Aeolus Substations are attributed to Segment 1W(c). There are no Route Alternatives proposed south of that point (see Appendix A, Figure A-2).

The Segment 1W(a) Proposed Route would cross 20.6 miles of highly sensitive rock formations. Three separate lines in this area would pass through over 16.3 miles of the Wind River and White River Formations, which have very high potential fossil yield ratings. It has one alternative, Alternative 1W-A, which would be 4.1 miles shorter than the comparison portion of the Proposed Route 1W(a) and have a proportionately lower risk factor. Neither Alternative 1W-A nor the comparison portion of the Proposed Route would be located in highly sensitive formations. Proposed Route 1W(c) would cross 25.3 miles of highly sensitive formations.

Segment 2

Segment 2, as proposed, would link the Aeolus and Creston Substations in southeast Wyoming with two 500-kV circuits on one structure. One circuit would be operated at 230 kV during the initial phase of the Project. Its total proposed length is 96.7 miles. Fifty-two acres of the expansion of the Aeolus Substation and the construction of the Creston Substation and 0.5 acre for one regeneration site are attributed to Segment 2. There are three Route Alternatives, two of which are near the community of Fort Fred Steele. Alternative 2A at 28.4 miles long is being considered by the BLM because it remains in the WWE corridor nearer the town and the state historic site, and Alternative

2B, at 6.2 miles, is closer to the community than the comparison portion of the Proposed Route and was the initially proposed route before the Proponents responded to local suggestions and relocated the Proposed Route farther to the south. Alternative 2C is a 24.4-mile alternative located north of Hanna, Wyoming. It is being evaluated at the recommendation of the Wyoming Governor's office to follow a utility corridor approved by that office for minimizing effects to sage-grouse (see Appendix A, Figure A-3).

The Segment 2 Proposed Route would pass through approximately 42 miles of sediment with a very high potential fossil yield rating. The comparison portion of the Proposed Route for Alternative 2A would have a somewhat lower overall risk factor than Alternative 2A and cross 3.6 miles fewer of highly sensitive formations. The areas with high concentrations of known localities are in the Hanna and Ferris Formations, common to both routes. Alternative 2B would have a somewhat lower risk factor rating than the comparison portion of the Proposed Route but cross slightly more highly sensitive rock formations, including the Cretaceous Niobrara Formation, which, as shown in Table 3.13-1, has a very high potential for paleontological finds. Alternative 2C would be 4 miles shorter than the comparison portion of the Proposed Route. However, the miles of sensitive rock formations crossed would be similar and the paleontological risk factor would be only slightly lower, 108.4 to 121.1.

Segment 3

Segment 3, as proposed, would link the Creston and Anticline Substations in southeast Wyoming with two 500-kV circuits on one structure. One circuit would be operated at 230 kV during the initial phase of the Project. Its total proposed length between those two substations is 46.7 miles. Sixty-nine acres of the construction of the Anticline and Creston Substations are attributed to Segment 3. Segment 3 would also link the Anticline and Jim Bridger Substations with a 4.3-mile 230-kV line and a 5.5-mile 345-kV line and includes the 10-acre expansion of the Jim Bridger 345-kV Substation. There are no alternatives proposed along this segment (see Appendix A, Figure A-4).

Segment 3 would pass through approximately 28 miles of Eocene and Paleocene sediments that possess very high potential fossil yield ratings.

Segment 4

Segment 4, as proposed, would link the Anticline Substation near the Jim Bridger Power Plant in southwestern Wyoming with the Populus Substation in Idaho with two 500-kV circuits on one structure. Its total proposed length is 203 miles. Eighty-nine acres of the construction of the Anticline Substation and the expansion of the Populus Substation and 1.5 acres for three regeneration sites are attributed to Segment 4. It has six Route Alternatives in the middle portion of its route but the first 52 miles to the east and the last 61 miles to the west (in Idaho) do not have any Route Alternatives. The middle section of the Proposed Route is 90.2 miles long, and its Route Alternatives vary from 85 to 102 miles long. These alternatives were proposed by the Wyoming Governor's office (4A, paralleling the existing 345-kV lines throughout); by the BLM Kemmerer FO (4B through 4E, including edits from various cooperating agencies), with the intent to avoid impacts to cultural resources to the extent practical; and by the

Proponents (4F, attempting to avoid impacts to cultural resources while still remaining north of the existing lines) (see Appendix A, Figures A-5 and A-6).

The Segment 4 Proposed Route would cross approximately 100 miles of highly sensitive rock formations. Alternative 4A and the comparison portion of the Proposed Route for Alternatives 4B, 4C, 4D, and 4E would have lower risk factor scores than Alternatives 4B, 4C, 4D, and 4E and cross fewer miles of highly sensitive rock formations. Given that the paths of the Proposed Route and the five alternatives would pass through from 44 to 60 miles of very fossiliferous Eocene sediments, the potential exists to significantly impact paleontological resources. Alternative 4F would share the path of the Proposed Route for Segment 4 along the most sensitive portions of the bedrock path, and then cross less sensitive bedrock units until rejoining the Proposed Route. Farther west, no highly fossiliferous units would be crossed in Idaho.

Segment 5

Segment 5, as proposed, would link the Populus and Borah Substations with a 54.6-mile single-circuit 500-kV line. Forty-four acres of the expansion of the Populus and Borah Substations are attributed to Segment 5. There are five Route Alternatives including two proposed by the BLM to avoid the Deep Creek Mountains (5A and 5B; 8 miles and 19 miles longer than the comparison portion of the Proposed Route), one preferred by Power County that crosses the Fort Hall Indian Reservation (5C; 6 miles shorter than the comparison portion of the Proposed Route), one originally proposed by the Proponents (5D; 2 miles shorter than the comparison portion of the Proposed Route but located within more agricultural lands), and one proposed by Power County as an alternative approach to the Borah Substation (5E) (see Appendix A, Figure A-7).

The Segment 5 Proposed Route would cross 4.7 miles of sensitive rock formations. Of the five possible routes, Alternative 5B would have the highest risk factor score. This is due in part to the fact that it is the longest alternative. The comparison portion of the Proposed Route for Alternatives 5A and 5B is shorter and would have a lower score (80.1) than either Alternative 5A (107.6) or 5B (145.8). The comparison portion of the Proposed Route for Segment 5 for Alternative 5C would have a higher score (101.6) than Alternative 5C (84.6). The comparison portion of the Proposed Route for Alternative 5D would be similar in risk factor to the alternative route (52.9 vs. 61.9). Alternative 5E and the comparison portion of the Proposed Route would also have very similar risks. The Proposed and Alternative Routes would generally cross less than 10 miles of sensitive formations, except Alternative 5D, which would cross 10.0 miles. Overall, the Proposed Route in combination with Alternative 5A would yield the lowest risk factor rating and fewest miles in sensitive formations.

Segment 6

Segment 6 is an existing transmission line linking the Borah and Midpoint Substations; it is now operated at 345 kV but would be changed to operate at 500 kV. This segment has no Route Alternatives. Existing support structures would be used and impacts would be limited to within approximately one-quarter mile from each substation to allow for moving the entry point into the substation to the new 500-kV bay. Thirty-one acres of the expansion of the Borah and Midpoint Substations are attributed to Segment 6. Changes in the two substations would allow it to be operated at 500 kV (see Appendix

A, Figure A-8). The disturbance for Segment 6 is only 0.5 mile, none in sensitive rock formations.

Segment 7

Segment 7, as proposed, would link the Populus and Cedar Hill Substations with a 118.1-mile single-circuit 500-kV line. Forty-two acres of the expansion of the Populus and the construction of the Cedar Hill Substations and 1 acre for two regeneration sites are attributed to Segment 7. In addition to the Proposed Route, which is principally on private lands, Route Alternatives have been proposed by the BLM to avoid the Deep Creek Mountains (7A and 7B; which are 5 miles and 11 miles longer than the comparison portion of the Proposed Route), by local landowners (7C, 7D, 7E, 7F, and 7G, which all represent minor adjustments proposed to address local issues), by local landowners to avoid private agricultural lands (7I or the State Line Route, which is 55 miles longer than the Proposed Route and would require 0.5 acre for an additional regeneration site), and by the Proponents to avoid the State Line Route (7H, which is 10 miles longer than the Proposed Route). Alternative 7J, which is a variant of the State Line Route also proposed by local landowners, would not terminate at the Cedar Hill Substation. This alternative, referred to as the Rogerson Alternative, would require a different substation be constructed near a 345-kV existing transmission line (approximately 24 miles southwest of the Cedar Hill Substation; see Appendix A, Figure A-9). The tables and discussion in this document compare 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

The Segment 7 Proposed Route would cross 14.7 miles of sensitive rock formations. Alternative 7B is would be longer than Alternative 7A, which in turn would be longer than the comparison portion of the Proposed Route. Their risk factor scores (152.2, 120.3, and 108.4, respectively) show that the Segment 7 Proposed Route would have the lowest risk factor and cross the fewest miles of sensitive formations. Alternative 7C and the comparison portion of the Proposed Route would be of approximately equal length. Alternative 7C would have a higher risk factor rating (69.4 versus 61.3) and cross 7.6 miles more sensitive formations. Alternatives 7D, 7E, 7F, and 7G would be slightly longer than the comparison portions of the Proposed Route, and their risk factor scores would be also slightly higher. No sensitive rock formations would be crossed. Alternatives 7H and 7I would be both longer than the comparison portion of the Proposed Route. Alternative 7H would have a higher risk factor rating (409.5) than the comparison portion of the Proposed Route (366.1), but cross 1.1 mile less sensitive rock formations. Alternative 7I would have a risk factor of 561.0 and cross 21.0 miles of sensitive formations. Alternative 7J, the longest alternative, would have the highest risk factor (647.2); it would also cross 21.0 miles of sensitive formations, the same areas as in Alternative 7I.

From a paleontology perspective, the Segment 7 Proposed Route would be preferred over any of the Route Alternatives. The comparison portions of the Proposed Route have lower risk factor ratings than any of the Route Alternatives. The comparison portions of the Proposed Route either do not cross sensitive rock formations or cross less miles than all of the Route Alternatives except 7H.

Segment 8

Segment 8, as proposed, would link the Midpoint and Hemingway Substations. This 131-mile single-circuit 500-kV transmission line would stay north of the Snake River until crossing through the SRBOP parallel to an existing 500-kV transmission line before ending at the Hemingway Substation. Thirteen acres of the expansion of the Midpoint Substation and 0.5 acre for a regeneration site are attributed to Segment 8. There are five Route Alternatives: 8A, which follows the WWE corridor but crosses the Snake River and I-84 twice (while the Proposed Route would stay north of this area); 8B and 8C, which represent the old routes originally proposed by the Proponents but that have now been changed to avoid the cities of Kuna and Mayfield, respectively; 8D, which represents a small revision involving a rebuild of the existing transmission line to move both away from the National Guard Maneuver Area; and 8E, which was proposed by the BLM in order to avoid crossing the Halverson Bar non-motorized portion of the Guffey Butte-Black Butte Archaeological District (see Appendix A, Figure A-10).

The Segment 8 Proposed Route would cross 23.1 miles of sensitive rock formations. The Glenns Ferry Formation, the host rock for the fossils at Hagerman Fossil Beds National Monument, is present in the segment. The Yahoo Clay Formation, a late-Pleistocene lacustrine sedimentary formation deposited within Lake McKinney, a lake that developed when basalt temporarily dammed the Snake River near Bliss, Idaho, is also present in the Hagerman Valley (Janssen 2010). The Yahoo Clay does not appear on the BLM lists for paleontologically significant units. However, Malde (1982) reports the presence of mollusks (species are modern, but indicative of cooler, wetter climate) and pollen within the Yahoo Clay. The comparison portion of the Proposed Route is somewhat shorter and has a lower risk factor rating than Alternative 8A (139.5 vs. 152.5). In addition, Alternative 8A would pass within less than 1 mile from the northern boundary of Hagerman Fossil Beds National Monument. Alternative 8B would have a lower risk factor rating than the comparison portion of the Proposed Route (123.8 vs. 143.2). The Alternative 8C risk factor rating would be similar to the comparison portion of the Proposed Route (both between 19 and 20). Alternative 8D would be slightly longer than the comparison portion of the Proposed Route and have a higher risk factor rating (18.7 vs. 13.9). Alternative 8E would be over 11 miles longer than the comparison portion of the Proposed Route and have a higher risk factor (39.4 vs. 20). Sensitive rock formations would not be present in Alternative 8C. In summary, the Proposed Route would have less impacts to fossil resources than Alternatives 8A, 8D, and 8E. Alternatives 8B and 8C would possess lower risk factor ratings than the comparison portions of the Proposed Route.

Segment 9

Segment 9, as proposed, would link the Cedar Hill and Hemingway Substations with a 161.7-mile single-circuit 500-kV transmission line which skirts the Jarbidge and Owyhee Military Operating Areas to the north, then follows the WWE corridor just north of the Saylor Creek Air Force Range, passing through Owyhee County before entering into the Hemingway Substation. Fifteen acres of the construction of the Cedar Hill Substation and 1 acre for two regeneration sites are attributed to Segment 9. There are eight Route Alternatives proposed, including 9A, which was the Proponents' Proposed Route until moving to avoid the Hollister area; 9B, which is being considered by the BLM

because it follows the WWE corridor and parallels existing utility corridors; 9C, which was the Proponents' Proposed Route until moving to avoid the Castleford area; and 9D and 9E, proposed by the Owyhee County Task Force, that cross more public lands north and south of the Proposed Route, respectively, than the Proposed Route. Most of Alternative 9D would be within the SRBOP. Alternatives 9F, 9G, and 9H were proposed to avoid crossing the non-motorized area south of C.J. Strike Reservoir. Alternatives 9G and 9H provide an alternate route location south of Alternative 8E (see Appendix A, Figure A-11).

The Segment 9 Proposed Route would cross 38.7 miles of sensitive rock formations. The comparison portion of the Proposed Route would be essentially the same length as Alternative 9A, and their risk factor ratings would be the nearly the same. Neither would cross sensitive formations. Alternatives 9B, 9C, 9D, and 9E would largely follow existing transmission lines and utility corridors. The risk factor ratings for the comparison portions of the Proposed Route would be lower than for Alternatives 9B, 9C, and 9E. The risk factor rating for Alternative 9D would be lower than the comparison portion of the Proposed Route (163.7 vs. 207.6), while the rating for Alternative 9E is higher (231.6 vs. 207.6), respectively. Alternatives 9F, 9G, and 9H are of similar distance to the comparison portion of the Proposed Route, and all alternatives have a lower risk factor rating. Overall, the route with the lowest risk factor rating would be the Proposed Route in combination with Alternatives 9D, 9F, 9G, and 9H. Alternative 9B would also pass near the southern boundary of the Hagerman Fossil Beds National Monument and that makes it more likely to impact paleontological resources.

Segment 10

Segment 10, as proposed, would link the Cedar Hill and Midpoint Substations with a 33.6-mile single-circuit 500-kV line, following a WWE corridor for most of its distance. Twenty-eight acres of the expansion of the Midpoint Substation and of the construction of the Cedar Hill Substation are attributed to Segment 10. There are no Route Alternatives proposed along this segment (see Appendix A, Figure A-12).

Segment 10 has a low risk factor rating because of extensive basalt flows. Segment 10 would also avoid all sensitive rock formations.

3.13.2.4 Design Variation

A Design Variation is being considered that would consist of constructing two single-circuit lines in Segments 2 through 4 instead of a single double-circuit line (which is the design assessed above). The disturbance footprint of the two single-circuit towers is greater than that of the double-circuit tower, in part because the requested ROW would be wider, but also because helicopter-assisted construction could be implemented in these areas due to the lighter weight of the towers, which would require additional fly yards. The additional ROW space and the fly yards would cause additional temporary disturbance during construction. Across Segments 2, 3, and 4, the additional disturbance of the single-circuit tower alternative ranges from 25 to 30 percent greater than the comparable portions of the double-circuit tower disturbance under the proposed design. The two single circuits require more ground disturbance, but would be designed and constructed to the same standards as the Proposed Action.

Impacts on paleontological resources under the Design Variation would be proportionately greater due to larger structure construction footprints. The risk factor ratings would be the same as shown in the previous analysis.

3.13.2.5 Structure Variation

The proposed guyed Structure Variation would add four guy wires about 140 feet long from a point about 100 feet up in each tower to four guy anchors spaced in a square around the tower (Appendix B, Figure B-6). This would not change the amount of disturbance during construction or operation appreciably.

The use of guyed structures for part of the single-circuit 500-kV segments would not alter risk factor ratings by route segment or alternative.

3.13.2.6 Schedule Variation

The Schedule Variation uses the two single-circuit Design Variation described above but extends construction over a longer timeframe. Initially only one of the eventual two single-circuit lines would be constructed with the second to be constructed at a later date. The Schedule Variation proposes that the first single-circuit transmission line in Segments 2, 3, and 4 would be built as soon as a ROW grant is issued, but that the second line would not begin construction until late 2018. This would mean nearly 2 years between the end of construction for the first line and beginning of construction for the second line. Any staging areas and fly yards that had been used for the first stage would have been revegetated after construction was complete and would have to be cleared again. There would be two sets of construction disturbances adding movement, noise, and dust to the area of construction in two instances in any given area. A longer construction schedule would create no difference in impacts from those previously described.

3.13.3 Mitigation Measures

To minimize or avoid impacts on paleontological resources, the Proponents have committed to EPMs that would be implemented Project-wide as outlined in this section and in Appendix C.

The following mitigation measures identified by the Agencies are required on federally managed lands. The Agencies recommend that the Proponents incorporate the measures into their EPMs and apply them Project-wide.

PALEO-1 The Proponents shall prepare a Paleontological Monitoring Plan for the Project, focusing on Segments 4, 7, 8, and 9 where the potential for adverse impacts is the greatest. This plan shall be submitted to appropriate agencies for review and approval prior to commencing construction. The plan should specify that:

- Monitoring of excavation and grading in sensitive sediments, especially access roads and tower sites, must occur when construction is near or in those geologic formations.
- Monitoring of augering in sensitive sediments, screening the excavated spoils, and processing of bulk sediment samples for microvertebrate

fossils must occur where there is a significant potential for data recovery from those spoils.

- Monitoring must be performed by a qualified paleontologist and in consultation with a designated paleontologist in each state, NF, or BLM district. The Authorized Officer will designate appropriate paleontologist depending on project location.

PALEO-3 Areas with Fossil Potential Classification sensitivity rankings of 3, 4, or 5 on NFS lands will be surveyed and posted.

In addition, the following mitigation measure was proposed by the Agencies and has been adopted by the Proponents.

PALEO-2 Where fossil-bearing sediments are exposed by construction, the sediments must be covered with a minimum 4-inch layer of soil where feasible to reduce unauthorized removal or disturbance of resources.

3.14 GEOLOGIC HAZARDS

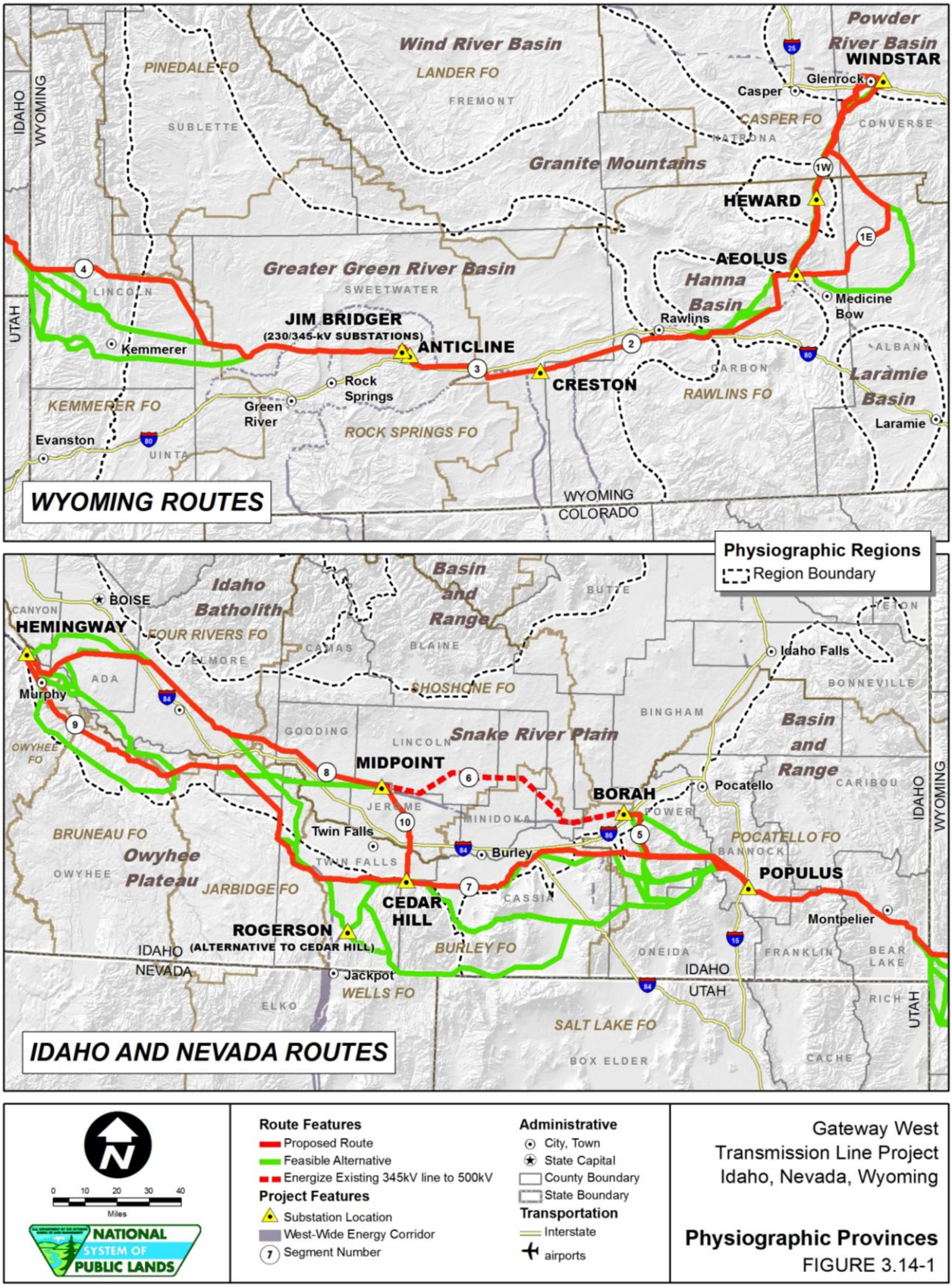
This section addresses potential impacts from geologic hazards on the Proposed Route and Route Alternatives during construction, operations, and decommissioning. The primary reason to define impacts from geologic hazards is to eliminate, minimize, or mitigate effects from these hazards during Project execution. This section analyzes the potential impacts from earthquakes, subsidence, landslides, and shallow bedrock on Project construction and operations. Impacts on minerals are discussed in Section 3.12 – Minerals, and impacts on soils are discussed in Section 3.15 – Soils.

3.14.1 Affected Environment

This section discusses those aspects of the environment that could be impacted by the Project. It starts with a discussion of the Analysis Area considered, identifies the issues that have driven the analysis, describes the method of analysis, and characterizes the existing conditions across the Project in Wyoming and Idaho.

3.14.1.1 Analysis Area

Figure 3.14-1 is a generalized map showing the location of prominent physiographic features along the Project alignment. The Project would be located on land consisting of predominantly north-south trending mountain ranges separated by geographic and structural basins. The eastern portion of the Project (Segments 1 and 2) would be located within the Laramie Mountains and the Shirley Mountains, which consist of pre-Cambrian-age granite and younger sedimentary rocks. Farther west, the geology is dominated by major structural basins, including the Hanna Basin in Carbon County (Segment 2) and the Greater Green River Basin in Sweetwater County (Segments 3 and 4). Mountainous terrain is present along the Idaho-Wyoming border in Segments 4 and 5. Thrust faulting dominated the mountain-building processes in the east portion of the mountains, while block faulting was more common farther west into southeast Idaho and northern Nevada. The mountain ranges consist of predominantly sedimentary or metamorphic rock. West of Borah Substation (Segments 6 through 10), the routes fall within the Snake River Plain, a broad structural valley, with extensive exposures of basalt, thinly covered with silty, mainly wind-blown soil. Some of the southern alternatives (Segments 7 and 9) remain within the basin and range mountain ranges similar to those in southeast Idaho, except with progressively more volcanism as one proceeds west. The nearest active volcanic field is the Wapi Lava Field, which erupted approximately 2,200 years ago. The Wapi Lava Field is within 650 feet of Segment 6, and approximately 8 miles northwest of Borah Substation. The Craters of the Moon Lava Field formed during eight eruptive periods with a recurrence interval averaging 2,000 years, and it has been more than 2,000 years since the last eruption. The Craters of the Moon Lava Field is approximately 29 miles from the Borah Substation and is within 4 miles of Segment 6. The Yellowstone volcano in northwest Wyoming is a caldera-type volcano, approximately 130 miles from the closest Route Alternative. It last erupted approximately 600,000 years ago but frequent hydrothermal activity and seismic events in this area suggest that the volcano could become active again. Neither is expected to affect the Project during its planned service life.


WYOMING ROUTES
Wind River Basin
LANDER FO
PINEDALE FO
FREMONT
SUBLETTE
Powder River Basin
WINDSTAR
Glenrock
Casper
CASPER FO
CONVERSE
NATRONA
Granite Mountains
HEWARD
AEOLUS
Hanna Basin
Medicine Bow
Rawlins
Greater Green River Basin
SWEETWATER
LINCOLN
JIM BRIDGER
(230/345-kV SUBSTATIONS)
ANTICLINE
CRESTON
Kemmerer
Rock Springs
Green River
KEMMERER FO
ROCK SPRINGS FO
RAWLINS FO
CARBON
ALBANY
Laramie Basin
Laramie
Evanston
UINTA
IDAHO
WYOMING
UTAH
WYOMING
COLORADO
Physiographic Regions
Region Boundary
IDAHO AND NEVADA ROUTES
Idaho Batholith
FOUR RIVERS FO
BOISE
HEMINGWAY
Murphy
ADA
CANYON
ELMORE
CAMAS
BLAINE
Basin and Range
BUTTE
Idaho Falls
BONNEVILLE
SHOSHONE FO
BINGHAM
GOODING
LINCOLN
Snake River Plain
MIDPOINT
BORAH
Pocatello
CARIBOU
Basin and Range
OWYHEE FO
BRUNEAU FO
Owyhee Plateau
OWYHEE
JERROME
MINIDOKA
POWER
Twin Falls
TWIN FALLS
Burley
POCATELLO FO
BANNOCK
POPULUS
JARBIDGE FO
CASSIA
CEDAR HILL
ROGERSON
(ALTERNATIVE TO CEDAR HILL)
Jackpot
BURLEY FO
WELLS FO
ELKO
IDAHO
NEVADA
ONEIDA
FRANKLIN
Montpelier
BEAR LAKE
IDAHO
UTAH
RICH
SALT LAKE FO
BOX ELDER
CACHE
Route Features
Proposed Route
Feasible Alternative
Energize Existing 345kV line to 500kV
Project Features
Substation Location
West-Wide Energy Corridor
Segment Number
Administrative
City, Town
State Capital
County Boundary
State Boundary
Transportation
Interstate
airports
0 10 20 30 40
Miles
NATIONAL SYSTEM OF PUBLIC LANDS
Gateway West
Transmission Line Project
Idaho, Nevada, Wyoming
Physiographic Provinces
FIGURE 3.14-1

The Analysis Area for geologic hazards (landslides, subsidence, and shallow bedrock) was defined in a GIS file by buffering the centerlines of the Proposed Route and Route Alternatives out 0.5 mile on either side and dissolving the buffers into a single polygon for each segment. This distance was used because it encompasses the potential geologic hazard area that could affect the stability of the transmission line relative to landslides, subsidence, and shallow bedrock, since each of those features is local in nature. The Analysis Area for earthquake hazard zones was based on the centerline locations for the Proposed Route and Route Alternatives, whereas the Analysis Area for earthquakes was defined by a variable buffer distance around epicenters, or groups of epicenters, of historical earthquakes and extended out to 100 miles for the most severe earthquakes. The distance of 100 miles was chosen because at that distance, the effect on the proposed transmission line from earthquakes would be minimal from even the strongest recorded past earthquakes in the area.

3.14.1.2 Issues to be Analyzed

This review of geologic hazards addressed public comments received during scoping (Tetra Tech 2009a) regarding the potential for impacts to the transmission line from mine subsidence. A detailed analysis of subsidence is presented herein. The following geologic hazard issues were carried through for detailed analysis:

- a full inventory of potentially affected geological resources;
- the potential for earthquakes to damage the transmission line and associated structures;
- the effect subsidence from underground mining would have on the transmission line, and what the hazard to workers or infrastructure would be;
- the effect landslides would have on the transmission line (segments that cross medium or high landslide risk areas are identified);
- the effect construction blasting in shallow bedrock would have on unstable landforms (landslide or subsidence-prone areas or coal-mining areas containing methane), or on adjacent human-made structures not related to the transmission line.

3.14.1.3 Regulatory Framework

The 2006 International Building Code (IBC) provides building standards for structures, including standards for structures located within seismically active areas. Local or state building codes may specify adherence to IBC standards. Management plans of the BLM and Forest Service also provide guidance relative to geologic hazards. The IBC will be used to design all structures considering seismic design criteria.

3.14.1.4 Methods

The environmental effects analyses completed for this assessment were conducted using readily available data and GIS files derived from preliminary centerline and component design for the Proposed Route and Route Alternatives including ROW, access roads, staging areas, and fly yards (see Section 3.1 for details on the development of these files). In all cases, after analysis of impacts was complete and

where impacts were identified, Proponent-proposed measures to reduce impacts were reviewed for sufficiency. Where those measures were determined to be insufficient, additional measures were identified.

Earthquakes

Earthquake hazards were evaluated using two methods, including use of Office of Pipeline Safety (OPS) data, and by reviewing the location and intensity of historic earthquakes within the analysis area. The Federal Emergency Management Agency (FEMA) and the U.S. Department of Transportation, OPS National Disaster Study, National Pipeline Risk Index Technical Report (OPS Study) (1996) was used to evaluate effects from earthquakes. The OPS data provide earthquake hazard rankings for the United States, including those portions of Idaho and Wyoming near the proposed transmission lines. The OPS report utilized information from the USGS National Earthquake Hazards Reduction Program. The USGS compiled a large database of past earthquake magnitudes and locations. Based on those data, earthquake hazards were assigned to all parts of the country. Based on historical earthquake magnitudes and locations, geographic areas were assigned an earthquake hazard ranking, ranging from zero (no earthquake hazard) to 100 (highest earthquake hazard). For this analysis, a high earthquake hazard was assigned for areas with earthquake hazard rankings of 85 to 100. Locations with earthquake hazard rankings between 70 and 84 were considered as medium risk, and rankings less than 70 were considered low risk.

To identify existing earthquake conditions, the centerlines of the Proposed Route and Route Alternatives in each segment were overlaid on the OPS GIS data file and the mileage crossed for each earthquake hazard risk was determined and expressed as a percent for the segment. To disclose overall hazard risk for impacts analysis, the mileage crossed by the entire Proposed Route by segment and for those portions of each segment where alternatives were proposed was identified. Miles of earthquake hazard category were then compared for each segment by alternative.

The locations of historical earthquake epicenters were also reviewed relative to the transmission line routes. Wyoming earthquake data were obtained from the University of Wyoming's Wyoming Geographic Information Science Center (http://uwyo.edu/wygisc/info). Earthquake data for Idaho, Colorado, Nevada, Oregon, and Utah were obtained from the applicable state geologic survey departments.

The damage to structures caused by earthquakes is highly variable and based on many features including, but not limited to, types of building materials and quality of construction, distance from epicenter, earthquake magnitude, and the susceptibility to ground shaking of underlying soil and rock at the site of the structure. Therefore, any relationship between structure damage and distance from earthquake epicenter is only an estimate. However, certain areas are subject to more earthquakes than others and the geographic distribution of earthquakes was considered.

Earthquake magnitude information obtained from University of Nevada, Reno (2008) estimated that earthquakes of Richter magnitude 6.0 to 6.9 may damage buildings for distances of up to 100 kilometers. For this analysis, a 50-mile radius buffer was assigned to earthquakes within these magnitudes. The University of Nevada, Reno (2008) information stated that for earthquakes of magnitude less than 6, some

structures could be damaged over small regions. For earthquakes of that magnitude, a buffer of 20 miles was assigned around each epicenter. University of Nevada, Reno (2008) described earthquakes of magnitude 7 or greater as having the potential for damage over larger areas. For these large earthquakes, a buffer of 100 miles was assigned. To identify the potential for structural damage, the centerlines of the Proposed Route and Route Alternatives in each segment were overlaid on the consolidated buffers derived from each epicenter, or group of epicenters, and the mileage crossed for each set of buffers was summed for each segment and expressed as a percent. To disclose overall risk of structure damage for impacts analysis, the mileage crossed by the entire Proposed Route by segment and for those portions of each segment where alternatives were proposed was identified. Miles of structure damage category were then compared for each segment by alternative.

Landslides

The OPS Study was used to evaluate effects from landslides. The OPS data provide landslide hazard rankings for the United States, including those portions of Idaho and Wyoming near the proposed transmission lines. The OPS report utilized information from USGS and U.S. Natural Resources Conservation Service (NRCS) for locations of swelling clay, landslide incidence, landslide susceptibility, and land subsidence. Based on those four factors, landslide hazard rankings were assigned from zero to 100, where zero represents the lowest ground failure hazard and 100 represents the highest. Landslide hazard rankings of 85 to 100 were assumed to have high risk of landslides, rankings between 70 and 84 were considered to have medium risk, and areas less than 70 were assumed to have low risk. To identify existing landslide potential, the Analysis Area within each segment was overlaid on the OPS data to identify the percent of the segment within each landslide risk category. To evaluate the possible interactions between areas of high landslide potential and the Project, the mileage crossed by the entire Proposed Route by segment and for those portions of each segment where alternatives were proposed was identified. Miles of landslide hazard category were then compared for each segment by alternative.

Subsidence

The locations of underground mineral deposits were obtained from Wyoming Geological Survey (http://www.wsgs.uwyo.edu/GIS/DigitalData). WDEQ also provided the known locations of historic abandoned underground mine sites. It is well-documented that some areas overlying underground mines in southern Wyoming have experienced subsidence. As a conservative measure, it was assumed that any area with underground mineral deposits of coal, trona, or oil and gas and any area with abandoned underground mines had the potential for subsidence.

To identify existing subsidence potential, the Analysis Area within each segment was overlaid on the Wyoming geological survey and WDEQ data to identify the percent of the segment within identified subsidence-prone areas. To evaluate the possible interactions between subsidence-prone areas and the Project, the mileage crossed by the entire Proposed Route by segment and for those portions of each segment where alternatives were proposed was identified. Miles of subsidence-prone areas were then compared for each segment by alternative.

Blasting in Shallow Bedrock

The NRCS State Soil Geographic (STATSGO) database was used to evaluate depth to shallow bedrock (NRCS 1995). The database separates the depth to bedrock into categories, including depths of 1 to 4 feet, 4 to 8 feet, and 8 to 12 feet. No readily available data were found to evaluate depth to bedrock at depths greater than 12 feet. However, Table B-2 in Appendix B indicates that the majority of transmission tower foundations are 20 feet or less, but a few double-circuit 500-kV towers (angle towers or dead-ends) may have foundations ranging from 20 to 30 feet deep. In 2010, drilling began in some areas of Segments 1 through 4 to support geotechnical evaluations for transmission line structures. The drilling was conducted on public land and private land where landowner permission was obtained. As a conservative measure, it was assumed that all shallow bedrock that would need to be removed would require blasting.

To evaluate existing shallow bedrock areas, the Analysis Area within each segment was overlaid on the STATSGO database to identify the percent of the segment containing shallow bedrock. To evaluate the possible interactions between shallow bedrock, including the need for blasting, and the Project, the mileage crossed by the entire Proposed Route by segment and for those portions or each segment where alternatives were proposed was identified. Miles of route crossing shallow bedrock areas were then compared for each segment by alternative.

A comment was received that methane could accumulate in shallow voids in the subsurface, including monitoring wells. This methane, if present in a blasting area, could cause unintended explosions. The locations of current coal leases, presented in Section 3.12 – Minerals, were compared to the Proposed Route and Route Alternatives. Information from WDEQ, Abandoned Mine Lands Division, was also reviewed to assess the location of historic coal mines and those locations were compared to the Proposed Route and Route Alternatives. Similarly, blasting could cause subsidence in unstable areas.

To evaluate the risks of subsidence or contact with methane in shallow blasting areas, the Analysis Area within each segment was overlaid on the STATSGO database to identify the percent of the segment containing shallow bedrock, merged with subsidence areas, then merged again with coal-producing areas. To evaluate the possible interactions between blasting, subsidence, and methane potential, the route mileages for intersected areas (bedrock vs. subsidence, and bedrock vs. coal) were then compared for each segment by alternative.

Depth to Bedrock Confirmation from Geotechnical Boreholes

In 2010, drilling began in some areas to support geotechnical evaluations for transmission line structures. The drilling was conducted on public land and private land where landowner permission was obtained. As of the date of this EIS, available information includes a total of 124 boreholes that were advanced along Segments 1 through 4. Total depths drilled ranged from 15 feet to 66.5 feet. Drilling logs were reviewed to evaluate depth to bedrock. Shallow bedrock (less than 20 feet deep) was found in 11 of the boreholes. The locations of these boreholes were compared to the

locations where STATSGO information indicated shallow bedrock. Where differences were found between the two information sources, it is noted in the text below.

3.14.1.5 Existing Conditions

Geologic processes within the Project area, including earthquakes, landslides, and subsidence, could occur during the life of the Project. Existing conditions that could lead to geologic hazards affecting the transmission lines and associated facilities such as substations access roads or communication facilities are described below. In addition, shallow depth to bedrock could require blasting. The resulting damage may result in adverse environmental effects.

Earthquakes

The Proposed Route and Route Alternatives across Wyoming and Idaho would be located in areas where earthquakes could occur. A summary of earthquakes that have occurred within the past 100 years, as well as an earthquake risk database, were reviewed in assessing the potential effects from earthquakes. Based on the data provided, earthquakes are most common in a north-south trending area along the Idaho-Wyoming border. Figure 3.14-2 shows the locations of earthquake epicenters, including Quaternary faults crossing the transmission lines, and corresponding buffer zones. The largest historical earthquakes have been in the Yellowstone area of northwest Wyoming, and in south and central Idaho. However, the frequency of earthquakes appears less in Idaho than in Wyoming. The data indicate that historical earthquakes have likely been felt in all of the segments.

Table 3.14-1 presents the percent of low, medium, and high earthquake risk within the Analysis Area by segment. Table 3.14-2 presents the Analysis Area within the buffers assumed for recent earthquake epicenters by segment. Parts of Segments 4, 5, 6, and 7 contain medium to high risks of earthquakes. Portions of Segments 5, 6, 7, 8, 9, and 10 have experienced an earthquake of greater than magnitude 7.

Table 3.14-1. OPS Earthquake Hazard Risk by Segment

Segment Number	Earthquake Zone Rank by Percent of Analysis Area		
	Low < 70	**Medium 70 to 84**	**High 85 to 100**
1	100	–	–
2	100	–	–
3	100	–	–
4	38	14	48
5	–	12	88
6	49	51	–
7	35	28	37
8	100	–	–
9	100	–	–
10	100	–	–

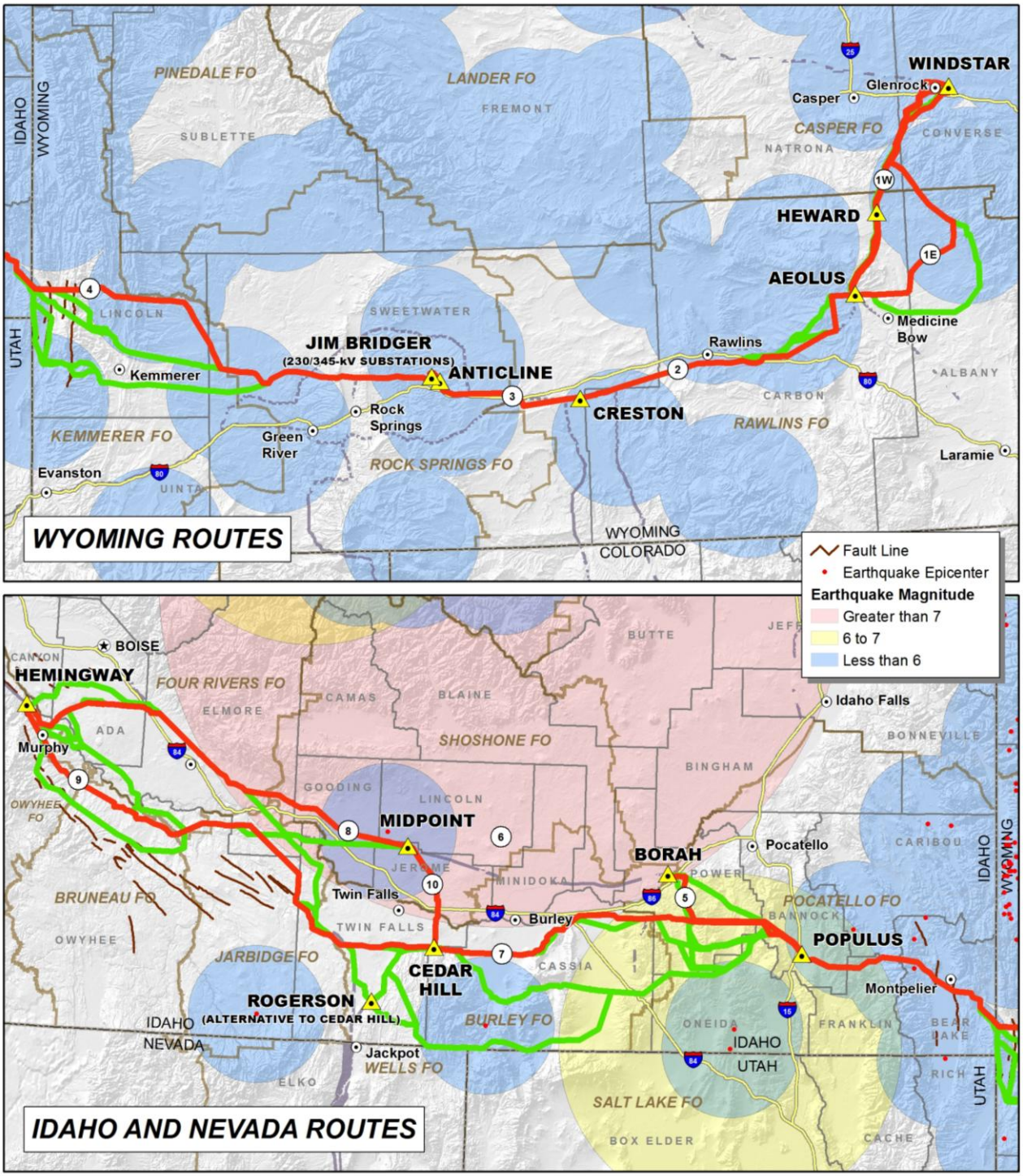

WYOMING ROUTES
PINEDALE FO
LANDER FO
FREMONT
SUBLETTE
IDAHO
WYOMING
UTAH
WINDSTAR
Glenrock
Casper
CASPER FO
NATRONA
CONVERSE
HEWARD
AEOLUS
Medicine Bow
LINCOLN
SWEETWATER
JIM BRIDGER
(230/345-kV SUBSTATIONS)
ANTICLINE
Kemmerer
Rock Springs
Green River
CRESTON
Rawlins
CARBON
RAWLINS FO
ALBANY
Laramie
KEMMERER FO
ROCK SPRINGS FO
Evanston
UINTA
WYOMING
COLORADO
Fault Line
Earthquake Epicenter
Earthquake Magnitude
Greater than 7
6 to 7
Less than 6
IDAHO AND NEVADA ROUTES
BOISE
CANYON
HEMINGWAY
FOUR RIVERS FO
ELMORE
CAMAS
BLAINE
BUTTE
Idaho Falls
ADA
Murphy
SHOSHONE FO
BONNEVILLE
BINGHAM
GOODING
LINCOLN
OWYHEE FO
MIDPOINT
BORAH
Pocatello
CARIBOU
JEROME
MINIDOKA
POWER
BRUNEAU FO
Twin Falls
Burley
POCATELLO FO
BANNOCK
TWIN FALLS
OWYHEE
POPULUS
JARBIDGE FO
CEDAR HILL
CASSIA
Montpelier
ROGERSON
(ALTERNATIVE TO CEDAR HILL)
BURLEY FO
ONEIDA
FRANKLIN
BEAR LAKE
IDAHO
NEVADA
Jackpot
WELLS FO
ELKO
RICH
SALT LAKE FO
BOX ELDER
CACHE
0 10 20 30 40
Miles
NATIONAL SYSTEM OF PUBLIC LANDS
Route Features
Proposed Route
Feasible Alternative
Energize Existing 345kV line to 500kV
Project Features
Substation Location
West-Wide Energy Corridor
Segment Number
Administrative
City, Town
State Capital
County Boundary
State Boundary
Transportation
Interstate
airports
Gateway West
Transmission Line Project
Idaho, Nevada, Wyoming
Earthquake Epicenters
FIGURE 3.14-2

Table 3.14-2. Earthquake Magnitude Buffers by Segment

Segment Number	Earthquake Buffer Zone by Percent of Analysis Area		
	Magnitude 0.1 to 6	Magnitude 6.0 to 6.9	Magnitude >7
1	69	–	–
2	95	–	–
3	72	–	–
4	80	6	–
5	11	93	4[1/]
6	49	–	100
7	24	47	1
8	21	–	47
9	–	–	6
10	42	–	76

1/ Some areas are in more than one earthquake magnitude zone; therefore, total percentage can exceed 100.

Landslides

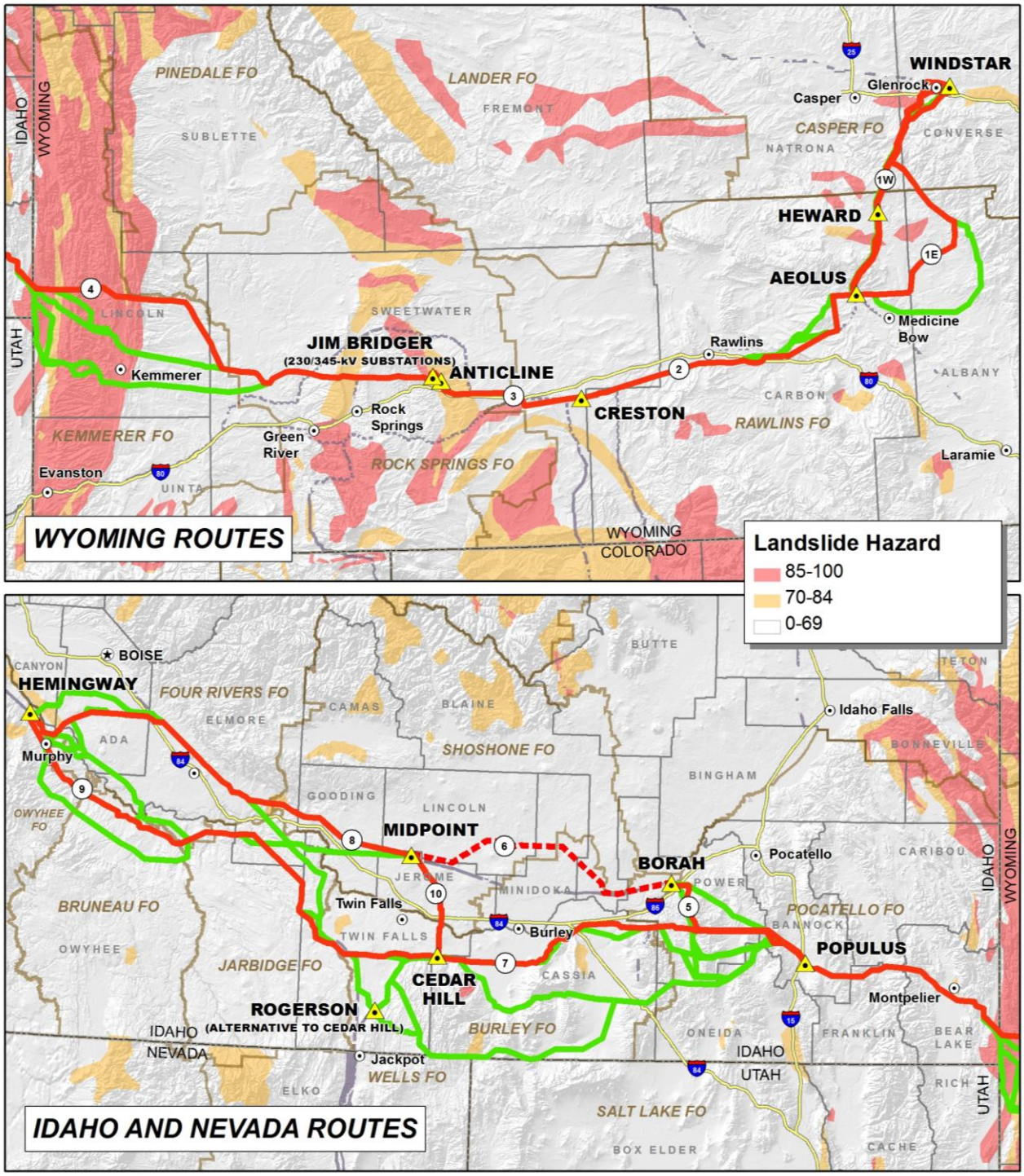
Landslides, including mudflows, mudslides, rock flows, rock slides, and debris flows could occur in mountainous portions of the Project area. Landslides are often triggered by other natural events, including earthquakes, or precipitation sufficient to cause earth movements. Certain geologic formations such as the Green River Formation are known to be more susceptible to landslides than others (Aase 2008). Table 3.14-3 presents the percent of low, medium, and high landslide risk within the Analysis Area by segment. The greatest landslide risks are in Segment 4, where 45 percent of the routes cross areas of medium to high landslide risks. Segment 3 contains medium landslide risk to 37 percent of the route (see Figure 3.14-3). Small portions (less than 5 percent) of medium or high landslide risk are also present in Segments 1, 7, and 8.

Table 3.14-3. OPS Landslide Risk by Segment

Segment Number	Landslide Hazard Rankings by Percent of Analysis Area		
	0 to 69	70 to 84	85 to 100
1	97	–	3
2	100	–	–
3	63	37	<1
4	55	10	35
5	100	–	–
6	100	–	–
7	99	1	–
8	96	4	–
9	100	–	–
10	100	–	–

Subsidence

Subsidence is the vertical sinking of earth, typically because of a natural or man-made void in underlying rock formations. Geologic areas with extensive limestone caves or large natural voids in basalt flows possess the potential for natural subsidence; however, there are no large areas of cavernous limestone or natural voids in the area crossed by the Proposed Route and Alternatives. Man-caused subsidence occurs in areas overlying extensive underground mine workings or in areas of aquifer drawdown


WYOMING ROUTES
PINEDALE FO
LANDER FO
FREMONT
SUBLETTE
IDAHO
WYOMING
UTAH
WINDSTAR
Glenrock
Casper
CASPER FO
NATRONA
CONVERSE
HEWARD
AEOLUS
Medicine Bow
Rawlins
ALBANY
CARBON
RAWLINS FO
LINCOLN
SWEETWATER
JIM BRIDGER
(230/345-kV SUBSTATIONS)
ANTICLINE
CRESTON
Kemmerer
Rock Springs
Green River
KEMMERER FO
ROCK SPRINGS FO
Evanston
UINTA
Laramie
WYOMING
COLORADO
Landslide Hazard
85-100
70-84
0-69
IDAHO AND NEVADA ROUTES
BOISE
CANYON
HEMINGWAY
FOUR RIVERS FO
ELMORE
ADA
Murphy
OWYHEE FO
BRUNEAU FO
OWYHEE
CAMAS
BLAINE
BUTTE
SHOSHONE FO
GOODING
LINCOLN
MIDPOINT
JEROME
MINIDOKA
Twin Falls
TWIN FALLS
Burley
JARBIDGE FO
CEDAR HILL
CASSIA
ROGERSON
(ALTERNATIVE TO CEDAR HILL)
BURLEY FO
IDAHO
NEVADA
Jackpot
WELLS FO
ELKO
BORAH
POWER
Pocatello
BINGHAM
Idaho Falls
TETON
BONNEVILLE
CARIBOU
POCATELLO FO
BANNOCK
POPULUS
Montpelier
ONEIDA
FRANKLIN
BEAR LAKE
IDAHO
UTAH
RICH
SALT LAKE FO
BOX ELDER
CACHE
0 10 20 30 40
Miles
NATIONAL SYSTEM OF PUBLIC LANDS
Route Features
Proposed Route
Feasible Alternative
Energize Existing 345kV line to 500kV
Project Features
Substation Location
West-Wide Energy Corridor
Segment Number
Administrative
City, Town
State Capital
County Boundary
State Boundary
Transportation
Interstate
airports
Gateway West
Transmission Line Project
Idaho, Nevada, Wyoming
Landslide Zones
FIGURE 3.14-3

or removal of other fluids, such as natural gas or crude oil. Underground trona and coal mines are particularly susceptible to subsidence because of their large extent. The subsidence potential analyzed in this assessment is associated with current and historic underground mine workings in southern Wyoming. Figures 3.12-1 through 3.12-4 show the locations of trona, oil and gas, coal, and uranium leases in Wyoming.

Table 3.14-4 presents the percent of the Analysis Area within each segment where subsidence could occur, based on the presence of mineral leases. Mineral extractions that could result in subsidence only occur in Segments 1 through 4. A total of 22 percent of the Analysis Area in these four segments is located in areas of possible subsidence.

Table 3.14-4. Potential Subsidence Areas by Segment

Segment Number	Mineral Lease Area as a Percent of Analysis Area				
	Coal	Oil and Gas	Trona	Abandoned Mines	Total Percent of Analysis Area
1	–	3	–	1	4
2	1	28	–	9	38
3	3	39	–	–	42
4	< 1	20	1	1	22

Shallow Bedrock

Table 3.14-5 presents the percent of the extent of shallow bedrock within the Analysis Area by segment. The STATSGO data indicate that shallow bedrock is found in all segments of the Project except Segment 2. As of the date of this EIS, a total of 124 boreholes have been advanced in Segments 1 through 4. Total depths drilled ranged from 15 feet to 66.5 feet. The drilling data indicate that 11 borings contained bedrock at depths less than 20 feet including one of the geotechnical borings in Segment 2, intercepted bedrock at a depth of 15 feet. Therefore, it is assumed that shallow bedrock could be encountered in any of the segments. The drilling data will be used by project engineers to identify additional areas containing shallow bedrock that may require blasting. Due to the lack of depth-to-bedrock data deeper than 12 feet, the amount of shallow bedrock presented in Table 3.14-5 and Table B-9, Appendix B likely underestimates the amount of shallow bedrock that will be intercepted during construction.

Table 3.14-5. Areas of Shallow Bedrock by Segment

Segment Number	Depth to Bedrock (feet) by Percent of Analysis Area			
	1 to 4	4 to 8	8 to 12	Total Percent of Analysis Area
1	10	14	11	35
2	–	–	–	–
3	67	6	–	73
4	38	1	2	41
5	8	24	–	32
6	47	29	–	76
7	12	19	17	48
8	16	51	14	81
9	24	39	15	78
10	21	2	2	25

3.14.2 Direct and Indirect Effects

This section is organized to present effects from geologic hazards on construction, then operations, followed by decommissioning activities for the proposed Project. Route Alternatives are analyzed in detail below in Section 3.14.2.3. There is a Design Variation involving use of two single-circuit structures proposed by the Proponents for Segments 2, 3, and 4 (see Section 2.2 for details), which is analyzed below in Section 3.14.2.4, and a Structure Variation that is analyzed in Section 3.14.2.5. The Proponents have also proposed a Schedule Variation, analyzed in Section 3.14.2.6, in which one of the two single circuits to be constructed in Segments 2, 3, and 4 and a portion of Segment 1W would be built on an extended schedule with construction beginning approximately 2.5 years after completion of the initial construction.

Mitigation measures or EPMs are presented in detail within this section only if it is the first time they have been discussed in Chapter 3; all other measures are referenced or summarized. A comprehensive list of all Proponent-proposed EPMs and Agency-required mitigation measures can be found in Table 2.7-1 of Chapter 2.

Plan Amendments

Proposed amendments are summarized in Table 2.2-1 of Chapter 2 and detailed in Appendices F and G. Amendments are needed to permit the Project to cross various areas of BLM-managed and NFS lands. Effects described for areas requiring an amendment in order for the Project to be built would only occur if the amendment were approved. Amendments that alter land management designations could change future use of these areas. No amendments specific to geologic hazards are proposed for the Project and no impacts to geologic hazards resulting from approving the amendments beyond the impacts of the Project are anticipated.

3.14.2.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be constructed or operated. No Project-related impacts due to geologic hazards would occur.

3.14.2.2 Effects Common to All Action Alternatives

Construction

Transmission lines and associated facilities could be negatively affected by geologic hazards, including earthquakes, landslides, subsidence, and blast vibrations in shallow bedrock. Earthquakes could occur in any segment of the Project. Project construction, operations, or decommissioning would have no effect on earthquake risks. However, ground shaking and displacement related to earthquakes may damage human-made structures, including transmission lines and substations. The risk interval from geologic hazards during construction is approximately 2 years.

Natural events, such as earthquakes, or excessive rain or snow fall, can trigger landslides that could damage transmission lines and associated structures. The potential for landslides is slope dependent, with steep slopes containing greater landslide potential than shallow slopes. Construction activities can result in human-caused landslides in landslide-prone areas. Removal of soil at the base of an unstable slope can decrease slope stability and result in a landslide. Excavation and/or blasting

in geological hazard areas at substations, transmission tower sites, or during road building could destabilize slopes, resulting in landslides, soil erosion, and stream sedimentation. Midslope road construction, concentration of drainage water on unstable ground, and removal of vegetation during construction can trigger landslides (CDC 2003).

To minimize failures due to landslides, the Agencies have identified the following mitigation measure:

GEO-1 A site-specific landslide mitigation plan that addresses measures to be taken in the design, construction, and operation to minimize failure due to landslides must be prepared and submitted by the Proponents with the construction POD prior to issuance of a ROW grant on federally managed lands.

The Wyoming Department of Homeland Security in their Multi-Hazard Mitigation Plan (2008) indicates that significant mine subsidence problems have occurred in all of the southern Wyoming counties, including those containing Segments 1 through 4. They estimate that mine subsidence has resulted in approximately $85 million in damage. Therefore, the assessment assumed that areas containing trona and coal leases may be prone to mine subsidence. Subsidence is also known to occur over areas with extensive oil and gas extraction. The construction interval for subsidence effects would be approximately 2 years.

To minimize impacts due to subsidence, the following mitigation measure has been proposed by the Agencies and adopted by the Proponents:

GEO-2 Review the final location of the preferred alternative with affected mine operators and lessees to ensure all measures are taken to protect against subsidence.

Foundations for transmission line towers can be as deep as 20 feet below ground surface. Construction in areas of shallow bedrock may require blasting. The vibrations generated by blasting can also result in slope instability, damage to nearby structures, damage to water wells, and disturbance to wildlife. Ground shaking from blasting could result in subsidence or landslides in unstable areas. Voids within bedrock in coal-producing areas of Segments 1 through 4 could contain methane; the location of coal-producing areas is described in Section 3.12 – Minerals. Blasting in areas containing methane could result in dangerous explosions. Blasting may also impact undiscovered cultural or paleontological resources. Paleontological effects are discussed in Section 3.13 – Paleontological Resources.

Table 3.14-6 presents the percent of the Analysis Area by segment where blasting of shallow bedrock may increase the potential for landslides, subsidence, or contact with methane.

Table 3.14-6. Risks from Blasting by Segment

Segment Number	Risks from Blasting (by Hazard) by Percent of Analysis Area			
	Blasting / Landslides[1/]	Blasting / Subsidence	Blasting / Coal Mines	Total Percent Area of Blasting Hazards
1	–	<1	–	<1
2	–	–	–	–
3	24	28	1	43[2/]
4	29	12	<1	32
5	–	–	–	–
6	–	–	–	–
7	1	–	–	1
8	1	–	–	1
9	–	–	–	–
10	–	–	–	–

1/ Represents medium to high landslide risks, as shown on Table 3.14-3.
2/ Some blasting area categories overlap. Therefore, total blasting hazard area can be less than the sum of the categories.

The Proponents would comply with all state and federal regulations regarding blasting. A Blasting Plan would be developed and used during construction. The Proponents have committed to implementing the following EPMs:

BLA-1 The Blasting Plan will identify blasting procedures including safety, use, storage, and transportation of explosives that will be employed where blasting is needed, and will specify the locations of needed blasting.

BLA-2 All blasting will be performed by registered licensed blasters who will be required to secure all necessary permits and comply with regulatory requirements in connection with the transportation, storage, and use of explosives, and blast vibration limits for nearby structures, utilities, wildlife, and fish (where blasting is conducted in waterbodies).

Operations

There is more risk from natural geologic hazards during operations than during construction of the Project because of the longer time interval for operation. The risk varies proportionally to the length of time of construction (2 years) versus the operational life of the Project (50 years). Ground shaking and displacement related to earthquakes may damage human-made structures, including transmission lines and substations, which could result in interruption of power and/or environmental consequences. Naturally occurring landslides could occur in areas of instability. However, the risks of Project-related landslides would be less than those during construction because Project areas disturbed during construction would be stabilized. The risk from subsidence would occur over a longer period during operations than during construction. The 50-year operations interval could also result in additional mining that could render more areas subject to subsidence risks. Blasting is not anticipated during the operations phase of the Project and therefore would have no effects during that phase.

Decommissioning

The decommissioning time interval for risks from natural geologic hazards (earthquakes, landslide, subsidence) is similar to the construction interval, about 2 years. Decommissioning would involve some ground disturbance, including vegetation removal, which could result in temporary increased risks for landslides on unstable slopes. No blasting is anticipated during Project decommissioning.

Summary

In summary, all phases of the Project would be subject to the effects of naturally occurring geologic hazards, such as earthquakes, landslides, and subsidence. The greatest risk from Project-caused geologic hazards would occur during construction. Construction activities could cause slope instability such as landslides and damage to structures. Blasting in areas of shallow bedrock could cause landslide or subsidence in unstable areas, damage to structures including water wells, and disturbance of wildlife. The Proponents would account for the risks of damage from earthquakes by designing and constructing transmission structures to withstand seismic forces and also wind/ice combination loads, which are considered more stringent than the loads induced due to ground motion.

The Proponents are committed to conducting all construction activities in accordance with the EPMs presented in Appendix C. The EPMs include mitigation measures for traffic and transportation management; reclamation, revegetation, and weed management; stormwater pollution prevention; spill prevention; cultural and paleontological mitigation; and blasting.

3.14.2.3 Proposed Route and Alternatives by Segment

This section evaluates the Proposed Action and the differences between the Proposed Route and Route Alternatives for hazards associated with earthquakes, landslides, subsidence, and blasting of shallow bedrock.

Table 3.14-7 is a summary table showing where geological hazard effects are present along the Proposed Route and Route Alternatives. The effects by segment are presented in the following paragraph. Tables D.14-1 through D.14-7 in Appendix D show the presence of geologic hazard conditions for the Proposed Route as well as a comparison between Route Alternative and the comparison portion of the Proposed Route for miles crossed.

Segment 1E

Segment 1E, as proposed, would link the Windstar and Aeolus Substations in south-central Wyoming with a 100.6-mile 230-kV single-circuit transmission line. Twenty acres of the expansion of Windstar and Aeolus Substations and 0.5 acre for one regeneration site are attributed to Segment 1E. Alternative 1E-A is a 16.1-mile alternative along the north end of Segment 1E, which was the Proponents' initial proposal before moving the Proposed Route at the suggestion of local landowners to avoid the more settled area around Glenrock. Alternative 1E-B is 21.4 miles longer than the Proposed Route but is being considered by the Proponents because it would avoid a Wyoming-designated sage-grouse core area to the east. The BLM has required the consideration of Alternative 1E-C, which parallels Segment 1W 230-kV lines into the Aeolus Substation (see Appendix A, Figure A-2).

Table 3.14-7. Summary of Potential Geologic Hazards in Proposed Routes and Alternatives

Segment Number	Route	Total Route Miles	Geologic Hazards				
			Earthquake Hazard[1/]	Earthquake Buffer[2/]	Landslide Hazard	Subsidence	Shallow Bedrock
1E	Proposed – Total Length	100.6				Yes	Yes
	Proposed – Comparison Portion for Alternative 1E-A	17.6				Yes	Yes
	Alternative 1E-A	16.1				Yes	Yes
	Proposed – Comparison Portion for Alternative 1E-B	37.9				Yes	Yes
	Alternative 1E-B	59.3				Yes	Yes
	Proposed – Comparison Portion for Alternative 1E-C	75.4				Yes	Yes
	Alternative 1E-C	48.7			Yes	Yes	Yes
1W(a)	Proposed – Total Length	76.5			Yes	Yes	Yes
	Proposed – Comparison Portion for Alternative 1W-A	20.3				Yes	Yes
	Alternative 1W-A	16.2				Yes	Yes
1W(c)	Proposed – Total Length	70.6			Yes	Yes	Yes
2	Proposed – Total Length	96.7				Yes	
	Proposed – Comparison Portion for Alternative 2A	28.8				Yes	
	Alternative 2A	28.4				Yes	
	Proposed – Comparison Portion for Alternative 2B	7.0				Yes	
	Alternative 2B	6.2				Yes	
	Proposed – Comparison Portion for Alternative 2C	28.4				Yes	
	Alternative 2C	24.4				Yes	
3	Proposed – Total Length	56.4			Yes	Yes	Yes
4	Proposed – Total Length	203.0	Yes	Yes	Yes	Yes	Yes
	Proposed – Comparison Portion for Alternatives 4A,B,C,D,E,F	90.2	Yes	Yes	Yes	Yes	Yes
	Alternative 4A	85.2	Yes	Yes	Yes	Yes	Yes
	Alternative 4B	100.2	Yes	Yes	Yes	Yes	Yes
	Alternative 4C	101.6	Yes	Yes	Yes	Yes	Yes
	Alternative 4D	100.8	Yes	Yes	Yes	Yes	Yes
	Alternative 4E	102.2	Yes	Yes	Yes	Yes	Yes
	Alternative 4F	87.5	Yes	Yes	Yes	Yes	Yes
5	Proposed – Total Length	54.6	Yes	Yes			Yes
	Proposed – Comparison Portion for Alternatives 5A,B	25.3	Yes	Yes			Yes
	Alternative 5A	33.7	Yes	Yes			Yes

Table 3.14-7. Summary of Potential Geologic Hazards in Proposed Routes and Alternatives (continued)

Segment Number	Route	Total Route Miles	Geologic Hazards				
			Earthquake Hazard[1/]	Earthquake Buffer[2/]	Landslide Hazard	Subsidence	Shallow Bedrock
5 (cont.)	Alternative 5B	44.4	Yes	Yes			Yes
	Proposed – Comparison Portion for Alternative 5C	33.2	Yes	Yes			Yes
	Alternative 5C	26.1	Yes	Yes			Yes
	Proposed – Comparison Portion for Alternative 5D	19.4	Yes	Yes			Yes
	Alternative 5D	17.5	Yes	Yes			Yes
	Proposed – Comparison Portion for Alternative 5E	5.8	Yes	Yes			
	Alternative 5E	5.3	Yes	Yes			
6	Proposed – Total Length	0.5	Yes	Yes			
7	Proposed – Total Length	118.1	Yes	Yes			Yes
	Proposed – Comparison Portion for Alternatives 7A, B	35.2	Yes	Yes			Yes
	Alternative 7A	38.0	Yes	Yes			Yes
	Alternative 7B	46.4	Yes	Yes			Yes
	Proposed – Comparison Portion for Alternative 7C	20.1	Yes	Yes			Yes
	Alternative 7C	20.3	Yes	Yes			Yes
	Proposed – Comparison Portion for Alternative 7D	6.2	Yes				Yes
	Alternative 7D	6.8	Yes				Yes
	Proposed – Comparison Portion for Alternative 7E	3.8					Yes
	Alternative 7E	4.5					Yes
	Proposed – Comparison Portion for Alternative 7F	10.5					Yes
	Alternative 7F	10.8	Yes				Yes
	Proposed – Comparison Portion for Alternative 7G	3.1					Yes
	Alternative 7G	3.2					Yes
	Proposed – Comparison Portion for Alternative 7H and 7I	118.1	Yes	Yes			Yes
	Alternative 7H	127.5	Yes	Yes			Yes
	Alternative 7I	173.4	Yes	Yes	Yes		Yes
	Proposed – Comparison Portion 7/9 for Alternative 7J[3/]	143.9	Yes	Yes			Yes
	Alternative 7J[3/]	202.1	Yes	Yes	Yes		Yes

Table 3.14-7. Summary of Potential Geologic Hazards in Proposed Routes and Alternatives (continued)

Segment Number	Route	Total Route Miles	Geologic Hazards				
			Earthquake Hazard[1/]	Earthquake Buffer[2/]	Landslide Hazard	Subsidence	Shallow Bedrock
8	Proposed – Total Length	131.0	Yes	Yes	Yes		Yes
	Proposed – Comparison Portion for Alternative 8A	51.4		Yes	Yes		Yes
	Alternative 8A	53.6		Yes			Yes
	Proposed – Comparison Portion for Alternative 8B	45.3			Yes		Yes
	Alternative 8B	45.8			Yes		Yes
	Proposed – Comparison Portion for Alternative 8C	6.5					Yes
	Alternative 8C	6.4					Yes
	Proposed – Comparison Portion for Alternative 8D	6.9					Yes
	Alternative 8D	8.1					Yes
	Proposed – Comparison Portion for Alternative 8E	7.0	Yes	Yes	Yes		Yes
	Alternative 8E	18.5	Yes	Yes			Yes
9	Proposed – Total Length	161.7					Yes
	Proposed – Comparison Portion for Alternative 9A	7.8					Yes
	Alternative 9A	7.7					Yes
	Proposed – Comparison Portion for Alternative 9B	49.5					Yes
	Alternative 9B	53.2		Yes			Yes
	Proposed – Comparison Portion for Alternative 9C	14.7					Yes
	Alternative 9C	15.3					Yes
	Proposed – Comparison Portion for Alternatives 9D, 9E, 9F, 9G, and 9H	57.2					Yes
	Alternative 9D	58.4					Yes
	Alternative 9E	68.7					Yes
	Alternative 9F	62.9					Yes
	Alternative 9G	56.4					Yes
	Alternative 9H	61.0					Yes
10	Proposed – Total Length	33.6		Yes			Yes

1/ Based on OPS data (see Section 3.14.1.4).
2/ Based on historical earthquake epicenters (see Section 3.14.1.4).
3/ Alternative 7J connects with Segment 9 approximately 25.8 miles west of the proposed Cedar Hill Substation, which is the western terminus of Segment 7 and the beginning point for Segment 9. The table above compares 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

Earthquake and landslide risks are low in this segment for the Proposed Route and all Route Alternatives. The Proposed Route contains shallow bedrock, and about 5 percent of the construction disturbance area contains subsidence potential due to blasting. Alternatives 1E-A, 1E-B, and 1E-C all contain less subsidence potential than the comparison portion of the Proposed Route. Alternatives 1E-B and 1E-C avoid crossing abandoned mines, while the construction disturbance areas of all three comparison portions cross at least 14 acres of abandoned mines. Alternative 1E-B is 21.4 miles longer than the comparison portion of the Proposed Route, resulting in a longer distance for exposure to earthquake risks. The route with the least geologic hazards potential would be Alternatives 1E-A and 1E-C in combination with the remainder of the Proposed Route.

Segment 1W

Segment 1W is composed of two parts, Segment 1W(a) and 1W(c), both of which would consist of a new 230-kV line for part of their length and a reconstruction of an existing 230-kV line for the remaining part. Segment 1W(a) would be about 76.5 miles long, and would extend from the Windstar Substation to the Aeolus Substation. Segment 1W(c) would be about 70.6 miles long, and would extend from the Dave Johnston Power Plant to the Aeolus Substation. Alternative 1W-A is a 16.2-mile alternative located near the town of Glenrock, which was the Proponents' initial proposal before moving the Proposed Route at the suggestion of local landowners in order to avoid the more settled area around Glenrock. Twenty acres of the proposed expansion at the Windstar and Aeolus Substations are attributed to Segment 1W(a) and 3 acres of the expansion at the Heward Substation and 17 acres of the expansion at the Windstar and Aeolus Substations are attributed to Segment 1W(c). There are no Route Alternatives proposed south of that point (see Appendix A, Figure A-2).

Earthquake hazards are low in this segment. The transmission line crosses the South Granite Mountain Fault in this segment, a west-northwest trending Class B fault that is potentially Quaternary in age. Project structures would need to be engineered to withstand seismic forces, including differential movement across fault zones. Approximately 6 percent of the Proposed Route is located in high landslide risk; otherwise, landslide risks are low. Implementing mitigation measure GEO-1 would assist in mitigating the construction effects to landslide-prone areas.

Low percentages of construction and operations disturbance areas are present in areas of potential subsidence. The construction acreage of Alternative 1W-A contains only 19 percent of the subsidence potential area in the comparison portion of the Proposed Route. Nine Segment 1 exploratory boring logs were reviewed that contained shallow bedrock, eight of which contained shallow bedrock in areas not identified by STATSGO. This suggests that Table 3.14-5 may underestimate the areas of shallow bedrock for the Segment 1 Analysis Area. However, blasting would not occur in areas of subsidence. Using Alternative 1W-A in combination with the remainder of Segment 1W would have the lowest potential for geologic hazards.

Segment 2

Segment 2, as proposed, would link the Aeolus and Creston Substations in southeast Wyoming with two 500-kV circuits on one structure. One circuit would be operated at

230 kV during the initial phase of the Project. Its total proposed length is 96.7 miles. Fifty-two acres of the expansion of the Aeolus Substation and the construction of the Creston Substation and 0.5 acre for one regeneration site are attributed to Segment 2. There are three Route Alternatives, two of which are near the community of Fort Fred Steele. Alternative 2A at 28.4 miles long is being considered by the BLM because it remains in the WWE corridor nearer the town and the state historic site, and Alternative 2B, at 6.2 miles, is closer to the community than the comparison portion of the Proposed Route and was the initially proposed route before the Proponents responded to local suggestions and relocated the Proposed Route farther to the south. Alternative 2C is a 24.4-mile alternative located north of Hanna, Wyoming. It is being evaluated at the recommendation of the Wyoming Governor's office to follow a utility corridor approved by that office for minimizing effects to sage-grouse (see Appendix A, Figure A-3).

Segment 2 contains a moderate risk from geologic hazards, mainly from potential subsidence. This segment contains low earthquake and landslide risks. According to NRCS STATSGO soil data, Segment 2 is the only segment where shallow bedrock is not present. The east half of Segment 2 is located within a coal-producing area (see Section 3.12). The route overlies several miles of continuous historic underground coal mines near Hanna, Wyoming, on the east end of the route. According to the WDEQ (Parfitt 2010), underground workings in this area are extensive and not well-mapped. Some subsidence has already occurred in this area. This portion of the route should receive an engineering review relative to potential subsidence prior to construction. In addition, voids in bedrock near coal deposits could contain methane. Shallow bedrock is not reported in Segment 2, but if blasting is necessary, the Proponents should follow the Blasting Plan procedures BLA-1 and BLA-2 for blasting in areas of possible coal-related methane. Subsidence potential occurs in some of the constructional and operations disturbance areas. As shown in Tables D.14-4 and D.14-5 in Appendix D, Alternative 2A has a larger area of subsidence in the operations and construction disturbance areas than the comparison portion of the Proposed Route. Alternatives 2B and 2C have smaller areas of subsidence in the construction and operations areas. Mitigation measure GEO-2 has been identified by the Agencies as a means of substantially reducing the potential for subsidence impact.

Segment 3

Segment 3, as proposed, would link the Creston and Anticline Substations in southeast Wyoming with two 500-kV circuits on one structure. One circuit would be operated at 230 kV during the initial phase of the Project. Its total proposed length between those two substations is 46.7 miles. Sixty-nine acres of the construction of the Anticline and Creston Substations are attributed to Segment 3. Segment 3 would also link the Anticline and Jim Bridger Substations with a 4.3-mile 230-kV line and a 5.5-mile 345-kV line and includes the 10-acre expansion of the Jim Bridger 345-kV Substation. There are no alternatives proposed along this segment (see Appendix A, Figure A-4).

Segment 3 contains low risk from earthquakes. Approximately 37 percent of the route is located in areas containing medium landslide risk. To minimize failures due to landslides, the Agencies have identified a landslide mitigation plan be prepared (GEO-1) that addresses measures to be taken in the Project design, construction, and operation.

Subsidence will be possible in operations and construction disturbance areas because 42 percent of the Analysis Area is underlain by mining leases. Shallow bedrock possibly requiring blasting is present over 73 percent of the route. Blasting in areas of potential subsidence may cause subsidence. The west end of Segment 3, including the area of the Anticline Substation, is located within a coal-producing area (see Section 3.12). If blasting of shallow bedrock is necessary in this vicinity, the Proponents should follow the EPM procedures outlined in Appendix C-1, Attachment E, for blasting where methane may occur. The Proponents intend to prepare a site-specific Blasting Plan prior to construction that incorporates covering blasting procedures, use of qualified blasters, site control and protection measures, and compensation for repair of damage. Mitigation measure GEO-2 has been identified by the Agencies as a means of substantially reducing the potential for subsidence impact.

Segment 4

Segment 4, as proposed, would link the Anticline Substation near the Jim Bridger Power Plant in southwestern Wyoming with the Populus Substation in Idaho with two 500-kV circuits on one structure. Its total proposed length is 203 miles. Eighty-nine acres of the construction of the Anticline Substation and the expansion of the Populus Substation and 1.5 acres for three regeneration sites are attributed to Segment 4. It has six Route Alternatives in the middle portion of its route but the first 52 miles to the east and the last 61 miles to the west (in Idaho) do not have any Route Alternatives. The middle section of the Proposed Route is 90.2 miles long, and its Route Alternatives vary from 85 to 102 miles long. These alternatives were proposed by the Wyoming Governor's office (4A, paralleling the existing 345-kV lines throughout); by the BLM Kemmerer FO (4B through 4E, including edits from various cooperating agencies), with the intent to avoid impacts to cultural resources to the extent practical; and by the Proponents (4F, attempting to avoid impacts to cultural resources while still remaining north of the existing lines) (see Appendix A, Figures A-5 and A-6).

Segment 4 and all of its alternatives stand out as containing the greatest potential geologic hazards of all segments. None of the Segment 4 alternatives offer a way of avoiding the multiple hazards present. Large portions of Segment 4 contain medium to high risk of earthquakes and Segment 4 routes cross several north/south-trending Quaternary faults, including the Rock Creek Fault, Eastern and Western Bear Valley Faults, and the Sublette Flat Fault. Project structures would need to be engineered to account for differential movement across active faults. Historical earthquakes have been in the magnitude 6.0 to 6.9 range, medium-size earthquakes capable of damage of structures for distances up to 100 kilometers.

Segment 4 also contains the highest risk from landslides. This segment and all the alternatives contain large areas of medium to high landslide risk, including approximately 0.5 mile of the Proposed Route on the western edge of the Caribou-Targhee NF. In the mid-1980s, a landslide failure near Viva Naughton Reservoir in southwest Wyoming (near Route Alternatives 4A and 4F) necessitated the re-alignment of the existing Bridger to Borah 345-kV transmission lines. To minimize failures due to landslides, the Agencies have identified mitigation measures (GEO-1, GEO-3, and GEO-4) to be taken in the Project design, construction, and operation.

GEO-3 On-site slope stability examinations will be performed on NFS lands for slopes over 40 percent prior to designing project features that require the removal of forest.

GEO-4 A site-specific soil analysis shall be conducted prior to construction to verify any areas identified as unstable or marginally unstable in the Caribou National Forest Soil Resource Inventory.

Using the STATSGO database information, approximately 32 percent of the Proposed Route is located on shallow bedrock. Results of the Segment 4 drilling log review indicate that five borings advanced in areas assumed to contain shallow bedrock did not encounter any, and one boring contained shallow bedrock in an area not anticipated by STATSGO. Therefore, shallow bedrock should be expected in Segment 4, but the bedrock percentages reported here are approximate. Much of the shallow bedrock is located within areas of medium to high landslide risk or in areas of potential subsidence. Blasting in these areas may cause landslides or subsidence. Trona mining companies in this segment indicated that subsidence has occurred near some of the previously mined areas, and they recommended avoidance of trona mining areas to avoid construction on subsidence-prone areas, as well as to avoid interference with mining operations (Hodgson 2008). The Proponents used active mining areas as a constraint when siting alternatives for the transmission line. Segment 4 includes three coal-producing locations (see Section 3.12 – Minerals). Blasting in these areas should occur using the EPM procedures BLA-1 and BLA-2 outlined in Appendix C-1 for blasting in areas of possible methane. The Proponents intend to prepare a site-specific Blasting Plan prior to construction that incorporates covering blasting procedures, use of qualified blasters, site control and protection measures and compensation for repair of damage. Mitigation measure GEO-2 has been identified by the Agencies as a means of substantially reducing the potential for subsidence impact.

In summary, the Proposed Route and all Route Alternatives contain the same landslide risk zones. Therefore, the risks are proportional to the segment lengths. As shown in Table 3.14-7, Alternatives 4A and 4F are shorter than the comparison portion of the Proposed Route and Alternatives 4B, 4C, 4D, and 4E are longer. Alternative 4A is the shortest of all and would have the lowest risk from landslides. Alternative 4A also has the least exposure to subsidence risk for the same reasons as landslide risk.

Segment 5

Segment 5, as proposed, would link the Populus and Borah Substations with a 54.6-mile single-circuit 500-kV line. Forty-four acres of the expansion of the Populus and Borah Substations are attributed to Segment 5. There are five Route Alternatives including two proposed by the BLM to avoid the Deep Creek Mountains (5A and 5B; 8 miles and 19 miles longer than the comparison portion of the Proposed Route), one preferred by Power County that crosses the Fort Hall Indian Reservation (5C; 6 miles shorter than the comparison portion of the Proposed Route), one originally proposed by the Proponents (5D; 2 miles shorter than the comparison portion of the Proposed Route but located within more agricultural lands), and one proposed by Power County as an alternative approach to the Borah Substation (5E) (see Appendix A, Figure A-7).

Earthquake risks in Segment 5 are medium to high. Portions of Segments 5 through 10 are located within the 100-mile buffer of historic earthquakes with magnitudes greater than 7.0. Landslide risks are low in this segment. Less than 27 percent of this segment is located in shallow bedrock, none of which is located in an area of subsidence or landslides. Therefore, the risk of initiating landslides or subsidence from blasting should be minimal. Subsidence was not identified in Segments 5 through 10 because underground mining has generally not occurred within the Project area in these segments.

The Proponents intend to prepare a site-specific Blasting Plan in accordance with the EPMs in Appendix C-1, Attachment E, prior to construction that incorporates covering blasting procedures, use of qualified blasters, site control and protection measures, and compensation for repair of damage.

In summary, earthquake risks are the only important risk from geologic hazards in Segment 5. Since the earthquake risk includes the entire segment, the risks are proportional to the lengths. Alternatives 5C and 5D are shorter than the comparison portion of the Proposed Route and therefore have less risk. Alternatives 5A and 5B are longer, with Alternative 5B being the longest and resulting in the greatest exposure to earthquake-related risks.

Segment 6

Segment 6 is an existing transmission line linking the Borah and Midpoint Substations; it is now operated at 345 kV but would be changed to operate at 500 kV. This segment has no Route Alternatives. Existing support structures would be used and impacts would be limited to within approximately 0.25 mile from each substation to allow for moving the entry point into the substation to the new 500-kV bay. Thirty-one acres of the expansion of the Borah and Midpoint Substations are attributed to Segment 6. Changes in the two substations would allow it to be operated at 500 kV (see Appendix A, Figure A-8).

Segment 7

Segment 7, as proposed, would link the Populus and Cedar Hill Substations with a 118.1-mile single-circuit 500-kV line. Forty-two acres of the expansion of the Populus and the construction of the Cedar Hill Substations and 1 acre for two regeneration sites are attributed to Segment 7. In addition to the Proposed Route, which is principally on private lands, Route Alternatives have been proposed by the BLM to avoid the Deep Creek Mountains (7A and 7B; which are 5 miles and 11 miles longer than the comparison portion of the Proposed Route), by local landowners (7C, 7D, 7E, 7F, and 7G, which all represent minor adjustments proposed to address local issues), by local landowners to avoid private agricultural lands (7I or the State Line Route, which is 55 miles longer than the Proposed Route and would require 0.5 acre for an additional regeneration site), and by the Proponents to avoid the State Line Route (7H, which is 10 miles longer than the Proposed Route). Alternative 7J, which is a variant of the State Line Route also proposed by local landowners, would not terminate at the Cedar Hill Substation. This alternative, referred to as the Rogerson Alternative, would require a different substation be constructed near a 345-kV existing transmission line (approximately 24 miles southwest of the Cedar Hill Substation; see Appendix A, Figure A-9). The tables and discussion in this document

compare 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

Earthquake risks in Segment 7 are variable with an approximately even mix of low, medium, and high risk. Landslide risks are low, with the exception of one 4.3-mile interval of Alternatives 7I/7J that contains medium landslide risk. This interval also contains shallow bedrock that, if blasted, may increase the landslide risk.

The Proponents intend to prepare a site-specific Blasting Plan in accordance with the EPMs in Appendix C-1, Attachment E, prior to construction that incorporates covering blasting procedures, use of qualified blasters, site control and protection measures, and compensation for repair of damage.

In summary, earthquake risks are the only important risk from geologic hazards for Segment 7. The Proposed Route is the shortest route and therefore would have the lowest exposure to geologic hazard risks.

Segment 8

Segment 8, as proposed, would link the Midpoint and Hemingway Substations. This 131-mile single-circuit 500-kV transmission line would stay north of the Snake River until crossing through the SRBOP parallel to an existing 500-kV transmission line before ending at the Hemingway Substation. Thirteen acres of the expansion of the Midpoint Substation and 0.5 acre for a regeneration site are attributed to Segment 8. There are five Route Alternatives: 8A, which follows the WWE corridor but crosses the Snake River and I-84 twice (while the Proposed Route would stay north of this area); 8B and 8C, which represent the old routes originally proposed by the Proponents but that have now been changed to avoid the cities of Kuna and Mayfield, respectively; 8D, which represents a small revision involving a rebuild of the existing transmission line to move both away from the National Guard Maneuver Area; and 8E, which was proposed by the BLM in order to avoid crossing the Halverson Bar non-motorized portion of the Guffey Butte-Black Butte Archaeological District (see Appendix A, Figure A-10).

The earthquake and landslide risks in Segment 8 are generally low except that the eastern half of the Proposed Route does fall at the edge of the buffer for a high risk earthquake zone. Shallow bedrock is present, but except for about 2 miles in Alternative 8B, any necessary blasting would not occur in landslide-prone areas.

The Proponents intend to prepare a site-specific Blasting Plan in accordance with the EPMs in Appendix C-1, Attachment E, prior to construction that incorporates covering blasting procedures, use of qualified blasters, site control and protection measures, and compensation for repair of damage.

In summary, the Segment 8 Proposed Route and Route Alternatives possess similar risks from geologic hazards and the risks are relatively low.

Segment 9

Segment 9, as proposed, would link the Cedar Hill and Hemingway Substations with a 161.7 mile single-circuit 500-kV transmission line which skirts the Jarbidge and Owyhee Military Operating Areas to the north, then follows the WWE corridor just north of the

Saylor Creek Air Force Range, passing through Owyhee County before entering into the Hemingway Substation. Fifteen acres of the construction of the Cedar Hill Substation and 1 acre for two regeneration sites are attributed to Segment 9. There are eight Route Alternatives proposed, including 9A, which was the Proponents' Proposed Route until moving to avoid the Hollister area; 9B, which is being considered by the BLM because it follows the WWE corridor and parallels existing utility corridors; 9C, which was the Proponents' Proposed Route until moving to avoid the Castleford area; and 9D and 9E, proposed by the Owyhee County Task Force, that cross more public lands north and south of the Proposed Route, respectively, than the Proposed Route. Most of Alternative 9D would be within the SRBOP. Alternatives 9F, 9G, and 9H were proposed to avoid crossing the non-motorized area south of C.J. Strike Reservoir. Alternatives 9G and 9H provide an alternate route location south of Alternative 8E (see Appendix A, Figure A-11).

Segment 9 contains low risks from earthquakes and landslides. Shallow bedrock is present, but because landslide risk is low, blasting would probably not cause landslides.

The Proponents intend to prepare a site-specific Blasting Plan in accordance with the EPMs in Appendix C-1, Attachment E, prior to construction that incorporates covering blasting procedures, use of qualified blasters, site control and protection measures, and compensation for repair of damage.

In summary, the Segment 9 Proposed Route and all Route Alternatives have low exposure to risks from geologic hazards.

Segment 10

Segment 10, as proposed, would link the Cedar Hill and Midpoint Substations with a 33.6-mile single-circuit 500-kV line, following a WWE corridor for most of its distance. Twenty-eight acres of the expansion of the Midpoint Substation and of the construction of the Cedar Hill Substation are attributed to Segment 10. There are no Route Alternatives proposed along this segment (see Appendix A, Figure A-12).

Segment 10 also contains low risks from earthquakes and landslides except that the northern three quarters of the Segment are within the edge of the buffer for a high risk earthquake zone. Blasting of shallow bedrock would not be likely to cause slope instabilities.

The Proponents intend to prepare a site-specific Blasting Plan in accordance with the EPMs in Appendix C-1, Attachment E, prior to construction that incorporates covering blasting procedures, use of qualified blasters, site control and protection measures, and compensation for repair of damage.

3.14.2.4 Design Variation

A Design Variation is being considered that would consist of constructing two single-circuit lines in Segments 2 through 4 instead of a single double-circuit line (which is the design assessed above). The disturbance footprint of the two single-circuit towers is greater than that of the double-circuit tower, in part because the requested ROW would be wider, but also because helicopter-assisted construction could be implemented in these areas due to the lighter weight of the towers, which would require additional fly

yards. The additional ROW space and the fly yards would cause additional temporary disturbance during construction. Across Segments 2, 3, and 4, the additional disturbance of the single-circuit tower alternative ranges from 25 to 30 percent greater than the comparable portions of the double-circuit tower disturbance under the proposed design. The two single circuits require more ground disturbance, but would be designed and constructed to the same standards as the Proposed Action. The exposure of either design to geologic hazards is equivalent. The effects from the two single-circuit lines would be slightly greater than from the double-circuit line, because there is more area of disturbance.

3.14.2.5 Structure Variation

The proposed guyed Structure Variation would add four guy wires about 140 feet long from a point about 100 feet up in each tower to four guy anchors spaced in a square around the tower (Appendix B, Figure B-6). This would not change the amount of disturbance during construction or operations appreciably. Therefore, there is no appreciable difference in impact on geologic hazards from the use of this Structure Variation when compared to the use of self-supporting lattice towers. Guyed structures would not be more susceptible to geologic hazards than the self-supporting lattice structures.

3.14.2.6 Schedule Variation

The Schedule Variation uses the two single-circuit Design Variation described above but extends construction over a longer timeframe. Initially only one of the eventual two single-circuit lines would be constructed with the second to be constructed at a later date. The Schedule Variation proposes that the first single-circuit transmission line in Segments 2, 3, and 4 would be built as soon as a ROW grant is issued, but that the second line would not begin construction until late 2018. This would mean nearly 2 years between the end of construction for the first line and beginning of construction for the second line. Any staging areas and fly yards that had been used for the first stage would have been revegetated after construction was complete and would have to be cleared again. There would be two sets of construction disturbances adding movement, noise, and dust to the area of construction in two instances in any given area. The extended construction schedule variation would not substantially alter the risk of geologic hazards.

3.14.3 Mitigation Measures

To minimize or avoid impacts on geologic hazards, the Proponents have committed to EPMs that would be implemented Project-wide as outlined in this section and in Appendix C.

The following mitigation measures identified by the Agencies are required on federally managed lands. The Agencies recommend that the Proponents incorporate the measures into their EPMs and apply them Project-wide.

GEO-1 A site-specific landslide mitigation plan that addresses measures to be taken in the design, construction, and operation to minimize failure due to landslides must be prepared and submitted by the Proponents with the

construction POD prior to issuance of a ROW grant on federally managed lands.

GEO-3 On-site slope stability examinations will be performed on NFS lands for slopes over 40 percent prior to designing project features that require the removal of forest.

GEO 4 A site-specific soil analysis shall be conducted prior to construction to verify any areas identified as unstable or marginally unstable in the Caribou National Forest Soil Resource Inventory.

In addition, the following mitigation measure has been proposed by the Agencies and adopted by the Proponents:

GEO-2 Review the final location of the preferred alternative with affected mine operators and lessees to ensure all measures are taken to protect against subsidence.

3.15 SOILS

This section addresses potential impacts to soils from the Proposed Route and Route Alternatives during construction, operation, and decommissioning. The primary reason to define impacts to soils is to reduce, minimize, or mitigate effects to soils from all phases of the Project. This section analyzes the potential impacts of the Project on soil erosion, soil compaction, and soil permanently removed from productivity due to the presence of roads and structures. In some cases, geologic features, such as landslides and shallow bedrock, could have an impact on soils. Those cases are also discussed in Section 3.14 – Geologic Hazards. Prime farmland is presented as a soil characteristic here and soil impacts to agricultural operations are also discussed in Section 3.18 – Agriculture. The discussion of hydric soils here supplements the broader discussion of wetlands found in Section 3.9 – Wetlands and Riparian Areas.

3.15.1 Affected Environment

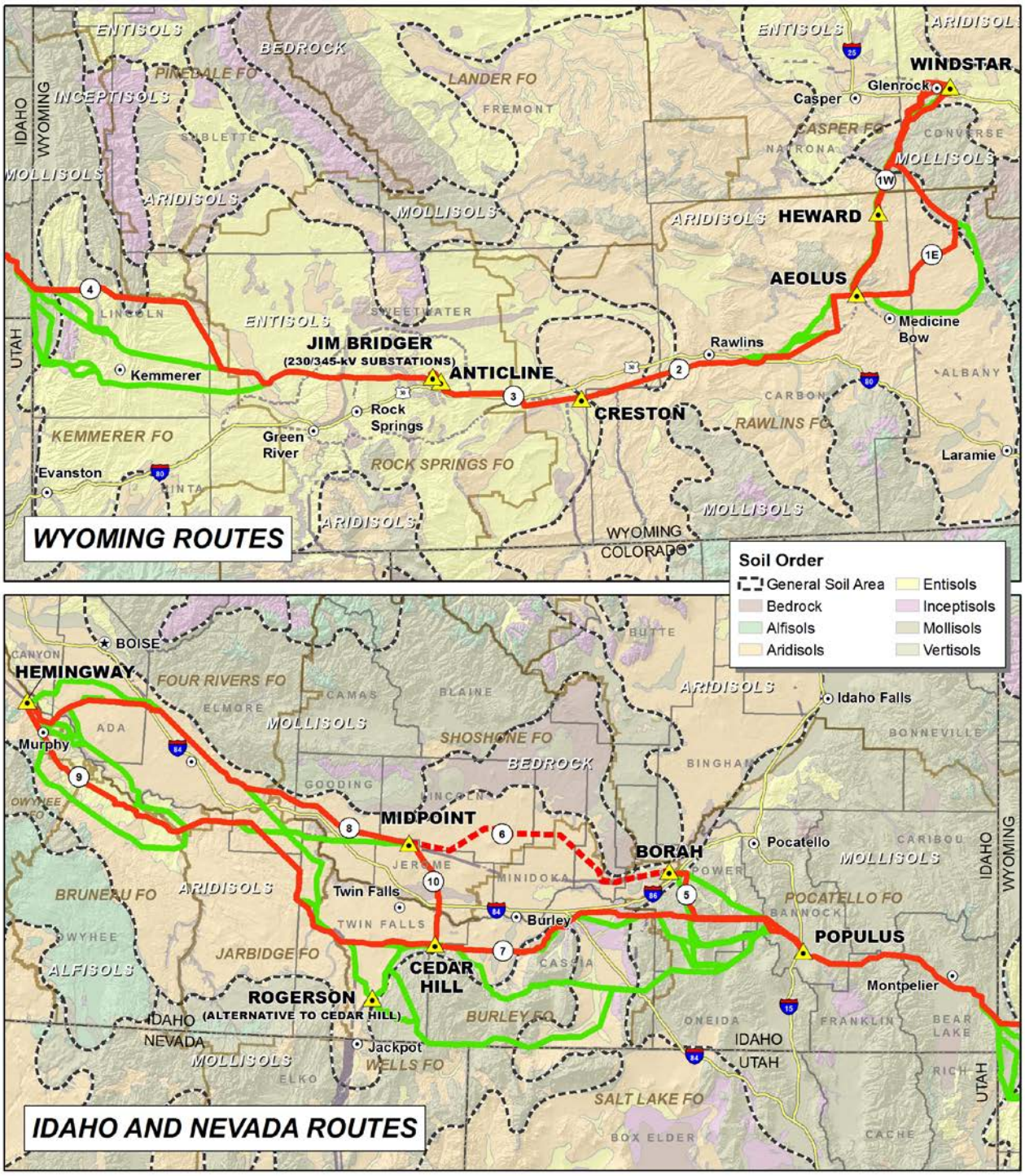
This section discusses those aspects of the environment that could be impacted by the Project. It starts with a discussion of the Analysis Area considered, identifies the issues that have driven the analysis, and characterizes the existing conditions across the Proposed Action in Wyoming, Idaho, and Nevada.

3.15.1.1 Analysis Area

The Project crosses several major soil orders (Figure 3.15-1). These soil orders closely match the physiographic regions (Figure 3.14-1). The mountainous parts of the Project area are slightly cooler than the valleys, receive more precipitation, and more readily support plant growth. The valley soils of southern Wyoming and Idaho support desert conditions, with less plant growth and infrequent summer precipitation. Soil found in the mountainous areas, including the Laramie Mountains in the northern part of Segment 1 and the mountainous areas in Segments 4 through 7 along the Idaho/Wyoming border and into southeast Idaho and northern Nevada, consist mainly of Mollisols with minor areas of Inceptisols and Alfisols. The Order Mollisol includes a variety of soils formed mainly under grasslands. These soils have a strong organic component formed by the decomposition of grass and other vegetation, which results in very productive soils. These soils, if properly preserved or reclaimed, should be favorable for revegetation.

Soil in the valley portions of Segments 1, 2, and 3, and the Snake River Plain in portions of Segments 7, 8, 9, and 10 predominantly consist of Aridisols. Aridisols are found in dry climates, and contain subsurface horizons in which clay, calcium carbonate, silica, salts, and/or gypsum have accumulated. They are usually not suitable for agriculture unless irrigation water is provided. Revegetation in these areas may be more difficult due to lack of water, or revegetation may need to proceed in a wetter portion of the year.

In the Green River Basin portion of Segment 4, soils consist predominantly of Entisols. Entisols are typically shallow or sandy, lacking in organic matter, and generally do not contain well-developed soil layers. The lack of water, scarce organic matter, and sandy soil conditions could require special considerations to complete revegetation in this portion of the Project.



Gateway West Transmission Line Project
Idaho, Nevada, Wyoming

Major Soil Orders
FIGURE 3.15-1

The Analysis Area for soils was defined in a GIS file by buffering the centerlines of the Proposed Route and Route Alternatives out 0.5 mile on either side of the centerlines and dissolving the buffers into a single polygon for each segment. This distance was used because it encompasses the area of greatest activity during construction and operation and it is estimated any Project impacts to Project soils would occur primarily within 0.5 mile of the disturbance.

3.15.1.2 Issues to be Analyzed

The following soil related issues were brought up by the public during public scoping (Tetra Tech 2009a), raised by federal and state agencies during scoping and agency discussions, or are issues that must be considered as stipulated in law or regulation:

- What would be the effect on soil erosion, and the potential for increased soil erosion from Project construction, operations, and decommissioning?
- What would be the effect on Project soils from compaction by vehicle and equipment traffic?
- What effect would topsoil disturbance have on soil productivity after construction and reclamation?

3.15.1.3 Regulatory Framework

Soil erosion is governed by regulations contained in USEPA's stormwater management regulations, derived as part of the CWA.

Environmental Protection Agency – Clean Water Act

Under the Clean Water Act, the NPDES stormwater program requires operators of construction sites one acre or larger (including smaller sites that are part of a larger common plan of development) to obtain authorization to discharge stormwater under an NPDES construction stormwater permit. The development and implementation of SWPPPs is the focus of NPDES stormwater permits for regulated construction activities.

Most states, including Wyoming and Nevada, are authorized to implement the stormwater NPDES permitting program. USEPA remains the permitting authority in a few states (including Idaho), territories, and on most land owned by Native American sovereign nations. For construction (and other land-disturbing activities) in areas where USEPA is the permitting authority, operators must meet the requirements of the USEPA Construction General Permit. In Wyoming and Nevada, compliance with state requirements would be necessary for construction stormwater activities. Each state has their own permits and requirements, although both are modeled after the USEPA program.

Federal agencies have handbooks and other guidance documents that govern soil management that would be applicable in their jurisdiction. Applicable Forest Service Handbooks (FSHs) for evaluating soil conditions on NFS lands include the following:

- FSH 2509.18 Soil Management Handbook (Forest Service 1991b)

- FSH 2509.22 Soil and Water Conservation Practices Handbook (Region R1/R4; Forest Service 1988)
- FSH 2509.25 Watershed Conservation Practices Handbook (Forest Service 2006)

BLM RMPs vary by BLM FO. Some RMPs contain quantitative soil requirements that would be applicable to the Project.

The BLM maintains a guidance document for permitting and drilling oil and gas wells. This document, called the Gold Book, also contains general standards for road construction and construction stormwater BMPs and is used as a guideline for construction activities on the Gateway West Project. The WWE Corridor PEIS (DOE and BLM 2008), a guidance document for location of preferred cross-country utility ROWs, references the BLM Gold Book as being useful for construction stormwater procedures for linear facilities. The State of Wyoming State Reclamation Policy and BLM's Rawlins District RMP (Appendix 36) also provide requirements for soil reclamation that would be complied with in the appropriate Project areas.

3.15.1.4 Methods

The environmental effects analyses completed for this assessment were conducted using readily available data and GIS files derived from preliminary centerline and component design for the Proposed Route and Route Alternative (see Section 3.1 – Introduction for details on development of these files). In all cases, after analysis of impacts was complete and where impacts were identified, Proponent-proposed measures to reduce impacts were reviewed for sufficiency. Where those measures were determined to be insufficient, additional measures were identified.

Soils data were obtained from the NRCS databases. The NRCS STATSGO database provides soil data on a state-wide basis. The STATSGO data were reviewed to identify soil factors that could affect soil erosion, soil compaction, or leading to difficulty in re-establishing vegetation during Project reclamation. STATSGO data were available for all factors, except prime farmland in Wyoming. To attain Wyoming prime farmland information, the NRCS Soil Survey Geographic database (county-level soils database) was reviewed but no prime farmland was found to be present in the Wyoming portion of the Project. In general, prime farmland requires an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, an acceptable level of acidity or alkalinity, an acceptable content of salt or sodium, and few or no rocks. Its soils are permeable to water and air. Prime farmland is not excessively eroded or saturated with water for long periods of time, and it either does not flood frequently during the growing season or is protected from flooding. At least some of these conditions, especially a short growing season and lack of water, are typically deficient in southern Wyoming soils, hence the absence of prime farmland in the Wyoming portion of the transmission line routes.

In 2010, drilling began in some areas to support geotechnical evaluations for transmission line structures. The drilling was conducted on public land and private land where landowner permission was obtained. As of the date of this draft EIS, available information includes a total of 124 boreholes that were advanced along Segments 1

through 4. Total depths drilled ranged from 15 feet to 66.5 feet. Drilling logs were reviewed to evaluate Unified Soil Classifications on soil from 0 to 5 feet below ground surface. Soils containing silt and/or fine sand were presumed to be erodible by wind or water. The locations of borings containing silt or sand soils were compared to the locations of highly erodible soils presented in the STATSGO database. Soils described as gravel were compared to the STATSGO areas for stony rocky soils. The locations of soil described as sand or gravel were compared to the locations of droughty soils as described by STATSGO. Where differences were found between the boring logs and the STATSGO database, they are noted in the text below. Otherwise, the following methods were used to evaluate Project soil conditions.

Wind Erodibility

The STATSGO data for wind erodibility group was reviewed for each segment's Analysis Area. The STATSGO database divides wind erodibility potential into eight categories based on slope, soil type, and wind characteristics. It was assumed that groups 1 through 4 represent soils that are highly erodible, with wind erodibility ranging from greater than 310 tons per acre per year (T/A/Y – Group 1), to 86 T/A/Y – Group 4. Groups 5 through 8 range from 56 T/A/Y (Group 5) to Group 8 – 0 T/A/Y.

To assess the impacts to soil from wind erodibility, the centerlines of the Proposed Route and Route Alternatives in each segment were overlaid on the STATSGO wind erodibility GIS data file and the area for each wind erodibility group (in acres) was determined. Soils in groups 1 through 4 (greater than or equal to 86 T/A/Y) were considered highly wind erodible. Highly wind erodible soils were expressed as a percentage of the total Analysis Area for the segment. To disclose overall impacts by segment, the area containing highly wind erodible soil was identified along the construction and operations disturbance areas of the Proposed Route and compared to the highly erodible soil areas for the construction and operations disturbance areas of the feasible alternatives.

Erosion Potential by K Factor

K Factor is a soil erodibility factor that measures a soil's potential to erode, and also the rate of runoff as measured compared to a "standard" condition. According to information provided on the U.S. Department of Energy, Pacific Northwest National Laboratory website (DOE 2003b), soil K Factors can range from 0.02 to 0.6. Therefore, low K values were assumed to range from 0.02 to 0.25, moderate K values from 0.25 to 0.37, and high K values greater than 0.37. The value of 0.37 and above was selected to define high K value because it was one of the values reported in the STATSGO GIS data file.

To assess the erodibility of soil, the centerlines of the Proposed Route and Route Alternatives in each segment were overlaid on the STATSGO K Factor GIS data file and the area for K Factor group (in acres) was determined. High K Factor soils were determined, and their area expressed as a percentage of the total Analysis Area for the segment. To disclose overall soil erodibility impacts by segment, the areas with high K Factor were identified within the construction and operations disturbance areas of the Proposed Route and compared to the high K Factor areas in the construction and operations disturbance areas of the feasible alternatives.

Steep Slopes

Soil disturbance on steep slopes would be more prone to soil erosion. The Rawlins FO RMP (Albany, Sweetwater and Carbon Counties, Wyoming; BLM 2008a) indicates that approval is necessary for surface disturbances on slopes greater than 25 percent. To assess Project areas with steep slopes, a slope inclination of 25 percent or greater to define steep slopes was used. The centerlines of the Proposed Route and Route Alternatives in each segment were overlaid on the STATSGO GIS data file and the area with steep slopes (in acres) was determined. The area with steep slopes was expressed as a percentage of the total Analysis Area for the segment. To disclose the proportion of steep slopes by segment, the areas with steep slopes were identified within the construction and operations disturbance areas of the Proposed Route and compared to the steeply sloped areas in the construction and operations disturbance areas of the feasible alternatives.

Soil T Factor

The soil T Factor is an indicator of soil loss tolerance, or the amount of soil loss that can be tolerated for a soil to remain productive. Soils with a low T Factor would be more sensitive to the effects of erosion than soils with higher T Factors. The Forest Service Soil Management Handbook (Forest Service 1991b) presents an example threshold soil loss tolerance of 2 T/A/Y for deep soils or 1 T/A/Y for shallow soils; however, it indicates that actual soil loss tolerance standards may vary. The Caribou-Targhee NF has adopted these tolerances in their Forest Plan. In their RMP Final EIS, the High Desert District, Rawlins FO BLM states that soil loss should not exceed 2 T/A/Y following reclamation (BLM 2008a). Given the Forest Service and at least one BLM district guideline of 2 T/A/Y soil loss tolerance, the effects analysis herein utilized this soil loss tolerance of 2 T/A/Y as a guideline.

For the analysis, each segment Analysis Area was examined and the percent of area containing a low T Factor (≤ 2 T/A/Y) determined. To assess the areas with low soil loss tolerance, the centerlines of the Proposed Route and Route Alternatives in each segment were overlaid on the STATSGO T Factor GIS data file and the area for T Factor group (in acres) was determined. Low T Factor soils were determined, and their area expressed as a percentage of the total Analysis Area for the segment. To disclose overall impacts to low soil loss tolerance soils by segment, the areas with low T Factor were identified within the construction and operations disturbance areas of the Proposed Route and compared to the low T Factor areas in the construction and operations disturbance areas of the feasible alternatives.

Prime Farmland

According to the NRCS, prime farmland contains soils with the best physical and chemical characteristics for production of food, feed, forage, fiber, and oilseed crops. It has the soil quality, growing season, and moisture supply needed to produce economically sustained high yields of crops when treated and managed according to acceptable farming methods, including water management. In general, prime farmlands have an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks. The soils are permeable to water and air.

Prime farmlands are not excessively erodible or saturated with water for a long period of time, and they either do not flood frequently or are protected from flooding (Forest Service 1991b).

The NRCS separates prime farmland into several categories. For this analysis, prime farmland with no restrictions, prime farmland when irrigated, and prime farmland when drained, were used to describe prime farmland. For the prime farmland analysis in this section, the centerlines of the Proposed Route and Route Alternatives in each segment were overlaid on the STATSGO Prime Farmland GIS data file. The prime farmland acreage was then determined, expressed as a percentage of the total Analysis Area for the segment. To disclose overall impacts to prime farmland by segment, the prime farmland areas were identified within the construction and operations disturbance areas of the Proposed Route and compared to the prime farmland areas in the construction and operations disturbance areas of the feasible alternatives. Section 3.18 – Agriculture presents further information on the Project's impacts to agriculture, including prime farmland.

Soil Compaction

The areas where compaction could occur are coincident to the disturbance acreage. Different soil types have different susceptibility to compaction; however, as a conservative measure, it was assumed that if the soil is disturbed by construction equipment or operations vehicles, there is at least some potential for soil compaction. Although all soil is susceptible to compaction to varying degrees, wet soils are more readily compacted than dry, and clay loam or finer soils with poor drainage characteristics were assumed to be highly compaction prone.

To assess the areas with highly compactable soil, the centerlines of the Proposed Route and Route Alternatives in each segment were overlaid on the STATSGO GIS data files showing clay loam or finer soil texture, and somewhat poorly drained to very poorly drained soil drainage characteristics. Soils meeting both the texture and drainage characteristics were defined as highly compactable, and the acreage of soils meeting these criteria was determined. The area of highly compactable soil (in acres) was expressed as a percentage of the total Analysis Area for the segment. To disclose overall impacts from highly compactable soils by segment, the highly compactable soil areas were identified within the construction and operations disturbance areas of the Proposed Route and compared to the highly compactable soil areas in the construction and operations disturbance areas of the feasible alternatives.

Stony-Rocky Soil

The NRCS Soil Survey Manual (1993) defines soil particles as being less than 2 millimeters (mm) in diameter. Particles larger than 2 mm, including gravel, cobbles, stones, and boulders, are coarse fragments. Soil with at least 20 percent coarse fragments was defined as stony-rocky soil. Rocks greater than 75 mm include cobbles, stones, and boulders. Stony-rocky soil containing predominantly gravel could reduce vegetation success because gravel competes with plant roots for space and does not retain moisture as well as fine-grained soils. Soils containing large quantities of cobbles and larger rocks provide the same impediments to revegetation as gravel. They also

interfere with mechanical cultivation equipment such as plows, soil augers, and seed drills.

To assess the impacts to revegetation efforts from stony-rocky soils, the centerlines of the Proposed Route and Route Alternatives in each segment were compared to the STATSGO GIS data file for soils containing greater than 20 percent by weight soil particles greater than 2 mm and the area of stony-rocky soils (in acres) was determined. The proportion of stony-rocky soils was expressed as a percentage of the total Analysis Area for the segment. To disclose overall impacts by segment, the area containing stony-rocky soils was identified along the construction and operations disturbance areas of the Proposed Route and compared to the stony-rocky soil areas for the construction and operations disturbance areas of the feasible alternatives.

Droughty Soil

Droughty soils contain a texture of sandy loam or coarser and are moderately to excessively well drained. Due to their low water-holding capacity, droughty soils may not hold enough water within the root zone to support plant life, making revegetation difficult. In the Project EPMs (see Appendix C-1), the Proponents commit to mulching and stabilizing droughty soils to minimize wind erosion and conserve soil moisture (SW-13). A soil was considered droughty if it has sandy loam or coarser texture, and drainage class of moderately to excessively well drained.

To assess the impacts to droughty soils, the centerlines of the Proposed Route and Route Alternatives in each segment were overlaid on the STATSGO GIS data files for soils with sandy loam or coarser texture and drainage class moderately to excessively well drained. The droughty soil acreage was then determined, and the acreage was expressed as a percentage of the total Analysis Area for the segment. To disclose the overall extent of droughty soil by segment, the droughty soil areas were identified within the construction and operations disturbance areas of the Proposed Route and compared to the droughty soil in the construction and operations disturbance areas of the feasible alternatives.

Shallow Bedrock

According to NRCS soil descriptions, shallow bedrock is defined as bedrock occurring within 20 inches of ground surface. Bedrock is considered as moderately deep between 20 and 40 inches, as deep from 40 to 60 inches, and as very deep if greater than 60 inches. The bedrock classifications from shallow to deep were examined and are referred to as “shallow bedrock” because they occur within 5 feet of ground surface, the area where most Project disturbance would occur. Blasting would be necessary in the footings of transmission line towers and possibly other structures, in areas where shallow bedrock would be encountered. This blasting could result in mixing of topsoil and subsoil, and an increase in the stony-rocky component in these areas, making revegetation difficult. The STATSGO database provided a category for bedrock of 51 inches below ground surface; therefore, the analysis here assumes that bedrock less than 51 inches that is disturbed during construction could negatively affect revegetation efforts. The evaluation of bedrock in this section is strictly relative to a soil’s ability to sustain revegetation. Section 3.14 – Geologic Hazards and Section 3.16 – Water Resources define shallow bedrock at a deeper level, and the effects presented in the

other sections are relative to destabilizing geological hazards (Section 3.14) or blasting effects to groundwater wells (Section 3.16). This is the reason for the differing definitions of shallow bedrock and the different percentages of shallow bedrock in the Analysis Areas.

To assess the impacts to revegetation efforts from shallow bedrock, as defined above, the centerlines of the Proposed Route and Route Alternatives in each segment were compared to the STATSGO GIS data file for soil profiles listing bedrock at 51 inches or less below ground surface. The proportion of soil having shallow bedrock was expressed as a percentage of the total Analysis Area for the segment. To disclose overall shallow bedrock impacts by segment, the acreage of shallow bedrock was identified along the construction and operations disturbance areas of the Proposed Route and compared to the amount of soil containing shallow bedrock (in acres) for the construction and operations disturbance areas of the feasible alternatives.

Hydric Soil

Hydric soils are formed under saturation, flooding, or ponding for sufficient period to develop anaerobic characteristics in the upper soil horizon. Hydric soils, combined with surface water or shallow groundwater and indicative vegetation species, are necessary indicators of wetlands. Disturbance of hydric soils may result in decreased water storage capacity of soil, decreased soil porosity, and decreased ability to replace hydrophytic vegetation. The STATSGO database delineates hydric soils, and the areas of hydric soil were reviewed in the Analysis Areas, and the amount of hydric soil was compared between the Proposed Route and feasible alternatives.

The estimated extent of wetlands, based strictly on vegetation mapping conducted for this project, is more fully discussed in Section 3.9 – Wetlands and Riparian Areas. Section 3.9 also contains mitigation measures proposed to protect wetlands and hydric soils. All areas estimated as wetlands in Section 3.9 presumably contain hydric soils. However, substantially more wetland acreage is estimated from the vegetation mapping when compared to the amount of hydric soils reported in the STATSGO database. The actual extent of wetlands (and therefore hydric soils) would be determined after a route has been selected.

To assess the areas with hydric soils based on the STATSGO data, the centerlines of the Proposed Route and Route Alternatives in each segment were overlaid on the STATSGO GIS data file for hydric soils and the acreage was determined. The hydric soil proportions were determined and their area expressed as a percentage of the total Analysis Area for the segment. To disclose overall impacts to hydric soils by segment, the hydric soil areas were identified within the construction and operations disturbance areas of the Proposed Route and compared to the hydric soil areas in the construction and operations disturbance areas of the feasible alternatives.

3.15.1.5 Existing Conditions

The Project area contains soils of several major soil orders, including Entisols, Aridisols, and Mollisols. Also included are small areas of Inceptisols and Alfisols in mountainous areas. The soil orders, and the physical characteristics listed in the Section 3.15.1.4 –

Methods above, were used to summarize existing soil conditions. Table 3.15-1 presents soil factors that were used to characterize Project soil conditions.

Erosion Potential

The soil characteristics of wind erodibility, K Factor, and slope were used to evaluate erosion potential. All of the segments contain at least some soil with a high potential for wind erosion. Nearly all of the soils in Segments 3 and 6 are highly wind erodible (98 percent). Soils in Segments 2, 4, and 10 have high wind erosion potential in at least 50 percent of their Analysis Areas. Only the Segment 5 Analysis Area contains a low percentage of wind erodible soil, at 5 percent. The erosion potential (high K Factor) ranged from 2 percent for Segment 2 to 63 percent for Segment 5. K Factor data suggest that Segments 1 through 4 have much lower erosion potential compared to Segments 5 through 10. Segments 5 and 7 are much steeper than any of the other segments, with steep slopes over 30 percent of their area. The other segments range from 0 to 14 percent steep slopes. Taken collectively, all of the Analysis Areas contain at least one characteristic that would result in vulnerability to soil erosion. Segments 2, 3, 4, 6, and 10 contain the highest potential for wind erosion, Segments 5, 7, 8, 9, and 10 contain high percentages of area with high erosion potential (K Factor). Segments 5 and 7 have the steepest slopes.

Soil Loss Tolerance

There are large areas with low soil loss tolerances in nearly all of the Analysis Areas. A review of T Factors within the Analysis Areas indicates that Segment 2 has no land designated as low soil loss tolerance, but all other segments contain moderate to high percentage of area with low soil loss tolerances. Segments 3, 4, 6, 8, and 9 contain low soil loss tolerances in 50 percent or greater of their areas.

Prime Farmland

Prime farmland soils provide an important economic base to southern Idaho. Dry land and irrigated farming covers the majority of private land in southern Idaho and 28 to 41 percent of Segments 5, 7, 8, 9, and 10 contain prime farmland. Much of the prime farmland in Idaho is currently used for farming. Areas of prime farmland soil that are not currently used would be good candidates for revegetation, provided the sites contain adequate moisture. A short growing season and lack of water result in the absence of prime farmland in Wyoming.

Soil Reclamation Potential

Several soil factors were used to evaluate the soil's potential for use in soil reclamation and revegetation, including soil order, soil compaction potential, stony-rocky soil, droughty soil, hydric soil, and depth to bedrock.

A review of the STATSGO soil data indicates that highly compaction-prone soil is rare. Two percent of Segment 4 contains highly compaction-prone soil; otherwise, it was absent in all other segments. The sandy desert soils found in most of the Project area are not especially prone to compaction.

Table 3.15-1. Soil Factors in the Gateway West Project Analysis Area (percent of area)

Segment Number	Total Analysis Acreage	Erosion Factors			Sensitive Soils		Factors Affecting Reclamation					Permanent Soil Loss
		Highly Wind Erodible[1/]	High K Factor[2/]	Slope Greater Than 25%	Low T Factor[3/]	Prime Farmland[4/]	Highly Compaction Prone[5/]	Stony / Rocky[6/]	Droughty[7/]	Shallow Bedrock[8/]	Hydric Soil	
1	177,561	36	–	14	19	–	–	19	55	10	–	<1
2	77,268	60	2	–	–	–	–	0	60	–	–	1
3	35,635	98	21	1	74	–	–	1	79	67	–	1
4	262,621	57	18	11	50	–	2	28	63	38	4	<1
5	102,093	5	63	36	35	37	–	38	40	8	–	<1
6	1,304	98	2	–	75	18	–	–	98	47	–	<1
7	292,396	23	49	34	43	41	–	41	52	12	–	<1
8	159,253	40	41	–	69	28	–	1	53	16	–	<1
9	229,434	48	43	1	60	32	–	10	42	42	–	<1
10	21,877	55	60	–	38	35	–	16	38	21	–	<1

1/ Includes wind erodibility groups ≥86 T/A/Y
2/ Includes K Factors ≥ 0.37 T/A/Y
3/ Includes T Factors ≤ 2/T/A/Y
4/ Idaho data from STATSGO, Wyoming data from Soil Survey Geographic database.
5/ Includes moderately to poorly drained soils with clay loam or finer textures.
6/ Includes soil with 20 percent or more by weight rocks ≥ 2 mm (gravel, cobbles, stones, or boulders).
7/ Includes sandy loam or coarser texture and moderately to excessively well drained soils.
8/ Includes exposed bedrock (from soil texture) and depth to bedrock less ≤ 51 inches.

The greatest percentage of stony-rocky soil in the Analysis Area is present in Segments 4, 5, and 7 with stony-rocky soils covering 28 to 41 percent of the Analysis Areas. The other segments contain less than 20 percent stony-rocky soil. Fourteen soil borings were drilled where no gravel was noted on the boring logs, despite being identified by STATSGO as stony-rocky soil. Two boreholes contained gravel soils, although STATSGO did not identify stony-rocky soil. These differences suggest that the percentage of actual stony-rocky soil may be slightly different than that reported here and in Table 3.15-1.

Shallow bedrock is found in all segments except Segment 2. Droughty soil is common throughout the Project. Segments 1, 2, 3, 4, 6, and 8 contain at least 50 percent droughty soil. According to the STATSGO database, hydric soils are not common in the Analysis Area; they are found only in 4 percent of the area of Segment 4. However, future Project wetland delineations would probably result in the discovery of additional hydric soil acreage.

Permanent Soil Loss

The acreage of permanent soil loss equals the operations disturbance area (the area beneath the Project structures and access roads). For the Proposed Route, the permanent soil loss is estimated at 3,029 acres, less than 1 percent of the Analysis Area.

3.15.2 Direct and Indirect Effects

This section is organized to present effects to soils from construction, then operation, followed by decommissioning activities for the proposed Project. Route Alternatives are analyzed in detail in Section 3.15.2.3. There is a Design Variation involving use of two single-circuit structures proposed by the Proponents for Segments 2, 3, and 4 (see Section 2.2 for details), which is analyzed in Section 3.15.2.4 and a Structure Variation that is analyzed in Section 3.15.2.5. The Proponents have also proposed a Schedule Variation, analyzed in Section 3.15.2.6, in which one of the two single circuits to be constructed in Segments 2, 3, and 4 and a portion of Segment 1W would be built on an extended schedule with construction beginning approximately 2.5 years after completion of the initial construction.

Mitigation measures or EPMs are presented in detail within this section only if it is the first time they have been discussed in Chapter 3; all other measures are referenced or summarized. A comprehensive list of all Proponent-proposed EPMs and Agency-required mitigation measures can be found in Table 2.7-1 of Chapter 2.

Plan Amendments

Proposed amendments are summarized in Table 2.2-1 of Chapter 2 and detailed in Appendices F and G. Amendments are needed to permit the Project to cross various areas of BLM-managed and NFS lands. Effects described for areas requiring an amendment in order for the Project to be built would only occur if the amendment were approved. Amendments that alter land management designations could change future use of these areas. No amendments specific to soils are proposed for the Project and no impacts to soils resulting from approving the amendments beyond the impacts of the Project are anticipated.

3.15.2.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be constructed or operated. No Project-related impacts to soils would occur.

3.15.2.2 Effects Common to All Action Alternatives

Construction

Construction Erosion Effects

Project construction activities that would affect soils include clearing, grubbing, and grading along the ROW and at additional temporary workspaces; trenching; backfilling; excavating; and construction of permanent structures, such as transmission line towers, access and service roads, co-generation sites, and substations. The total Project construction disturbance area consists of approximately 16,000 acres, which is approximately one percent of the Analysis Area. The construction disturbance area was calculated by establishing an assumed construction disturbance area around all Project features, such as transmission line towers, regeneration sites, substations, staging areas, laydown yards, and access roads. This predicted area was entered into a GIS database and compared to the areas of the various soil factors used for the soils analyses using the methods described in Section 3.15.1.4. The estimated soil effects within the construction disturbance area are presented in Table D.15-1 in Appendix D. Ground clearing during construction would increase the potential for erosion. Certain soils within the Project area would be more sensitive to soil impacts, including soils with a low soil loss tolerance, and soils qualifying as prime farmland. Removal of protective vegetation would expose soil to potential wind and water erosion. The construction acreage is larger than the operations area due to the need for tower erection areas at each structure, laydown yards, staging areas, and tensioning sites. The areas used only for construction would be reclaimed as soon as possible, which may include regrading to original land contours, topsoil replacement, and revegetation.

Portions of all Segments except Segment 2 contain areas with low soil loss tolerance, defined as soil loss tolerance less than or equal to 2 T/A/Y. EPMs and Agency-proposed mitigation measures would be used to minimize soil losses. When effectively used, these would ensure that soil loss is minimized and soil loss tolerances would meet applicable RMP and Forest Plan guidelines.

Prior to construction, wetland delineations would be necessary in areas crossing or adjacent to assumed wetlands. At that time, the amount of hydric soils/wetlands would be re-evaluated and measures would be implemented to preserve or reclaim those acreages during construction and operation. The procedures presented in the Reclamation Plan (Appendix C-2), EPMs included in Appendix C-1, and the mitigation measures contained in Section 3.9 – Wetlands and Riparian Areas would be used to minimize effects to hydric soils and wetlands. FSH 2509.22, Soil and Water Conservation Practices, contains mitigation measures for hydric soils to be used on NFS land.

Reclamation would be necessary in disturbed soil areas. Appendix C-2 presents a Framework Reclamation Plan that the Proponents would use for Project reclamation. The Framework Reclamation Plan presented in Appendix C-2 and the EPMs presented

in Appendix C-1 also contain many BMPs that would be used during Project construction, operations, and reclamation. Erosion in all areas could be exacerbated unless revegetation efforts are implemented as soon as possible following disturbance.

Construction on Sensitive Soils

For the effects analysis, soils with low soil loss tolerances and prime farmland soils were combined and considered as sensitive soils due to the special characteristics that separate them from other Project soils. Potential soil impacts to prime farmland from transmission line construction include soil erosion, damage to the agricultural land drainage and irrigation systems, mixing of topsoil and subsoil, potential loss of topsoil, and soil compaction. Prime farmland within the construction zone would be unavailable to agriculture during the construction interval. Construction on soil with low soil loss tolerance may cause erosion. If blasting is necessary for placement of foundations, the rocky component of soils may increase in blasting areas. Based on all of the soil factors, it appears that accounting for droughty, rocky conditions would be most critical to successful revegetation.

It may be necessary to build construction access roads on sensitive soil areas, including highly erosive soils, steep slopes or near NHT trails. These construction roads would be restored and an alternative access route would be designated for operations.

The reclamation measures presented in Appendix C-2 and EPMs in Appendix C-1 would keep soil losses to a minimum. Areas not also used for operations would be reclaimed as soon as possible following construction.

Soil Compaction

Soil compaction would occur in the construction disturbance area from driving vehicles and heavy equipment over the soil. Areas under roadways, structures, and high-use areas would be most affected. Some soils, such as very fine-grained, poorly drained soil have the greatest potential for soil compaction; however, all soil would have some potential for soil compaction, and compacted soil would need to be ripped, loosened, or otherwise treated using BMPs at the end of the Project to restore their productivity.

Accidental Spills

During construction, use of trucks, heavy equipment, or stored supplies could result in accidental discharge of fuel, lubricants, automotive fluids, or other chemicals. Although the potential exists, these chemical releases would be accidental, occasional, and of limited extent. BMPs for construction housekeeping, spill prevention, and cleanup would be used to prevent and remediate accidental chemical releases. Therefore, chemical releases would not result in widespread or long-term effects to Project soils.

The Proponents have identified and are committed to implementing extensive EPMs related to controlling soil erosion in accordance with NPDES requirements and spill prevention and containment in accordance with industry standards. These EPMs are listed in Appendix C-1, Attachments B and C, and are included below.

SW-1 The appropriate NPDES permits for construction activities that disturb one acre or more of land will be obtained from the Department of Environmental Quality and USEPA or their designees.

SW-2 NPDES permit requirements will be met. This includes implementing and maintaining appropriate BMPs for minimizing impacts to surface water.

SW-3 One or more responsible persons will be designated to manage stormwater issues, conduct the required stormwater inspections, and maintain the appropriate records to document compliance with the terms of the NPDES permit.

SW-4 The SWPPPs will be modified as necessary to account for changing construction conditions.

SW-5 The SWPPPs will identify areas with critical erosion conditions that may require special construction activities or additional BMPs to minimize soil erosion.

SW-6 Migration of construction-related sediment to all adjacent surface waterbodies will be prevented.

SW-7 Stormwater BMPs will be maintained on all disturbed lands during construction activities, as described in the SWPPP.

SW-8 Approved sediment and erosion control BMPs will be installed and maintained until disturbed areas meet final stabilization criteria.

SW-9 Temporary BMPs will be used to control erosion and sediment at staging areas (equipment storage yards, fly yards, lay down areas) and substations.

SW-10 The construction schedule may be modified to minimize construction activities in rain-soaked or muddy conditions.

SW-11 Damaged temporary erosion and sediment control structures will be repaired in accordance with the SWPPP.

SW-12 Upon completion of construction, permanent erosion and sediment BMPs will be installed along the transmission line within the ROW, at substations, and at related facilities in accordance with the SWPPPs.

SW-13 In areas of droughty soils, the soil surfaces will be mulched and stabilized to minimize wind erosion and to conserve soil moisture in accordance with the SWPPPs.

SPC-1 Construction industry standard practices and BMPs will be used for spill prevention and containment.

SPC-2 Construction spills will be promptly cleaned up and contaminated materials hauled to a disposal site that meets local jurisdictional requirements.

SPC-3 All staging areas will contain fueling areas with containment. Where fueling must be conducted along the ROW, the plan will specify BMPs.

SPC-4 If an upland spill occurs during construction, berms will be constructed with available equipment to physically contain the spill. Absorbent materials will be applied to the spill area. Contaminated materials will be excavated and temporarily placed on and covered by plastic sheeting in a containment area a minimum of 100 feet away from any wetland or waterbody, until proper disposal is arranged.

SPC-5 If a spill occurs which is beyond the capability of on-site equipment and personnel, an Emergency Response Contractor will be identified and available to further contain and clean up the spill.

SPC-6 For spills in standing water, floating booms, skimmer pumps, and holding tanks will be used as appropriate by the contractor to recover and contain released materials on the surface of the water.

SPC-7 If pre-existing contamination is encountered during operations, work will be suspended in the area of the suspected contamination until the type and extent of the contamination is determined. The type and extent of contamination; the responsible party; and local, state, and federal regulations will determine the appropriate cleanup method(s) for these areas.

SPC-8 The SPCC Plan will include details on the types and quantities of absorbent and protective materials (e.g., visqueen, booms) that must be readily available to construction personnel and requirements for the restocking of materials.

SPC-9 Materials such as fuels, other petroleum products, chemicals, and hazardous materials including wastes will be located in upland areas at least 500 feet away from streams, 400 feet for public wells, and 200 feet from private wells.

SPC-10 Pumps and temporary fuel tanks for the pumps will be stored in secondary containment. Containment will provide a minimum volume equal to 110 percent of the volume of the largest storage vessel located in the yard.

The Agencies have identified the following mitigation measures to provide additional protection of soils during construction. The Agencies recommend that these measures be applied to the entire route:

SOIL-1 Efforts will be made to preserve topsoil and minimize mixing with subsoil. In agricultural areas, the landowner or land management agency will be asked to provide input on placement of removed topsoil. The Wyoming State Reclamation policy and applicable Agency management plan requirements for soil management will be followed. Soil disturbances in agricultural areas will be developed to minimize impacts to existing agricultural activities where possible. Unless the landowner or land management agency specifically approves otherwise, the Proponents will prevent the mixing of topsoil with subsoil by stripping topsoil from the portion of the construction work area that will be restored (construction

pad, storage yards, and fly yards) in actively cultivated or rotated croplands and pastures and other areas at the landowner's or land-managing agency's request. Where topsoil segregation is required, the Proponents will maintain separation of salvaged topsoil and subsoil throughout all construction activities. Immediately after construction, topsoil will be restored to the areas not dedicated to operational requirements and revegetated as specified in the EPMs (see also measure AGRI-6 in Section 3.18 – Agriculture).

SOIL-2 The Proponents will submit a Compaction Monitoring Plan for review and Agency approval prior to construction that specifies the conditions under which construction will either not start or will be shut down due to excessively wet soils. Conditions will be measurable in the field and easy to demonstrate to construction workers.

SOIL-5 Disturbed soil will not be allowed to support the growth of noxious weeds, or invasive weedy species. Prevention of noxious weeds will apply to all phases of the Project.

SOIL-6 Detrimental soil disturbance such as compaction, erosion, puddling, and displacement will be limited or mitigated to meet long-term soil productivity goals on NFS lands. Treatment should include road ripping, frequent waterbars, cross-ditching (e.g., rolling-dips), or other methods to reduce compaction while preventing gully formation. Ripping pattern should be altered to a crossing, diagonal, or undulating pattern of tine paths to avoid concentrated runoff patterns that can lead to gullies.

SOIL-7 The Proponents are responsible for monitoring to ensure soil protection is achieved and providing monitoring reports on reseeding success or other methods to stabilize soils to the Forest Service by the end of each growing season for areas on NFS lands.

SOIL-8 Reclamation of all temporary disturbances on NFS lands (such as road cuts) should include replacement of material to original contours. Re-compaction to pre-existing compaction percentage (which should be identified before disturbance) should be included in the plan. Guidelines for streambank re-compaction to maximize vegetative regrowth and mechanical stability are covered in USACE publication ERDC TN-EMRRP-SR-26 (Goldsmith et al. 2001).

SOIL-9 On federal land, follow land management plan requirements on the location of waste material (silt, sand, gravel, soil, slash, debris, chemical, etc.).

SOIL-10 On NFS lands, soil resources will be inventoried to National Cooperative Soil Survey Standards, and the volumes and suitability of soil resources for reclamation will be determined prior to disturbance.

SOIL-11 In specific sensitive areas (such as erosive soils or steep slopes) on lands managed by the Kemmerer FO, the access road used for construction will be restored and an alternative access route for operations designated.

Operations

Operations Erosion Effects

The erosional effects from Project operations would consist of soil disturbances necessary to maintain the transmission lines in working order and conduct necessary repairs. Stormwater BMPs, including erosion and sediment control structures, as well as new culverts would require inspection, maintenance, and repair through the operational life of the Project to minimize soil erosion or sedimentation to surface water. The Proposed Route operations disturbance area is about 3,000 acres, or approximately 19 percent of the construction area disturbance. Due to the smaller size of the operations area, the erosion effects in this area would be much less than for the construction area but would last for a much longer time. The operations area consists of buffered areas surrounding transmission line towers, regeneration sites, substations, access roads, and other areas that would remain during Project operations. The predicted operations area was entered into a GIS database and compared to the areas of the various soil factors used for the soil analyses using the methods described in Section 3.15.1.4. The estimated effects to soil within operations disturbance areas are presented in Table D.15-2, Appendix D.

The treatment of soils in the operations area would result in more stable soil conditions than those found during construction. For instance, substations would be covered with free draining rock, which would isolate native soil from erosive conditions. Roads retained for operations would be seeded with a grass mix and allowed to revegetate and thereby minimize the surface exposed to erosive conditions. For normal maintenance activities, an 8-foot portion of the road would be used and vehicles would drive over the vegetation. For non-routine maintenance requiring access by larger vehicles, the full width of the access road may be used. Access roads would be repaired, as necessary, but not be routinely graded again to minimize impact to vegetation. Appendix C-1, Attachment B, includes EPMs that specify that stormwater protection measures would be employed to minimize erosion and sedimentation to surface water.

Sensitive Soil Effects

Reclamation after construction would minimize effects to soils with low soil loss tolerance during the operations phase of the Project. The area of loss of prime farmland would be less than during construction but for the longer time interval, 50 years compared to 2 years for construction.

Soil Compaction

No additional soil compaction would occur during Project operations. Vehicle travel would occur predominantly on established access roads.

Permanent Soil Loss

The area under the footprint of structures would result in a long-term loss of that acreage to other productive soil uses. Structures in the operations area were

considered to result in “permanent” soil loss. However, it is not really permanent, and following Project decommissioning, those areas would be reclaimed for other beneficial uses. The acreage of permanent soil loss would depend on the route alternatives selected; the longer the route, the more acres of soil that would be permanently removed from production.

The Proponents have identified and are committed to implementing extensive EPMs related to controlling soil erosion in accordance with NPDES requirements and spill prevention and containment in accordance with industry standards. These EPMs are listed in Appendix C-1 and are listed in the preceding section.

Decommissioning

Decommissioning would result in temporary soil effects of approximately the same magnitude as during construction; therefore, the same practices used during construction to minimize effects to the soil would be used during decommissioning activities. All transmission line structures and associated features would be removed, and disturbed areas would be reclaimed. Based on the descriptions of soil orders, the Mollisols found in Segments 1, 4, 5, and 7 were assumed to be most suitable for reclamation and revegetation, given the assumed slightly wetter, cooler climate in these segments; existing grassy vegetation; and the organic content of these soils. Variations in soil properties, including wind and water erosion potential, soil moisture, texture, and drainage characteristics, would cause soils to be affected differently in regard to erosion potential, compaction potential, and their suitability for reclamation and revegetation.

Decommissioning activities would include excavation to remove structures. This temporarily exposes bare soil to erosional effects. Grading may occur to restore natural land contours, or to spread stockpiled topsoil onto reclaimed land. Reclaimed roads would be ripped to reduce compaction. During decommissioning, those areas with “permanent” topsoil removal would be reclaimed, and revegetated to pre-construction conditions. These activities would result in temporary exposure of bare soil to increased erosion.

The Agencies have identified the following mitigation measures to protect soils during decommissioning and the Proponents have agreed to incorporate them in their EPMs:

SOIL-3 During decommissioning, some obviously compacted areas, such as established service roads, will require loosening prior to revegetation. If necessary to re-establish vegetation, the Proponents will use a ripper blade, till, or similar instrument to loosen the surface soil layer.

SOIL-4 Reclamation will include revegetation unless pre-existing conditions were not vegetated (rocky areas, agricultural fields). On public land the appropriate agency will provide input on the extent of reclamation, the type of vegetation to be planted, and the monitoring necessary to ensure reclamation success.

3.15.2.3 Proposed Route and Alternatives by Segments

This section details the differences among alternatives for soils effects from Project construction, operations, and decommissioning. Tables D.15-1 and D.15-2 in Appendix D present the results of soil analyses for the Proposed Route and Route Alternatives.

Segment 1E

Segment 1E, as proposed, would link the Windstar and Aeolus Substations in south-central Wyoming with a 100.6-mile 230-kV single-circuit transmission line. Twenty acres of the expansion of Windstar and Aeolus Substations and 0.5 acre for one regeneration site are attributed to Segment 1E. Alternative 1E-A is a 16.1-mile alternative along the north end of Segment 1E, which was the Proponents' initial proposal before moving the Proposed Route at the suggestion of local landowners to avoid the more settled area around Glenrock. Alternative 1E-B is 21.4 miles longer than the Proposed Route but is being considered by the Proponents because it would avoid a Wyoming-designated sage-grouse core area to the east. The BLM has required the consideration of Alternative 1E-C, which parallels Segment 1W 230-kV lines into the Aeolus Substation (see Appendix A, Figure A-2).

As shown in Table D.15-1 in Appendix D, the construction of the proposed Segment 1E would result in disturbance of approximately 1,096 acres that would be exposed to the effects of soil erosion and compaction. There would be 5 acres of disturbance, distributed along the Proposed Route for Segment 1E, associated with cut and fill methods and the installation of temporary and permanent culverts where access roads cross streams. About 26 percent of the Segment 1E construction disturbance area would contain soil with high wind erosion potential and 18 percent of the construction disturbance area would contain steep slopes. About 21 percent of Segment E would have a low soil loss tolerance. Approximately 25 percent of the Proposed Route would contain stony-rocky soil.

Table D.15-1 lists the acreages of the soil factors for each alternative that would be disturbed during construction. As shown in Table D.15-1, Alternative 1E-A would have less disturbance than the comparison portion of the Proposed Route. This is because Alternative 1E-A would be adjacent to the Proposed Route for Segment 1W(c) and would use the same fly yards and staging areas. These acreages are accounted for in Segment 1W(c). Alternative 1E-B is 21.4 miles longer than the comparison portion of the Proposed Route. The soils would be similar in both cases but the disturbed acreages for the various soil types would be proportionately larger in Alternative 1E-B than in the comparison portion of the Proposed Route. Alternative 1E-C would parallel the Proposed Route for Segment 1W(a) and be substantially shorter than the comparison portion of the Proposed Route. Alternative 1E-C would use the same fly yards, staging areas, and some of the access roads that are accounted for in Segment 1W(a). As a result, Alternative 1E-C would disturb considerably less acreage than the comparison portion of the Proposed Route.

Table D.15-2 in Appendix D lists the acreages of the soil factors for each alternative that would be impacted by operations. For the Proposed Route, 283 acres would be disturbed. Each alternative would have a proportionately larger or smaller disturbance area, depending primarily on the relative length of the alternative compared to Segment

1E. Alternative 1E-C would be the most favorable, resulting in a disturbance area of 92 acres.

As noted in Section 3.15.2.2, decommissioning and reclamation would result in temporary soil disturbance of approximately the same magnitude as during construction. Similar construction equipment is involved. Therefore, the disturbance acreages presented in Table D.15-1 are indicative of the acreages that would be impacted during decommissioning of Segment 1E or any of the alternatives. The final step of decommissioning, however, is reclamation. This step would restore the areas to pre-construction conditions and mitigate future soil impacts, although the preponderance of droughty soils will make reclamation challenging.

A portion of the Proposed Route for Segment 1E is located on the Medicine Bow-Routt NFs (see Tables D.15-3 and D.15-4). The Proposed Route would affect approximately 25 acres during construction and 8 acres during operations. None of the soils crossed on the Medicine Bow-Routt NFs are highly erodible. Alternatives 1E-A and 1E-B would not be located in the Medicine Bow-Routt NFs. Alternative 1E-C would affect approximately 12 acres during construction and 4 acres during operations, which is 13 and 4 acres, respectively, less than the comparison portion of the Proposed Route. There would be a long-term loss of 5 acres of productive soils from the Segment 1E Proposed Route and 3 acres from Alternative 1E-C. The effects on NFS lands are shown in Tables D.15-3 and D.15-4.

Segment 1W

Segment 1W is composed of two parts, Segment 1W(a) and 1W(c), both of which would consist of a new 230-kV line for part of their length and a reconstruction of an existing 230-kV line for the remaining part. Segment 1W(a) would be about 76.5 miles long, and would extend from the Windstar Substation to the Aeolus Substation. Segment 1W(c) would be about 70.6 miles long, and would extend from the Dave Johnson Power Plant to the Aeolus Substation. Alternative 1W-A is a 16.2-mile alternative located near the town of Glenrock, which was the Proponents' initial proposal before moving the Proposed Route at the suggestion of local landowners in order to avoid the more settled area around Glenrock. Twenty acres of the proposed expansion at the Windstar and Aeolus Substations are attributed to Segment 1W(a) and 3 acres of the expansion at the Heward Substation and 17 acres of the expansion at the Windstar and Aeolus Substations are attributed to Segment 1W(c). There are no Route Alternatives proposed south of that point (see Appendix A, Figure A-2).

As shown in Table D.15-1, construction of the proposed Segment 1W(a) would disturb approximately 623 acres. The construction disturbance area of proposed Segment 1W(c) would be 817 acres. There would be 3 acres of disturbance, distributed along these segments, associated with cut and fill methods and the installation of temporary and permanent culverts where access roads cross streams. Alternative 1W-A would be shorter than Segment 1W(a) and mostly parallels Segment 1W(c). As a result, the disturbance effects associated with construction of Alternative 1W-A would be greater than for the comparison portion of Proposed Route (see Table D.15-1).

As shown in Table D.15-2, the operations areas of Segment 1W(a) and 1W(c) Proposed Routes would result in the permanent disturbance of 182 acres and 144 acres of soil, respectively. As described in the previous paragraph relating to construction, Alternative 1W-A would result in a somewhat smaller disturbance acreage during operations than the comparison portion of the Proposed Route because it is shorter.

Approximately 29 percent of the soil in Segment 1W is considered droughty and soils are moderately wind erodible. As noted in Section 3.15.2.2, decommissioning and reclamation would result in temporary soil disturbance of approximately the same magnitude as during construction and as shown in Table D.15-1 for each segment of Alternative 1W-A. The final step of reclamation would restore the areas to pre-construction conditions and mitigate future soil impacts. The droughty portions of the alternative will make reclamation challenging.

A small portion of Segment 1W would be located on the Medicine Bow-Routt NFs (see Tables D.15-3 and D-15-4). The construction and operations phases of the Proposed Route for Segment 1W(a) would affect 16 acres and 5 acres, respectively. The Proposed Route for Segment 1W(c) would affect 27 acres and 4 acres, respectively. None of the soils crossed on the Medicine Bow-Routt NFs acreage are highly erodible. There would be a long-term loss of 2 acres of NFS land for the Segment 1W(a) Proposed Route and 4 acres for the Segment 1W(c) Proposed Route. Alternative 1W-A is not located in the Medicine Bow-Routt NFs.

When reviewing all of the soil factors, the Proposed Route would result in the least overall impacts to soil in Segment 1W, mainly due to fewer erosional effects and avoidance of shallow bedrock.

Segment 2

Segment 2, as proposed, would link the Aeolus and Creston Substations in southeast Wyoming with two 500-kV circuits on one structure. One circuit would be operated at 230 kV during the initial phase of the Project. Its total proposed length is 96.7 miles. Fifty-two acres of the expansion of the Aeolus Substation and the construction of the Creston Substation and 0.5 acre for one regeneration site are attributed to Segment 2. There are three Route Alternatives, two of which are near the community of Fort Fred Steele. Alternative 2A at 28.4 miles long is being considered by the BLM because it remains in the WWE corridor nearer the town and the state historic site, and Alternative 2B, at 6.2 miles, is closer to the community than the comparison portion of the Proposed Route and was the initially proposed route before the Proponents responded to local suggestions and relocated the Proposed Route farther to the south. Alternative 2C is a 24.4-mile alternative located north of Hanna, Wyoming. It is being evaluated at the recommendation of the Wyoming Governor's office to follow a utility corridor approved by that office for minimizing effects to sage-grouse (see Appendix A, Figure A-3).

As shown in Table D.15-1, Segment 2 construction would disturb approximately 1,544 acres of soil. There would be 4 acres of disturbance distributed along Segment 2 associated with cut and fill methods and the installation of temporary and permanent culverts where access roads cross streams. The Proposed Route and Route

Alternatives would be highly wind erodible, with 5 percent of the Proposed Route considered highly erodible. Segment 2 would not contain soil with low soil loss tolerance, and no prime farmland would be present. About 53 percent of the soils would be considered droughty; however, stony-rocky soil is not present. Overall, there would be little difference with respect to soil disturbance impacts between the Proposed Route for Segment 2 and Alternatives 2A, 2B, and 2C. The soils conditions would be similar because the routes would be in relative close proximity to each other. Alternative 2B would result in about 77 percent of the disturbance as the comparison portion of the Proposed Route. The differences in soil effects between the Route Alternatives and the Proposed Route would be minor.

As shown in Table D.15-2, the Segment 2 operations area would comprise 401 acres. The disturbed area associated with operations in all of the alternatives would be approximately the same as in the respective comparison portion of the Proposed Route. This is because their lengths would be nearly identical.

As noted above, Segment 2 would contain 53 percent droughty soil, which would affect the success of reclamation. Rocky soils and shallow bedrock would be absent. As noted in Section 3.15.2.2, decommissioning and reclamation would result in temporary soil disturbance of approximately the same magnitude as during construction as shown in Table D.15-1. As noted in the preceding construction paragraph, there would be little difference between the disturbance footprint of the Proposed Route for Segment 2 or any of the alternatives, although Alternative 2B would result in a slightly less acreage. There would be less difference during decommissioning than construction because the overall lengths are nearly identical. The droughty nature of the soils throughout Segment 2 would make restoration challenging. No NFS land would be present in Segment 2.

Segment 3

Segment 3, as proposed, would link the Creston and Anticline Substations in southeast Wyoming with two 500-kV circuits on one structure. One circuit would be operated at 230 kV during the initial phase of the Project. Its total proposed length between those two substations is 46.7 miles. Sixty-nine acres of the construction of the Anticline and Creston Substations are attributed to Segment 3. Segment 3 would also link the Anticline and Jim Bridger Substations with a 4.3-mile 230-kV line and a 5.5-mile 345-kV line and includes the 10-acre expansion of the Jim Bridger 345-kV Substation. There are no alternatives proposed along this segment (see Appendix A, Figure A-4).

As shown in Table D.15-1 in Appendix D, Segment 3 construction would disturb about 863 acres. There would be 3 acres of disturbance, distributed along Segment 3, associated with cut and fill methods and the installation of temporary and permanent culverts where access roads cross streams. Nearly all of the soil in Segment 3 would be highly wind erodible and 71 percent would be droughty. A total of 29 percent would be classified as highly erodible, 65 percent have a low soil loss tolerance, and 60 percent have shallow bedrock. There would be no prime farmland in Segment 3. Most of the soils in the Proposed Route for Segment 3 would be subject to wind erosion and they are not well-suited to support good vegetative cover. There are no Route Alternatives in Segment 3. The nature of the soils in Segment 3 makes it especially

important that disturbance during construction be minimized and as much acreage as possible be restored for operations when construction is complete.

Operations of the Proposed Route in Segment 3 would result in a disturbance area of 219 acres. As during construction, the soils in this segment would be susceptible to wind erosion. It will be important to minimize traffic during operations to reduce soil erosion potential and maintain the vegetation in restored construction areas.

Over 70 percent of the Proposed Route for Segment 3 would be considered droughty. The soil would not be very rocky, but 47 percent of the Analysis Area would be occupied by shallow bedrock. As noted in Section 3.15.2.2, decommissioning and reclamation would result in temporary soil disturbance of approximately the same magnitude as during construction as shown in Table D.15-1. The droughty characteristics of the soils in the Proposed Route for Segment 3 would make restoration of disturbed areas following decommissioning challenging. Therefore, as during construction, disturbance of soils should be kept to the minimum possible. No NFS land would be present in Segment 3.

Segment 4

Segment 4, as proposed, would link the Anticline Substation near the Jim Bridger Power Plant in southwestern Wyoming with the Populus Substation in Idaho with two 500-kV circuits on one structure. Its total proposed length is 203 miles. Eighty-nine acres of the construction of the Anticline Substation and the expansion of the Populus Substation and 1.5 acres for three regeneration sites are attributed to Segment 4. It has six Route Alternatives in the middle portion of its route but the first 52 miles to the east and the last 61 miles to the west (in Idaho) do not have any Route Alternatives. The middle section of the Proposed Route is 90.2 miles long, and its Route Alternatives vary from 85 to 102 miles long. These alternatives were proposed by the Wyoming Governor's office (4A, paralleling the existing 345-kV lines throughout); by the BLM Kemmerer FO (4B through 4E, including edits from various cooperating agencies), with the intent to avoid impacts to cultural resources to the extent practical; and by the Proponents (4F, attempting to avoid impacts to cultural resources while still remaining north of the existing lines) (see Appendix A, Figures A-5 and A-6).

As shown in Table D.15-1, construction of the Proposed Route for Segment 4 would disturb approximately 2,846 acres. Segment 4 would contain 6 acres of disturbance associated with cut and fill methods and the installation of temporary and permanent culverts where access roads cross streams. About 62 percent of Segment 4 soils are droughty and 46 percent are highly wind erodible. About 38 percent of the soils would have a low soil loss tolerance and about 31 percent would be highly erodible. Segment 4 would contain the only highly compactable soil along the entire transmission line, although the percentage of soil in this category would be only 4 percent, consisting of slightly more than 100 acres located in the Bear River drainage. As noted above, the Route Alternatives for the Segment 4 Proposed Route would be located in the middle portion and either decrease the segment length by 5 miles or less (Alternatives 4A and 4F) or increase the length by approximately 10 to 12 miles (Alternatives 4B, 4C, 4D, and 4E). The Proposed Route and each of the alternatives would have similar soils types. The relative construction disturbance acreages in each soil factor category are listed in

Table D.15-1 and tend to be proportional to the lengths of each alternative, with the Proposed Route generally having the least disturbed acreages in the critical soil types. The one exception is that the comparison portion of the Proposed Route would have a higher acreage in areas with slopes greater than 25 percent than all but Alternative 4F, but still only amount to about 3 percent of the length of the route. The Proposed Route in combination with Alternative 4A would have the least potential soils impacts at all stages of the Project in this segment.

According to the NRCS STATSGO database, hydric soils would be found only in Segment 4 and only in about 5 percent of the Analysis Area. The area of hydric soils predicted by STATSGO is strongly underestimated, based on the wetland analysis in Section 3.9 – Wetlands and Riparian Areas, which assumes wetlands or riparian areas are present in all segments except Segment 10. The quantity of wetlands/hydric soils would be determined after the routes have been established by conducting wetland delineations. All hydric soils would be preserved where possible or reclaimed using measures described in Section 3.9.

As shown in Table D.15-2, operations of the Proposed Route would result in permanent soil productivity loss on approximately 651 acres. The areas impacted by operations for the Proposed Route and Route Alternatives would be proportional to the relative lengths. Since the lengths vary by 5 percent less to 12 percent more than the comparison portion of the Proposed Route, the disturbed acreages would vary by similar percentages. The shorter alternatives (4A and 4F) would have the least amount of soil disturbance, followed by the Proposed Route; the longer alternatives (4B, 4C, 4D, and 4E) would have the greatest amount of disturbance.

As noted in Section 3.15.2.2, decommissioning and reclamation would result in temporary soil disturbance of approximately the same magnitude as during construction as shown in Table D.15-1. The droughty characteristics of much of the soil in Segment 4 would make restoration of disturbed areas following decommissioning challenging. Therefore, as during construction, disturbance of soils should be kept to the minimum possible. The disturbance areas during construction and operations would be proportional to the relative lengths of the Proposed Route and each Route Alternative.

Approximately 9.2 miles of the Proposed Route for Segment 4 would be located on the Caribou-Targhee NF (see Tables D.15-3 and D-15-4). This would occur in the western portion of the segment. The construction phase of the Proposed Route would disturb approximately 116 acres and operations would affect approximately 27 acres. All of the soil on the portion of the Proposed Route that crossed the Caribou-Targhee NF would be highly erodible, based on the NRCS STATSGO database. However, based on the Soil Survey for the Caribou NF (Forest Service 1990b), approximately 23 acres would be on soils with a high erosion potential and approximately 3 acres would be on unstable soil. Shifting the route 200 to 300 feet to the north for the last mile of the route on the Caribou-Targhee NF would avoid the unstable area and approximately 5 acres of soil with a high erosion potential. None of the soil would have low soil loss tolerance. The Project would result in a long-term loss of 27 acres of productive soil. None of the Route Alternatives would cross the NF.

A review of all the soil factors indicates the shorter alternatives (4A and 4F) would have the least disturbance, followed by the Proposed Route, and then the longer alternatives (4B through 4E).

Segment 5

Segment 5, as proposed, would link the Populus and Borah Substations with a 54.6-mile single-circuit 500-kV line. Forty-four acres of the expansion of the Populus and Borah Substations are attributed to Segment 5. There are five Route Alternatives including two proposed by the BLM to avoid the Deep Creek Mountains (5A and 5B; 8 miles and 19 miles longer than the comparison portion of the Proposed Route), one preferred by Power County that crosses the Fort Hall Indian Reservation (5C; 6 miles shorter than the comparison portion of the Proposed Route), one originally proposed by the Proponents (5D; 10 miles shorter than the comparison portion of the Proposed Route but located within more agricultural lands), and one proposed by Power County as an alternative approach to the Borah Substation (5E) (see Appendix A, Figure A-7).

As shown in Table D.15-1, the Proposed Route for Segment 5 construction would disturb about 982 acres. There would be 1 acre of disturbance, distributed along the Proposed Route, associated with cut and fill methods and the installation of temporary and permanent culverts where access roads cross streams. Soils in this segment would have low wind erodibility, but would be predominantly highly susceptible to water erosion. All soils would be droughty. There would be a moderate quantity of low soil loss tolerance soil. About 37 percent of Segment 5 routes would consist of stony-rocky soils. Steep slopes occupy 36 percent of the Analysis Area, the highest percentage of any segment. Prime farmland makes up 37 percent of the Analysis Area. The disturbance areas during construction of Segment 5 and each alternative are listed on Table D.15-1. The soils in the Route Alternatives would be similar to the soils in the Proposed Route; therefore, the impacts would be mostly proportional to the lengths of the various routes. However, Alternatives 5A and 5B would increase the area with steep slopes, whereas Alternative 5C reduces that area compared to the Proposed Route. This is important because the combination of steep slopes and the large percentage of soils that are susceptible to water erosion, which is aggravated by steeper slopes, would make Alternative 5C have the least potential propensity for soil erosion. The least impact overall would result from the combination of the eastern portion of Segment 5 up to where Alternative 5C begins, then follow Alternative 5C to 5E, and then to the Borah Substation. The longest route with the greatest disturbance area would be Alternative 5B. Also, Alternatives 5A and 5B would traverse substantially more prime farmland than the comparison portion of the Proposed Route or Alternative 5C. Alternatives 5D and 5E would be minor adjustments to the western portions of the Proposed Route and would not have distinguishable soil impacts compared to the Proposed Route.

Operations in Segment 5 would result in the soil loss of 175 acres, 31 percent of which is in prime farmland. Table D.15-2 details the disturbance acreages for Segment 5 and the alternatives that will be maintained during operations. The greatest difference between these would be the amount of prime farmland disturbed. As noted in the previous paragraph, Alternative 5C would be the most favorable because it would have the least disturbance to prime farmland and the least amount of steep slopes.

Alternatives 5A and 5B result in the most disturbance to prime farmland. Alternatives 5D and 5E would be minor adjustments to the western portions of the Proposed Route and would not have distinguishable soil impacts compared to the Proposed Route.

As noted in Section 3.15.2.2, decommissioning and reclamation would result in temporary soil disturbance of approximately the same magnitude as during construction as shown in Table D.15-1. The droughty characteristics in combination with the steep slopes and soils subject to water erosion of the soils in the Proposed Route and Route Alternatives for Segment 5 would make restoration of disturbed areas following decommissioning challenging. Therefore, disturbance of soils should be kept to the minimum possible during restoration. The disturbance areas during construction and operations would be proportional to the relative lengths of the Proposed Route and each alternative. However, as noted above, Alternative 5C would have the least area of steep slopes and be shortest overall. Therefore, this alternative would have the least disturbance and be the most readily restored compared to either the Proposed Route or the longer alternatives.

Segment 6

Segment 6 is an existing transmission line linking the Borah and Midpoint Substations; it is now operated at 345 kV but would be changed to operate at 500 kV. This segment has no Route Alternatives. Existing support structures would be used and impacts would be limited to within approximately 0.25 mile from each substation to allow for moving the entry point into the substation to the new 500-kV bay. Thirty-one acres of the expansion of the Borah and Midpoint Substations are attributed to Segment 6. Changes in the two substations would allow it to be operated at 500 kV (see Appendix A, Figure A-8).

Construction activities would disturb 65 acres of highly erodible, droughty soil with low soil loss tolerance. The permanent soil loss would be equivalent to the operations disturbance area, approximately 61 acres. Segment 6 has no alternatives and would affect no NFS land.

Segment 7

Segment 7, as proposed, would link the Populus and Cedar Hill Substations with a 118.1-mile single-circuit 500-kV line. Forty-two acres of the expansion of the Populus and the construction of the Cedar Hill Substations and 1 acre for two regeneration sites are attributed to Segment 7. In addition to the Proposed Route, which is principally on private lands, Route Alternatives have been proposed by the BLM to avoid the Deep Creek Mountains (7A and 7B; which are 5 miles and 11 miles longer than the comparison portion of the Proposed Route), by local landowners (7C, 7D, 7E, 7F, and 7G, which all represent minor adjustments proposed to address local issues), by local landowners to avoid private agricultural lands (7I or the State Line Route, which is 55 miles longer than the Proposed Route and would require 0.5 acre for an additional regeneration site), and by the Proponents to avoid the State Line Route (7H, which is 10 miles longer than the Proposed Route). Alternative 7J, which is a variant of the State Line Route also proposed by local landowners, would not terminate at the Cedar Hill Substation. This alternative, referred to as the Rogerson Alternative, would require a different substation be constructed near a 345-kV existing transmission line

(approximately 24 miles southwest of the Cedar Hill Substation; see Appendix A, Figure A-9). The tables and discussion in this document compare 7J (202.1 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

As shown in Table D.15-1, construction of the Proposed Route for Segment 7 would disturb 1,804 acres. There would be 5 acres of disturbance, distributed along the Proposed Route, associated with cut and fill methods and the installation of temporary and permanent culverts where access roads cross streams. There would be a relatively low percentage of soils subject to wind erodibility (23 percent), but 96 percent would be considered highly susceptible to water erosion, and 30 percent have a low soil loss tolerance. Prime farmland makes up 39 percent of the Segment 7 Analysis Area and 38 percent of the soils are droughty. Steep slopes would occur in 33 percent of the area, second only to Segment 5. The disturbance areas during construction of the Proposed Route and Route Alternatives are listed on Table D.15-1 in Appendix D. The soils in the Route Alternatives would be similar to the soils in the Proposed Route; therefore, the impacts would be mostly proportional to the lengths of the various routes. Alternatives 7A and 7B, when compared to their equivalent portion of the Proposed Route, would be longer and proportionately increase the areas falling in steeper slopes with erosion susceptible soils. They would be less favorable than the comparison portion of the Proposed Route. Alternatives 7C, 7D, 7E, 7F, and 7G would be relatively minor adjustments to the Proposed Route. With the exception of Alternative 7F, which would disturb only about 20 percent of the prime farmland acreage as the comparison portion of the Proposed Route, there would be only minor differences to the impacts on soils during construction for these alternatives. Alternatives 7H, 7I, and 7J are longer than the comparison portion of the Proposed Route. These alternatives would affect less prime farmland than the comparison portion of the Proposed Route; however, Alternatives 7H, 7I, and 7J would result in greater effects to other soil categories, due to their longer lengths. Soils with greater than 20 percent stony-rocky soil would generally occur only in Alternatives 7H, 7I, and 7J. All of these alternatives would substantially increase the acreages of steep slopes and exposure to highly water erosion–susceptible soils compared to the Proposed Route. The Proposed Route in combination with Alternative 7F would result in the least overall impacts to soils during construction.

During operations, the Proposed Route disturbance area would result in the direct loss of 231 acres of land, 47 percent of which is prime farmland. The effects to agricultural land are further discussed in Section 3.18 – Agriculture. Table D.15-2 in Appendix D details the operations disturbance acreages for the Proposed Route and Route Alternatives. For the same reasons discussed for construction impacts, the Proposed Route in combination with Alternative 7F would result in the least overall impacts to soils during operations. The major Alternatives 7A, 7B, 7H, 7I, and 7J would all be longer and would increase the disturbance acreages in proportion to their relative lengths, with Alternatives 7A and 7H resulting in less disturbance than 7B or 7I, respectively.

As noted in Section 3.15.2.2, decommissioning and reclamation would result in temporary soil disturbance of approximately the same magnitude as during construction

as shown in Table D.15-1 in Appendix D. The droughty characteristics in combination with the steep slopes and soils subject to water erosion of the soils in Segment 7 would make restoration of disturbed areas following decommissioning challenging. Therefore, disturbance of soils should be kept to the minimum possible during restoration. For the same reasons discussed for construction impacts, the Proposed Route in combination with Alternative 7F would result in the least overall operations impacts to soils.

The Proposed Route would not cross the Sawtooth NF; however, Alternatives 7H and 7I would cross the NF. Alternative 7H would affect approximately 167 acres on the Sawtooth NF during construction and 26 acres during operations. Approximately 99 acres and 21 acres, respectively, would be located in areas with low soil loss tolerance; approximately 75 acres and 7 acres, respectively, would be rated as highly erodible.

Alternative 7I would affect approximately 448 acres on the Sawtooth NF during construction and 94 acres during operations. Approximately 306 acres and 55 acres, respectively, would be located in areas with low soil loss tolerance; approximately 337 acres and 72 acres, respectively, would be rated as highly erodible. Alternative 7J would affect approximately 251 acres on the Sawtooth NF during construction and 53 acres during operations. Approximately 176 acres and 32 acres, respectively, would be located in areas with low soil loss tolerance; approximately 158 acres and 35 acres, respectively, are rated as highly erodible.

In comparing all of the soil factors, the Proposed Route in combination with Alternative 7F would result in the least overall impacts to soils. The major Alternatives 7A, 7B, 7H, 7I, and 7J would all be longer than the comparison portion of the Proposed Route or Alternatives 7C, 7D, and 7E and would, therefore, increase soil disturbance proportionally. If Alternatives 7H 7I, and 7J are not selected, there would be no impacts to soils on the Sawtooth NF.

Segment 8

Segment 8, as proposed, would link the Midpoint and Hemingway Substations. This 131-mile single-circuit 500-kV transmission line would stay north of the Snake River until crossing through the SRBOP parallel to an existing 500-kV transmission line before ending at the Hemingway Substation. Thirteen acres of the expansion of the Midpoint Substation and 0.5 acre for a regeneration site are attributed to Segment 8. There are five Route Alternatives: 8A, which follows the WWE corridor but crosses the Snake River and I-84 twice (while the Proposed Route would stay north of this area); 8B and 8C, which represent the old routes originally proposed by the Proponents but that have now been changed to avoid the cities of Kuna and Mayfield, respectively; 8D, which represents a small revision involving a rebuild of the existing transmission line to move both away from the National Guard Maneuver Area; and 8E, which was proposed by the BLM in order to avoid crossing the Halverson Bar non-motorized portion of the Guffey Butte-Black Butte Archaeological District (see Appendix A, Figure A-10).

As shown in Table D.15-1, construction of the Proposed Route for Segment 8 would disturb about 2,125 acres. There would be 1 acre of disturbance, distributed along Segment 8, associated with cut and fill methods and the installation of temporary and

permanent culverts where access roads cross streams. A total of 36 percent of the Analysis Area is highly wind erodible, and 69 percent is highly susceptible to water erosion. About 61 percent of the soils in the Proposed Route are droughty. Low soil loss tolerance soil makes up 68 percent of the Analysis Area and 28 percent is prime farmland. The disturbance areas during construction of Segment 8 and each alternative are listed on Table D.15-1. The soils in the Route Alternatives would be similar to the soils in the Proposed Route; therefore, the impacts would be mostly proportional to the lengths of the various routes. Alternative 8A would replace the first 51 miles of the Proposed Route with a 53-mile alternative route. The soil impacts between these two routes would be substantially different with respect to the acreages with low soil loss tolerance and prime farmland. For both soil conditions, Alternative 8A would have substantially less impact to these soil conditions. Alternatives 8B and 8C would be generally less favorable than the comparison portion of the Proposed Route and, in comparison, increase the acreages in these sensitive soil types. Alternative 8D would be a minor variation that would have similar impacts on soils as the comparison portion of the Proposed Route. Alternative 8E would contain more acres, including more highly erodible acres and more acres of droughty soil. However, there would be slightly less shallow bedrock in Alternative 8E than in the comparison portion of the Proposed Route. The route with the least impact to soils during construction would be Alternative 8A in combination with the Proposed Route from the end of Alternative 8A to Hemingway.

During operations, the Proposed Route would affect 246 acres, 19 percent of which would be prime farmland. Table D.15-2 in Appendix D details the operations disturbance acreages for Segment 8 and its alternatives. For the same reasons discussed for construction impacts, the Proposed Route in combination with Alternative 8A at the eastern end would result in the least overall operations impacts to soils. Alternatives 8B and 8C would have similar impacts as the comparison portion of the Proposed Route during the operational life of the Project.

As noted in Section 3.15.2.2, decommissioning and reclamation would result in temporary soil disturbance of approximately the same magnitude as during construction as shown in Table D.15-1 in Appendix D. The droughty soils found mainly in the Proposed Route and Alternatives 8A and 8B would make restoration challenging. As noted in the construction paragraph above, the overall route with the least impact on soils would be Alternative 8A in combination with the remainder of Segment 8. Apart from the reduced acreages in Alternative 8A compared to the comparison portion of the Proposed Route, however, the remaining Alternatives (8B, 8C, and 8D) would not be substantially different from the Proposed Route. No NFS land would be crossed in Segment 8.

Segment 9

Segment 9, as proposed, would link the Cedar Hill and Hemingway Substations with a 161.7-mile single-circuit 500-kV transmission line which skirts the Jarbidge and Owyhee Military Operating Areas to the north, then follows the WWE corridor just north of the Saylor Creek Air Force Range, passing through Owyhee County before entering into the Hemingway Substation. Fifteen acres of the construction of the Cedar Hill Substation and 1 acre for two regeneration sites are attributed to Segment 9. There are eight

Route Alternatives proposed, including 9A, which was the Proponents' Proposed Route until moving to avoid the Hollister area; 9B, which is being considered by the BLM because it follows the WWE corridor and parallels existing utility corridors; 9C, which was the Proponents' Proposed Route until moving to avoid the Castleford area; and 9D and 9E, proposed by the Owyhee County Task Force, that cross more public lands north and south of the Proposed Route, respectively, than the Proposed Route. Most of Alternative 9D would be within the SRBOP. Alternatives 9F, 9G, and 9H were proposed to avoid crossing the non-motorized area south of C.J. Strike Reservoir. Alternatives 9G and 9H provide an alternate route location south of Alternative 8E (see Appendix A, Figure A-11).

As shown in Table D.15-1 in Appendix D, construction of the Proposed Route for Segment 9 would disturb 2,670 acres. There would be 4 acres of disturbance, distributed along the Proposed Route, associated with cut and fill methods and the installation of temporary and permanent culverts where access roads cross streams. Soil in this segment would contain moderate proportions of highly wind and water erosion susceptible soils. Some 65 percent of the soils would have a low soil loss tolerance, approximately one-third of the soils would be prime farmland, and essentially all of the soils a would be re droughty. Shallow bedrock may be present in 44 percent of the area and droughty soils make up about 55 percent of the Proposed Route.

The disturbance areas during construction of the Proposed and Alternative Routes are listed on Table D.15-1 in Appendix D. The soils in the Route Alternatives would be similar to the soils in the Proposed Route; therefore, the impacts would be mostly proportional to the lengths of the various routes. With the exception of Alternative 9E, which would be about 11 miles longer than the comparison portion of the Proposed Route, all of the alternatives would be essentially the same length and therefore have mostly similar soil impacts as their comparison portions of the Proposed Route. However, Alternatives 9A, 9B, 9C, and 9D would all impact substantially more prime farmland than the Proposed Route. Therefore, with respect to sensitive soils, the Proposed Route would have the least impact. Alternative 9E would slightly decrease the impact to prime farmland, but it would be longer and generally increase the overall disturbed acreage during construction and be also less favorable than the comparison portion of the Proposed Route.

During operations, the Proposed Route would affect 359 acres, of which 28 percent would be prime farmland. Table D.15-2 details the operations disturbance acreages for the Segment 9 Proposed Route and Route Alternatives. For the same reasons discussed for construction impacts, the Proposed Route would be the most favorable route. This distinction is primarily based on less disturbance to prime farmland and, in the case of Alternative 9E, less overall disturbance due to its shorter length.

As noted in Section 3.15.2.2, decommissioning and reclamation would result in temporary soil disturbance of approximately the same magnitude as during construction as shown in Table D.15-1 in Appendix D. The droughty soils found along the Proposed Route and its alternatives would make restoration challenging. As noted in the construction paragraph above, the Proposed Route would result in less soil impacts

during decommissioning and reclamation than any of the five alternatives. No NFS land would be crossed in Segment 9.

Segment 10

Segment 10, as proposed, would link the Cedar Hill and Midpoint Substations with a 33.6-mile single-circuit 500-kV line, following a WWE corridor for most of its distance. Twenty-eight acres of the expansion of the Midpoint Substation and of the construction of the Cedar Hill Substation are attributed to Segment 10. There are no Route Alternatives proposed along this segment (see Appendix A, Figure A-12).

As shown in Table D.15-1, construction of the Proposed Route for Segment 10 would disturb 549 acres. There would be less than 1 acre of disturbance, distributed along the Proposed Route, associated with cut and fill methods and the installation of temporary and permanent culverts where access roads cross streams. This segment would have wind and water erosion susceptible soils. Low soil loss tolerance soil occupies 42 percent of the Analysis Area, prime farmland covers 26 percent, and 37 percent of the soils are droughty. There are no alternatives to compare and contrast with the Proposed Route.

As shown in Table D.15-2 in Appendix D, Proposed Route operations would result in a soil disturbance of 81 acres, 16 percent of which would be prime farmland. There are no alternatives to compare and contrast with the Proposed Route.

Similar to all segments with droughty soils, restoration of the areas to their original condition prior to construction would be challenging. There are no alternatives to compare and contrast with the Proposed Route. No NFS land would be crossed in Segment 10.

3.15.2.4 Design Variation

A Design Variation is being considered that would consist of constructing two single-circuit lines in Segments 2 through 4 instead of a single double-circuit line (which is the design assessed above). The disturbance footprint of the two single-circuit towers is greater than that of the double-circuit tower, in part because the requested ROW would be wider, but also because helicopter-assisted construction could be implemented in these areas due to the lighter weight of the towers, which would require additional fly yards. The additional ROW space and the fly yards would cause additional temporary disturbance during construction. Across Segments 2, 3, and 4, the additional disturbance of the single-circuit tower alternative ranges from 25 to 30 percent greater than the comparable portions of the double-circuit tower disturbance under the proposed design. The two single circuits require more ground disturbance, but would be designed and constructed to the same standards as the Proposed Action. The Design Variation would disturb more acreage and would expose 25 to 30 percent more soils to erosion effects, soil compaction, and permanent soil losses than the proposed double-circuit line. Table D.15-5 in Appendix D summarizes the soil effects for the Design Variation. The operations and decommissioning stage would also see 25 to 30 percent higher impacts because of the greater area.

3.15.2.5 Structure Variation

The proposed guyed Structure Variation would add four guy wires about 140 feet long from a point about 100 feet up in each tower to four guy anchors spaced in a square around the tower (Appendix B, Figure B-6). The guy anchors would fall within the disturbed area around each tower. Therefore, there is no appreciable difference in impact on soil resources from the use of this Structure Variation when compared to the use of self-supporting lattice towers.

3.15.2.6 Schedule Variation

The Schedule Variation uses the two single-circuit Structure Variation described above but extends construction over a longer time frame. Initially, only one of the eventual two single-circuit lines would be constructed, with the second to be constructed at a later date. The Schedule Variation proposes that the first single-circuit transmission line in Segments 2, 3, and 4 would be built as soon as a ROW grant is issued, but that the second line would not begin construction until late 2018. This would mean nearly 2 years between the end of construction for the first line and beginning of construction for the second line. Any staging areas and fly yards that had been used for the first stage would have been revegetated after construction was complete and would have to be cleared again. There would be two sets of construction disturbances, adding movement, noise, and dust to the area of construction in two instances in any given area. In the short term, the potential for the Project to impact soils would be reduced when compared to the Proposed Action and Design Variation due to the fewer number of structures erected. However, the short-term reduction in soil impacts would be lost with construction of the second line. The overall net impact of this schedule variation would be to increase the total amount of soil acreage disturbed during construction. The impacts on operations and decommissioning (assuming the latter takes place for both lines at the same time) would be negligible.

3.15.3 Mitigation Measures

To minimize or avoid impacts on soils, the Proponents have committed to EPMs that would be implemented Project-wide as outlined in this section and in Appendix C.

The following mitigation measures identified by the Agencies are required on federally managed lands. The Agencies recommend that the Proponents incorporate the measures into their EPMs and apply them Project-wide.

SOIL-1 Efforts will be made to preserve topsoil and minimize mixing with subsoil. In agricultural areas, the landowner or land management agency will be asked to provide input on placement of removed topsoil. The Wyoming State Reclamation Policy and applicable Agency management plan requirements for soil management will be followed. Soil disturbances in agricultural areas will be developed to minimize impacts to existing agricultural activities where possible. Unless the landowner or land management agency specifically approves otherwise, the Proponents will prevent the mixing of topsoil with subsoil by stripping topsoil from the portion of the construction work area that will be restored (construction pad, storage yards, and fly yards) in actively cultivated or rotated

croplands and pastures and other areas at the landowner's or land-managing agency's request. Where topsoil segregation is required, the Proponents will maintain separation of salvaged topsoil and subsoil throughout all construction activities. Immediately after construction, topsoil will be restored to the areas not dedicated to operational requirements and revegetated as specified in the EPMs.

SOIL-5 Disturbed soil shall not be allowed to support the growth of noxious weeds, or invasive weedy species. Prevention of noxious weeds shall apply to all phases of the Project.

SOIL-7 The Proponents are responsible for monitoring to ensure soil protection is achieved and providing monitoring reports on reseeding success or other methods to stabilize soils to the Forest Service by the end of each growing season for areas on NFS lands.

SOIL-8 Reclamation of all temporary disturbances on NFS lands (such as road cuts) should include replacement of material to original contours. Re-compaction to pre-existing compaction percentage (which should be identified before disturbance) should be included in the plan. Guidelines for stream bank re-compaction to maximize vegetative regrowth and mechanical stability are covered in USACE publication ERDC TN-EMRRP-SR-26 (Goldsmith et al. 2001).

SOIL 9 On federal land, follow land management plan requirements on the location of waste material (silt, sand, gravel, soil, slash, debris, chemical, etc.).

SOIL-10 On NFS lands, soil resources will be inventoried to National Cooperative Soil Survey Standards, and the volumes and suitability of soil resources for reclamation will be determined prior to disturbance.

SOIL-11 In specific sensitive areas (such as erosive soils or steep slopes) on lands managed by the Kemmerer FO, the access road used for construction will be restored and an alternative access route for operations designated.

In addition, the following mitigation measures have been proposed by the Agencies and adopted by the Proponents:

SOIL-2 The Proponents will submit a Compaction Monitoring Plan for review and Agency approval prior to construction that specifies the conditions under which construction will either not start or will be shut down due to excessively wet soils. Conditions will be measurable in the field and easy to demonstrate to construction workers.

SOIL-3 During decommissioning, some obviously compacted areas, such as established service roads, will require loosening prior to revegetation. If necessary to re-establish vegetation, the Proponents will use a ripper blade, till, or similar instrument to loosen the surface soil layer.

SOIL-4 Reclamation will include revegetation unless pre-existing conditions were not vegetated (rocky areas, agricultural fields). On public land the appropriate agency will provide input on the extent of reclamation, the type of vegetation to be planted, and the monitoring necessary to ensure reclamation success.

SOIL-6 Detrimental soil disturbance such as compaction, erosion, puddling, and displacement will be limited or mitigated to meet long-term soil productivity goals on NFS lands. Treatment should include road ripping, frequent waterbars, cross-ditching (e.g., rolling-dips), or other methods to reduce compaction while preventing gully formation. Ripping pattern should be altered to a crossing, diagonal, or undulating pattern of tine paths to avoid concentrated runoff patterns that can lead to gullies.

Under the CWA, the NPDES stormwater program requires operators of construction sites to obtain authorization to discharge stormwater under an NPDES construction stormwater permit. A key component in stormwater management is the development of BMPs to prevent soil erosion, and sediment migration to nearby surface water bodies. The Proponents will adhere to state and federal stormwater requirements to mitigate the soil effects during construction, operations, and decommissioning.

3.16 WATER RESOURCES

This section addresses potential impacts to surface water and groundwater from the Proposed Route and Route Alternatives during construction, operations, and decommissioning.

3.16.1 Affected Environment

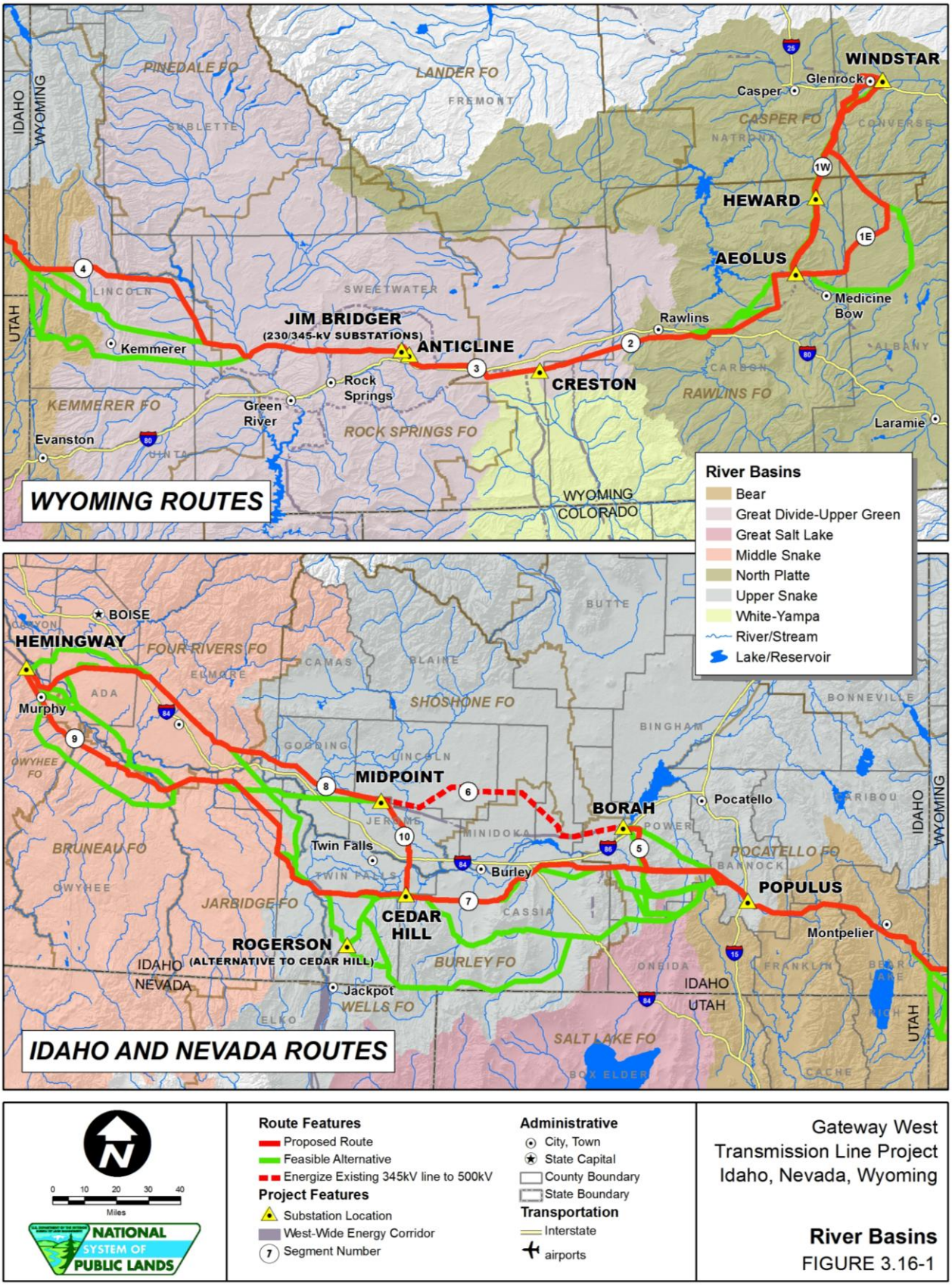
This section describes the existing surface water features and groundwater that could be impacted within the Analysis Area. It starts with a discussion of the Analysis Area considered, identifies the issues that have driven the analysis, and characterizes the existing conditions across the Proposed Route and Route Alternatives.

3.16.1.1 Analysis Area

The Project area is located across six river basins and several major surface watersheds, as shown on Figure 3.16-1. From east to west, they include the North Platte, White-Yampa, Great Divide-Upper Green, and Bear River watersheds in Wyoming. The North Platte is located east of the continental divide and ultimately discharges into the Missouri/Mississippi River systems. The White-Yampa and Green Rivers are tributaries to the Colorado River. The Bear River drainage is part of a closed basin system that ends in the Great Salt Lake. The Bear River and Snake River watersheds are located in Idaho. The Snake River is part of the Columbia River system. In Idaho, surface water from natural drainages is extensively diverted into canals and drainage ditches for flood irrigation of crop land. These surface diversions are crossed by the transmission line routes, and are included in the evaluation of surface water crossings.

Groundwater occurs in several major aquifers throughout the Project area. Valleys within the eastern portion of Wyoming contain Tertiary and Cretaceous sandstone aquifers (Segments 1, 2, and 3). Western Wyoming is underlain by the northern portion of the Colorado Plateau aquifer (Segment 4). Southeast Idaho contains small Basin and Range valley fill aquifers (Segments 4 and 5). Southern and southwest Idaho is underlain by the Snake River Plain aquifer (Segments 5 through 10).

The Eastern Snake River Plain Aquifer is a sole-source aquifer. USEPA defines a sole- or principal-source aquifer as an aquifer that supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer. These areas may have no alternative drinking water source(s) that could physically, legally, and economically supply all those who depend on the aquifer for drinking water. For convenience, all designated sole- or principal-source aquifers are referred to as “sole-source aquifers” (SSAs). The designation protects an area's groundwater resource by requiring USEPA to review certain proposed projects within the designated area. All proposed projects receiving federal funds are subject to review to ensure that they do not endanger the water source.


WYOMING ROUTES
WINDSTAR
Glenrock
Casper
CASPER FO
HEWARD
AEOLUS
Medicine Bow
Rawlins
RAWLINS FO
Laramie
JIM BRIDGER
(230/345-kV SUBSTATIONS)
ANTICLINE
CRESTON
Kemmerer
Rock Springs
Green River
KEMMERER FO
ROCK SPRINGS FO
Evanston
PINEDALE FO
LANDER FO
IDAHO
WYOMING
UTAH
WYOMING
COLORADO
River Basins
Bear
Great Divide-Upper Green
Great Salt Lake
Middle Snake
North Platte
Upper Snake
White-Yampa
River/Stream
Lake/Reservoir
IDAHO AND NEVADA ROUTES
BOISE
HEMINGWAY
FOUR RIVERS FO
Murphy
SHOSHONE FO
MIDPOINT
BORAH
Pocatello
POCATELLO FO
POPULUS
Montpelier
Twin Falls
Burley
BRUNEAU FO
JARBIDGE FO
CEDAR HILL
ROGERSON
(ALTERNATIVE TO CEDAR HILL)
BURLEY FO
Jackpot
WELLS FO
SALT LAKE FO
IDAHO
NEVADA
IDAHO
UTAH
IDAHO
WYOMING
UTAH
Route Features
Proposed Route
Feasible Alternative
Energize Existing 345kV line to 500kV
Project Features
Substation Location
West-Wide Energy Corridor
Segment Number
Administrative
City, Town
State Capital
County Boundary
State Boundary
Transportation
Interstate
airports
0 10 20 30 40
Miles
NATIONAL SYSTEM OF PUBLIC LANDS
Gateway West
Transmission Line Project
Idaho, Nevada, Wyoming
River Basins
FIGURE 3.16-1

Shallow groundwater often occurs above the regional aquifers. The source of shallow groundwater is usually from infiltration from surface water sources. In Idaho, the quantity of shallow groundwater is enhanced by the widespread flood irrigation that occurs in agricultural areas. In some portions of the Project area, depth to groundwater is so shallow that facility foundations may extend into the groundwater.

The Analysis Area for surface water and groundwater resources was defined in a GIS file by buffering the centerlines of the Proposed Route and Route Alternatives out 0.5-mile on either side of the centerlines and dissolving the buffers into a single polygon for each segment. This distance was used because it encompasses the area of greatest activity during construction and operations, and it is estimated any Project impacts (changes in water quality, including sedimentation or temperature change) to surface or groundwater due to the Project would occur within 0.5 mile of the disturbance.

3.16.1.2 Issues to be Analyzed

The following water-related issues were brought up by the public during public scoping (Tetra Tech 2009a), were raised by federal and state agencies during scoping and agency discussions, or are issues that must be considered as stipulated in law or regulation:

- Whether there would be impacts to water quality from roads and other causes of erosion;
- Whether state water quality standards would be met;
- Determining which pollutants could enter waterbodies and what the impacts would be from them;
- What the impacts would be on drinking water, wells, and springs;
- Whether municipal water service to individual properties would be affected;
- What the handling procedures would be for hazardous materials near waterbodies and wells;
- Whether water would be drawn from surface waterbodies, and what the effects of that would be;
- What stormwater permits would be required, and whether there their stipulations would be met;
- Whether there would be any impacts on water rights;
- What the impacts would be from sedimentation and temperature increases in sediment and temperature-impaired waterbodies;
- Whether there would be a risk of floods;
- Whether groundwater would be affected;
- Riparian vegetation removal for road and transmission line construction could cause erosion, resulting in sedimentation within surface water, and may cause an increase in temperature in streams, including but not limited to those already listed under the CWA 303(d) as temperature-impaired waterbodies; and

- Potential of structures located in flood-prone areas to impede or redirect flood flows.

3.16.1.3 Regulatory Framework

Federal and State

The CWA (33 U.S.C. § 1251 et seq., formerly the Federal Water Pollution Control Act of 1972), was enacted with the intent of restoring and maintaining the chemical, physical, and biological integrity of the waters of the United States. The CWA requires states to set standards to protect, maintain, and restore water quality through the regulation of point source and certain non-point source discharges to surface water.

- Point and non-point discharges are regulated by the NPDES permit process (CWA Section 402). NPDES permitting authority is administered by USEPA in Idaho, WDEQ in Wyoming, and Nevada Division of Environmental Protection (NDEP) in Nevada. Projects that disturb one or more acres are required to obtain a Construction General Permit (CGP). The CGPs require the development and implementation of a SWPPP. The SWPPP describes BMPs the Proponent would use to protect surface water from stormwater runoff.
- If hazardous materials, including fuels and lubricants, are used or stored in quantities exceeding certain minimal quantities, an SPCC Plan is required. Section 311 (j)(1)(c) of the CWA contains the regulations preventing discharge of oil to surface water.
- Section 401 of the CWA requires that any activity, including river or stream crossings during road, pipeline, or transmission line construction that may result in a discharge into a state waterbody must be certified by IDEQ or WDEQ. This certification ensures that the proposed activity does not violate state and/or federal water quality standards.
- Section 404 of the CWA authorizes the USACE to regulate the discharge of dredged or fill material to the waters of the United States. Discharges are authorized through issuance of nationwide permits or individual permits for specific activities.
- Section 303(d) of the CWA requires states to establish TMDL programs, which are approved by the USEPA for streams and lakes that do not meet certain water quality standards. In compliance with the federal CWA, the IDEQ and the WDEQ have identified Section 303(d) water quality limited streams and lakes for development of TMDL criteria. A TMDL includes a quantitative assessment of water quality problems, contributing sources, and load reductions or control actions needed to restore and protect bodies of water. Stream segments within the Analysis Area have been identified on the 303(d) list as impaired due to either sedimentation (sediment-impaired streams) or high temperatures (temperature-impaired streams). TMDLs have been established for surface waters in Idaho and Nevada and are in the development process in Wyoming. IDEQ assesses impaired streams on a subbasin level, which is the same as a USGS fourth-field hydrologic unit, or HUC. Therefore, if it has been established that a stream segment does meet water quality standards, all the streams within

that HUC do not meet the standard. NPDES permits address point-source pollution to surface waters. Non-point source pollution is addressed by the application of BMPs, EPMs, and mitigation measures during the construction and operation of the proposed Project. BMPs recommended by IDEQ to protect water quality were compared to the Proponents' EPMs and Agency-recommended mitigation measures. EPMs and mitigation measures are generally compatible with the state BMPs.

The Upper Colorado Endangered Fish Recovery Program was established in 1988, and serves as conservation measures to minimize adverse effects to the endangered fishes and their critical habitat caused by a project's water depletions. Under this program, any amount of water removed from the Colorado River system is considered to be a depletion of water and requires formal consultation with the USFWS for downstream impacts to threatened and endangered species. To streamline the process, the USFWS will issue a tiered BO based on the amount of the depletion. *De minimis* depletions (less than 0.1 acre-foot/year) require no depletion fee. Small depletions (projects that would withdraw between 0.1 and 100 acre-feet/year) require no depletion fee. Any depletions greater than 100 acre-feet/year require a one-time depletion fee (for which this Project qualifies). However, the USFWS has indicated that if the entirety of this depletion is drawn from existing water rights (i.e. if the Proponents purchase existing water rights and only draw water in accordance with these existing water rights), this would constitute a historical withdrawal (Kantola 2010). Withdrawals of this nature would still require formal consultation with the USFWS, but would not require a depletion fee (Kantola 2010). If the entirety of water withdrawals cannot come for existing rights, then depletion impacts can be offset by accomplishment of activities necessary to recover the endangered fishes as specified under the Recovery Implementation Program Recovery Action Plan and the one-time contribution to the Recovery Program for new depletions greater than 100 acre-feet/year.

The PRRIP, established in 1997, implements actions designed to assist in the conservation and recovery of the target species and their associated habitats along the central and lower Platte River in Nebraska through a basin-wide cooperative approach agreed to by the states of Wyoming, Nebraska, and Colorado, as well as the U.S. Department of the Interior. The PRRIP addresses the adverse impacts of existing and certain new water-related activities on the Platte River target species and associated habitats, and provides ESA compliance for effects to the target species. The State of Wyoming is in compliance with its obligations under the PRRIP.

The Wyoming State Engineers Office is responsible for determining if a water withdrawal is an existing or new water withdrawal and what level of withdrawal it constituted. The level of withdrawal for a temporary industrial use would depend on the amount of depletion, and the existing conditions of the river at the time of the depletion. Furthermore, if the entirely of the withdrawal was taken from existing rights (i.e. if the Proponents purchase existing water rights and only draw water in accordance with these existing water rights) then this would constitute an existing depletion as it relates to the Wyoming State Engineers' Depletion Report (Hoobles 2010). Unlike the Upper Colorado Endangered Fish Recovery Program, there is no depletion fee associated with the PRRIP.

EO 11988 requires federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. In accomplishing this objective, "each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by flood plains in carrying out its responsibilities."

As discussed in Section 3.9 – Wetlands and Riparian Areas, the NFS has identified AIZs based on a specific width on either side of a stream. These areas provide a buffer between a stream or waterbody and the upland areas, and can influence water quality. The Caribou NF has delineated about 63,000 acres of AIZ on its 1.1 million acres (Forest Service 2003e). The Sawtooth NF has delineated about 66,210 acres of AIZ on its 596,791 acres. Based on methodology provided by the Medicine Bow-Routt NFs, about 13,619 acres of WIZs on its174,300 acres has been delineated within the southern portion of the Douglas Ranger District. Land management agencies' plans (RMPs and Forest Plans) that have standards, guidelines, stipulations, or avoidance buffers for activity near surface waters would be adhered to.

State

The Idaho Stream Channel Protection Act requires that the stream channels of the state and their environment be protected against alteration for the protection of fish and wildlife habitat, aquatic life, recreation, aesthetic beauty, and water quality. The Act requires a stream channel alteration permit from IDWR before one can begin any work that would alter the stream channel. A stream channel alteration is defined as any activity that would obstruct, diminish, destroy, alter, modify, relocate, or change the natural existing shape or direction of water flow of any stream channel. This includes taking material out of the channel or placing material or structures in or across the channel where the potential exists to affect flow in the channel.

Under authority of the federal CWA, IDEQ has issued Water Quality Standards (IDAPA 58.01.02). The standards include a description of hydrologic units, a list of priority pollutants, a list of the water quality impaired streams within each subbasin, and the parameters for which the stream is impaired.

WDEQ maintains similar water quality standards (Water Quality Rules and Regulations, Chapter 1) that also contain priority and non-priority pollutants, and water quality standards for Wyoming surface water.

NDEP maintains water quality standards in the Nevada Administrative Code, Chapter 445A.118-445A.225 for surface water. Under the CWA, NDEP prepares nonpoint source assessment reports to identify waterbodies that are not likely to meet water quality standards or goals and identify contributing sources of pollution.

Local

To protect property purchases, some cities or counties may have floodplain and drainage regulations for floodplain development. These protections generally appear as part of city or county zoning ordinances. Where established, they typically prohibit floodplain development that would result in flooding of the development (i.e., within a 100-year floodplain), and prohibit floodplain development that would result in adverse

flooding impacts on other property. For instance, floodplain encroachments that raise water levels on other property may be prohibited, as are diversions and concentrations of flow.

3.16.1.4 Methods

The environmental effects analyses completed for this assessment were conducted using readily available data and GIS files derived from preliminary centerline and component design for the Proposed Route and Route Alternatives (see Section 3.1 – Introduction, for details on development of these files). In all cases, after analysis of impacts was complete and where impacts were identified, Proponent-proposed measures to reduce impacts were reviewed for sufficiency. Where those measures were determined to be insufficient, additional measures were identified.

Surface Water

Stream Type

The USGS National Database for Streams and Waterbodies of the United States was used to evaluate the number of surface waterbodies that would be crossed by the Project, including any natural or human-made surface water structure that would be crossed by roads associated with the Project. In order to identify water resources within the Analysis Area, estimates of stream flow along the transmission line were made using USGS regression models created using data gathered from established stream gages. Independent variables such as drainage area, average annual precipitation, elevation, and basin slope are used within the models to create the flow estimates. These models were used to estimate stream flow at ungaged sites within the Analysis Area. Estimates of flow presence for this Project (used to determine whether a culvert is necessary) were based on average 2-year recurrence intervals. Measurements garnered from identified sixth-field HUCs were used in the regression models.

After the estimated flows were calculated for the terminal stream order within each HUC, determinations were made on the likelihood of encountering active flow at proposed crossings within that HUC.

Natural streams were characterized as perennial, intermittent-dry, intermittent-wet, or ephemeral. Perennial streams included streams that contain water throughout the year except during periods of drought. Ephemeral streams included those that contain water only briefly and in direct response to precipitation; the beds of these types of streams are always above the water table of the adjacent region. Intermittent streams included those that contain water for extended periods but only at certain times of the year, such as when it receives seasonal flow from springs or melting snow. The term intermittent-wet refers to intermittent streams that would be crossed while water is present; intermittent-dry are those that would be crossed while they are likely dry. The database also counted human-made structures, such as ditches, aqueducts or canals, and artificial paths. These five surface waterbody types; perennial, intermittent-wet, intermittent-dry, ephemeral, and artificial listed in the USGS database were included in the analysis. Wetlands are not evaluated in this section and are addressed in Section 3.9 – Wetlands and Riparian Areas.

Surface Water Crossings

Section 1.5 of Appendix B describes vehicle access roads and the types of stream crossings that would be necessary for this Project. Three types of waterbody crossings, plus stream avoidance, are assumed for this Project as detailed in Section 1.5 of Appendix B and briefly summarized here:

- **Type 1—Drive through:** Crossing of a channel with only minimal vegetation removal and no cut or fill needed. This is typical for much of the low-precipitation sagebrush country with rolling topography and streams that rarely flow with water.
- **Type 2—Ford:** Crossing of a channel that includes grading and stabilization. Streambanks and approaches would be graded to allow vehicle passage and stabilized with rock or other erosion control devices. The streambed would in some areas be reinforced with coarse rock material, where approved by the land-management agency, to support vehicle loads, prevent erosion and minimize sedimentation into the waterway. The rock would be installed in the streambed such that it would not raise the level of the streambed, thus allowing continued movement of water, fish, and debris. A ford crossing results in an average disturbance profile of 25 feet wide (along the waterbody) and 50 feet long (along the roadway) for 1,000 square feet or 0.02 acre at each crossing. Disturbance amount is estimated based on need to get equipment into the riparian area to build the 14-foot-wide travelway and protect it from erosion by adding armoring.
- **Type 3— Culvert:** Culvert installation would also include a stable road surface established over the culvert for vehicle passage. Culverts would be used on intermittent and perennial streams. Whether flow is preset at a particular stream crossing would be determined using a 2-year return interval; streams that are normally dry do not need a culvert. Culverts would be designed and installed under the guidance of a qualified engineer who, in collaboration with a hydrologist and aquatic biologist where required by the land-management agency, would recommend placement locations; culvert gradient, height, and sizing; and proper construction methods. Culvert design would consider bedload and debris size and volume. The disturbance footprint for culvert installation is estimated to be 50 feet wide (along the waterbody) and 150 feet long (along the road) for 7,500 square feet or 0.17 acre at each crossing. Ground-disturbing activities would comply with Agency-approved BMPs. Construction would occur during periods of low water or normal flow. The use of equipment in streams would be minimized. All culverts would be designed and installed to meet desired riparian conditions, as identified in applicable unit management plans. Culvert slope would not exceed stream gradient. Typically, culverts would be partially buried in the streambed to maintain streambed material in the culvert. Sandbags or other non-erosive material would be placed around the culverts to prevent scour or water flow around the culvert. Adjacent sediment control structures such as silt fences, check dams, rock armoring, or riprap may be necessary to prevent erosion or sedimentation. Streambanks and approaches may be stabilized with rock or other erosion control devices. Culverts would be inspected and maintained annually for the life of the Project (estimated at 50 years or longer) for proper operation and to protect water quality.

- **Avoid Crossing:** Where constructing a new waterbody crossing is impractical or would require a bridge or a very large (>48-inch-diameter) culvert, existing waterbody crossings would be used and access redesigned to avoid a new crossing. All canals and ditches would be avoided by using existing crossings, as would all large perennial bodies like rivers.

For non-listed waterbodies or listed waterbodies that are dry, the crossing options include Type 1 through 3, requiring agency consultation for crossings on federal lands. For TMDL and 303(d) listed streams for sediment, additional erosion and sediment control devices such as haybales, and/or turbidity curtains would be used if flow is present during installation of in-stream structures. The installation of culverts constitutes the greatest disturbance to a stream, and in sensitive stream systems, these impacts may not be justifiable (IDEQ 2005). The specific loads and the stream conditions will dictate what type of stream crossing to employ. The performance of culverts and low-water stream crossings would be monitored for the life of the access road, and maintained, repaired, or replaced as necessary to protect water quality.

All waterbody and wetland disturbances would be completed under the terms of a USACE CWA Section 404 permit, the NPDES Construction Stormwater Permit (CWA 402), and State 401 water quality certification requirements that govern activities within any waters of the United States. In Idaho, there is an additional requirement for a stream channel alteration permit for activities in streambeds.

The Project at this stage of design does not identify exact locations of stream crossings. The type of crossing used would depend largely on the flow and stream channel conditions at the location and time of the crossing.

Natural and man-made stream channels were analyzed to estimate the number of crossing types and included stream orders up to a seventh order system. Crossings were broken into five categories based on stream type and expected crossing type which include:

- Ephemeral – Dry Crossing
- Intermittent – Dry Crossing
- Intermittent – Wet Crossing
- Perennial – Culvert Installation
- Perennial – Avoid Waterway

To estimate the number and type of stream crossings, the Project GIS data file showing the indicative road layout was obtained from the Project engineer. The GIS roads layer was overlaid on the GIS file from the USGS database describing surface waterbodies. Several factors were used to estimate the road crossing types anticipated for the Project. They included stream type (perennial, intermittent, ephemeral), and flow volume. The topographic maps in the GIS file were also reviewed to determine the degree of slope leading into drainages and the amount of drainage incisement, to predict crossings that might require cut and fill. After the number and types of stream crossings were initially estimated, the Project engineers were invited to review the estimates and to provide comments based on their past experience with similar utility

projects in the general Project area. Based on the practical experience comments from the engineers, further refinements were made to the stream crossing type estimates. The centerlines of the Proposed Route and Route Alternatives in each segment were overlaid on the stream crossing GIS data file and the number of each crossing type was counted.

Similar methods were used to estimate the acreage of impacts that would occur due to waterbody crossings by roads. Disturbance areas along each waterbody crossing were designated based on the widths described above for the four types of waterbody crossings. These disturbance areas were compared with the GIS files for the locations of each proposed waterbody crossing type, in order to calculate the acreage of disturbance for road crossings.

Flood Hazard Rankings

FEMA and the OPS *National Disaster Study, National Pipeline Risk Index Technical Report* (1996) were used to evaluate the flood hazard rankings for the Analysis Area, construction disturbance area, and operations disturbance area. The OPS data provide flood hazard rankings for the United States, including those portions of Idaho and Wyoming near the Project. Soil type and flooding risk (based on FEMA mapping) were used to produce flood hazard rankings from zero to 100, where zero represents the lowest flood hazard and 100 represents the highest. Flood hazard rankings of 85 to 100 were assumed to have high risk from flooding, rankings between 70 and 84 were considered to have medium risk, and areas less than 70 were assigned a low risk.

To evaluate areas where flood risks may occur, the OPS GIS data file for flood risks was used to determine the areas of medium and high flood risks within the disturbance areas. The area (in acres) of medium and high floods risk within the disturbance areas was calculated and expressed as a percentage of disturbance area for the Proposed Route to Route Alternatives. The acreage of flood hazard areas occurring within the Analysis Area was summarized by segment.

Surface Water Diversions

Established by Executive Order, the State of Idaho via the University of Idaho has established a clearinghouse for geospatial data. This service (InsideIdaho) was reviewed to evaluate surface water diversions within the Analysis Area. Similar information for Wyoming was collected from their Water Resources Data System. Surface water diversions were not described by use. Most diversions are for irrigation; however, some may be potable water sources.

To quantify the number of surface water diversions by Analysis Area, the Analysis Area was overlaid on the InsideIdaho GIS data file for surface water diversions and the number of diversions was counted. To compare the Proposed Route to Route Alternatives, the number of surface water diversions was counted by alternative. The percent of surface water diversions by each segment or alternative was based on the number of diversions in the segment as compared to the number of diversions in the Analysis Area.

Total Maximum Daily Loads

Lists of waterbodies with TMDLs and 303(d) listed waterbodies were obtained from GIS files maintained by the IDEQ, NDEP, and WDEQ Web sites. To quantify the number of TMDL and 303(d) listed waterbodies by Analysis Area, the Analysis Area was overlaid on the IDEQ and NDEP GIS databases (there are no listed streams along the portion of the Project located in Wyoming) for impaired waterbodies, and the number of impaired waterbodies was counted for sediment and temperature TMDLs and 303(d) for sediment and temperature impairment. To compare the Proposed Route to Route Alternatives, the number of impaired waterbodies within the Analysis Area was counted by alternative. In addition, the number of road crossings of impaired waterbodies was counted by alternative and categorized by stream type.

The effects to TMDL and 303(d) listed sediment-impaired streams were further analyzed by comparing the GIS construction and operations disturbance areas to the location of impaired streams. To assess the effects on sediment-impaired streams, the GIS data file from IDEQ for impaired streams was overlaid on the GIS disturbance area file. Disturbance acreage within 500 feet of the impaired stream was noted. The 500-foot distance was selected because that distance should provide adequate buffer to place stormwater BMPs between the disturbance and the impaired stream to prevent further sediment degradation, and several RMPs include a 500-foot buffer to protect water quality in surface waterbodies. To compare the Proposed Route to Route Alternatives, the construction and operations disturbance areas within 500 feet of sediment-impaired streams were compared by alternative.

For TMDL and 303(d) listed temperature-impaired streams, the effects from removal of shading vegetation on temperature degradation were analyzed. To assess the effects on temperature-impaired streams, the GIS data file for impaired streams was overlaid on the GIS construction and operations disturbance area files. These files were then compared with the GIS files for woody vegetation, including the location of trees and shrubs. Acres of woody vegetation removed within 500 feet of the temperature impaired stream were calculated. The 500-foot distance was selected to be consistent with RMP buffers used to protect water quality.

Groundwater

Shallow Groundwater

The NRCS STATSGO database was used to identify shallow groundwater within the Analysis Area and disturbance areas. Shallow groundwater may complicate construction of footings of transmission line towers, which require a foundation as deep as 20 feet. The GIS files of the Analysis Area and disturbance area were overlaid on the GIS file from the STATSGO database. To evaluate the possible interactions between shallow depth to groundwater and the Project, the acreage of the disturbance footprint underlain by shallow depth to groundwater for the entire Proposed Route by segment and for those portions of each segment where Route Alternatives were proposed was identified. Acres of disturbance over shallow depth to groundwater areas were then compared for each segment by alternative. Acreage of shallow depth to groundwater areas within the Analysis Area were summarized by segment.

Water Wells

IDWR and the Wyoming State Engineer's Office databases were used to identify potable water wells and total water wells within the Analysis Area. To identify the number of water wells in the Analysis Area, the GIS file of the Analysis Area was overlaid on the GIS file from the Idaho and Wyoming water entities. The numbers of both potable water wells and total wells were determined by segment. To compare the number of wells between the Proposed Route and Route Alternatives, the numbers of total wells and potable wells within the 1-mile route buffer were counted by alternative.

Shallow bedrock within the Project area could require the use of blasting to set Project foundations. Blasting in shallow bedrock is more fully described in Section 3.14 – Geologic Hazards. Blasting in shallow bedrock could damage nearby structures, including wells. Wells within 200 feet of the blasting areas could be especially susceptible to damage. To assess the number of water wells within 200 of the blasting zones, the GIS file of the Analysis Area was overlaid on the GIS file from the Idaho and Wyoming water entities. The number of total wells within 200 feet of the Project centerline was determined by segment. To compare the number of wells within 200 feet of centerline between the Proposed Route and Route Alternatives, the number of total wells within 200 feet of centerline was counted by alternative.

Sole-source Aquifers

The USEPA Regions 8 and 10 Web sites were searched to identify locations of SSAs. To identify the Project areas located within SSAs, the GIS file of the Analysis Area was overlaid on the GIS file from the USEPA database showing SSAs. The acreage of each Analysis Area within the SSA was calculated and presented as a percentage of the total Analysis Area by segment. To compare the effects on SSAs between the Proposed Route and Route Alternatives, the Analysis Area within SSAs was compared by alternative.

3.16.1.5 Existing Conditions

The Analysis Area is located in areas with perennial, intermittent, and ephemeral streams. Most of the surface waterbodies in Wyoming are natural waterways. In Idaho, there are thousands of stream diversions to support an extensive irrigation system that facilitates agriculture in the Bear River and Snake River Valleys. Groundwater occurs under most portions of the Analysis Area. The Project would not come into contact with groundwater deeper than 20 feet (i.e., the depth of the deepest structure foundations considered for this Project).

Surface Water

Project roads would cross many natural and human-made surface waterbodies. Table 3.16-1 presents the miles of streams located within each segment's Analysis Area. There are 5,090 miles of streams located within the Analysis Area. Segments 1, 4, and 7 each have over 800 miles of streams. However, the Analysis Area encompasses arid areas with low precipitation. Average rainfall is about 10 inches per year. Most of the streams are ephemeral, fed by stormwater.

Table 3.16-1. Water Resources in Analysis Area

Segment	Streams (miles)[1/]	TMDL or 303(d) listed Streams – Sediment (miles)	TMDL or 303(d) listed Streams – Temperature (miles)	Surface Water Diversions (total number)	Flood Areas Medium or High Risk (acres)[1/]	Shallow Groundwater (acres)
1 (1W and 1E)	860	–	–	258	13,254	15
2	372	–	–	58	8,896	–
3	150	–	–	26	3,217	–
4	1,192	18	5	198	53,356	15,437
5	370	111	2	290	30,708	2,539
6	2	–	–	5	343	–
7	1,069	231	58	2,450	30,024	10,532
8	439	100	28	1,284	29,169	–
9	595	91	39	1,172	43,603	–
10	50	9	1	145	2,540	–

1/ Mileages and acreages are rounded to nearest whole number.

The miles of TMDL and 303(d) listed streams that are located in the Analysis Area are included in Table 3.16-1. The percentage of TMDL and 303(d) listed streams for sediment are highest in Segments 5 (20 percent), 7 (41 percent), and 8 (18 percent). The percentage of TMDL and 303(d) listed streams for temperature are highest in Segments 7 (44 percent), 8 (21 percent), and 9 (29 percent). No temperature- or sediment-impaired streams were found in the Wyoming portion of the Project area.

Only one temperature-impaired stream was found in the Nevada portion of the Project area.

This analysis identified a total of 5,886 surface water diversions within the Analysis Area (Table 3.16-1). The most diversions are found in Segments 7, 8, and 9. Although the purpose for diversions was not found in the InsideIdaho database, the majority of these likely support the extensive agricultural flood irrigation practices in southern Idaho.

Areas of medium to high flood risk are located within the Analysis Area. Segment 4 contains the most acres of the Analysis Area located within medium to high flood hazard risks. This segment would also cross a mountainous region, where there are many drainages.

Groundwater

Shallow groundwater is of limited extent within the Analysis Area (Table 3.16-1) Shallow groundwater (i.e., 13 feet deep or less) is found in Segments 1, 4, 5, and 7.

The Project is located within only one SSA. The Eastern Snake River Plain (ESRP) Aquifer occurs in southern Idaho. Portions of Segments 5 through 10 are located on the ESRP. The ESRP Aquifer occupies about 10,800 square miles in southern Idaho and contains approximately one billion acre-feet of water. The aquifer is several hundred feet thick, with the most permeable zone located in the upper 200 to 300 feet. The ESRP Aquifer is often overlain by other, more shallow perched groundwater units, usually the result of infiltration from the extensive flood irrigation practices in the area. Miles of ESRP crossed by each segment and alternative are included in Table D.16-11

in Appendix D. Excavation for transmission line towers or other structures or blasting that could be required in areas of shallow bedrock could cause contact with shallow perched groundwater. However, given the size of this aquifer and the depth of productive units, the Project would not impact this SSA.

Groundwater is the major potable source in southern Idaho. Water wells and potable water wells are found in all portions of the Analysis Area (Table 3.16-2). Table 3.16-2 presents the total number of wells and the number of potable wells within the Analysis Area for each segment (i.e., along the Proposed Route and all Route Alternatives combined). Segment 8 has the greatest number of potable wells (316) within the Analysis Area, followed by Segment 7 (214 potable wells), and Segment 9 (129 potable wells). All other segments have fewer than 100 potable wells within the Analysis Area. Table 3.16-2 also indicates the number of those wells that would be located near areas of shallow bedrock where blasting may be necessary.

Table 3.16-2. Wells within the Analysis Area and Wells near Potential Blasting Areas

Segment Number[1/]	Potable Water Wells	Potable Wells Near Shallow Bedrock	Total Water Wells	Total Wells Near Shallow Bedrock	Total Wells Within 200 Feet of Centerline in Shallow Bedrock
1	79	14	220	25	3
2	14	–	55	–	–
3	3	2	22	14	2
4	49	11	92	22	1
5	66	5	95	5	–
6	5	3	5	5	–
7	214	52	283	82	12
8	316	297	509	373	6
9	129	100	176	133	1
10	62	11	74	13	2

1/ This includes the total number of wells and number of potable wells within the buffered analysis area around each proposed transmission line segment and all of its alternatives. For a breakdown of potable wells along the Proposed Route and Route Alternatives, see Table D.16-10 in Appendix D.

3.16.2 Direct and Indirect Effects

This section is organized to present effects to surface water and groundwater resources from construction, then operations, followed by decommissioning activities for the proposed Project. Route Alternatives are analyzed in detail below in Section 3.16.2.3. There is a Design Variation involving the use of two single-circuit structures proposed by the Proponent for Segments 2, 3, and 4 (see Section 2.2 for details), which is analyzed below in Section 3.16.2.4, and a Structure Variation that is analyzed in Section 3.16.2.5. The Proponents have also proposed a Schedule Variation, analyzed in Section 3.16.2.6, in which one of the two single circuits to be constructed in Segments 2, 3, and 4 and a portion of Segment 1W would be built on an extended schedule with construction beginning approximately 2.5 years after completion of the initial construction.

Mitigation measures or EPMs are presented in detail within this section only if it is the first time they have been discussed in Chapter 3; all other measures are referenced or

summarized. A comprehensive list of all Proponent-proposed EPMs and Agency-required mitigation measures can be found in Table 2.7-1 of Chapter 2.

Plan Amendments

Proposed amendments are summarized in Table 2.2-1 of Chapter 2 and detailed in Appendices F and G. Amendments are needed to permit the Project to cross various areas of BLM-managed and NFS lands. Effects described for areas requiring an amendment in order for the Project to be built would only occur if the amendment were approved. Amendments that alter land management designations could change future use of these areas. No amendments specific to water resources are proposed for the Project and no impacts to water resources resulting from approving the amendments beyond the impacts of the Project are anticipated.

3.16.2.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be constructed or operated. No Project-related impacts to surface water or groundwater resources would occur.

3.16.2.2 Effects Common to All Action Alternatives

Construction

Impacts to Surface Water

Access roads would need to cross streams as part of the proposed Project. There are no assigned site-specific crossing types. Road crossings were estimated based on the data available, and would depend on site-specific conditions at the site location. A summary of the percentage of the types of road crossings and stream types for the Proposed Route are included in Table 3.16-3. Most of the crossing types would be drive through, estimated at 41 percent, followed by fords (37 percent), and 8 percent of the crossings would be culverts. Sensitive stream crossings (7 percent) would need additional mitigation measures (e.g., OM-22, Table 2.7-1), and 9 percent of the stream crossings would be avoided.

Table 3.16-3. Percentage of Crossing Type and Stream Type on Proposed Route

Road Crossing Type	Percent	Stream Type	Percent
Drive through	41	Ephemeral	73
Ford	37	Intermittent	15
Culvert	8	Perennial	5
Sensitive (TMDL/303[d])	7	Artificial	7
Avoid	9		

Because the Project would be located in an arid area, most of the crossings would be ephemeral streams, representing 73 percent of the total. Intermittent streams would account for 15 percent of the types of streams crossed, human-made structures (canals, aqueducts, ditches, drains, channelized natural streams) would be 7 percent of streams crossed, while perennial streams would account for only about 5 percent of the total along the Proposed Route.

Table D.16-1 in Appendix D shows the distribution of types of road crossings over different stream types by Proposed Route segments and the Route Alternatives. The number of crossings for TMDL and 303(d) listed streams are also included in Table D.16-1. Table D.16-6 identifies the types of streams that are crossed by segment and alternative.

The construction of Project components (e.g., transmission line towers, substations, pull sites, staging areas, fly yards, and access roads) would require excavation, grading, and the subsequent removal of vegetation. In areas where the transmission line would cross forested riparian areas, tree heights would need to be kept below the transmission line for safety and maintenance reasons (see Section 3.6 – Vegetation Communities). Riparian areas would be avoided by 500 feet to the extent possible. Transmission poles would not be constructed within river or spring habitats, as avoiding placing poles within these areas is a standard engineering practice. Areas under the transmission line would not be cleared of tall vegetation during initial construction or during ROW maintenance if the distance between the conductor and the top of mature trees or shrubs is greater than 50 feet (e.g., a canyon or ravine crossing with high ground clearance at mid-span). At this time the exact number and location of where the conductor clearances would be greater than 50 feet is uncertain; therefore, impact values for forest and riparian clearing have conservatively calculated ROW impacts as a complete removal of forested vegetation within the ROW, regardless of conductor clearance height. This means that the impact values reported for ROW maintenance are an overestimate of the true impacts that would actually occur, as forested vegetation (including riparian areas) would not be maintained along the entire ROW if the top of mature vegetation is 50 feet or more below the transmission line.

Loss of riparian vegetation resulting from construction activities can reduce stream summer shading, LWD input, terrestrial organic input, as well as increase bank instability, average water temperatures, and erosion potential. In areas where the roots of riparian vegetation are the primary bank stabilizing force, loss of riparian vegetation can result in stream migration. In addition, soil disturbances can increase soil erosion, (or water runoff in areas with compacted soils), and result in an increase in suspended sediments within adjacent waterbodies (Naiman and Bilby 1998). These impacts would be greatest where waterbodies would be crossed by roads due to the extent of direct disturbances to banks and riparian vegetation.

Impacts resulting from the spanning of waterbodies by the transmission line would primarily result from ROW vegetative clearing and maintenance of tree heights. Effects from the spanning of waterbodies by the transmission line would be mitigated to minimize or eliminate changes in stream temperatures, sedimentation, or water quality.

Erosion, sedimentation, and stream stability would be controlled with the use of BMPs as well as the revegetation efforts described in Section 3.6 – Vegetation Communities, and Section 3.15 – Soils. Loss of riparian vegetation and trees along the transmission line crossings may cause a slight localized increase in temperature (immeasurable on most perennial streams) because stream temperature dynamics in forested settings can be strongly regulated by shade. These impacts would be greatest along small, slow-moving, shallow waterbodies. Removal of vegetation and direct solar radiance can result in high local temperature increases. As stream temperature is constantly striving

to gain equilibrium with air temperature, influences of direct solar radiance can be substantial. However, even though gaps in canopy cover can result in an immediate increase in stream temperature, stream temperatures do not continue to increase at an accelerated rate as canopy cover resumes downstream (Danehy et al. 2005). Vegetation removal associated with crossings in forested settings is expected to be minimal and localized, without an overall increase in stream temperatures. The majority of the Analysis Area consists of low grassland and shrub environments; therefore, the majority of stream crossings would occur outside of forested areas (see Section 3.6 – Vegetation Communities). Minimal research has been conducted regarding the effects of riparian vegetation removal on stream temperatures in shrub-steppe ecosystems. Disregarding the influence of groundwater or low-order tributaries, stream temperatures in shrub-steppe systems can be expected to be generally higher than those of forested systems, due to a lack of canopy cover. Furthermore, existing canopy cover likely has a limiting effect within shrub-steppe systems due to its minimal contribution of shade; as shrub canopy cover is typically concentrated only along the edges of a stream (i.e., when the sun is directly overhead it is imparting maximum solar radiance directly onto the middle / deeper portions of the stream). Based on this, changes in stream temperature related to riparian vegetation removal in shrub-steppe systems is likely to be immeasurable. However, in order to further limit the potential impact on adjacent water resources (related to the initial clearing of riparian vegetation in the ROW), the Agencies have identified the mitigation measures SOIL-4, VEG-3, VEG-6, FISH-1, and FISH-2.

Impacts to waterbodies from road crossings would depend on the type of crossing. Table D.16-1 in Appendix D presents an estimate of the number and type of road crossings that are expected to occur, by segment and alternative. These road crossings could result in a potential for localized increases in erosion and surface water sedimentation, as well as direct impacts to streambanks and adjacent vegetation. These impacts would be greatest in areas that contain forested riparian vegetation; however, the Project has been routed to avoid these areas to the extent practical.

As listed in Table D.16-1 and summarized in Table 3.16-3, drive-through crossings on ephemeral or intermittent dry streams account for 41 percent of the total crossings. One impact to stream habitat from drive-through crossings is sedimentation, as sediment loosened during drive-throughs while the channel is dry would become suspended when flow did commence. Erosion of streambanks may also occur. Erosion effects would be mitigated with erosion control measures as needed. Drive-through crossings could also disturb and disrupt appropriate substrate habitat for some aquatic fauna.

Ford crossings on ephemeral or intermittent dry streams account for 37 percent of the total crossings. Sedimentation impacts from dry ford crossings may result when water is present. Sedimentation impacts would be mitigated with sediment controls devices. Erosion of streambanks may occur from dry ford crossings, and effects would be mitigation with erosion control measures. Another impact could be disturbance of suitable substrate habitat for some aquatic fauna, if present.

The installation of culverts on intermittent and perennial streams account for 7 percent of the total crossings. Culverts require in-stream work that may cause an increase in

erosion and sedimentation in the waterbody at the construction site with effects extending downstream. Other impacts from culverts could include scouring, changes in channel geometry and gradient, aggradation or degradation of the stream channel, and changes to habitat for aquatic fauna.

The Agencies have identified the following mitigation measures to reduce the impact of road crossings on aquatic resources; and the Proponents have adopted them as part of their Project description:

WQA-1 Avoid placement of road bed material in channels (perennial, intermittent or ephemeral). Road bed material contains considerable fines that would create sedimentation in coarse cobble dominated stream channels. Even in seasonally dry reaches those fines could be transported during flow periods and negatively impact fish spawning reaches below.

WQA-2 On federal lands, consult with appropriate land management agency staff prior to siting and design for stream crossings (location, alignment, and approach for culvert, drive-through, and ford crossings). This may include a hydrologist, engineer and, for perennial and many intermittent streams, an aquatic biologist.

In addition, the Agencies have identified BIO-3 (in Section 3.6 – Vegetation Communities), which requires that access roads be constructed and sited in such a way as to minimize the number of trees that would need to be removed. Based on the current Project design, approximately 1 acre or less of forested riparian vegetation would be impacted along each segment, resulting from the crossings of waterbodies by roads (for a total of approximately 2 acres of riparian forests impacted by road crossings of waterbodies along the entire length of the Project). To reduce the impacts of unavoidable waterbody crossings by roads, the BLM and cooperating agencies have identified BIO-6 (in Section 3.6 – Vegetation Communities), BIO-28 (in Section 3.10 – General Wildlife and Fish), as well as SOIL-5 and SOIL-6 (in Section 3.15 – Soils) which establish restoration efforts that would need to be conducted in order to re-establish pre-construction conditions along these waterbodies.

Some of the road crossings would include the installation of a culvert (see Table D.16-1 in Appendix D). If culverts are designed or installed improperly, they can isolate wetlands, reduce water flow, change a stream's hydrodynamics, and impede fish passage. Therefore, all culverts would be designed and installed to ensure the continued free flow of water, as well as to allow both the upstream and downstream movement of aquatic organisms. The Proponents would conduct construction and decommissioning of culverts under a CGP required for stormwater operations; which includes the development of BMPs to protect water from stormwater runoff. BMPs would also be employed to minimize sedimentation to waterbodies due to construction activities. In addition, culverts would be inspected regularly by staff approved by the applicable land-management agencies (permanent culverts inspected annually during operations) to ensure that they are not plugged and are functioning properly. The Proponents' responsibility for inspecting culverts, as well as conducting all necessary repairs, would continue as long as the culverts are present within the watershed (this would continue for the life of the Project). The BLM and Forest Service have specific

requirements regarding culvert design and installation on lands they manage. The Proponents would consult with the Forest Service and BLM prior to construction regarding design, layout, and decommissioning requirements for each culvert that would be located on federal lands. All culverts located on federal lands would be constructed in accordance with the applicable federal agencies' management plan standards. In all other areas where more restrictive regulations are not in place, the culvert specifications outlined in Appendix B would be used. The Agencies have identified the following mitigation measures regarding culverts that would need to be applied on federal lands, and the Proponents have adopted them as part of their Project description.

WQA-3 All culverts on NFS lands, both permanent and temporary, shall be designed and installed to meet desired conditions for riparian and aquatic species as identified in the applicable Forest Plan. Culverts should not be hydraulically controlled. Hydraulically controlled culverts create passage problems for aquatic organisms. Culvert slope should not exceed stream gradient and should be designed and implemented (typically by partial burial in the streambed) to maintain streambed material in the culvert.

WQA-4 Culvert sizing on NFS lands shall comply with *Guidance for Aquatic Species Passage Design, Forest Service Northern Region & Intermountain Region* (Forest Service 2003f), and culvert sizing on BLM-administered lands shall comply with BLM Manual 9113.

The Proponents have agreed to the following measure:

WQA-5 On non-federal lands, culvert placement should comply with state BMPs. The minimum size culvert will be 12 inches in diameter. If a channel width exceeds 3 feet, additional pipes may be used until the cross-sectional area of the pipes is greater than 60 percent of the cross-sectional area of the existing channel. Filter cloth should be placed on the streambed and banks prior to placement of the pipe, and the culvert should be covered with a minimum of 1 foot of aggregate.

As part of the SWPPP, the Proponents have proposed the following EPMs related to prevention of erosion and sedimentation:

SW-1 The appropriate NPDES permits for construction activities that disturb 1 acre or more of land will be obtained from the Department of Environmental Quality and USEPA or their designees.

SW-4 The SWPPPs will be modified as necessary to account for changing construction conditions.

SW-5 The SWPPPs will identify areas with critical erosion conditions that may require special construction activities or additional BMPs to minimize soil erosion.

SW-6 Migration of construction-related sediment to all adjacent surface waterbodies will be prevented.

SW-7 Stormwater BMPs will be maintained on all disturbed lands during construction activities, as described in the SWPPP.

SW-8 Approved sediment and erosion control BMPs will be installed and maintained until disturbed areas meet final stabilization criteria.

SW-9 Temporary BMPs will be used to control erosion and sediment at staging areas (equipment storage yards, fly yards, laydown areas) and substations.

SW-10 The construction schedule may be modified to minimize construction activities in rain-soaked or muddy conditions.

SW-12 Upon completion of construction, permanent erosion and sediment BMPs will be installed along the transmission line within the ROW, at substations, and at related facilities in accordance with the SWPPP.

Based on the implementation of this SWPPP, direct and indirect impacts to vegetation from erosion and sedimentation are expected to be minor and would be limited to temporary loss or disturbance of vegetation at sites where BMPs are installed and some disturbance resulting from erosion of soils or deposition of sediment. An additional mitigation measure to reduce compaction is found in Section 3.15 – Soils. Reclamation, however, would take a number of years to implement, depending on the habitat type impacted, and the beneficial functions of streamside vegetation, such as shading and bank stability, will not recover immediately.

Construction of access roads and stream crossings would result in impacts to TMDL and 303(d) listed sediment-impaired streams due to soil disturbance during construction, but this would be minimized by the BMPs, EPMs, and mitigation measures discussed above. Named streams that have TMDLs or are on the 303(d) list for sediment or temperature are included in Table D.16-13 in Appendix D.

TMDL and 303(d) listed temperature-impaired streams would also be impacted during construction. Any crossings of these streams that occur at points that do not currently contain forested vegetation (which serves as summer stream shade) would not have a measurable impact to average stream temperatures. However, as discussed above, tree removal would be necessary in forested riparian areas in order to provide clearance for energized lines, and this tree removal could contribute to increases in stream temperatures if substantial areas are cleared. Table 3.16-4 includes the number of acres of woody vegetation that would be impacted due to construction and operations disturbance within 500 feet of a TMDL or 303(d) listed stream for temperature. Alternatives in Segments 4, 7, 8, and 9 include removal of woody vegetation within 500 feet of a temperature-impaired stream.

Table 3.16-4. Acres of Woody Vegetation within 500 Feet of Temperature Impaired Streams Impacted by Construction and Operation Disturbance

		Construction Disturbance			Operation Disturbance			Two Single-Circuit Construction Disturbance		
Segment Number	**Proposed Alternative or Route Name**	**TMDL and 303(d) Listed Temperature (acres)**	**%**	**Total Acres**	**TMDL and 303(d) Listed Temperature (acres)**	**%**	**Total Acres**	**TMDL and 303(d) Listed Temperature (acres)**	**%**	**Total Acres**
4	Proposed 4	0.3	<0.1	2,846	0.2	<0.1	651	0.3	<0.1	3,705
7	Alternative 7H	0.3	<0.1	2,118	0	0	340	0	0	2,118

Table 3.16-4. Acres of Woody Vegetation within 500 Feet of Temperature Impaired Streams Impacted by Construction and Operation Disturbance (continued)

Segment Number	Proposed Alternative or Route Name	Construction Disturbance			Operation Disturbance			Two Single-Circuit Construction Disturbance		
		TMDL and 303(d) Listed Temperature (acres)	%	Total Acres	TMDL and 303(d) Listed Temperature (acres)	%	Total Acres	TMDL and 303(d) Listed Temperature (acres)	%	Total Acres
7	Alternative 7I	7.6	0.3	2,735	1.2	0.3	450	7.6	0.3	2,735
	Alternative 7J	4.1	0.1	3,180	0.7	0.1	512	4.1	0.1	3,180
8	Proposed 8	0.2	<0.1	2,125	0.01	<0.1	246	0.2	<0.1	2,125
	Proposed 8, compare to 8B	0.2	<0.1	2,125	0.01	<0.1	87	0.2	<0.1	2,125
	Alternative 8B	0.01	<0.1	779	0	0	69	0.01	<0.1	779
9	Alternative 9D	0.001	<0.1	815	0.000004	<0.1	80	0.001	<0.1	815
	Alternative 9F	0.001	<0.1	971	0.000004	<0.1	93	0.001	<0.1	971
	Alternative 9G	0.001	<0.1	848	0.000004	<0.1	83	0.001	<0.1	848
	Alternative 9H	0.001	<0.1	979	0.000004	<0.1	96	0.001	<0.1	979

1/ Total acres of surface disturbance along riparian areas.

Alternatives 7H and 7I would impact 0.3 and 7.6 acres of woody vegetation during construction (Alternative 7H would not impact woody vegetation during operations. The construction impact area is due to the construction buffer around a deadend pulling yard used during construction that would be revegetated after construction is complete). Alternative 7J includes a total impact of 4.1 acres of woody vegetation spread over four different streams. Segment 8 of the Proposed Route would impact 0.2 acre of woody vegetation during construction, while Alternative 8B would impact less than 0.1 acre (Alternative 8B would not impact woody vegetation for operations. The construction impact area is due to the tower pad construction disturbance buffer area that would be revegetated after completion of construction). Route Alternatives within Segment 9 would impact less than 0.1 acre of woody vegetation within 500 feet of temperature impaired streams.

Accidental spills or disposal of harmful materials used during construction could wash into and pollute surface water. Materials that could contaminate the construction area include lead-based paint flakes, diesel fuel, gasoline, lubrication oil, cement slurry, hydraulic fluid, antifreeze, transmission fluid, lubricating grease, or other toxic fluids. Downstream beneficial uses could be adversely affected if these chemicals enter into waterbodies. The Project SWPPP (Appendix C-1, Attachment B) would include procedures for promptly reporting and cleaning up spills generated during construction. The Proponents have committed to EPMs, which includes measures for temporary and permanent erosion and sediment controls that would be used during construction, operations, and maintenance of the Project, as well as an SPCC Plan (SW-1 through SW-12 in Appendix C-1, Attachment C). The EPMs would also include measures for spill prevention practices, requirements for refueling and equipment operation near waterbodies, procedures for emergency response and incident reporting, and training requirements. Actions taken in accordance with these EPMs should assist in mitigation of impacts to surface water. In addition, the Agencies have identified SOIL-1 (in Section 3.15 – Soils), which creates additional requirements for the SWPPP, to limit potential impacts.

Water would be necessary for construction of the transmission lines and associated facilities. Water would be used for mixing of portland cement concrete as well as for dust control on service or access roads. Water usage for dust control provides a benefit by preventing air quality degradation. The Proponents would use municipal and local sources for construction water and would contract for the water rights prior to Project initiation; water would not be withdrawn from public waterways or surface sources without agreement by appropriate entities. The Proponents intend to draw water from existing developed water rights (i.e., purchasing existing water rights and only draw water in accordance with these existing water rights); therefore, if the entirety of this water use was diverted from existing rights, there would be no depletion of water beyond existing depletions related to existing water rights (Kantola 2010; Hoobles 2010). However, at this time it is uncertain if the Proponents would be able to purchase enough existing water rights to cover the Project's needs, and as such, there may be a depletion of water from the affected systems (in addition to current water depletions related to existing rights). The water estimates for transmission line construction along all segments would be about 4,200 to 9,200 gallons per day (see Table D.16-12 in Appendix D), or about one to two large water truckloads per day (a typical construction water truck holds approximately 4,000 to 5,000 gallons). The water estimates for all segments are dependent on a number of factors (weather, soil type, length of construction, construction sequencing, and others) and the actual construction water usage would likely vary from these preliminary estimates. Water use for substation construction would range from an estimated total of 1 million gallons (3 acre-feet) at Heward to 19 million gallons (58.8 acre-feet) at Anticline (see Table B-10, Appendix B). Water used from the North Platte River and Colorado River basins would be under consultation with the USFWS (see Section 3.7 – Special Status Plants, and Section 3.11 – Special Status Wildlife and Fish Species). Mitigation measure TESWL-17 is required to comply with the USFWS tiered BO under the Upper Colorado Endangered Fish Recovery Program, due to the water withdrawals from the Colorado River (as initially described in Section 3.7 – Special Status Plants). This measure would be applied Project-wide regardless of land ownership.

Impacts to Groundwater

Due to the shallow excavations required for Project foundations it is unlikely that this Project would affect groundwater. Shallow groundwater of 14 feet or less is present only in Segments 1, 4, 5, and 7. Any impacts to groundwater would be of short duration and consist mainly of temporary sedimentation. Excavations for transmission line structures may contact shallow groundwater; however, the groundwater contact would be unlikely to adversely impact this resource, unless an accidental chemical spill occurs near an open excavation. The Proponents have committed that materials such as fuels, other petroleum products, chemicals, and hazardous materials including wastes would be located in upland areas at least 500 feet away from streams, 400 feet for public wells, and 200 feet from private wells. The Proponents would adhere to state requirements for containment of hazardous materials. Typically, contact with construction equipment would not impact groundwater quality except to increase turbidity temporarily, and only in a limited area.

The Project could temporarily impact water quality in potable water wells to a limited extent from excess sediment influx into the potable water wells located near Project

excavations. The greatest risk to water wells of any use would be from damage that could occur during blasting of shallow bedrock. Many wells in southern Idaho are constructed as an "open hole," meaning they are not cased along their entire interval. If nearby blasting causes the dislodging of a rock from the boring sidewall, the rock can fall down the well and trap the submersible pump. This could result in temporary or permanent damage to the well. The effects of well damage could be loss of a potable water supply or loss of irrigation water flow to farmlands. In the Proponents' Blasting Plan (as required by mitigation measure GEO-1 of Section 3.14 – Geologic Hazards), damage to nearby wells would be repaired or replaced. If access is given by well owners, the Proponents propose to conduct pre-blast and post-blast inspections of wells within 200 feet of blasting areas.

Construction dewatering could result in a local and temporary drawdown of groundwater levels, temporarily (i.e., during the withdrawal) reducing the yield of nearby shallow water wells and potentially adjacent surface water systems (such as wetlands; see Section 3.9 – Wetlands and Riparian Areas). In addition, blasting or drilling for tower foundations could reduce flows in wells and springs. However, water supply wells are typically deeper than the proposed maximum excavation depth of 20 feet, so a temporary drawdown limited to that depth is unlikely to affect water yield.

In no case would groundwater removed during construction be discharged to surface waters or storm drains without first obtaining any applicable permits or without approval of the applicable federal land-managing agency.

Operations

Impacts to Surface Water

The impacts from Project operations on surface water would be less in magnitude as compared to the impacts from construction, but longer in duration. The disturbed area of operations would be about approximately 30 percent of the construction area disturbance. For this reason, the erosion effects in the operation area should be much less than for construction areas, but would persist for a much longer time. Potential impacts to surface water from road crossings include erosion of streambanks and sedimentation of road runoff from stormwater. Culverts may get blocked by debris in streams and cause water to back up and flood areas. Use of roads during maintenance activities may promote erosion. Stormwater BMPs, including erosion and sediment control structures, as well as new culverts would require inspection, maintenance, and repair through the operational life of the Project to minimize soil erosion or sedimentation to surface water.

Some of the streams that would be crossed by the Project have delineated 100-year floodplains or flood hazard areas designated by FEMA. Flood hazard areas include streams in the North Platte River drainage near Windstar Substation, the Green River and tributaries in Sweetwater County (Segment 4), the Bear River in Oneida County, and tributaries of the Snake River in southern Idaho. The 100-year floodplain is the area that would be inundated by a flood with a recurrence interval of once in 100 years, on average. The Project would be designed to withstand flooding during all its phases. Building is permitted in flood-prone areas with certain restrictions. For instance, buildings are to be elevated such that the lowest floor is above the 100-year flood level, and an area of the watercourse is typically set aside for flow conveyance (the floodway).

Since floodplain mapping is usually done as an aid to local governments in urban areas or areas that are expected to be prone to urbanization, most watercourses in non-urban areas are not mapped even though they may be subject to substantial flood hazards. It is reasonable to assume that all watercourses that convey natural flows, whether mapped as floodplains, flood hazard areas, or not, present some level of flood hazard. The flood hazard is not limited to inundation; bank erosion and bed scour (a lowering or destabilization of the channel bed during a flow event) are also hazards that can occur due to flooding. On lands with restrictions in building within 100-year floodplains, requirements in Forest Plans/RMPs will apply.

Encroachment of a Project structure into a flood path could result in flooding of or erosion damage to the encroaching structure, diversion of flows and increased flood risk for adjacent property, or increased erosion on adjacent property. Impacts are likely to occur only where power poles or other permanent Project features are constructed in or closely adjacent to a watercourse; this will not occur per standard engineering practices. All towers within a flood hazard area subject to scour or lateral movement of a stream channel would be protected by burial beneath the 100-year scour depth, setbacks from the channel bank, or bank protection. Structures impacted from floods would be maintained or replaced.

The number of acres of operations disturbance located in medium- to high-risk flood zones is less than 18 percent of the total operations disturbance area. The Project includes small footprint structures; the permanent footprint of each structure adds up to a small percentage of the high-risk flood hazard area. A majority of the operations disturbance is access roads and maintenance of the ROW. Therefore, the Project is not likely to measurably impact flood flows. However, flood flows could impact the Project structures and roads. Therefore, Project structures would be placed to avoid impacts from floods, if possible. Structures would be designed to withstand impacts from flood waters.

Impacts to Groundwater

Groundwater would not be directly impacted during transmission line operation because all operations activities would occur above the ground surface, and there would be measures in place to protect against chemical spills (see Appendix C-1, Attachment B). During operations, insulating mineral oil is used in some electrical equipment at substations, such as transformers, and some reactors and circuit breakers. The POD indicates that oil-filled equipment would be placed within secondary containment structures to ensure that oil spills would not impact soil or groundwater. The containment structures take many forms, depending on site requirements, environmental conditions, and regulatory restrictions. Different varieties of containment structures include artificially lined sumps of sufficient volume to contain oil spills, and oil-water separators. The Proponents would adhere to state requirements for containment of hazardous materials. Because of the corrective measures built into the Project plan, chemical spills are not further discussed here.

Decommissioning

During decommissioning, all structures would be removed. Land managers or property owners would be contacted about the final disposition of roads installed for the Project. The effects from soil disturbances and water effects during decommissioning would be similar to those of construction, and are not discussed in detail separately.

Groundwater would not be affected during transmission line decommissioning. Foundations would be abandoned in place, or cut off below ground surface and buried. This makes contact with groundwater less likely than during construction.

3.16.2.3 Proposed Route and Alternatives by Segment

Tables D.16-1 through D.16-16 in Appendix D show the surface water and groundwater conditions for the Proposed Route and as well as a comparison between Route Alternatives and the comparison portion of the Proposed Route (i.e., the portion of the Proposed Route that starts and ends at the same nodes as the Route Alternative).

Segment 1E

Segment 1E, as proposed, would link the Windstar and Aeolus Substations in south-central Wyoming with a 100.6-mile 230-kV single-circuit transmission line. Twenty acres of the expansion of Windstar and Aeolus Substations and 0.5 acre for one regeneration site are attributed to Segment 1E. Alternative 1E-A is a 16.1-mile alternative along the north end of Segment 1E, which was the Proponents' initial proposal before moving the Proposed Route at the suggestion of local landowners to avoid the more settled area around Glenrock. Alternative 1E-B is 21.4 miles longer than the Proposed Route but is being considered by the Proponents because it would avoid a Wyoming-designated sage-grouse core area to the east. The BLM has required the consideration of Alternative 1E-C, which parallels the proposed and rebuilt Segment 1W 230-kV lines into the Aeolus Substation (see Appendix A, Figure A-2).

Construction

Surface Water

There would be 319 surface water crossings on the Proposed Route that would require an estimated 140 drive-through crossings, 144 fords, and 28 culverts for a total of 5 acres of disturbance (Table D.16-1 in Appendix D). Of the 319 crossings, 73 percent are non-listed ephemeral streams and there are no TMDL or 303(d) listed streams (Table D.16-6 in Appendix D). Alternative 1E-C contains 179 fewer crossings, 13 fewer culverts, 83 fewer fords, 78 fewer drive-through crossings, and 2 acres less disturbance than the comparison portion of the Proposed Route.

A total of 179 acres of construction disturbance for this segment or 16 percent of the disturbance area would be located within 500 feet of perennial and intermittent streams and 72 acres or 7 percent would be located within 100 feet of ephemeral streams (Table D.16-14 in Appendix D). Alternative 1E-C would have 71 less acres of disturbance within 500 feet of perennial streams and 37 less acres within 100 feet of ephemeral streams than the comparison portion of the Proposed Route.

Approximately 9 percent of the construction disturbance area would be located within the moderate- and high-risk flood zone (Table D.16-2 in Appendix D). Alternative 1E-A has 5 percent less than the comparison portion or the Proposed Route.

There are 71 surface water diversions within 0.5 mile of this segment. Alternative 1E-A has approximately half the number of surface water diversions than the comparison portion of the Proposed Route (Table D.16-5 in Appendix D).

Table 3.16-5 contains the number of stream crossings on NFS land. This segment includes 19 stream crossings on the Medicine Bow-Routt NFs. Of these 19 stream crossings, 3 are intermittent, and 16 are ephemeral. There are no TMDL or 303(d) listed streams located on NFS lands in Segment 1. Alternative 1E-C includes 12 fewer stream crossings than the comparison portion of the Proposed Route. See Section 3.9 – Wetlands and Riparian Areas for effects on riparian zones. With the application of the SWPPP and Reclamation, Revegetation, and Maintenance Plan, construction is not expected to result in a long-term reduction or loss of function for the streams within the Project area, due to the revegetation efforts and the measures to restrict sedimentation input to waterbodies. Site-specific crossing plans and measures to mitigate impacts will be submitted to Medicine Bow-Routt NF for approval prior to construction in these areas.

Groundwater

The overall risk to groundwater from construction of Segment 1E and its Alternatives would be low because shallow groundwater does not underlie these routes (Table D.16-7 in Appendix D). Segment 1E contains 57 potable water wells within 0.5 mile of the Proposed Route (Table D.16-10 in Appendix D). There are fewer wells located in proximity to Alternatives 1E-A and 1E-C than in the comparison portions of the Proposed Route. Three wells in the Segment 1 Analysis Area are located in shallow bedrock within 200 feet of the route centerline, which may be affected by blasting due to proximity (Table 3.16-2).

Table 3.16-5. Number of Stream Crossings in National Forests

Segment or Alternative[1/]	Perennial	Intermittent - Wet	Intermittent - Dry	Ephemeral	Total Crossings
Proposed Segment 1E – Total Length	–	–	3	16	19
Proposed – Comparison Portion for Alternative 1E-C	–	–	3	16	19
Alternative 1E-C	–	–	–	7	7
Proposed Segment 1W(a) – Total Length	–	–	–	15	15
Proposed Segment 1W(c) – Total Length	–	–	5	13	18
Proposed Segment 4 – Total Length	15	–	9	–	24
Alternative 7H	–	1	25	42	68
Alternative 7I (non-TDML/303[d] streams)	9	5	27	65	106
Alternative 7I TMDL and 303(d) Listed Sediment	3	–	–	–	3
Alternative 7I TMDL and 303(d) Listed Temperature	2	–	1	3	6
Alternative 7J (non-TDML/303[d] streams)	–	1	27	54	82
Alternative 7J TMDL and 303(d) Listed Temperature	2	–	1	3	6

1/ Segment 1: Medicine Bow-Routt NF; Segment 4: Caribou-Targhee NF; Segment 7: Sawtooth NF

Construction water usage for this segment would consist of approximately 2,200,000 gallons (6.6 acre-feet), given an estimate of approximately 1.2 years for construction. Alternative 1E-A would use a comparable amount of water as the comparison portion of the Proposed Route, whereas Alternative 1E-B would require greater water usage, and Alternative 1E-C would require less water usage during construction (Table D.16-12 in Appendix D).

Operations

This segment includes 49 acres of operations disturbance area within 500 feet of perennial and intermittent streams, or 17 percent of the operations disturbance area, and 25 acres within 100 feet of ephemeral streams, or 9 percent of the operations disturbance area (Table D.16-15 in Appendix D). Alternative 1E-C would have a total of 23 less acres of disturbance within 500 feet of perennial or intermittent streams and 10 less acres within 100 feet of ephemeral streams.

Approximately 13 percent of the operations disturbance area would be located within the moderate- and high-risk flood zone (Table D.16-3 in Appendix D). Alternative 1E-A has a lower percent of disturbance area located within a flood zone than the comparison portion of the Proposed Route.

The operations disturbance area does not overlay shallow groundwater (Table D.16-8 in Appendix D).

Segment 1W

Segment 1W is composed of two parts, Segments 1W(a) and 1W(c), both of which would consist of a new 230-kV line for part of their length and a reconstruction of an existing 230-kV line for the remaining part. Segment 1W(a) would be about 76.5 miles long, and would extend from the Windstar Substation to the Aeolus Substation. Segment 1W(c) would be about 70.6 miles long, and would extend from the Dave Johnson Power Plant to the Aeolus Substation. Alternative 1W-A is a 16.2-mile alternative located near the town of Glenrock, which was the Proponents' initial proposal before moving the Proposed Route at the suggestion of local landowners in order to avoid the more settled area around Glenrock. Twenty acres of the proposed expansion at the Windstar and Aeolus Substations are attributed to Segment 1W(a) and 3 acres of the expansion at the Heward Substation and 17 acres of the expansion at the Windstar and Aeolus Substations are attributed to Segment 1W(c). There are no Route Alternatives proposed south of that point (see Appendix A, Figure A-2).

Construction

Surface Water

There would be 165 surface water crossings on the Proposed Route that would require an estimated 73 drive-through crossings, 74 fords, and 16 culverts for a total of 3 acres of disturbance (Table D.16-1 in Appendix D). Of the 165 crossings, 73 percent are non-listed ephemeral streams and there are no TMDL or 303(d) listed streams (Table D.16-6 in Appendix D). Alternative 1W-A contains more crossings, culverts, and disturbance acreage than the comparison portion of the Proposed Route.

A total of 83 acres of construction disturbance for this segment would be located within 500 feet of perennial or intermittent streams or 13 percent of the disturbance area, and

39 acres would be located within 100 feet of ephemeral streams (6 percent of the disturbance area (Table D.16-14 in Appendix D). Alternative 1W-A would have a total of 18 more acres of disturbance within 500 feet of perennial or intermittent streams and 1 more acre within 100 feet of ephemeral streams than the comparison portion of the Proposed Route.

Approximately 11 percent of the construction disturbance area would be located within the moderate- and high-risk flood zone (Table D.16-2). Alternative 1W-A has a lower percent of disturbance area located within a flood zone than the comparison portion of the Proposed Route.

There are 71 surface water diversions within 0.5 mile of this segment. Alternative 1W-A has fewer surface water diversions than the comparison portion of the Proposed Route (Table D.16-5 in Appendix D).

Segment 1W(a) would include 15 stream crossings on the Medicine Bow-Routt NFs (Table 3.16-5). Of these 15 crossings, all would be of ephemeral streams. There are no TMDL or 303(d) listed streams located on NFS lands. The alternative would not contain stream crossings on NFS lands. Segment 1W(c) would include 13 ephemeral stream crossings and 5 intermittent dry crossings. See Section 3.9 – Wetlands and Riparian Areas for effects on riparian zones. With the application of the SWPPP and Reclamation, Revegetation, and Maintenance Plan, construction is not expected to result in a reduction or loss of function for the streams within the Project area, due to the revegetation efforts and the measures to restrict sedimentation input to waterbodies. Site-specific crossing plans and measures to mitigate impacts will be submitted to the Medicine Bow-Routt NFs for approval prior to construction in these areas.

Groundwater

The overall risk to groundwater from construction and operations of Segment 1W and its alternative would be low because shallow groundwater does not underlie this segment (Table D.16-7 in Appendix D). Segment 1W(a) would contain 53 potable water wells and Segment 1W(c) would contain 65 potable water wells within 0.5 mile of the Proposed Route (Table D.16-10 in Appendix D). There would be more wells located near Alternative 1W-A than the comparison portion of the Proposed Route (56 wells versus 51 wells, respectively; Table D.16-10 in Appendix D). Three wells in the Segment 1 Analysis Area would be located in shallow bedrock within 200 feet of the route centerline, which may be affected by blasting due to proximity (Table 3.16-2).

Construction water usage for this segment would consist of approximately 1,700,000 gallons (5.3 acre-feet) over approximately one year of construction. Alternative 1W-A would use a comparable amount of water as the comparison portion of the Proposed Route (Table D.16-12 in Appendix D).

Operations

Segment 1W(a) would include 34 acres of operations disturbance area within 500 feet of perennial streams or 19 percent of the operations disturbance area, and 11 acres within 100 feet of ephemeral streams or 6 percent of the operations disturbance area (Table D.16-15 in Appendix D). Alternative 1W-A would have a total of 5 more acres of

disturbance within 500 feet of perennial streams and 1 acre within 100 feet of ephemeral streams than the comparison portion of the Proposed Route.

Approximately 18 and 12 percent of the operations disturbance area would be located within the moderate- and high-risk flood zone for Segment 1W(a) and 1W(c), respectively (Table D.16-3 in Appendix D). Alternative 1W-A would have a lower percent of disturbance area located within a flood zone than the comparison portion of the Proposed Route.

The operations disturbance area would not overlay shallow groundwater (Table D.16-8 in Appendix D).

Segment 2

Segment 2, as proposed, would link the Aeolus and Creston Substations in southeast Wyoming with two 500-kV circuits on one structure. One circuit would be operated at 230 kV during the initial phase of the Project. Its total proposed length is 96.7 miles. Fifty-two acres of the expansion of the Aeolus Substation and the construction of the Creston Substation and 0.5 acre for one regeneration site are attributed to Segment 2. There are three Route Alternatives, two of which are near the community of Fort Fred Steele. Alternative 2A at 28.4 miles long is being considered by the BLM because it remains in the WWE corridor nearer the town and the state historic site, and Alternative 2B, at 6.2 miles, is closer to the community than the comparison portion of the Proposed Route and was the initially proposed route before the Proponents responded to local suggestions and relocated the Proposed Route farther to the south. Alternative 2C is a 24.4-mile alternative located north of Hanna, Wyoming. It is being evaluated at the recommendation of the Wyoming Governor's office to follow a utility corridor approved by that office for minimizing effects to sage-grouse (see Appendix A, Figure A-3).

Construction

Surface Water

There would be 276 surface water crossings on the Proposed Route that would require an estimated 143 drive-through crossings, 105 fords, and 22 culverts for a total of 4 acres of disturbance (Table D.16-1 in Appendix D). Of the 276 crossings, 92 percent would be non-listed ephemeral streams and there would be no TMDL or 303(d) listed streams (Table D.16-6 in Appendix D). Only Alternative 2C contains fewer crossings, and culverts, and lower disturbance acreage than the comparison portion of the Proposed Route (Table D.16-1 in Appendix D).

A total of 102 acres of construction disturbance for this segment would be located within 500 feet of perennial or intermittent streams or 7 percent of the construction disturbance area, and 122 acres would be located within 100 feet of ephemeral streams or 8 percent of the disturbance area (Table D.16-14 in Appendix D). Alternative 2C would have a total of 31 less acres of disturbance within 500 feet of perennial or intermittent streams and 33 less acres within 100 feet of ephemeral streams.

Approximately 13 percent of the construction disturbance area would be located within the moderate- and high-risk flood zone (Table D.16-2 in Appendix D). All alternatives

would have higher percentages of disturbance area located within a flood zone than the comparison portion of the Proposed Route.

There would be 36 surface water diversions within 0.5 mile of this segment. Alternative 2C would have fewer surface water diversions than the comparison portion of the Proposed Route (Table D.16-5 in Appendix D).

Groundwater

The effects to groundwater in Segment 2 would be low because shallow groundwater does not underlie this segment (Table D.16-7 in Appendix D). There would be eight potable water wells within 0.5 mile of the proposed Segment 2 (Table D.16-10 in Appendix D). There would be more wells located near Alternative 2B than the comparison portion of the Proposed Route (12 wells and 1 well, respectively), and the same number located near Alternative 2A (3 wells; Table D.16-10 in Appendix D). There would be no wells located in shallow bedrock (Table 3.16-2); therefore, there would not be blasting near wells, and construction damage to the wells would not be expected under the Proposed Route or any of the Route Alternatives

An estimated 2,730,000 gallons (8.4 acre-feet) of water would be used for construction over a 1-year period. All Route Alternatives would use a similar amount of water as their comparison portions of the Proposed Route (Table D.16-12 in Appendix D).

The operations disturbance area would not overlay shallow groundwater (Table D.16-8 in Appendix D).

Operations

This segment would include 43 acres (11 percent) of operations disturbance area within 500 feet of perennial or intermittent streams, and 28 acres (7 percent) within 100 feet of ephemeral streams (Table D.16-15 in Appendix D). Alternative 2C would have 7 fewer acres of disturbance within 500 feet of perennial or intermittent streams and 6 fewer acres within 100 feet of ephemeral streams than the comparison portion of the Proposed Route.

Approximately 22 percent of the operations disturbance area would be located within the moderate- and high-risk flood zone (Table D.16-3 in Appendix D). All alternatives would have higher percentages of disturbance area located within a flood zone than the comparison portions of the Proposed Route.

Segment 3

Segment 3, as proposed, would link the Creston and Anticline Substations in southeast Wyoming with two 500-kV circuits on one structure. One circuit would be operated at 230 kV during the initial phase of the Project. Its total proposed length between those two substations is 46.7 miles. Sixty-nine acres of the construction of the Anticline and Creston Substations are attributed to Segment 3. Segment 3 would also link the Anticline and Jim Bridger Substations with a 4.3-mile 230-kV line and a 5.5-mile 345-kV line and includes the 10-acre expansion of the Jim Bridger 345-kV Substation. There are no alternatives proposed along this segment (see Appendix A, Figure A-4).

Construction

There would be 127 stream crossings in this segment, requiring 52 drive-through crossings, 52 fords, and 20 culverts (Table D.16-1 in Appendix D). Approximately 66 percent of the crossings would be non-listed ephemeral drainages (Table D.16-6 in Appendix D). There would be no TMDL and 303(d) listed streams crossed by this segment.

There would be 27 surface water diversions along this segment (Table D.16-5 in Appendix D). Approximately 10 percent of the construction disturbance area and 10 percent of the operations disturbance area would be located within a moderate- to high-risk flood hazard area (Tables D.16-2 and D.16-3 in Appendix D).

A total of 111 acres of construction disturbance for this segment would be located within 500 feet of perennial or intermittent streams or 13 percent of the construction disturbance area, and 63 acres would be located within 100 feet of ephemeral streams or 7 percent of the disturbance area (Table D.16-14 in Appendix D).

Three potable water wells would be located within the Segment 3 Analysis Area and 2 are located within 200 feet of the centerline in shallow bedrock and therefore at risk of damage during blasting (Table 3.16-2). Over an estimated 1.1-year construction interval, an estimated 1,700,000 gallons (5.1 acre-feet) of water would be required (Table D.16-12 in Appendix D).

Operations

The operations disturbance area would not overlay shallow groundwater (Table D.16-8 in Appendix D). This segment would include 19 acres of operations disturbance area within 500 feet of perennial or intermittent streams, or 9 percent of the operations disturbance area. Approximately 18 acres would be located within 100 feet of ephemeral streams, or 8 percent of the operations disturbance (Table D.16-15 in Appendix D).

Segment 4

Segment 4, as proposed, would link the Anticline Substation near the Jim Bridger Power Plant in southwestern Wyoming with the Populus Substation in Idaho with two 500-kV circuits on one structure. Its total proposed length is 203 miles. Eighty-nine acres of the construction of the Anticline Substation and the expansion of the Populus Substation and 1.5 acres for three regeneration sites are attributed to Segment 4. It has six Route Alternatives in the middle portion of its route but the first 52 miles to the east and the last 61 miles to the west (in Idaho) do not have any Route Alternatives. The middle section of the Proposed Route is 90.2 miles long, and its Route Alternatives vary from 85 to 102 miles long. These alternatives were proposed by the Wyoming Governor’s office (4A, paralleling the existing 345-kV lines throughout); by the BLM Kemmerer FO (4B through 4E, including edits from various cooperating agencies), with the intent to avoid impacts to cultural resources to the extent practical; and by the Proponents (4F, attempting to avoid impacts to cultural resources while still remaining north of the existing lines) (see Appendix A, Figures A-5 and A-6).

Construction

Surface Water

There would be 414 surface water crossings on the Proposed Route that would require an estimated 154 drive-through crossings, 179 fords, and 38 culverts for a total of 6 acres of disturbance (Table D.16-1 in Appendix D). Of the 414 crossings, 69 percent would be non-listed ephemeral streams and there are 3 TMDL or 303(d) listed ephemeral streams for sediment (Table D.16-6 in Appendix D). Alternative 4F would contain fewer stream crossings, fords, and drive-through crossings but more culverts than the comparison portion of the Proposed Route (Table D.16-1 in Appendix D).

A total of 327 acres of construction disturbance for this segment would be located within 500 feet of perennial or intermittent streams or 11 percent of the construction disturbance area, and 184 acres would be located within 100 feet of ephemeral streams or 7 percent of the disturbance area (Table D.16-14 in Appendix D). No alternative would have less acres of disturbance within 500 feet of perennial or intermittent streams than the comparison portion of the Proposed Route; however, Alternatives 4A and 4F would have 42 and 32 fewer acres, respectively, within 100 feet of ephemeral streams than the comparison portion of the Proposed Route, and the same disturbance acreage (5 acres) located within 500 feet of a TMDL or 303(d) listed stream for sediment.

There is no woody vegetation that is located within 500 feet of a temperature-impaired stream that would be disturbed due to construction of the Proposed Route (Table 3.16-4).

Approximately 25 percent of the construction disturbance area would be located within the moderate- and high-risk flood zone (Table D.16-2 in Appendix D). All alternatives have less acreage located within a flood zone than the comparison portion of the Proposed Route.

There would be 121 surface water diversions within 0.5 mile of this segment. All alternatives would have more surface water diversions than the comparison portion of the Proposed Route (Table D.16-5 in Appendix D).

This segment would include 24 stream crossings on the Caribou-Targhee NF (Table 3.16-5). Of these 24 stream crossings, 9 would be intermittent, and 15 would be perennial. There would be no TMDL or 303(d) listed streams located on NFS lands and none of the alternatives would include stream crossings on NFS land. See Section 3.9 – Wetlands and Riparian Areas for effects on riparian zones. With the application of the SWPPP and Reclamation, Revegetation, and Maintenance Plan, construction is not expected to result in a reduction or loss of function for the streams within the Project area, due to the revegetation efforts and the measures to restrict sedimentation input to waterbodies. Site-specific crossing plans and measures to mitigate impacts will be submitted to Caribou-Targhee NF for approval prior to construction in these areas.

Groundwater

Of the total number of wells within the Segment 4 Analysis Area, 59 percent would occur in shallow bedrock. However, none of the wells would be within 200 feet of the route centerline. There would be 23 potable water wells within 0.5 mile of the proposed Segment 4 (Table D.16-10 in Appendix D). All Route Alternatives would have more

potable wells within 0.5 mile than the comparison portion of the Proposed Route, the greatest number being under Alternatives 4C and 4E (12 potable wells). Therefore, the potential for well damage would be greater under the Route Alternatives than the Proposed Route.

Approximately 5 percent of the Segment 4 Analysis Area is underlain by shallow groundwater (less than or equal to 13 feet deep; Table D.16-7 in Appendix D). All of the alternatives in Segment 4 would affect more acres of shallow groundwater during construction than the Proposed Route. However, given its rarity along the segment and the Project SPCC Plan (Appendix C-1, Attachment C), risk of accidental contamination or sedimentation of groundwater during construction would be low.

Segment 4, the longest segment, would be constructed over a 2-year period and would require an estimated 5,900,000 gallons (8.1 acre-feet) of construction water. The Route Alternatives would use a comparable amount of water as the comparison portion of the Proposed Route (Table D.16-12 in Appendix D).

Operations

This segment would include 68 acres of operations disturbance area within 500 feet of perennial or intermittent streams, or 11 percent of the operations disturbance area. Approximately 40 acres would be located within 100 feet of ephemeral streams, or 6 percent of the operations disturbance (Table D.16-15 in Appendix D). No alternatives would have less acres of disturbance within 500 feet of perennial and intermittent streams. Alternatives 4A and 4F would have 7 and 6 fewer acres, respectively, within 100 feet of ephemeral streams than the comparison portion of the Proposed Route and each would have about the same acres of disturbance within 500 feet of a TMDL or 303(d) listed stream for sediment.

There is no woody vegetation that is located within 500 feet of a temperature-impaired stream that would be disturbed due to operation of the Proposed Route or alternatives (Table 3.16-4).

Approximately 21 percent of the operations disturbance area would be located within the moderate- and high-risk flood zone (Table D.16-3 in Appendix D). All the alternatives would have similar acreage and all would have less disturbance area located within a flood zone than the comparison portion of the Proposed Route.

There would be shallow groundwater in approximately 4 percent of the operations disturbance area of this segment. All Route Alternatives would have similar acreage of shallow groundwater.

Segment 5

Segment 5, as proposed, would link the Populus and Borah Substations with a 54.6-mile single-circuit 500-kV line. Forty-four acres of the expansion of the Populus and Borah Substations are attributed to Segment 5. There are five Route Alternatives including two proposed by the BLM to avoid the Deep Creek Mountains (5A and 5B; 8 miles and 19 miles longer than the comparison portion of the Proposed Route), one preferred by Power County that crosses the Fort Hall Indian Reservation (5C; 6 miles shorter than the comparison portion of the Proposed Route), one originally proposed by the Proponents (5D; 2 miles shorter than the comparison portion of the Proposed Route

but located within more agricultural lands), and one proposed by Power County as an alternative approach to the Borah Substation (5E) (see Appendix A, Figure A-7).

Construction

Surface Water

There would be 177 surface water crossings on the Proposed Route that would require an estimated 91 drive-through crossings, 39 fords, and no culverts for a total of 1 acre of disturbance (Table D.16-1 in Appendix D). Of the 177 crossings, 73 percent would be non-listed ephemeral streams and there would be 40 TMDL or 303(d) listed ephemeral streams for sediment (Table D.16-6 in Appendix D). Alternative 5A would contain fewer stream crossings, drive-through crossings, and fords than the comparison portion of the Proposed Route; however, it would contain 15 culverts, more than all other alternatives or the comparison portion of the Proposed Route (Table D.16-1 in Appendix D).

A total of 0.2 acre of construction disturbance for this segment would be located within 500 feet of perennial or intermittent streams or 0.02 percent of the construction disturbance area, and 118 acres would be located within 100 feet of ephemeral streams or 12 percent of the disturbance area (Table D.16-14 in Appendix D). Alternative 5E would have no disturbance within 500 feet of perennial or intermittent streams, the same as the comparison portion of the Proposed Route, and 2 fewer acres within 100 feet of ephemeral streams than the comparison portion of the Proposed Route, and no acres of disturbance within 500 feet of a TMDL or 303(d) listed stream for sediment.

There would be no woody vegetation located within 500 feet of a temperature-impaired stream that would be disturbed due to construction of this segment or alternatives (Table 3.16-4).

Approximately 37 percent of the construction disturbance area would be located within the moderate- and high-risk flood zone (Table D.16-2 in Appendix D). All alternatives would have a higher percentage of disturbance area located within a flood zone than the comparison portion of the Proposed Route.

There would be 130 surface water diversions within 0.5 mile of this segment. Alternative 5E would have fewer surface water diversions than the comparison portion of the Proposed Route (Table D.16-5 in Appendix D).

Groundwater

Approximately 1 percent of Segment 5 would be underlain by shallow groundwater (Table D.16-7 in Appendix D). Disturbance effects to areas with shallow groundwater during construction would be greater under Alternatives 5A and 5C than the comparison portions of the Proposed Route (Table D.16-7 in Appendix D). Alternatives 5D and 5E would not cross areas of shallow groundwater; however, given its rarity along the segment and the Project SPCC Plan (Appendix C-1, Attachment C), risk of accidental contamination or sedimentation of groundwater during construction would be low.

Segment 5 would cross 2.3 miles of the ESRP Aquifer, or about 4 percent of the Proposed Route length (Table D.16-11 in Appendix D). This Project would be almost entirely above ground and the productive portion of this aquifer is much deeper than any

Project foundation. Alternatives 5D and 5E would also cross this aquifer to the same extent as the comparison portion of the Proposed Route.

Approximately 5 percent of all the wells in the Analysis Area for Segment 5 are in shallow bedrock and none within 200 feet of the route centerline; therefore, risk of well damage due to blasting along Segment 5 would be low (Table 3.16-2). There would be 38 potable water wells within 0.5 mile of the Proposed Route. There would be a similar number of potable wells within 0.5 mile of the alternatives as the comparison portions of the Proposed Route, except Alternative 5D, where there would be 25 wells within 0.5 mile compared to 10 wells along the comparison portion of the Proposed Route (Table D.16-10 in Appendix D). Therefore, risk of well damage would be lower under the alternatives, with the exception of Alternative 5D, than under the Proposed Route.

Project construction would require about 1,600,000 gallons (5.0 acre-feet) of water over a 1-year period. The Route Alternatives would use about the same amount of water as the comparison portion of the Proposed Route (Table D.16-12 in Appendix D).

Operations

This segment would include 0.1 acre of operations disturbance area within 500 feet of perennial or intermittent streams, or 0.04 percent of the operations disturbance area. Approximately 28 acres would be located within 100 feet of ephemeral streams, or 16 percent of the operations disturbance (Table D.16-15 in Appendix D). Alternative 5E would have 0 acres of disturbance within 500 feet of perennial and intermittent streams, 1 acre within 100 feet of ephemeral streams, and 0 acres of disturbance within 500 feet of a TMDL or 303(d) listed stream for sediment, same as the comparison portion of the Proposed Route.

There would be no woody vegetation located within 500 feet of a temperature-impaired stream that would be disturbed due to operations of the Proposed Route or Route Alternatives (Table 3.16-4).

Approximately 28 percent of the operations disturbance area would be located within the moderate- and high-risk flood zone (Table D.16-3 in Appendix D). All alternatives would have a higher percentage of disturbance area located within a flood zone than the comparison portion of the Proposed Route.

During operations, the number of acres of disturbance to areas with shallow groundwater would be similar to the Proposed Route, Alternatives 5A, 5C, and the comparison portions of the Proposed Route (Table D.16-8 in Appendix D). There would be no underlying shallow groundwater in Alternatives 5B, 5D, or 5E.

Segment 6

Segment 6 is an existing transmission line linking the Borah and Midpoint Substations; it is now operated at 345 kV but would be changed to operate at 500 kV. This segment has no Route Alternatives. Existing support structures would be used and impacts would be limited to within approximately 0.25 mile from each substation to allow for moving the entry point into the substation to the new 500-kV bay. Thirty-one acres of the expansion of the Borah and Midpoint Substations are attributed to Segment 6. Changes in the two substations would allow it to be operated at 500 kV (see Appendix A, Figure A-8).

Construction

Surface Water

A total of zero acres of construction disturbance for this segment would be located within 500 feet of perennial or intermittent streams, 3 acres would be located within 100 feet of ephemeral streams, or 5 percent of the construction disturbance area, and 0 acres of disturbance would be within 500 feet of a TMDL or 303(d) listed stream for sediment (Table D.16-14 in Appendix D). Approximately 32 percent of the construction disturbance area would be located within the moderate- and high-risk flood zone (Table D.16-2 in Appendix D). There would be five surface water diversions within 0.5 mile of this segment (Table D.16-5 in Appendix D).

Groundwater

The Proposed Route would have three potable water wells within 0.5 mile of the centerline (Table D.16-10 in Appendix D). The entire length of the Proposed Route (0.5 miles) would cross the ESRP Aquifer (Table D.16-11 in Appendix D).

Operations

This segment would include zero acres of operations disturbance area within 500 feet of perennial or intermittent streams, 3 acres within 100 feet of ephemeral streams, or 5 percent of the operations disturbance area, and 0 acres of disturbance within 500 feet of a TMDL or 303(d) listed stream for sediment (Table D.16-15 in Appendix D). Approximately 30 percent of the operations disturbance area would be located within the moderate- and high-risk flood zone (Table D.16-3 in Appendix D). The operations disturbance area for Segment 6 would not overlay shallow groundwater (Table D.16-8 in Appendix D).

Segment 7

Segment 7, as proposed, would link the Populus and Cedar Hill Substations with a 118.1-mile single-circuit 500-kV line. Forty-two acres of the expansion of the Populus and the construction of the Cedar Hill Substations and 1 acre for two regeneration sites are attributed to Segment 7. In addition to the Proposed Route, which is principally on private lands, Route Alternatives have been proposed by the BLM to avoid the Deep Creek Mountains (7A and 7B, which are 5 miles and 11 miles longer than the comparison portion of the Proposed Route), by local landowners (7C, 7D, 7E, 7F, and 7G, which all represent minor adjustments proposed to address local issues), by local landowners to avoid private agricultural lands (7I or the State Line Route, which is 55 miles longer than the Proposed Route and would require 0.5 acre for an additional regeneration site), and by the Proponents to avoid the State Line Route (7H, which is 10 miles longer than the Proposed Route). Alternative 7J, which is a variant of the State Line Route also proposed by local landowners, would not terminate at the Cedar Hill Substation. This alternative, referred to as the Rogerson Alternative, would require a different substation be constructed near a 345-kV existing transmission line (approximately 24 miles southwest of the Cedar Hill Substation; see Appendix A, Figure A-9). The tables and discussion in this document compare 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

Construction

Surface Water

There would be 209 surface water crossings on the Proposed Route that would require an estimated 50 drive-through crossings, 73 fords, and 35 culverts for a total of 5 acres of disturbance (Table D.16-1 in Appendix D). Of the 209 crossings, 59 percent would be non-listed ephemeral streams and there would be 15 TMDL or 303(d) listed ephemeral streams for sediment (Table D.16-6 in Appendix D). Only Alternative 7F would contain fewer stream crossings, fords, culverts, and lower disturbance acreage than the comparison portion of the Proposed Route.

A total of 193 acres of construction disturbance for this segment would be located within 500 feet of perennial or intermittent streams or 11 percent of the construction disturbance area, and 104 acres would be located within 100 feet of ephemeral streams or 6 percent of the disturbance area (Table D.16-14 in Appendix D). Alternative 7G would have zero acres of disturbance within 500 feet of perennial or intermittent streams, same as the comparison portion, and 3 less acres within 100 feet of ephemeral streams than the comparison portion of the Proposed Route. However, it would have 5 more acres of construction disturbance within 500 feet of a TMDL or 303(d) listed stream for sediment than the comparison portion of the Proposed Route. Alternatives 7D and 7E are approximately the same as the comparison portions of the Proposed Route, with similar acres of disturbance within 500 feet and 100 feet of streams, and no acres within 500 feet of TMDL or 303(d) listed streams for sediment.

The Proposed Route and most of the Route Alternatives do not include disturbance due to construction of woody vegetation within 500 feet of a temperature-impaired stream (Table 3.16-4). Alternative 7J would include 3.9 acres of disturbance of woody vegetation within 500 feet of four temperature-impaired streams: South Hannahs Fork, Willow Spring Creek, Middle Fork Hannahs Fork, and Little Piney Creek.

Approximately 22 percent of the construction disturbance area would be located within the moderate- and high-risk flood zone (Table D.16-2 in Appendix D). All of the Route Alternatives would have a lower percentage of disturbance area located within a flood zone than the comparison portions of the Proposed Route.

There would be 700 surface water diversions within 0.5 mile of this segment. Alternatives 7H and 7I would have a higher number of surface water diversions than the comparison portions of the Proposed Route (Table D.16-5 in Appendix D).

Alternative 7H would include 68 stream crossings on the Caribou-Targhee NF (Table 3.16-5). Of these 68 stream crossings, 1 would be intermittent-wet, 25 would be intermittent-dry, and 42 would be ephemeral. There would be no TMDL or 303(d) listed streams located on NFS lands along Alternative 7H. Alternative 7I would include 115 stream crossings on the Sawtooth NF (Table 3.16-5) consisting of 106 non-TMDL/303(d) streams, and 9 TMDL or 303(d) listed streams. The 106 non-TMDL/303(d) streams along Alternative 7I would consist of 9 perennial, 5 intermittent-wet, 27 intermittent-dry, and 65 ephemeral streams. There would be 3 perennial TMDL or 303(d) listed streams for sediment along Alternative 7I. There would be 2 perennial, 1 intermittent-dry, and 3 ephemeral TMDL or 303(d) listed streams for temperature along Alternative 7I. Alternative 7J would include 88 total stream crossings on the

Sawtooth NF, consisting of 82 non-TMDL/303(d) streams, and 6 TMDL or 303(d) listed streams. Of the 82 non-TMDL/303(d) streams, 1 would be intermittent-west, 27 intermittent-dry, and 54 ephemeral. There would be no TMDL or 303(d) sediment listed streams located on NFS lands along Alternative 7J; however, the number of TMDL or 303(d) temperature listed streams along Alternative 7J is the same as Alternative 7I. See Section 3.9 – Wetlands and Riparian Areas for effects on riparian zones. With the application of the SWPPP and Reclamation, Revegetation, and Maintenance Plan, construction is not expected to result in a reduction or loss of function for the streams within the Project area, due to the revegetation efforts and the measures to restrict sedimentation input to waterbodies. Site-specific crossing plans and measures to mitigate impacts will be submitted to Sawtooth NF for approval prior to construction in these areas.

Groundwater

Approximately 11 percent of Segment 7 would be underlain by shallow groundwater (Table D.16-7 in Appendix D). Disturbance effects to areas with shallow groundwater during construction would be less under all of the Route Alternatives than the comparison portions of the Proposed Route (Table D.16-7 in Appendix D). However, given its rarity along the segment and the Project SPCC Plan (Appendix C-1, Attachment C), risk of accidental contamination or sedimentation of groundwater during construction would be low.

About 29 miles of Segment 7 would cross the ESRP Aquifer (Table D.16-11 in Appendix D). Alternatives 7E, 7F, 7H, 7I, and 7J would cross fewer miles of the aquifer than the comparison portion of the Proposed Route (Alternative 7F would not cross it at all). Alternative 7G would cross more miles of the aquifer than the comparison portion of the Proposed Route.

Roughly 30 percent of all the water wells in the Segment 7 Analysis Area would occur with shallow bedrock, 12 of which would be within 200 feet of the centerline and thus at most risk of damage due to blasting (Table 3.16-2). This segment would contain 81 potable water wells within 0.5 mile of the Proposed Route (Table D.16-10 in Appendix D). Alternatives 7A, 7B, 7C, and 7D would contain more potable water wells than the comparison portion of the Proposed Route. Alternatives 7E, 7F, 7H, 7I, and 7J would contain fewer potable wells than the comparison portion of the Proposed Route.

Construction of the Proposed Route along Segment 7 would require about 3,500,000 gallons (10.8 acre-feet) of water over a 1.3-year period. The Route Alternatives would use about the same amount of water during construction as the comparison portion of the Proposed Route, with the exception of Alternatives 7I and 7J, which would require 5,000,000 gallons (15.9 acre-feet) and 6,000,000 gallons (18.5 acre-feet), respectively. (Table D.16-12 in Appendix D).

Operations

This segment would include 22 acres of operations disturbance area within 500 feet of perennial or intermittent streams, or 9 percent of the operations disturbance area. Approximately 19 acres would be located within 100 feet of ephemeral streams, or 8 percent of the operations disturbance (Table D.16-15 in Appendix D). Alternatives 7C, 7D, 7E, 7F, and 7G would have similar acres of disturbance within 500 feet of perennial

and intermittent streams, similar acres within 100 feet of ephemeral streams, and similar acres within 500 feet of TMDL or 303(d) listed streams for sediment than the comparison portions.

The Proposed Route and most of the Route Alternatives would not include operations disturbance due of woody vegetation within 500 feet of a temperature-impaired stream (Table 3.16-4). Alternative 7J would include 0.6 acre of disturbance of woody vegetation.

Approximately 15 percent of the operations disturbance area would be located within the moderate- and high-risk flood zone (Table D.16-3 in Appendix D). Alternatives 7E, 7F, and 7G would not include operations disturbance area within a flood zone. Alternatives 7A, 7B, 7H, 7I, and 7J would include less operations disturbance within a flood zone than the comparison portions of the Proposed Route.

There would be shallow groundwater in approximately 6 percent of the operations disturbance area of this segment. Alternatives 7C, 7D, 7E, 7F, and 7G would not overlay shallow groundwater. Alternatives 7A, 7B, 7H, 7I, and 7J would overlay shallow groundwater and have less acreage of shallow groundwater than the comparison portions of the Proposed Route (Table D.16-8 in Appendix D).

Segment 8

Segment 8, as proposed, would link the Midpoint and Hemingway Substations. This 131-mile single-circuit 500-kV transmission line would stay north of the Snake River until crossing through the SRBOP parallel to an existing 500-kV transmission line before ending at the Hemingway Substation. Thirteen acres of the expansion of the Midpoint Substation and 0.5 acre for a regeneration site are attributed to Segment 8. There are five Route Alternatives: 8A, which follows the WWE corridor but crosses the Snake River and I-84 twice (while the Proposed Route would stay north of this area); 8B and 8C, which represent the old routes originally proposed by the Proponents but that have now been changed to avoid the cities of Kuna and Mayfield, respectively; 8D, which represents a small revision involving a rebuild of the existing transmission line to move both away from the National Guard Maneuver Area; and 8E, which was proposed by the BLM in order to avoid crossing the Halverson Bar nonmotorized portion of the Guffey Butte-Black Butte Historical Area (see Appendix A, Figure A-10).

Construction

Surface Water

There would be 259 surface water crossings on the Proposed Route that would require an estimated 113 drive-through crossings, 66 fords, and 3 culverts for a total of 1 acre of disturbance (Table D.16-1 in Appendix D). Of the 259 crossings, 61 percent are non-listed ephemeral streams and there are 30 TMDL or 303(d) listed ephemeral streams (Table D.16-6 in Appendix D). Alternative 8B contains 94 fewer stream crossings, 24 fewer fords, and 42 fewer drive-through crossings than the comparison portion of the Proposed Route.

A total of 111 acres of construction disturbance for this segment would be located within 500 feet of perennial or intermittent streams or 5 percent of the construction disturbance area, and 103 acres would be located within 100 feet of ephemeral streams or 5 percent

of the disturbance area (Table D.16-14 in Appendix D). Alternative 8A would have a total of 30 less acres of disturbance within 500 feet of perennial or intermittent streams and 3 more acres within 100 feet of ephemeral streams, and 12 less acres disturbance within 500 feet of a TMDL or 303(d) listed stream for sediment than the comparison portion of the Proposed Route.

Approximately 0.2 acre of woody vegetation located within 500 feet of a temperature-impaired stream would be disturbed due to construction along this segment (Table 3.16-4). Only Alternative 8B would include construction disturbance within the 500-foot buffer with 0.01 acre disturbed. No other alternatives or comparison portions would contain disturbance of woody vegetation within 500 feet of a temperature-impaired stream.

There is no woody vegetation that is located within 500 feet of a temperature-impaired stream that would be disturbed due to construction of the Proposed Route or alternatives (Table 3.16-4).

There would be 327 surface water diversions within 0.5 mile of this segment. All alternatives except 8E would have a higher number of surface water diversions than the comparison portion of the Proposed Route (Table D.16-5 in Appendix D).

Groundwater

Approximately 73 percent of all the wells in the Segment 8 Analysis Area are located in shallow bedrock, 6 of which are within 200 feet of the centerline and would be most at risk of damage due to blasting (Table 3.16-2). Along Segment 8 there would be 176 potable water wells within 0.5 mile of the Proposed Route. All of the Route Alternatives would have more potable water wells within 0.5 mile than the comparison portions of the Proposed Route (Table D.16-10 in Appendix D). Therefore, risk of well damage due to blasting would be higher under any of the Route Alternatives than the comparison portions of the Proposed Route.

Segment 8 would cross 42.5 miles of the ESRP Aquifer, or about 32 percent of the Proposed Route length (Table D.16-11 in Appendix D). This Project would be almost entirely above ground and the productive portion of this aquifer is much deeper than any Project foundation. Alternative 8A would cross fewer miles of the aquifer than the comparison portion of the Proposed Route. No other alternatives would cross the aquifer.

Project construction along Segment 8 would require about 3,800,000 gallons (1.7 acre-feet) of water over a 14-month period. The Route Alternatives would use about the same amount of water as their comparison portions of the Proposed Route except for Alterative 8E, which would use approximately 334,000 more gallons (1 acre-feet) than the comparison portion (Table D.16-12 in Appendix D).

Operations

This segment would include 18 acres of operations disturbance area within 500 feet of perennial or intermittent streams, or 7 percent of the operations disturbance area. Approximately 16 acres would be located within 100 feet of ephemeral streams, or 7 percent of the operations disturbance (Table D.16-15 in Appendix D). Alternative 8A would have a total of 5 less acres of disturbance within 500 feet of perennial and

intermittent streams, a similar number of acres within 100 feet of ephemeral streams, and the same number of acres of disturbance within 500 feet of TMDL or 303(d) listed streams for sediment than the comparison portion of the Proposed Route.

There is no woody vegetation that is located within 500 feet of a temperature-impaired stream that would be disturbed due to operations of the Proposed Route or alternatives (Table 3.16-4).

Approximately 16 percent of the operations disturbance area would be located within the moderate- and high-risk flood zone (Table D.16-3 in Appendix D). Alternative 8A would have a lower percentage of disturbance area located within a flood zone than the comparison portion of the Proposed Route.

Segment 8 operations disturbance would not overlay shallow groundwater (Table D.16-8 in Appendix D).

Segment 9

Segment 9, as proposed, would link the Cedar Hill and Hemingway Substations with a 161.7 mile single-circuit 500-kV transmission line which skirts the Jarbidge and Owyhee Military Operating Areas to the north, then follows the WWE corridor just north of the Saylor Creek Air Force Range, passing through Owyhee County before entering into the Hemingway Substation. Fifteen acres of the construction of the Cedar Hill Substation and 1 acre for two regeneration sites are attributed to Segment 9. There are eight Route Alternatives proposed, including 9A, which was the Proponents' Proposed Route until moving to avoid the Hollister area; 9B, which is being considered by the BLM because it follows the WWE corridor and parallels existing utility corridors; 9C, which was the Proponents' Proposed Route until moving to avoid the Castleford area; and 9D and 9E, proposed by the Owyhee County taskforce, that cross more public lands north and south of the Proposed Route, respectively, than the Proposed Route. Most of Alternative 9D would be within the SRBOP. Alternatives 9F, 9G, and 9H were proposed to avoid crossing the nonmotorized area south of C.J. Strike Reservoir. Alternatives 9G and 9H provide an alternate route location south of Alternative 8E (see Appendix A, Figure A-11).

Construction

Surface Water

There would be 322 surface water crossings on the Proposed Route that would require an estimated 111 drive-through crossings, 92 fords, and 25 culverts for a total of 4 acres of disturbance (Table D.16-1 in Appendix D). Of the 322 crossings, 59 percent would be non-listed ephemeral streams and there would be 16 TMDL or 303(d) listed streams for sediment and 4 TMDL or 303(d) listed streams for temperature (Table D.16-6 in Appendix D). Alternative 9E would be the only alternative with more stream crossings.

A total of 131 acres of construction disturbance for this segment would be located within 500 feet of perennial or intermittent streams or 5 percent of the construction disturbance area, and 120 acres would be located within 100 feet of ephemeral streams or 5 percent of the disturbance area (Table D.16-14 in Appendix D). Alternative 9D would have a total of 25 fewer acres of disturbance within 500 feet of perennial or intermittent streams and 34 fewer acres within 100 feet of ephemeral streams than the comparison portion of

the Proposed Route, and 3 fewer acres of disturbance area within 500 feet of a TMDL or 303(d) listed stream for sediment.

Less than 0.1 acre of woody vegetation located within 500 feet of a temperature-impaired stream would be disturbed due to construction of Alternatives 9F, 9G, or 9H, and no acres would be disturbed in the Proposed Route or any other Route Alternative (Table 3.16-4).

Approximately 19 percent of the construction disturbance area would be located within the moderate- and high-risk flood zone (Table D.16-2 in Appendix D). All Route Alternatives would have similar percentages disturbance area located within a flood zone than the comparison portions of the Proposed Route.

There are 724 surface water diversions within 0.5 mile of this segment. Alternatives 9D, 9E, 9F, 9G, and 9H would have fewer surface water diversions than the comparison portion of the Proposed Route (Table D.16-5 in Appendix D).

Groundwater

The construction disturbance area for Segment 9 and the Route Alternatives would not overlay shallow groundwater (Table D.16-7 in Appendix D). Approximately 8.4 miles, or 5 percent, of the Proposed Route along Segment 9 would be located on the ESRP Aquifer. Alternatives 9A would cross fewer miles than the comparison portion of the Proposed Route. No other alternative would cross the aquiver (Table D.16-11 in Appendix D).

Approximately 75 percent all the wells within the Segment 9 Analysis Area would occur over shallow bedrock; one of the wells would be within 200 feet of the centerline and would be most at risk of damage from blasting (Table 3.16-2). Along the Proposed Route there would be 88 potable water wells within 0.5 mile of the centerline (Table D.16-10 in Appendix D). More wells would be located near Alternatives 9B and 9C than the comparison portions of the Proposed Route, and fewer wells would be near Alternatives 9A, 9D, 9E, 9F, 9G, and 9H (Table D.16-10 in Appendix D). Thus, the potential for well damage due to blasting would be greater than the comparison portion of the Proposed Route under Alternatives 9B and 9C, and less than the comparison portion of the Proposed Route under Alternatives 9A, 9D, and 9E.

Segment 9 would be constructed over a 17-month period and would require an estimated 4,700,000 gallons (14.3 acre-feet) of construction water. All of the alternatives would use about the same amount of water as the comparison portion of the Proposed Route (Table D.16-12 in Appendix D).

Operations

This segment would include 21 acres of operations disturbance area within 500 feet of perennial or intermittent streams, or 6 percent of the operations disturbance area. Approximately 23 acres would be located within 100 feet of ephemeral streams, or 7 percent of the operations disturbance (Table D.16-15 in Appendix D). Alternative 9D would have a total of 3 fewer acres of disturbance within 500 feet of perennial and intermittent streams and 7 fewer acres within 100 feet of ephemeral streams, and 1 less acre of disturbance within 500 feet of a TMDL or 303(d) listed stream for sediment than the comparison portion of the Proposed Route.

Less than 0.1 acre of woody vegetation located within 500 feet of a temperature-impaired stream would be disturbed due to operations of Alternatives 9F, 9G, or 9H, and no acres would be disturbed in the Proposed Route or any other alternative (Table 3.16-4).

Approximately 17 percent of the operations disturbance area would be located within the moderate- and high-risk flood zone (Table D.16-3 in Appendix D). All alternatives have percentages of disturbance area located within a flood zone similar to those of the comparison portion of the Proposed Route.

The operations disturbance area for Segment 9 and its Route Alternatives would not overlay shallow groundwater (Table D.16-8 in Appendix D).

Segment 10

Segment 10, as proposed, would link the Cedar Hill and Midpoint Substations with a 33.6-mile single-circuit 500-kV line, following a WWE corridor for most of its distance. Twenty-eight acres of the expansion of the Midpoint Substation and of the construction of the Cedar Hill Substation are attributed to Segment 10. There are no Route Alternatives proposed along this segment (see Appendix A, Figure A-12).

Construction

Surface Water

There would be 16 surface water crossings on the Proposed Route and 9 artificial waterways that would need to be avoided (Table D.16-1 in Appendix D). Eight would be non-listed ephemeral streams (Table D.16-6 in Appendix D).

A total of 25 acres of construction disturbance for this segment would be located within 500 feet of perennial or intermittent streams and 19 acres would be located within 100 feet of ephemeral streams (Table D.16-14 in Appendix D). Approximately 9 percent of the construction disturbance area would be located within the moderate- and high-risk flood zone (Table D.16-2 in Appendix D). There would be 145 surface water diversions within 0.5 mile of this segment.

Groundwater

Of all the wells within the Segment 10 Analysis Area, approximately 17 percent would occur in shallow bedrock and two of the wells would be within 200 feet of the route centerline (Table 3.16-2); therefore, the risk of well damage along this segment would be low. The Proposed Route would have 55 potable water wells within 0.5 mile of the centerline (Table D.16-10 in Appendix D). The entire length of the Proposed Route (33.6 miles) would cross the ESRP Aquifer (Table D.16-11 in Appendix D). Construction along Segment 10 would be expected to take less than one year, and require about 1,000,000 gallons (3.1 acre-feet) of construction water (Table D.16-12 in Appendix D).

Operations

This segment would include 1 acre of operations disturbance area within 500 feet of perennial or intermittent streams, and 2 acres within 100 feet of ephemeral streams (Table D.16-15 in Appendix D). Approximately 7 percent of the operations disturbance area would be located within the moderate- and high-risk flood zone (Table D.16-3 in

Appendix D). The operations disturbance area for Segment 10 would not overlay shallow groundwater (Table D.16-8 in Appendix D).

3.16.2.4 Design Variation

A Design Variation is being considered that would consist of constructing two single-circuit lines in Segments 2 through 4 instead of a single double-circuit line (which is the design assessed above). The disturbance footprint of the two single-circuit towers is greater than that of the double-circuit tower, in part because the requested ROW would be wider, but also because helicopter-assisted construction could be implemented in these areas due to the lighter weight of the towers, which would require additional fly yards. The additional ROW space and the fly yards would cause additional temporary disturbance during construction. Across Segments 2, 3, and 4, the additional disturbance of the single-circuit tower alternative ranges from 25 to 30 percent greater than the comparable portions of the double-circuit tower disturbance under the proposed design. The two single circuits require more ground disturbance, but would be designed and constructed to the same standards as the Proposed Action.

The vast majority of impacts to water resources would result from access road crossings, and there would be no difference in access roads with respect to water crossings between the Proposed Action and Design Variation. Impacts to water resources from vegetation management in riparian areas would be slightly larger because the border zone is slightly wider for the Design Variation. The Design Variation would have less disturbance acreage located within the moderate to high flood hazard areas than the Proposed Action (Table D.16-4 in Appendix D). The Design Variation Segment 4 would have more disturbance acreage located above shallow groundwater than the Proposed Action (Table D.16-9 in Appendix D). The Design Variation would have more disturbance acreage located within 500 feet of perennial and intermittent streams and 100 feet of ephemeral streams than the Proposed Action (Table D.16-16 in Appendix D).

3.16.2.5 Structure Variation

The proposed guyed Structure Variation would add four guy wires about 140 feet long from a point about 100 feet up in each tower to four guy anchors spaced in a square around the tower (Appendix B, Figure B-6). This would not change the amount of disturbance during construction or operations appreciably. Extra care would be needed where towers are near wetland and riparian areas to avoid placing guy wires in these areas. Self-supporting lattice towers would be used if, as a result, it would be possible to avoid impacts to wetland or riparian impacts. Therefore, there is no appreciable difference in impact on water resources from the use of this Structure Variation when compared to the use of self-supporting lattice towers.

3.16.2.6 Schedule Variation

The Schedule Variation uses the two single-circuit Design Variation described above but extends construction over a longer timeframe. Initially, only one of the eventual two single-circuit lines would be constructed with the second to be constructed at a later date. The Schedule Variation proposes that the first single-circuit transmission line in Segments 2, 3, and 4 would be built as soon as a ROW grant is issued, but that the second line would not begin construction until late 2018. This would mean nearly

2 years between the end of construction for the first line and beginning of construction for the second line. Any staging areas and fly yards that had been used for the first stage would have been revegetated after construction was complete and would have to be cleared again. There would be two sets of construction disturbances adding movement, noise, and dust to the area of construction in two instances in any given area.

The Schedule Variation would therefore have essentially double the adverse indirect impacts on adjacent habitats and populations as the simultaneous construction or double-circuit alternative, even though direct habitat disturbance overall would not be any greater.

3.16.3 Mitigation Measures

To minimize or avoid impacts on water resources, the Proponents have committed to EPMs that would be implemented Project-wide as outlined in this section and in Appendix C.

The following mitigation measures were identified by the Agencies and have been adopted by the Proponents.

WQA-1 Avoid placement of road bed material in channels (perennial, intermittent or ephemeral). Road bed material contains considerable fines that would create sedimentation in coarse cobble dominated stream channels. Even in seasonally dry reaches those fines could be transported during flow periods and negatively impact fish spawning reaches below.

WQA-2 On federal lands, consult with appropriate land management agency staff prior to siting and design for stream crossings (location, alignment, and approach for culvert, drive-through, and ford crossings). This may include a hydrologist, engineer and, for perennial and many intermittent streams, an aquatic biologist.

WQA-3 All culverts on NFS lands, both permanent and temporary, shall be designed and installed to meet desired conditions for riparian and aquatic species as identified in the applicable Forest Plan. Culverts should not be hydraulically controlled. Hydraulically controlled culverts create passage problems for aquatic organisms. Culvert slope should not exceed stream gradient and should be designed and implemented (typically by partial burial in the streambed) to maintain streambed material in the culvert.

WQA-4 Culvert sizing on Region 2 of NFS lands shall also comply with *Guidance for Aquatic Species Passage Design, Forest Service Northern Region & Intermountain Region* (Forest Service 2003f) , and culvert sizing on BLM-administered lands shall comply with BLM Manual 9113.

The Proponents have agreed to the following measure:

WQA-5 On non-federal lands, culvert placement should comply with state BMPs. The minimum size culvert will be 12 inches in diameter. If a channel width exceeds 3 feet, additional pipes may be used until the cross sectional area of the pipes is greater than 60 percent of the cross sectional area of the

existing channel. Filter cloth should be placed on the streambed and banks prior to placement of the pipe, and the culvert should be covered with a minimum of 1 foot of aggregate.

3.17 LAND USE AND RECREATION

This section addresses potential impacts on land use and recreation from the Proposed Route and Route Alternatives during construction, operations, and decommissioning. This section analyzes the land ownership affected by the Project's activities; use of designated utility corridors and existing ROW; and the potential impacts of the Project on specific land uses including commercial and residential properties, timber and fire management, Indian reservations, recreational and public interest areas, and OHV use. Impacts on forests are addressed in Section 3.6 – Vegetation Communities. Agricultural uses (prime farmland, livestock grazing, crop production, lands enrolled in the Conservation Reserve Program, and dairy farms) are addressed in Section 3.18 – Agriculture. Visual and noise effects on land uses are discussed in Sections 3.2 – Visual Resources and 3.23 – Noise, respectively. Mines are discussed in Section 3.12 – Minerals.

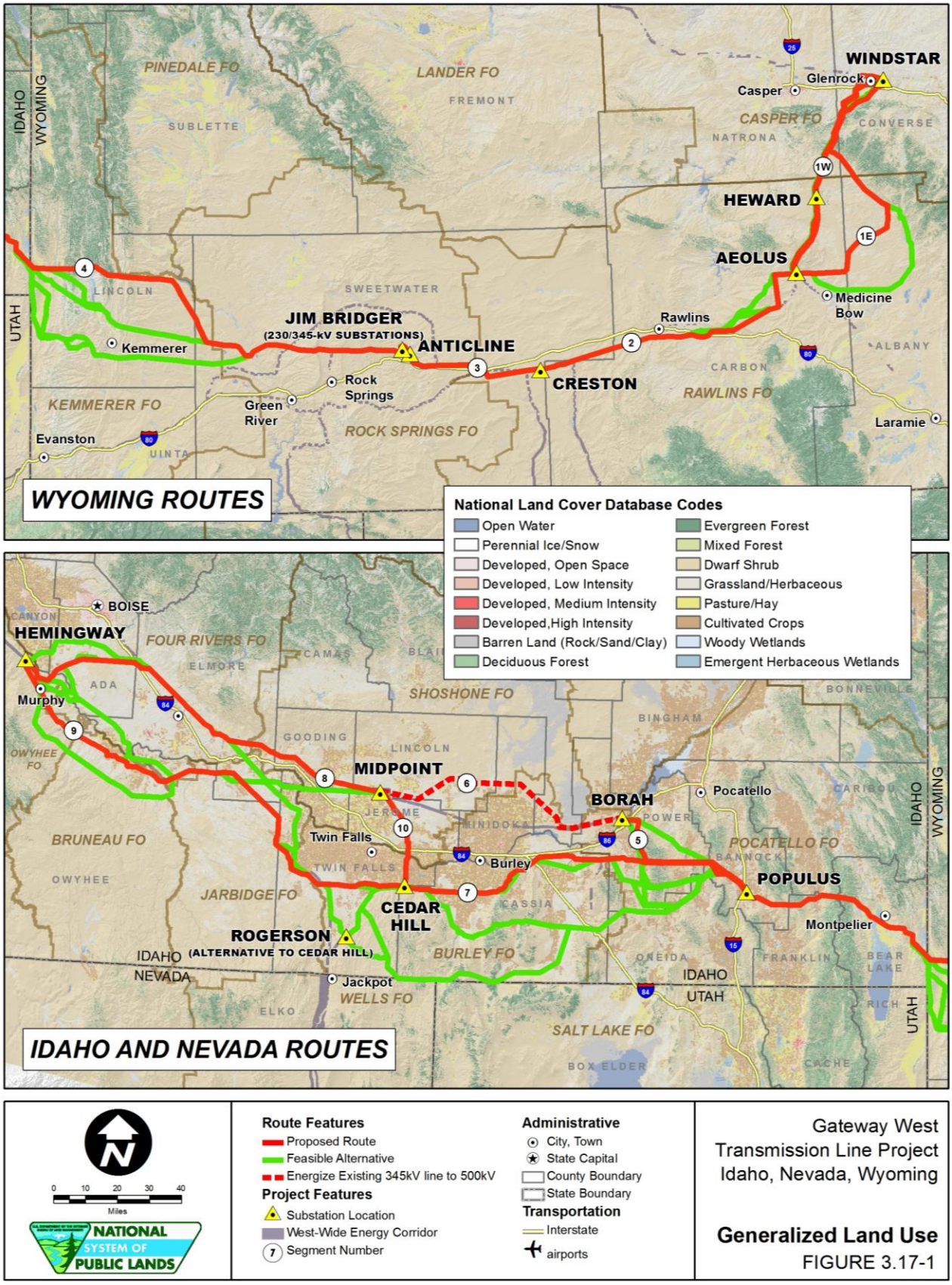
3.17.1 Affected Environment

This section discusses those aspects of the environment that could be affected by the Project. It starts with a discussion of the Analysis Area considered, identifies the issues that have driven the analysis, and characterizes the existing conditions within the Analysis Area.

3.17.1.1 Analysis Area

The Analysis Area for characterizing land use and ownership patterns extends 500 feet on either side of the Proposed Route and Route Alternatives, and 25 feet on either side of access roads and includes the areas needed for new or expansions of substations as well as temporary facilities such as staging areas and fly yards. Specific land uses are identified as crossed or within 1,000 feet of the Proposed Route and Route Alternatives. This area is used because the ground-disturbing activities related to the transmission line that could cause land use effects would occur within these areas. Specific land uses, such as residences, schools, and dairies, that may be affected by close proximity to a transmission line are also discussed in Sections 3.18 – Agriculture, 3.21 – Electrical Environment, and 3.22 – Public Safety.

Land uses in the area where the Project would be located generally consist of open spaces and agricultural use with an occasional town, city, or other urbanized or developed area. Much of the land in the region is managed by federal agencies, which generally provide for multiple use management or preservation of natural resources. Special uses within the vicinity of the Analysis Area include areas of prehistoric and historic significance and wildlife management areas. The eastern portion of the Project (Segments 1, 2, and 3) would be located in open range–type land uses with some topographic relief provided by major drainages (see Figure 3.17-1). Moving west, land uses continue as in the eastern portion, but the landscape becomes more forested and the terrain steeper (Segments 4, 5, and the eastern portion of 7). Farther west, the mountain ranges give way to the Snake River Plain, where land use includes irrigated crop land.


WYOMING ROUTES
IDAHO AND NEVADA ROUTES
WINDSTAR
Glenrock
Casper
CASPER FO
CONVERSE
NATRONA
HEWARD
AEOLUS
Medicine Bow
Rawlins
ALBANY
CARBON
RAWLINS FO
Laramie
PINEDALE FO
LANDER FO
FREMONT
SUBLETTE
IDAHO
WYOMING
UTAH
LINCOLN
SWEETWATER
JIM BRIDGER
(230/345-kV SUBSTATIONS)
ANTICLINE
CRESTON
Kemmerer
Rock Springs
Green River
KEMMERER FO
ROCK SPRINGS FO
Evanston
UINTA
National Land Cover Database Codes
Open Water
Perennial Ice/Snow
Developed, Open Space
Developed, Low Intensity
Developed, Medium Intensity
Developed,High Intensity
Barren Land (Rock/Sand/Clay)
Deciduous Forest
Evergreen Forest
Mixed Forest
Dwarf Shrub
Grassland/Herbaceous
Pasture/Hay
Cultivated Crops
Woody Wetlands
Emergent Herbaceous Wetlands
BOISE
HEMINGWAY
FOUR RIVERS FO
ELMORE
ADA
Murphy
OWYHEE FO
BRUNEAU FO
OWYHEE
JARBIDGE FO
SHOSHONE FO
GOODING
LINCOLN
MIDPOINT
JEROME
MINIDOKA
BORAH
POWER
Pocatello
BINGHAM
BONNEVILLE
CARIBOU
POCATELLO FO
BANNOCK
POPULUS
Montpelier
Twin Falls
TWIN FALLS
Burley
CASSIA
CEDAR HILL
ROGERSON
(ALTERNATIVE TO CEDAR HILL)
IDAHO
NEVADA
Jackpot
WELLS FO
ELKO
BURLEY FO
ONEIDA
FRANKLIN
BEAR LAKE
RICH
SALT LAKE FO
BOX ELDER
CACHE
0 10 20 30 40
Miles
NATIONAL SYSTEM OF PUBLIC LANDS
Route Features
Proposed Route
Feasible Alternative
Energize Existing 345kV line to 500kV
Project Features
Substation Location
West-Wide Energy Corridor
Segment Number
Administrative
City, Town
State Capital
County Boundary
State Boundary
Transportation
Interstate
airports
Gateway West
Transmission Line Project
Idaho, Nevada, Wyoming
Generalized Land Use
FIGURE 3.17-1

3.17.1.2 Issues to be Analyzed

The following issues related to land use were brought up by the public during public scoping (Tetra Tech 2009a), raised by federal and state agencies during scoping and agency discussions, or are issues that must be considered as stipulated in law or regulation. These issues are discussed in more detail in Section 3.17.2 – Direct and Indirect Effects, with the exception of the first two bullets below, which are discussed in Section 3.18 – Agriculture.

- Identify how the Project would affect CAFOs;
- Identify how the Project would affect current agricultural systems, including pivot irrigation and advanced positioning systems used in farm equipment;
- Identify residential areas, planned development, and specially designated uses that would be affected by the Project;
- Assess the effects of the Project on specially designated areas including NWRs, National Parks, National Monuments, SMAs, recreation sites, and roadless areas;
- Assess potential impacts to timber and fire management activities;
- Assess potential effects on Indian Reservations;
- Identify the extent to which the Project would be co-located with existing developments;
- Assess potential effects to hunting or fishing;
- Assess whether there would be any loss of recreational opportunities;
- Describe how the Project would adhere to local land use plans and policies;
- Assess potential Project impacts to military activities;
- Assess how construction of this transmission line would influence the installation of more developments and projects in the same area in the future;
- Indicate whether construction buffers around buildings would be maintained;
- Identify the permits and plan amendments that would be required for this project; and
- Describe the plan for re-entries and maintenance activities on private land that would likely continue over the life of the Project.

3.17.1.3 Regulatory Framework

This section first summarizes county plans and the one city planning area crossed, then discusses state planning requirements, and concludes with a discussion of federally managed land use planning.

<u>County and City Plans</u>

Local guidance provided by county and community plans and policy documents is summarized below by county and community, and route segment.

Converse County, Wyoming (Segments 1E, 1W[a], and 1W[c])

Converse County does not have a comprehensive plan or any planning and zoning regulations. The construction of transmission lines, substations, or any other structures is not regulated by Converse County.

Albany County, Wyoming (Segment 1E)

The Albany County Comprehensive Plan was approved in 2008, and designed to guide county growth for the next 20 years. In regard to utilities, the main emphasis is on telecommunications, as many rural areas of the county do not have landline or wireless telephone service. Transmission lines are not mentioned in the Albany County Plan. No conditional use permits (CUPs) are required for construction of transmission lines.

Natrona County, Wyoming (Segments 1E, 1W[a), and 1W[c])

The Natrona County Development Plan was approved in 1998 and amended in 2004. The Plan is concerned with "promoting regionalization of utilities to promote efficiency and to protect the environment." Otherwise, transmission lines are not included in it. The Natrona County Planning Department requires CUPs for construction of transmission lines and substations in areas zoned for agriculture, ranching, and mining.

Carbon County, Wyoming (Segments 1E, 1W[a), 1W[c], and 2)

The current Carbon County Land Use Plan was adopted on April 20, 1998, and has no requirements concerning transmission lines. Carbon County has been in the process of revising the plan and a draft Carbon County Comprehensive Land Use Plan was released in August 2010. The draft Comprehensive Plan references the Gateway West Project and identifies proposed revisions to existing county regulations that include developing conditional use standards for energy development and transmission lines to limit environmental impact (WLC Engineering et al. 2010). Carbon County would require a CUP for expansion of the Aeolus and Heward Substations.

Sweetwater County, Wyoming (Segments 2, 3, and 4)

The Sweetwater County Comprehensive Plan was adopted in 2002, consolidating the 1977 Sweetwater County Land Use Plan and the 1996 Growth Area Management Plan. A goal of the Sweetwater County Plan is to encourage the proactive, coordinated planning and delivery of public utilities and infrastructure services. Otherwise, transmission lines are not referenced in the Plan. The Sweetwater County Planning Department indicates they are currently revising their Plan to require CUPs for construction of transmission lines and substations. The proposed Anticline, Jim Bridger 230-kV, Jim Bridger 345-kV, and Creston Substations would be located in Sweetwater County. While the Anticline, Jim Bridger 230-kV, and Jim Bridger 345-kV Substations would be subject to a CUP if the proposed plan revision moves forward, the Creston Substation is wholly located on BLM-managed lands and therefore would not be subject to a County CUP.

Lincoln County, Wyoming (Segment 4)

The Lincoln County Comprehensive Plan was adopted in 2006. The County Plan has an objective to "promote and support the development of infrastructure in and around the towns and community centers for the creation and expansion of new and existing

businesses." An attached public land use policy lists an objective to "ensure public and private access and rights-of-way for utilities and transportation of people and products on and across public lands." Transmission lines are not specifically mentioned in the County Plan. Lincoln County does not require a CUP for transmission lines.

Bear Lake County, Idaho (Segment 4)

Bear Lake County does not have a comprehensive plan. However, the County uses land use ordinances to guide development within the county. The ordinances establish land use zones and include a table with different land uses and associated permitting requirements. Public utilities require a CUP when in agricultural zones. The proposed Project would be located within an agricultural zone and would, therefore, require a CUP.

Franklin County, Idaho (Segment 4)

The Franklin County Comprehensive Plan was adopted in 2007. The Plan is strongly geared toward residential and commercial development and does not discuss utility corridors. The Franklin County Planning Department does not require a CUP for construction of transmission lines.

Bannock County, Idaho (Segments 4, 5, and 7)

The Bannock County Comprehensive Plan was adopted in 2008. The County Plan has a public services, facilities, and utilities goal to "[p]lan for adequate public facilities and services to meet future needs." Otherwise, transmission lines are not included in the Plan. Bannock County requires a CUP for transmission lines but not for substations. The Proponents have indicated that they would comply with the substantive information filing requirements of the County for expansion of the Populus Substation, although they are not required to by statute.

Power County, Idaho (Segments 5 and 7)

Power County prepared a Comprehensive Plan in 1975 that is currently under revision. In 2009 the County adopted utility transmission corridors ordinances to provide a set of standards for the development and installation of natural gas and electric transmission structures and related facilities. Among other provisions, it establishes siting criteria and zones limiting transmission lines with capacities of 460 volts or higher. Expansion of the Borah Substation would be covered by this ordinance. A special use permit would be required for construction of transmission lines and expansion of the Borah Substation.

Oneida County, Idaho (Segment 5 and 7)

Oneida County has a Comprehensive Plan that is currently under revision, but the County does not have a date for completion. Oneida County does not require CUPs for construction of transmission lines.

Cassia County, Idaho (Segments 7, 9, and 10)

The Cassia County Comprehensive Plan was revised in 2006 and designed to guide development for the next 20 to 25 years. Cassia County's Plan includes a brief discussion of electrical transmission corridors and indicates that collective efforts between the County and power companies would provide better siting options within the

county. Cassia County requires a CUP for construction of transmission lines and substations.

Cassia County recently adopted a new ordinance designating an Electrical Transmission Corridor Overlay Zone. The purpose of this overlay zone is to allow for the siting of electrical transmission lines exceeding 138 kV within Cassia County's geographical boundaries and overriding any contrary provisions in current regulations for any underlying zone. The County will develop regulations governing the establishment and operation of transmission lines more than 138 kV. These regulations will be contained in Section 5, Chapter 9, Title 9 of the Cassia Code (9-5-5, Electrical Transmission Lines Siting and Performance Standards.) The Electrical Transmission Corridor Overlay Zone will be legally described and defined in Appendix 18 of Title 9 of the Cassia County Code. The proposed Cedar Hill Substation would require a CUP.

Elko County, Nevada (Segment 7)

Elko County has a General Plan that was written in 1972 and several area-specific plans. However, no specific plans exist for the area of the county that would be crossed by the Project. The County's zoning code has general provisions for siting of utilities but transmission lines would be reviewed on a case-by-case basis to determine if a CUP was necessary or not (Brown 2010).

Twin Falls County, Idaho (Segments 9 and 10)

The Twin Falls County Comprehensive Plan was adopted in 2008. The Plan lists a policy to "coordinate with utility companies to develop plans for energy services and public utility facilities for long term needs of the County." Twin Falls County requires a CUP for substations but not for transmission lines.

Lincoln County, Idaho (Segment 8)

The Lincoln County Comprehensive Plan was adopted in 2008. The Plan includes, as an appendix, a map provided by Idaho Power showing future additional transmission lines. Lincoln County requires CUPs for construction of transmission lines and substations within the County's Agricultural (A-40) Zone.

Gooding County, Idaho (Segment 8)

The Gooding County Comprehensive Plan was adopted on March 8, 1999. The Plan was designed to provide development guidance until 2015. A revised Gooding County Comprehensive Plan, approved in May 2010, references the Gateway West Project and includes Goal 13.1 to "work with power companies to establish a corridor which is in the interest of both parties" and the associated implementation action to "(u)pdate County Zoning Ordinances to accommodate utility providers' application for long-term 'Special Use Permits.'" Goal 13.2 to "(p)romote public health, safety and general welfare in the designated corridors" has the following associated implementation action: "(a) 'Special Use Permit' will be required for power transmission lines" (Gooding County 2010).

Elmore County, Idaho (Segments 8 and 9)

Elmore County established the 2004 Comprehensive Growth and Development Plan adopted in 2004, and amended on October 3, 2007, mainly to address land use for planned communities. The Elmore Plan lists three goals for electrical power:

- Work with Idaho Power Company to develop three-phase power capability in all areas of the County and all communities;
- Encourage local power companies to upgrade distribution systems for reliable service to outlying areas of the County; and
- Support creation of wind energy farms in appropriate areas of the County.

A CUP would not be necessary in Elmore County for construction of transmission lines. However, other facilities, such as storage yards, would require a CUP.

Ada County, Idaho (Segment 8)

The Ada County Comprehensive Plan was adopted in 2007. Due to population growth, much of the Ada Plan addresses managing that growth with land use guidelines and improvements to transportation and infrastructure. A stated goal in the Ada Plan is to "promote the development of energy services and public utility facilities to meet public needs". The Plan includes a map of Idaho Power facilities, including a future 500-kV line in southern Ada County. Construction of transmission lines in Ada County would require a CUP.

City of Kuna, Idaho (Segment 8)

The City of Kuna approved a Comprehensive Plan update in 2009 that included an accompanying Future Land Use map. This Plan update includes a new electric transmission corridor component as required by Idaho State Code and in response to the Energy Policy Act of 2005. This new section includes a goal and several supporting objectives to ensure that electric transmission corridors are considered in land use planning decisions, and to minimize the adverse impacts of transmission corridors on the community. A version of the Future Land Use map was prepared to show the proposed Gateway West route through the southern reaches of the city but this map was not adopted as part of the Comprehensive Plan update. Public utilities are subject to a Special Use Permit.

Owyhee County, Idaho (Segments 8 and 9)

The Owyhee County Comprehensive Plan was published on February 11, 2002. An economic goal is to protect and improve infrastructure so that agriculture, grazing, and industry will generate income. Transmission lines are not mentioned in the Plan but the County states that a CUP would be required. Construction of substations is permitted in the County's Multi-use district and would require a CUP in the Agricultural, Residential, Commercial, or Industrial districts. Additions to the Hemingway Substation would occur within the existing fenced substation yard and would not require a CUP.

Jerome County, Idaho (Segments 8 and 10)

The current Jerome County Comprehensive Plan was adopted on January 1, 1997. The County's economy is based largely on agricultural production and related

industries. The Plan indicated that dairy farming was the leading industry. From a power perspective, the Plan states a goal to "provide County facilities that are adequate for the needs of citizens." A CUP is not necessary for construction of transmission lines and expansion of the Midpoint Substation.

City Impact Areas

According to Section 50-222 of the Idaho Code, an area of city impact must be established before a city may annex adjacent territory. Each county and city adopts by ordinance a map identifying an area of city impact within the relevant unincorporated area of the county. In defining an area of city impact, the following factors shall be considered: 1) trade area; 2) geographic factors; and 3) areas that can reasonably be expected to be annexed to the city in the future. Each city adopting an area of city impact must identify the comprehensive plan and zoning ordinances that will apply within the established area of impact.

Idaho counties crossed by the Proposed Route or Route Alternatives with city impact areas include Bear Lake, Franklin, Bannock, Oneida, Power, Cassia, Jerome, Lincoln, Twin Falls, Gooding, Owyhee, Elmore, Ada, and Canyon. The Proposed or Alternative Routes cross the city impact areas for the cities of Downey (Bannock County), Melba (Canyon County), and Kuna (Ada County) (see Figure 3.17-2).

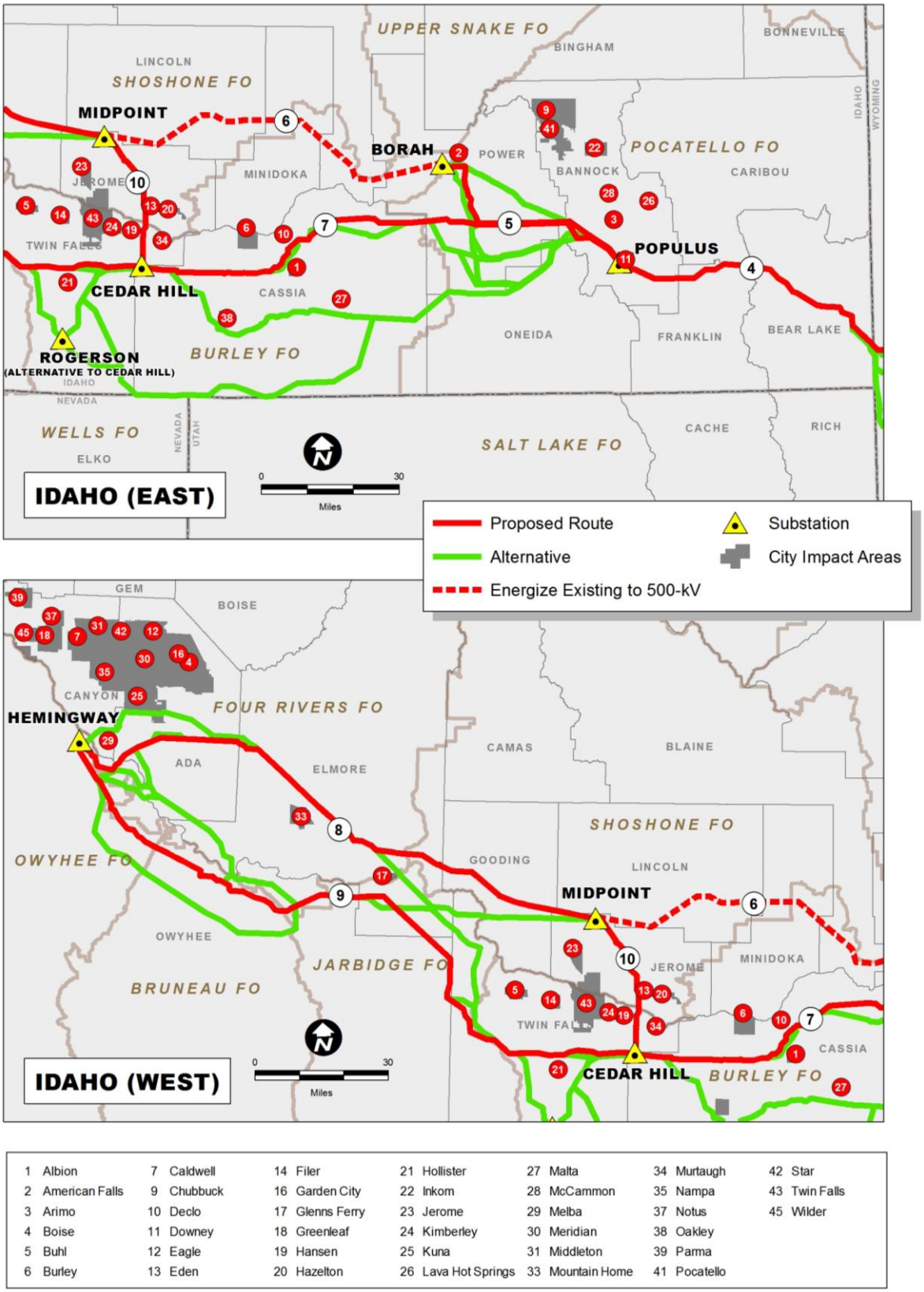
State Rules for Land Use

Wyoming

In Wyoming, land use permits must be obtained from counties and local governments initially (where applicable, see above). The siting process then proceeds through the Wyoming PSC, which has jurisdiction over transmission lines greater than 69 kV and longer than 3 miles. Lines greater than 230 kV require public notice and hearing.

If a utility wishes to construct a transmission line, it must submit an application for a Certificate of Public Convenience and Necessity. As part of that process, the applicant must demonstrate the necessity of the additional service and the financial ability to complete the project. If the proposed line requires condemnation of land, the Certificate must be obtained prior to any condemnation hearings (Wyoming Statute 75-2-205[f]). There is no time limit for the PSC to make a decision once an application is submitted. Once the PSC makes a final decision, it issues or denies the certificate and, unless otherwise prescribed, any order the PSC makes is effective 30 days after its issuance (Wyoming Statute 75-2-213) (Western Interstate Energy Board 2009).

The Wyoming Board of Land Commissioners is responsible for the direction, control, leasing, and disposal of state lands. The Board currently manages approximately 3.6 million surface acres and 4.2 million mineral acres of state lands. The Board of Land Commissioners leases virtually all of the state trust lands for mineral production and grazing and agricultural use, with a small portion leased for industrial, commercial, or recreational use. Easements would be required for the transmission line where it would cross state lands. Revenues from trust land activities are used to support the state's schools and institutions (http://slf-web.state.wy.us/admin/boards.aspx.).



1 Albion	7 Caldwell	14 Filer	21 Hollister	27 Malta	34 Murtaugh	42 Star
2 American Falls	9 Chubbuck	16 Garden City	22 Inkom	28 McCammon	35 Nampa	43 Twin Falls
3 Arimo	10 Declo	17 Glenns Ferry	23 Jerome	29 Melba	37 Notus	45 Wilder
4 Boise	11 Downey	18 Greenleaf	24 Kimberley	30 Meridian	38 Oakley	
5 Buhl	12 Eagle	19 Hansen	25 Kuna	31 Middleton	39 Parma	
6 Burley	13 Eden	20 Hazelton	26 Lava Hot Springs	33 Mountain Home	41 Pocatello	

Figure 3.17-2. Idaho City Impact Areas

The WDEQ's Industrial Siting Division administers the state's Industrial Information and Siting Act. The Industrial Siting Council reviews the socioeconomic and environmental impacts of industrial facilities before issuing a permit for construction. Permits are required for all projects with a construction cost of $175.5 million or more (Wyoming Statute 35-12, http://deq.state.wy.us/isd/) including collector systems (transmission lines) with voltages greater than or equal to 160 kV (http://deq.state.wy.us/isd/). Any facility for which a permit is required will be constructed, operated, and maintained in conformity with the permit and any terms, conditions, and modifications contained in the permit. Permit requirements may be extended to transmission lines 230 kV and higher.

Idaho

The State of Idaho owns and manages more than 2 million acres of endowment lands that provide financial support to public schools and other institutions. The IDL manages these trust lands under the governance of the Idaho Board of Land Commissioners, which consists of Idaho's Governor, Secretary of State, Attorney General, Superintendent of Public Instruction, and State Controller. The Board of Land Commissioners acts in the capacity of trustees on behalf of the beneficiary schools and other institutions to manage the state's endowment lands.

All endowment assets of the State of Idaho, per the state constitution, must be managed "in such manner as will secure the maximum long term financial return" to the trust beneficiaries. The *State Trust Lands Asset Management Plan* (Idaho State Board of Land Commissioners 2007) identifies utility and roadway ROWs as valid uses of endowment lands. However, any easement would need to be negotiated with the Land Board. Table 3.17-1 identifies the Proposed Route segments and alternatives that pass through Idaho endowment land.

Table 3.17-1. Idaho Endowment Land

Segment Number	Segment/Alternative	Total Miles
4	Proposed–Total Length	8.1
5	Proposed–Total Length	3.5
	Proposed–Comparison Portion for Alternative 5A,B	3.0
	Alternative 5A	0.3
	Alternative 5B	0.3
	Proposed–Comparison Portion for Alternative 5C	3.5
	Alternative 5C	0.7
	Proposed–Comparison Portion for Alternative 5D	0.6
	Alternative 5D	0.8
7	Proposed-Total Length	4.3
	Proposed–Comparison Portion for Alternative 7A,B	3.8
	Alternative 7C	1.0
	Proposed–Comparison Portion for Alternative 7D	0.5
	Alternative 7D	1.0
	Proposed–Comparison Portion for Alternatives 7H, I	4.3
	Alternative 7H	4.7
	Alternative 7I	7.9

Table 3.17-1. Idaho Endowment Land (continued)

Segment Number	Segment/Alternative	Total Miles
7	Proposed–Comparison Portion for Alternative 7J	4.3
	Alternative 7J	8.9
8	Proposed–Total Length	9.0
	Proposed–Comparison Portion for Alternative 8A	2.0
	Alternative 8A	6.2
	Alternative 8B	2.8
	Alternative 8C	0.3
	Alternative 8D	1.0
\9	Proposed–Total Length	4.6
	Proposed-Comparison Portion for Alternative 9B	1.1
	Alternative 9B	1.0
	Proposed–Comparison Portion for Alternative 9C	1.1
	Proposed–Comparison Portion for Alternative 9D,E	1.1
	Alternative 9D	3.9
	Alternative 9E	2.4
	Alternative 9F	3.9
	Alternative 9G	3.9
	Alternative 9H	3.9

Rows missing from this table indicate that no Idaho Endowment Lands occur along that Segment or Alternative.

Idaho Title 67-65, Local Land Use Planning, requires all city and county governments to establish local planning procedures and land use regulations. The Local Land Use Planning Act requires every city and county to enact a comprehensive plan; zoning ordinance; subdivision ordinance; area of city impact ordinances; and regulations for confined animal feeding operations (counties only). The Act also grants cities and counties the authority to adopt certain laws and policies at the discretion of the governing board. Local authorities have siting authority for transmission lines and substations (see discussion by county above).

Nevada

NRS 740 grants the Nevada Public Utility Commission (NPUC) the authority to regulate public utilities. Utility lines proposed for construction within Nevada must file for a Utility Environmental Protection Act permit with the NPUC, as required by NRS 704.820 through 704.900. The permit application ensures that the applicant is in compliance, or will comply, with all applicable statues and regulations of the NPUC. The permit process also creates a forum for the resolution of all matters concerning the location and construction of electric, gas, and water transmission lines and associated facilities. Other Nevada state agencies that need to be consulted during this permit process include, but are not limited to, the Nevada Environmental Commission, the Nevada Department of Conservation and Natural Resources, and local air pollution control boards.

Federal Lands

Land uses on federal lands in the Analysis Area are governed by various land use plans, including BLM RMPs and MFPs, and Forest Service Forest Plans. These plans typically establish goals, objectives, and standards that apply to the land and resources managed under the plan. The Forest Service and the BLM have determined that, depending on the route selected, the proposed Project would not conform to certain aspects of some of the RMPs and MFPs that guide management of the lands crossed by the Proposed Route and/or Route Alternatives. Approval of a project that has elements that are inconsistent with an applicable management plan requires consideration of an amendment at the same time that the project is being analyzed. Proposed plan amendments for the Proposed Route and/or Route Alternatives are discussed for each RMP and MFP in Appendix F-1 and each Forest Plan in Appendix F-2.

Forest Service Plans

A Forest Plan provides direction for all resource management activities on a national forest. An approved Forest Plan is the product of a process established by Congress in the National Forest Management Act (NFMA). A plan allocates land for timber production, oil and gas leasing, and other resource management activities. It designates areas for recreation and recommends the establishment of wilderness, WSRs, and other special designations. Forest Plans establish standards for resource management, either forest-wide or for specific management areas. The Proposed Route and Route Alternatives cross three NFs: the Medicine Bow-Routt, Caribou-Targhee, and Sawtooth NFs.

Medicine Bow NF Revised Land and Resource Management Plan (Segments 1E, 1W)

Established in December 2003, the Medicine Bow Forest Plan (Forest Service 2003b) provides direction for the management of approximately 1.1 million acres in southeastern Wyoming. Timber harvest and livestock grazing have been historical uses on the forest since before the turn of the century. The Forest provides a wide variety of recreation activities, such as hunting, snowmobiling, skiing, hiking, and camping. The primary purpose of land and resource planning on the Medicine Bow-Routt NFs is to ensure sustainable ecosystems, provide multiple benefits to people, provide scientific and technical assistance, and provide effective public service.

Revised Forest Plan for the Caribou NF (Segment 4)

The Caribou Forest Plan (Forest Service 2003a) addresses management of the Caribou portion of the Caribou-Targhee NF. The 2003 Revised Plan updated the 1985 Caribou Forest Plan's guidance to better reflect changing public values and current science. The Caribou NF is located primarily in southeastern Idaho, within the northern extent of the Great Basin Region, with small amounts of land in Wyoming and Utah. The Caribou portion of the Caribou-Targhee NF includes land within 11 counties in 3 states. Several urban centers use the Caribou-Targhee NF for recreation and commercial uses.

The Caribou NF is an area of high, rugged mountain ranges rising sharply from semi-arid sagebrush plains and agricultural valleys. Forestlands occupy approximately 50 percent of the Caribou NF, mainly above 6,000 feet in elevation. The Caribou NF

provides a wide variety of diverse habitats for the 334 species of terrestrial vertebrate wildlife known or suspected to occur on the Forest. The Caribou Forest Plan establishes direction to ensure coordination of multiple uses (outdoor recreation, range, timber, watershed, wildlife, fish, minerals, and wilderness) and the sustained yield of products and services (16 U.S.C. 1604[e]). The Revised Forest Plan focuses small landscape planning on the mix of activities and projects needed to meet Forest-wide goals and implement the Forest Plan.

Sawtooth NF Revised Land and Resource Management Plan (Segment 7)

The Sawtooth Forest Plan (Forest Service 2003c) guides natural resource management activities on NFS lands on the Sawtooth. The purpose of the Forest Plan is to provide management direction to ensure sustainable ecosystems that provide beneficial goods and services to the public. The Sawtooth NF is located in south-central Idaho and administers approximately 2.1 million acres of federal lands, including an estimated 218,000 acres in the Sawtooth Wilderness. A wide range of landforms, elevation, and climate occur across the Forest and provide a wide variety of vegetative conditions. Timber harvest and grazing contribute to the economic health of the region. The Forest serves as an important recreation destination, receiving approximately 1.3 million visits per year. Land management on the Forest is driven by the goals and objectives listed in Chapter III of the Forest Plan.

BLM Resource Management Plans and Management Framework Plans

BLM's land use planning process (43 CFR 1610) combines Section 202 of the FLPMA of 1976 and NEPA regulations. To ensure the best balance of uses and resource protections for America's public lands, the BLM undertakes extensive land use planning through a collaborative approach with local, state, and Tribal governments; the general public; and stakeholder groups. BLM-managed land use plans include both RMPs and MFPs. These documents provide land use planning and management direction on a broad scale and guide future actions on BLM-managed lands. Land use plan decisions consist of 1) desired outcomes (goals and objectives) and 2) allowable uses and management actions. Land use plans are used by managers and the public to: allocate resources and determine appropriate multiple uses for the public lands; develop a strategy to manage and protect resources; and set up systems to monitor and evaluate the status of resources and the effectiveness of management practices over time.

Land use plans and planning decisions are the basis for every on-the-ground action the BLM undertakes. Land use plans ensure that the public lands are managed under the principles of multiple use and sustained yield except in those areas that have been designated for special management such as the SRBOP. The SRBOP, for example, is managed for the specific purposes outlined in the enabling legislation, which include the conservation, protection, and enhancement of raptor populations and habitat. As required by FLPMA and BLM policy, public lands must be managed in a manner that protects the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archaeological values; that, where appropriate, preserves and protects certain public lands in their natural condition; that provides food and habitat for fish and wildlife and domestic animals; that provides for outdoor recreation and human occupancy and use; and that recognizes the nation's need for

domestic sources of minerals, food, timber, and fiber from the public lands by encouraging collaboration and public participation throughout the planning process (BLM 2005a).

The Proposed Route and Route Alternatives cross BLM-administered lands managed under 11 different RMPs and 5 different MFPs. These RMPs and MFPs are identified by name and segment in Table 3.17-2. The order of the plans generally proceeds from east to west.

Table 3.17-2. BLM Management Plan Jurisdiction Crossed by the Proposed Route

Resource Management Plan	Segment	Management Framework Plan	Segment
Casper	1E, 1W	Malad	5, 7
Rawlins	1E, 1W, 2, 3	Twin Falls	7, 9, 10
Green River	3, 4	Bennett Hills/Timmerman Hills	8
Kemmerer	4	Kuna	8
Pocatello	4, 5, 7	Bruneau	9
Monument	6, 8, 10		
Cassia	5, 6, 7,9,10		
Wells	7		
Jarbidge	8, 9		
SRBOP	8, 9		
Owyhee	8, 9		

BLM Casper Resource Management Plan (Segments 1E and 1W)

The Casper RMP (BLM 2007a) provides direction for managing public lands under the jurisdiction of the Casper FO in east-central Wyoming. The RMP planning area encompasses approximately 8.5 million acres in Natrona, Converse, Platte, and Goshen Counties. Other land management agencies in the area are the Bureau of Reclamation, Department of Defense, USFWS, Forest Service, and NPS.

The RMP identifies the following four key planning issues regarding management of resources or uses on BLM-managed lands within the Casper RMP planning area:

- Energy and mineral resources—suitability and level of intensity that the lands of the Casper FO should be explored for energy development and mineral extraction;
- Vegetation and habitat management—including management for the reduction of fuel loads and increase of forest and rangeland health, as well as conservation of protected species while serving all other land users;
- Land ownership adjustments, access and transportation—such as travel management to serve the public for commercial, recreational and general use, while also protecting cultural and natural resources;
- Special designation—where necessary, to protect unique sensitive resources.

The Casper RMP designates areas for limiting OHV use on BLM-managed lands. The Proposed Route and Route Alternatives would cross only through lands designated for

OHV use on existing roads and trails, with the possible exception of the Bates Hole MA, portions of which restrict OHV use to designated roads and trails only.

BLM Rawlins Resource Management Plan (Segments 1E, 1W, 2, and 3)

The Rawlins RMP (BLM 2008a) provides direction for managing public lands under the jurisdiction of the Rawlins FO in southeastern Wyoming. The Rawlins RMP planning area covers approximately 11.2 million acres in Sweetwater, Carbon, Albany, and Laramie Counties. Other land management agencies in the area are the Bureau of Reclamation, Department of Defense, and the USFWS.

The RMP establishes and addresses the following eight key planning issues regarding management of resources or uses on BLM-managed lands within the Rawlins RMP planning area:

- Development of energy resources and minerals-related issues, including solar and wind as well as oil, gas and coal;
- Special management designations, including five WSAs, four ACECs, three Wild Horse Herd Management Areas, and three National Natural Landmarks designated by the NPS;
- Public access and transportation systems, especially with regards to the legal and physical accessibility of resources on BLM-managed lands;
- Wildland-urban interface;
- Management of special status species, including the identification of areas where resource activities conflict with threatened and endangered species habitat;
- Water quality, such as issues arising from the demand for water used in resource extraction activities, including contaminated discharge water;
- Vegetation management, especially how it relates to special status species habitat as well as livestock, big game, and wild horse grazing, and its role in erosion control; and
- Recreation and cultural resources, including potential conflicts between recreation and resource uses of the land, and the impact on the viewshed of development along historic transportation routes of the area.

The Rawlins RMP designates areas for limiting OHV use on BLM-managed lands.

Green River Resource Management Plan (Segments 3 and 4)

The Green River RMP, completed in October 1997 (BLM 1997), provides direction for managing public lands under the jurisdiction of the Rock Springs FO in southwestern Wyoming. The RMP planning area encompasses approximately 3.6 million acres in Sweetwater, Lincoln, Sublette, Fremont, and Uinta Counties.

The Green River RMP designates areas for limiting OHV use on BLM-managed lands, and it is not anticipated that the Proposed Route or Route Alternatives would cross the OHV exclusion areas. The Green River RMP also designates six SRMAs, which would also not be crossed by the Proposed Route or Route Alternatives for Segment 4.

Kemmerer Resource Management Plan (Segment 4)

The Kemmerer RMP (BLM 2010b) provides direction for managing public lands under the jurisdiction of the Kemmerer FO in southwest Wyoming. The RMP planning area encompasses 3.9 million acres in Lincoln, Uinta, and Sweetwater Counties. The 2010 RMP and resulting ROD are intended to provide land use planning and management direction at a broad scale and guide future actions. The 2010 RMP supersedes the 1986 Kemmerer RMP and subsequent amendments. Land use plan decisions consist of desired outcomes (goals and objectives) and allowable uses and management actions. Key planning issues in the preparation of the RMP include energy and mineral resources; vegetation and habitat management; land ownership adjustments; access and transportation; NHT management; and special designation for unique or sensitive resources. The RMP increases conservation of physical, biological, and heritage resources and emphasizes moderate constraints on resource issues.

Pocatello Resource Management Plan (Segments 4, 5, and 7)

The Pocatello RMP, as written in 1988, identifies resource management objectives and required management actions for the Pocatello FO. The Pocatello FO, located in southeastern Idaho, covers all or portions of Bannock, Bear Lake, Bingham, Bonneville, Caribou, Franklin, and Power Counties, and encompasses 264,481 acres of public land, including the lands surrounding the city of Pocatello. The RMP addresses the following issues identified by planning team members, interagency consultation, public input, and review by BLM managers: land ownership adjustments; legal and physical access to public lands; rangeland management; protection of wildlife habitat; control of grasshoppers and weeds on public lands; OHV use on public lands; timber and firewood utilization; protection of riparian habitat and water quality; Shoshone-Bannock off-reservation rights; mineral development (prospecting leases, phosphate mining, geophysical, and oil and gas exploration); and availability of lands for phosphate, oil and gas leasing. Other management concerns included in the RMP are fire management, cultural resource management, threatened and endangered plants and animals, WSAs, and access.

On May 7, 2010, the Pocatello FO released a proposed Draft RMP and EIS (BLM 2010c) that analyzed four management alternatives that could be used to guide the multiple-use management of all resources and uses in the Pocatello FO. Completion of this proposed plan, once approved, will result in a revised RMP for the Pocatello FO.

Malad Management Framework Plan (Segments 5 and 7)

The Malad MFP provides direction for management of resource activities on public lands administered by the BLM within the southwestern portion of the Pocatello FO. The MFP includes objectives and recommendations for the following activities: lands, minerals, recreation, timber, wildlife, range management, and watershed management. The Malad MFP will be replaced by the revised Pocatello RMP currently being prepared by the Pocatello FO.

Monument Resource Management Plan (Segments 6, 8, and 10)

The Monument RMP (BLM 1986c) provides direction for management of public lands within the Monument Planning Area, which encompasses 2,059,441 acres of land north

of the Snake River in south-central Idaho. The Monument RMP planning area includes lands that are part of the Shoshone FO, as well as lands that are part of the Burley FO. The RMP planning area includes all of Jerome and Minidoka Counties and portions of Gooding, Lincoln, Blaine, Butte, and Power Counties. Approximately 57 percent of the planning area is public land administered by the BLM, 2 percent is land administered by other federal agencies, 3 percent is land belonging to the State of Idaho, and 38 percent is private land.

The RMP includes goals that would allow a variety of resource uses within the planning area. Production and use of commodity resources and commercial use authorization may occur, while protecting fragile resources and wildlife habitat, preserving natural systems and cultural values, and allowing for nonconsumptive resource uses. The RMP also includes management prescriptions to guide resource management activities within the planning area.

Cassia Resource Management Plan (Segments 5, 6, 7, 9, and 10)

The Cassia RMP (BLM 1985a) provides direction for management of public lands in a 1.6 million-acre planning area located south of the Snake River in south-central Idaho. This area is located entirely within the Burley FO. Approximately 97 percent of the planning area is within Cassia County, with 2 percent in Oneida County and less than 1 percent in each of Twin Falls and Power Counties. Twenty-nine percent of the planning area is public land administered by BLM; 22 percent is administered by the Forest Service, USFWS, and Bureau of Reclamation; and 5 percent is owned by the State of Idaho. The remaining land is privately owned.

The planning area's local economy is based on agriculture and agricultural-supporting industries. Domestic livestock grazing is the area's primary agricultural use involving nearly all of the public lands in the planning area. The Cassia RMP (BLM 1985a) divides the planning area into 14 management areas for the purposes of organizing and presenting its planning decisions. A management area generally contains lands having similar resources, features, and characteristics that can be effectively managed as a unit. Resource management guidelines are used to direct BLM management actions on public lands. The Cassia RMP includes policies and resource management guidelines for the management of the following specific resources: air quality; cultural resources; economic and social considerations; fire management; fish and wildlife; forest management; geology, energy and minerals management; motorized vehicle access and use; public utilities; rangeland management; recreation; transportation; visual resources management; and watershed management.

Twin Falls Management Framework Plan (Segments 7, 9, and 10)

The Twin Falls MFP (BLM 1982) provides direction for management of resource activities on public lands administered by the BLM within the western portion of the Burley FO. The MFP includes objectives and recommendations for the following activities: lands, minerals (oil and gas, geothermal, saleable), cultural resource management, forestry, recreation management, visual resource management, wilderness management, natural history resource management, range management, wildlife (big game, upland game, sage grouse, sharp-tailed grouse, quail, aquatics,

wetland-riparian, furbearers, waterfowl, fisheries, raptors, general, non-game), watershed management, and fire management.

Wells Resource Management Plan (Segment 7)

The Wells RMP (originally prepared in 1985 [BLM 1985b], and subsequently amended in 1987, 1992, 2003, and 2004) guides BLM management of 4.1 million acres of BLM-managed land within Elko County in northeastern Nevada. The RMP includes goals and objectives for the management of lands, corridors, recreation, livestock grazing, wild horses, terrestrial wildlife habitat, riparian/stream habitat, ACECs, threatened and endangered species, woodland products, and minerals and energy.

Bennett Hills/Timmerman Hills Management Framework Plan (Segment 8)

The Bennett Hills/Timmerman Hills MFP (1980) provides direction for management of resource activities on public lands administered by the BLM within the western portion of the Shoshone FO. The MFP includes objectives and recommendations for the following activities: lands, minerals, recreation, wildlife, range management, and watershed management.

Jarbidge Resource Management Plan (Segments 8 and 9)

The current Jarbidge RMP (BLM 1987), which is currently being revised, is designed to guide the management of public land resources in the Jarbidge FO and ensure that the public lands and resources are planned and managed in accordance with the principles of multiple use and sustained yield. The FO includes 2,100,519 acres of land in south-central Idaho and northern Nevada. Approximately 81 percent of the lands in this area are public lands administered by BLM in Elmore, Owyhee, and Twin Falls Counties, Idaho and Elko County, Nevada. Five percent of the remaining lands are state-owned.

The plan focuses on nine issues identified by the public: land tenure and adjustments; livestock grazing; management of wildlife resources (including riparian and aquatic habitats); wilderness management; recreation; soil, air, and water; energy and mineral exploitation and development; fire management; and special designations. Special management concerns also addressed in the plan include cultural resource protection, paleontologic resource protection, timber management, and social and economic changes. The Plan includes objectives and management actions for 16 separate management areas called multiple use areas (MUAs) and three ACECs.

In August 2010 the Jarbidge FO released a proposed Draft RMP and EIS that analyzes management alternatives that could be used to guide the multiple-use management of all resources and uses in the Jarbidge FO. Completion of this proposed plan, once approved, will result in a revised RMP for the Jarbidge FO.

Kuna Management Framework Plan (Segment 8)

The Kuna MFP (BLM 1983a) provides direction for management of resource activities on public lands administered by the BLM within a portion of the Four Rivers FO. The MFP includes objectives and recommendations for the following activities: lands, minerals, range management, watershed management, wildlife-terrestrial, wildlife-aquatic, cultural resource management, recreation, visual resource management, and transportation/support.

Snake River Birds of Prey National Conservation Area Resource Management Plan (Segments 8 and 9)

The SRBOP RMP (BLM 2008b) provides guidance for the public lands and resources within the SRBOP, which are managed as a part of the BLM Four Rivers FO. The SRBOP contains approximately 485,600 acres of public land extending 81 miles along the Snake River in the Idaho counties of Ada, Canyon, Elmore, and Owyhee. The SRBOP includes the approximately 142,000-acre Orchard Training Area, used by the IDANG for military training since 1953.

The SRBOP contains the greatest concentration of nesting raptors in North America and the greatest density of prairie falcons in the world. The area is a unique habitat for birds of prey because the cliffs of the Snake River Canyon provide ideal nesting sites, while the adjacent upland plateau supports unusually large populations of small mammal prey species.

The SRBOP is managed by BLM under the concept of dominant use rather than multiple use. This means that prior to authorizing uses, BLM determines the compatibility of those uses with the purposes for which the SRBOP was established. The purpose of the SRBOP is to ensure that public land uses are planned for and managed in accordance with the requirements of P.L. 103-64. The SRBOP RMP replaced portions of the 1983 Kuna MFP, 1983 Bruneau MFP, 1987 Jarbidge RMP, and 1999 Owyhee RMP that cover the SRBOP, and replaced the 1996 SRBOP Management Plan. Specific management decisions for the public lands within the SRBOP include the following:

- Protecting remaining shrub communities through aggressive wildfire suppression;
- Restoring up to 130,000 acres of shrub habitat;
- Completing up to 100,000 acres of fuels management projects;
- Modifying IDANG training activities by limiting vehicular maneuver training to non-shrub communities to protect existing shrub communities, and by providing 4,100 acres of additional training area to enhance military maneuvers impacted by restrictions; and
- Area and use designations for livestock grazing, OHV use, ROWs, visual resource management, and energy corridors.

The approved RMP emphasizes the restoration and rehabilitation of all non-shrub areas outside the Orchard Training Area to improve raptor and raptor prey habitat while imposing only moderate restrictions on recreation, military training, and commodity uses.

Bruneau Management Framework Plan (Segment 9)

The Bruneau MFP (BLM 1983b) provides direction for management of resource activities on public lands administered by the BLM within the Bruneau FO. The MFP includes objectives and recommendations for the following activities: lands, minerals, forest products, range management, watershed management, wildlife-terrestrial, wildlife-aquatic, cultural resource management, recreation, visual resource management, and wilderness.

Owyhee Resource Management Plan (Segments 8 and 9)

The Owyhee RMP (BLM 1999) is a general RMP for BLM-managed public lands in western Owyhee County in southwestern Idaho. The Owyhee FO manages 1,779,492 acres. This total includes 1,320,032 acres administered by BLM and 136,936 acres administered by the State of Idaho. The FO contains the northern extent of the Owyhee Mountain Range and lies within what is often referred to as the Columbia Plateau, an elevated plateau with mountains which are separated by canyons draining to the Pacific Ocean via the Snake and Columbia Rivers.

The Owyhee RMP establishes guidance for managing a broad spectrum of land uses and allocations including livestock grazing management; wild horse management; land tenure adjustments; OHV designations; wild, scenic, and recreational river designations; and ACECs. The RMP contains resource objectives, land use allocations, management actions, and direction needed to achieve program and multiple use goals.

The Owyhee FO is currently developing a travel management plan for motorized routes on non-wilderness public lands in Owyhee County, west of the Bruneau River. Once completed, this will result in an updated RMP for the Owyhee FO.

Military Operations Areas and Military Training Routes

A military operations area is “airspace established outside Class A airspace to separate or segregate certain nonhazardous military activities from instrument flight rules traffic and to identify for visual flight rules traffic where these activities are conducted” (14 CFR Part 1.1). Military operations areas are designed for routine training or testing maneuvers. A military operations area is a type of special use airspace, other than restricted airspace or prohibited airspace, where military operations justify limitations on aircraft not participating in those operations.

The designation of special use airspaces identifies areas where military activity occurs, provides for segregation of that activity from other fliers, and allows charting to keep airspace users informed. Local flight service facilities maintain current schedules and contacts for the agency controlling each military operations area. Military operations areas are often positioned over isolated, rural areas to provide ground separation for any noise nuisance or potential accident debris. Each designated military operations area appears on the relevant sectional charts, along with its normal hours of operation, lower and upper altitudes of operation, controlling authority contact, and using agency.

The Owyhee and Jarbidge Military Operations Areas are located in the southern portion of Owyhee County, Idaho, south of Segment 9 (see Figure 3.17-3). Mountain Home Air Force Base is located in southwestern Elmore County, Idaho, in the vicinity of Segments 8 and 9 (Figure 3.17-3).

Military Training Routes (MTRs) are aerial corridors used solely by military aviation for training flights. The routes are the result of a joint venture between the FAA and the Department of Defense to provide for high-speed, low-level military activities. MTRs are divided into Instrument Routes (IR) and Visual Routes (VR). Each route is identified by either of these two letters, followed by either four digits for routes below 1,500 feet above ground level (AGL), or three digits for routes extending for at least one leg above 1,500 feet AGL. IR routes are flown under Air Traffic Control, while VR routes are not.

Each route is defined by a number of geographical coordinates. MTRs are individually operated through one of the local military air bases.

One MTR is located within the vicinity of Segment 7. IR-302/305/VR-1304/1305 is located in Minidoka, Blaine, and Cassia Counties, Idaho; Box Elder County, Utah; and Elko County, Nevada (see Figure 3.17-3). Unless noted on the air navigation chart, aircraft may fly as low as 100-110 AGL in the Project area along these routes.

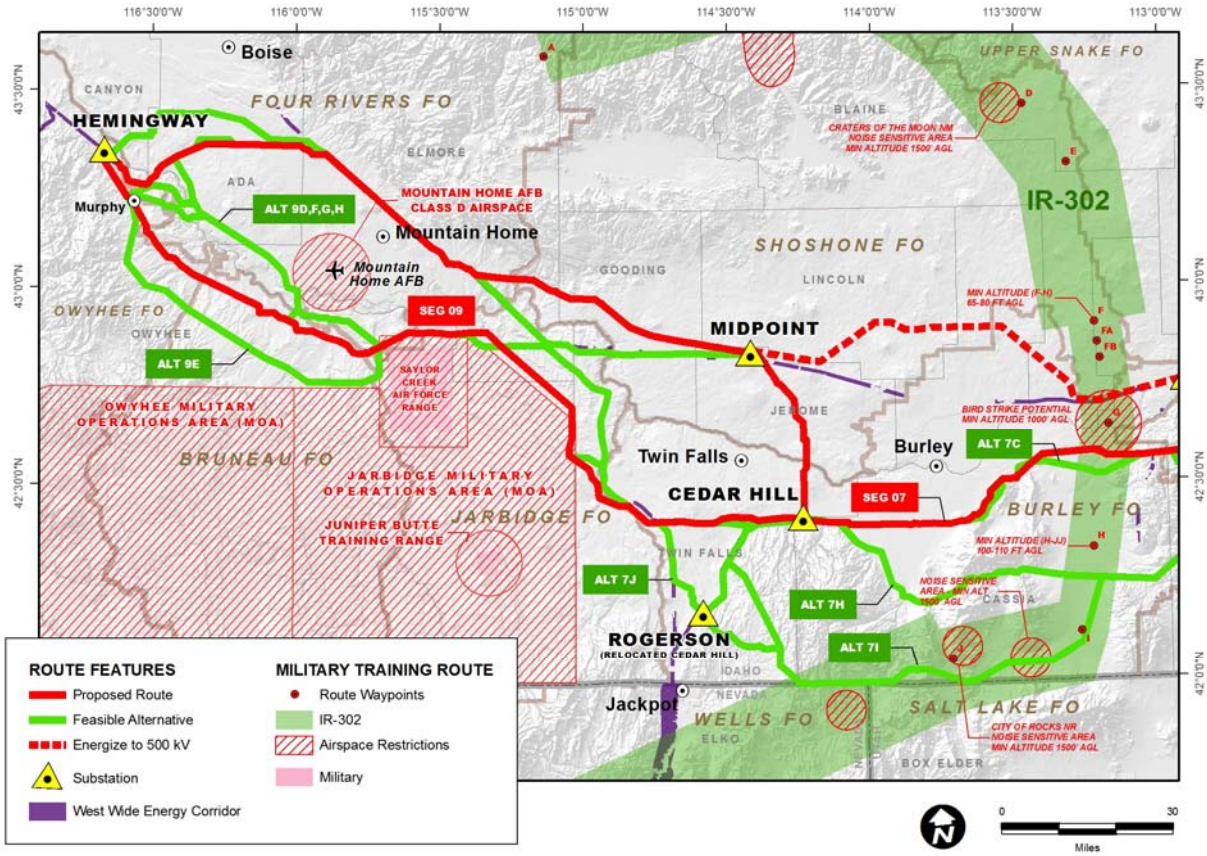


Figure 3.17-3. Military Operations Areas and Training Routes

Indian Reservations

Lands within the Fort Hall Indian Reservation are currently managed in accordance with the Shoshone-Bannock Tribes 1976 Comprehensive Plan, and the draft Comprehensive Plan, as proposed in 2005. Under this plan, tribal departments work independently to plan and implement programs and projects, with various departments coordinating with one another to ensure that their actions do not impact the ability of other resource managers to attain their goals (Shoshone-Bannock 2010a). The tribes are in the process of developing a Tribal Integrated Resource Management Plan (TIRMP), which would provide guidance for natural resource management that reflects the traditional and cultural land use patterns of the Shoshone-Bannock Tribes (Shoshone-Bannock 2010b). The TIRMP would integrate interdisciplinary resource planning into all resource

plans and projects in order to balance resource development with natural sustainability and cultural resource protection (Shoshone-Bannock 2010a).

3.17.1.4 Methods

The environmental effects analyses completed for this assessment were conducted using readily available data and GIS files derived from preliminary centerline and component design for the Proposed Route and Route Alternatives, including ROW, access roads, staging areas, and fly yards. (See Section 3.1 – Introduction for details on the development of these files.) Where impacts were identified, Proponent-proposed measures to reduce impacts were reviewed for sufficiency. Where those measures were determined to be insufficient, additional measures were identified.

Land ownership, Indian Reservations, and designated areas were determined from GIS data gathered from the Forest Service, the BLM, and the states of Wyoming and Idaho. Information about existing corridors and ROWs was gathered from USGS, field information, RMPs and MFPs, and Forest Plans.

Information on land use was obtained from GIS mapping of aerial photographs, and from federal and state agency personnel and state databases. Other GIS information collected and used for this Project included vegetation mapping prepared in accordance with NVCS, NWI wetland maps, and federal agency data on land use management plans. Land use classifications follow Anderson et al. (1976). Recreation and special interest areas were identified by reviewing USGS topographic maps; DeLorme Gazetteers for Wyoming and Idaho (DeLorme 2003, 2000); WGFD and IDFG interactive maps; BLM RMP and MFP and Forest Service Forest Plan maps of the proposed Project area; and field reconnaissance. Aerial photography was used to identify and confirm land uses within 1,000 feet of the centerline of the Proposed Route and Route Alternatives.

Data on property ownership, miles of various land uses crossed, and disturbance to land use types during construction and operation were generated in GIS.

3.17.1.5 Existing Conditions

Land Ownership

Table 3.17-3 summarizes miles crossed by land ownership by Proposed Route segment. Private lands make up 46 percent of the total miles that would be crossed by the Proposed Route; BLM-managed lands account for 43 percent of the total (Table 3.17-3). Approximately 9 percent of the total miles cross state-managed lands, 2 percent cross NFS lands, and 1 percent cross Bureau of Reclamation lands.

Private lands as a share of total miles by segment range from 18 percent for Segment 9 to 73 percent for Segment 7. State-managed lands comprise a relatively large share of the land crossed by Segments 1E, 1W(a), and 1W(c), accounting for 22 percent to 24 percent of total miles crossed (Table 3.17-3).

BLM-managed lands range from 12 percent of total miles crossed by Segment 1E to 80 percent of the lands crossed by Segment 9 (Table 3.17-3). The BLM Management Plan jurisdictions crossed by the Proposed Route are identified by segment in Table 3.17-2. Segments 1E, 1W(a), 1W(c), and 4 cross NFS lands, which range from 3 to 5 percent of total miles crossed (Table 3.17-3).

Table 3.17-3. Miles Crossed by Land Ownership

Segment	Total Miles Crossed	Percent of Total Miles Crossed				
		BLM	NF	State[1/]	Private	Other[2/]
1E	100.6	12	3	22	64	–
1W(a)	76.5	35	3	24	38	–
1W(c)	70.6	34	3	22	41	–
2	96.7	38	–	6	55	–
3	56.5	51	–	2	47	–
4	203.0	40	5	5	48	2
5	54.6	24	–	7	69	–
7	118.1	24	–	4	73	–
8	131.0	65	–	7	26	3
9	161.7	80	–	3	18	–
10	33.6	39	–	–	61	–
Total	**1,102.9**	**43**	**2**	**9**	**46**	**1**

1/ State includes water.
2/ Other includes Bureau of Reclamation, USFWS, and Indian Reservation lands where crossed.

Land Use

Land use within the Analysis Area is primarily rangeland (84 percent), with cropland and forestland accounting for about 10 percent and 4.5 percent, respectively (Table 3.17-4). Relatively small portions of the route border or cross developed areas (including industrial, commercial, and residential areas, and existing ROWs), wetlands and open water, and "barren" areas (including disturbed and extractive mining areas) (Table 3.17-4).

Table 3.17-4. Existing Land Uses within the Analysis Area

Segment	Analysis Area Total (Acres)[1/]	Percent of Analysis Area						
		Rangeland	Cropland	Forest	Water and Wetlands	ROW	Developed[2/]	Other[3/]
1E	12,149	90	–	6	2	1	–	1
1W(a)	9,284	93	–	4	2	1	–	–
1W(c)	8,577	88	–	7	3	1	–	1
2	11,727	96	–		2	1	–	1
3	6,885	95	–	–	2	2	1	–
4	24,586	80	4	10	4	1	–	1
5	6,633	61	21	15	1	1	–	–
7	14,323	57	37	4	–	1	–	–
8	15,898	88	10	–	1	1	–	–
9	19,594	90	9	–	–	1	–	–
10	4,081	49	46	–	1	1	2	–
Total	**133,736**	**83**	**10**	**4**	**2**	**1**	–	**1**

1/ Based on a corridor 500 feet on either side of the Proposed Route. Note that the Analysis Area used for the Project varies by resource.
2/ Developed includes industrial, commercial, and residential land uses, as well as lands within existing ROWs.
3/ Other includes "barren" areas, which include disturbed and extractive mining areas.

Rangeland accounts for the majority (82 percent) of the land use within the Analysis Area for the Proposed Route, ranging from 49 percent for Segment 10 to 96 percent for Segment 2 (Table 3.17-4). Cropland, including dryland and irrigated farming, accounts for approximately 10 percent of total land use. Cropland would only be present along the Idaho portion of the Proposed Route, and would range from 4 percent of total land use for Segment 4 (including the Wyoming portion) to 46 percent for Segment 10 (Table 3.17-4). Rangeland and agricultural lands, including prime farmland and lands in the CRP, are discussed in Section 3.18 – Agriculture.

Forestland accounts for approximately 4 percent of the lands within the Analysis Area for the Proposed Route. Not all of the route segments cross forestland. Forestland as a share of total land use for the other segments would range from 4 percent for Segment 1W(a) to 15 percent for Segment 5 (Table 3-17.4). Forestland is discussed below relative to effects on timber management. Additional detail on the composition and extent of the forests found in the Analysis Area is presented in Section 3.6 – Vegetation Communities.

Water and wetlands make up about 1 percent of the total land use within the Analysis Area for the Proposed Route, ranging from about 1 percent to 2 percent for each segment (Table 3.17-4). Water and wetlands are discussed in Sections 3.16 – Water Resources and 3.9 – Wetlands and Riparian Areas, respectively.

Developed land, including residential, commercial, and industrial development, occupies only 0.2 percent of the Analysis Area. Most of this development occurs along Segments 7, 9, and 10. Existing ROW accounts for approximately 0.8 percent of the overall Analysis Area and includes lands used for roads, transmission lines, gas pipelines, and other linear facilities.

The following sections discuss land use within the Analysis Area by segment.

Segment 1E

Rangeland accounts for the majority (90 percent) of the land use within the Analysis Area for Segment 1E. Higher elevation forestland in and around the Medicine Bow-Routt NFs accounts for about 6 percent of total land use (Table 3.17-4). There is limited development within the Analysis Area for Segment 1E. Developed land use mainly occurs in the vicinity of the Dave Johnston Power Plant just south of the Windstar Substation and includes ancillary facilities that serve the power plant, including electric transmission lines, two railroads, and two highways. The Analysis Area also includes part of an existing residential area east of Glenrock on the south side of U.S. Highway 20/26. Development from this area south through Converse, Natrona, Albany, and Carbon Counties to the Aeolus Substation is limited to a few scattered homes and ranches.

Segment 1W

Rangeland accounts for the majority (93 percent) of the land use within the Analysis Area for Segment 1W(a). Higher elevation forestland in and around the Medicine Bow-Routt NFs accounts for about 4 percent of total land use (Table 3.17-4). Segment 1W(a) trends west from the Windstar Substation, north of the town of Glenrock, before

heading south west of town. Development within the Analysis Area is limited to a few scattered homes and ranches.

Land use within the Analysis Area for Segment 1W(c) mainly consists of rangeland (88 percent) and forestland (7 percent). Development within the Analysis Area is limited to scattered homes and ranches.

Segment 2

Segment 2 would generally follow the existing SR 72 and U.S. Highway 30 corridors west from the Aeolus Substation. Land use within the Analysis Area for this segment is primarily rangeland (96 percent) (Table 3.17-4). This segment begins in the vicinity of an existing wind farm. Approximately 12.5 miles southwest of the Aeolus Substation it would cross about 2 miles of former strip mines. Farther west, south of the city of Rawlins, the segment would pass within 1 mile of oil and gas development that continues for about 10 miles to the proposed Creston Substation site.

Segment 3

Segment 3 would generally follow the existing U.S. Highway 30 corridor. Land use within the Analysis Area for this segment is primarily rangeland (95 percent) with existing ROWs accounting for about 2 percent of the total Analysis Area for this segment (Table 3.17-4). Oil and gas development occurs in the general vicinity of both the proposed Creston and Anticline Substation sites. Several areas of strip mining are also located in the vicinity of the Anticline Substation site. These land uses are not within 500 feet of Segment 3.

Segment 4

Land use within the Analysis Area for Segment 4 consists of rangeland (80 percent), cropland (4 percent), and forestland (10 percent) (Table 3.17-4). The cropland occurs in three main areas: near the two proposed crossings of the Bear River and near the city of Downey. The forestland occurs within and in the vicinity of Caribou-Targhee NF in Idaho, as well as along the Proposed Route in western Wyoming. Development is limited within the Analysis Area. Residential development in the general vicinity of the Analysis Area tends to be located in proximity to communities like Kemmerer and Cokeville in Wyoming and Montpellier and Downey in Idaho. The area between the Jim Bridger Power Plant and the town of Cokeville has substantial oil and gas development and coal mining.

Segment 5

Rangeland accounts for more than half (61 percent) of the land use in the Analysis Area for Segment 5, with cropland and forestland accounting for 21 percent and 15 percent, respectively (Table 3.17-4). Dryland farming occurs mostly west of the Deep Creek Mountains. Irrigated cropland is scattered along the Analysis Area. Forestland within the Analysis Area is mainly concentrated in the Deep Creek Mountains. Residential development within the Analysis Area is limited to scattered rural residences.

Segment 6

No new transmission line construction would be required along Segment 6 to operate this line segment at 500 kV, except in the vicinity of the existing Borah and Midpoint

Substations, where approximately 10 new structures would be required, 5 at each substation. Modifications would also be required at both substations. The Borah Substation is located approximately 0.5 mile north of the Snake River. Land use in the surrounding area consists of rangeland with some areas of irrigated cropland. The existing Midpoint Substation is located approximately 0.2 mile east of U.S. Highway 93. Land use to the north, east, and west is primarily rangeland. The area south of the substation is irrigated cropland.

Segment 7

Rangeland accounts for more than half (57 percent) of the land use in the Analysis Area for Segment 5, with cropland and forestland accounting for 37 percent and 4 percent, respectively (Table 3.17-4). Cropland within the Analysis Area may be broadly divided into irrigated cropland and dryland farming (see Section 3.18 – Agriculture). Irrigated cropland accounts for an estimated 16 percent of the Analysis Area for this segment; dryland farming accounts for an estimated 21 percent. The irrigated cropland within the Analysis Area occurs predominantly south of Burley and at scattered locations east and west of the Deep Creek Mountains. The Burley area is part of the Mini-Cassia community of Minidoka County and Cassia County in south-central Idaho, which includes some of the best agricultural land in the region. Forestland mainly occurs in higher elevation areas. Development includes a number of residences, farms including dairy operations, and feedlots along much of the Analysis Area except in the more mountainous locations.

Segment 8

The Analysis Area for Segment 8 is primarily rangeland (88 percent), with irrigated cropland accounting for 10 percent. Irrigated agriculture is found mostly in the first 40 miles from the Midpoint Substation and the last 25 miles before Hemingway Substation. This segment parallels existing transmission facilities for much of its length. Farms and residences occur along the Analysis Area and more intensive residential development is planned in the area south of Boise.

Segment 9

The Analysis Area for Segment 9 is mainly rangeland (90 percent) with approximately 9 percent used for irrigated crop production (Table 3.17-4). Irrigated cropland in the vicinity of the Analysis Area is concentrated in three main areas: west of the proposed Cedar Hill Substation, west of Castleford, and between the communities of Bruneau and Grandview. The majority of the irrigated acres within the Analysis Area are located between Bruneau and Grandview. Development in the Analysis Area for this segment includes a small number of scattered residences and farms. More concentrated residential development exists near the town of Murphy and near the proposed Hemingway Substation.

Segment 10

The Analysis Area for Segment 10 is approximately 49 percent rangeland and 46 percent cropland (Table 3.17-4). In the vicinity of Jerome and from Eden south to the Cedar Hill Substation, the entire Analysis Area is irrigated agricultural lands with

scattered farms and residences. From Jerome north, the area is mostly rangeland with some crop production.

Designated Corridors and Existing ROWs

Corridors are established in BLM and Forest Service land use plans and, most recently, by the West-Wide Energy Corridor ROD (see Section 1.6.2; BLM 2009a). There is a robust system of east-west high-voltage (230-kV and above) transmission lines across Wyoming and Idaho. Locations of existing electric transmission lines near the Project are noted on figures in Appendix A. The length and percentage of the Proposed Route and Route Alternatives that align with the WWE corridor and existing transmission lines is summarized in Table 2.4-2 and discussed below in Section 3.17.2.3 by segment.

Timber and Fire Management Activities

Timber Management

Timber management includes the commercial and non-commercial harvest of forest wood products. Forest products may include lumber, poles, posts, firewood, and Christmas trees. Timber harvest is governed by the Wyoming State Forest Practice Act in Wyoming and by the Idaho State Forest Practice Act in Idaho. In addition, RMP requirements apply to BLM-managed lands and Forest Plan standards and guidelines and regional BMPs apply to NFS lands. Four of the proposed segments—1, 4, 5, and 7—cross forested lands. See Section 3.4 – Socioeconomics and Section 3.6 – Vegetation Communities for further discussion of forest economics and communities.

NFS lands crossed by the Proposed Route and Route Alternatives include the Medicine Bow-Routt NFs, crossed by Segments 1E and 1W, and the Caribou-Targhee NF crossed in Segment 4. The Proposed Route would not cross the Sawtooth NF but alternatives to the Segment 7 Proposed Route would cross the Sawtooth NF. Both the Caribou-Targhee and Sawtooth NFs have suitable timber lands that would be affected by the Proposed Route or a Route Alternative.

BLM-managed forested lands crossed include those lands managed by the Pocatello FO and Burley FO that are crossed by Segments 5 and 7.

Fire Management

Across Wyoming and Idaho, areas have been designated for initial fire suppression responsibility to eliminate confusion about who is in charge during a fire emergency. Primarily, initial suppression authority falls to either a federal (Forest Service or BLM) or state (Wyoming State Forestry Division or IDL) department, and less commonly, fire protective associations have this responsibility. Fire protective associations are set up by groups of landowners to provide wildland fire protection. Participating landowners contribute funding to the association who hires firefighters and provides services in a designated area. These agencies work across land ownership boundaries.

Individual land management agencies or landowners have responsibility for managing lands to reduce fire hazards and provide fire suppression access prior to the event of a fire.

Wildland fire operations in Nevada are managed by the Great Basin Multi-Agency Coordination group, which includes representatives of the BLM, Forest Service, NPS, USFWS, Bureau of Indian Affairs, and the states of Nevada, Utah, and Idaho. The portion of the analysis area in Nevada is within the Elko Dispatch Zone, one of five dispatch zones in the Western Great Basin established for the purpose of local interagency fire management coordination and mobilization of wildland firefighting resources (Western Great Basin Coordination Center 2011).

The Project area often experiences fire ignitions that quickly escalate to large fires, due to fuel types including annual grasses and brush, combined with summer temperatures in the 90°F to 105°F range, and relative humidity in the 10 to 25 percent range. The fire season typically starts in May and ends in mid-October. Fires occur as early as March and as late as December depending on weather and ignition activities (lightning, vehicles, sparks from railroads, fireworks, debris burning, arson, etc.). Power lines that are downed during high wind events may also be a potential ignition source (BLM 2005b).

Indian Reservations

The Fort Hall Indian Reservation, which is crossed by Segment 5, is the only Indian Reservation crossed by the proposed Project; this crossing accounts for approximately 0.4 percent of the total miles crossed by the Proposed Route for Segment 5. The Fort Hall Indian Reservation was established for the Shoshone and Bannock Tribes, as well as one Northern Paiute band, as part of the Fort Bridger Treaty of 1868 (Shoshone-Bannock 2009). Today, the reservation consists of approximately 521,519 acres, and is included in parts of four counties within southeastern Idaho: Bingham, Power, Bannock, and Caribou Counties. According to the 2000 U.S. Census, there were an estimated 5,762 individuals living within the Fort Hall Reservation and on Off-Reservation Trust Lands (U.S. Census 2000e), with approximately 70 percent of these people living within the boundary of the Fort Hall Indian Reservation (Shoshone-Bannock 2009).

Recreational and Public Interest Areas

Recreation on federal and other public lands in Wyoming, Idaho, and Nevada involve developed sites and also dispersed activities, such as hiking, OHV use, hunting, and fishing, which occur in and outside designated use and public interest areas. Recreation opportunities are offered to the public on all NFS lands and BLM-managed lands where legal access exists. Existing recreation resources in the general vicinity of the proposed Project were avoided during the initial route selection studies wherever possible in order to limit the potential impact of the Project on these areas. Recreation, and other specific land uses crossed or within 1,000 feet of the Proposed Route and Route Alternatives, are identified by segment in Table D.17-1 of Appendix D.

Recreation activities on federal lands in the Analysis Area are managed under the applicable resource management plans (see Section 3.17.1.3), which specify the locations and times when many of these activities can occur, as well as applicable State regulations. Hunting in the Analysis Area, for example, varies by season and location, as permitted by the WGFD, IDFG, and Nevada Department of Wildlife.

Designated recreation resources within the Analysis Area include SRMAs and other special management areas designated by the BLM, historic trails, and scenic byways, as well as developed recreation facilities. Recreation management is guided on NFS lands by the Recreation Opportunity Spectrum (ROS) system. Management on public lands for OHV use also has important implications for recreation use.

FLPMA recognizes recreation as an important component of multiple use management and BLM Manual 8300 (Recreation) "directs the BLM to designate administrative units known as SRMAs where there is a need for a higher level of managerial presence or investment than is typical of most public land. BLM-managed land outside of SRMAs is designated as an Extensive Recreation Management Area (ERMA) where limited resources are required to provide extensive, unstructured recreational activities" (BLM 2008b). SRMAs that would be crossed by or are within 1,000 feet of the Proposed Route or Route Alternatives are discussed by segment in the following section.

Historic trails within the Project area include trails that have been designated as NHTs by Congress under the National Trail Systems Act of 1968, as amended 1978. These include the web of pathways that are variously known as the Oregon, Mormon Pioneer, California, or Pony Express Trails. These pathways were historically a network of trail segments, river crossings, and landmarks that stretched across 1,800 miles of territory and linked the western frontier to the settled lands of the east. Most components of these four historic trails have been designated as NHTs and are part of the National Trails System. The Oregon, Mormon Pioneer, California, and Pony Express NHTs coincide and share a common corridor across many, but not all, portions of the Project area. Shortcuts that developed along the Oregon-California-Mormon Pioneer trail system were called "Cutoffs" by emigrants. The Project would also cross a number of Cutoffs, including Child's Cutoff, Slate Creek Cutoff, Sublette Cutoff, Hams Fork Cutoff, and Hudspeth's Cutoff (see Section 3.3 – Cultural Resources).

There are also a number of scenic byways within the Analysis Area that would be crossed by the Proposed Route and/or Route Alternatives. Scenic byways are generally roads that have historic, recreational, scenic, or other qualities that make them attractive for recreationists and others interested in driving for pleasure. Developed recreation facilities within the Analysis Area are also identified by segment below. These facilities include a ski area and two developed campground sites with boat ramps.

The following sections provide an overview of recreational resources within the Project Analysis Area by segment. OHV use on BLM-managed and NFS lands and the ROS system are discussed in separate sections that follow the segment-by-segment summaries.

Segment 1E

Recreational resources on federal lands along Segment 1E are regulated by the Medicine Bow Forest Plan and the Casper and Rawlins RMPs. Recreational activities identified in the Medicine Bow LRMP include camping, horseback riding, fishing, snow mobile use, OHV use, boating, and hunting. Recreational activities on the Casper and Rawlins BLM districts that are identified in their respective RMPs include those listed

above for the Medicine Bow-Routt NFs, as well as the use of historic trails, wildlife viewing, hiking, cave exploration, use of WSRs, and the use of areas established for special events. Note that these are the recreational resources identified in the applicable federal plans, and it is possible that some of these recreational activities take place within or near the Project area.

There are no SRMAs crossed or located within 1,000 feet of the Proposed Route or Route Alternatives for this segment. One designated Management Area (MA), the Bates Hole MA, is located within the Analysis Area and would be crossed by the Proposed Route along Segment 1E, as well as Alternative 1E-C. The Bates Hole MA was established in the 2007 ROD and Approved Casper RMP to "protect highly erosive soils, fragile watersheds, and important and crucial wildlife habitat" (BLM 2007a). The area encompasses 375,221 acres, including 158,023 acres of BLM-managed lands.

Segment 1E would cross a segment of the Oregon/California, Pony Express, and Mormon Pioneer NHTs, where they all share the same alignment, and would also cross the Child's Cutoff to the California NHT. Alternative 1E-B would also cross the Rock Creek and Fort Fetterman Road trail twice (see Table 3.3-7 in Section 3.3 – Cultural Resources).

There are no developed recreation facilities located within 1,000 feet of the Proposed Route and Route Alternatives for Segment 1E.

The Proposed Route along Segment 1E would either cross or pass within 1,000 feet of areas on the Medicine Bow-Routt NFs and BLM-managed lands that offer dispersed recreation opportunities. Named landscape features that offer potential recreation opportunities within 1,000 feet of the Proposed Route include Rainbow Canyon, Moonshine Canyon, and North Fork Cottonwood Creek (Table D.17-1). Reed Pass and Little Pinto Creek are located within 1,000 feet of Alternative 1E-B, and Alternative 1E-C would pass within 1,000 feet of Smith Creek Reservoir and an ice cave that the BLM considers a locally historic feature (Table D.17-1).

Segment 1W

Recreational resources on federal lands along Segment 1W are regulated in part by the Medicine Bow NF LRMP and the Casper and Rawlins RMPs. Recreational activities that are identified in these plans are listed above under Segment 1E.

There are no SRMAs crossed or located within 1,000 feet of the Proposed Route or Route Alternatives for this segment. Like Segment 1E, there is one MA, the Bates Hole MA, located within the Analysis Area for this segment. Summary information is provided for this area under Segment 1E.

Segment 1W(a) would cross a segment of the Oregon/California, Pony Express, and Mormon Pioneer NHTs, where they all share the same alignment, and would also cross the Child's Cutoff and the Bozeman Trail (see Table 3.3-8 in Section 3.3 – Cultural Resources).

There are no developed recreation facilities located within 1,000 feet of the Proposed Route and Route Alternatives for Segment 1W.

The Proposed Route along Segment 1W would either cross or pass within 1,000 feet of areas on the Medicine Bow-Routt NFs and BLM-managed lands that offer dispersed recreational opportunities. Named landscape features that offer potential recreation opportunities within 1,000 feet of the Proposed Route include Sensebaugh Canyon, Smith Creek Rim, Banner Mountain, Negro Creek Park, and Perey Reservoir (Table D.17-1). Willow Creek is located within 1,000 feet of Alternative 1W-A. In addition, the Proposed Route along Segment 1W would cross through the Shirley Basin, which is an important area used by recreationists to hunt pronghorn antelope.

Segment 2

Recreational resources on federal lands along Segment 2 are regulated in part by the Rawlins RMP. Recreational activities that are identified in the Rawlins RMP include camping, hiking, fishing, boating, sightseeing, OHV use, cave exploration, and use of WSRs. Note that these are the recreational resources identified in the applicable federal plans, and it is possible that some of these recreational activities take place within or near the Project area. Segment 2 would cross through “checkerboard lands,” where every square mile section of federal land alternates with non-federal lands in a checkerboard pattern. This pattern of land ownership complicates recreation management on public lands.

There are three SRMAs and one Wildlife Habitat MA located within the Analysis Area for this segment. These are the North Platte River, Continental Divide National Scenic Trail, and OHV SRMAs and the Red Rim-Daley Wildlife Herd Management Area (HMA).

The North Platte River SRMA consists of 5,060 acres of lands located in discrete and separate areas along the river. The management goal for this SRMA is to “ensure the continued availability of outdoor recreation opportunities associated with the North Platte and Encampment Rivers” (BLM 2008a: 2-27). This area is managed to provide high quality recreation opportunities, especially for floating, fishing, camping, and sightseeing. Surface-disturbing activities on public lands within 0.25 mile on either side of the river are intensively managed to maintain the quality of the visual resource.

The Continental Divide National Scenic Trail SRMA consists of 600 acres based on a 0.25-mile corridor that follows the trail on lands managed under the Rawlins RMP. The management goals for this SRMA are to emphasize interpretive and educational opportunities and ensure the availability of associated outdoor recreation opportunities (BLM 2008, p. 2-26).

The OHV SRMA includes 480 acres set aside for OHV use, southwest of the city of Rawlins. The management goal for the OHV SRMA is to provide opportunities for safer OHV riding opportunities and OHV use for local residents and visitors to the area (BLM 2008, Rawlins ROD and RMP, p. 2-28).

The Red Rim-Daley Wildlife HMA consists of 11,100 acres of BLM-managed lands located in 640 acre sections interspersed with other landowners in a checkerboard pattern. The management goals for this wildlife HMA include the protection of crucial winter habitat for pronghorn antelope and nesting habitat for raptors (BLM 2008a: 2-39). This area is open to management activities including oil and gas leasing, locatable

mineral entry, and mineral material disposal, with intensive management of surface disturbing and disruptive activities (BLM 2008a).

Segment 2 would not cross any NHTs, but would cross the Rawlins to Baggs Stage Road and would also cross the Lincoln Highway several times (see Table 3.3-9 in Section 3.3 – Cultural Resources). Alternatives 2A and 2B pass close to the Fort Fred Steele Historic Site, which is a historic site managed by Wyoming State Parks, Historic Sites & Trails.

Landscape features that offer potential recreation opportunities within 1,000 feet of the Proposed Route include Hanna Draw, Barrel Spring, Antelope Dam and Reservoir, and Whitehorse Canyon. Eagle Rock is located within 1,000 feet of Alternative 2A (Table D.17-1).

Segment 3

Recreational resources on federal lands along Segment 3 are regulated in part by the Rawlins and Green River RMPs. Recreational activities identified under the Rawlins RMP are discussed above, for Segment 1E. Recreational activities that are identified in the Green River RMP include camping, fishing, hunting, OHV use, mountain biking, use of snow mobiles, use of historic trails, and viewing of wild horses. Note that these are the recreational resources identified in the applicable federal plans, and it is possible that some of these recreational activities take place within or near the Project area.

Segment 3 would also cross through “checkerboard lands.” The Proposed Route and Route Alternatives for Segment 3 would not cross any special MAs identified in these plans.

Segment 3 would not cross any NHTs but would cross the Overland Trail and the Point of Rocks to South Pass Stage Road, as well as the Lincoln Highway (see Table 3.3-10 in Section 3.3 – Cultural Resources).

There are no developed recreation facilities located within 1,000 feet of the Proposed Route and Route Alternatives for Segment 1W.

The Proposed Route along Segment 3 would either cross or pass within 1,000 feet of areas of BLM-managed lands that offer dispersed recreational opportunities. There are few named landscape features that offer potential recreation opportunities within 1,000 feet of the Proposed Route; Tenmile Draw is the only named landscape feature identified in Table D.17-1 of Appendix D for Segment 3.

Segment 4

Recreational resources on federal lands along Segment 4 are regulated in part by the Caribou Forest Plan and the Green River, Kemmerer, and Pocatello RMPs. Recreational activities identified in the Caribou Forest Plan include skiing, fishing, boating, swimming, and scenic viewing. Recreational activities identified in the Green River RMP are identified above under Segment 3. Recreational activities identified in the Kemmerer and Pocatello RMPs include the use of historic trails, OHVs, and snowmobiles. Note that these are the recreational resources identified in the applicable federal plans, and it is possible that some of these recreational activities take place within or near the Project area.

The Proposed Route and Route Alternatives for Segment 4 would cross the Oregon Trail, Pine Creek Canyon, and Dempsey Ridge SRMAs, as well as the Rock Creek/Tunp and Bear River Divide SMAs and the Cokeville Meadows NWR. These areas are briefly described below.

The Oregon NHT SRMA includes Class I portions of the Oregon-California NHT on BLM-managed lands that are managed under the 2010 Kemmerer RMP. The management goal for this SRMA is to "manage trails to provide an opportunity to visit and learn about trail history and use, while maintaining setting character and present condition of trails and associated historic sites" (BLM 2010b: 2-47). Cultural resource and NHT prescriptions apply and no motor vehicle use is allowed on NHT trail trace.

The Pine Creek Canyon SRMA encompasses the Pine Creek Canyon area managed under the Kemmerer RMP. The management objective for this SRMA is to "enhance recreation opportunities while protecting the riparian, water, and wildlife values that exist in the area" (BLM 2010b: 2-46). This area serves the camping and dispersed recreation niche and offers the following primary recreation activities: hunting, camping, snowmobiling, and driving for pleasure. Motor vehicles are limited to designated roads and trails.

BLM-administered lands in the vicinity of Dempsey Ridge (33,445 acres) are managed as an SRMA. The management objective for this SRMA is to "manage the area to provide quality dispersed recreation opportunities in a natural setting" (BLM 2010b: 2-47). Primary recreation activities identified for this area include hunting, driving for pleasure, and heritage tourism. Management prescriptions allow mineral development and other construction activities with the goal of no further loss of habitat from these activities.

The Rock Creek/Tunp SMA consists of 45,863 acres managed under the 2010 Kemmerer RMP with the objective of preserving and enhancing the critical wildlife habitats and cultural values that occur in the area. Off-trail motor vehicle travel is not allowed and all new ROW actions are restricted to existing disturbance zones (BLM 2010b: 2-53).

The Bear River Divide SMA consists of 74,954 acres managed under the 2010 Kemmerer RMP. Like the Rock Creek/Tunp SMA, the objective of this SMA is to preserve and enhance the critical wildlife habitats and cultural values that occur in the management area. Off-trail motor vehicle travel is not allowed and ROW actions are considered on a case-by-case basis, with proponents encouraged to use existing disturbance zones (BLM 2010b: 2-54). The Bear River Divide SMA is located directly south of the Rock Creek SMA.

The Cokeville Meadows NWR is centered around a 20-mile stretch of the Bear River and its associated wetlands and uplands, south of Cokeville, Wyoming. Wetlands within the NWR provide high quality habitat for migratory and resident wildlife species and support high densities of nesting waterfowl. Established in 1992, the NWR is currently managed by the USFWS as a satellite of the relatively nearby Seedskadee NWR. The approved acquisition boundary for the refuge encompasses 26,657 acres. To date,

9,259 acres have been purchased or are protected through conservation easements (USFWS 2011).

The Proposed Route and Route Alternatives for Segment 4 would cross a number of NHTs and other trails, including stage and wagon roads, that have potential historic significance (see Table 3.3-11 in Section 3.3 – Cultural Resources). These include the Oregon, Pony Express and Mormon Pioneer trails, and the California NHT Sublette Cutoff, Slate Creek Cutoff, and Bartleton-Bidwell Route. Alternative 4F would also cross the Dempsey-Hockaday Cutoff. The Proposed Route along Segment 4 would also cross the Overland Trail and the 1849 Evans Cherokee Trail, as well as a number of historic stage and wagon roads (see Section 3.3 – Cultural Resources).

The Analysis Area for Segment 4 also crosses a number of scenic byways. The Proposed Route along Segment 4 would cross the Oregon NHT/Bear Lake Scenic Byway southeast of Montpelier, Idaho; the Pioneer Historic Byway approximately 0.3 mile south of Thatcher, Idaho; and the Big Spring Scenic Backway directly south of the Bridger NF and again north of Cokeville, Wyoming. Alternatives 4A and 4F would cross the Big Spring Scenic Backway between the Kemmerer Reservoir and Lake Viva Naughton, while Alternative 4F would also cross this backway a second time north of Cokeville, Wyoming (see Section 3.2 – Visual Resources).

Alternative 4F would pass within 1,000 feet of the Pine Creek Ski Area. The Pine Creek Ski Area is a ski resort located on BLM-managed land south of Cokeville, Wyoming, between the Pine Creek and Dempsey Ridge SRMAs. The ski area includes 30 ski runs and 60 acres of skiable terrain.

The Proposed Route along Segment 4 would either cross or pass within 1,000 feet of areas on BLM-managed lands that offer dispersed recreational opportunities. Named landscape features that offer potential recreation opportunities within 1,000 feet of the Proposed Route include North Fork Roney Creek, West Fork Beaver Creek, Birch Gulch, Dixon Slough, Garrett Creek, Cook Canal, Sago Spring, Ledge Hollow, Humberg Spring, Portneuf Marsh Valley Canal, Quealy Reservoir, Sheep Creek Dam and Reservoir, Banks Valley (Table D.17-1).

There are a number of developed recreation facilities located outside but near the Analysis Area for Segment 4. The trailheads for Meacham Hollow Trail and Emigration Camping Trail are located about 0.5 mile from the Proposed Route. In addition, the Fontenelle Creek Recreation Area is located about 2 miles from the Proposed Route. The Fontenelle Creek Recreation Area is located on the south side of Fontenelle Reservoir (on Bureau of Reclamation-administered land), and contains developed camping areas.

Segment 5

Recreational resources on federal lands along Segment 5 are regulated in part by the Pocatello and Cassia RMPs and the Malad MFP. Recreational activities identified in the Pocatello RMP include use of historic trails, OHVs, and snowmobiles. Recreational activities identified in the Malad RMP include OHV use and visiting historic sites. Recreational activities identified in the Cassia RMP include trail use, skiing, hunting, fishing, biking, OHV use, and snowmobile use. Note that these are the recreational

resources identified in the applicable federal plans, and it is possible that some of these recreational activities take place within or near the Project area.

The Proposed Route and Route Alternatives for Segment 5 would not cross any special management areas identified in these plans.

The Proposed Route and Route Alternatives for Segment 5 would cross the Oregon NHT in Idaho and the North Alternate Oregon Trail (see Table 3.3-13 in Section 3.3 – Cultural Resources).

The Proposed Route along Segment 5 would either cross or pass within 1,000 feet of areas on the Caribou-Targhee NF and BLM-managed lands that offer dispersed recreational opportunities. The Proposed Route would cross the Snake River and pass within 1,000 feet of the Pipeline Recreation Site. Located on the Snake River about 3 miles southwest of American Falls, Idaho, the Pipeline Recreation Site is a developed campground with eight campsites and a boat ramp. This site is managed by the BLM Pocatello FO.

Alternative 5B would pass within 1,000 feet of the Hawkins Reservoir Campground. Located about 9 miles west of Virginia, Idaho, on the Hawkins Reservoir, this campground is managed by the BLM Pocatello FO and includes 10 campsites and a boat ramp.

Named landscape features that offer potential recreation opportunities within 1,000 feet of the Proposed Route include Potter Creek, Warner Flat, East Fork Canyon, Hutchinson Canyon, and Green Canyon (Table D.17-1).

Alternatives 5D and 5E both cross the Snake River at different locations to the Proposed Route. Named landscape features that offer potential recreation opportunities within 1,000 feet of the Route Alternatives to Segment 5 include Sawmill Creek, Cold Creek, Warm Creek, Deep Creek Mountains, Mill Canyon, Portage Canyon, and Cold Creek Canyon (Table D.17-1).

Segment 7

Recreational resources on federal lands along Segment 7 are regulated in part by the Sawtooth Forest Plan; the Pocatello, Malad, Cassia, and Wells RMPs; as well as the Twin Falls MFP. Recreational activities identified in the Pocatello, Malad, and Cassia RMPs are listed above under Segment 5. Recreational activities identified in the Sawtooth Forest Plan include mountain biking, cross country and downhill skiing, hunting, rafting, boating, horseback riding, and wildlife viewing. Recreational activities identified in the Cassia RMP include trail use, skiing, hunting, fishing, biking, OHV use, and snowmobile use. Recreational activities identified in the Wells RMP include camping and OHV use. Recreational activities identified in the Twin Falls MFP include camping, hunting, fishing, boating, target shooting, hiking, trail use, OHV use, and rock collecting. Note that these are the recreational resources identified in the applicable federal plans, and it is possible that some of these recreational activities take place within or near the Project area.

The Proposed Route and Route Alternatives for Segment 7 would not cross any SRMAs or other SMAs identified in these plans. Alternatives 7H, 7I, and 7J would, however,

cross the Raft River/Curlew Valley IBA. This area consists of approximately 490,000 acres of sagebrush/grass rangelands within the Raft River and Curlew-Juniper Valleys in south-central Idaho. The area was designated an IBA by the National Audubon Society and the American Bird Conservancy to protect the large population of ferruginous hawks found in the area (National Audubon Society 2011). IBAs may include public or private lands, or both, and they may be protected or unprotected.

The Proposed Route and Route Alternatives for Segment 7 would cross a number of NHTs and other trails that have potential historic significance (see Table 3.3-14 in Section 3.3 – Cultural Resources). These include the Oregon Trail, California National Historic Trail–Hudspeth Cutoff, and Kelton Road. Alternative 7I would also cross the California National Historic Trail – Salt Lake Alternate.

The Proposed Route and Alternatives 7H, 7I, and 7J would also each cross City of Rocks Backcountry Byway twice; Alternatives 7E and 7F would cross this byway once each. The byway is a 49-mile loop around the Albion Mountain Range that includes parts of Idaho SRs 27 and 77.

The Proposed Route along Segment 7 would either cross or pass within 1,000 feet of areas on the Sawtooth NF and BLM-managed lands that offer dispersed recreational opportunities. The Proposed Route would also pass within 1,000 feet of the Hawkins Reservoir Campground, which, as noted above under Segment 5, is managed by the BLM Pocatello FO and includes 10 campsites and a boat ramp.

Named landscape features that offer potential recreation opportunities within 1,000 feet of the Proposed Route include Cold Spring Creek (Table D.17-1). Alternatives 7A through 7G would cross within 1,000 feet of additional named landscape features, including Bull Canyon, South Fork Bull Canyon, Stewart Canyon, and Goddard Canyon (Alternative 7B), and Water Canyon Spring (Alternative 7E) (Table D.17-1). Named landscape features cross or within 1,000 feet of Alternatives 7H, 7I, and 7J include Middle Fork Hannah's Fork, North Fork Hannah's Fork, South Hannah's Fork, Buckhorn Canyon, Monument Canyon, Mahogany Butte, and Willow Spring Creek. A more complete list is provided in Table D.17-1.

There are a number of developed recreational facilities located outside of, but near, the Analysis Area for Segment 7. Both Bear Gulch and the Shoshone Wildlife Pond are located about 2 miles from Alternative 7I (on the Sawtooth NF). Bear Gulch provides facilities/opportunities for camping, picnicking, and fishing. The Shoshone Wildlife Pond has an information center, fishing opportunities, and scenic viewing opportunities.

Segment 8

Recreational resources on federal lands along Segment 8 are regulated in part by the Monument, Jarbidge, SRBOP, and Owyhee RMPs, as well as the Bennett Hills/Timmerman Hills and Kuna MFPs. Recreational activities identified in the Monument RMP include fishing, shooting, archery, picnicking, boating, sightseeing, cave exploration, and motorcycle racing, as well as use of ORVs and trails. Recreational activities identified in the Jarbidge RMP include hiking, collecting fossils, and use of OHVs and trails. Recreational activities identified in the SRBOP RMP include camping, rock climbing, paintballing, hunting, fishing, and OHV use.

Recreational activities identified in the Owyhee RMP include OHV use, river recreation, hiking, and horseback riding. Recreational activities identified in the Bennett Hills/Timmerman Hills MFP include camping, fishing, boating, hunting, rock collecting, and use of OHVs and snowmobiles. Recreational activities identified in the Kuna MFP include horseback riding, hunting, bird watching, fishing, and use of OHVs and trails. Note that these are the recreational resources identified in the applicable federal plans, and it is possible that some of these recreational activities take place within or near the Project area.

The Proposed Route and Route Alternatives for Segment 8 would cross the SRBOP and three SRMAs managed under the SRBOP RMP: the Oregon NHT, Owyhee Front, and Snake River Canyon SRMAs.

The Oregon NHT SRMA consists of approximately 7,900 acres along a 1-mile-wide (0.5 mile either side) corridor of the South Alternate of the Oregon NHT. The purpose of the Oregon NHT SRMA is to protect the visual and historic values of the NHT.

The Owyhee Front SRMA consists of 6,300 acres located west of SR 78. The purpose of this SRMA is to provide enhanced management of recreational resources in the area.

The Snake River Canyon SRMA consists of 22,300 acres in the Snake River Canyon downstream from Grand View, Idaho, that are managed for the protection of cultural and scenic values.

Other special management areas crossed by the Proposed Route and Route Alternatives for this segment are the Birds of Prey Avoidance Area, the Guffey Butte-Black Butte Archaeological District, the Black Mountain HMA, the Halverson Bar Non-motorized Area, and the Wees Bar Non-motorized Area.

The Birds of Prey Avoidance Area is a 43,000-acre ROW avoidance area established in the 2008 SRBOP RMP to protect the visual corridor along the Oregon NHT and resources along the Snake River Canyon. This avoidance area includes parts of Oregon NHT and Snake River Canyon SRMAs.

The Guffey Butte-Black Butte Archaeological District includes approximately 26,300 acres of public land that extends upstream along the Snake River Canyon from Guffey Bridge to Grand View. This district was listed on the NRHP in 1978 to protect over 200 known prehistoric sites in the area.

The Black Mountain HMA is managed under the Owyhee RMP and consists of 50,611 acres of public and other land south of the Snake River, between Murphy and U.S. Highway 95 to the west. The area is generally characterized by rolling hills and sagebrush steppe (BLM 2011b).

The Halverson Bar Non-motorized Area includes a 1,150-acre area. Wees Bar Non-motorized Area encompasses a 1,200-acre area that has been closed to motorized use and where non-motorized use (e.g., horseback riding and biking) is encouraged.

The Proposed Route along Segment 8 and route alternatives to this segment would cross a number of NHTs and other trails such as stage and wagon roads that have potential historic significance (see Table 3.3-15 in Section 3.3 – Cultural Resources).

These include the Oregon NHT, the Oregon NHT South Alternate, the Northside Alternate Oregon NHT, the North Alternate Oregon NHT, Kelton Road, Dorsey's Road, and the Boise City-Silver City Road.

The Proposed Route and Route Alternatives for Segment 8 would also cross three scenic byways: the Western Heritage Historic Byway, the Snake River Canyon Scenic Byway, and the Thousand Springs Scenic Byway (see Section 3.2 – Visual Resources).

The Western Heritage Historic Byway is 47 miles long and includes parts of SR 69 and Swan Falls Road (Idaho Transportation Department 2011). This byway mainly passes through the SRBOP. The Proposed Route along Segment 8 would cross this byway south of Initial Point, while Alternative 8B would cross it south of Kuna, Idaho (directly east of Kuna Butte). Alternative 8B would also cross the Snake River Canyon Scenic Byway on Map Rock Road, north of Walters Island. Alternative 8A would cross the Thousand Springs Scenic Byway between Hagerman, Idaho, and Lower Salmon Falls (see Section 3.2 – Visual Resources).

The Proposed Route along Segment 8 would either cross or pass within 1,000 feet of areas on BLM-managed lands that offer dispersed recreational opportunities. Named landscape features that offer potential recreation opportunities within 1,000 feet of the Proposed Route and Route Alternatives include Bell Mare Creek, Cedar Spring, Buckbrush Draw, and Walker Draw (Table D.17-1).

Segment 9

Recreational resources on federal lands along Segment 9 are regulated in part by the Cassia, Jarbidge, SRBOP, and Owyhee RMPs, as well as the Twin Falls and Bruneau MFPs. Recreational activities identified in the Cassia RMP are listed above under Segment 5. Recreational activities identified in the Twin Falls RMP are listed above under Segment 7. Recreational activities identified in the Jarbidge, SRBOP, and Owyhee RMPs are listed above under Segment 8. Recreational activities that are identified in the Bruneau MFP include camping, fishing, boating, rock collecting, motorcycle racing, and OHV use. Note that these are the recreational resources identified in the applicable federal plans, and it is possible that some of these recreational activities take place within or near the Project area.

The Proposed Route and Route Alternatives for Segment 9 would cross the SRBOP and four SRMAs: the Oregon NHT, Owyhee Front, Snake River Canyon, and C.J. Strike Reservoir SRMA. Summary information is presented for the Oregon NHT, Owyhee Front, and Snake River Canyon SRMAs under Segment 8.

The C.J. Strike SRMA consists of 20,000 acres surrounding C.J. Strike Reservoir along the Snake River. The purpose of the SRMA is to provide enhanced recreation management associated with the reservoir, and protection of the Oregon NHT adjacent to the reservoir.

Other SMAs that would be crossed by the Proposed Route and Route Alternatives for this segment are the Salmon Falls Creek ACEC, the Birds of Prey Avoidance Area, the Guffey Butte-Black Butte Archaeological District, and the Black Mountain and Saylor Creek HMAs. Summary information is presented for the Birds of Prey Avoidance Area,

the Guffey Butte-Black Butte Archaeological District, and the Black Mountain HMA under Segment 8.

The Salmon Falls Creek ACEC consists of 2,700 acres of public land managed with the goal of protecting Salmon Falls Creek Canyon for its natural and scenic values.

The Saylor Creek HMA consists of 94,992 acres, located approximately 15 miles south of Glenns Ferry, Idaho, in Owyhee and Elmore Counties (BLM 2011c).

The Proposed Route along Segment 9 and Route Alternatives to this segment would cross several NHTs and other trails such as stage and wagon roads that have potential historic significance (see Table 3.3-16 in Section 3.3 – Cultural Resources). These include the Oregon NHT, California NHT, Toana Freight Wagon Road, and Boise City-Silver City Road. Alternative 9D would also cross the Oregon NHT South Alternate several times.

In addition, the Proposed Route and Alternative 9E would cross the Owyhee Uplands Backcountry Byway, directly north of Rock House Ranch (see Section 3.2 – Visual Resources).

The Proposed Route and Route Alternatives for Segment 9 would either cross or pass within 1,000 feet of areas on BLM-managed lands that offer dispersed recreational opportunities. Named landscape features that offer potential recreation opportunities within 1,000 feet of the Proposed Route and Route Alternatives include McMullen Creek Dam, Lower Salmon Falls Creek, Deadman Falls, Bieroth Canal, Beeroth Canal, Feeny Wells, and Browns Creek. Additional named features within 1,000 feet of the alternatives include Magic Water Canal (Alternative 9B); Sinker Butte and Cove Non-motorized Area (Alternative 9D); Buckaroo Dam and Harris Dam (Alternative 9E); and Locust Park (Alternative 9G).

In addition, Alternative 9E would cross a motorcycle raceway area located on lands managed by the BLM's Bruneau FO. Alternative 9E would cross this area between the Grandview area (around Shoofly Creek) and Castle Creek. This motorcycle raceway is an undeveloped raceway (e.g., there are no restroom facilities or staging areas present). The majority of people that utilize this area are looking for a less developed racing experience, and one of the major events at this facility is a long-distance endurance race. This area is already disturbed due to the previous land use in this area (it was historically a missile base).

Segment 10

Recreational resources on federal lands along Segment 10 are regulated in part by the Monument and Cassia RMPs, as well as the Twin Falls MFP. Recreational activities identified in the Monument and Cassia RMPs and the Twin Falls MFP are listed above under Segment 8, Segment 5, and Segment 7, respectively. The Proposed Route for Segment 10 would not cross any SMAs identified in these plans.

Segment 10 would cross the Oregon NHT, Northside Alternate Oregon NHT, and Kelton Road (see Table 3.3-17 in Section 3.3 – Cultural Resources).

The Proposed Route along Segment 10 would either cross or pass within 1,000 feet of areas on BLM-managed lands that offer dispersed recreational opportunities. No

named landscape features that offer potential recreation opportunities were identified within 1,000 feet of the Proposed Route (Table D.17-1).

OHV Use on BLM-managed and NFS Lands

The OHV designations for the majority of travel routes on public lands are currently either "open," "closed," "seasonally closed," or "limited" (use is limited to existing travel routes designated as open to OHV use). The Analysis Area includes numerous trails that are maintained by the land management agencies, some of which are designated as open to OHV use and some as closed to OHV use (Table 3.17-5).

Table 3.17-5. OHV Designations on Federal Lands for the Proposed Route (miles)

Segment	Total Route Length	Assumed Closed (Sawtooth NF)	Closed	Limited	Limited Designated Roads	Limited Existing Routes	Seasonal Closure	Winter Limited Designated Routes	Open	Undesignated
1E	100.6	–	–	–	–	2.8	4.2	–	–	–
1W(a)	76.5	–	–	–	–	3.8	3.9	–	–	–
1W(c)	70.6	–	–	–	–	2.9	3.4	–	–	–
2	96.7	–	2.4	–	–	36.9	–	–	1.0	–
3	56.5	–	–	–	–	12.0	–	–	–	–
4	203.0	–	–	5.0	1.5	–	15.6	2.0	7.2	1.2
5	54.6	–	2.2	2.3	–	–	–	–	–	8.7
6	0.5	–	–	–	–	–	–	–	–	–
7	118.1	–	3.1	3.9	–	–	–	–	15.9	5.3
8	131.0	–	–	34.6	–	–	–	–	30.2	24.4
9	161.7	–	3.3	37.2	–	–	–	–	89.1	–
10	33.6	–	–	–	–	–	–	–	–	13.3
Total	**1,103.4**	**0.0**	**11.0**	**83.0**	**1.5**	**58.4**	**27.1**	**2.0**	**143.4**	**52.9**

Travel by snowmobiles is permitted off existing routes and in all open or limited areas (unless otherwise specifically limited or closed to snowmobiles) if the snowmobiles are operated in a responsible manner without damaging the vegetation or harming wildlife.

The non-highway road networks within the planning area consist of a series of county roads, BLM- and Forest Service-maintained roads, private (ungated) roads, two-track routes, and snowmobile trails. These travel ways are used for both recreational and nonrecreational purposes. The three NFs potentially crossed by the Proposed Route or Route Alternatives have completed travel management plans that designate which roads are open for use. All areas on these national forests are closed to motor vehicles, including OHVs, unless designated open.

Typical recreational OHV activities within the planning area include enduro races, trial competitions, all-terrain vehicle and motorcycle trail riding, and snowmobiling. OHV use, in itself, has become a popular method for exploring public lands. In addition, OHV use provides access for other recreational purposes, such as fishing, hiking, mountain biking, horseback riding, and primitive camping opportunities.

Nonrecreational OHV use includes agricultural management, energy development, and land management activities. OHVs may also be used for the noncommercial collection of decorative rock and native plant materials. Employees of government agencies, ranchers, timber companies, energy companies, and utility providers are permitted users who utilize OHVs to access and maintain the infrastructure required for the continued operation and maintenance of their facilities. OHVs are used for range inspections, vegetation treatments, surveying and mapping, inventories, monitoring, fire suppression, project construction, and maintenance.

Recreation Opportunity Spectrum

The Forest Service developed the ROS land classification system to help identify and describe possible combinations of recreation activities, settings, and experiences for management purposes. The ROS system portrays the appropriate combination of activities, settings, and experiences along a continuum that ranges from highly modified to primitive environments. Six factors describe the range along the spectrum of available opportunities: access, other non-recreational resource uses, on-site management, social interaction, acceptability of visitor impacts, and acceptable level of regimentation. Classifications typically identified along this continuum include Urban, Rural, Roaded Modified, Roaded Natural, Semi-Primitive Motorized, Semi-Primitive Non-Motorized, and Primitive. These classifications may be summarized as follows:

- **Urban (U) –** This class is characterized by a substantially urbanized environment, although the background may have natural-appealing elements. High levels of human activity and concentrated development, including recreation opportunities are prevalent.
- **Rural (R) –** This class provides highly developed opportunities. Visitor use levels are high, facilities accommodate greater numbers of visitors, management is more obvious, and visitors can expect opportunities to interact with others.
- **Roaded Modified (RM) –** This class is predominantly influenced by human management activities, such as road building and timber production. It provides opportunities for dispersed recreation without any formal structure.
- **Roaded Natural (RN) –** This class is found around developed sites where the setting is managed for outdoor recreation. These areas provide scenic driving opportunities, trailheads, dispersed campsites, and fishing and hunting areas. They are natural appearing settings that may have modifications that range from being easily noticed to strongly dominant to observers within the area.
- **Semi-Primitive Motorized (SPM) –** This class is a natural appearing setting with 2-track roads or motorized trails. It provides for a more solitary experience. This setting may challenge survival skills. Lands within this classification should be at least 2,500 acres in size, but the shape can be linear (along a motorized trail, with a buffer for noise absorption). The areas have natural appearing settings that may have moderately dominant alterations but do not draw the attention of motorized observers on trails and primitive roads within the area. This class is more restrictive than RN because structures are rare and isolated.

- **Semi-Primitive Nonmotorized (SPNM) –** This class offers solitude. It is an unaltered natural setting with only non-motorized trails. This class may require a high level of survival skill because there's a lower probability of meeting other users. This class should cover at least 2,500 acres.
- **Primitive (P) –** This class includes areas that are at least 5,000 acres and provides for solitude with a very low likelihood of encountering other users. This is backcountry where survival skills are required. This class is at least three miles from roads with traffic (Forest Service 2003b).

Changes in ROS classification are used to evaluate the potential recreation effects on NFS lands due to the Proposed Route and Route Alternatives on NFS lands.

The BLM's Owyhee FO also uses the ROS system, as does the SRBOP RMP; therefore, potential changes in ROS classification on lands managed under the Owyhee and SRBOP RMPs are also used to evaluate potential impacts of the Proposed Route and Route Alternatives.

3.17.1.6 Lands with Wilderness Characteristics

The FLPMA requires the BLM to maintain inventories of lands with wilderness characteristics and both FLPMA and NEPA require disclosure of impacts on wilderness characteristics from proposed projects. Direction for conducting wilderness characteristics inventories is included under Section 201 of the FLPMA. The inventory evaluates wilderness characteristics as defined in Section 2(c) of the Wilderness Act, and incorporated in the FLPMA. In order for an area to have wilderness characteristics, it must possess sufficient size, naturalness, and outstanding opportunities for either solitude or primitive and unconfined recreation. In addition, it may also possess supplemental values.

For an area of land to be characterized as wilderness, it must be over 5,000 acres of contiguous BLM-managed land that does not contain maintained roads or other developments. Parcels of BLM-managed land connected only at the junction of two corners (i.e., checkerboard land ownership) are not considered continuous. Areas with less than 5,000 acres of contiguous BLM-managed land can still be considered wilderness if they are contiguous with one or more of the following: designated wilderness, BLM WSAs, USFWS areas proposed for wilderness designation, Forest Service WSAs or areas of recommended wilderness, and NPS areas recommended or proposed for designation. Areas of land less than 5,000 acres that still have wilderness characteristics and are large enough to be managed for preservation may also be considered. Examples of these areas include islands, buttes, and isolated canyons.

An area is considered to be in a natural condition if it is affected only by the dominant forces of nature, with limited influence of human beings on the land. Examples of human-made features that may be considered unnoticeable include trails, historic properties, archaeological resources, minor radio repeater sites, air quality monitoring devices, some types of fencing, spring developments, and stock ponds. A wilderness area may also have ecological, geological, or other features of scientific, educational, scenic, or historical value.

As part of the wilderness characteristics inventory conducted for the Project, existing wilderness inventory findings for BLM-managed lands crossed by the Proposed Route or Route Alternative completed prior to December 2010 were reviewed. The completed forms are included in the project record. None of the existing inventories identified lands crossed by the Project with wilderness characteristics. However, many of the areas crossed did not have existing inventories on record.

The following steps were taken to identify areas crossed by the Project that may have wilderness characteristics:

- Blocks of BLM-managed land that are over 5,000 acres or contiguous to wilderness areas, WSAs, or other federal lands recommended for wilderness designation were mapped.
- Railroads, highways, county, BLM, or other maintained roads, transmission lines, and pipelines that cross a block were identified.
- Blocks crossed by any of these features were separated into smaller units using the roads and utility lines as boundaries. (Roads that enter into but do not fully cross a unit, referred to as cherry stem roads, do not subdivide a unit.)
- Maps documenting this process were distributed to the applicable FOs, along with shape files and layers of existing features for review and approval.
- BLM staff at each FO used local knowledge and records to identify additional roads maintained by mechanical means and other evidences of human presence not already identified. Additional information provided by each FO was included on the maps. Areas that did not meet the criteria were dropped from the inventory.
- Remaining areas were reviewed in the field to determine if they met the criteria. Some areas were not accessible due to snow or access restrictions.
- Reports for each area were submitted to the FO manager for review and approval.

Areas identified as having wilderness characteristics (or areas that are assumed to have wilderness characteristics pending completion of a field inventory) are identified by route segment below.

Segment 1E

Inventory Unit WY-C-1F is partly within Natrona and Converse Counties (Township 29 N., Range 77 West) in the Casper FO and partly within Carbon and Albany Counties (Township 28 North, Range 77 West) in the Rawlins FO. The area is bounded by the Old Casper Medicine Bow Road on the west and by private lands to the north, east, and south. The portion east of the road is approximately 8,009 acres. The portion west of the road would not be crossed by the Project. Field inventory identified a road that splits the eastern subunit in half. The northern portion is approximately 5,400 acres; the southern portion is less than 5,000 acres and does not meet the size criteria.

Inventory Unit WY-R-3A is in Albany County, Wyoming (Township 27/28 N., Range 76 W.). It is part of a BLM inventory unit that is nearly 30,000 acres. This unit is broken

into four units by roads. The three portions south of the Holiday Road would not be affected by the Project. The portion north of the road has approximately 5,073 acres of BLM-managed land. The northern portion of the inventory unit is bounded by the Holiday Road on the south and by state and privates lands to the north, east, and west. Topography in the unit is characterized by open prairie. The inventory unit is not crossed by the Proposed Route based on indicative engineering; however, it is within 0.5 mile of the Proposed Route. This is within the 1-mile study area used in this Draft EIS to analyze potential effects.

Inventory Unit WY-R-4A is a 5,745-acre block of BLM-managed land in Albany County, Wyoming (Township 28 N., Range 75/76 W.) that is surrounded by non-federal land. The unit includes several non-federal parcels totaling approximately 440 acres. The inventory unit lacks public access and no field inventory was completed. The topography in the unit includes steep slopes in the northern section. South Prong Creek and the Medicine Bow River run through the central portion of the unit, while North Prong Creek flows southwest through the northern portion of the unit. These topographic features indicate that the unit would provide for both solitude and primitive recreation. Based on BLM records and aerial imagery, it does not appear to contain maintained roads or other developments. Therefore, this inventory unit is assumed to contain wilderness characteristics.

Alternative 1E-C

Inventory Unit WY-R-1C includes approximately 8,964 acres managed by the BLM in Carbon County, Wyoming (Township 28 N., Range 78/79 W.). The inventory unit is bounded by State Highway 487 in the south, by CR 2 in the west, and by an existing transmission line (1W[c] proposed to rebuilt) on the east. Segment 1W(a) of the Proposed Route and Alternative 1E-C cross along the eastern boundary of the unit, 1,500 feet and 3,000 feet from the existing transmission line, respectively. The unit is just north of WY-R-1D, separated from that unit by Highway 487.

Inventory Unit WY-R-1D includes approximately 56,265 acres managed by the BLM in Carbon County, Wyoming (Township 26/27/28 N., Range 78/79/80 W.). There are approximately 5,300 acres of non-federal land within the inventory unit. The unit is within the Shirley Basin; the topography is characterized as open prairie. It is an important hunting area for antelope. Shirley Basin Reservoir is within the southeastern boundary of the unit and Measel Spring Reservoir is in the northern section of the unit. There is a “cherry stem” maintained road in the south part of the unit (photos ID-10, ID-11). BLM Route 3141 is a “cherry stem” road from CR 2 south to Measel Spring Reservoir. A powerline in the northeast part of the site forms the third cherry stem. An existing transmission line (1W[c] proposed to rebuilt) forms the eastern boundary of the unit. Segment 1W(a) of the Proposed Route and Alternative 1E-C cross along the eastern boundary of the inventory unit, 1,500 feet and 3,000 feet from the existing line, respectively.

Inventory Unit WY-R-1E s part of a 9,674-acre inventory unit east of WY-R-1D. It is in Carbon County, Wyoming (Township 26/27N., Range 76 W.). The unit includes several non-federal parcels totaling approximately 2,500 acres. Field inventory identified a powerline running north/south that divides the unit in two. The western half is

approximately 5,461 acres (the eastern half is less than 5,000 acres). The remaining unit is characterized as open prairie with some topographic relief. This inventory unit is not crossed by the Proposed Route or Route Alternative based on indicative engineering; however, it is within 0.3 mile of the Proposed Route and a Route Alternative. This is within the 1-mile study area used in this Draft EIS to analyze potential effects.

Segment 1W

Inventory Unit WY-R-1C. See the description under Alternative 1E-C above.

Inventory Unit WY-R-1D. See the description under Alternative 1E-C above.

Segment 2

No areas with wilderness characteristic are crossed in this segment.

Segment 3

No areas with wilderness characteristic are crossed in this segment.

Segment 4

Inventory Unit WY-K-6I is a large unit on both the Kemmerer and Pinedale FOs in Lincoln County, Wyoming. It lies to the west of Fontenelle Reservoir. The unit includes several non-federal parcels totaling approximately 1,120 acres. Additional field inventory is needed to finalize the unit boundaries, which include state and private land, along with numerous roads divide the unit into many subunits, two of which are crossed by the Proposed Route (WY-K-6I-2 and WY-K-6I-3). Subunit WY-K-6I-2 (Township 23/24/25 N., Range114/115/116 W.) is bound by maintained roads, state and private land, and an existing transmission line. This subunit consists of 43,282 acres. Subunit WY-K-6I-3 (Township 23/24/25 N., Range 115 W.) consists of 12,588 acres. This subunit is bound by private land and maintained roads, including the Sublet-Pomeroy Basin CR 306.

Inventory Unit WY-K-6L is a large unit in Lincoln County, Wyoming, divided in two by Trail Creek Road, which runs north/south through the unit. Subunit WY-K-6L-1 (Township 23/24 N., Range 115/116 W.) is bound by Trail Creek Road, CR 306, an existing transmission line, and state and private land. It has approximately 17,642 acres. This subunit includes two non-federal parcels totaling approximately 680 acres. Subunit WY-K-6L-2 (Township 24/25 N., Range 115/116 W.) is bound by Trail Creek Road, State Highway 233, and state, private, and NFS land. It has approximately 17,709 acres. This area is a high mountain-rimmed desert plateau with an extensive terrace system creating numerous canyons and drainages. Commissary Ridge runs along the eastern boundary of unit WY-K-6L-2. South Fork Mountain lies along the western boundary of unit WY-K-6L-1 and the eastern boundary of WY-K-6L-2.

Inventory Unit WY-K-6S is a large unit in Lincoln County, Wyoming. The unit includes several non-federal parcels totaling approximately 6,500 acres. A county maintained road separates the unit into two sections. The eastern portion, WY-K- 6S-1, would be crossed by route alternatives. The subunit (Township 20/21 N., Range 117/118/119 W.) is bound by an existing transmission line in the north and east, and maintained county roads in the south and west. The subunit has approximately 37,617 acres. Topography

includes numerous ridges sloping into valleys and drainages. Fossil Ridge occupies the northwest portion of the subunit and Bear River Divide follows the south border. Smaller drainages and creeks are found throughout. The vegetation community is dominated by sagebrush. Gas wells are found along a ridge near the western boundary. A field inventory was not completed due to snow.

Inventory Unit WY-K-8A is in Lincoln County, Wyoming. It is approximately 33,293 acres (Township 25/26/27/28 N., Range 119/120 W.). The unit includes several non-federal parcels totaling approximately 1,520 acres. It is bounded by a maintained county road and by state and private land. Sublette Range runs the length of the unit (north/south). There are numerous drainages in the unit. Lodgepole pine is dominant on the eastern slopes of the range and Doulas-fir is dominant on the western slopes of the range. The inventory unit includes the Raymond Mountain WSA (Decision 7001 in the Kemmerer RMP). This inventory unit is not crossed by the Proposed Route or Route Alternative based on indicative engineering; however, it is within 0.25 mile of the Proposed Route. This is within the 1-mile study area used in this Draft EIS to analyze potential effects.

Segment 5

No areas with wilderness characteristic are crossed in this segment.

Segment 6

Segment 6 involves the rebuilding an existing transmission line. No areas with wilderness characteristic are affected in this segment.

Segment 7

Inventory Unit ID-B-18A (Jim Sage) is part of a large block (42,000 acres) in Cassia County, Idaho. It is bounded by an existing transmission line and State Highway 81 in the east and by state and private lands in every other direction. Irrigated agricultural lands are found to the east of the unit. The Sawtooth NF is to the west and south of the unit. The topography in the area is dominated by the north/south oriented Jim Sage Mountain Range. Cassia Creek is to the north of the unit and Raft River runs along the southern boundary of the unit. The vegetation is comprised primarily of a forested community. The boundary was modified to follow natural contours and exclude portions that lack naturalness. The revised unit (Township 25/26 N., R 13/14/15 W.) is approximately 31,062 acres.

Inventory Unit ID-B-22A (Mountain Meadow) is in Cassia County, Idaho (Township 12 N., R 20 W.). It is approximately 5,442 acres. The unit is bounded by maintained roads and by private and state lands. The Sawtooth NF lies to the south. The topography is steep and rugged. Mountain Meadow Creek flows through the middle of the unit. The unit requires field inventory to verify whether it has outstanding opportunities for solitude or primitive recreation.

Segment 8

No areas with wilderness characteristic are crossed in this segment.

Segment 9

No areas with wilderness characteristic are affected in this segment.

Segment 10

No areas with wilderness characteristic are affected in this segment.

3.17.2 Direct and Indirect Effects

This section is organized to present the effects to land use and recreation from construction, then operation, followed by decommissioning activities for the proposed Project. Route Alternatives are analyzed in detail below in Section 3.17.2.3. There is a Design Variation involving use of two single-circuit structures proposed by the Proponents for Segments 2, 3, and 4 (see Section 2.2 for details), which is analyzed below in Section 3.17.2.4, and a Structure Variation that is analyzed in Section 3.17.2.5. The Proponents have also proposed a Schedule Variation, analyzed in Section 3.17.2.6, in which one of the two single circuits to be constructed in Segments 2, 3, and 4 and a portion of Segment 1W would be built on an extended schedule with construction beginning approximately 2.5 years after completion of the initial construction.

Mitigation measures or EPMs are presented in detail within this section only if it is the first time they have been discussed in Chapter 3; all other measures are referenced or summarized. A comprehensive list of all Proponent-proposed EPMs and Agency-required mitigation measures can be found in Table 2.7-1 of Chapter 2.

3.17.2.1 No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed or operated. No Project-related impacts would occur to land use or recreation resources or the management of public or private lands.

3.17.2.2 Effects Common to Action Alternatives

Construction

Land Use and Ownership

During scoping, some commenters expressed strong opinions on whether it is better to place transmission lines on private or public lands.

Private lands are owned by individuals or groups, and, therefore, fewer potential users are directly affected. Properties owned by individuals or groups tend to be smaller than publicly managed lands. Effects to private lands may be felt more intensely by the affected landowner because affected lands typically represent a larger relative share of their property and may affect existing or proposed land uses on those lands. Some private landowners may find ROW compensation adequate or beneficial and may actually request placement of transmission line facilities on their property, while other private owners may not feel that they can be adequately compensated for loss of the use of their land and inconvenience.

Public lands are managed for all citizens, under various laws and plans. Therefore, everyone gets the benefit and consequences. Public lands provide resources that could

be affected by the location of the transmission line (see other resource analyses, such as wildlife, visual, cultural, historical, etc.). Both the Forest Service and the BLM derive their authority to locate transmission lines on public land under the FLPMA (BLM and Office of the Solicitor 2001). This act explicitly permits the issuance of ROWs under Title V, Section 503. Decisions on issuing a ROW grant or a Special Use Permit must also consider national and state land use policies, environmental quality, economic efficiency, national security, safety, and good engineering and technological practices.

The direct and indirect effects of a transmission line crossing rangeland, pasture, and other low vegetation are generally minor, beyond the localized impacts of structure installation and the construction of roads and other facilities, because the surrounding vegetation is low-growing and generally compatible with the proposed transmission line (i.e., the existing vegetation would not be affected). Potential impacts in forested areas would, however, be greater because in addition to the effects of roads and structures, the entire ROW would need to be cleared of trees tall enough to endanger the line. Construction clearing limits in forested environments are illustrated in Figure 3.6-1 in Section 3.6 – Vegetation Communities. Chapter 2 provides a detailed description of the construction ROW, access roads, and other Project facilities.

As discussed in Section 3.17.1.5 – Existing Conditions, land use within the Analysis Area is primarily rangeland (84 percent), with cropland and forestland accounting for about 10 percent and 4.5 percent, respectively (Table 3.17-4). Relatively small portions of the route border or cross developed areas (including industrial, commercial, and residential areas, and existing ROWs), wetlands and open water, and “barren” areas (including disturbed and extractive mining areas) (Table 3.17-4).

Potential impacts to rangeland and cropland during construction and operation of the Proposed Route and Alternative Routes are assessed in detail by segment in Section 3.18 – Agriculture. Impacts to vegetation including forestland are addressed in Section 3.6 – Vegetation.

Land Use Plans

The potential effects of the Project on public resources are considered by evaluating conformance with land use plans administered by the BLM and Forest Service. Effects on private lands are influenced through a combination of comprehensive plans and zoning; for example, CUPs and associated conditions would have to be obtained and met as a condition of approval on private lands (see Section 3.17.1.3). In the initial siting of the Proposed Route by the Proponents and subsequent evaluation of alternatives by the IDT, an attempt has been made to meet all plan requirements.

The IDT reviewed the Forest Service standards and guidelines and BLM requirements (stipulations) that would be applicable to the proposed Project and identified whether the Project would be consistent with these standards (and, in some cases, guidelines) or requirements. The results of this analysis are summarized in a series of tables that are included in the Administrative Record for this Project. Cases where the proposed Project would not be consistent with the identified standards or stipulations would in most cases require that the management plan (Forest Plan, RMP, or MFP) that contains these standards or stipulations be amended. Proposed plan amendments are

summarized in Table 2.2-1 and discussed in more detail for BLM and Forest Service plans in Appendices F-1 and F-2, respectively. Appendices G-1 and G-2 provide analyses of visual resource impacts of BLM and Forest Service plan amendments, respectively. Inconsistencies of the Project with the applicable plans include:

- Developing a new ROW outside of approved corridors,
- Building additional roads where motorized access is limited,
- Crossing NHTs,
- Crossing ACECs,
- Crossing National WSR-eligible segments,
- Modifying wildlife habitat requirements,
- Allowing surface disturbance near scenic rivers,
- Allowing new roads near special status plant species,
- Changing VRM classifications, and
- Allowing incompatibility with established VRM classes.

Plan amendments that are directly related to land use or recreation (i.e., the need for these amendments is directly related to the Project's impacts on land use or recreation) or visual resources (due to the close relationship between visual resources and recreation) are identified by Segment in Section 3.17.2.3.

In addition, there are plan amendments proposed that, although not specifically related to land use or recreation, would result in alterations to current land management practices and would allow the permitting of this Project in areas that are currently managed in such a way as to exclude projects of this type (see Appendices G-1 and G-2 for maps of areas with visual resource management class changes). These types of proposed plan amendments could have an indirect impact on the allowable use of lands as well as recreational experiences. For example, proposed amendments to the federal wildlife stipulations could alter the composition of wildlife species found near the Project (see Sections 3.10 – General Wildlife and Fish and 3.11 – Special Status Wildlife and Fish Species), which could in turn affect hunting and wildlife viewing in these areas (as discussed in more detail later in this section).

Designated Corridors and Existing ROW

Major portions of the Proposed Route and Route Alternatives would use one or more of the proposed WWE corridors (DOE and BLM 2008). Other portions are located within or adjacent to Forest Service- or BLM-designated utility corridors. Use of these corridors was considered a siting opportunity during the route selection process and these corridors were used whenever feasible considering all the resource categories and when the WECC 1,500-foot separation for reliability reasons could be met. Table 2.4-2 presents the length and percentage of Proposed Route and Route Alternative segments that are within the proposed WWE corridor (federal lands only), within the projected WWE corridor (private land segments between WWE corridor segments), adjacent to the WWE corridor (within 1/3 mile of the WWE corridor), and

within or adjacent to existing transmission corridors (including the WWE corridor and existing transmission lines).

For reliability reasons, the Proponents have proposed to site the facilities an average of 1,500 feet from existing transmission lines 230 kV or higher (see Section 1.3.3.3 of Chapter 1). During final design the separation distance could be greater if the distance between the tower of the existing line is greater than 1,500 feet. ROWs typically are wide enough only to accommodate the existing facility safely, and none of the Proposed Route and Route Alternatives would occupy any existing 230-kV or higher utility transmission ROW except as they approach substations. An exception is the 5.3-mile-long Alternative 5E proposed by Power County, which would be located adjacent to an existing 345-kV line and would, therefore, not be consistent with the 1,500-foot separation criteria established for the Project.

The Proposed Route and Route Alternatives would also cross numerous federal, state, county, and local highways and railroads, electric transmission lines, gas and oil pipelines, sewer lines, and irrigation pipes and canals. The exact alignment and design configurations of the crossings would be in accordance with applicable regulations and codes. Special construction protection measures would be undertaken at road and other ROW crossings, and would include measures such as the use of protective wood poles to prevent conductors from interfering with road traffic.

Existing, Proposed, and Planned Commercial or Residential Areas

Existing commercial and residential structures located within 1,000 feet of the Proposed Route and Route Alternatives are identified by segment in Table D.17-1 and discussed below by segment in Section 3.17.2.3.

The effects on commercial farm and dairy operations are discussed in Section 3.18 – Agriculture and 3.21 – Electrical Environment. All existing improvements, such as fences, gates, irrigation ditches, cattle guards, and reservoirs would be maintained during construction and repaired to pre-construction conditions or better. If pipelines or canals transporting water for livestock, wildlife, and crops were damaged by construction activities, the Proponents would repair them to the landowner or land management agency specifications.

Other commercial operations located in the vicinity of the proposed Project could be temporarily affected during construction by the presence of construction workers and equipment, noise from construction, and areas where access is temporarily prohibited for safety reasons. Some areas may be disturbed by access roads, fly yards, and staging areas. In some cases, access to commercial operations may be hindered periodically during construction. The Proponents have designed EPMs to minimize traffic and transportation-related impacts. These measures, described in Appendix C-1, Attachment A, and further discussed in Section 3.19 – Transportation, would help reduce potential construction-related impacts to commercial operations. Any residual construction-related impacts would be short-term, occurring for the few months that construction activities occur in any one area.

Potential construction impacts on nearby residences could include dust and noise from construction activities, additional traffic, and emergency access. Residences within

1,000 feet and 300 feet are identified for the Proposed Route and Route Alternatives by segment in Section 3.17.2.3 below. Effects from noise and traffic are addressed in Section 3.23 – Noise, and Section 3.19 – Transportation, respectively. The EPMs designed to minimize traffic and transportation-related impacts would help reduce potential construction-related impacts to existing residences (see Appendix C-1, Attachment A, and Section 3.19 – Transportation).

Planned commercial and residential developments would only be affected during construction if the Proposed Route or Route Alternatives precluded access to lots intended for other uses or if the schedule for development coincided with the Gateway West Project construction schedule. In that case, the Proponents and the development construction operators would need to coordinate their efforts to minimize the effects on each other.

Timber Management

Construction through timber management areas would require the removal of trees within the ROW and adjacent hazard trees that could fall into the structures, conductors, and/or access roads. Land within the ROW, as well as land occupied by new permanent roads, would no longer be available for timber production. When these activities occur, the merchantable value of the timber is determined and the landowner or land management agency would be compensated for the timber taken and for the loss of timber production on that land. Impacts from other construction-related ground disturbance, such as staging areas and fly yards, would be temporary and sited to avoid timbered areas, where possible.

Section 3.6 – Vegetation Communities contains information on the acres of forest that would be affected by construction. Section 3.4 – Socioeconomics discusses the associated economic impacts.

Fire Management

A transmission line can influence fire management in the following ways:

- Construction equipment starting a fire;
- Transmission lines being the cause of fires, resulting from downed power lines, birds or airplanes striking a line and starting a fire upon hitting the ground, sparking at substations and transformers or, during smoky or humid conditions, electric arcs hitting the ground;
- Interfering with aerial suppression or fuel reduction operations, including helicopters, single-engine air tankers, air tactical aircraft, utility aircraft, aerial supervision modules, heavy air tankers, smokejumper aircraft, and large transport aircraft; and
- Delaying firefighters as they wait for the line to be de-energized for safety.

Construction would increase the potential for ignition in the proposed ROW corridor due to operation of equipment capable of producing heat and sparks in the presence of wildland fuel. The states of Wyoming, Idaho, and Nevada, along with the Forest Service and BLM, have requirements for fire preparedness for construction equipment

operating during fire season, including the availability of a bucket and shovel, spark arrestors, mufflers, spill control, and brush disposal. During extreme fire danger, state and federal agencies would implement operating restrictions during specified hours. To reduce the potential for construction-related fires, the BLM has identified 11 measures to be taken by the Proponents and its contractors to ensure that fire prevention and suppression measures are carried out in accordance with federal, state, and local regulations. These measures are described in Section 3.22 – Public Safety.

Safety hazards would increase in localized areas of the ROW corridor presenting challenges for fire managers whose first priority is safety. The effect of these safety hazards on fire management would depend on the particular hazard encountered. Potential effects could range from a simple alteration in fire suppression tactics—in the case of an overhead hazard—to outright avoidance, in the case of hazardous materials or fuel storage tanks. The potential for fire managers to alter suppression tactics or avoid suppression operations in the ROW corridor altogether due to safety hazards is low due to the low probability that a fire would coincide with fueling activities or occur at a fuel station.

Motor vehicle traffic mobilizing into and out of the proposed ROW area could increase emergency response times if fire responders encounter construction related traffic en-route to an incident. There is a low potential for fire responders to encounter traffic associated with ROW construction on low capacity roads. Traffic bottlenecks would not be expected to affect firefighter safety or fire size unless responders encounter convoys of ingress / egress traffic on low capacity roads. BLM and the cooperating agencies have identified a mitigation measure regarding fire management (VEG-5).

Recreation and Public Interest Areas

Existing recreation and public interest areas found within the general vicinity of the Project are discussed by segment in Section 3.17.1.5. Construction of the Project is not expected to permanently preclude the use of or access to any existing recreation areas or activities; however, some short-term impacts to these resources would occur during the construction phase of the Project.

Hunting and wildlife viewing opportunities could be impacted by the Project if wildlife species are displaced from areas near construction activities to suitable habitats adjacent to, but beyond the extent of, construction disturbances. Alternately, some wildlife may be attracted to disturbed areas (see Section 3.10 – General Wildlife and Fish). This could improve hunting and wildlife viewing opportunities in some areas while reducing or temporarily eliminating opportunities in other areas. These impacts would be limited to the immediate area of construction activity and short-term in nature.

Construction of the Project would also affect dispersed recreation activities, such as river rafting, fishing, hiking, camping, that are influenced by the presence of construction noises, visual disturbances, or other humans. The presence of these construction-related disturbances would likely diminish the quality of these recreation activities for the duration of the construction phase of the Project. These impacts would be localized and short-term in nature.

Construction of the Project may require the temporary closure of access roads for public safety reasons, while construction crews move large equipment in and out of remote areas. Recreation areas that have only limited access options may become inaccessible for short periods of time during construction. Road closures would be conducted in accordance with the Proponents' Traffic and Transportation Management Plan (Appendix C-1, Attachment A) and agency requirements. The movement of vehicles and heavy equipment could also temporarily affect the recreation experience of visitors traveling the scenic byways that pass through the Analysis Area.

As construction activities are not expected to occur during winter months, winter sports and recreation activities (such as skiing and snowmobiling) are not expected to be affected during the construction phase of the Project.

OHV Use

Construction of the Project would create additional access routes, which may facilitate OHV use in areas that are currently designated as closed to OHVs or where OHV use is limited. In addition, where a ROW or new access road crosses trails not designated as open to OHV use, the Project may lead to unauthorized use of these trails by OHVs. Therefore, as indicated in EPM TR-7, vehicles within the construction ROW or along roadsides near the ROW will not be allowed.

TR-7 Unauthorized vehicles will not be allowed within the construction ROW or along roadsides near the ROW.

Some unauthorized OHV use may occur during construction when workers are not on site (such as weekends or between the time that a section is completed but not activated) but unauthorized use is more likely to occur after construction is completed. Therefore, unauthorized OHV use is discussed under Operations (see below). Effects of unauthorized OHV use during construction, if any, would be similar to those discussed under Operations.

Operations

Land Use and Ownership

Placement of towers, development of access roads, and construction of substations, and substation expansions would affect existing land uses as described elsewhere in this section and document, but would not substantially affect overall existing or future land use or ownership patterns along most of the route. On a per mile basis, a 250-foot ROW would require 30.3 acres of easement. Structure bases would occupy about 0.3 acre of this area and access roads about 1.7 acres, for a total of 2.0 acres or 6.6 percent of the total ROW area. It is recommended that the Proponents work with landowners, as required, to locate roads and structures to minimize impacts to existing and planned subdivisions.

Existing land use or ownership would not change along the majority of the ROW but easements (private land) and authorizations (public land) would encumber the ROW area with some land use limitations. During operations, the Proponents would require access to the ROW for operations and maintenance purposes, including vegetation management and routine, periodic maintenance, and emergency repairs to the

transmission line, should they be required. The easement would also specify that the ROW be kept clear of trees and buildings or structures, and prohibit storage of flammable material of any kind within the boundaries of the ROW or bringing equipment or vehicles to the ROW that would exceed 14 feet in height. The ROW may be used for roads, agricultural crops, other purposes not inconsistent with the above limitations, and special circumstances in mining and agricultural areas where necessary to maintain existing practices, as negotiated with the landowner. It is recommended that the Proponents, where appropriate, work with local communities to avoid creating barriers between various types of development. On federal lands, authorizations would specify vegetation management and other activities within the ROW.

Designated Corridors and Existing ROW

In some locations, the presence of a 230- or 500-kV transmission line ROW could be considered a corridor. Some federal and county land use plans require use of existing ROW or designated utility corridors for new utility projects. Section 503 (43 U.S.C. § 1763) of the FLPMA encourages the BLM and Forest Service to use existing corridors to the extent practical to minimize adverse environmental impacts and the proliferation of separate ROWs.

Power County and Cassia County have initiated efforts to designate transmission line corridors in response to the Gateway West proposed routes and in anticipation of other transmission lines that have been publicly disclosed (see http://swipps.com/ overland-intertie.htm and http://www.trancanada.com/company/zephyr-chinook.html). Both counties have expressed concern that permitting the Gateway West Project could result in the establishment of a de facto corridor and in additional requests for locating additional transmission lines in close proximity. As a practical matter, many factors influence the feasibility of using common corridors. These include beginning and ending points, intermediate substation interconnections, reliability criteria dictating minimum separation distances, physical pinch points such as concentrations of oil and gas wells or sensitive natural resources such as nesting habitat, land use exclusion areas such as wilderness areas or NWRs, and intensively developed commercial, residential or agricultural uses. Route Alternatives proposed by Power and Cassia Counties are discussed below in Section 3.17.2.3 under Segments 5 and 7, respectively.

Existing, Proposed, and Planned Commercial or Residential Development

Effects of transmission line operations on commercial dairies, farms, and feedlots are discussed in Section 3.18 – Agriculture. The impact of operations of the proposed Project on other commercial facilities is expected to be minimal in most cases.

Effects on existing and planned residential development would vary. Potential effects on residential property values and visual quality are discussed in Section 3.4 – Socioeconomics and Section 3.2 – Visual Resources, respectively. The presence of a transmission line may be viewed negatively by residents living nearby. As discussed with respect to potential impacts to property values, proximity to electric transmission lines can have negative effects on residential property values. These effects tend to decrease with distance and over time, with short-term impacts usually greater than long-term effects (see Section 3.4 – Socioeconomics). Proposed and Alternatives Routes to

avoid existing and planned residential development are discussed in Section 3.17.2.3 under Segments 2 and 8.

Timber Management

Impacts to forested areas from clearing the ROWs and constructing new roads, transmission structures, and substations would be permanent and would continue through operations. Section 3.6 – Vegetation Communities contains information on the acres of forest that would be affected by the Project.

The existence of the transmission line structures and conductors could interfere with any aerial logging operations, such as helicopter or skyline logging. These potential impacts would be limited to forested areas managed for timber and are not expected to be extensive.

The use of new roads and the maintenance and operation of a new transmission line would increase the risk of wildland fire. Fires could spread to adjacent forestland and could damage or kill existing timber.

The construction of new access roads could be beneficial to timber harvest activities. These roads would provide access to timber resources where access did not previously exist and could also support future management of other resources. However, as noted above, land occupied by new permanent roads would no longer be available for timber production.

Fire Management

The proposed transmission line would increase the potential for ignitions along the corridor, particularly during summertime red flag warnings, which bring low humidity, low fuel moisture, and high winds (BLM 2005b; Orr 2008). Maintenance and routine inspection of the lines would minimize the potential for abnormal arcing or overheating to cause a wildfire. The potential for ignitions along the ROW corridor would remain low during the operational life of the Project due to scheduled maintenance of equipment and vegetation within the ROW corridor.

The proposed ROW would become a high-priority suppression and fuels management area where it traverses undeveloped areas. Clearing of trees and large brush and treating weeds within the proposed ROW would decrease the continuity of ladder fuels and increase the fire-free interval in the vicinity of the proposed ROW corridor (Deanne et al. 1998).

One commenter suggested the use of green strips (grass areas managed to prevent annual weeds) as a fire suppression technique along the ROW. In concept, green strips in combination with the ROW would provide an enhanced fire suppression management tool. However, implementation of this approach would have significant land use and wildlife habitat impacts. Additional land use controls would be needed in areas of adjacent native vegetation. This vegetation, which would otherwise be unaffected, would be converted to grass and maintained with herbicides to prevent weed infestations.

Structures and facilities proposed for the ROW could narrow the range of appropriate management response to future wildfires in the vicinity. "Wildland fire use" fires or containment fires could become inappropriate where excessive heat and smoke might damage structures or prevent effective transmission of electricity. Prescribed fire would also be limited in the vicinity of the proposed ROW for the same reasons. This would reduce opportunities to reintroduce fire into localized ecosystems along the Proposed Route and Route Alternatives but the overall reduction would be minor because fire is undesirable along a majority of the routes due to existing resource conditions and structures. In the Caribou-Targhee NF, 2.5 miles of the 9.2 miles crossed are in the "fire use" prescription. This area would not be allowed to burn should an ignition occur. This change is not considered significant because much of the Caribou-Targhee NF is prescribed as "wildland fire use" or "prescribed fire" (Forest Service 2003a) and, therefore, the area affected by the Project is a minor component of these areas.

Some suppression tactics in the ROW vicinity may become inappropriate due to the safety hazard that the infrastructure represents to firefighters and the potential for damage to the infrastructure in the ROW. Aerial operations may become inappropriate near the ROW corridor because they would endanger pilots and firefighters and cause potential damage to infrastructure in the ROW. Direct suppression using engines and hand crews may also become inappropriate where it exposes firefighters to an unacceptable level of risk during periods of high wind and smoke. These limitations could have a cumulative effect where the ROW passes areas of sensitive resources, such as historic portions of the Oregon NHT, where heavy equipment to construct fire line is already limited. Limitations on fire suppression tactics in the vicinity of the ROW corridor could result in a minor increase in the extent of fires that occur there.

In forested environments such as the Medicine Bow-Routt and Caribou-Targhee NFs, broadcast burning may become an inappropriate tool to dispose of slash near the ROW.

Recreation and Public Interest Areas

Operations of the Project are not expected to preclude the use of or access to any existing recreation areas or activities. The primary operations impact to recreation resources would likely result from the visual effect of the transmission line and associated facilities on recreation activities near the Project (see Section 3.2 – Visual Resources). The visual presence of the proposed Project could have a detrimental effect on the recreation experience associated with recreation activities that typically benefit from a lack of human disturbance, including dispersed camping, hunting, wildlife viewing, and rafting.

The visual impact of the Project could also potentially affect the quality of the recreation experience in locations where the proposed Project would cross or be located near NHT and other trails including stage and wagon roads that have potential historic significance. NHTs are typically established to preserve the conditions historically experienced along these trails and, depending on existing conditions, the presence of a transmission line and its associated facilities could diminish the "historical experience" along those portions of the NHT located within sight of the Project. Visual impacts to historic trails are evaluated in detail in Section 3.3 – Cultural Resources. The Project

could also have detrimental impacts on scenic byways by reducing the quality the natural or rural landscapes that typically characterize these highways.

The extent of these effects would, however, depend on existing visual conditions in the affected areas, with impacts lower in those areas where high-voltage transmission lines and other types of development are already present. Impacts would also vary based on the distance of the recreation area from the proposed transmission line and potential effects would tend to be greater in locations where the Project would be visible on the horizon. Site-specific visual impacts are evaluated in detail in Section 3.2 – Visual Resources.

Additional impacts could also result from operations and maintenance activities; however, these activities are expected to be infrequent and localized and are, therefore, not expected to substantially affect recreation areas or the experiences of those who use these areas (see Chapter 2 for a description of the operation and maintenance activities that would occur).

OHV Use

The Proposed Route and Route Alternatives would create additional access routes across areas that are currently closed to OHVs. In addition, where a ROW or new access road crosses trails that are closed to OHV use, the Project may lead to unauthorized use of these trails by OHVs. Unless signage and effective barriers are in place, it is likely that the access roads would provide additional points of OHV entry into new areas, particularly areas that have low vegetation and are in relatively flat or gentle terrain. Therefore, the Agencies have identified the following mitigation measure to assist agency and county law enforcement in minimizing unauthorized OHV use on public and private lands:

LU-1 To assist agency and county law enforcement in minimizing unauthorized OHV use on public and private lands, monitor OHV use and post signs along access roads where OHV activity has increased in areas on public lands where OHVs are regulated by a land use plan, and on private, state, and Tribal lands at the request of the landowner, agency, or Tribal government. Signs shall indicate the restriction or regulation, location, penalty for violation, and appropriate contact information for reporting violations. Signage shall be maintained and replaced as part of the routine maintenance of the transmission line and facilities. Consult with appropriate Agencies on additional measures to block unauthorized OHV use.

Decommissioning

Decommissioning would create another temporary disturbance of the area and land uses along the ROW, and vegetation, including trees, could be removed to provide safe work areas for decommissioning activities. Once structures and facilities are removed, former uses could resume and forested areas would be replanted. It is unlikely that decompaction of soils would be 100 percent effective, so it is possible that forests reestablished in some areas would not be as productive as areas that had never been a road or facility location. These impacts would remain until the soil naturally recovers.

Once decommissioning is complete and areas restored to their previous condition, fire management activities would no longer be affected.

3.17.2.3 Proposed Route and Alternatives by Segment

This section evaluates the potential impacts of the Proposed Route and the Route Alternatives in terms of land ownership, designated corridors and existing ROWs, anticipated federal land use plan amendments, and specific land uses and recreational resources.

Specific land uses, including residences, commercial buildings, barns, other structures, wind farms, mines, gravel pits, wells, center-pivot agricultural fields, and historic trails that are either crossed or within 1,000 feet of the centerline of the Proposed Route and Route Alternatives are identified in Table D.17-1 in Appendix D. The following segment-by-segment discussion also addresses SMAs, historic trails, and OHV use.

Other potential land uses including wetlands, mineral resources, water resources, and agriculture are discussed in Sections 3.9, 3.12, 3.16, and 3.18, respectively. Potential impacts related to visual resources, transportation, and noise are noted in this section, as appropriate. Detailed analyses of impacts to these resources are included in the visual resources (Section 3.2), transportation (Section 3.19), and noise (Section 3.23) sections.

Segment 1E

Segment 1E, as proposed, would link the Windstar and Aeolus Substations in south-central Wyoming with a 100.6-mile 230-kV single-circuit transmission line. Twenty acres of the expansion of Windstar and Aeolus Substations and 0.5 acre for one regeneration site are attributed to Segment 1E. Alternative 1E-A is a 16.1-mile alternative along the north end of Segment 1E, which was the Proponents' initial proposal before moving the Proposed Route at the suggestion of local landowners to avoid the more settled area around Glenrock. Alternative 1E-B is 21.4 miles longer than the Proposed Route but is being considered by the Proponents because it would avoid a Wyoming-designated sage-grouse core area to the east. The BLM has required the consideration of Alternative 1E-C, which parallels the proposed and rebuilt Segment 1W 230-kV lines into the Aeolus Substation (see Appendix A, Figure A-2).

Land Ownership

The Proposed Route would cross approximately 2.8 miles of the Medicine Bow-Routt NFs, 11.6 miles of BLM-managed land, and 22 miles of state-owned land; the rest is privately owned (Table 3.17-6). Alternative 1E-A is 1.5 miles shorter than the comparison portion of the Proposed Route[1] and would cross approximately 3.5 miles more private land. Alternative 1E-B would be 21.4 miles longer than the comparison portion of the Proposed Route and would cross 15.5 miles more private land. Alternative 1E-C would be approximately 26.8 miles shorter than the comparison portion of the Proposed Route. This route would cross fewer miles of private (-38.3 miles) and NFS land (-1.5 miles) and more (12.3 miles) of BLM-managed land (Table 3.17-6).

[1] The portion of the Proposed Route that starts and ends at the same nodes as the Route Alternative.

Table 3.17-6. Miles Crossed by Land Ownership – Segment 1E

Segment/Alternative	Total	BLM	NFS	Other	State	Private
Proposed – Total Length	100.6	11.6	2.8	–	22.0	64.0
Proposed – Comparison portion for Alternative 1E-A	17.6	–	–	–	11.4	6.1
Alternative 1E-A	16.1	–	–	–	6.6	9.5
Proposed – Comparison portion for Alternative 1E-B	37.9	3.8	–	–	3.9	30.1
Alternative 1E-B	59.3	8.7	–	–	4.9	45.6
Proposed – Comparison portion for Alternative 1E-C	75.4	11.2	2.8	–	8.2	53.2
Alternative 1E-C	48.7	23.5	1.3	–	9.0	14.9

Miles are rounded to tenths of a mile; columns/rows may therefore not sum exactly.

Designated Corridors and Existing ROW

The Proposed Route for Segment 1E would be adjacent to Segment 1W(c) for 9 miles and Segment 1W(a) for 14 miles. In addition, 6.6 miles (6.5 percent of the Proposed Route for Segment 1E) would be within the projected WWE corridor and 6.7 miles (6.7 percent) would be adjacent to (within 1/3 mile of) the projected WWE corridor.

The northern end of the Proposed Route was sited by the Proponents to minimize the occurrence of multiple transmission lines on privately owned land. Alternative 1E-A, which would be 1.5 miles shorter than the comparison portion of the Proposed Route, would substantially parallel (offset by 1,500 feet) the existing 230-kV transmission proposed to be rebuilt as Segment 1W(c). Approximately 14.2 miles or 88 percent of this 16.1-mile alternative would be adjacent to of an existing transmission corridor or transmission line. Approximately 7.2 miles (45 percent) of Alternative 1E-A would be located within the projected WWE corridor and 6.3 miles (39.1 percent) would be adjacent to the projected WWE corridor (Table 2.4-2).

The comparison portion of the Proposed Route and Alternative 1E-B are similar in that they would both create new ROW corridors. The comparison portion of Alternative 1E-C would be entirely within a common corridor with the Proposed Routes for Segments 1W(a) and 1W(c) (Table 2.4-2).

Overall, Alternatives 1E-A and 1E-C would make more use of existing transmission line corridors and would be within or adjacent to more WECC and projected WWE corridors than their respective comparison portions of the Proposed Route.

Federal Land Use Plan Amendments

This section and the corresponding sections for the other segments below discuss the plan amendments that directly impact land use or recreation. However, as discussed in the Effects Common to All Action Alternatives section, proposed plan amendments found in Appendix F could have indirect impacts to land use and recreation. These remaining plan amendments are discussed in the EIS sections that address the resource that is directly related (e.g., wildlife amendments are discussed in Sections 3.10 and 3.11) as well as Chapter 2 and Appendix F.

Medicine Bow Forest Plan

The Proposed Route and Alternative 1E-C would both cross the Medicine Bow-Routt NFs (Figure 3.17-4). The Project, as currently designed along the Proposed Route and Alternative 1E-C, would not be consistent with a Management Prescription as well as a Scenery Standard found in the Medicine Bow Forest Plan (see Table 2.2-1). Segment 1E would require the construction of roads and a transmission line in the Medicine Bow-Routt NFs in an area allocated to MA 3.31 (Backcounty), which is inconsistent with the plan standards; therefore, an amendment to the plan has been proposed (see Appendix F). If the Proposed Route for Segment 1E is selected, the Medicine Bow-Routt NFs propose to change all of Sections 13, 14, 23, and 24, Township 30 North, Range 78 West, that are not currently designated as a utility corridor and the west half of Sections 18 and 19, Township 30 North, Range 77 West, to MA 8.3 (Utility Corridors and Electronic Sites). Approximately 2,252 acres would change from an ROS of SPM to RN as a result of the transmission line and new road construction. NFS land within the WWE corridor (948 acres) currently has an ROS of RN. In addition, an amendment to the Scenery Standards would be required for the Proposed Route and Alternative 1E-C to be approved, because the Project would not be consistent with the SIOs established according to the SMS for this portion of the NF (see Section 3.2 – Visual Resources; as well as Table 2.2-1).

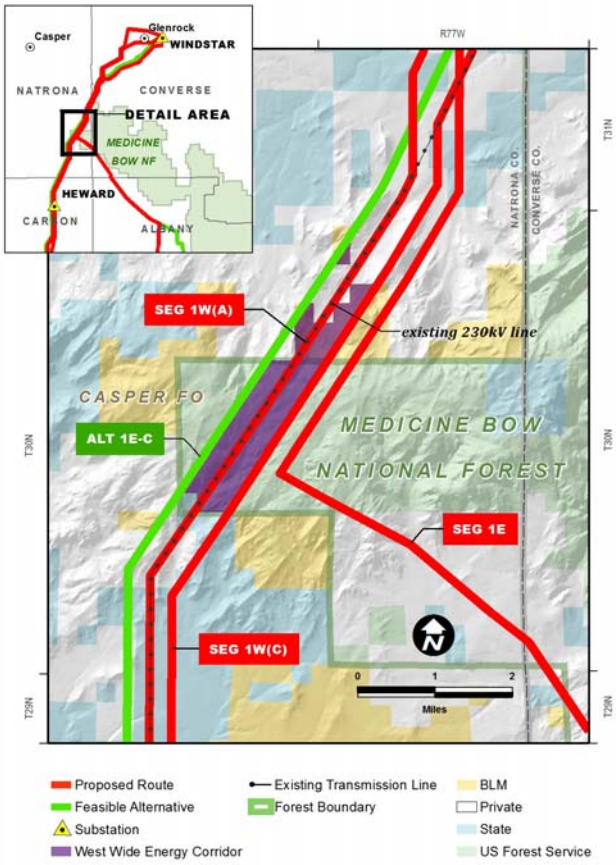


Figure 3.17-4. Medicine Bow-Routt NF Proposed Route and Route Alternatives

Alternative 1E-C would also require construction of a transmission line and new roads in the Medicine Bow Forest Plan MA 3.31 (Backcounty), which (as noted above) is inconsistent with the plan standards; therefore, an amendment to the plan has been proposed (see Appendix F). All of Sections 13, 14, 23, and 24, T30N R78W that are not currently designated as a utility corridor would be allocated to MA 8.3 (Utility Corridors and Electronic Sites). Under this Route Alternative, approximately 1,612 acres would change from an ROS of SPM to RN as a result of the transmission line and new road construction. Alternative 1E-C would require construction of approximately 1.7 miles of new roads in the Medicine Bow-Routt NFs, compared to approximately 8 miles under the comparison portion of the Proposed Route.

Segment 1E would cross BLM-managed lands that fall within the jurisdiction of the Casper and Rawlins RMPs (Table 3.17-2). Proposed amendments for the Proposed Route and Route Alternatives are identified in Table 2.2-1.

Casper RMP

The Casper RMP would need to be amended for the Proposed Route to be approved; this amendment would be required to allow the reclassification of 630 acres of VRM Class II to VRM Class III in the Deer Creek area. It would also require that the Project be allowed as a single-use visually altering action without changing the VRM class for approximately 2 miles in the Dugway Rim area. The Proposed Route for Segment 1E would also require that the Laramie RMP be amended to allow the Project as a single-use visually altering action without changing the VRM class for approximately 2.8 miles in the Laramie South area.

The Casper RMP would need to be amended for Alternative 1E-C to be approved; this amendment would be required to allow the Project as a single-use visually altering action without changing the VRM class for about 0.5 mile in the Spruce Creek and Bates Creek areas as well as for approximately 0.4 mile just north of the Deer Creek area.

Rawlins RMP

The Rawlins RMP would need to be amended for the Proposed Route and Alternative 1E-B to be approved; this amendment would be required to allow the Project as a single-use visually altering action without changing the VRM class for about 0.9 mile in the Laramie South area, and amended to allow the reclassification of 177 acres of VRM Class II to VRM Class III, also in the Laramie South area.

Plan Amendment Summary

Approval of plan amendments that would result in changes to ROS settings, SIO, or VRM classes to more developed classifications have the potential to affect the quality of the experience for recreationists using the affected areas and would, in some cases, afford a less “semi-primitive” experience to users. Visual impacts to the potentially affected areas as well as the visual amendments, as discussed above, are evaluated in more detail in Section 3.2 – Visual Resources.

Specific Land Uses and Recreational Resources

Land Use

Land use within the Analysis Area for the Proposed Route is summarized by segment in Table 3.17-4. Viewed in terms of miles crossed, the Proposed Route for Segment 1E would primarily cross rangeland (90 percent), with the remainder of the route crossing forest (7 percent) and water and wetlands (2 percent). Alternatives 1E-A through 1E-C would range from approximately 22 miles shorter than their respective comparison portions of the Proposed Route to 27 miles longer, with generally equivalent changes in the amount of rangeland crossed. Alternative 1E-C would also cross approximately 3 miles less forest than the comparison portion of the Proposed Route (Table 3.17-7).

There is limited development within the Analysis Area for Segment 1E. Developed land use mainly occurs in the vicinity of the Dave Johnston Power Plant just south of the Windstar Substation and includes ancillary facilities that serve the power plant, including electric transmission lines, two railroads, and two highways. The Analysis Area also

Table 3.17-7. Miles Crossed by Land Use – Segment 1E

Segment/ Alternative	Total	Rangeland	Agriculture	Forest	Water and Wetlands	ROW	Developed	Other
Proposed – Total Length	100.6	90.7	–	6.5	2.1	0.5	–	0.8
Proposed – Comparison portion for Alternative 1E-A	17.6	17.0	–	–	0.4	0.3	–	–
Alternative 1E-A	16.1	15.5	–	–	0.4	0.1	–	0.1
Proposed – Comparison portion for Alternative 1E-B	37.9	36.2	–	0.6	0.7	0.1	–	0.2
Alternative 1E-B	59.3	58.2	–	–	0.8	0.2	–	0.2
Proposed – Comparison portion for Alternative 1E-C	75.4	67.5	–	5.2	1.7	0.2	–	0.8
Alternative 1E-C	48.6	45.0	–	2.2	0.7	0.3	–	0.5

Miles are rounded to tenths of a mile; columns/rows may therefore not sum exactly.

includes part of an existing residential area east of Glenrock on the south side of U.S. Highway 20/26. Development from this area south through Converse, Natrona, Albany, and Carbon Counties to the Aeolus Substation is limited to a few scattered homes and ranches.

Approximately nine residences would be located within 1,000 feet of the Proposed Route; none would be located within 300 feet of the proposed ROW centerline. No residences would be located within 300 feet of Alternatives 1E-B and 1E-C; one residence would be located approximately 200 feet from the centerline of Alternative 1E-A.

The Proposed Route would cross the boundary of a planned wind energy facility at approximately MP 79. No use conflicts are anticipated between the Proposed Route and this planned facility. Alternatives 1E-B and 1EC would both also pass near proposed wind developments and would not be expected to affect these developments.

Alternative 1E-C would cross the end of the Foxley Airstrip at MP 45.2, as well as pass within 1,000 feet of an airport outbuilding (Figure 3.17-5). The impact on the airstrip needs to be carefully evaluated. The Agencies have identified the need for the Proponents to coordinate with the airstrip owner to realign the location of Alternative 1E-C to eliminate the impact to the airstrip or in some manner compensate for any loss of use:

LU-2 Coordinate with the Foxley Airstrip owner to realign the location of Alternative 1E-C to eliminate the impact to the airstrip or in some manner compensate for any loss of use.

Alternative 1E-C would also pass within 1,000 feet of an ice cave that BLM has identified as a locally historic feature (Figure 3.17-6). The Agencies have identified the

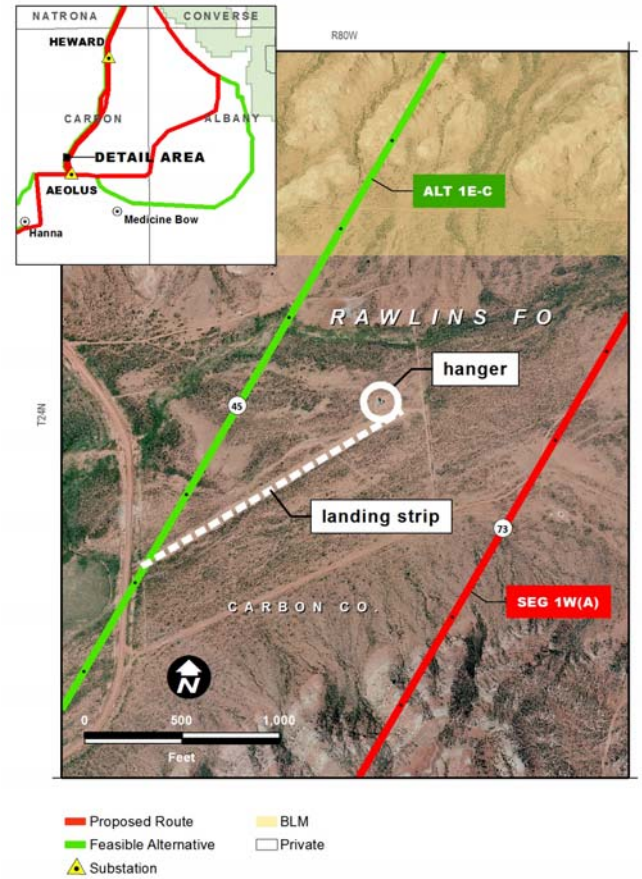


Figure 3.17-5. Foxley Airstrip – Alternative 1E-C

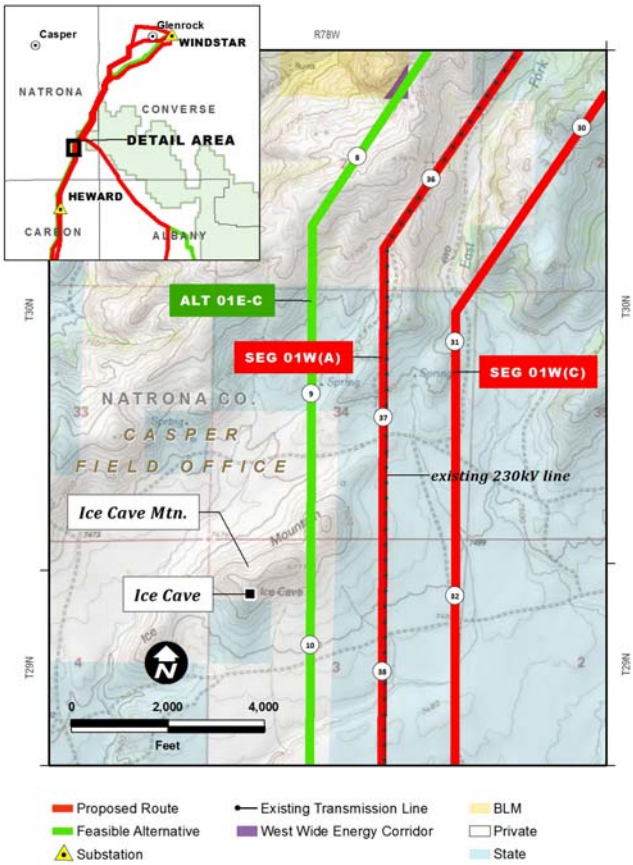


Figure 3.17-6. Ice Cave – Alternative 1E-C

need to consider micrositing of the facilities during final design with the overall goal of substantially reducing potential effects on this feature:

LU-3 Work with the private landowner of the ice cave along Alternative 1E-C and microsite the facilities during final design to reduce effects.

Special Management Areas

The Proposed Route would cross approximately 2.4 miles of the Bates Hole MA, which has a restriction against new utility corridors unless there are no other feasible options. The portion of the Proposed Route for Segment 1E that would cross the Bates Hole MA would be adjacent to, but offset 1,500 feet from, an existing line (that would be rebuilt as Segment 1W[c]) and the Proposed Route for Segment 1W(a).

Alternative 1E-C would cross approximately 10.3 miles of the Bates Hole MA. This alternative would be adjacent to, but offset 1,500 feet from, the existing line for its entire length, including the section that would cross the Bates Hole MA.

Wilderness Characteristics

Segment 1E

Segment 1E of the Proposed Route would cross two areas identified as containing wilderness characteristics and come within a mile of a third area.

Inventory Unit WY-C-1F contains approximately 5,400 acres of BLM-managed land identified as having wilderness characteristics. Approximately 0.8 mile of Segment 1E crosses the eastern arm of the inventory unit. If approved and constructed, this route would reduce the inventory unit by approximately 911 acres, shifting the boundary to the west. The remaining unit would no longer meet the size requirement; therefore, the unit would no longer have wilderness characteristics.

Inventory Unit WY-R-3A contains approximately 5,073 acres of BLM-managed land identified as having wilderness characteristics. The inventory unit is not crossed by the Proposed Route based on indicative engineering; however, it is within 0.5 mile of the Proposed Route. This is within the 1-mile study area within which micrositing may be implemented to reduce effects on resources, for example to avoid crossing a visually sensitive area. If the route remains to the northeast of the inventory unit, it would not affect the area's wilderness characteristics.

Inventory Unit WY-R-4A is approximately 5,745 acres of BLM-managed land surrounded by non-federal land that likely has wilderness characteristics. The inventory unit lacks public access and no field inventory was completed; however, based on BLM records and aerial imagery, this inventory unit is assumed to contain wilderness characteristics.

Segment 1E of the Proposed Route crosses the southeast corner of the unit. If approved and constructed, this route would reduce the size of the unit by approximately 150 acres. The remaining unit would still meet the size requirement. Since there is no public access, recreational users would not be adversely affected by the Project. If access across surrounding private land were obtained, the transmission line in an otherwise undisturbed setting would have an adverse effect of the wilderness experience. Due to the rugged topography, users in other portions of the inventory unit would still find a natural condition with outstanding opportunities for solitude and primitive recreation.

Alternative 1E-C

Inventory Unit WY-R-1C contains approximately 8,964 acres of BLM-managed land identified as having wilderness characteristics. Alternative 1E-C crosses the entire eastern side of the inventory unit, approximately 3,000 feet from the existing transmission line that forms the current boundary of the unit. If approved and constructed, this route would reduce the inventory unit by approximately 1,690 acres, sifting the boundary approximately 3,000 feet to the west. The remaining unit would still meet the size requirement. Construction activities would disrupt those seeking solitude. In the long term, people seeking solitude or primitive recreation would find opportunities for both, but would have to travel an additional 3,000 feet to the west, away from the transmission line which forms the current boundary.

Inventory Unit WY-R-1D contains approximately 56,265 acres of BLM-managed land identified as having wilderness characteristics. Alternative 1E-C crosses the entire eastern side of the inventory unit, approximately 3,000 feet from the existing transmission line that forms the current boundary of the unit. If approved and constructed, this route would reduce the inventory unit by approximately 2,617 acres, sifting the boundary approximately 3,000 feet to the west. The remaining unit would still meet the size requirement. Construction activities would disrupt those seeking solitude. In the long term, people seeking solitude or primitive recreation would find opportunities for both, but would have to travel an additional 3,000 feet to the west, away from the highway which lies just east of the current boundary.

Inventory Unit WY-R-1E contains approximately 5,461 acres managed by the BLM which lies between two transmission lines. This area has been identified as having wilderness characteristics. None of the proposed or alternative routes cross this inventory unit. However it is within the 1-mile study area within which micrositing may be implemented to reduce effects on resource. If the route remains to the west of the inventory unit, it would not affect the area's wilderness characteristics. If Alternative 1E-C were moved to the east of the existing transmission line and State Highway 487 and into this inventory unit, the unit would no longer be large enough to qualify as an area with wilderness characteristics. Conversely, 1E-C would no longer cross through all or part of WY-R-1D, reducing effects on that inventory unit.

Historic Trails

Segment 1E would cross a segment of the Oregon/California, Pony Express, and Mormon Pioneer NHTs, where they all share the same alignment, and would also cross the Child's Cutoff to the California NHT. Child's Cutoff is located on private property and not marked. Alternative 1E-B would also cross the Rock Creek and Fort Fetterman Road trail twice. Potential impacts to historic trails are assessed in Section 3.3 – Cultural Resources.

OHV Use

The Proposed Route would cross 2.8 miles of NFS land where OHV use is limited to existing routes and 4.2 miles of BLM-managed lands with seasonal closure. The Proposed Route would cross three trails designated as closed to OHV use and new road construction associated with the Proposed Route would result in one additional trail crossing. In open areas (the majority of the route), it would be difficult to physically close these access points to unauthorized OHV use. OHV use on non-motorized trails could disrupt existing uses, such as hiking and horseback riding, and may result in adverse effects to trails not designed or maintained for motorized use. The Proponents would post signs identifying the area as closed to OHV use and implement blocking measures where practical.

Alternative 1E-A would be 1.5 miles shorter than the comparison portion of the Proposed Route but it would cross a similar amount of area with a seasonal closure. Both Alternative 1E-A and the comparison portion of the Proposed Route would cross one trail designated as closed to OHV use. The number of trail crossings due to new roads would also be the same (one each for Alternative 1E-A and the comparison portion of the Proposed Route). However, since nearly 85 percent of Alternative 1E-A

would follow existing transmission lines compared to about 2 percent for the comparison portion of the Proposed Route, Alternative 1E-A would likely result in less new opportunity for unauthorized OHV access to trails and disruption of existing uses.

Alternative 1E-B would be 21.4 miles longer than the comparison portion of the Proposed Route and it would cross an additional 5.2 miles where OHV access is limited. This would result in a greater potential for unauthorized OHV use in areas where OHV access is limited. Alternative 1E-B would cross three trails designated as closed to OHV use and the comparison portion of the Proposed Route would cross one. There would be three additional trail crossings due to new road construction (versus one for the comparison portion of the Proposed Route). Overall, there would be a greater opportunity for unauthorized OHV access to these trails under Alternative 1E-B, increasing the potential for disruption of existing uses.

Alternative 1E-C would be 26.7 miles shorter than the comparison portion of the Proposed Route but it would cross an additional 1.4 miles where OHV access is limited compared to the comparison portion of the Proposed Route. However, the portion of Alternative 1E-C that would cross an area with seasonal closure would be 1.5 miles less than the comparison portion of the Proposed Route. Alternative 1E-C would not cross any trails designated as closed to OHV use while the comparison portion of the Proposed Route would cross two trails designated as closed to OHV use. There would be one additional trail crossing due to road construction compared to the comparison portion of the Proposed Route. Therefore, there would be less opportunity for unauthorized OHV access to these trails under Alternative 1E-C, decreasing the potential for disruption of existing uses.

Segment 1W

The Proposed Route 1W(a) would consist of a new transmission line from the Windstar Substation to about MP 30 (approximately 2 miles north of where the route enters the Medicine Bow-Routt NFs) and again from near MP 39 to the Aeolus Substation (see Appendix A, Figure A-2). Between these two points it would consist of a rebuild of an existing 230-kV line. This switch is proposed in order to avoid Ice Cave Mountain. The rebuild portion of this route would involve replacement of the existing wood H-frame structures with steel pole H-frame structures, similar in height and appearance to the existing line. The route (including the new portion of the line and the rebuild portion together as one route) would extend from the Windstar Substation south and west to the planned Aeolus Substation (points 1, 1Wa, 1Wb, 1Wc, 1Wd, 2). Beginning at Windstar, the proposed line would proceed to the northwest and west staying just north of an existing 230-kV line and about 1 mile north of the North Platte River. At MP 7.4, the line would turn to the south, crossing two historic trails, an oil and gas well field, Burlington Northern Railroad, North Platte River, Wyoming Highway 87/20, and I-25. The route would cross one raptor nest buffer north of the interstate. At MP 11.2, the line would turn to the southwest for approximately 10 miles, at which point the route would be parallel to and west of Segment 1W(c). The routes would maintain a minimum of separation of 1,500 feet to meet reliability criteria.

Proposed Route 1W(c) would consist of a rebuild of an existing 230-kV line from the Dave Johnston Power Plant to about MP 24 and then again from about MP34 to the

Aeolus Substation. Between these two points, the route would consist of a new 230-kV line transmission line. (This switching of the rebuild from 1W[c] to 1W[a] was planned in order to avoid Ice Cave Mountain in the alignment of the Proposed Route.) The rebuild portion of this route would involve replacement of the existing wood H-frame structures with steel pole H-frame structures, similar in height and appearance to the existing line. The route (including the new portion of the line and the rebuild portion together as one route) would leave the existing substation at the Dave Johnston Power Plant and proceeds south and west to the vicinity of the Aeolus Substation, a distance of approximately 70.6 miles (points 1x, 1x.1, 1x.2, 2). Upon reaching the Aeolus Substation, the new 230-kV line would be looped in and back out of the Aeolus Substation continuing through intermediate substations to the Rock Springs Substation.

Land Use and Ownership

The Proposed Route for Segment 1W(a) would cross approximately 26.6 miles of BLM-managed land, 2.3 miles of NFS land, 18.5 miles of state land, and 29.1 miles of private land (Table 3.17-8). Alternative 1W-A would be approximately 4 miles shorter than the comparison portion of the Proposed Route and would affect less state-managed land (Table 3.17-8).

The Proposed Route for Segment 1W(c) would cross approximately 24.2 miles of BLM-managed land, 2.3 miles of NFS land, 15.4 miles of state land, and 28.7 miles of private land.

Table 3.17-8. Miles Crossed by Land Ownership – Segment 1W

Segment/Alternative	Total	BLM	NFS	Other	State	Private
1W(a) Proposed – Total Length	76.5	26.6	2.3	–	18.5	29.1
Proposed – Comparison portion for Alternative 1W-A	20.3	–	–	–	10.3	10.0
Alternative 1W-A	16.2	–	–	–	5.6	10.7
1W(c) Proposed – Total Length	70.6	24.2	2.3	–	15.4	28.7

Miles are rounded to tenths of a mile; columns/rows may therefore not sum exactly.

Designated Corridors and Existing ROW

Segment 1W(a) would be adjacent to Segment 1W(c) for 61.1 miles of its 76.5-mile length. About 18.8 miles of Segment 1W(a) (25 percent of its total length) would be within the WWE corridor, 14.1 miles (18 percent) would be within the projected WWE corridor, and 21.9 miles (29 percent) would be adjacent to the projected WWE corridor (Table 2.4-2).

Approximately 5.3 miles of the 16.2-mile Alternative 1W-A (33 percent) is adjacent to the existing transmission line and 10.7 miles is adjacent to the projected WWE corridor. Viewed in terms of designated corridors and existing ROW, Alternative 1W-A makes better use of proximity to existing utility lines and the designated WWE corridor than the comparison section of the Proposed Route.

Approximately 21.0 miles (30 percent) of Segment 1W(c) is within the WWE corridor, 38.9 miles (55 percent) is within the projected WWE corridor, and 11.2 miles (16 percent) is adjacent to the projected WWE corridor.

Federal Land Use Plan Amendments

Medicine Bow Forest Plan

The Proposed Routes for Segments 1W(a) and 1W(c) would both cross the Medicine Bow-Routt NFs (see Figure 3.17-4). The Project, as currently designed along the Segments 1W(a) and 1W(c), would not be consistent with a standard found in the Medicine Bow Forest Plan (see Table 2.2-1). Segments 1W(a) and 1W(c) would each cross approximately 2.3 miles of land classified as MA 8.3, which allows development to dominate the foreground views; however, the development must be consistent with the SIOs of adjacent MAs. The adjacent land is MA 3.31where the SIO is Moderate. A plan amendment would be needed to permit a one-time allowance for the Gateway West Project to cross land managed to be consistent with this adjacent MA SIO (see Appendix F-2).

Segments 1W(a) and 1W(c) would also cross BLM-managed lands that fall within the jurisdiction of the Casper and Rawlins RMPs (Table 3.17-2). Proposed amendments for the Proposed Route and Route Alternatives are identified in Table 2.2-1.

Casper RMP

Portions of each of the Proposed Routes for Segments 1W(a) and 1W(c) would require that the Casper RMP be amended to allow the Project as a single-use visually altering action without changing the VRM class for about 0.1 mile in the Bates Creek area. The Proposed Route for Segment 1W(c) would also require that the Casper RMP be amended to allow the reclassification of 630 acres of VRM Class II to VRM Class III in the Deer Creek area.

No other plan amendments directly related to land use or recreation have been proposed for Segment 1W; however, as discussed in the Effects Common to All Action Alternatives section, all proposed plan amendments found in Appendix F could have indirect impacts to land use and recreation.

Plan Amendment Summary

Approval of plan amendments that would result in changes to ROS settings or VRM classes to more developed classifications have the potential to affect the quality of the experience for recreationists using the affected areas and would, in some cases, afford a less “semi-primitive” experience to users. Visual impacts to the potentially affected areas as well as the visual amendments, as discussed above, are evaluated in Section 3.2 – Visual Resources.

Specific Land Uses and Recreational Resources

Land Use

Land use within the Analysis Area for the Proposed Route is summarized by segment in Table 3.17-4. Viewed in terms of miles crossed, the Proposed Route for Segment 1W(a) would primarily cross rangeland (94 percent), with the remainder of the route crossing forest (3 percent) and water and wetlands (2 percent). The Proposed Route for Segment 1W(c) would also primarily cross rangeland (97 percent), with forest and water and wetlands each accounting for about 1 percent of the routes total length. Much of the Proposed Route for Segment 1W(c) would be rebuilt within an existing

ROW that would need to be expanded by only 25 feet and, as a result, relatively small amounts of clearing would be required in forested areas (Table 3.17-9).

Alternative 1W-A runs parallel to the northern portion of Proposed Route 1W(c) and is approximately 4 miles shorter than the comparison portion of the Proposed Route for Segment 1W(a). This alternative would cross approximately 4 miles less rangeland than the comparison portion of the Proposed Route (Table 3.17-4).

The Proposed Route for Segment 1W(a) would pass within 1,000 feet of eight residences; one of these residences would be within 300 feet of the proposed ROW centerline. Alternative 1W-A would pass within 1,000 feet of fewer residences than the comparison portion of the Proposed Route (two versus seven), and no residences are located within 300 feet of Alternative 1W-A compared to one within 300 feet of the comparison portion of the Proposed Route.

Table 3.17-9. Miles Crossed by Land Use – Segment 1W

Segment/ Alternative	Total	Rangeland	Agriculture	Forest	Water and Wetlands	ROW	Developed	Other
1W(a) Proposed – Total Length	76.5	72.2	–	2.6	1.2	0.4	–	–
Proposed – Comparison portion for Alternative 1W-A	20.3	19.7	–	0.1	0.2	0.2	–	–
Alternative 1W-A	16.2	15.5	–	–	0.6	0.2	–	–
1W(c) Proposed – Total Length	70.6	62.8	–	4.7	1.9	0.7	0.2	0.4

Miles are rounded to tenths of a mile; columns/rows may therefore not sum exactly.

The Proposed Route for Segment 1W(c) would pass within 1,000 feet of 23 residences between MPs 1.3 and 2.3; five of these residences are within 300 feet of the proposed ROW centerline. Segment 1W(c) involves the reconstruction of an existing transmission line and would, therefore, result in minimal new long-term effects on existing residences. The Proponents have committed to developing a transportation plan (see Appendix C-1, Attachment A) that addresses issues such as maintaining emergency access during construction, dust suppression, and notification procedures. The implementation of this plan is expected to reduce impacts to nearby private residences during construction.

The Proposed Route for Segment 1W(a) would cross two active mining claims and pass within 1,000 feet of several industrial buildings and outbuildings, a mine, and the boundary for a proposed wind farm. Like the comparison portion of the Proposed Route, Alternative 1W-A would pass within 1,000 feet of several outbuildings or structures. Segment 1W(c) would cross two active mining claims and a wind energy project and pass within 1,000 feet of a radio tower, a barn, and an electric substation.

Special Management Areas

The Proposed Routes for Segments 1W(a) and 1W(c) both cross about 10.5 miles of the Bates Hole MA, which was established by the BLM in 2007 to "protect highly erosive soils, fragile watersheds, and important and crucial wildlife habitat". This area has a restriction against new utility corridors, unless there are no other feasible options.

Wilderness Characteristics

Inventory Unit WY-R-1C contains approximately 8,964 acres of BLM-managed land identified as having wilderness characteristics. Proposed Route 1W(a) crosses the entire eastern side of the inventory unit, approximately 1,500 feet from the existing transmission line that forms the current boundary of the unit. If approved and constructed, this route would reduce the inventory unit by approximately 840 acres, shifting the boundary approximately 1,500 feet to the west. The remaining unit would still meet the size requirement. Construction activities would disrupt those seeking solitude. In the long term, people seeking solitude or primitive recreation would find opportunities for both, but would have to travel an additional 1,500 feet to the west, away from the highway that lies just east of the current boundary.

Inventory Unit WY-R-1D contains approximately 56,265 acres of BLM-managed land identified as having wilderness characteristics. Proposed Route 1W(a) crosses the entire eastern side of the inventory unit, approximately 1,500 feet from the existing transmission line that forms the current boundary of the unit. If approved and constructed, this route would reduce the inventory unit by approximately 1,308 acres, shifting the boundary approximately 1,500 feet to the west. The remaining unit would still meet the size requirement. Construction activities would disrupt those seeking solitude. In the long term, people seeking solitude or primitive recreation would find opportunities for both, but would have to travel an additional 1,500 feet to the west, away from the highway which lies just east of the current boundary.

Inventory Unit WY-R-1E contains approximately 5,461 acres of BLM-managed land which lies between two transmission lines. This area has been identified as having wilderness characteristics. None of the proposed or alternative routes cross this inventory unit. However, it is within the 1-mile study area within which micrositing may be implemented to reduce effects on resource. If the route remains to the west of the inventory unit, it would not affect the area's wilderness characteristics. If Proposed Route 1W(a) were moved to the east of the existing transmission line and Highway 487 and into this inventory unit, the unit would no longer be large enough to qualify as an area with wilderness characteristics. Conversely, if both Proposed Route 1W(a) and Alternative 1E-C no longer cross through all or part of WY-R-1D, effects on that inventory unit would be reduced. If only 1W(a) were moved east of the highway and 1E-C remained as proposed, effects on WY-R-1D would remain as described above.

Historic Trails

Segments 1W(a) and 1W(c) would cross a segment of the Oregon/California, Pony Express, and Mormon Pioneer NHTs, where they all share the same alignment, and would also cross the Child's Cutoff and the Bozeman Trail. Alternative 1W-A would cross the Oregon/California, Pony Express, and Mormon Pioneer NHTs and Child's

Cutoff, but would not cross the Bozeman Trail. Potential impacts to historic trails are assessed in Section 3.3 – Cultural Resources.

OHV Use

The Proposed Route would cross 2.8 miles of public land where OHV use is limited to existing roads and 4.2 miles with seasonal closure. The Proposed Route would cross one trail that is designated closed to OHV use and new road construction would result in one additional trail crossing. In open areas (the majority of the route), it would be difficult to physically close these access points to unauthorized OHV use. OHV use on nonmotorized trails could disrupt existing uses, such as hiking and horseback riding, and may result in adverse effects to trails not designed maintained for motorized use. The Proponents would post signs identifying the area as closed to OHV use and implement blocking measures where practical.

Alternative 1W-A would be 4.1 miles shorter than the comparison portion of the Proposed Route and it would cross 0.3 mile less area with seasonal closure. Alternative 1W-A would cross one trail designated as closed to OHV use, the same as the comparison portion of the Proposed Route. There would be two trail crossings due to road construction under both Alternative 1W-A and the comparison portion of the Proposed Route. Overall, there would be slightly less risk of unauthorized OHV access under Alternative 1W-A and a similar opportunity for unauthorized OHV access to trails.

Segment 2

Segment 2, as proposed, would link the Aeolus and Creston Substations in southeast Wyoming with two 500-kV circuits on one structure. One circuit would be operated at 230 kV during the initial phase of the Project. Its total proposed length is 96.7 miles. Fifty-two acres of the expansion of the Aeolus Substation and the construction of the Creston Substation and 0.5 acre for one regeneration site are attributed to Segment 2. There are three Route Alternatives, two of which are near the community of Fort Fred Steele. Alternative 2A at 28.4 miles long is being considered by the BLM because it remains in the WWE corridor nearer the town and the state historic site, and Alternative 2B, at 6.2 miles, is closer to the community than the comparison portion of the Proposed Route and was the initially proposed route before the Proponents responded to local suggestions and relocated the Proposed Route farther to the south. Alternative 2C is a 24.4-mile alternative located north of Hanna, Wyoming. It is being evaluated at the recommendation of the Wyoming Governor's office to follow a utility corridor approved by that office for minimizing effects to sage-grouse (see Appendix A, Figure A-3).

Land Ownership

The Proposed Route for Segment 2 would cross approximately 36.9 miles of BLM-managed land, 6.2 miles of state land, and 53.5 miles of private land (Table 3.17-10). Alternatives 2A and 2B would be both less than 1 mile shorter than the Proposed Route and cross almost the same miles of land ownership. Alternative 2C would be approximately 4 miles shorter than the comparison portion of the Proposed Route and would cross almost 5 fewer miles of private land (Table 3.17-10).

Table 3.17-10. Miles Crossed by Land Ownership – Segment 2

Segment/Alternative	Total	BLM	NFS	Other	State	Private
Proposed – Total Length	96.7	36.9	–	–	6.2	53.5
Proposed – Comparison Portion for Alternative 2A	28.8	10.1	–	–	2.4	16.2
Alternative 2A	28.4	10.2	–	–	1.7	16.5
Proposed – Comparison Portion for Alternative 2B	7.0	4.2	–	–	–	2.7
Alternative 2B	6.2	2.3	–	–	–	3.8
Proposed – Comparison Portion for Alternative 2C	28.4	9.6	–	–	1.0	17.8
Alternative 2C	24.4	11.4	–	–	–	13.0

Miles are rounded to tenths of a mile; columns/rows may therefore not sum exactly.

Designated Corridors and Existing ROW

There is an existing 230-kV transmission line corridor between the planned Aeolus and proposed Creston Substations. During siting studies, routing obstacles pushed the Proposed Route away from the existing and designated WWE corridor. These obstacles include oil and gas development, lek concentrations, and proximity to Fort Fred Steele. The Proposed Route would follow the existing transmission corridor for 53.9 miles (56 percent) of its length. This includes 16.5 miles (17 percent) within the WWE corridor, 24.2 miles (25 percent) within the projected WWE corridor, and 11.8 miles (12 percent) adjacent to the projected WWE corridor (Table 2.4-2).

Alternatives 2A and 2B would remain adjacent to the existing transmission lines as well as being substantially in or adjacent to the WWE corridor (Table 2.4-2). While these alternatives maximize use of existing and designated corridors, they are closer to Fort Fred Steele and residences. Alternative 2C would be mostly a Greenfield route proceeding northeast to southwest and north of the Proposed Route and Alternative 2A. Alternative 2C would be within or adjacent to an existing transmission corridor for just 3.5 miles (14 percent of its total length), but would follow an established corridor through core sage-grouse population areas (Table 2.4-2).

Federal Land Use Plan Amendments

Segment 2 would cross BLM-managed lands that fall within the jurisdiction of the Rawlins RMP (Table 3.17-2). Proposed amendments for the Proposed Route and Route Alternatives are identified in Table 2.2-1.

<u>Rawlins RMP</u>

The Proposed Route for Segment 2, if approved, would require two amendments to the Rawlins RMP to allow surface-disturbing activities on public lands within 0.25 mile on either side of the North Platte River, and to allow the Project as a visually altering action without changing the affected VRM classifications (Table 2.2-1). The Proposed Route would also cross 0.24 mile of the North Platte SRMA on the east side of the river. Alternatives 2A and 2B would cross the North Platte River north of the Proposed Route's crossing and would not cross the North Platte SRMA.

Plan Amendment Summary

Approval of plan amendments that would result in changes to visual resources that have the potential to affect the quality of the experience for recreationists using the affected areas and would, in some cases, afford a less "semi-primitive" experience to users. Visual impacts to the potentially affected areas as well as the visual amendments, as discussed above, are evaluated in Section 3.2 – Visual Resources.

Specific Land Uses and Recreational Resources

Land Use

Land use within the Analysis Area for the Proposed Route is summarized by segment in Table 3.17-4. Viewed in terms of miles crossed, the Proposed Route for Segment 2 would primarily cross rangeland (96 percent), with water and wetlands accounting for about 2 percent of the route's total length. Alternatives 2A through 2C would range from less than 1 mile to about 4 miles shorter than their respective comparison portions of the Proposed Route, with generally commensurate reductions in the miles of rangeland crossed (Table 3.17-11).

Table 3.17-11. Miles Crossed by Land Use – Segment 2

Segment/ Alternative	Total	Rangeland	Agriculture	Forest	Water and Wetlands	ROW	Developed	Other
Proposed – Total Length	96.7	93.1	–	–	1.6	1.0	0.1	0.9
Proposed – Comparison Portion for Alternative 2A	28.8	27.8	–	–	0.7	0.3	–	–
Alternative 2A	28.4	27.5	–	–	0.6	0.2	–	–
Proposed – Comparison Portion for Alternative 2B	7.0	6.8	–	–	0.1	0.1	–	–
Alternative 2B	6.2	5.8	–	–	0.3	0.1	–	–
Proposed – Comparison Portion for Alternative 2C	28.4	27.5	–	–	0.3	0.2	–	0.4
Alternative 2C	24.4	23.8	–	—	0.2	0.1	–	0.3

Miles are rounded to tenths of a mile; columns/rows may therefore not sum exactly.

Segment 2 generally would follow the existing SR 72 and U.S. Highway 30 corridors west from the Aeolus Substation. Land use within the Analysis Area for this segment is primarily rangeland (96 percent) (Table 3.17-4). This segment begins in the vicinity of an existing wind farm. Approximately 12.5 miles of the Aeolus Substation, it would cross about 2 miles of a former strip mine. Farther west, south of the city of Rawlins, the segment would pass within 1 mile of oil and gas development that continues for about 10 miles to the proposed Creston Substation site.

The Proposed Route for Segment 2 would pass within 1,000 feet of one residence; there are no residences located within 300 feet of the proposed ROW centerline. Alternative 2B would pass within 1,000 feet of seven residences between MP 1.8 and 1.9; one of these residences is within 300 feet of the proposed ROW centerline.

The Proposed Route would cross approximately 15 miles of the planned Chokecherry-Sierra Madre Wind Farm Project and would pass within 1,000 feet of several industrial

buildings (at about MP 23), two mines, and an active mining claim. The 500-kV TransWest Express transmission line is proposed to traverse from east to west in the same general area. Alternative 2A would also cross potential wind energy sites and pass within 1,000 feet of a gravel pit. Alternative 2B would pass within 1,000 feet of a gravel pit and an active mine. Alternative 2C would pass within 1,000 feet of an active mine and cross areas identified as active coal leases and a coal mine.

The following mitigation measures are proposed to address potential conflicts between the project and wind energy facilities and industrial buildings:

LU-4 Coordinate with the Chokecherry-Sierra Madre Wind Farm and TransWest Express Project developers and BLM along the Segment 2 Proposed Route to ensure mutually compatible siting of transmission lines and wind energy facilities.

LU-5 Work with the owners of potentially affected industrial buildings and microsite the transmission line during final design to avoid impact to these structures.

During follow-on meetings sponsored by the Proponents, concerns were raised about visual impacts to the Fort Fred Steele Historic Site and proximity to nearby rural residences. In addition, the Wyoming Office of the Governor requested that an alternative crossing to the south of I-80 be considered for detailed analysis to avoid these resources (OGW 2009a). Based on these concerns, the Proposed Route was modified to avoid the Fort Fred Steele Historic Site and nearby residences. Figure 3.17-7 shows the Proposed Route and Route Alternatives for this portion of Segment 2.

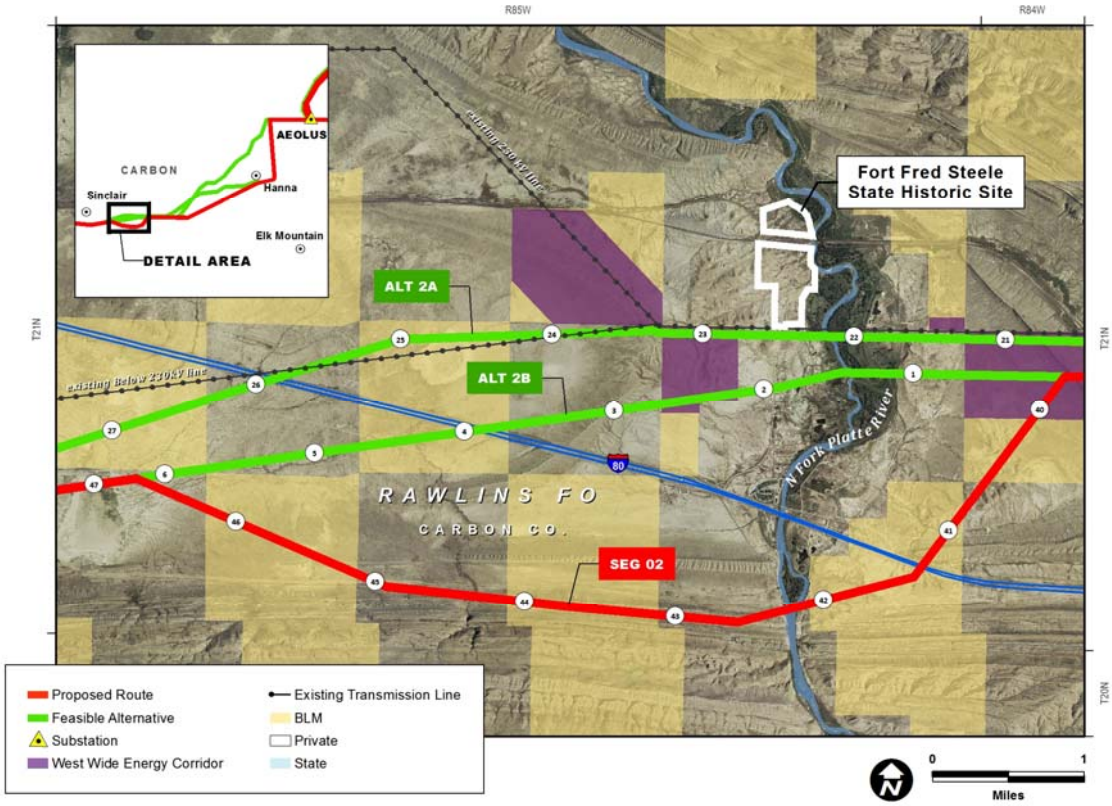


Figure 3.17-7. Fort Fred Steele Vicinity – Proposed Route and Route Alternatives

This portion of the Proposed Route is slightly longer than the corresponding parts of the Route Alternatives (see Table 3.17-6) but avoids potential impacts to the Fort Fred Steele Historic Site and the rural residences located near the Route Alternatives.

Special Management Areas

The Proposed Route and Route Alternatives for Segment 2 would cross three SRMAs and one Wildlife Habitat MA (Table 3.17-12).

Table 3.17-12. Special Management Areas Crossed by the Proposed Route and Route Alternatives for Segment 2

Proposed Route/Alternative[1/]	Segment Length (Miles)	Management Area	Miles Crossed
Proposed – Total Length	96.7	North Platte River SRMA	0.24
		Continental Divide National Scenic Trail (NST) SRMA	0.25
		OHV SRMA	1.0
		Red Rim-Daley Wildlife HMA	5.7
Proposed – Comparison portion for Alt 2A	28.8	North Platte River SRMA	0.24
		Continental Divide NST SRMA	0.25
Alternative 2A	28.4	Continental Divide NST SRMA	0.25
Proposed – Comparison portion for Alt 2B	7.0	North Platte River SRMA	0.24
		Continental Divide NST SRMA	0.25
Alternative 2B	6.2	Continental Divide NST SRMA	0.25
Proposed – Comparison portion for Alternative 2C	28.4	None	NA
Alternative 2C	24.4	None	NA

1/ Route Alternative are only included in this table if the comparison portion of the Proposed Route or the Route Alternative would cross a species designated management area.

The Proposed Route would cross 0.24 mile of the North Platte River SRMA on the east side of the river. The North Platte River SRMA consists of 5,060 acres of lands located in discrete areas along the river. Surface-disturbing activities on public lands within 0.25 mile on either side of the river are intensively managed to maintain the quality of the visual resource. As a result, the proposed crossing would require an amendment to the Rawlins RMP (as discussed above).

The part of the SRMA that would be crossed by the Proposed Route is less than 1,000 feet from I-30 at its closest point, and the Proposed Route would cross this SRMA within 0.5 mile of I-80. This part of the SRMA is separated from the river by an access road. Construction of the proposed Project in this location could potentially affect the quality of the recreation experience in this area but the visual setting is only one aspect of the outdoor recreation experience and other types of infrastructure, including I-80, already exist in the immediate vicinity.

Alternatives 2A and 2B would cross the North Platte River, north of I-30, but would not cross the North Platte River SRMA. Alternative 2C would also not cross the North Platte River SRMA.

The Continental Divide National Scenic Trail SRMA consists of 600 acres based on a 0.25-mile corridor that follows the trail on lands managed under the Rawlins RMP. The Proposed Route would cross this SRMA south of I-80 in the vicinity of Rawlins. Alternatives 2A and 2B would also cross this SRMA (Table 3.17-12); however, Alternative 2C would not cross this SRMA.

The Proposed Route would cross 1 mile of the OHV SRMA. The management goal for this SRMA is to provide opportunities for safer OHV riding opportunities and OHV use for local residents and visitors to the area. There are no alternatives to this portion of the Proposed Route (Table 3.17-11).

The Proposed Route would cross approximately 5.7 miles of the Red Rim-Daley Wildlife HMA. The Proposed Route would parallel (offset by 1,500 feet) an existing 230-kV transmission line across the affected sections. There are no alternatives to this portion of the Proposed Route (Table 3.17-12).

Wilderness Characteristics

As noted earlier, no areas with wilderness characteristic are crossed in this segment.

Historic Trails

Segment 2 would not cross any NHTs but would cross the Rawlins to Baggs Stage Road and would also cross the Lincoln Highway several times (see Table 3.3-9 in Section 3.3 – Cultural Resources). Potential impacts to historic trails are assessed in Section 3.3 – Cultural Resources.

OHV Use

The Proposed Route would cross 2.4 miles of public land closed to OHV use and 36.9 miles where OHV use is limited to existing routes. The Proposed Route would not cross any additional trails closed to OHV use and there would be no additional trail crossings due to new road construction. The Proposed Route would provide new access for OHVs to areas where OHV use is limited. In open areas (the majority of the route) it would be difficult to physically close the route to unauthorized OHV use. The Proponents would post signs identifying the area as closed to OHV use and implement blocking measures where practical.

Alternative 2A would be 0.4 mile shorter than the comparison portion of the Proposed Route but it would cross a similar amount of area with seasonal closure. Neither Alternative 2A nor the comparison portion of the Proposed Route would result in additional trail crossings; however, all of Alternative 2A is co-located with existing transmission lines, compared to less than 25 percent of the comparison portion of the Proposed Route. Therefore, the Proposed Route would likely have a greater effect on unauthorized OHV use compared to Alternative 2A.

Alternative 2B would be 0.8 mile shorter than the comparison portion of the Proposed Route and it would cross 1.9 miles less area where OHV use is limited to existing routes. Neither Alternative 2B nor the comparison portion of the Proposed Route would result in additional trail crossings. However, nearly 95 percent of Alternative 2B is co-located with existing transmission lines, compared to 11 percent of the comparison

portion of the Proposed Route. Therefore, the Proposed Route would likely have a greater effect on unauthorized OHV use compared to Alternative 2B.

Alternative 2C would be 4 miles shorter than the comparison portion of the Proposed Route but it would cross 1.9 miles more area where OHV use is limited to existing routes. Neither Alternative 2C nor the comparison portion of the Proposed Route would result in additional trail crossings. The comparison portion of the Proposed Route is routed to better utilize existing transmission line ROWs. Therefore, the Proposed Route would likely have less of an effect on unauthorized OHV use compared to Alternative 2C.

Segment 3

Segment 3, as proposed, would link the Creston and Anticline Substations in southeast Wyoming with two 500-kV circuits on one structure. One circuit would be operated at 230 kV during the initial phase of the Project. Its total proposed length between those two substations is 46.7 miles. Sixty-nine acres of the construction of the Anticline and Creston Substations are attributed to Segment 3. Segment 3 would also link the Anticline and Jim Bridger Substations with a 4.3-mile 230-kV line and a 5.5-mile 345-kV line and includes the 10-acre expansion of the Jim Bridger 345-kV Substation. There are no alternatives proposed along this segment (see Appendix A, Figure A-4).

Land Ownership

The Proposed Route would cross approximately 29 miles of BLM-managed land, 1 mile of state land, and 26.5 miles of private land (Table 3.17-13).

Table 3.17-13. Miles Crossed by Land Ownership – Segment 3

Segment/Alternative	Total	BLM	NFS	Other	State	Private
Proposed – Total Length	56.5	29.0	–	–	1.0	26.5

Miles are rounded to tenths of a mile; columns/rows may therefore not sum exactly.

The proposed Creston Substation would be located on BLM-managed lands approximately 4 miles south of Wamsutter, as shown in Appendix A-Figure A-4. Approximately 13 acres would be developed within the fenced area. The substation would be on the east side of Wamsutter Crooks Gap Road, allowing easy access while avoiding impacts to wetlands, oil and gas wells, and pipelines. There appear to be no land use constraints that would prohibit construction of the proposed substation at this location.

Designated Corridors and Existing ROW

The 56.5-mile Proposed Route would follow a combination of existing transmission lines for 49.3 miles but very little would be within the WWE corridor. The WWE corridor does not follow existing transmission lines in this area and the WWE corridor location is constrained by existing development associated with roads, railroad, mining, and oil and gas operations.

Federal Land Use Plan Amendments

Segment 3 would cross BLM-managed lands that fall within the jurisdiction of the Rawlins and Green River RMPs (Table 3.17-2). Proposed amendments for the Proposed Route are identified in Table 2.2-1. No plan amendments are proposed for

Segment 3 that are directly related to land use or recreation; however, as discussed in the "Effects Common to All Action Alternatives" section, all proposed plan amendments found in Appendix F could have indirect impacts to land use and recreation.

Specific Land Uses and Recreational Resources

Land Use

Land use within the Analysis Area for the Proposed Route is summarized by segment in Table 3.17-4. Viewed in terms of miles crossed, the Proposed Route for Segment 3 would primarily cross rangeland (96 percent), with water and wetlands accounting for about 2 percent of the route's total length.

Segment 3 generally would follow the existing U.S. Highway 30 corridor and existing ROWs account for about 2 percent of the total Analysis Area for this segment (Table 3.17-4). Oil and gas development occurs in the general vicinity of both the proposed Creston and Anticline Substation sites. Several areas of strip mining are also located in the vicinity of the Anticline Substation site. These land uses are not within 500 feet of Segment 3.

There are no residences or other structures located within 1,000 feet of the Proposed Route. This segment would cross 0.3 mile of the Table Rock city limits and would pass within 1,000 feet of the Patrick Draw Oil Field, nine oil/gas wells, and the Point of Rocks city limits. The Agencies have identified the following mitigation measure to ensure that the final alignment maintains a 250-foot buffer from identified wells:

LU-6 Review the final location of the Segment 3 Proposed Route with any affected oil/gas well operators to ensure measures are taken to protect against any impacts to wells. This measure also applies to any segment where the Proposed Route would be near oil/gas wells.

Special Management Areas

Federal lands along Segment 3 are regulated in part by the Rawlins and Green River RMPs. Segment 3 would not cross any SMAs identified in these plans.

Wilderness Characteristics

As noted earlier, no areas with wilderness characteristic are crossed in this segment.

Historic Trails

Segment 3 would not cross any NHTs but would cross the Overland Trail and the Point of Rocks to South Pass Stage Road, and would also cross the Lincoln Highway (see Table 3.3-10 in Section 3.3 – Cultural Resources). The Overland Trail is not well-marked and mostly alternates between sections of private lands and BLM-managed public lands west of the Platte River. The part of the Point of Rocks to South Pass Stage Road that would be crossed by Segment 3 has been converted to a modern roadway. Potential impacts to historic trails are assessed in Section 3.3.

OHV Use

The Proposed Route would cross 12.0 miles of public land where OHV use is limited to existing roads. The Proposed Route would not cross any trails closed to OHV use and

there would be no additional trail crossings due to new road construction. Approximately 98 percent of the Proposed Route is co-located with an existing transmission line; therefore, there would be no effect on OHV use.

Segment 4

Segment 4, as proposed, would link the Anticline Substation near the Jim Bridger Power Plant in southwestern Wyoming with the Populus Substation in Idaho with two 500-kV circuits on one structure. Its total proposed length is 203.0 miles. Eighty-nine acres of the construction of the Anticline Substation and the expansion of the Populus Substation, and 1.5 acres for three regeneration sites are attributed to Segment 4. It has six Route Alternatives in the middle portion of its route but the first 52 miles to the east and the last 61 miles to the west (in Idaho) do not have any Route Alternatives. The middle section of the Proposed Route is 90.2 miles long, and its Route Alternatives vary from 85.2 to 102.2 miles long. These alternatives were proposed by the Wyoming Governor's office (4A, paralleling the existing 345-kV lines throughout); by the BLM Kemmerer FO (4B through 4E, including edits from various cooperating agencies), with the intent to avoid impacts to cultural resources to the extent practical; and by the Proponents (4F, attempting to avoid impacts to cultural resources while still remaining north of the existing lines) (see Appendix A, Figures A-5 and A-6).

Land Ownership

The Proposed Route for Segment 4 would cross approximately 82.2 miles of BLM-managed land, 3.1 miles of Bureau of Reclamation land, 9.2 miles of NFS land, 10.7 miles of state land, and 97.7 miles of private land (Table 3.17-14). The six proposed alternatives (Alternatives 4A through 4F) range from 5 miles shorter to 12 miles longer than the comparison portion of the Proposed Route and would cross similar totals of miles by land ownership (Table 3.17-14). In addition, Alternatives 4C and 4E cross 0.7 mile of the USFWS-managed Cokeville Meadows NWR.

Table 3.17-14. Miles Crossed by Land Ownership – Segment 4

Segment/Alternative	Total	BLM	NFS	Other[1/]	State	Private
Proposed – Total Length	203.0	82.2	9.2	3.1	10.7	97.7
Proposed – Comparison Portion for Alternative 4A - 4F	90.2	53.0	–	3.1	2.7	31.4
Alternative 4A	85.2	43.0	–	3.1	4.5	34.4
Alternative 4B	100.2	50.6	–	0.6	8.1	41.0
Alternative 4C	101.6	46.9	–	1.2	8.6	44.9
Alternative 4D	100.8	52.1	–	0.6	6.7	41.4
Alternative 4E	102.2	48.4	–	1.2	7.2	45.3
Alternative 4F	87.5	45.2	–	3.1	3.6	35.7

Miles are rounded to tenths of a mile; columns/rows may therefore not sum exactly.

1/ The Other category for the Proposed Route and Alternatives 4A, 4B, 4D, and 4F consists of Bureau of Reclamation lands; Other for Alternatives 4C and 4E consists of 0.6 mile Bureau of Reclamation and 0.7 mile USFWS-managed lands.

Designated Corridors and Existing ROW

The Proposed Route begins on the east end in the Rock Springs FO where it would follow the WWE corridor. It proceeds into the Kemmerer FO where there is no WWE corridor or designated corridor going in the same direction as the Gateway West route.

An existing 345-kV transmission line does, however, cross the Kemmerer FO diagonally, southeast to northwest, and would be paralleled by Alternative 4F.

From the Kemmerer FO, the route heads into the BLM Pocatello FO in an area where there are no designated corridors and across the Caribou-Targhee NF, where there is no WWE corridor. The Caribou-Targhee NF is, however, crossed by a 600–foot-wide designated utility corridor that is occupied by two existing 345-kV transmission lines. Initial siting studies for the Project attempted to locate this part of the segment within the existing corridor but, due to terrain, narrow corridor width, and reliability separation criteria, the route was not co-located. The current, nearby location has been developed in conjunction with the Forest Service to best meet the intent of consolidating utility lines.

Approximately 96.4 miles (48 percent) of the Proposed Route would be located within or adjacent to an existing transmission corridor, 11.9 miles (6 percent) is within the WWE corridor, 14.1 miles (7 percent) is within the projected WWE corridor, and 10.6 miles (5 percent) is adjacent to the WWE corridor (Table 2.4-2).

The lengths of the Route Alternatives that follow existing transmission lines range from 35.6 miles under Alternatives 4B through 4E, 54.1 miles under Alternative 4F, to 77.5 miles under Alternative 4A. The 77.5 miles of Alternative 4A that follow existing transmission lines comprise the majority (91 percent) of the total length of this alternative. Alternatives 4A through 4F all cross the Kemmerer FO where there is no WWE corridor or designated corridor. As a result, none of these alternatives would be located within a designated ROW corridor.

Federal Land Use Plan Amendments

Caribou Forest Plan

The Project, as currently designed along Segment 4, would not be consistent with a standard found in the Caribou Forest Plan, which requires that “existing and proposed rights-of-way… shall be designated as corridors” (see Table 2.2-1). This requirement includes “[e]lectric transmission lines of 66KV and greater, including fiberoptics.” Segment 4 would cross portions of the Caribou-Targhee NF currently designated as Prescription 5.2 (Forest Vegetation Management), Prescription 2.7.2 (Elk and Deer Winter Range), and Prescription 3.2 (Semi-Primitive Recreation). In addition, the Project would not be consistent with two guidelines within the Caribou Forest Plan that would directly affect recreation. The Scenic Resources Guideline 2 states that projects should be implemented to meet the VQOs displayed on the Forest VQO map and the Recreation Guideline 4 states that they should be implemented to meet the ROS depicted on the Forest ROS map. The portions of the NF that would be crossed by the Project have VQOs of Retention and Partial Retention and ROS classifications of RN and SPM. To be consistent with Forest Plan direction, an amendment is needed to designate the ROW for the proposed double circuit 500-kV line as Prescription 8.1 (Concentrated Development Areas; see Appendix F-2). The corridor would be 9.2 miles long by 300 feet wide and areas within 500 feet of the transmission line and new access roads would be amended to have an ROS of RN. VQOs are not specifically assigned to areas with MA 8.1; therefore, an amendment to the Scenery Guideline to allow the

Project would be needed. Approval of this plan amendment would result in impacts to the experiences of recreationalists that use these areas, in that these areas would afford a less "semi-primitive" experience to users. The associated changes in ROS are discussed below in the Specific Land Uses and Recreational Resources subsection.

Segment 4 would cross BLM-managed lands that fall within the jurisdiction of the Green River, Kemmerer, and Pocatello RMPs (Table 3.17-2). No amendments would be required for the portion of the Project located on lands managed under the Pocatello RMPs (no amendments directly related to land use or otherwise).

Green River RMP

The Proposed Route for Segment 4, if approved, would require that the Green River RMP be amended to allow the Project to cross the VRM Class II designated areas on the east side of the Green River (see Section 3.2 – Visual Resources).

Kemmerer RMP

The Proposed Route and Alternatives 4A, 4B, 4C, 4D, 4E, and 4F cross lands mapped as VRM Class II within the Kemmerer RMP (a corridor extending up to 1 mile on either side of the Sublette Cutoff and Slate Creek Cutoff). The Project would not be consistent with the VRM class in this area. Therefore, these routes could not be selected unless the Kemmerer RMP is amended to allow the Project as a visually altering action. In order for the Proposed Route or any of the Route Alternatives to be selected, an amendment to the Kemmerer RMP would be needed to allow the Project as a visually altering action without changing the VRM class. If any of the Alternatives 4B through 4E is selected, the plan would also be amended to change the VRM classification from VRM Class II to VRM Class III for areas crossed by portions of those routes (see Section 3.2 – Visual Resources and Appendices F-1 and G-1).

The Proposed Route and Alternatives 4A, 4C, 4E, and 4F would not be consistent with the management objectives found in the Kemmerer RMP for the Tunp/Dempsey area, or areas near U.S. Highway 189 (see Table 2.2-1). Therefore, these routes could not be selected unless the Kemmerer RMP is amended to permit a one-time allowance for the Project where it would otherwise be in conflict. One amendment is proposed for the impacts to the viewshed of this area that would result from the Proposed Route and Alternatives 4A and 4F, while another amendment is proposed for impacts to habitats and the creation of a new ROW within this area as a result of Alternatives 4A, 4C, and 4E (see Section 3.2 – Visual Resources and Appendices F-1 and G-1).

The Proposed Route would cross within 3 miles of eligible NRHP sites whose viewsheds are protected under the Kemmerer RMP; thus, the Proposed Route does not conform to the Kemmerer RMP. An amendment to the Kemmerer RMP has been proposed that would permit a one-time allowance for the Project within these sites' viewshed (see Section 3.2 – Visual Resources and Appendix F).

Plan Amendment Summary

Approval of plan amendments that would result in changes to ROS settings, VQO, or VRM classes to more developed classifications have the potential to affect the quality of the experience for recreationalists using the affected areas and would, in some cases,

afford a less "semi-primitive" experience to users. Visual impacts to the potentially affected areas as well as the visual amendments, as discussed above, are evaluated in Section 3.2 – Visual Resources.

Specific Land Uses and Recreational Resources

Land Use

Land use within the Analysis Area for the Proposed Route is summarized by segment in Table 3.17-4. Viewed in terms of miles crossed, the Proposed Route for Segment 4 would primarily cross rangeland (80 percent), with the remainder of the route crossing forest (10 percent), cropland (5 percent), and water and wetlands (2 percent). Alternatives 4A through 4F range from approximately 5 miles shorter (Alternative 4A) than the comparison portion of the Proposed Route to 12 miles longer (Alternative 4E). All of the alternatives would cross fewer miles of forest than the Proposed Route—with the net reduction in miles of forest crossed ranging from 6.6 miles to 8.9 miles—and more miles of rangeland (Table 3.17-15).

Table 3.17-15. Miles Crossed by Land Use – Segment 4

Segment/ Alternative	Total	Rangeland	Agriculture	Forest	Water and Wetlands	ROW	Developed	Other
Proposed – Total Length	203.0	162.0	9.3	20.7	7.2	1.2	0.1	2.5
Proposed – Comparison Portion for Alternative 4A - 4F	90.2	77.9	0.4	8.9	2.5	0.5	0.1	–
Alternative 4A	85.2	79.4	0.7	1.2	3.3	0.2	0.3	–
Alternative 4B	100.2	94.4	2.6	–	2.1	0.5	0.2	0.4
Alternative 4C	101.6	98.6	0.2	–	1.5	0.6	0.4	0.4
Alternative 4D	100.8	95.0	2.6	0.1	2.1	0.4	0.2	0.4
Alternative 4E	102.2	99.2	0.2	0.1	1.5	0.5	0.4	0.4
Alternative 4F	87.5	80.6	1.4	2.3	2.9	0.2	0.2	–

Miles are rounded to tenths of a mile; columns/rows may therefore not sum exactly.

The Proposed Route for Segment 4 would pass within 1,000 feet of 11 residences; four of these residences are located within 300 feet of the proposed ROW centerline. The number of residences within 1,000 feet of the Route Alternatives ranges from one (Alternative 4B and 4D) to 3 (Alternative 4F), versus 3 for the comparison section of the Proposed Route. There are no residences located within 300 feet of the proposed ROW centerlines for the Route Alternatives, versus 1 for the comparison portion of the Proposed Route (Table 3.17-16).

The Proposed Route would cross 2.5 miles of the city impact area of the City of Downey (Bannock County) in the vicinity of the Populus Substation.

Table 3.17-16. Number of Residences within 1,000 feet and 300 feet – Segment 4

Proposed Route/ Alternative	Within 1,000 Feet			Within 300 Feet		
	Proposed Route/ Alternative	Comparison Portion of the Proposed Route	Net Difference	Proposed Route/ Alternative	Comparison Portion of the Proposed Route	Net Difference
Proposed Route	11	3	8	4	1	3
Alternative 4A	2	3	-1	–	1	-1
Alternative 4B	1	3	-2	–	1	-1
Alternative 4C	2	3	-1	–	1	-1
Alternative 4D	1	3	-2	–	1	-1
Alternative 4E	2	3	-1	–	1	-1
Alternative 4F	3	3	–	–	1	-1

The Proposed Route would pass within 1,000 feet of a wind energy facility, 10 non-residential buildings or structures, a substation, a gravel pit, and a mine. None of these land uses are located within 1,000 feet of the portion of the Proposed Route used for comparison with the proposed Route Alternatives. Commercial, industrial, and institutional land uses crossed or within 1,000 feet of the Route Alternatives are itemized by milepost in Table D.17-1 in Appendix D and summarized below.

Alternative 4A would cross approximately 7 miles of a proposed wind farm boundary and is within 1,000 feet of one other wind energy facility, an oil/gas well, three industrial buildings or other structures, the Kemmerer #1 dam and reservoir, a wastewater treatment facility, and Cook Canal.

Alternative 4B would pass within 1,000 feet of an oil/gas well, the Glencoe Mine and Elkol Strip Mine, the CH Smith dam and reservoir, two center-pivot agricultural facilities, and the B-Q Dam.

Alternative 4C would cross approximately 1 mile of a proposed wind farm boundary and an active mining claim. This alternative is within 1,000 feet of an oil/gas well, the Glencoe Mine and the Elkol Strip Mine, the CH Smith dam and reservoir, a substation, a gravel pit, two commercial buildings, and several barns and sheds.

Alternative 4D would cross approximately 4.5 miles of wind energy facilities and an active mining claim. This alternative is within 1,000 feet of an oil/gas well, the Glencoe Mine and the Elkol Strip Mine, the CH Smith dam and reservoir, a mine, two center-pivot agricultural facilities, and the B-Q Dam.

Alternative 4E would cross approximately 2 miles of a proposed wind farm boundary and an active mining claim. This alternative is within 1,000 feet of an oil/gas well, the Glencoe Mine, the Elkol Strip Mine, the CH Smith dam and reservoir, a mine, a substation, a gravel pit, two commercial buildings, and several barns and sheds.

Alternative 4F would cross approximately 8 miles of a proposed wind farm boundary. This alternative is within 1,000 feet of an oil/gas well, four center-pivot agricultural facilities, and the Cook Canal. Alternative 4F also would pass within 1,000 feet of the Pine Creek Ski Area, a ski resort located south of Cokeville, Wyoming, on BLM-

managed land. The Proposed Route and other Route Alternatives for Segment 4 do not cross or pass within 1,000 feet of this area.

Special Management Areas

Federal lands along Segment 4 are regulated in part by the Green River, Kemmerer, and Pocatello RMPs. The Proposed Route and Route Alternatives for Segment 4 would cross the Oregon Trail, Pine Creek Canyon, and Dempsey Ridge SRMAs, as well as the Rock Creek/Tunp and Bear River Divide SMAs and the Cokeville Meadows NWR (Table 3.17-17).

Table 3.17-17. Special Management Areas Crossed by the Proposed Route and Route Alternatives for Segment 4

Proposed or Alternative Name[1/]	Segment Length (Miles)	Management Area	Miles Crossed
Proposed - Total Length	203.0	Oregon Trail SRMA	3.0
		Pine Creek Canyon SRMA	1.7
Proposed - Comparison portion for Alternatives 4A,B,C,D,E,F	90.2	Oregon Trail SRMA	3.0
		Pine Creek SRMA	1.7
Alternative 4A	85.2	Dempsey Ridge SRMA	6.0
		Rock Creek/Tunp SMA	3.6
Alternative 4B	100.2	Bear River Divide SMA	5.5
		Cokeville Meadows NWR	4.6
Alternative 4C	101.6	Bear River Divide SMA	4.3
		Cokeville Meadows NWR	2.3
		Rock Creek/Tunp SMA	4.1
Alternative 4D	100.8	Bear River Divide SMA	5.5
		Cokeville Meadows NWR	4.6
Alternative 4E	102.2	Bear River Divide SMA	4.3
		Cokeville Meadows NWR	2.3
		Rock Creek/Tunp SMA	4.1
Alternative 4F	87.5	Dempsey Ridge SRMA	9.4

1/ Alternative routes are only included in this table if the comparison portion of the Proposed Route or Route Alternative would cross a species designated management area.

The Proposed Route would cross 3 miles and 1.7 miles of the Oregon NHT and Pine Creek Canyon SRMAs, respectively. All of the Route Alternatives proposed for this segment—Alternatives 4A to 4F—would avoid crossing both of these SRMAs (Table 3.17-17).

Alternatives 4A and 4F would cross approximately 6 miles and 9.4 miles of the Dempsey Ridge SRMA, respectively. The Proposed Route would not cross the SRMA (Table 3.17-17).

Alternative 4A would cross approximately 3.6 miles of the Rock Creek/Tunp SMA and Alternatives 4C and 4E, sharing a common alignment, would cross approximately 4.1 miles. The Proposed Route would not cross this SMA (Table 3.17-17).

Alternatives 4B and 4D, sharing a common alignment, would cross approximately 5.5 miles of the Bear River Divide SMA, and Alternatives 4C and 4E, sharing a different

common alignment, cross approximately 4.3 miles. The Proposed Route would not cross this SMA (Table 3.17-17).

Alternatives 4B and 4D, sharing a common alignment, would cross approximately 4.6 miles of the Cokeville Meadows NWR, and Alternatives 4C and 4E, sharing a different common alignment, cross approximately 2.3 miles (Table 3.17-17). The Proposed Route would not cross this NWR (Table 3.17-17).

Wilderness Characteristics

Inventory Unit WY-K-6I-2 contains approximately 43,282 acres of BLM-managed land identified as having wilderness characteristics. The inventory unit is crossed by approximately 9.1 miles of the Proposed Route. If this route were approved and constructed, the inventory unit would be divided into two units, both large enough to have wilderness characteristics. The northern subunit would be approximately 13,921 acres and the southern subunit would be approximately 29,361 acres. Construction activities would disrupt those seeking solitude. In the long term, people would be able to find outstanding opportunities for solitude and primitive recreation in both subunits. However, the naturalness of the area along the proposed transmission line would be degraded by the presence of towers up to 190 feet high and multiple cables crossing between the towers. People crossing between to two subunits, including those following the Emigrant Trail (an NHT), would pass through an altered landscape.

Inventory Unit WY-K-6I-3 contains approximately 12,588 acres of BLM-managed land near Fontenelle Gap that has been identified as having wilderness characteristics. The inventory unit is crossed by approximately 2.5 miles of the Proposed Route. If this route were approved and constructed, the inventory unit would be divided into two subunits, both large enough to have wilderness characteristics. The northern subunit would be approximately 5,518 acres and the southern subunit would be approximately 7,070 acres. Construction activities would disrupt those seeking solitude. In the long term, people would be able to find outstanding opportunities for solitude and primitive recreation in both subunits. However, as with the adjacent unit (WY-K-6I-2), the naturalness of the area along the proposed transmission line would be degraded by the presence of towers up to 190 feet high and multiple cables crossing between the towers. As in WY-K-6I-2, people crossing between the two subunits would pass through an altered landscape. However, the portion of the inventory unit crossed by the Emigrant Trail in WY-K-6I-3 would not be affected.

Inventory Unit WY-K-6L-1 contains approximately 17,642 acres of BLM-managed land identified as having wilderness characteristics. The inventory unit is crossed by the Proposed Route in the northern portion of the unit and by both Alternative 4A and 4E near the southern boundary. If the Proposed Route were approved and constructed, approximately 182 acres in the northeast corner would be dropped from the unit. The remainder of the unit would be split in two subunits. The northern subunit would be approximately 7,183 acres and the southern one approximately 10,307 acres; both subunits would retain naturalness and outstanding opportunities for solitude and primitive recreation, except for the area immediately under and adjacent to the transmission line. If Alternative 4A were built instead of the Proposed Route, approximately 1,383 acres along the southern boundary of the unit would be dropped.

Alternative 4A would be adjacent to existing transmission lines; therefore, the effect of the Project would be to move the southern boundary approximately 1,500 feet to the north. The remainder of the unit would retain naturalness and outstanding opportunities for solitude and primitive recreation, except for the area immediately under and adjacent to the transmission line. Alternative 4F follows the same route for approximately half its length within the inventory unit and then follows a more northwest path. If Alternative 4F were built, approximately 2,457 acres would drop from the unit, nearly 1,000 acres more than under Alternative 4A and more than approximately 2,204 acres more than under the Proposed Route. People using the Emigrant Trail (which crossed the unit) would not be affected by any of the three alternatives. If any of these routes is approved, construction activities would disrupt those seeking solitude in the short term.

Inventory Unit WY-K-6L-2 contains approximately 17,709 acres of BLM-managed land identified as having wilderness characteristics. The inventory unit is crossed by the Proposed Route in the northern portion of the unit. If built, this would divide the inventory unit into two units, both would be large enough to have wilderness characteristics. The northern subunit would be 7,150 acres and the southern subunit would be 10,559 acres. The northern subunit borders the NF. People would be able to find outstanding opportunities for solitude and primitive recreation in both subunits. However, the naturalness of the area along the proposed transmission line would be degraded by the presence of towers up to 190 feet high and multiple cables crossing between the towers. People crossing between the two subunits would pass through an altered landscape. If this route is approved, construction activities would disrupt those seeking solitude in the short term.

Inventory Unit WY-K-6S-1 contains approximately 37,617 acres of BLM-managed land assumed to have wilderness characteristics pending field inventory. Alternatives 4B/C and 4D/E cross the inventory unit. Alternative 4B/C crosses the northeast corner of the unit. If this route were constructed, approximately 3,592 acres northeast of the transmission line would drop from the unit. Alternative 4D/E follows 4B/C through the northeastern corner of the inventory unit but instead of exiting the unit at the north boundary, it continues west and then northwest for approximately 10 miles. If constructed, the area affected by Alternative 4B/C would also be affected by 4D/E. In addition, the area north of the 4D/E line (approximately 7,004 acres) would drop from the unit. In either case, the remaining portion of this large unit transmission would still have wilderness characteristics. People would be able to find outstanding opportunities for solitude and primitive recreation. However, the naturalness of the area along the proposed transmission line would be degraded by the presence of towers up to 190 feet high and multiple cables crossing between the towers. If either of these routes is approved, construction activities would disrupt those seeking solitude in the short term.

Inventory Unit WY-K-8A contains approximately 33,293 acres of BLM-managed land identified as having wilderness characteristics. It includes the Raymond Mountain WSA (Decision 7001 in the Kemmerer RMP). The Proposed Route crosses less than 0.25 mile south of the inventory unit. In addition, Alternative 4F joins the Proposed Route where it passes to the south of the inventory unit. A county road separates the route from the inventory unit/WSA. The Proponents have stipulated that they would not move the route north into the unit; therefore, the inventory unit/WSA would not be

directly affected by the Project. If either of these routes is approved, construction activities would disrupt users seeking solitude in the southern portion of the unit in the short term.

Historic Trails

The Proposed Route and Route Alternatives for Segment 4 would cross a number of NHTs and other trails, including stage and wagon roads, that have potential historic significance (see Table 3.3-11 in Section 3.3 – Cultural Resources). These include the Oregon, Pony Express, and Mormon Pioneer NHTs, and the California NHT Sublette Cutoff, Slate Creek Cutoff, and Bartleton-Bidwell Route. Alternative 4F would also cross the Dempsey-Hockaday Cutoff. The Proposed Route along Segment 4 would also cross the Overland Trail and the 1849 Evans Cherokee Trail, as well as a number of historic stage and wagon roads. Potential impacts to historic trails are assessed in Section 3.3 – Cultural Resources.

OHV Use

The Proposed Route would cross 8.5 miles of public land where OHV use is limited and 15.6 miles with seasonal closure. The Proposed Route would cross six trails closed to OHV use (and three that are open to OHV use). There would be five additional trail crossings due to new road construction, three of which would be trails closed to OHV use. In open areas (the majority of the route) it would be difficult to physically close these access points to unauthorized OHV use. OHV use on nonmotorized trails could disrupt existing uses, such as hiking and horseback riding, and may result in adverse effects to trails not designed or maintained for motorized use. The Proponents would post signs identifying the area as closed to OHV use and implement blocking measures where practical.

Alternative 4A would be 5.0 miles shorter that the comparison portion of the Proposed Route and it would cross 11.0 miles less area with seasonal closure and 1.0 mile less area where OHV use is limited. Alternative 4A would cross one trail closed to OHV use, compared to four for the comparison portion of the Proposed Route. New roads associated with Alternative 4A would cross one trail closed to OHV use, compared to two for the comparison portion of the Proposed Route. Nearly 90 percent of Alternative 4A would follow existing transmission lines, compared to less than 22 percent of the comparison portion of the Proposed Route. Over all, Alternative 4A would have less effect than the comparison portion of the Proposed Route in opportunity for unauthorized OHV use and disruption of existing uses.

Alternative 4B would be 10.0 miles longer than the comparison portion of the Proposed Route; it would cross 5.2 miles less area with seasonal closure and 0.1 mile where OHV access is limited. Alternative 4B would cross one trail closed to OHV use, compared to four for the comparison portion of the Proposed Route. New roads associated with Alternative 4B would cross one trail closed to OHV use, compared to two for the comparison portion of the Proposed Route. Overall, Alternative 4B would have less effect than the comparison portion of the Proposed Route in terms of unauthorized OHV access to trails or areas closed to OHV use.

Alternative 4C would be 11.4 miles longer than the comparison portion of the Proposed Route, but it would cross 2.0 miles less area with seasonal closure. Alternative 4C and the comparison portion of the Proposed Route would cross a similar amount of area where OHV access is limited. Alternative 4C would cross one trail closed to OHV use, compared to four for the comparison portion of the Proposed Route. New roads associated with Alternative 4C would cross one trail closed to OHV use, compared to two for the comparison portion of the Proposed Route. Overall, Alternative 4C would have less effect than the comparison portion of the Proposed Route in unauthorized OHV access to trails or areas closed to OHV use.

Alternative 4D would be 10.6 miles longer than the comparison portion of the Proposed Route, but it would cross 8.7 miles less area with seasonal closure. Alternative 4D and the comparison portion of the Proposed Route both cross a similar amount of area where OHV access is limited. Alternative 4D would cross one trail closed to OHV use, compared to four for the comparison portion of the Proposed Route. New roads associated with Alternative 4D would cross one trail closed to OHV use, compared to two for the comparison portion of the Proposed Route. Overall, Alternative 4D would have less effect than the comparison portion of the Proposed Route in unauthorized OHV access to trails or areas closed to OHV use.

Alternative 4E would be 12.0 miles longer than the comparison portion of the Proposed Route, but it would cross 5.4 miles less area with seasonal closure. Alternative 4E and the comparison portion of the Proposed Route both cross a similar amount of area where OHV access is limited. Alternative 4E would cross one trail closed to OHV use, compared to four for the comparison portion of the Proposed Route. New roads associated with Alternative 4E would cross one trail closed to OHV use, compared to two for the comparison portion of the Proposed Route. Overall, Alternative 4-Ewould have less effect than the comparison portion of the Proposed Route in unauthorized OHV access to trails or areas closed to OHV use.

Alternative 4F would be 2.7 miles shorter than the comparison portion of the Proposed Route, and it would cross 12.1 miles less area with seasonal closure and 1.0 mile less area where OHV access is limited. Alternative 4F would cross two trails closed to OHV use, the same as the comparison portion of the Proposed Route. New roads associated with Alternative 4F would not cross any trails closed to OHV use, compared to two for the comparison portion of the Proposed Route. Also, nearly 62 percent of Alternative 4F would be co-located with existing transmission lines, compared to less than 22 percent of the comparison portion of the Proposed Route. Overall, Alternative 4F would have less effect than the comparison portion of the Proposed Route.

Segment 5

Segment 5, as proposed, would link the Populus and Borah Substations with a 54.6-mile single-circuit 500-kV line. Forty-four acres of the expansion of the Populus and Borah Substations are attributed to Segment 5. There are five Route Alternatives including two proposed by the BLM to avoid the Deep Creek Mountains (5A and 5B; 8 miles and 19 miles longer than the comparison portion of the Proposed Route), one preferred by Power County that would cross the Fort Hall Indian Reservation (5C; 6 miles shorter than the comparison portion of the Proposed Route), one originally

proposed by the Proponents (5D; 2 miles shorter than the comparison portion of the Proposed Route but located within more agricultural lands), and one proposed by Power County as an alternative approach to the Borah Substation (5E) (see Appendix A, Figure A-7).

Land Ownership

Approximately 69 percent or 37.8 miles of the Proposed Route for Segment 5 would cross private land, with the remainder of the route crossing BLM (13.2 miles) and State (3.6 miles) land (Table 3.17-18). Alternatives 5A and 5B are approximately 8.4 miles and 19.1 miles longer than the comparison portion of the Proposed Route, respectively, with private lands accounting for the majority of the increase in miles by land ownership in both cases (Table 3.17-18).

Alternative 5C is approximately 7.1 miles shorter than the comparison portion of the Proposed Route and would cross fewer miles of BLM, state, and private lands. However, unlike the Proposed Route and other alternatives to Segment 5, Alternative 5C also would cross about 12.4 miles of the Fort Hall Indian Reservation (Table 3.17-18).

Table 3.17-18. Miles Crossed by Land Ownership – Segment 5

Segment/Alternative	Total	BLM	NFS	Other[1/]	State	Private
Proposed – Total Length	54.6	13.2	–	–	3.6	37.8
Proposed – Comparison Portion for Alternative 5A and 5B	25.3	8.7	–	–	3.0	13.5
Alternative 5A	33.7	10.1	–	–	0.3	23.3
Alternative 5B	44.4	10.3	–	–	0.3	33.8
Proposed – Comparison Portion for Alternative 5C	33.2	8.8	–	–	3.5	20.9
Alternative 5C	26.1	–	–	12.4	0.7	13.0
Proposed – Comparison Portion for Alternative 5D	19.4	2.7	–	–	0.7	16.1
Alternative 5D	17.5	–	–	–	1.1	16.4
Proposed – Comparison Portion for Alternative 5E	5.8	1.2	–	–	0.1	4.5
Alternative 5E	5.3	0.1	–	–	0.2	5.0

Miles are rounded to tenths of a mile; columns/rows may therefore not sum exactly.
1/ The 12.4 “Other” miles crossed by Alternative 5C are part of the Fort Hall Indian Reservation.

Alternative 5C would parallel an existing transmission, offset 1,500 feet to the south and west, across the southern half of the Fort Hall Indian Reservation, from the southeastern corner, angling diagonally to the northwest. Potential impacts to visual and cultural resources on the reservation are discussed in Section 3.2 – Visual Resources and Section 3.3 – Cultural Resources, respectively. Approximately 219 acres would be disturbed within the reservation boundary for construction if this route was selected.

A crossing of the Fort Hall Reservation would have to be negotiated between the Proponents and the Shoshone-Bannock Tribes. The Tribes could refuse to allow the route to cross their Reservation if they decide they do not like the terms or effects of the ROW the Proponents would seek. The Tribes have the authority to negotiate the location, management, and compensation for the transmission line through the Reservation. The outcome of this negotiation is beyond the scope of this EIS.

Alternatives 5D and 5E are approximately 1.9 miles and 0.5 mile shorter than their respective comparison portions of the Proposed Route and cross similar totals of miles by land ownership (Table 3.17-18).

Designated Corridors and Existing ROW

Between the Populus and the Borah Substations there is no WWE corridor or other designated corridors for the Proposed Route and Route Alternatives to follow. However, existing 345-kV and other lines exist between these points as well as in the general vicinity. The Proposed Route and Route Alternatives make the following use of existing utility corridors:

- Proposed Route – 16.8 miles (31 percent) adjacent to an existing transmission corridor;
- Alternative 5A – 1.8 miles (5 percent) adjacent to an existing transmission corridor;
- Alternative 5B – 1.8 miles (4 percent) adjacent to an existing transmission corridor;
- Alternative 5C – 100 percent adjacent to an existing transmission corridor;
- Alternative 5D – 1.3 miles (7 percent) adjacent to an existing transmission corridor; and
- Alternative 5E – 100 percent adjacent to an existing transmission corridor (Note: this alternative would be located adjacent to an existing 345-kV line and would, therefore, not be consistent with the 1,500-foot separation criteria established for the Project [see Section 1.3.3.3]).

Federal Land Use Plan Amendments

Segment 5 would cross BLM-managed lands that fall within the jurisdiction of the Pocatello, Monument, and Cassia RMPs and the Malad MFP (Table 3.17-2). Proposed amendments for the Proposed Route and Route Alternatives are identified in Table 2.2-1.

<u>Malad RMP</u>

The Proposed Route for Segment 5, as well as Alternative 5A, would require that the Malad MFP be amended to allow the Project as a single-use visually altering action without changing the VRM class for about 4.3 miles in the Deep Creek area.

The Proposed Route for Segment 5, as well as Alternatives 5A and 5B, as currently designed do not conform to a land use stipulation found in the Malad MFP. The Malad MFP states the following:

> *Future major utilities will be routed across public lands within the corridor systems as located.*

However, the Proposed Route and Alternatives 5A and 5B would be constructed in areas outside of the corridor systems that are identified in the MFP; therefore, the Project would either need to be altered so that it is conforms to the Malad MFP, or the MFP would need to be amended. The proposed amendment would allow the Project to

be constructed outside of identified corridor system under the Proposed Route or Alternatives 5A and 5B (see Appendix F). Allowing this Project to be constructed outside of the "identified corridor system" on lands managed by the Malad MFP could potentially create a new "corridor system," which may make it more likely that additional lines would be routed in this area.

No amendments related to Segment 5 have been identified for the Pocatello, Monument, or Cassia RMPs (those directly related to land use/recreation, or otherwise). Amendments have, however, been proposed for the Cassia RMP for Segment 7 (Table 2.2-1).

Plan Amendment Summary

Approval of plan amendments that would result in changes to VRM classes to more developed classifications has the potential to affect the quality of the experience for recreationalists using the affected areas and would, in some cases, afford a less "semi-primitive" experience to users. Visual impacts to the potentially affected areas as well as the visual amendments, as discussed above, are evaluated in more detail within Section 3.2 – Visual Resources and Appendix G.

Specific Land Uses and Recreational Resources

Land Use

Land use within the Analysis Area for the Proposed Route is summarized by segment in Table 3.17-4. Viewed in terms of miles crossed, more than half of the Proposed Route for Segment 5 would cross rangeland (62 percent), with the remainder of the route crossing cropland (21 percent), forest (14 percent), and water and wetlands (1 percent). Alternatives 5A through 5E range from approximately 7 miles shorter than their respective comparison portions of the Proposed Route to 19 miles longer (Table 3.17-19).

The two Route Alternatives that are longer than the comparison portion of the Proposed Route (Alternatives 5A and 5B) are located south of the Proposed Route to avoid crossing the Deep Creek Mountains. Both Alternatives 5A and 5B would cross more miles of rangeland and dryland farming than the comparison portion of the Proposed Route.

Alternative 5C extends to the north and east of the Proposed Route and would cross approximately 12.4 miles of the Fort Hall Indian Reservation (as discussed above). This alternative is approximately 7 miles shorter than the comparison portion of the Proposed Route and would cross approximately 1.7 fewer miles of rangeland and about 6 miles less forestland.

Alternatives 5D and 5E are shorter than their respective comparison portions of the Proposed Route and primarily would cross fewer miles of rangeland. Alternative 5D would also cross approximately 1.3 miles of cropland.

Dryland farming occurs mostly west of the Deep Creek Mountains. Irrigated cropland is scattered along the Analysis Area. Forestland within the Analysis Area is mainly concentrated in the Deep Creek Mountains. Residential development within the Analysis Area is limited to scattered rural residences.

Table 3.17-19. Miles Crossed by Land Use – Segment 5

Segment/ Alternative	Total	Rangeland	Agriculture	Forest	Water and Wetlands	ROW	Developed	Other
Proposed – Total Length	54.6	34.0	11.5	7.9	0.5	0.5	0.1	–
Proposed – Comparison Portion for Alternatives 5A and 5B	25.3	14.5	4.5	6.1	0.1	–	–	–
Alternative 5A	33.7	21.5	7.1	5.0	0.1	0.1	–	–
Alternative 5B	44.4	27.7	13.5	2.9	0.1	0.2	–	–
Proposed – Comparison Portion for Alternative 5C	33.2	20.5	4.5	7.8	0.2	0.1	–	–
Alternative 5C	26.1	18.7	5.2	1.9	0.2	0.1	–	–
Proposed – Comparison Portion for Alternative 5D	19.4	13.2	3.6	1.8	0.4	0.3	0.1	–
Alternative 5D	17.5	7.9	5.0	3.7	0.6	0.1	0.2	–
Proposed – Comparison Portion for Alternative 5E	5.8	2.3	3.0	–	0.3	0.1	0.1	–
Alternative 5E	5.3	1.3	2.3	–	0.2	0.2	0.2	1.2

Miles are rounded to tenths of a mile; columns/rows may therefore not sum exactly.

The Proposed Route for Segment 5 would pass within 1,000 feet of 22 residences; 2 of these residences are located within 300 feet of the proposed ROW centerline. Eight of the houses within 1,000 feet are part of a subdivision located on the west side of I-86, near the existing Borah Substation (Table 3.17-20).

Table 3.17-20. Number of Residences within 1,000 feet and 300 feet – Segment 5

Proposed Route/ Alternative	Within 1,000 Feet			Within 300 Feet		
	Proposed Route/ Alternative	Comparison Portion of the Proposed Route	Net Difference	Proposed Route/ Alternative	Comparison Portion of the Proposed Route	Net Difference
Proposed Route	22	NA	NA	2	NA	NA
5A	3	4	-1	4	3	1
5B	4	4	–	4	3	1
5C	–	–	–	–	–	–
5D	24	10	14	2	–	2
5E	2	10	-8	–	–	–

NA – not applicable

Alternatives 5A and 5B would pass within 1,000 feet of 3 and 4 residences, respectively, versus 4 for the comparison portion of the Proposed Route. However, unlike the comparison portion of the Proposed Route, one residence would be located within 300 feet of the ROW centerline for Alternative 5A, and two are within 300 feet of the ROW centerline for Alternative 5B. There are no residences within 1,000 feet of Alternative

5C. Alternative 5D would pass within 1,000 feet of 24 residences, 14 more residences than the comparison portion of the Proposed Route; 2 of these residences are within 300 feet of the proposed centerline for Alternative 5D. Alternative 5E would pass within 1,000 feet of 2 residences versus 10 for the comparison portion of the Proposed Route; none of these residences are located within 300 feet of the proposed centerline for Alternative 5E (Table 3.17-20).

Commercial, industrial, and institutional land uses crossed or within 1,000 feet of the Proposed Route and Route Alternatives are itemized by milepost in Table D.17-1 in Appendix D and summarized below. The Proposed Route would pass within 1,000 feet of the Arbon Elementary School, a commercial building, three barns, a pipeline, Marys Mine Access Area, and a substation.

Alternatives 5A and 5B would both pass within 1,000 feet of the Hawkins Dam and Reservoir, and the Hawkins Dam Recreation Site. Alternative 5A would also pass within 1,000 feet of the Arbon Cemetery. There are no commercial, industrial, or institutional land uses within 1,000 feet of Alternative 5C.

Alternative 5D would pass within 1,000 feet of a borrow pit and a substation. The alternative is also near but would not affect a recreational access site on the East Fork of Rock Creek. Alternative 5E would be located within 1,000 feet of a barn and a commercial building.

Power County requested that a combination of Alternatives 5C and 5E be considered as the preferred route to the Borah Substation. Alternative 5E would proceed due west parallel and adjacent to existing transmission lines for approximately 4.2 miles, crossing irrigated cropland and the Snake River in this interval. As noted above, this Route Alternative would be adjacent to existing 230- and 345-kV transmission lines (Figure 3.17-8).

Alternative 5E would pass within 1,000 feet of fewer residences than the comparison portion of the Proposed Route (3 versus 11) and would cross 0.6 mile less of irrigated cropland. There are no residences within 300 feet of the proposed centerline for Alternative 5E or the comparison portion of the Proposed Route (Table 3.17-20).

As noted above, the ROW for this alternative, as proposed by Power County, would be located immediately adjacent to an existing 345-kV line (with a tower-to-tower distance of less than 200 feet) and would, therefore, not be consistent with the 1,500-foot separation criteria established for the Project (see Section 1.3.3.3). An exception does exist in the WECC criterion that allows the last five spans approaching a substation to be closer to existing lines. For Gateway West this would be up to 1.5 miles; however, the length of Alternative 5E would be approximately 4.2 miles and would, therefore, not be consistent with this exception.

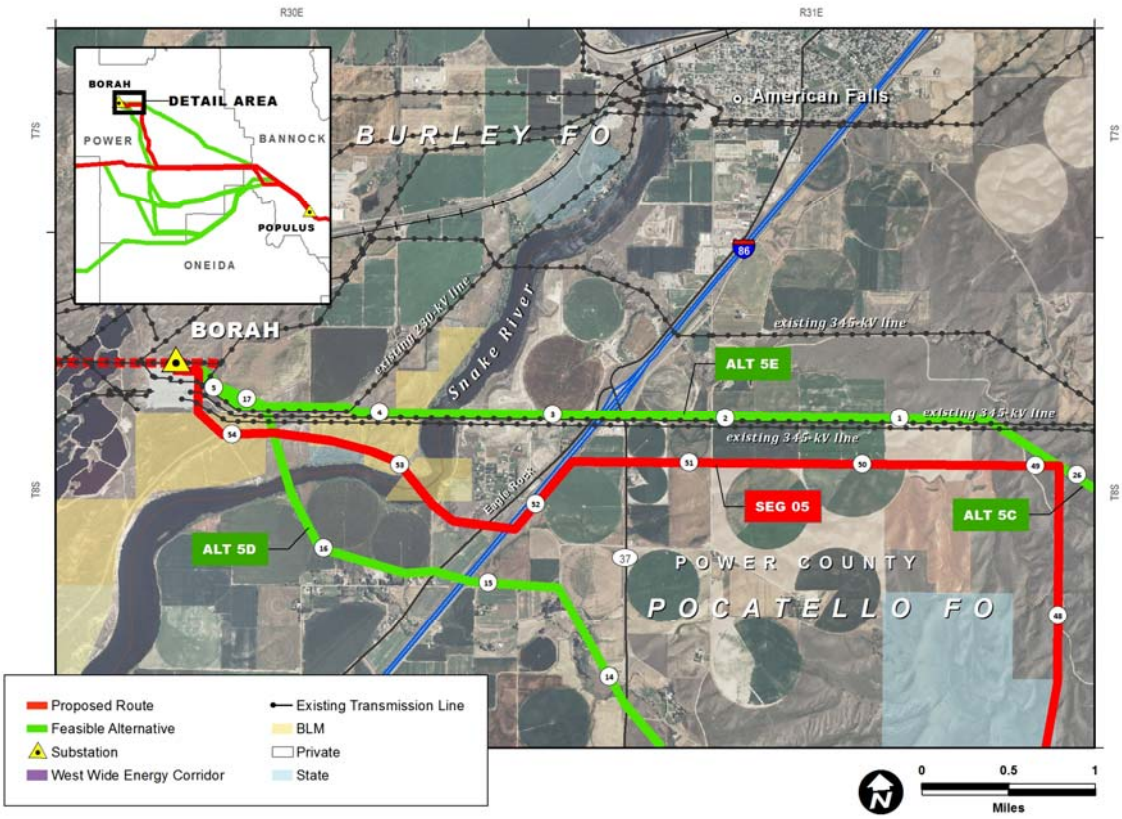


Figure 3.17-8. Power County – Alternative 5E

Special Management Areas

Federal lands along Segment 5 are regulated in part by the Pocatello and Cassia RMPs, and the Malad MFP. The Proposed Route and Route Alternatives for Segment 5 would not cross any SMAs identified in these plans.

Wilderness Characteristics

As noted earlier, no areas with wilderness characteristic are affected in this segment.

Historic Trails

The Proposed Route and Route Alternatives for Segment 5 would cross the Oregon NHT and the North Alternate Oregon NHT (see Table 3.3-13 in Section 3.3 – Cultural Resources). Potential impacts to historic trails are assessed in Section 3.3.

OHV Use

The Proposed Route would cross 2.2 miles of public land closed to OHV use and 2.3 miles where OHV use is limited. The Proposed Route would cross one trail closed to OHV use and there would be one additional trail crossing due to new road construction. In open areas (the majority of the route) it would be difficult to physically close these access points to unauthorized OHV use. OHV use on nonmotorized trails would disrupt existing uses, such as hiking and horseback, and may result in adverse effects to trails not designed maintained for motorized use. The Proponents would post signs

identifying the area as closed to OHV use and implement blocking measures where practical.

Alternative 5A would be 8.4 miles longer than the comparison portion of the Proposed Route but it would not cross any areas closed to OHV use or where OHV use is limited (compared to the comparison portion of the Proposed Route, which would cross 2.4 miles closed to OHV use). Alternative 5A and the comparison portion of the Proposed Route would both cross one trail closed to OHV use. New roads associated with both routes would cross one additional trail closed to OHV use. Over all, there would be less opportunity for unauthorized OHV use, and less potential disruption of existing uses under Alternative 5A.

Alternative 5B would be 19.1 miles longer that the comparison portion of the Proposed Route, but it would not cross any areas closed to OHV use or where OHV use is limited (compared to the comparison portion of the Proposed Route, which would cross 2.4 miles closed to OHV use). Alternative 5B and the comparison portion of the Proposed Route would both cross one trail closed to OHV use. Alternative 5B would cross one additional trail due to new road construction, compared to two trails for the comparison portion of the Proposed Route. There would be less opportunity for unauthorized OHV use in areas closed to OHVs under Alternative 5B but a greater risk for unauthorized use of trails closed to OHV use.

Alternative 5C would be 7.1 miles shorter than the comparison portion of the Proposed Route. Alternative 5C would follow an existing transmission line; therefore, there would be no additional effects on areas closed to OHV use. The comparison portion of the Proposed Route would cross 2.2 miles of land closed to OHV use. Therefore, Alternative 5C would have a lower potential for unauthorized OHV use in areas closed to OHVs. There would be no additional trail crossings under Alternative 5C or the comparison portion of the Proposed Route. Overall, Alternative 5C would have less effect on OHV use.

Alternative 5D would be 1.9 miles longer than the comparison portion of the Proposed Route and would cross 1.2 miles less area where OHV use is limited while the comparison portion of the Proposed Route would not cross any areas where OHV use is limited. Alternative 5D would not cross any areas closed to OHV access while the comparison portion of the Proposed Route would cross 2.2 miles closed to OHV use. This would result in a lower potential for unauthorized OHV use in areas where OHV access is limited or not allowed. There would be no additional trail crossings for Alternative 5D or for the comparison portion of the Proposed Route. Overall, Alternative 5D would have less effect on OHV use.

Alternative 5E would be 0.5 mile shorter than the comparison portion of the Proposed Route and it would cross 1.0 mile less area where OHV access is limited. This would result in a lower potential for unauthorized OHV use in areas where OHV access is limited. There would be no additional trail crossings for Alternative 5D or for the comparison portion of the Proposed Route. All of Alternative 5E would follow existing transmission lines, as does over 91 percent of the comparison portion of the Proposed Route. Therefore, there would be little difference in terms of OHV use between these two alternatives.

Segment 7

Segment 7, as proposed, would link the Populus and Cedar Hill Substations with a 118.1-mile single-circuit 500-kV line. Forty-two acres of the expansion of the Populus and the construction of the Cedar Hill Substations and 1 acre for two regeneration sites are attributed to Segment 7. In addition to the Proposed Route, which is principally on private lands, Route Alternatives have been proposed by the BLM to avoid the Deep Creek Mountains (7A and 7B; which are 3 miles and 11 miles longer than the comparison portion of the Proposed Route), by local landowners (7C, 7D, 7E, 7F, and 7G, which all represent minor adjustments proposed to address local issues), by local landowners to avoid private agricultural lands and create a corridor for multiple proposed transmission lines (7I or the State Line Route, which is 55 miles longer than the Proposed Route and would require 0.5 acre for an additional regeneration site), and by the Proponents to avoid the State Line Route (7H, which is 10 miles longer than the Proposed Route). Alternative 7J, which is a variant of the State Line Route also proposed by local landowners, would not terminate at the Cedar Hill Substation. This alternative, referred to as the Rogerson Alternative, would require a different substation be constructed near a 345-kV existing transmission line (approximately 24 miles southwest of the Cedar Hill Substation; see Appendix A, Figure A-9). The tables and discussion in this document compare 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

Land Ownership

Almost three quarters (73 percent) or 85.7 miles of the Proposed Route for Segment 7 would cross private lands, with the remainder of the route crossing BLM-managed (28.1 miles) and state (4.3 miles) land (Table 3.17-21). Alternatives 7A and 7B would be 2.8 miles and 11.3 miles longer, respectively, than the comparison portion of the Proposed Route. Both routes would cross 3.8 miles less of state land than the Proposed Route and more miles of private land (Table 3.17-21). Alternatives 7C through 7G range from 0.1 mile to 0.7 mile longer than their respective comparison portions of the Proposed Route and cross similar totals of miles by land ownership.

Alternative 7H is approximately 9.4 miles longer than the comparison portion of the Proposed Route and would cross approximately 21.2 fewer miles of private lands, and 18.5 miles more BLM-managed land, as well as 11.4 miles of the Sawtooth NF (Table 3.17-21).

Alternative 7I is approximately 55.2 miles longer than the comparison portion of the Proposed Route, almost half (47 percent) as long again. This alternative would cross approximately 20.4 fewer miles of private lands than the Proposed Route, but substantially more miles (44.3 miles) of BLM-managed land. Alternative 7I would also cross 27.7 miles of the Sawtooth NF that would not be crossed by the Proposed Alternative, as well as 3.6 more miles of state land (Table 3.17-21).

Although Alternative 7I has been routed to avoid private agricultural lands, despite being 55 miles longer than the Proposed Route and crossing almost four times as much Federal land (100.1 miles versus 28.1 miles, respectively), it still would cross 65.3 miles of private land, just 20.4 miles less than the Proposed Route (Table 3.17-21). Alternative 7H would cross slightly fewer miles of private land than Alternative 7I (64.5

miles versus 65.3 miles), and substantially fewer miles of public lands, 63 miles versus 108 miles, a difference of 45 miles (Table 3.17-21).

Table 3.17-21. Miles Crossed by Land Ownership – Segment 7

Segment/Alternative	Total	BLM	NFS	Other	State	Private
Proposed – Total Length	118.1	28.1	–	–	4.3	85.7
Proposed – Comparison Portion for Alternatives 7A,B	35.2	7.0	–	–	3.8	24.4
Alternative 7A	38.0	7.2	–	–	–	30.7
Alternative 7B	46.4	7.7	–	–	–	38.7
Proposed – Comparison Portion for Alternative 7C	20.1	9.1	–	–	–	11.0
Alternative 7C	20.3	7.2	–	–	1.0	12.0
Proposed – Comparison Portion for Alternative 7D	6.2	1.7	–	–	0.5	4.0
Alternative 7D	6.8	0.1	–	–	1.0	5.7
Proposed – Comparison Portion for Alternative 7E	3.8	0.3	–	–	–	3.5
Alternative 7E	4.5	1.9	–	–	–	2.6
Proposed – Comparison Portion for Alternative 7F	10.5	1.3	–	–	–	9.2
Alternative 7F	10.8	4.4	–	–	–	6.4
Proposed – Comparison Portion for Alternative 7G	3.1	2.4	–	–	–	0.8
Alternative 7G	3.2	1.8	–	–	–	1.4
Proposed – Comparison Portion for Alternatives 7H and 7I	118.1	28.1	–	–	4.3	85.7
Alternative 7H	127.5	46.6	11.4	–	5.0	64.5
Alternative 7I	173.4	72.5	27.7	–	7.9	65.3
Proposed – Comparison Portion 7/9 for Alternative 7J[1/]	143.9	48.1	–	–	4.3	91.6
Alternative 7J	202.1	87.9	13.0	–	8.9	92.4

Miles are rounded to tenths of a mile; columns/rows may therefore not sum exactly.

1/ Alternative 7J connects with Segment 9 approximately 25.8 miles west of the proposed Cedar Hill Substation, which is the western terminus of Segment 7 and the beginning point for Segment 9. The table above compares 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

Note that Alternative 7I has also been routed to avoid mapped roadless areas on the Sawtooth NF. This alternative would cross into Nevada just east of the eastern Sawtooth NF boundary, follow just south of the state line, and then cross back into Idaho just west of the western boundary of the Sawtooth NF.

Alternative 7J is approximately 58.2 miles longer than the comparison portion of the Proposed Route. It would cross substantial lengths of BLM and NFS-managed lands, while the comparison portion of the Proposed Route would avoid much of the BLM-managed lands and all of the NFS lands.

Designated Corridors and Existing ROW

Most of the Proposed Route along Segment 7 between Populus and Cedar Hill Substations does not follow existing corridors and construction of a transmission line would, therefore, result in the development of a new utility corridor. The Proposed Route would be co-located with existing transmission lines for about 16.5 miles (14 percent of its length). The Proposed Route would be within the WWE corridor for 0.5 mile, within the projected WWE corridor for 0.9 mile, and adjacent to the WWE corridor for 0.9 mile.

In addition, the Proposed Route would cross through an MA 11 area, as designated by the Cassia RMP. The Cassia RMP limits new ROWs in MA 11 to areas adjacent to existing facilities. This limitation in the plan requires a plan amendment for Gateway West in order for Segment 7 to be consistent with it; therefore, a plan amendment has been proposed (as discussed below in the Federal Land Use Plans section).

Alternatives 7A through 7F do not follow existing transmission lines, nor do they occur within or near the WWE corridor. Alternatives 7G and 7H would follow existing transmission lines and the WWE corridor for a combined total of 17 and 12 percent of their respective routes. Alternative 7I would be co-located with existing transmission lines for about 30 miles (17 percent), within the WWE corridor for 8.3 miles, within the projected WWE corridor for 3.3 miles, and adjacent to the WWE corridor for 9.1 miles. Alternative 7J would be co-located with existing transmission lines for about 41.6 miles (21 percent), within the WWE corridor for 19.7 miles, within the projected WWE corridor for 13.1 miles, and adjacent to the WWE corridor for 11.4 miles (see Table 2.4-2).

Alternatives 7I and 7J are Cassia County's proposal to provide for a corridor for Gateway West and other transmission lines that might be proposed in the future. Assessment of alternatives has determined that there would be serious environmental impacts for just one transmission line such as the Gateway West Project. Additional transmission lines in this corridor would have a substantial adverse effect on the same resources. Finally, of the transmission lines currently identified, none have apparent plans to extend in the direction set by Alternative 7I.

Accommodating one or more extra high-voltage transmission line along the same path as Gateway West may not be reasonable. The establishment of the alignment is a very site-specific exercise to avoid areas where impacts might occur. In doing so, the alignment attempts to make the best use of topography and to go around features such as sage-grouse leks and uses such as irrigated fields. A second future transmission line would presumably go through the same siting process but would unlikely be able to take advantage of the locations occupied by the first line. Important resources avoided in establishing the alignment for Alternatives 7I and 7J that may not be able to be avoided by a future line include roadless areas, sage-grouse leks, rugged terrain, and irrigated cropland.

Federal Land Use Plan Amendments

Segment 7 would cross BLM-managed lands that fall within the jurisdiction of the Pocatello, Cassia, and Wells RMPs, and the Malad and Twin Falls MFPs (Table 3.17-2). Proposed amendments for the Proposed Route and Route Alternatives are identified in Table 2.2-1. Some portions of the Project located along Segment 7 would not conform to land use stipulations found in the Cassia and Wells RMPs and the Malad and Twin Falls MFPs, as discussed below.

<u>Cassia RMP</u>

The Project, as currently designed along Segment 7, would not conform to two land use stipulations found in the Cassia RMP. The Cassia RMP management direction for MA 11 is as follows:

> *Limit rights-of-way (ROWs) to existing facilities/localities.*

The Proposed Route along Segment 7 would cross through MA 11. As currently designed, this route would not conform to the Cassia RMP stipulations, because the Project would not be constructed within "existing facilities/localities." Therefore, the Project would either need to be altered so that it conforms to the Cassia RMP or the RMP would need to be amended. The proposed amendment would allow the Project to be constructed outside of "existing facilities/localities" (see Appendix F-1). Allowing this Project to be constructed outside of "existing facilities/localities" on lands managed by the Cassia RMP could potentially create new areas where additional lines could be routed in the future, because the Project would become an "existing facility" following construction.

Alternatives 7E, 7H, 7I, and 7J would all require that the Cassia RMP be amended to allow the reclassification of certain VRM Class II areas to VRM Class III. Alternative 7E would require the reclassification of approximately 39 acres in the Spring Canyon area. Alternative 7H would require the reclassification of approximately 122 acres and 806 acres in the Jim Sage and Cottonwood Creek areas, respectively. Alternatives 7I and 7J would require the reclassification of the area in the vicinity of 0.1 mile of the proposed Project crossing the Goose Creek Travel Zone, and would also require that the plan be amended to allow the Project as a single-use visually altering action without changing the VRM class for about 0.2 mile, also in the Goose Creek Travel Zone area.

Wells RMP

The Project as currently designed along Alternatives 7I and 7J would not conform to a land use stipulation found in the Wells RMP. The Wells RMP states the following:

> *Locate new facilities in identified planning corridors.*

Alternatives 7I and 7J would cross through lands managed by the Wells RMP, but would not be constructed within areas identified in the RMP as "planning corridors." Therefore, Alternatives 7I and 7J do not conform to the Wells RMP and the Project would either need to be altered so that it conforms to the Wells RMP or the RMP would need to be amended. The proposed amendment would allow the Project to be constructed outside of the Wells RMP "planning corridors" along Alternatives 7I and 7J, if either of these alternatives is selected (see Appendix F). The land crossed by Alternatives 7I and 7J that is managed by the Wells RMP is also classified as VRM Class II. A high-voltage transmission line would not conform to the management goals for VRM Class II, and thus an amendment would be needed. The proposed amendment would permit the Project as a one-time visually altering action without changing the VRM classification. Allowing this Project to be constructed outside of the "identified planning corridors" is not likely to create new areas where additional lines could be routed in the future, unless the final amendment is worded such that it designates the Project's ROW as part of the planning corridor. Permitting the Project without changing the VRM classification would retain the more restrictive management guidelines; however, the presence of the Project could affect future visual inventories classification determinations for the area.

Twin Falls RMP

The Project as currently designed along Alternatives 7I and 7J would not conform to a land use stipulation found in the Twin Falls MFP. The Twin Falls MFP states the following:

> *L-4.1 Allow future major power transmission lines (line of at least 46-138RV which originate and terminate outside of the MFP area) to be constructed within the recommended corridors. Also allow construction of transmission lines between the corridors. Do not permit power lines to the west or the east of the two corridors. Exempt service lines from restriction.*

Alternatives 7I and 7J, as well as the Proposed Route along Segment 9 and Alternative 9A, would cross through lands managed by the Twin Falls MFP, but would not be constructed in areas identified by the RMP as "recommended corridors." Therefore, these routes are not conform to the Twin Falls MFP, and the Project would either need to be altered so that it is conforms to the Twin Falls MFP or the MFP would need to be amended. The proposed amendment would allow the Project to be constructed outside of the Twin Falls MFP's "recommended corridors" along Alternatives 7I and 7J, as well as the Proposed Route for Segment 9 and Alternative 9A, if one or more of these routes are selected (see Appendix F). As discussed above, allowing this Project to be constructed outside of the "recommended corridors" is not likely to create new areas where additional lines could be routed in the future, unless the final amendment is worded such that it designates the Project's ROW as part of the recommended corridors.

Alternatives 7I and 7J would also require that the Twin Falls MFP be amended to allow the reclassification of 70 acres of VRM Class II to VRM Class III in the Rock Creek area.

Malad MFP

The Proposed Route for Segment 7 would require that the Malad MFP be amended to allow the Project as a single-use visually altering action without changing the VRM class for about 4.3 miles in the Deep Creek area.

The Proposed Route for Segment 7 and Alternatives 7A and 7B would also be inconsistent with the following stipulation in the Malad MFP:

> *Future major utilities will be routed across public lands within the corridor systems as located.*

The Proposed Route and Alternatives 7A and 7B would be constructed in areas outside of the corridor systems that are identified in the MFP. Therefore, the Project would either need to be altered so that it conforms to the Malad MFP, or the MFP would need to be amended. The proposed amendment would allow the Project to be constructed outside of identified corridor system under the Proposed Route or Alternatives 7A and 7B (see Appendix F). Allowing this Project to be constructed outside of "identified corridor system" on lands managed by the Malad MFP could potentially create a new "corridor system," which could allow additional lines to be routed in this area.

Sawtooth NF Revised Forest Plan

The Project would also be inconsistent with a Forest Service Forest Plan along portions of Segment 7. Alternatives 7H, 7I, and 7J, as currently designed, are not consistent with a land use stipulation found in the Sawtooth Forest Plan, which states:

> *All projects and activities should maintain or enhance the adopted ROS classes as displayed on the Forest ROS strategy maps. New road construction should not occur within the summer Primitive and Semi-Primitive Non-Motorized areas. Facilities identified as being necessary should blend with the surrounding landscape character and the ROS setting.*

Alternatives 7H, 7I, and 7J would cross Modification and Partial Retention VQOs within the Sawtooth NF. This would not be consistent with the management direction for scenic environment found in the Sawtooth Forest Plan, which states:

> *All projects shall be designed to meet the adopted VQOs as displayed on the Forest VQO map. Portions of Alternative Segments are currently designated as Partial Retention. There should be minimal distraction from scenic quality in the foreground from road construction, reconstruction, and other excavation management. Roads and other excavation may be visible in the middleground and background landscapes, but should blend into the characteristic landscape of the surroundings. Portions of Alternative Segments are also currently designated as Modification. Management activities may dominate the characteristic landscape but must use naturally established form, line, color, and texture. They should appear as a natural occurrence when viewed as middleground.*

Alternatives 7H, 7I, and 7J are coincident for the first 57 miles of their alignment. At MP 37.9, the routes enter the Sublett portion of the Sawtooth NF, turning to the southwest. This results in the alternatives crossing approximately 4.0 miles of NFS land managed as VQO Modification. The presence of the proposed transmission line in these landscapes would not meet the designated VQOs. As a result, Forest Service action would be necessary to modify the visual classification or approve a one-time allowance to be consistent with the Forest Plan.

Alternative 7H enters the narrowest portion of the Albion Division of the Sawtooth NF. At this point, the route is within Cold Spring Creek Valley between Cache Peak to the south and Mt. Harrison to the north, the two highest peaks within the Albion Mountain Range. As a result, the alternative crosses 2.9 miles of land managed as VQO Partial Retention and 1.5 miles in land with a VQO of Modification. The presence of the transmission line in these landscapes would not meet the designated VQOs. As a result, Forest Service action would be necessary to modify the visual classification or approve a one-time allowance to be consistent with the Forest Plan.

Alternatives 7I and 7J share the same alignment until MP 137.3, at which point 7J continues in a northwest direction, while 7I proceeds north, through the Sawtooth NF. The joint route is partially located in Elko County, Nevada, staying just south of the Cassia Division of the Sawtooth NF. It then turns north-northwest at MP 129.5, passing in and out of the western edge of the NF for a total distance of approximately 18 miles.

As a result, Alternative 7I crosses 0.8 mile of land managed as VQO Partial Retention and 5.2 miles in VQO Modification. Alternative 7J crosses 0.1 mile of land managed as VQO Partial Retention and 2.2 miles of land managed as VQO Modification. The presence of the transmission line in these landscapes would not meet the designated visual resource management objectives. As a result, Forest Service action would be necessary to modify the visual classification or approve a one-time exemption to be consistent with the Forest Plan.

Alternative 7H would cross about 7 miles of NFS lands allocated to the RN ROS class, 4.1 miles allocated to Roaded Modified, and 0.2 mile allocated to SPM (note that these are summer allocations). In the winter, the areas crossed by Alternative 7H are entirely allocated to SPM use, because existing roads are closed. An estimated 11.5 miles of new access road would be required along the portion of Alternative 7H that would cross the Sawtooth NF. Because this is not consistent with the Sawtooth Forest Plan, a plan amendment would be required (if this route is selected and approved) that would convert current ROS classification to a type that can accommodate the Project's development. Land that is currently allocated to SPM and within 0.5 mile of a new road or the proposed Project's ROW would be converted to RN if the proposed plan amendment is adopted (see Appendix F). This would result in 1,234 acres on the Sawtooth NF changing from SPM to RN during the summer. Alternatives 7I and 7J would also require a plan amendment (if one of these alternatives is selected), which would result in 8,465 acres and 2,613 acres, respectively, on the Sawtooth NF changing from SPM to RN during the summer.

Alternative 7I crosses two divisions of the Sawtooth NF—the Sublett and Cassia Divisions—for a total distance of 27.7 miles and passes within 0.5 mile of the northern boundary of the Black Pine Division. Alternatives 7H and 7I share the same alignment where they cross the Sublett Division and pass within 0.5 mile of the Black Pine Division. An estimated 30.5 miles of new road would be required along the majority of the portion of Alternative 7I that crosses the Sawtooth NF, with an estimated 53.2 miles of existing road on the Sawtooth NF requiring improvement. The transmission line and associated new roads construction for Alternative 7I would result in 8,465 acres on the Sawtooth NF changing from SPM to RN during the summer.

Alternative 7J crosses the Sublett and Cassia Divisions of the Sawtooth NF for a total distance of 14.9 miles, and shares the same route as Alternative 7I in these areas (with Alternative 7I crossing an additional 12.8 miles). An estimated 17.5 miles of new road would be required on the Sawtooth NF to build Alternative 7J, with an additional 20.8 miles of existing road on the Sawtooth NF requiring improvement. The transmission line and associated new road construction for Alternative 7J would result in 2,613 acres on the Sawtooth NF changing from SPM to RN during the summer.

Plan Amendment Summary

Approval of plan amendments that would result in changes to ROS settings, VQOs, or VRM classes to more developed classifications have the potential to affect the quality of the experience for recreationists using the affected areas and would, in some cases, afford a less "semi-primitive" experience to users. Visual impacts to the potentially

affected areas as well as the visual amendments, as discussed above, are evaluated in more detail within Section 3.2 – Visual Resources.

Specific Land Uses and Recreational Resources

Land Use

Land use within the Analysis Area for the Proposed Route is summarized by segment in Table 3.17-4. Viewed in terms of miles crossed, more than half of the Proposed Route for Segment 7 would cross rangeland (58 percent), with the remainder of the route crossing cropland (37 percent), and forest (4 percent). The irrigated cropland crossed by the Proposed Route (approximately 15.7 miles) occurs predominantly south of Burley and at scattered locations east and west of the Deep Creek Mountains.

Alternatives 7A through 7J range from less than 1 mile longer to approximately 58 miles longer than their respective comparison portions of the Proposed Route (Table 3.17-22).

Table 3.17-22. Miles Crossed by Land Use – Segment 7

Segment/Alternative	Total	Rangeland	Agriculture	Forest	Water and Wetlands	ROW	Developed	Other
Proposed – Total Length	117.4	68.0	43.6	4.6	0.3	0.5	0.4	–
Proposed – Comparison Portion for Alternative 7A,B	35.1	19.9	10.4	4.6	0.1	–	–	–
Alternative 7A	36.0	22.5	7.5	5.1	0.6	0.2	–	–
Alternative 7B	46.4	30.1	13.5	2.6	–	0.3	–	–
Proposed – Comparison Portion for Alternative 7C	20.1	11.9	8.1	–	–	–	–	–
Alternative 7C	20.3	15.2	4.8	–	–	–	0.2	–
Proposed – Comparison Portion for Alternative 7D	6.2	5.3	0.8	–	0.1	0.1	–	–
Alternative 7D	6.8	5.6	1.0	–	0.1	0.1	–	–
Proposed – Comparison Portion for Alternative 7E	3.8	3.6	0.2	–	–	–	–	–
Alternative 7E	4.5	4.5	–	–	–	–	–	–
Proposed – Comparison Portion for Alternative 7F	10.5	8.3	2.1	–	–	–	0.1	–
Alternative 7F	10.8	8.8	2.0	–	–	–	–	–
Proposed – Comparison Portion for Alternative 7G	3.1	2.7	0.4	–	–	–	–	–
Alternative 7G	3.2	2.5	0.7	–	–	–	–	–
Proposed – Comparison Portion for Alternative 7H and 7I	117.4	68.0	43.6	4.6	0.3	0.5	0.4	–
Alternative 7H	126.8	98.4	14.2	8.0	4.8	1.3	–	0.1
Alternative 7I	172.7	142.9	13.3	9.9	5.8	0.6	–	0.2
Proposed – Comparison Portion 7/9 for Alternative 7J1/	143.9	91.0	46.4	4.6	0.4	0.7	0.6	0.2
Alternative 7J	202.1	177.1	13.6	9.3	1.4	0.7	—	<0.1

Miles are rounded to tenths of a mile; columns/rows may therefore not sum exactly.

1/ Alternative 7J connects with Segment 9 approximately 25.8 miles west of the proposed Cedar Hill Substation, which is the western terminus of Segment 7 and the beginning point for Segment 9. The table above compares 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

Alternatives 7A and 7B would extend to the south of the Proposed Route to avoid the Deep Creek Mountains. Both alternatives are longer than the comparison portion of the Proposed Route and cross more miles of rangeland. Alternative 7A would also cross about 1 mile more of irrigated cropland and 4 miles less of dryland farming. Alternative 7B would cross approximately 3 miles more of dryland farming than the comparison portion of the Proposed Route and about 2 miles less forest. Alternative 7C is almost the same length as the comparison portion of the Proposed Route but would cross about 3 miles more rangeland and about 2 miles and 1.5 miles less, respectively, of dryland farming and irrigated cropland.

Alternatives 7D through 7G are each almost the same length as their respective comparison portion of the Proposed Route and would cross roughly the same miles of different land uses.

Alternative 7H is approximately 126.8 miles long, about 9.5 miles longer than the comparison portion of the Proposed Route. As noted above, this alternative was proposed by the Proponents in response to the State Line Route (Alternative 7I, see below) proposed by local landowners. Alternative 7H would cross approximately 29 fewer miles of agricultural land (18.6 miles of dryland farming; 10.8 miles of irrigated cropland) than the comparison portion of the Proposed Route. This alternative would cross about 30 more miles of rangeland and 3.4 more miles of forest than the comparison portion of the Proposed Route.

Alternative 7I is approximately 172.7 miles long, about 55 miles longer than the comparison portion of the Proposed Route. As noted above, this alternative was proposed by local landowners to avoid private agricultural lands and would cross approximately 30 fewer miles of cropland (18.6 miles of dryland farming; 11.8 miles of irrigated cropland) than the comparison portion of the Proposed Route. This alternative would, however, cross about 75 more miles of rangeland and 5 more miles of forest than the comparison portion of the Proposed Route.

Alternative 7J is approximately 202.1 miles long, about 58 miles longer than the comparison portion of the Proposed Route. It would cross about 87.1 miles more rangeland than the comparison portion of the Proposed Route, but 32.8 fewer miles of agricultural lands.

The Proposed Route for Segment 7 would pass within 1,000 feet of 21 residences; 6 of these residences are located within 300 feet of the proposed ROW centerline (Table 3.17-23). Seven of the houses within 1,000 feet are clustered on the east side of State Route 77, north of Albion, Idaho.

Alternatives 7A and 7B would each pass within 1,000 feet of three residences versus two for the comparison portion of the Proposed Route; the proposed ROW centerlines for Alternative 7B and the comparison portion of the Proposed Route both pass within 300 feet of one residence.

Table 3.17-23. Number of Residences within 1,000 feet and 300 feet – Segment 7

Proposed Route / Alternative	Within 1,000 Feet			Within 300 Feet		
	Proposed Route / Alternative	Comparison Portion of the Proposed Route	Net Difference	Proposed Route / Alternative	Comparison Portion of the Proposed Route	Net Difference
Proposed Route	21	NA	NA	6	NA	NA
7A	3	2	1	–	1	-1
7B	3	2	1	1	1	–
7C	2	–	2	–	–	–
7D	–	–	–	–	–	–
7E	4	7	-3	1	1	–
7F	–	7	-7	–	1	-1
7G	1	1	–	–	1	-1
7H	6	21	-15	1	6	-5
7I	5	21	-16	2	6	-4
7J	5	23	-18	2	7	-5

NA – not applicable

Alternative 7C would pass within 1,000 feet of two residences versus none for the comparison portion of the Proposed Route; neither of these residences are located within 300 feet of the proposed ROW centerline for Alternative 7C. There are no residences within 1,000 feet of Alternative 7D or the comparison portion of the Proposed Route.

Alternative 7E would pass within 1,000 feet of four residences versus seven for the comparison portion of the Proposed Route; the proposed ROW centerlines for Alternative 7E and the comparison portion of the Proposed Route both pass within 300 feet of one residence. There are no residences within 1,000 feet of Alternative 7F versus seven for the comparison portion of the Proposed Route, one of which would be located within 300 feet of the proposed ROW centerline. Alternative 7G and the comparison portion of the Proposed Route would each pass within 1,000 feet of one residence; the residence for Alternative 7G would be within 300 feet of proposed ROW centerline (Table 3.17-23).

Alternatives 7H and 7I would pass within 1,000 feet of 6 and 5 residences, respectively, versus 21 for the comparison portion of the Proposed Route; 1 and 2 of the residences for Alternatives 7H and 7I, respectively, would be within 300 feet, versus 6 residences within 300 feet of the comparison portion of the Proposed Route (Table 3.17-23).

Alternative 7J would pass within 1,000 feet of 5 residences versus 23 for the comparison portion of the Proposed Route; 2 of these residences would be within 300 feet, versus 7 residences within 300 feet of the comparison portion of the Proposed Route (Table 3.17-23).

Commercial, industrial, and institutional land uses crossed or within 1,000 feet of the Proposed Route and Route Alternatives are itemized by milepost in Table D.17-1 in Appendix D and summarized below. The Proposed Route would cross a CAFO (see

Section 3.18 – Agriculture) and an MTR (see below) and would pass within 1,000 feet of many center pivots and the Bower Cemetery. Alternatives 7G and 7H would also pass within 1,000 feet of the Bower Cemetery.

Alternatives 7A and 7B would each pass within 1,000 feet of one farm. Alternative 7C would pass within 1,000 feet of a center-pivot and a CAFO. Alternative 7D would cross 0.3 mile of a wind energy facility and pass within 1,000 feet of a center pivot.

Alternative 7H, would pass within 1,000 feet of a silo, a warehouse, a gravel pit, an active mining claim, and the Bower Cemetery. Alternative 7I would pass within 1,000 feet of a silo, a warehouse, a water tank, a gravel pit, an unidentified structure, and a center-pivot. Alternative 7J would pass within 1,000 feet of a silo, warehouse, and a center-pivot.

The Proposed Route and Alternative 7H would both cross MTR 302, at MPs 58 and 66, respectively, and Alternatives 7I and 7J would parallel MTR 302 between MPs 65 and 98. Consultation with the IDANG (Postema 2010) indicates that, in general, there is an approximate height restriction of 100 feet AGL. However, higher structures can be accommodated along these routes, if marked on charts so that pilots are alerted to their presence. There should be no impact on the MTRs from the transmission line. The Proponents have not reported any plans to coordinate with the IDANG; therefore, the Agencies recommend that once the final location of towers is known, the Proponents should consult with the IDANG to ensure that the proper information is made available for warnings.

LU-7 Once the final locations of towers where crossings of the MTR would occur are known, IDANG should be consulted to ensure that the proper information is made available for proper warnings.

The Proposed Route would cross the planned Dry Creek Sky Ranches airstrip (Figure 3.17-9). According to the owner, the location of the runway is approved by the FAA and will be marked on the FAA Sectional as an unrestricted public use facility. A helipad is also planned, which would be located approximately 2,000 feet south of the Proposed Route. The Agencies recommend that the Proponents coordinate with the owner to realign the transmission line or airstrip or in some way compensate for loss of use if the airstrip receives local approvals for construction.

LU-8 Coordinate with the owner of the planned Dry Creek Sky Ranches airstrip to realign the Segment 7 Proposed Route or airstrip or in some way compensate for loss of use.

Special Management Areas

Federal lands along Segment 7 are regulated in part by the Caribou Forest Plan; the Pocatello, Malad, Cassia, and Wells RMPs; and the Twin Falls MFP. The Proposed Route for Segment 7 would not cross any SMAs identified in these plans. Alternatives 7H, 7I, and 7J would, however, cross 12.1 miles, 25.5 miles, and 25.5 miles respectively, of the Raft River-Curlew Valley IBA. The Proposed Route and other alternatives for Segment 7 would not cross this IBA.

Wilderness Characteristics

Inventory Unit ID-B-18A contains approximately 31,062 acres of BLM-managed land identified as having wilderness characteristics. The northern edge of the area would be crossed by Alternative 7H. Based on indicative engineering, the transmission line would closely follow the northern boundary of the inventory unit. If this route is approved and constructed, it would have little effect on the size of the unit or on the opportunities for solitude and primitive recreation. Construction activities would disrupt users seeking solitude in the northern portion of the unit in the short term.

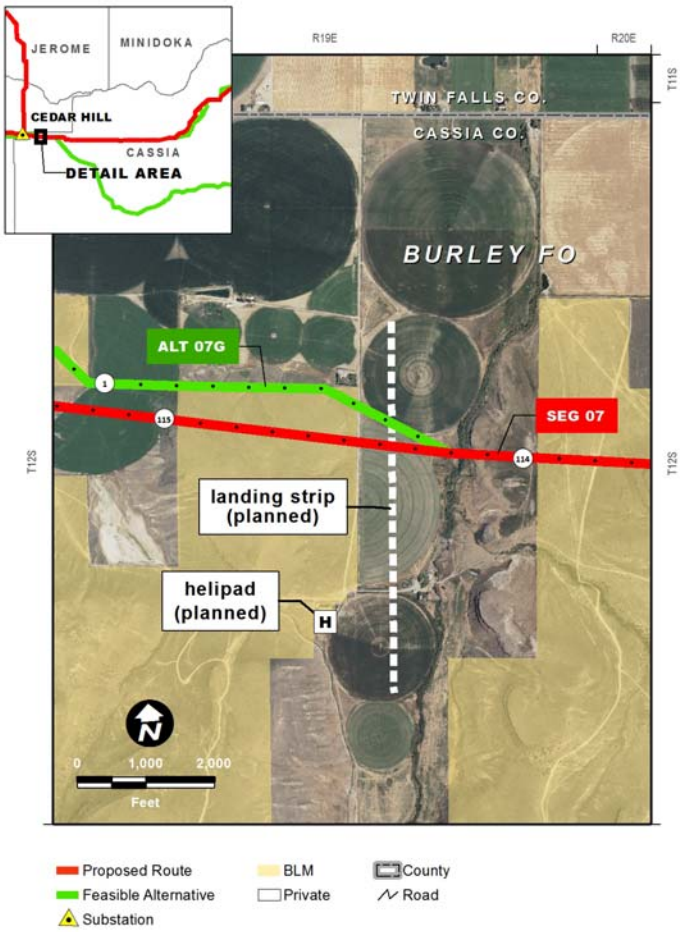


Figure 3.17-9. Dry Creek Sky Ranches Planned Airstrip

Inventory Unit ID-B-22A contains approximately 5,442 acres of BLM-managed land assumed to have wilderness characteristics pending field inventory. Alternative 7H crosses through the northeastern quarter of the inventory unit. If this route is approved and constructed as planned, the area northeast of the new transmission line and access roads would be dropped. Although opportunities for solitude and primitive recreation may still be present in the western portion of the unit due to the rugged topography, the unit would no longer be large enough to qualify as an area with wilderness characteristics. Construction activities would disrupt users seeking solitude in the northern portion of the unit in the short term.

Historic Trails

The Proposed Route and Route Alternatives for Segment 7 would cross a number of NHTs and other trails that have potential historic significance (see Table 3.3-14 in Section 3.3 – Cultural Resources). These include the Oregon NHT, California NHT–Hudspeth Cutoff, and Kelton Road. Alternative 7I and 7J would also cross the California NHT – Salt Lake Alternate. Potential impacts to historic trails are assessed in Section 3.3 – Cultural Resources.

OHV Use

The Proposed Route would cross 3.1 miles of public land closed to OHV use and 3.9 miles where OHV use is limited. The Proposed Route would cross three trails closed to OHV use and there would be two additional trail crossings due to new road

construction. In open areas (the majority of the route), it would be difficult to physically close these access points to unauthorized OHV use. OHV use on nonmotorized trails would disrupt existing uses, such as hiking and horseback riding, and may result in adverse effects to trails not designed or maintained for motorized use. The Proponents would post signs identifying the area as closed to OHV use and implement blocking measures where practical.

Alternative 7A would be 2.8 miles longer than the comparison portion of the Proposed Route but it would not cross any areas closed to OHV use or where OHV use is limited (compared to the comparison portion of the Proposed Route, which would cross 2.3 miles closed to OHV use). Alternative 7A would cross one trail closed to OHV use, and new road construction associated with Alternative 7A would cross one additional trail. The comparison portion of the Proposed Route would not cross any trails closed to OHV use. Overall, there would be less opportunity for unauthorized use in areas closed to OHVs but more opportunity for unauthorized access to trails closed to OHV use.

Alternative 7B would be 11.2 miles longer than the comparison portion of the Proposed Route but would not cross any areas closed to OHV use or where OHV use is limited (compared to the comparison portion of the Proposed Route, which would cross 2.3 miles closed to OHV use). Alternative 7B would cross one trail closed to OHV use, the same as the comparison portion of the Proposed Route. New road construction associated with Alternative 7B would cross two additional trails, one more than the comparison portion of the Proposed Route. Overall, there would be the less opportunity for unauthorized use in areas closed to OHVs, but more opportunity for unauthorized access to trails closed to OHV use and a greater potential disruption of existing uses on these trails.

Alternative 7C would be 0.2 mile longer than the comparison portion of the Proposed Route, but it would cross 0.7 miles closed to OHV use more than the comparison portion of the Proposed Route. Alternative 7B would cross one trail closed to OHV use, the same as the comparison portion of the Proposed Route. New road construction associated with Alternative 7C would cross one additional trail, one more than the comparison portion of the Proposed Route. Overall, there would be a greater opportunity for unauthorized use in areas closed to OHVs and for unauthorized access to trails closed to OHV use and potential disruption of existing uses on these trails under Alternative 7C,

Alternative 7D would be 0.6 mile longer than the comparison portion of the Proposed Route but would cross 1.6 miles less area where OHV use is limited than the comparison portion of the Proposed Route. Alternative 7D would cross one trail closed to OHV use and there would be one additional trail crossing due to new road construction. This would be the same as the comparison portion of the Proposed Route; therefore, there would be no difference in the risk of unauthorized use on trails closed to OHVs and less potential for unauthorized OHV use in areas where OHV access is limited under Alternative 7D.

Alternative 7E would be 0.7 mile longer than the comparison portion of the Proposed Route, but it would cross 1.6 miles where OHV use is limited more than the comparison portion of the Proposed Route. This would result in a greater potential for unauthorized

OHV use in areas where OHV access is limited. There would be no additional trail crossings for Alternative 7E or for the comparison portion of the Proposed Route; therefore, there would be no additional opportunity for unauthorized use on trails closed to OHVs or potential disruption of existing uses on these trails.

Alternative 7F would be 0.3 mile longer than the comparison portion of the Proposed Route, but would cross 3.1 miles more where OHV use is limited than the comparison portion of the Proposed Route. This would result in a greater potential for unauthorized OHV use in areas where OHV access is limited. There would be no additional trail crossings for Alternative 7F or for the comparison portion of the Proposed Route; therefore, there would be no additional opportunity for unauthorized use on trails closed to OHVs or potential disruption of existing uses on these trails.

Alternative 7G would be approximately the same length as the comparison portion of the Proposed Route, and neither route would cross areas closed to OHVs or where OHV use is limited. There would be no additional trail crossings for Alternative 7G or for the comparison portion of the Proposed Route; therefore, there would be no additional opportunity for unauthorized use on trails closed to OHVs or potential disruption of existing uses on these trails under either alternative.

Alternative 7H would be 9.4 miles longer than the comparison portion of the Proposed Route, and would cross 8.4 miles more area closed to OHV use and 16.4 miles more area where OHV use is limited than the comparison portion of the Proposed Route. This would result in a much greater potential for unauthorized OHV use in areas where OHV access is limited or nor allowed.

Alternative 7I would be 55.3 miles longer than the comparison portion of the Proposed Route, and would cross 26.7 miles more area closed to OHV use and 24.3 miles more area where OHV use is limited than the comparison portion of the Proposed Route. This would result in a much greater potential for unauthorized OHV use in areas where OHV access is limited or not allowed.

Alternative 7J would be about 58.2 miles longer than the comparison portion of the Proposed Route, and would cross 11.8 miles more area closed to OHV use and 19.3 miles more area where OHV use is limited than the comparison portion of the Proposed Route. This would result in a much greater potential for unauthorized OHV use in areas where OHV access is limited or not allowed.

Segment 8

Segment 8, as proposed, would link the Midpoint and Hemingway Substations. This 131-mile single-circuit 500-kV transmission line would stay north of the Snake River until crossing through the SRBOP parallel to an existing 500-kV transmission line before ending at the Hemingway Substation. Thirteen acres of the expansion of the Midpoint Substation and 0.5 acre for a regeneration site are attributed to Segment 8. There are five Route Alternatives: 8A, which follows the WWE corridor but crosses the Snake River and I-84 twice (while the Proposed Route would stay north of this area); 8B and 8C, which represent the old routes originally proposed by the Proponents but that have now been changed to avoid the cities of Kuna and Mayfield, respectively; 8D, which represents a small revision involving a rebuild of the existing transmission line to move

both away from the National Guard Maneuver Area; and 8E, which was proposed by the BLM in order to avoid crossing the Halverson Bar nonmotorized portion of the Guffey Butte-Black Butte Historical Area (see Appendix A, Figure A-10).

Land Ownership

Almost two-thirds (65 percent) or 84.5 miles of the Proposed Route for Segment 8 would cross BLM-managed land, with the remainder crossing private (33.5 miles), state (9.3 miles), and Bureau of Reclamation (3.7 miles) land (Table 3.17-24). Alternatives 8A, 8C, and 8D range from 0.1 mile shorter to 2.2 miles longer than their respective comparison portions of the Proposed Route and would cross similar totals of miles by land ownership. Alternative 8B is 0.5 mile longer than the comparison portion of the Proposed Route and would cross 24.5 more miles of private land and 25.7 fewer miles of BLM-managed land (Table 3.17-24). Alternative 8E would be about 11.5 miles longer than the comparison portion of the Proposed Route and would cross more BLM-managed lands and slightly less private land.

Table 3.17-24. Miles Crossed by Land Ownership – Segment 8

Segment/Alternative	Total	BLM	NFS	Other[1/]	State	Private
Proposed – Total Length	131.0	84.5	–	3.7	9.3	33.5
Proposed – Comparison Portion for Alternative 8A	51.4	29.1	–	–	2.3	20.0
Alternative 8A	53.6	25.1	–	–	6.3	22.1
Proposed – Comparison Portion for Alternative 8B	45.3	39.9	–	2.7	–	2.7
Alternative 8B	45.8	14.2	–	1.5	2.8	27.2
Proposed – Comparison Portion for Alternative 8C	6.5	5.5	–	–	–	0.8
Alternative 8C	6.4	2.3	–	–	0.3	3.9
Proposed – Comparison Portion for Alternative 8D	6.9	6.9	–	–	–	–
Alternative 8D	8.1	2.9	–	–	1.0	4.2
Proposed – Comparison Portion for Alternative 8E	7.0	6.4	–	0.1	–	0.4
Alternative 8E	18.5	18.0	–	0.1	–	0.3

Miles are rounded to tenths of a mile; columns/rows may therefore not sum exactly.
1/ The "Other" miles crossed by the Proposed Route and some of the Route Alternatives are Bureau of Reclamation lands.

Approximately 6 miles of Alternative 8B would cross land that is part of the city of Kuna, and zoned and identified in the City's 2009 Comprehensive Plan for future residential and commercial development (City of Kuna 2009b). The comparison portion of the Proposed Route would avoid this and other current and planned development that would be affected by Alternative 8B by crossing the SRBOP.

Designated Corridors and Existing ROW

The Proposed Route is adjacent to existing transmission corridors for 114.5 miles (87 percent of its length). For most of its length, this route would follow the WWE corridor except at the north end where there are no existing designated corridors across

the SRBOP. Over 18 miles of the 131-mile-long Segment 8 Proposed Route (14.4 percent of its total length) is within the WWE corridor, 19.3 miles (15 percent) is within the projected WWE corridor, and 4.7 miles (4 percent) is adjacent to the WWE corridor (Table 2.4-2).

Alternative 8A is adjacent to existing transmission corridors for 38.3 miles (72 percent) of its total 53.6 miles. The alternative is within the WWE corridor for 18.9 miles (35 percent of its total length), within the projected WWE corridor for 10.7 miles (20 percent), and is adjacent to the WWE corridor for 9.3 miles (17 percent). The Jarbidge RMP restricts the location of new utilities in MUA 7. The alternative would cross a part of an existing wind farm that the Proponents would avoid during final design.

Alternative 8B is adjacent to existing transmission corridor for 17.1 miles (38 percent) of its total 45.8 miles. The alternative is within or adjacent to the WWE corridor for less than 3 miles.

Alternative 8C is adjacent to existing transmission corridors for 5.5 miles (86 percent) of its total length of 6.4 miles. For this alternative 1.9 miles (29 percent of its total length) is within the WWE corridor, 2.5 miles (39 percent) is within the projected WWE corridor, and 0.5 mile (8 percent) is adjacent to the projected WWE corridor.

Approximately 86 percent of Alternative 8D is adjacent to existing transmission corridors. There is no WWE corridor in this area.

About 11.3 miles of Alternative 8E (61.1 percent of its total length) would be located adjacent to existing transmission line corridors. There is no WWE corridor in this area.

Federal Land Use Plan Amendments

Segment 8 would cross BLM-managed lands that fall within the jurisdiction of the Monument, Jarbidge, SRBOP, and Owyhee RMPs and the Bennett Hills/Timmerman Hills, and Kuna MFPs (Table 3.17-2). Proposed amendments for the Proposed Route and Route Alternatives are identified in Table 2.2-1. No plan amendments to the Monument or Owyhee RMPs have been proposed.

<u>Jarbidge RMP</u>

The Proposed Route for Segment 8 would require that the Jarbidge RMP be amended to allow the reclassification of approximately 5,200 acres of VRM I to VRM III in the vicinity of the Oregon Trail. Alternative 8A would require a similar amendment to the Jarbidge RMP to allow the reclassification of approximately 2,800 acres of VRM Class I to VRM Class III in the vicinity of the Oregon NHT.

<u>SRBOP RMP</u>

The Project as currently designed along Segments 8 and 9 would not conform to a land use stipulation and a recreation stipulation found in the SRBOP RMP. These stipulations are as follows:

> *Restrict major utility developments to the two utility corridors identified.* (see Lands Map 3 in the SRBOP RMP)

This SRMA (Snake River SRMA) consists of 22,300 acres in the Snake River Canyon downstream from Grandview, Idaho that is managed for the protection of cultural and scenic values. (2.14 Recreation 2-20).

Close the following areas to motorized vehicles:

- *Halverson Bar – 1,150 acres*

The Proposed Route along Segment 8, as well as Alternatives 8D and 8E, would cross through areas managed under the SRBOP RMP and would be constructed in areas outside of the two utility corridors identified within this RMP. Therefore, these alternatives would not conform to the SRBOP RMP stipulation regarding utility corridors and the Project would either need to be altered so that it conforms to the SRBOP RMP, or the RMP would need to be amended. The proposed amendment would allow the Project to be constructed outside of the two utility corridors defined in the SRBOP RMP along Segments 8 and 9, as well as Alternatives 8D, 9D, and 9E, if these alternatives are selected (see Appendices F and G). Allowing this Project to be constructed outside of the utility corridors identified within the RMP is not likely to create new areas where additional lines could be routed in the future, unless the final amendment is worded such that it identifies the Project's ROW as a viable utility corridor for future lines.

The Proposed Route along Segment 8 would cross through the Halverson Bar area, which is designated as a non-motorized area. Therefore, this route would not conform to the SRBOP RMP stipulation regarding the Halverson Bar area, and the Project would either need to be altered so that conforms to the SRBOP RMP, or the RMP would need to be amended for this route to be approved. An amendment would be needed to allow the Project to be constructed within this non-motorized area; however, the Boise District BLM Office has stated that the RMP could not be amended in this way to meet objectives. Alternative 8E would avoid this area.

The Proposed Route along Segment 8 would cross the Snake River SRMA managed under the SRBOP RMP. Because a transmission line does not conform to the SRMA designation, an amendment would be required to allow the Project to cross and would result in a reduction of the total acreage by removing the area crossed by the Project from the SRMA designation. The proposed amendment would reduce the size of the Snake River SRMA by 6,400 acres. This could impact the purpose and goals of the SRMA due to the visual disturbance of a utility line, as well as reducing the overall size of the SRMA.

The Proposed Route along Segment 8 as well as Alternative 8E would cross through a ROW avoidance area designated by the SRBOP RMP to protect the visual corridor along the Oregon NHT and the resources along the Snake River canyon. Therefore, these routes would not conform to the SRBOP RMP regarding this ROW avoidance area, and the Project would either need to be altered so that it conforms to the SRBOP, or the RMP would need to be amended for this route to be approved. The proposed amendment would allow the Project to be constructed within this ROW avoidance area.

Approval of the proposed amendments to the SRBOP RMP would result in approximately 653 acres changing from an ROS of SPM to RN as a result of the

transmission line and new road construction under Alternatives 8B and 8E. The majority of the SRBOB is currently allocated to the RN ROS class.

Bennett Hills/Timmerman Hills MFP

The Proposed Route for Segment 8 would require that the Bennett Hills/Timmerman Hills MFP be amended to allow the reclassification of approximately 3,000 acres of VRM Class II to VRM Class III in the Burnt Ridge area to the north of the Proposed Route.

Kuna MFP

The Project, as currently designed along Segment 8, would not conform to a land use stipulation found in the Kuna MFP. The Kuna MFP states the following:

> *Confine major new utility R/Ws (i.e., 500KV or larger or 24-inch pipeline) to existing corridors. The R/Ws will subject to reasonable stipulations to protect other resource uses.*

The Proposed Route along Segment 8, as well as Alternatives 8B, 8C, and 8D, would cross through areas managed under Kuna MFP and would be constructed in areas outside of existing corridors. Therefore, these routes would not conform to the Kuna MFP. The proposed amendment would allow the Project to be constructed outside of "existing corridors" along Segment 8, as well as Alternatives 8B, 8C, and 8D if these alternatives are selected (see Appendix F). Allowing this Project to be constructed outside of "existing corridors" on lands managed by the Cassia RMP could potentially create new areas where additional lines could be routed in the future, as the Project would become an "existing corridor" following construction.

Plan Amendment Summary

Approval of plan amendments that would result in changes to VRM classes to more developed classifications have the potential to affect the quality of the experience for recreationists using the affected areas and would, in some cases, afford a less "semi-primitive" experience to users. Visual impacts to the potentially affected areas as well as the visual amendments, as discussed above, are evaluated in more detail within Section 3.2 – Visual Resources.

Specific Land Uses and Recreational Resources

Land Use

Land use within the Analysis Area for the Proposed Route is summarized by segment in Table 3.17-4. Viewed in terms of miles crossed, the majority of Proposed Route for Segment 8 would cross rangeland (89 percent), with the remainder of the route crossing cropland (9 percent), and water and wetlands (1 percent). Alternatives 8A through 8E range from less than 1 mile shorter to approximately 11.5 miles longer than their respective comparison portions of the Proposed Route (Table 3.17-25).

Table 3.17-25. Miles Crossed by Land Use – Segment 8

Segment/ Alternative	Total	Rangeland	Agriculture	Forest	Water and Wetlands	ROW	Developed	Other
Proposed – Total Length	131.0	116.9	12.0	–	1.0	0.8	–	0.3
Proposed – Comparison Portion for Alternative 8A	51.4	39.5	11.2	–	0.3	0.4	–	–
Alternative 8A	53.6	40.2	11.7	–	0.6	0.3	0.7	–
Proposed – Comparison Portion for Alternative 8B	45.3	44.1	0.4	–	0.2	0.3	–	0.2
Alternative 8B	45.8	29.9	11.7	–	0.4	2.6	0.4	0.8
Proposed – Comparison Portion for Alternative 8C	6.5	6.4	–	–	–	0.1	–	–
Alternative 8C	6.4	6.3	–	–	–	0.1	–	–
Proposed – Comparison Portion for Alternative 8D	6.9	6.9	–	–	–	–	–	–
Alternative 8D	8.1	6.6	1.4	–	–	–	–	–
Proposed – Comparison Portion for Alternative 8E	7.0	6.3	0.4	–	0.1	0.04	–	–
Alternative 8E	18.5	18.2	–	–	0.1	0.1	–	–

Miles are rounded to tenths of a mile; columns/rows may therefore not sum exactly.

Alternative 8A is approximately 53.6 miles long and extends to the south of the eastern portion of the Proposed Route. This alternative generally would follow the WWE corridor but would cross the Snake River and I-84 twice. Alternative 8A is about 2.2 miles longer than the comparison portion of the Proposed Route and would cross very similar miles of different land uses.

Alternative 8B is approximately 45.8 miles, about 0.5 mile longer than the comparison portion of the Proposed Route. This route, originally identified by the Proponents as the Proposed Route, would cross approximately 14 fewer miles of rangeland and about 11 miles more of cropland, mostly irrigated.

Alternatives 8C and 8D, 6.4 miles and 8.1 miles long, respectively, are very similar in total length to their respective comparison portion of the Proposed Route and would cross roughly the same miles of different land uses.

Alternative 8E would be approximately 18.5 miles long, about 11.5 miles longer than the comparison portion of the Proposed Route. Alternative 8E and the comparison portion

of the Proposed Route both primarily cross rangeland; approximately 18.2 miles or 98 percent of Alternative 8E crosses rangeland.

The Proposed Route and Route Alternatives for Segment 8 pass within 1,000 feet of more residences than the Proposed Route and Route Alternatives for any of the other segments. The Proposed Route would pass within 1,000 feet of 27 residences; 6 of these residences are located within 300 feet of the proposed ROW centerline (Table 3.17-26). Eight of the residences within 1,000 feet are between MPs 130.4 and 130.7 where the Proposed Route approaches the Hemingway Substation.

Table 3.17-26. Number of Residences within 1,000 feet and 300 feet – Segment 8

Proposed Route / Alternative	Within 1,000 Feet			Within 300 Feet		
	Proposed Route / Alternative	Comparison Portion of the Proposed Route	Net Difference	Proposed Route / Alternative	Comparison Portion of the Proposed Route	Net Difference
Proposed Route	27	NA	NA	6	NA	NA
8A	46	14	32	7	3	4
8B	55	12	43	24	2	22
8C	1	–	1	–	–	–
8D	1	–	1	1	–	1
8E	–	–	–	–	–	–

NA – not applicable

The two longer Route Alternatives, Alternatives 8A and 8B, would both pass within 1,000 feet of substantially more residences than the Proposed Route. Alternative 8A would pass within 1,000 feet of 46 residences versus 14 for the comparison portion of the Proposed Route. The majority of these residences, approximately 30, are located north of the city of Hagerman near where Alternative 8A would cross U.S. Highway 30. Seven of the residences within 1,000 feet of Alternative 8A are located within 300 feet of the proposed ROW centerline versus 3 for the comparison portion of the Proposed Route. No residences are located near Alternative 8E or the comparison portion of the Proposed Route (Table 3.17-26).

Alternative 8B would pass within 1,000 feet of 56 residences versus 12 for the comparison portion of the Proposed Route. These residences are clustered in the vicinities of Mora, Kuna, and Melba, and at the approach to the Hemingway Substation. Twenty-four of the residences within 1,000 feet of Alternative 8B are located within 300 feet of the proposed ROW centerline versus 2 for the comparison portion of the Proposed Route (Table 3.17-26).

Alternatives 8C and 8D each pass within 1,000 feet of one residence versus none for the respective comparison portions of the Proposed Route (Table 3.17-26).

Commercial, industrial, and institutional land uses crossed or within 1,000 feet of the Proposed Route and Route Alternatives are itemized by milepost in Table D.17-1 in Appendix D and summarized below.

The Proposed Route for Segment 8 would cross approximately 0.5 mile of a wind energy facility and the Wilson Creek Sanitary Landfill, and pass within 1,000 feet of five

center-pivots, two CAFOs, a gravel pit, and four other structures. Potential impacts to agricultural operations are addressed in Section 3.18 – Agriculture.

The Proposed Route would also cross approximately 9.2 miles of the IDANG Orchard Training Area. Consultation with the IDANG indicates their preference for the line to avoid a portion of the "Alpha" Maneuver Sector, Orchard Training Area (see Alternative 8D below). The IDANG has indicated that the presence of additional power lines would adversely affect existing ground maneuver and aerial combat training operations within the Orchard Training Area (Kelly 2011). The IDANG has also indicated that the Proposed Route would adversely affect approximately 3,500 acres of lands in the northern portion of the Orchard Training Area by limiting or restricting training near the proposed transmission line. This would adversely affect their ability to train personnel. In addition, this impact would constitute a permanent loss of lands within the Orchard Training Area, due to the Major Land Acquisition Moratorium established in 1990 by the Deputy Secretary of Defense, which constrains the DoD Agencies from acquiring new land.

Alternative 8A would cross approximately 0.3 mile of the Glenns Ferry Landfill and pass within 1,000 feet of two center-pivot agricultural fields, a CAFO, an animal pen, the Billingsley Creek Wildlife Management Area, a fish farm, and a wind farm.

Alternative 8B would pass close to a planned development near Mayfield in Elmore County, Idaho. Alternative 8B also would cross approximately 6 miles of the city of Kuna in Ada County, as well as 3 miles of its city impact area. Part of the area within the Kuna city limits that would be crossed was recently annexed to include the proposed Osprey Ridge development and other smaller proposed developments (City of Kuna 2009b). The area that would be crossed by Alternative 8B is currently largely agricultural land use, with existing commercial and residential development mainly limited to farms and rural residences (Figure 3.17-10). The City has, however, installed sewer lines in this area and modified its treatment plan to accommodate future development (Hasson 2010). The City of Kuna approved a Comprehensive Plan update in September 2009 that identified the proposed Osprey Ridge development area as Mixed Use General, which is defined as a zoning classification that "pertains to a land parcel or combination of parcels that are planned and developed together" (City of Kuna 2009b).

The City of Kuna has indicated that if Alternative 8B were part of the selected route the City would require the following items as part of its land use permitting process: an amendment of the City's recently approved comprehensive plan; "special use permit; design review, possible rezone; special studies; variance procedure; amendment to sewer, water, pressure irrigation and transportation plans; and road permits" (Hasson 2010).

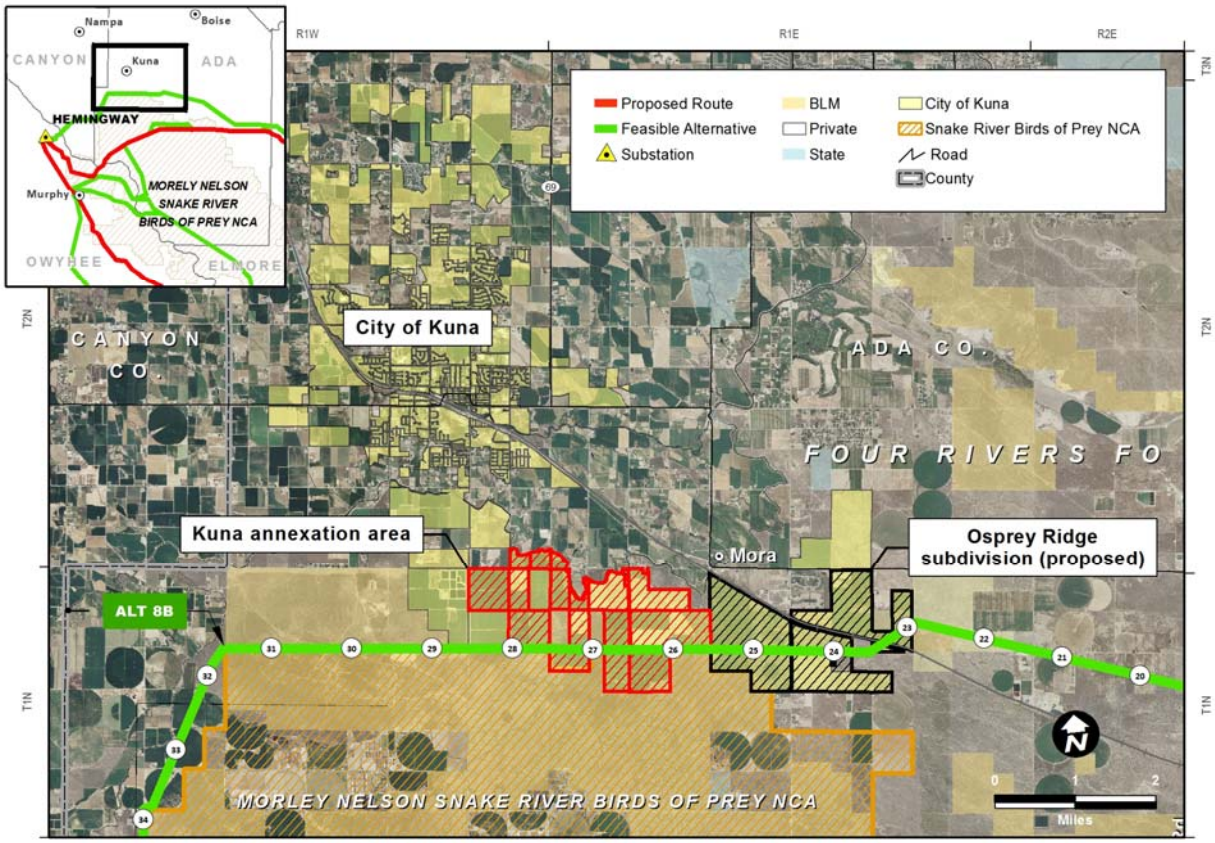


Figure 3.17-10. Alternative 8B – Vicinity of Kuna

Alternative 8B also runs along 2 miles of the northern edge of the city impact area for the city of Melba in Canyon County. This alternative would also cross approximately 0.1 mile and 0.3 mile of two residential subdivisions (Colombani Estates and Sagebrush Ridge Estates), respectively, within Ada County, Idaho (Table D.17-1). These two subdivisions are not located within an incorporated town or city; the closest city to these subdivisions is Melba, located in Canyon County. This alternative also would cross a short section of the SRBOP that is in the process of being acquired by BLM and pass within 1,000 feet of two animal pens, two CAFOs, a commercial building, two gravel pits, a silo, a warehouse, and six outbuildings.

Alternative 8B (45.8 miles) was originally identified by the Proponents as their proposed route. However, the communities of Kuna and Melba expressed strong opposition to this route when it was proposed. The City of Kuna and a number of private landowners in Kuna and Melba commissioned a study of the effects of the then-proposed route on these communities (ECS 2009). This study contends that this route (now Alternative 8B) would adversely affect the planned Osprey Ridge development and would also impact an adjacent 600-acre tract of land owned by the City of Kuna. The referenced City of Kuna land is identified in the 2009 City Future Land Use Map as agricultural with a “City Interest” overlay, which the ECS study identifies as sewer and waste water treatment, with future park and recreational development also envisioned (ECS 2009).

Much of the 6 miles of proposed transmission line that would cross the City of Kuna parallels an existing road, Barker Road.

The ECS study contends that this route (now Alternative 8B) would affect long-term growth potential in Kuna and Melba by altering the comprehensive planning process for Kuna that was ongoing when ECS prepared its study, "resulting in:

- Requiring the possible relocation of essential public services such as fire and police stations;
- Altering infrastructure such as roads and their placement;
- Rerouting the City's traffic circulation;
- Impairing utility services such as sewer and water by requiring the City's wastewater, water and stormwater management plans to be modified;
- Affecting the desirability and therefore the value of residential property; and
- Degrading view-sheds in Kuna and Melba including but not limited to the Kuna Butte and the McElroy Butte, Powers Butte and Hat Butte near Melba as well as the views in the Snake River canyon" (ECS 2009: 4).

Although not stated, it appears that the first four points pertain specifically to development in the recently annexed part of Kuna, while the last two points are more general and meant to apply to both Kuna and Melba. It is important to note that the impacts identified in the first four bullets apply to public services, infrastructure, and utility services that, for the most part, do not yet exist. Construction of the proposed transmission line through the planned Osprey Ridge development, and along the south boundary of the 600-acre parcel owned by the City of Kuna, could have implications for the location of future infrastructure and public utilities, but would not require that existing facilities be relocated.

Construction of the proposed transmission line along Alternative 8B could affect future development plans in the planned Osprey Ridge development and other areas identified as part of the city impact areas for Kuna and Melba, as could many other factors, including housing market trends and the availability of development capital. The presence of a transmission line corridor could discourage some development in the immediate vicinity, but high-voltage transmission lines coexist with residential and other types of development in cities, suburbs, and rural subdivisions, throughout the United States, with many examples of commercial and residential development abutting the transmission line ROW. Potential impacts to property values and visual impacts are addressed in Section 3.4 – Socioeconomics and Section 3.2 – Visual Resources, respectively.

The ECS study also contends that Alternative 8B would "considerably impair Kuna's and Melba's economic development opportunities by diminishing potential revenue from property taxes, building permits, and utility fees" from future planned developments like Osprey Ridge. These concerns are addressed in Section 3.4 – Socioeconomics.

In a separate comment, the City of Kuna expressed concern that construction of the proposed transmission line along Alternative 8B could negatively affect the ability of the Osprey Ridge development to provide the public amenities required by the applicable

City of Kuna zoning classification (Planned Unit Development). Kuna believes this could occur if a portion of Osprey Ridge property was "severed" by the proposed transmission line corridor in a way that affected the developers' ability to benefit from potential economies of scale that would facilitate the provision of public amenities. While this could potentially occur, the concept of "severance damage", whereby the presence of a transmission line potentially diminishes the utility of a portion of property by severing this area from the remaining property, is more generally applicable to properties smaller than large scale planned developments like Osprey Ridge (see Section 3.4 – Socioeconomics).

Alternative 8C would cross the Mayfield Springs planned community and Regina Heights. BLM has identified the need for the transmission line to be realigned in the vicinity of the planned Mayfield Springs community to substantially reduce impact to the planned development if Alternative 8C is selected.

LU-9 Alternative 8C along Segment 8 should be realigned in the vicinity of the Mayfield Springs subdivision during final design to reduce impact on the planned Mayfield Springs community.

Alternative 8D would accommodate the IDANG concerns that the "Alpha" Maneuver Sector, Orchard Training Area be avoided. This 8.1-mile alternative begins at the east boundary of the Alpha Maneuver Sector. At this point, the transmission line would be located in the existing Summer Lake to Midpoint 500-kV ROW or on new structures if the existing ones are not adequate to support the proposed conductor. The existing circuits would be relocated to a parallel 4.7-mile-long segment offset 1,500 feet to the north to maintain the reliability separation distance. This alternative would avoid the Alpha Maneuver Sector but would still be within the SRBOP. Figure 3.17-11 shows the location of Alternative 8D, the Proposed Route, and the training area. While the realignment proposed as Alternative 8D appears feasible, it would cause more construction disturbance than the Proposed Route. A detailed study would be required in conjunction with the IDANG to ensure selection of the least impacting alternative and one that does not compromise the training area's mission.

LU-10 Consult with the IDANG to determine if the Segment 8 Proposed Route can be sited in such a way as to not compromise the training mission in the Alpha Maneuver Sector of the Orchard Training Area, thereby avoiding relocation of the existing transmission line if possible.

Alternative 8E would not pass within 1,000 feet of any identified structures; however, see the discussion in the "Special Management Areas" section below regarding special designated areas crossed by Alternative 8E.

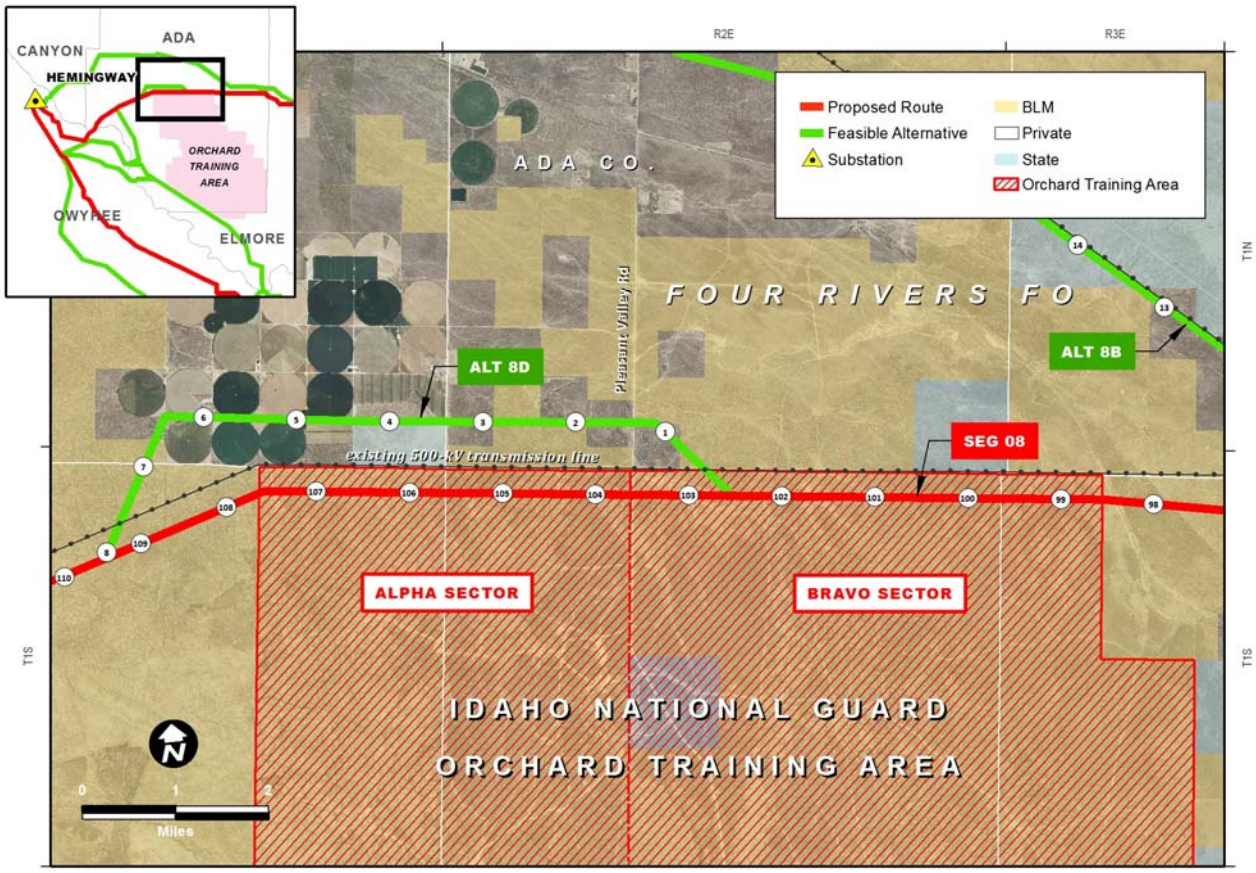


Figure 3.17-11. Orchard Training Area – Proposed Route and Route Alternatives

Special Management Areas

Federal lands along Segment 8 are regulated in part by the Monument, Jarbidge, SRBOP, and Owyhee RMPs, as well as the Bennett Hills/Timmerman Hills and Kuna MFPs.

The Proposed Route for Segment 8 would cross approximately 29.8 miles of the SRBOP and three SRMAs managed under the SRBOP RMP: the Oregon NHT, Owyhee Front, and Snake River Canyon SRMAs (Table 3.17-27). Alternative 8B does

Table 3.17-27. Special Management Areas Crossed by the Proposed Route and Route Alternatives for Segment 8

Proposed or Alternative Name[1/]	Segment Length (Miles)	Management Area	Miles Crossed
Proposed – Total Length	131.0	SRBOP	29.8
		Oregon NHT SRMA	0.2
		Owyhee Front SRMA	2.8
		Snake River Canyon SRMA	2.1
		SRBOP ROW Avoidance Area	5.3
		Guffey Butte/Black Butte Archaeological District	3.2
		Black Mountain HMA	7.0
Proposed – Comparison portion for Alternative 8A	51.4	none	NA
Alternative 8A	53.6	Oregon NHT SRMA	1.5

Table 3.17-27. Special Management Areas Crossed by the Proposed Route and Route Alternatives for Segment 8 (continued)

Proposed or Alternative Name[1/]	Segment Length (Miles)	Management Area	Miles Crossed
Proposed – Comparison portion for Alternative 8B	45.3	SRBOP	29.8
		Oregon NHT SRMA	0.2
		Owyhee Front SRMA	2.8
		Snake River Canyon SRMA	2.1
		SRBOP ROW Avoidance Area	5.3
		Guffey Butte-Black Butte Archaeological District	3.2
		Black Mountain HMA	7.0
Alternative 8B	45.8	none	NA
Proposed – Comparison portion for Alternative 8C	6.5	none	NA
Alternative 8C	6.4	none	NA
Proposed – Comparison portion for Alternative 8D	6.9	SRBOP	6.9
Alternative 8D	8.1	SRBOP	7.9
Proposed – Comparison portion for Alternative 8E	7.0	SRBOP	7.0
		SRBOP ROW Avoidance Area	2.6
		Guffey Butte-Black Butte Archaeological District	3.2
		Snake River Canyon SRMA	2.1
Alternative 8E	18.5	SRBOP	18.5
		SRBOP ROW Avoidance Area	8.3
		Guffey Butte-Black Butte Archaeological District	3.5
		Snake River Canyon SRMA	1.4

1/ Alternative routes are only included in this table if the comparison portion of the Proposed Route or the Route Alternative would cross a species designated management area.
NA – not applicable; HMA – Herd Management Area

not cross the SRBOP. Alternative 8D would cross approximately 1 mile more of the SRBOP than the comparison portion of the Proposed Route, while Alternative 8E would cross about 11.5 miles more (Table 3.17-27).

The Proposed Route for Segment 8 would cross approximately 0.2 mile of the Oregon NHT SRMA, 2.1 miles of the Owyhee Front SRMA, and 2.1 miles of the Snake River Canyon SRMA, as well as 5.3 miles of the SRBOP ROW avoidance area (Table 3.17-27). Alternative 8A would cross an additional 1.5 miles of the Oregon NHT SRMA. Alternative 8B would not cross the SRBOP and would, therefore, avoid crossing all three SRMAs and the ROW avoidance area. Alternative 8E would cross an additional 5.7 miles of the SRBOP ROW avoidance area but 0.7 mile less of the River Canyon SRMA (Table 3.17-27).

The Proposed Route would cross approximately 3.2 miles of the Guffey Butte-Black Butte Archaeological District and 7 miles of the Black Mountain HMA. Alternative 8B would avoid crossing this district and HMA, while Alternative 8E would cross about 0.3 mile more of this area than the comparison portion of the Proposed Route (Table 3.17-27).

Wilderness Characteristics

As noted earlier, no areas with wilderness characteristic are affected in this segment.

Historic Trails

The Proposed Route along Segment 8 and route alternatives to this segment would cross a number of NHTs and other trails such as stage and wagon roads that have potential historic significance. These include the Oregon NHT, the Oregon NHT South Alternate, the Northside Alternate Oregon NHT, the North Alternate Oregon NHT, Kelton Road, Dorsey's Road, and the Boise City-Silver City Road. Potential impacts to historic trails are assessed in Section 3.3 – Cultural Resources.

OHV Use

The Proposed Route would cross 34.6 miles of public land where OHV use is limited. Segment 8 of the Proposed Route would cross approximately 0.8 mile of Halverson Bora (public land) immediately north of the Snake River that is closed to all motorized vehicles. The Proposed Route would result in five trail crossings and there would be five additional trail crossings due to new road construction. Over 90 percent of the Proposed Route would follow existing transmission lines; therefore, there would be little effect on OHV access.

LU-11 Consult with the BLM to determine how best to construct and maintain the Proposed Route transmission line through the area closed to motorized vehicles along the Snake River to ensure no impacts to existing natural, cultural, and historic resources.

Alternative 8A would be 2.2 miles longer than the comparison portion of the Proposed Route and would cross 1.1 miles of land closed to OHV use and 3.3 miles where OHV use is limited. The comparison portion of the Proposed Route would not cross any areas closed to OHV use or where use is limited. Alternative 8A would cross three trails closed to OHV use, one more than the comparison portion of the Proposed Route. There would be two additional trail crossings due to new road construction, the same as for the comparison portion of the Proposed Route. Approximately 76 percent of Alternative 8A and 95 percent of the comparison portion of the Proposed Route would follow existing transmission lines. Overall, there would be a somewhat greater risk of unauthorized OHV under Alternative 8A.

Alternative 8B would be 0.5 mile longer than the comparison portion of the Proposed Route but would cross 24.9 miles more land where OHV use is limited than the comparison portion of the Proposed Route. Alternative 8B would cross one trail closed to OHV use, the same as the comparison portion of the Proposed Route. There would be one additional trail crossing due to new road construction, compared to no trail crossings for the comparison portion of the Proposed Route. In addition, 81 percent of the comparison portion of the Proposed Route would follow existing transmission lines, compared to about 31 percent under Alternative 8B; therefore, Alternative 8B would have a greater risk for adverse effects due to increased OHV access.

Alternative 8C would be 0.1 mile shorter than the comparison portion of the Proposed Route. Neither Alternative 8C nor the comparison portion of the Proposed Route would cross areas closed to OHV use or where OHV use is limited. Alternative 8C would not result in any additional trail crossing, nor would the comparison portion of the Proposed Route. All of Alternative 8C would follow existing transmission lines, compared to 46

percent of the comparison portion of the Proposed Route. Overall, there would be little effect on unauthorized OHV use under either alternative.

Alternative 8D would be 1.2 miles longer than the comparison portion of the Proposed Route but would cross 3.5 miles less area where OHV use is limited than the comparison portion of the Proposed Route. Alternative 8D would not result in any additional trail crossings due to new road construction, nor would the comparison portion of the Proposed Route. Nearly 86 percent of Alternative 8D would follow existing transmission lines, as would all of the comparison portion of the Proposed Route. Overall, there would be little difference in the risk of unauthorized use in areas closed to OHVs or the potential for disruption of existing uses on trails closed to OHV use.

Alternative 8E would be 11.5 miles longer than the comparison portion of the Proposed Route and would cross 11.7 miles more area where OHV use is limited. Alternative 8E would not result in any additional trail crossings due to new road construction, nor would the comparison portion of the Proposed Route. About 61 percent of Alternative 8E would follow existing transmission lines. Because of the longer length and the additional crossing of areas where OHV use is limited, Alternative 8E would generally have a greater risk for adverse effects due to increased OHV access than the comparison portion of the Proposed Route.

Segment 9

Segment 9, as proposed, would link the Cedar Hill and Hemingway Substations with a 161.7 mile single-circuit 500-kV transmission line which skirts the Jarbidge and Owyhee Military Operating Areas to the north, then follows the WWE corridor just north of the Saylor Creek Air Force Range, passing through Owyhee County before entering into the Hemingway Substation. Fifteen acres of the construction of the Cedar Hill Substation and 1 acre for two regeneration sites are attributed to Segment 9. There are eight Route Alternatives proposed, including 9A, which was the Proponents' Proposed Route until moving to avoid the Hollister area; 9B, which is being considered by the BLM because it follows the WWE corridor and parallels existing utility corridors; 9C, which was the Proponents' Proposed Route until moving to avoid the Castleford area; and 9D and 9E, proposed by the Owyhee County Task Force, that cross more public lands north and south of the Proposed Route, respectively, than the Proposed Route. Most of Alternative 9D would be within the SRBOP. Alternatives 9F, 9G, and 9H were proposed to avoid crossing the nonmotorized area south of C.J. Strike Reservoir. Alternatives 9G and 9H provide an alternate route location south of Alternative 8E (see Appendix A, Figure A-11).

Land Ownership

The majority (80 percent) of the Proposed Route for Segment 9, approximately 128.7 miles, would cross BLM-managed lands, with the remainder crossing private (28.4 miles) and state (4.6 miles) lands (Table 3.17-28). Alternative 9A is 0.1 mile shorter than the comparison portion of the Proposed Route and would cross similar totals of miles by land ownership. Alternatives 9B and 9C would be approximately 3.8 miles and 0.6 mile longer than their respective comparison portions of the Proposed Route and

Table 3.17-28. Miles Crossed by Land Ownership – Segment 9

Segment/Alternative	Total	BLM	NFS	Other	State	Private
Proposed – Total Length	161.7	128.7	–	–	4.6	28.4
Proposed – Comparison Portion for Alternative 9A	7.8	6.0	–	–	–	1.8
Alternative 9A	7.7	5.6	–	–	–	2.1
Proposed – Comparison Portion for Alternative 9B	49.5	46.0	–	–	1.1	2.4
Alternative 9B	53.2	33.1	–	–	1.0	19.1
Proposed – Comparison Portion for Alternative 9C	14.7	13.6	–	–	1.1	–
Alternative 9C	15.3	8.3	–	–	–	7.0
Proposed – Comparison Portion for Alternatives 9D, 9E, 9F, 9G, 9H	57.2	37.6	–	–	1.1	18.4
Alternative 9D	58.4	51.1	–	–	4.0	3.3
Alternative 9E	68.7	65.1	–	–	2.3	1.3
Alternative 9F	62.9	46.5	–	0.2	3.9	12.3
Alternative 9G	56.4	49.4	–	0.2	3.9	3.0
Alternative 9H	61.0	44.8	–	0.2	3.9	12.0

Miles are rounded to tenths of a mile; columns/rows may therefore not sum exactly.

would cross 16.7 miles and 7 miles more private land, respectively, with a generally commensurate reduction in the acres of BLM-managed lands that would be crossed (Table 3.17-28).

Alternatives 9D and 9E would be approximately 1.2 miles and 11.5 miles longer than the comparison portions of the Proposed Route and would cross 15.1 and 17.1 fewer miles of private land, respectively. Both alternatives are located almost entirely on BLM-managed lands, and Alternative 9D would cross 54.3 miles of the SRBOP.

Alternatives 9F and 9H would be approximately 5.7 miles and 3.8 miles longer, respectively, than the comparison portion of the Proposed Route. Both alternatives would cross more miles of BLM-managed land and fewer miles of private land than the comparison portion of the Proposed Route.

Alternative 9G would be approximately 0.8 mile shorter than the comparison portion of the Proposed Route. Like Alternatives 9F and 9H, Alternative 9G would cross more miles of BLM-managed land and fewer miles of private land than the comparison portion of the Proposed Route.

Designated Corridors and Existing ROW

The 161.7-mile Proposed Route would follow existing transmission line corridors for 16.9 miles (11 percent) of its length. The route would be within the WWE corridor for 53.9 miles (33 percent of its total length), within the projected WWE corridor for 13.9 miles (9 percent), and adjacent to the WWE corridor for 10.6 miles (7 percent; Table 2.4-2).

Approximately 2.2 miles (28 percent) of Alternative 9A would be adjacent to an existing transmission corridor and about 2.2 miles (29 percent) would be adjacent to the WWE corridor.

Alternative 9B would follow an existing 138-kV transmission line for 23.3 miles (44 percent of its total length). The route would be within the WWE corridor for 28.2 miles (53 percent of its total length), within the projected WWE corridor for 15.7miles (30 percent), and adjacent to the WWE corridor for 2.8 miles (5 percent).

Alternative 9C would follow an existing 138-kV transmission line for 10.4 miles. Approximately 3 miles of the route (21 percent) would be adjacent to the projected WWE corridor.

Alternatives 9D would follow an existing 138-kV transmission line for 31.3 miles (54 percent). The route would be within the WWE corridor for 0.4 mile and adjacent to the WWE corridor for 1.1 miles.

Alternative 9E would not follow an existing transmission; however, it would be within the WWE corridor for 0.4 mile and adjacent to the WWE corridor for 1.8 miles.

Alternative 9F would follow an existing transmission line for 28.6 miles (46 percent of its total length). The route would be within the WWE corridor for 8.4 miles, within the projected WWE corridor for 3.0 miles, and adjacent to the WWE corridor for 3.6 miles.

Alternative 9G would follow an existing transmission line for 26.3 miles (47 percent of its total length). The route would be within the WWE corridor for 0.4 mile, and adjacent to the WWE corridor for 1.0 mile.

Alternative 9H would follow an existing transmission line for 23.6 miles (39 percent). The route would be within the WWE corridor for 8.4 miles, within the projected WWE corridor for 3.0 miles, and adjacent to the WWE corridor for 3.5 miles.

Federal Land Use Plan Amendments

Segment 9 would cross BLM-managed lands that fall within the jurisdiction of the Cassia, Jarbidge, SRBOP, and Owyhee RMPs, and the Twin Falls and Bruneau MFPs (Table 3.17-2). Proposed amendments for the Proposed Route and Route Alternatives are identified in Table 2.2-1.

No plan amendments to the Cassia and Owyhee MFPs that are directly related to land use or recreation are proposed for Segment 9; however, as discussed in the Effects Common to All Action Alternatives section, all proposed plan amendments found in Appendix F could have indirect impacts to land use and recreation.

<u>Bruneau MFP</u>

The Project as currently designed is not in conformance with the Bruneau MFP in regards to VRM. The MFP designates areas that are proposed for crossing by the Project as VRM Class II. Two proposed plan amendments would convert the entire VRM Class II parcel crossed by the Project (located near Castle Creek) to a VRM Class III classification (see Appendix F).

Twin Falls MFP

The Project as currently designed does not conform to the Twin Falls MFP. The details regarding the Project's inconsistency with the Twin Falls MFP land use stipulation L-4.1 are discussed above in the Segment 7 section.

The Proposed Route along Segment 9 would require an amendment to the Twin Falls VRM classification for the Rock Creek area before this route could be approved. Seventy acres of VRM Class II (the Rock Creek area, north of the section line) would be changed to VRM Class III (see Appendix F).

Segment 9 of the Proposed Route, as currently designed, would cross the Salmon Falls Creek ACEC along a WSR-eligible portion of Salmon Falls Creek. WSR eligibility requires management that prevents activities that could result in the river being declared WSR-unsuitable. A powerline crossing would not conform to WSR management and therefore no amendment can be proposed unless the river is determined to be unsuitable (see Appendix F-1). WSR eligibility is discussed at the end of the Segment 9 amendment discussion.

SRBOP RMP

The Project as currently designed along Segment 9 would not conform to a land use stipulation and two recreational stipulations found in the SRBOP RMP. These stipulations are as follows:

> *Restrict major utility developments to the two utility corridors identified.* (see Lands Map 3 in the SRBOP RMP)
>
> *The Snake River SRMA consists of 22,300 acres in the Snake River Canyon downstream from Grandview, Idaho that is managed for the protection of cultural and scenic values. (2.14 Recreation 2-20).*
>
> *The C.J. Strike SRMA consists of 20,000 acres surrounding C.J. Strike Reservoir along the Snake River. The purpose of the SRMA is to provide enhanced recreation management associated with the reservoir, and protection of the Oregon Trail adjacent to the reservoir (2.14 Recreation 2-20).*
>
> *Close the following areas to motorized vehicles:*
>
> - *Cove – 1,600 acres*

The Proposed Route, as well as Alternatives 9D, 9E, 9F, 9G, and 9H, would cross through areas managed under the SRBOP RMP and would be constructed in areas outside of the two utility corridors identified within this RMP. Therefore, these alternatives would not conform to the SRBOP RMP stipulation regarding utility corridors, and the Project would either need to be altered so that it conforms to the SRBOP RMP or the RMP would need to be amended. The proposed amendment would allow the Project to be constructed outside of the two utility corridors defined in the SRBOP RMP along Segment 9, as well as the Route Alternatives, if these routes are selected (see Appendices F and G). Allowing this Project to be constructed outside of the utility corridors identified within the RMP is not likely to create new areas where additional

lines could be routed in the future, unless the final amendment is worded such that it identifies the Project's ROW as a viable utility corridor for future lines.

Alternatives 9D and 9G would cross through the Snake River and the C.J. Strike SRMAs managed under the SRBOP RMP. A transmission line does not conform to the SRMA designation for these areas; therefore, an amendment that would reduce the acreage of the designated areas (i.e., remove the area crossed by the Project from the SRMA designation) would be required to construct the line along Alternatives 9D and 9G (see Appendices F and G). The amendment would remove about 6,400 acres from the Snake River SRMA and about 3,100 acres from the C.J. Strike SRMA. This would impact the utility of these SRMAs due to the visual disturbance of a transmission line near these areas, as well as reducing their overall size.

Alternatives 9D, 9F, 9G, and 9H would also require that the SRBOP RMP be amended to allow the reclassification of approximately 3,100 acres of VRM Class II to VRM Class III in the vicinity of the Oregon NHT and the Snake River Canyon.

In addition, Alternatives 9D and 9G would cross through the Cove Non-motorized Area. Roads would be constructed as part of these alternatives, which means they would not conform to the SRBOP RMP stipulation for this area, and the Project would either need to be altered so that it conforms to the SRBOP RMP or the RMP would need to be amended for this route to be approved. An amendment would be needed to allow the Project to be constructed within this non-motorized area; however, the Boise District BLM Office has stated that the RMP could not be amended in this way to meet objectives. The Proposed Route and Alternatives 9F and 9H would avoid this area.

Alternatives 9D, 9F, 9G, and 9H would cross through a ROW avoidance area designated by the SRBOP RMP to protect the visual corridor along the Oregon NHT and the resources along the Snake River canyon. Therefore, these routes would not conform to the SRBOP RMP regarding this ROW avoidance area, and the Project would either need to be altered so that it conforms to the SRBOP, or the RMP would need to be amended for this route to be approved. The proposed amendment would allow these alternatives to be constructed within this ROW avoidance area.

Approval of the proposed amendments to the SRBOP RMP would result in approximately 653 acres changing from an ROS of SPM to RN as a result of the transmission line and new road construction along the Proposed Route though the SRBOP. Alternatives 9D and 9G would result in approximately 955 acres changing from an ROS of SPM to RN. The majority of the SRBOP is currently allocated to the RN ROS class.

Jarbidge RMP

The Proposed Route along Segment 9 would pass through the Salmon Falls Creek ACEC. As a result, it does not conform to the Jarbidge RMP, due to the restriction of "No developments in the Salmon Falls Creek ACEC," the establishment of the ACEC as a utility avoidance/restriction area, and the current VRM Class I designation. Therefore, for the Proposed Route along Segment 9 to be approved, the Jarbidge RMP would either need to be amended to allow construction of the Project in the Salmon Falls Creek ACEC or the Project would need to be modified to avoid this area. The crossing

of Salmon Falls Creek occurs within a WSR-eligible portion of the river. WSR eligibility requires management that prevents activities that could result in the river being declared WSR-unsuitable. A powerline crossing would not conform to WSR management and therefore no amendment can be proposed unless the river is determined to be unsuitable (see Appendix F-1). No other plan amendments are proposed for Segment 9 that are directly related to land use or recreation; however, as discussed in the Effects Common to All Action Alternatives section, all proposed plan amendments found in Appendix F could have indirect impacts to land use and recreation.

The Proposed Route along Segment 9 would also cross VRM Class II area in the Saylor Creek area. An amendment would be needed to reclassify the area within the WWE corridor to VRM Class II, in order to conform to the Jarbidge RMP.

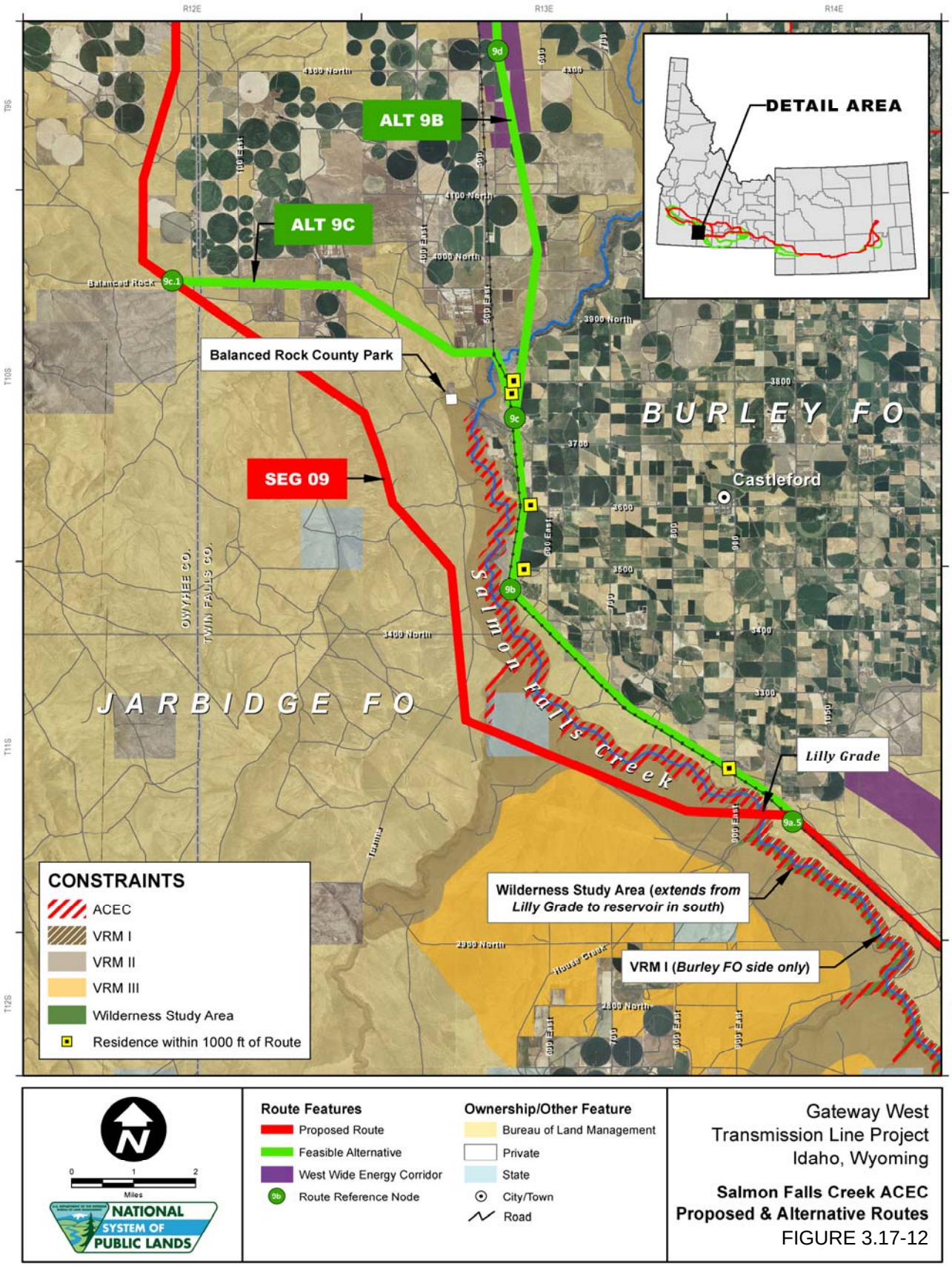
No other plan amendments are proposed for Segment 9 that are directly related to land use or recreation; however, as discussed in the Effects Common to All Action Alternatives section, all proposed plan amendments found in Appendix F could have indirect impacts to land use and recreation.

Approval of plan amendments that would result in changes to VRM classes to more developed classifications have the potential to affect the quality of the experience for recreationalists using the affected areas and would, in some cases, afford a less “semi-primitive” experience to users. Visual impacts to the potentially affected areas as well as the visual amendments, as discussed above, are evaluated in more detail within Section 3.2 – Visual Resources and Appendix G.

Salmon Falls Creek Wild and Scenic River Eligibility

The Proponents’ Proposed Route (points 9a.4, 9a.5, 9c.1) was developed in cooperation with Twin Falls County to cross Salmon Falls Creek at Lily Grade (see Figure 3.17-12). The reason for the crossing is to keep the Project on public lands and off of private agriculture lands (points 9a.4, 9b, 9c, 9c.1). The alternative route crossing at Lilly Grade is north of the Salmon Falls Creek WSA and would not affect the use. However, the route would. The Lilly Grade would cross the Salmon Falls Creek ACEC and an eligible WSR segment (as shown in Figure 3.17-12).

An RMP amendment could address issues with the proposed crossing as they relate to Salmon Falls Creek ACEC by either: 1) removing the ACEC designation, or 2) changing the management for ROW avoidance. However, a plan amendment cannot be used in a similar way to address the issues associated with crossing the eligible WSR segment because an amendment cannot 1) remove the eligibility determination without doing a full suitability study or 2) remove scenery as one of the outstandingly remarkable values (ORVs) of the segment. Therefore, a plan amendment has not been proposed for this crossing.


R12E
R13E
R14E
T9S
T10S
T11S
T12S
ALT 9B
ALT 9C
SEG 09
DETAIL AREA
Balanced Rock County Park
Balanced Rock
9c.1
9d
9c
9b
9a.5
BURLEY FO
JARBIDGE FO
Castleford
Salmon Falls Creek
Lilly Grade
OWYHEE CO.
TWIN FALLS CO.
Wilderness Study Area (extends from Lilly Grade to reservoir in south)
VRM I (Burley FO side only)
CONSTRAINTS
ACEC
VRM I
VRM II
VRM III
Wilderness Study Area
Residence within 1000 ft of Route
Route Features
Proposed Route
Feasible Alternative
West Wide Energy Corridor
Route Reference Node
Ownership/Other Feature
Bureau of Land Management
Private
State
City/Town
Road
Miles
NATIONAL SYSTEM OF PUBLIC LANDS
Gateway West
Transmission Line Project
Idaho, Wyoming
Salmon Falls Creek ACEC
Proposed & Alternative Routes
FIGURE 3.17-12

The segment of Salmon Falls Creek from Salmon Falls Dam to Balanced Rock is eligible as a WSR because it is free-flowing and possesses scenic, recreational, and geological ORVs; this segment's tentative classification is Scenic. BLM Manual 8351, *Wild and Scenic Rivers*, states at .32 C:

> *When a river segment is determined eligible and given a tentative classification (wild, scenic, and/or recreational), its identified ORVs must be afforded adequate protection, subject to valid existing rights, and until the eligibility determination is superseded, management activities and uses shall not be allowed to adversely affect either eligibility or the tentative classification....Each segment shall be managed to protect identified ORVs (subject to valid existing rights) and, to the extent practicable such values shall be enhanced.*

This policy is reiterated in Section 0.52 C. of the same manual. An eligibility determination is superseded when the BLM completes a suitability study; if the segment is determined to not be suitable for inclusion in the National Wild and Scenic Rivers System, the segment ceases to be eligible and no longer receives protective management. If the segment is determined to be suitable, the suitability recommendation is forwarded to Congress for further action. Therefore, the BLM concludes that the Proposed Route along Segment 9 could not be approved unless the river is found to be not suitable.

Specific Land Uses and Recreational Resources

Land Use

Land use within the Analysis Area for the Proposed Route is summarized by segment in Table 3.17-4. Viewed in terms of miles crossed, the majority of the Proposed Route for Segment 9 would cross rangeland (90 percent), with much of the remainder of the route crossing cropland (8 percent). Alternatives 9A through 9E would range from less than 1 mile shorter to approximately 11.5 miles longer than their respective comparison portions of the Proposed Route (Table 3.17-29). Alternatives 9A and 9C are very similar in total length to their respective comparison portion of the Proposed Route and cross very similar miles of different land uses.

Table 3.17-29. Miles Crossed by Land Use – Segment 9

Segment/ Alternative	Total	Rangeland	Agriculture	Forest	Water and Wetlands	ROW	Developed	Other
Proposed – Total Length	161.7	145.2	13.5	–	0.6	1.3	0.2	0.8
Proposed – Comparison Portion for Alternative 9A	7.8	7.6	–	–	0.1	0.1	–	–
Alternative 9A	7.7	7.1	0.1	–	–	0.3	0.1	0.1
Proposed – Comparison Portion for Alternative 9B	49.5	48.7	–	–	–	0.6	–	0.1
Alternative 9B	53.3	43.6	9.3	–	0.1	0.1	0.2	–

Table 3.17-29. Miles Crossed by Land Use – Segment 9 (continued)

Segment/ Alternative	Total	Rangeland	Agriculture	Forest	Water and Wetlands	ROW	Developed	Other
Proposed – Comparison Portion for Alternative 9C	14.7	14.3	–	–	–	0.3	–	0.1
Alternative 9C	15.3	14.8	0.4	–	–	–	–	–
Proposed – Comparison Portion for Alternatives 9D, 9E, 9F, 9G, 9H	57.2	45.7	10.0	–	0.6	0.4	–	0.5
Alternative 9D	58.4	55.6	1.5	–	0.5	0.8	–	–
Alternative 9E	68.7	67.6	0.1	–	0.2	0.3	–	0.4
Alternative 9F	62.9	54.9	6.4	–	0.7	0.8	–	0.2
Alternative 9G	56.4	53.6	1.5	–	0.5	0.9	–	0.0
Alternative 9H	61.0	52.9	6.4	–	0.7	0.8	–	0.2

Miles are rounded to tenths of a mile; columns/rows may therefore not sum exactly.

Alternative 9B, which would follow the WWE corridor and parallel existing utility corridors, would be approximately 53 miles long, about 3.8 miles longer than the comparison portion of the Proposed Route. This alternative would cross 9.3 more miles of irrigated cropland and 5 miles less of rangeland.

Alternatives 9D and 9E, both proposed by the Owyhee County Task Force, are approximately 58.4 miles and 68.7 miles long, respectively, about 1.2 miles and 11.5 miles longer than the comparison portion of the Proposed Route. The majority of Alternative 9D (93 percent; 54.3 miles) would cross the SRBOP. Viewed in terms of land use cover, this alternative would cross 8.5 miles less of irrigated cropland and 9.9 more miles of rangeland. Alternative 9E, which would cross 2.7 miles of the SRBOP, would cross 8.5 miles less of irrigated cropland and 21.9 more miles of rangeland.

Alternatives 9F and 9H are both longer than the comparison portion of the Proposed Route (about 5.7 miles and 3.8 miles longer, respectively). Alternative 9G is 0.8 mile shorter than the comparison portion of the Proposed Route. All three of these alternatives predominantly cross rangelands, with a small component of agricultural lands, wetlands, and other.

The Proposed Route for Segment 9 would pass within 1,000 feet of 20 residences; 8 of these residences are located within 300 feet of the proposed ROW centerline (Table 3.17-30). Nine of the houses within 1,000 feet are clustered near where the Proposed Route approaches the proposed Hemingway Substation.

Table 3.17-30. Number of Residences within 1,000 feet and 300 feet – Segment 9

Proposed Route / Alternative	Within 1,000 Feet			Within 300 Feet		
	Proposed Route / Alternative	Comparison Portion of the Proposed Route	Net Difference	Proposed Route / Alternative	Comparison Portion of the Proposed Route	Net Difference
Proposed Route	20	NA	NA	8	NA	NA
9A	1	1	–	–	–	–
9B	7	–	7	1	–	1
9C	5	–	5	1	–	1
9D	–	9	-9	–	6	-6
9E	–	9	-9	–	6	-6
9F	8	9	-1	2	6	-4
9G	–	9	-9	–	6	-6
9H	8	9	-1	2	6	-4

NA – not applicable

Alternative 9A and the comparison portion of the Proposed Route would each pass within 300 feet and 1,000 feet of 1 residence.

Alternatives 9B and 9C would pass within 1,000 feet of 7 and 5 more residences than the Proposed Route, respectively; in both cases 1 of these residences would be located within 300 feet of the proposed ROW centerline.

Alternatives 9D, 9E, and 9G would all pass within 1,000 feet of 9 fewer residences than the Proposed Route; six of the residences they avoid are within 300 feet of the proposed ROW centerline for the Proposed Route.

Alternatives 9F and 9H would both pass within 1,000 feet of 1 less residence than the Proposed Route, and 4 fewer residences within 300 feet.

Commercial, industrial, and institutional land uses crossed or within 1,000 feet of the Proposed Route and Route Alternatives are itemized by milepost in Table D.17-1 in Appendix D and summarized below.

The Proposed Route for Segment 9 would cross 1 mile of a proposed wind farm and 0.5 mile of an active mining claim. The Proposed Route would also pass within 1,000 feet of two gravel pits, a clay pit, the Indian Springs Estate, two animal pens, a water tank, a cemetery, and a center-pivot.

From MPs 48 to 54, the Proposed Route would be just inside the east boundary of the general Jarbidge Military Operating Area. Within the general Military Operating Area, the height of transmission structures normally cannot extend more than 100 feet above ground level. Consultation between Twin Falls County and the U.S. Air Force has determined that this height restriction would not apply and this minor encroachment would be acceptable (Kramer 2009).

The Proposed Route would also pass through the Saylor Creek Air Force Range restricted area and to the south of Bruneau Dunes State Park in the vicinity of MPs 90 to 95. Consultation between representatives of the BLM, U.S. Air Force, Idaho Department of Parks and Recreation, and the Proponents has determined that the

location of the Proposed Route within the restricted military operations area and just to the south of Bruneau Dunes State Park is acceptable.

Alternative 9A would pass within 1,000 feet of a gravel pit. Alternative 9B would cross approximately 0.1 mile of an active mining claim and about 0.7 mile of a wind energy facility, and pass within 1,000 feet of a CAFO, six center-pivots, a proposed wind farm boundary, miscellaneous outbuildings (e.g., warehouses and animal pens), and the Grindstone Agricultural Airport (the airport would be located about 398 feet southwest of this alternative). Alternative 9C would cross 0.1 mile of the same active mining claim as Alternative 9B and pass within 1,000 feet of a CAFO.

Alternative 9D would follow the southwest boundary of the IDANG Orchard Training Area and pass within 1,000 feet of two structures and Locust Park, which is owned and maintained by Idaho Power.

Alternative 9E would cross approximately 10 miles of active mining claims, as well as 0.1 mile of the Murphy Landfill and the Idaho Launch Complex (U.S. Department of Defense). This alternative would also pass within 1,000 feet of the Buckaroo and Harris Dams. Alternative 9E would also cross a motorcycle raceway area between the Grandview area (around Shoofly Creek) and Castle Creek. The area was historically a missile base and has been disturbed in the past.

Alternatives 9F and 9H would cross about 4.6 miles of the IDANG Orchard Training Area and would pass within 1,000 feet of three structures, one center-pivot, a cemetery, Beeroth Canal, and Bieroth Canal.

Alternative 9G would cross about 4.6 miles of the IDANG Orchard Training Area and would pass within 1,000 feet of Locust Park and one structure.

Special Management Areas

Federal lands along Segment 9 are regulated in part by the Cassia, Jarbidge, SRBOP, and Owyhee RMPs, as well as the Twin Falls and Bruneau MFPs.

The Proposed Route would cross approximately 2.9 miles of the Salmon Falls Creek ACEC. This is discussed in more detail above in the Federal Land Use Amendments section. The Route Alternatives would not cross this area (Table 3.17-31).

Table 3.17-31. Special Management Areas Crossed by the Proposed Route and Route Alternatives for Segment 9

Proposed or Alternative Name[1/]	Segment Length (Miles)	Management Area	Miles Crossed
Proposed – Total Length	161.7	Salmon Falls Creek ACEC	2.9
		SRBOP	13.6
		Owyhee Front SRMA	4.7
		Black Mountain HMA	9.5
		Saylor Creek HMA	12.9
Proposed – Comparison portion for Alternative 9A	7.8	none	NA
Alternative 9A	7.7	none	NA
Proposed – Comparison portion for Alternative 9B	49.5	Salmon Falls Creek ACEC	2.9
		Saylor Creek HMA	12.9

Table 3.17-31. Special Management Areas Crossed by the Proposed Route and Route Alternatives for Segment 9 (continued)

Proposed or Alternative Name[1/]	Segment Length (Miles)	Management Area	Miles Crossed
Alternative 9B	53.2	Saylor Creek HMA	6.1
Proposed – Comparison portion for Alternative 9C	14.7	Salmon Falls Creek ACEC	2.9
Alternative 9C	15.3	None	NA
Proposed – Comparison portion for Alternatives 9D–9H	57.2	SRBOP	6.1
		Owyhee Front SRMA	4.7
		Black Mountain HMA	1.1
Alternative 9D	58.4	SRBOP	54.3
		Oregon NHT SRMA	0.6
		Owyhee Front SRMA	1.2
		Snake River Canyon SRMA	1.5
		C.J. Strike Reservoir SRMA	6.0
		SRBOP ROW Avoidance Area	10.8
		Guffey Butte-Black Butte Archaeological District	3.0
		Black Mountain HMA	1.3
Alternative 9E	68.7	SRBOP	2.7
		Owyhee Front SRMA	0.2
		Black Mountain HMA	1.2
Alternative 9F	62.9	SRBOP	42.6
		SRBOP ROW Avoidance Area	10.8
		Black Mountain HMA	1.3
		Guffey Butte/Black Butte Archaeological District	3.0
		Oregon Trail SRMA	0.2
		Owyhee Front SRMA	1.2
		Snake River Canyon SRMA	1.5
Alternative 9G	56.4	SRBOP	52.0
		SRBOP ROW Avoidance Area	10.5
		Black Mountain HMA	1.2
		Guffey Butte/Black Butte Archaeological District	3.3
		Oregon Trail SRMA	0.3
		Owyhee Front SRMA	1.1
		Snake River Canyon SRMA	2.6
		C.J. Strike SRMA	9.4
Alternative 9H	61.0	SRBOP	40.3
		SRBOP ROW Avoidance Area	10.5
		Black Mountain HMA	1.2
		Guffey Butte/Black Butte Archaeological District	3.3
		Oregon Trail SRMA	0.2
		Owyhee Front SRMA	1.1
		Snake River Canyon SRMA	2.6

1/ Route Alternatives are only included in this table if the comparison portion of the Proposed Route or the Route Alternative would cross a species designated management area.

HMA – Herd Management Area; NA – not applicable; SRMA –Special Recreation Management Area

The Proposed Route would cross approximately 13.6 miles of the SRBOP and would also cross the Owyhee Front SRMA (4.7 miles), the Black Mountain HMA (9.5 miles), and the Saylor Creek HMA (12.9 miles) (Table 3.17-31). Alternative 9B would cross approximately 6.8 fewer miles of the Saylor Creek HMA than the comparison portion of the Proposed Route.

Alternatives 9A and 9C would not cross any SMAs.

Alternative 9D would cross approximately 54.3 miles of the SRBOP, about 48.2 miles more than the comparison portion of the Proposed Route (Table 3.17-31). This alternative would cross approximately 3.5 fewer miles of the Owyhee Front SRMA and 0.2 more mile of the Black Mountain HMA than the comparison portion of the Proposed Route. It would also cross a number of other SMAs that would not be crossed by the Proposed Route or the other alternatives (Table 3.17-31). These areas include the C.J. Strike Reservoir SRMA, the Snake River Canyon SRMA, the Oregon NHT SRMA, the Guffey Butte-Black Butte Archaeological District, and the SRBOP ROW avoidance area. Construction of a transmission line through some these areas (through selection of this alternative or any other alternative that would cross these areas) would require amendments to the SRBOP RMP as discussed above in the Federal Land Use Plan Amendments section.

Alternative 9E would cross approximately 3.4 fewer miles of the SRBOP than the comparison portion of the Proposed Route, 4.5 fewer miles of the Owyhee Front SRMA, and approximately 0.1 mile of the Black Mountain HMA (Table 3.17-31).

Alternative 9F would cross approximately 42.6 miles of the SRBOP, about 29.0 miles more than the comparison portion of the Proposed Route. Alternative 9G would cross approximately 52.0 miles of the SRBOP, about 38.4 miles more than the comparison portion of the Proposed Route. Alternative 9H would cross approximately 40.3 miles of the SRBOP, about 26.7 miles more than the comparison portion of the Proposed Route. Alternatives 9F, 9G, and 9H would cross similar amounts of the Owyhee Front SRMA, Black Mountain HMA, Snake River Canyon SRMA, the Oregon NHT SRMA, the Guffey Butte-Black Butte Archaeological District, and the SRBOP ROW avoidance area (Table 3.17-31). Alternative 9G would also cross the C.J. Strike SRMA, which would not be crossed by Alternatives 9F and 9H. With the exception of the SRBOP, these alternatives would cross fewer miles of the SMAs that are also crossed by the comparison portion of the Proposed Route (Owyhee Front SRMA and Black Mountain HMA) and unlike the Proposed Route would not cross the Salmon Falls Creek ACEC (Table 3.17-31).

Wilderness Characteristics

As noted earlier, no areas with wilderness characteristic are affected in this segment.

Historic Trails

The Proposed Route along Segment 9 and route alternatives to this segment would cross several NHTs and other trails such as stage and wagon roads that have potential historic significance (see Table 3.3-16 in Section 3.3 – Cultural Resources). These include the Oregon NHT, California NHT, Toana Freight Wagon Road, and Boise City-

Silver City Road. Alternative 9D would also cross the Oregon NHT South Alternate several times. Potential impacts to historic trails are assessed in Section 3.3 – Cultural Resources.

OHV Use

The Proposed Route would cross 3.3 miles of public land closed to OHV use and 37.2 miles where OHV use is limited, resulting in increased opportunities for unauthorized OHV access, and potential for disruption of existing uses. The Proposed Route would not cross any trails closed to OHV use. The Proponents would post signs identifying the area as closed to OHV use and implement blocking measures where practical.

Alternative 9A would be 0.1 mile shorter than the comparison portion of the Proposed Route, but it would cross 1.2 miles of land where OHV use is limited. In comparison, the comparison portion of the Proposed Route would cross 0.6 mile of land where use is limited. Neither Alternative 9A nor the comparison portion of the Proposed Route would result in any additional trail crossings. Overall, there would be more opportunity for unauthorized use in areas closed to OHVs under Alternative 9A.

Alternative 9B would be 3.7 miles longer than the comparison portion of the Proposed Route and would cross 0.3 mile more land closed to OHV use and 1.7 miles more land where OHV use is limited compared to the comparison portion of the Proposed Route. However, because all of Alternative 9B would follow existing transmission lines, there would be little difference between the two alternatives in this regard. Alternative 9B would cross one more trail compared to the comparison portion of the Proposed Route and two additional trails due to new road construction; therefore, Alternative 9B would have a greater risk of unauthorized use on trails closed to OHVs than the comparison portion of the Proposed Route.

Alternative 9C would be 0.6 mile longer than the comparison portion of the Proposed Route and would cross 0.3 mile more land closed to OHV use than the comparison portion of the Proposed Route. Neither Alternative 9C nor the comparison portion of the Proposed Route would result in any additional trail crossing. More than 88 percent of Alternative 9C would follow existing transmission lines; therefore, there would be little potential for increased unauthorized OHV use over that in the comparison portion of the Proposed Route.

Alternative 9D would be 1.2 miles longer than the comparison portion of the Proposed Route and would cross 25.7 miles more area where OHV use is limited compared to comparison portion of the Proposed Route. Alternative 9D would cross two trails closed to OHV use and new road construction associated with this alternative would result in an additional two crossings. This would be a total of four crossings more than the comparison portion of the Proposed Route. Approximately 54 percent of Alternative 9D would follow existing transmission lines, compared to 85 percent for the comparison portion of the Proposed Route. Overall, there would be a greater potential for increased unauthorized OHV use compared to the comparison portion of the Proposed Route.

Alternative 9E would be 11.5 miles longer than the comparison portion of the Proposed Route and would cross 7.3 miles more area where OHV use is limited than the

comparison portion of the Proposed Route. Approximately 3 percent of Alternative 9E would follow existing transmission lines, compared to 85 percent for the comparison portion of the Proposed Route. Overall, there would be a greater opportunity for unauthorized use in areas closed to OHVs under Alternative 9E than under the comparison portion of the Proposed Route, as well as a greater potential disruption of existing uses.

Alternative 9F would be 5.7 miles longer than the comparison portion of the Proposed Route and would cross 18.0 miles more area where OHV use is limited than the comparison portion of the Proposed Route. Approximately 46 percent of Alternative 9F would follow existing transmission lines, compared to 85 percent for the comparison portion of the Proposed Route. Alternative 9F would cross two more trails than the comparison portion of the Proposed Route and two additional trails due to new road construction. Overall, there would be a greater opportunity for unauthorized use in areas closed to OHVs under Alternative 9F than under the comparison portion of the Proposed Route, as well as a greater potential disruption of existing uses.

Alternative 9G would be about 0.8 mile shorter than the comparison portion of the Proposed Route, but it would cross 23.6 miles more area where OHV use is limited than the comparison portion of the Proposed Route. Approximately 47 percent of Alternative 9G would follow existing transmission lines, compared to 85 percent for the comparison portion of the Proposed Route. Alternative 9G would cross two more trails than the comparison portion of the Proposed Route and five additional trails due to new road construction. Overall, there would be a greater opportunity for unauthorized use in areas closed to OHVs under Alternative 9G than under the comparison portion of the Proposed Route, as well as a greater potential disruption of existing uses.

Alternative 9H would be 3.8 miles longer than the comparison portion of the Proposed Route and would cross 15.7 miles more area where OHV use is limited than the comparison portion of the Proposed Route. Approximately 39 percent of Alternative 9H would follow existing transmission lines, compared to 85 percent for the comparison portion of the Proposed Route. Alternative 9H would cross two more trails than the comparison portion of the Proposed Route and four additional trails due to new road construction. Overall, there would be a greater opportunity for unauthorized use in areas closed to OHVs under Alternative 9H than under the comparison portion of the Proposed Route, as well as a greater potential disruption of existing uses.

Segment 10

Segment 10, as proposed, would link the Cedar Hill and Midpoint Substations with a 33.6-mile single-circuit 500-kV line, following a WWE corridor for most of its distance. Twenty-eight acres of the expansion of the Midpoint Substation and of the construction of the Cedar Hill Substation are attributed to Segment 10. There are no Route Alternatives proposed along this segment (see Appendix A, Figure A-12).

The Proposed Route would comprise 49.2 percent rangeland, 46.1 percent agriculture, and 2.1 percent commercial and residential development. In the vicinity of Jerome and from Eden south to the Cedar Hill Substation, the entire route would be irrigated agricultural lands with scattered farms and residences. From Jerome north, this area is mostly rangeland with some agriculture. Both the Midpoint Substation and the

proposed Cedar Hill Substation would be located on rangeland. Also, there is an existing 345-kV line that follows the Proposed Route from north to south for its entire length.

Land Ownership

The 33.6-mile-long Proposed Route would cross 13.2 miles of BLM-managed land and 20.4 miles of private land (Table 3.17-32).

Table 3.17-32. Miles Crossed by Land Ownership – Segment 10

Segment/Alternative	Total	Federal	Indian Reservation	State (including water)	Private
Proposed – Total Length	33.6	13.2	–	–	20.4

Miles are rounded to tenths of a mile; columns/rows may therefore not sum exactly.

Designated Corridors and Existing ROW

The Proposed Route would follow an existing transmission line for its entire length, except to deviate from the existing line in the vicinity of the Minidoka National Historic Site. The Proposed Route would be within the WWE corridor for 11.6 miles (35 percent of its total length), within the projected WWE corridor for 19.7 miles (59 percent), and adjacent to the projected WWE corridor for 0.4 mile (1 percent).

Federal Land Use Plan Amendments

Segment 10 would cross BLM-managed lands that fall within the jurisdiction of the Monument and Cassia RMPs, and the Twin Falls MFP (Table 3.17-2). Proposed amendments for the Proposed Route are identified in Table 2.2-1. No plan amendments (related to land use or otherwise) are currently proposed for Segment 10.

Specific Land Uses and Recreational Resources

Land Use

Land use within the Analysis Area for the Proposed Route is summarized by segment in Table 3.17-4. Viewed in terms of miles crossed, half of the Proposed Route for Segment 10 would cross rangeland (approximately 50 percent), with the remainder crossing irrigated cropland (46 percent), and water and wetlands (1 percent). In the vicinity of Jerome and from Eden south to the Cedar Hill Substation, the entire Analysis Area would be irrigated agricultural lands with scattered farms and residences. From Jerome north, the area is mostly rangeland with some crop production.

The Proposed Route for Segment 10 would pass within 1,000 feet of 20 residences; 6 of these residences are located within 300 feet of the proposed ROW centerline.

Segment 10 would pass within 1,000 feet of two CAFOs and a center-pivot agricultural field. Between MPs 11 and 20, the Proposed Route would deviate from the existing 345-kV transmission line and follow the WWE corridor, thereby increasing the distance between the proposed transmission line and the NPS-managed Minidoka National Historic Site, which would be located approximately 1 mile east of the Proposed Route.

Special Management Areas

Federal lands along Segment 10 are regulated in part by the Monument and Cassia RMPs, as well as the Twin Falls MFP. The Proposed Route for Segment 10 would not cross any SMAs identified in these plans.

Wilderness Characteristics

As noted earlier, no areas with wilderness characteristic are affected in this segment.

Historic Trails

Segment 10 would cross the Oregon NHT, Northside Alternate Oregon NHT, and Kelton Road. Potential impacts to historic trails are assessed in Section 3.3 – Cultural Resources.

OHV Use

The Proposed Route would not cross any public land closed to OHV use or where OHV use is limited, nor would it result in any trail crossings. In addition, all of the Proposed Route would follow existing transmission lines; therefore, there would be no effect on OHV access.

3.17.2.4 Design Variation

A Design Variation is being considered that would consist of constructing two single-circuit lines in Segments 2 through 4 instead of a single double-circuit line (which is the design assessed above). The disturbance footprint of the two single-circuit towers is greater than that of the double-circuit tower, in part because the requested ROW would be wider, but also because helicopter-assisted construction could be implemented in these areas due to the lighter weight of the towers, which would require additional fly yards. The additional ROW space and the fly yards would cause additional temporary disturbance during construction. Across Segments 2, 3, and 4, the additional disturbance of the single-circuit tower alternative ranges from 25 to 30 percent greater than the comparable portions of the double-circuit tower disturbance under the proposed design. The two single circuits require more ground disturbance, but would be designed and constructed to the same standards as the Proposed Action. Table 3.17-33 shows the difference in acres for each of the segments or alternatives of increasing the ROW from 300 feet to 350 feet.

Table 3.17-33. Difference in ROW Acres for Design Variation

Segment/Route Name	Segment Length (Miles)[1/]	Difference (Acres)[2/]
Segment 2 – Proposed	96.7	587
Segment 2 – Alternative 2A	28.4	173
Segment 2 – Alternative 2B	6.2	38
Segment 2 – Alternative 2C	24.4	148
Segment 3	56.5	344
Segment 4 – Proposed	203.0	1,231
Segment 4 – Alternative 4A	85.2	517
Segment 4 – Alternative 4B	100.2	608
Segment 4 – Alternative 4C	101.6	616
Segment 4 – Alternative 4D	100.8	611
Segment 4 – Alternative 4E	102.2	620
Segment 4 – Alternative 4F	87.5	531

1/ Miles rounded to tenths of a mile.
2/ Acres rounded to nearest acre.

3.17.2.5 Structure Variation

The proposed guyed Structure Variation would add four guy wires about 140 feet long from a point about 100 feet up in each tower to four guy anchors spaced in a square around the tower (Appendix B, Figure B-6). This would not change the amount of disturbance during construction or operation appreciably. These structures would not be used adjacent to public roads or in rural development areas; therefore, there is no appreciable difference in impact on land use from the use of this Structure Variation when compared to the use of self-supporting lattice towers.

3.17.2.6 Schedule Variation

The Schedule Variation uses the two single-circuit design variation described above but extends construction over a longer time frame. Initially, only one of the eventual two single-circuit lines would be constructed, with the second to be constructed at a later date. The Schedule Variation proposes that the first single-circuit transmission line in Segments 2, 3, and 4 would be built as soon as a ROW grant is issued, but that the second line would not begin construction until late 2018. This would mean nearly 2 years between the end of construction for the first line and beginning of construction for the second line. Any staging areas and fly yards that had been used for the first stage would have been revegetated after construction was complete and would have to be cleared again. There would be two sets of construction disturbances, adding movement, noise, and dust to the area of construction in two instances in any given area. Varying the schedule as proposed in this variation would have no effect on most land uses, but it would affect adjacent landowners as construction occurring in two cycles would require use of access roads twice, possibly cause a delay in some reclamation, and may cause some acres to be non-productive for a longer period.

3.17.3 Mitigation Measures

To minimize or avoid impacts on land use and recreation, the Proponents have committed to EPMs that would be implemented Project-wide as outlined in this section and in Appendix C.

The following mitigation measures identified by the Agencies are required on federally managed lands. The Agencies recommend that the Proponents incorporate the measures into their EPMs and apply them Project-wide.

LU-1 To assist agency and county law enforcement in minimizing unauthorized OHV use on public and private lands, monitor OHV use and post signs along access roads where OHV activity has increased in areas on public lands where OHVs are regulated by a land use plan, and on private, state, and tribal lands at the request of the landowner, agency, or tribal government. Signs shall indicate the restriction or regulation, location, penalty for violation, and appropriate contact information for reporting violations. Signage shall be maintained and replaced as part of the routine maintenance. Consult with appropriate Agencies on additional measures to block unauthorized OHV use.

LU-2 Coordinate with the Foxley Airstrip owner to realign the location of Alternative 1E-C to eliminate the impact to the airstrip or in some manner compensate for any loss of use.

LU-3 Work with the private landowner of the ice cave along Alternative 1E-C and microsite the facilities during final design to reduce effects.

LU-4 Coordinate with the Chokecherry-Sierra Madre Wind Farm and TransWest Express Project developers and BLM along the Segment 2 Proposed Route to ensure mutually compatible siting of transmission lines and wind energy facilities.

LU-5 Work with the owners of potentially affected industrial buildings and microsite the transmission line during final design to avoid impact to these structures.

LU-6 Review the final location of the Segment 3 Proposed Route with any affected oil/gas well operators to ensure measures are taken to protect against any impacts to wells. This measure also applies to any segment where the Proposed Route would be near oil/gas wells.

LU-7 Once the final location of towers where crossings of the MTR would occur is known, IDANG should be consulted to ensure that the proper information is made available for proper warnings.

LU-8 Coordinate with the owner of the planned Dry Creek Sky Ranches airstrip to realign the Segment 7 Proposed Route or airstrip or in some way compensate for loss of use.

LU-9 Alternative 8C along Segment 8 should be realigned in the vicinity of the Mayfield Springs subdivision during final design to reduce impact on the planned Mayfield Springs community.

LU-10 Consult with the IDANG to determine if the Segment 8 Proposed Route can be sited in such a way as to not compromise the training mission in the Alpha Maneuver Sector of the Orchard Training Area, thereby avoiding relocation of the existing transmission line if possible.

LU-11 Consult with the BLM to determine how best to construct and maintain the Proposed Route transmission line through the area closed to motorized vehicles along the Snake River to ensure no impacts to existing natural, cultural, and historic resources.

3.18 AGRICULTURE

This section addresses potential impacts from the Proposed Route and Route Alternatives during construction, operation, and decommissioning. The section analyzes the potential impacts the Project's activities could have on prime farmland, livestock grazing, crop production, lands enrolled in the Conservation Reserve Program (CRP), and dairy farms. Electrical effects on agricultural operations are summarized here and described in more detail in Section 3.21 – Electrical Environment.

3.18.1 Affected Environment

This section discusses those aspects of the environment that could be affected by the Project. It starts with a discussion of the Analysis Area considered, identifies the issues that have driven the analysis, and characterizes the existing conditions within the Analysis Area.

The Project would be located across a landscape where land is primarily used for rangeland and pasture and other agricultural purposes, with an occasional town, city, or other urbanized or developed area. The eastern portion of the Project (Segments 1, 2, and 3) would be located in lands generally characterized by open rangeland and pasture. Moving west, the Project would cross steeper terrain with more forested lands (Segments 4, 5, and 7). Farther west (Segments 6 through 10), the Project would cross the Snake River Plain, which is characterized by agricultural crop production, as well as areas of urban development. Figure 3.17-1 shows generalized land use in the areas that would be crossed by the Proposed Route and Route Alternatives.

Land in farms accounted for almost half of the total land area in Wyoming in 2007, 22 percent of Idaho, and 8 percent of Nevada. In Wyoming counties, land in farms as a share of total land area ranged from 13 percent (Lincoln County) to 87 percent (Converse County). In Idaho, this share ranged from 15 percent (Lincoln County) to 74 percent (Owyhee County), with land in farms accounting for 19 percent of the land in Elko County, Nevada (Table 3.4-6). Average farm sizes ranged from 110 acres in Canyon County, Idaho, to 7,570 acres in Carbon County, Wyoming.

3.18.1.1 Analysis Area

The Analysis Area for impacts on agriculture consists of an area 500 feet on each side of the Proposed Route and Route Alternatives and 25 feet on each side of the centerline for access roads that extend outside this area and includes the areas needed for new or expanded substations as well as temporary facilities such as staging areas and fly yards. The majority of this Analysis Area, about 83 percent, is rangeland and pasture, with land used for crop production (irrigated or dryland farming) accounting for another 10 percent of the total Analysis Area.

Agricultural land use within the Analysis Area for Segments 1E, 1W, 2 and 3 is almost entirely rangeland and pasture. Rangeland and pasture is also the dominant land use in the Analysis Area segments in Idaho (Segments 4 [part], 5, 7, 8, 9, and 10), but land along these segments is also cultivated for crops (Table 3.18-1).

Table 3.18-1. Agricultural Land Use in the Analysis Area

Segment	Analysis Area Total (Acres)	Total Agricultural Use		Rangeland and Pasture		Irrigated Farming		Dryland Farming	
		Acres	Percent of Analysis Area	Acres	Percent of Analysis Area	Acres	Percent of Analysis Area	Acres	Percent of Analysis Area
1E	26,953	25,107	93	25,095	93	11	–	–	–
1W	19,752	18,019	91	18,005	91	14	–	–	–
2	17,304	16,649	96	16,649	96	–	–	–	–
3	6,858	6,507	95	6,507	95	–	–	–	–
4	50,980	45,673	90	43,975	86	681	1	1,017	2
5	20,096	17,055	85	11,855	59	1,070	5	4,130	21
7	51,086	46,982	92	37,717	74	3,406	7	5,859	11
8	28,942	28,149	97	23,491	81	4,658	16	–	–
9	41,875	41,196	98	37,985	91	3,197	8	14	–
10	4,081	3,893	95	2,009	49	1,866	46	18	–

Acreages are rounded to the nearest acre.
Source: GIS vegetation coverages

Segment 4 is approximately 86 percent rangeland and 4 percent cropland. The Analysis Area for Segment 5 consists of approximately 59 percent rangeland and 26 percent cropland.

The Analysis Area for Segment 7 consists of approximately 72 percent rangeland and 19 percent cropland. The irrigated cropland in Segment 7 occurs predominantly south of Burley and at scattered locations east and west of the Deep Creek Mountains. Burley is located in the Mini-Cassia area, which consists of Minidoka and Cassia Counties, and includes some of the best agricultural land in the region.

The Analysis Area for Segment 8 is primarily rangeland (81 percent), with cropland accounting for an additional 16 percent. Irrigated agriculture is found mostly in the first 40 miles from the Midpoint Substation and the last 25 miles before Hemingway Substation.

The Analysis Area for Segment 9 is mainly rangeland (91 percent) with approximately 8 percent used for crop production. There are three areas of extensive agriculture in this segment, near the proposed Cedar Hill Substation, west of Castleford, and between Grandview and Bruneau.

The Analysis Area for Segment 10 is approximately 49 percent rangeland and 46 percent cropland. In the vicinity of Jerome and from Eden south to the Cedar Hill Substation, the entire Analysis Area is irrigated agricultural lands with scattered farms and residences. From Jerome north, the area is mostly rangeland with some crop production.

3.18.1.2 Issues to be Analyzed

The following agriculture-related issues were brought up by the public during public scoping (Tetra Tech 2009a), raised by federal and state agencies during scoping and agency discussions, or are issues that must be considered as stipulated in law or regulation.

- How much agricultural land would be impacted, and what the effects would be;

- What the effects on livestock grazing would be from construction and operations of the transmission line;
- Whether there would be a loss of prime farmland;
- What the impacts would be to agricultural production including equipment operation and aerial spraying;
- Whether there would be a disruption to dairy operations and other types of CAFOs;
- How the transmission line would interfere with crop dusting; and
- Whether the transmission line would cause electronic interference with agricultural equipment.

3.18.1.3 Regulatory Framework

Prime farmland – Prime farmland is a land use classification used by the USDA (7 CFR Part 657.5) for lands that contain soils with the best physical and chemical characteristics for production of food, feed, forage, fiber, and oilseed crops. In addition to the FLPMA and the CWA, federal legislative acts addressing the management and protection of prime farmland include the Farmland Protection Policy Act (1984); EO 11752 (1973); EO 11988 (1973); Secretary of Agriculture Memorandum 1827; and Department Regulation 9500-3 for prime farmland, rangeland, and forest land.

Livestock grazing – Grazing on public lands is subject to the guidelines included in the various RMPs, MFPs, and Forest Plans that these lands are managed under. Grazing allotments are managed under grazing Allotment Management Plans, which are agreements developed between the rancher and the agency. Each Allotment Management Plan determines how many head of livestock may graze on the land, where they can go, how often, and for how long. Grazing allotments typically contain a mix of public, private, and state lands, which are grazed as a single unit, and can vary considerably in size. Grazing allotments in the BLM Kemmerer FO planning area, for example, range from 7 acres to 470,680 acres, with an average size of 10,149 acres (BLM 2008c).

In Wyoming, the Office of State Lands and Investment (OSLI) maintains a Farm Loan program that was established by the State Legislature in 1921 to provide long-term real estate loans to Wyoming's agricultural operators and includes loans to livestock owners to enhance and restore livestock numbers within the state.

Crop production – In Idaho the Idaho Department of Agriculture has crop regulations related to seed quality and standards. None of these regulations relate to transmission lines and their facilities or land use related to cropland.

Crop spraying – Aviation is regulated by the Federal Aviation Administration (FAA). Crop dusting is exempt from FAA aviation requirements regarding ground clearance. Aerial application of pesticides and herbicides in the Analysis Area is regulated by Idaho and Wyoming. None of these regulations apply to transmission lines or their facilities, except requirements for towers over 200 feet to be lit at night. None of the Gateway West structures would be that tall.

USDA Conservation Programs – The USDA Farm Service Agency (FSA) is authorized to provide monetary and technical support to private landowners who reserve agricultural lands for protection of wildlife, wildlife habitat, and wetlands. Contracts are made with landowners to set aside acreage for the reserve programs. The set-asides consist of leases that limit land use to the conservation purposes established within the programs. These programs include the CRP, the Grassland Reserve Program, and the Wetlands Reserve Program; these program acreages are combined and treated as agricultural land for the purposes of analysis and referred to as "CRP" lands for the remainder of this section. These CRP lands are not presently used for agriculture, but would likely revert to agricultural use if they were not part of one of the CRP programs.

Dairy farms – Management of dairy animals is regulated in Idaho by the Idaho Department of Agriculture. None of these regulations applies to transmission lines or facilities near dairy farms. There are no dairy farms in the Analysis Area in Wyoming.

Protection of agriculture – Several of the counties that would be crossed by the proposed Project have comprehensive plans that advocate protection of agriculture from development but none specifically prohibits conversion of farmland to other uses. Some of these comprehensive plans also include objectives to enforce "Right to Farm" laws and to encourage protection of agricultural lands. A list and brief description of the county and city comprehensive plans that apply to lands within the Analysis Area is provided in Section 3.17 – Land Use and Recreation (see Section 3.17.2.1).

3.18.1.4 Methods

Data on agricultural use in the Analysis Area were obtained from various sources, including aerial photographic interpretation and the vegetation mapping prepared for this project (Tetra Tech 2009b). These data were used to determine the types of agricultural land use within the Analysis Area. Potential impacts were evaluated using GIS based on projected construction and operations disturbance areas by Proposed Route Segment and Route Alternative. As noted above, the Analysis Area used to characterize and assess impacts to agriculture consists of the area within 500 feet of the centerline of the Proposed Route and Route Alternatives and 25 feet on each side of the centerline for access roads that extend outside this area.

CRP data for landowners in the Analysis Area were provided by the FSA. The 2008 Food, Conservation and Energy Act (Section 1619) prevents disclosure of specific information about individual landowners or the programs they participate in. The FSA was, however, able to use information provided by the Proponents on the route locations and provide an analysis of miles of CRP land crossed by segment.

This analysis also includes a literature review that was conducted to determine likely effects of stray voltage on dairy operations and agricultural equipment operations. Contacts were made with representative farmers and ranchers to determine the importance of crops crossed. Additional information on field induction and stray voltage is presented in Section 3.21 – Electrical Environment.

In cases where the analysis of impacts identified potential impacts, Proponent-proposed measures to reduce impacts were reviewed for sufficiency. Where those measures were determined to be insufficient, additional measures were identified.

3.18.1.5 Existing Conditions

Rangeland in the Analysis Area occurs on both publicly managed and private lands. Cropland in the Analysis Area is primarily in private ownership and includes annually cultivated or rotated cropland, land in perennial field crops, improved pasture, hayfields, and hay meadows. Cropland is divided for the purposes of analysis into irrigated cropland and dryland farming (see Table 3.18-1). Some private land in Idaho is managed as CRP lands. As noted above, CRP lands are treated as agricultural land for the purposes of this analysis.

Prime Farmland

According to the NRCS, prime farmland is defined as land that contains soils with the best physical and chemical characteristics for production of food, feed, forage, fiber, and oilseed crops, which have not already been targeted for urban development or water storage. Prime farmland has the soil quality, growing season, and moisture supply needed to produce economically sustained high yields of crops when treated and managed according to acceptable farming methods, including water management. The NRCS identifies soil mapping units that qualify as prime based on specific soil criteria. Soil mapping units may be classified as prime farmland under current conditions or as prime farmland if certain qualifying conditions exist on the site (e.g., “prime farmland if irrigated,” “prime farmland when protected from flooding,” etc.). In such cases, if the qualifying conditions do not exist, then the unit is considered “not prime.” For this analysis, “prime farmland with no restrictions,” “prime farmland when irrigated,” and “prime farmland when drained” are included in the definition and estimated acres of prime farmland.

The NRCS STATSGO database was used to evaluate the location of prime farmland in the Analysis Area for impacts on agriculture. Approximately 19 percent of the Analysis Area is classified as prime farmland by NRCS. No prime farmland was identified in the Wyoming part of the Analysis Area. All of the Proposed Route segments in Idaho cross prime farmland, with prime farmland ranging from 27 percent to 41 percent of Segments 5, 7, 8, 9, and 10 (Table 3.18-2).

Table 3.18-2. Prime Farmland within the Analysis Area by Segment

Segment	Total Analysis Area Acreage[1/]	Prime Farmland Acreage	Percent of Analysis Area by Segment
4	50,980		
5	20,096	8,215	41
7	51,086	20,115	39
8	28,942	7,759	27
9	41,875	13,795	33
10	4,081	1,436	35

1/ Note that the Total Analysis Area and Prime Farmland acreages shown here are different to those identified in Table 3.15-1 in Section 3.15 – Soils because the Analysis Area for Soils is a 1-mile corridor. The Analysis Area for Agriculture is primarily the area within 500 feet of the proposed transmission line centerline (see Section 3.18.1.1). As a result, the share of the Analysis Area that is Prime Farmland also differs slightly between the two tables. Acreages are rounded to nearest acre.

Livestock Grazing

Livestock grazing occurs on both publicly managed and private lands. Rangeland and pasture are the dominant land uses in the Analysis Area, and comprise 82.5 percent of the total Analysis Area. The percent of land within the Analysis Area used for livestock grazing (rangeland and pasture) by segment ranges from 59 percent for Segment 5 to about 96 percent for Segment 2 (Table 3.18-1).

The Analysis Area includes lands that are part of BLM- and Forest Service-managed grazing allotments, as well as Idaho and Wyoming state lands that are leased for grazing. BLM and Forest Service allotments typically include a mixture of public, private, and state lands. The BLM Rawlins FO planning area, for example, includes 582 grazing allotments that contain 6.6 million acres, of which slightly more than half (52.9 percent) are BLM-managed lands. Other land ownerships include other federal lands (0.8 percent), state land (5.3 percent), and private land (40.9 percent) (BLM 2008a). Grazing allotments can vary considerably in size. Allotments in the Rawlins FO planning area, for example, range in size from 20 acres to 291,954 acres of public land. In the BLM Kemmerer FO planning area, to take another example, grazing allotments range from 7 acres to 470,680 acres (BLM 2008c).

BLM and Forest Service grazing allotments that are within the Analysis Area are listed by name by segment in Table 3.18-3. This table also identifies Idaho and Wyoming grazing leases by number.

Crop Production

Crop production in the Analysis Area includes annually cultivated or rotated cropland, land in perennial field crops, improved pasture, hayfields, and hay meadows. Crop production occurs in the Idaho portion of the Analysis Area and is divided for the purposes of analysis into irrigated cropland and dryland farming (see Table 3.18-1).

Irrigated cropland includes cropland irrigated using pivot, wheel and hand line, and flood irrigation systems. Irrigated land may have existing subsurface drainage systems (drain tiles) and surface irrigation ditches. Irrigated cropland comprises 6 percent of total land use in the Analysis Area, with the majority of this land located along Segments 5, 7, 8, 9, and 10 (Table 3.18-1). Crops grown in irrigated fields in the Analysis Area include spring wheat, winter wheat, barley, sugar beets, corn, and alfalfa hay.

Dryland farming does not involve any type of irrigation. Dryland farmed acres in the Idaho portion of the Analysis Area are typically used to grow grains or hay. No dryland farming was identified in the Wyoming portion of the Analysis Area (Table 3.18-1). The share of the Analysis Area in Idaho used for dryland farming by segment ranges from less than 1 percent for Segments 9 and 10 to 21 percent for Segment 5 (Table 3.18-1).

Crop Spraying

Crop spraying is used to apply fertilizer, fungicides, or pesticides during growing season. Crop spraying is most common in the Idaho portion of the Analysis Area, especially along Segments 7, 8, 9, and 10. Aerial crop spraying is supported by a

Table 3.18-3. Grazing Allotments within the Analysis Area by Segment

Segment	BLM Allotment (Range)	Forest Service Allotment	Grazing Lease (Idaho)	Grazing Lease (Wyoming)
1E	Antelope Springs, Bailey Atkinson, Banner Mountain, Bar M Mountain, Bates Benchmark, Bates Creek, Bell-otte Ranch, Burnett Creek, Carlin Ranch, Curry Creek, Davidson Creek, Deer Creek, Deer Creek 2, Dodge Creek Ranch, Ellis Block, Grasshopper, Green Creek, Hay Draw, Hess Draw, Ice Cave Mountain, James Atkinson, Ken Atkinson, Little Medicine, Moss Agate, Mud Gulch, Mud Springs, Mule Creek, Mule-rogers Cr., North Area, Pinto Creek, Red Butte, River Pasture, Robbers Roost, Robbins, Rock Creek, Rock Creek Lakes, Rogers Creek, Sheep Creek, Slate Ridge, Smith Creek, Snowshoe Creek, Sommers, Spruce Cr/bates U, Sullivan, T.b. North Area, Tatman Original, Taylor, Texas Creek, Thornton Place, Three D"s & T, Twentymile Draw, Twentytwo Mile, V R, Vandiver Ditch, Warren George, West Little Medic, Wlx	Bates Creek, Boxelder, Curry Creek, Indian Flat, Rock Creek, Sagebrush, Texas Creek		1-7087, 1-7093, 1-7209, 1-7258, 1-7309, 1-7360, 1-7394, 1-7542, 1-7867, 1-7938, 1-7942, 1-8043, 1-8118, 1-8119, 1-8124, 1-8203, 1-8230, 1-8277, 1-8385, 1-8505, 1-8532, 1-8623, 3-7218, 3-7282, 3-7339, 3-7434, 3-8035, 3-8138, 3-8701
1W(a)	Antelope Springs, Banner Mountain, Bates Benchmark, Bates Creek, Big Muddy, Deer Creek 2, Ellis Block, Hess Draw, Ice Cave Mountain, Mine, Moss Agate, Red Butte, Smith Creek, Spruce Cr/bates U, Sullivan, Thorton Place, V R, West Little Medic	Bates Creek, Sagebrush		1-7209, 1-7334, 1-7394, 1-8277, 1-8323, 1-8343, 1-8505, 3-7282, 3-8138
1W(c)	Antelope Springs, Banner Mountain, Bates Benchmark, Bates Creek, Deer Creek 2, Ellis Block, Ice Cave Mountain, Mine, Moss Agate, Smith Creek, Sullivan, V R	Bates Creek, Sagebrush		1-7209, 1-7394, 1-8277, 3-7282, 3-7434, 3-8138
2	Chace Block, Daley Ranch, Dana Block North, Dana Meadows Sout, Echo Springs, Ellis Block, Lazy Y S Ranch, Medicine Bow, North Walcott, Pass Creek Ridge, Quealey Block, Riner, Sixteen Mile, South Wamsutter			3-6999, 3-7585, 3-7597, 3-7697, 3-7953, 3-8027, 3-8610
3	G.L., North Laclede, South Red Desert, South Wamsutter, Tipton			3-6918

Table 3.18-3. Grazing Allotments within the Analysis Area by Segment (continued)

Segment	BLM Allotment (Range)	Forest Service Allotment	Grazing Lease (Idaho)	Grazing Lease (Wyoming)
4	Beaver Creek, Border Summit-1, Boyd Hollow, Carter Lease, Chausse, Christy Canyon, Commissary, Cow Hollow, Coyote Springs, Cumberland Flats, Cumberland/uinta, Dempsey Basin, Downata Hot Springs, East Fork, East Willow Creek, Elkol, Erwin Creek, Fish Creek, Goblin Gulch, Granger Lease, Hassett, Hoodoo, Leefe, Left Hand Fork Marsh Creek, Lost Creek, Lund Draw, Mammoth Hollow, Mayfield, North Creek, Pegram, Pine Creek, Poison Creek, Pole Creek, Pomeroy Basin, Quakenasp Canyon, Quealy Reservoir, Rock Creek, Rocky Knoll, Ryan Creek, Sage, Seedskadee, Sheep Creek Hills-1, Sheep Creek Hills-2, Slate Creek, Slide Rock, Smithsfork, South Lake, Stockton Creek-1, Sublette Canyon, Thatcher Hill-1, Thatcher Hill-3, Tom Goure, Trail Creek, Twin Creek, West Mound Valley, West Of Rocky Knoll, West Willow Creek, Wilkinson Creek, Sheep Creek Hills-1, Sheep Creek Hills-2	Lago C & H, North Can S & G, Rock Springs (BLM Admin)		3-6910, 3-6949, 3-6953, 3-7053, 3-7134, 3-7225, 3-7620, 3-7722, 3-7738, 3-7972, 3-8104, 3-8502, Su-583
5	Anderson, Baker Canyon, Bear Hollow, Big Canyon, Big Onion, Borah, Cedar Mountain, Dairy Creek, East Fork, Ford Road-1, Freeway, Hermitsville, Indian Springs, Knox Canyon, North Bull Canyon, Peak, Pleasantview, Sawmill Canyon, Stewart Canyon, Timber, Windmill, Wiregrass Reservoir		G8550, G9185, G9706	
7	Artesian-kidd, Baker Canyon, Big Bend, Big Canyon, Big Creek, Big Onion, Bridge, Bruce Bedke-private, Buckhorn-churchill, Callahan, Cassia Creek, Cavenaugh, Cedar Mountain, Cedarville, Chapin, Churchill Tracts, Churchill-mullen, Churchill-poulton, Cld Springs, Clear Creek, Cold Springs, Critchfield-individual, Dairy Creek, Dairy Springs, Dale Pierce - Basalt, Dale Pierce - No Mans Land, Densmore Creek, Dry Creek, East Fork, Elba C & H, E-y Flat, Ford Road-1, Ford Road-2, Goose Creek Group, Goose Creek-mullen, Goose Creek-ward, Gulley, Houtz Canyon, Howe Peak, Isolated Tr-kunkel, Jim Sage, Johnson Creek, Junction Seeding, Karl E. Bedke-gse Ck, Knox Canyon, Kunau, Lunch Creek, Marchant-goose Creek, Marion Group, Martin-goose Creek, Middle Hill, Narrows Seeding, North Bull Canyon, North Cotterel, Peak, Pickett-wake, Pine Knob,	Big Creek C & H, Cold Springs C & H, Deadline, Elba C & H, Goose Creek C & H, Pothole/bedke C & H, Rock Creek C & H, Sublett C & H, Tunnel Hill C & H	G700033, G7041, G7322, G7356, G7360, G7506, G7512, G7685, G7733, G8077, G8550, G9571	

Table 3.18-3. Grazing Allotments within the Analysis Area by Segment (continued)

Segment	BLM Allotment (Range)	Forest Service Allotment	Grazing Lease (Idaho)	Grazing Lease (Wyoming)
	Pleasantview, Point Allotment, Pothople/bedke C & H, Raft River, Ridge, Rocky Hollow, South Bull Canyon, South Lake Fork, Sparks Basin, Squaw Joe Isolated, State Line, Stewart Canyon, Strevell, Table Mountain, Timber, Uncle Ike Creek, View, Warm Springs, Warr-pickett, Water Canyon, Western Stockgrowers, Whitnah, Windmill, Wiregrass Reservoir, Yale			
8	101, Black Mesa, Bowns Creek, Camp 1, Clover Creek, Common, Con Shea, Cornell, Davis Mtn, Ditto Creek, Double Anchor Ffr, East Reynolds Creek, Emigrant Crossing, Goodtime, Hagerman Group, Hammett #1, Hammett #4, Hardtrigger, Indian, Indian Creek Ffr, Junction, King Hill, King Hill Canyon, Little Canyon, Martha Avenue, Melba Seeding, Mountain Home Subunit, Mud Springs, North Cold Springs, Pioneer, Plateau, Poleline, Rabbit Creek/peters Gulch, Sand Bt, Seven Mile, Shoestring Ct, Shoestring Sp, South Cold Springs, Sunnyside Spring/fall, Sunnyside Winter, Thompson, Wendell Ct, West Pioneer		G600044, G6005, G6009, G6326, G6383, G6532, G6535, G6710, G7148, G7315, G7459, G7551, G7600, G7603, G7746, G7748	
9	Artesian-kidd, Battle Creek, Black Mesa, Browns Gulch, Bruneau Arm, Bruneau Hill, Buhl Group-berger, Chattin Hill, Cheatgrass, Con Shea, Devil Creek Balanced Rock, Diamond Basin, East Castle Creek, East Reynolds Creek, Ellis Tews-berger, Fossil Butte, Griff, Hagerman Group, Hardtrigger, Hart Creek, Hub Butte-western Sg, Isolated Tr-kunkel, Joyce Ffr, Kerr-berger, Kinyon, Kubic, Lilly Grade, Little Three Island, Loughmiller, Lower Saylor Creek, Martens Bros.-berger, Noh Field, North Balanced Rock, Northwest, Rabbit Creek/peters Gulch, Red Mountain, Ridge, Roseworth Point, Salmon Tract-u2, Saylor Creek/north Three Island, Silver City, Sinker Butte, Squaw Joe Isolated, Sunnyside Winter, Thompson, Three Island, Twin Butte, Vinson Wash, West Castle, West Castle Creek, West Saylor Creek, Western Stockgrowers, Whitehorse/antelope, Yahoo		G600007, G600035, G6152, G6190, G6255, G6410, G6466, G6634, G6636, G6652, G7056, G7128, G7631	
10	Camp 1, Milner Plot, N Milner, S Milner			

network of controlled airports and secondary airstrips. The quantity of farmed land receiving aerial crop spraying is unknown. As a result, the following analysis assumes that any dryland or irrigated farmland could receive aerial spraying. Airstrips within 3 miles of the Proposed Route and Route Alternatives are identified in Section 3.19.1.5.

CRP Lands

CRP is a popular USDA set-aside program that encourages farmers to convert highly erodible cropland or other environmentally sensitive acreage to vegetative cover, such as tame or native grasses, wildlife plantings, trees, filterstrips, or riparian buffers. Farmers receive an annual rental payment for the term of the multi-year contract. Cost sharing may be provided to establish the vegetative cover practices.

Contact with the FSA indicated that there are no CRP lands within the Wyoming portion of the Analysis Area. The FSA did, however, identify CRP lands that would be crossed by three of the proposed segments in Idaho. Estimated miles of CRP land that would be crossed range from 6.1 miles for Segment 4 to 25.6 miles for Segment 7 (Table 3.18-4).

Table 3.18-4. CRP Lands crossed by Segment (miles)

Segment Number	Total Segment (miles)	CRP (miles)	Percent of Total Segment
4	**203.0**	6.1	3
5	**54.6**	18.4	34
7	**118.1**	25.6	22

Mileages are rounded to tenths of a mile and therefore may not sum exactly.

Dairy Farms

The detailed mapping conducted by Tetra Tech (2009b) grouped dairy operations and feed lots with other commercial agricultural operations. These areas are identified as CAFOs for the purposes of this analysis. Three of the proposed segments would cross CAFOs, Segments 7, 9, and 10, with each segment crossing less than 1 mile of land identified as part of a CAFO. Estimated distances of CAFO land crossed range from 0.2 mile for Segment 9 to 0.5 mile for Segment 10.

3.18.2 Direct and Indirect Effects

This section is organized to present effects to agricultural resources from construction, then operation, followed by decommissioning activities for the proposed Project. Route Alternatives are analyzed in detail below in Section 3.18.2.3. There is a Design Variation involving use of two single-circuit structures proposed by the Proponent for Segments 2, 3, and 4 (see Section 2.2 for details), which is analyzed below in Section 3.18.2.4, and a Structure Variation that is analyzed in Section 3.18.2.5. The Proponents have also proposed a Schedule Variation, analyzed in Section 3.18.2.6, in which one of the two single circuits to be constructed in Segments 2, 3, and 4 and a portion of Segment 1W would be built on an extended schedule with the second circuit to begin construction approximately 2.5 years after completion of the first circuit.

Mitigation measures or EPMs are presented in detail within this section only if it is the first time they have been discussed in Chapter 3; all other measures are referenced or

summarized. A comprehensive list of all Proponent-proposed EPMs and Agency-required mitigation measures can be found in Table 2.7-1 of Chapter 2.

Plan Amendments

Proposed amendments are summarized in Table 2.2-1 of Chapter 2 and detailed in Appendices F and G. Amendments are needed to permit the Project to cross various areas of BLM-managed and NFS lands. Effects described for areas requiring an amendment in order for the Project to be built would only occur if the amendment were approved. Amendments that alter land management designations could change future use of these areas. No amendments specific to agriculture are proposed for the Project and no impacts to agriculture resulting from approving the amendments beyond the impacts of the project are anticipated.

3.18.2.1 No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed, operated, or decommissioned. There would be no Project-related impacts to agriculture.

3.18.2.2 Effects Common to All Action Alternatives

Construction

Short-term disruption of farming activities along the ROW could occur locally during construction. However, with implementation of the agricultural mitigation measures identified below in the Agricultural Construction Mitigation Plan section, impacts are expected to be minimal. Viewed in terms of agricultural operations in the potentially affected counties, the total estimated Project-related construction disturbance represents a small share of the 17 million acres of land in farms in the 21 potentially affected counties and is unlikely to noticeably affect overall agricultural production and employment in any of the affected counties. The Proponents do, however, recognize that construction of the proposed Project could have detrimental impacts on farms and have stated that they would negotiate damage-related issues, such as temporary reductions in the acreage available for cultivation, with affected farmers during the easement acquisition process.

Prime Farmland

Direct impacts to prime farmland would primarily result from the construction-related soil disturbance expected to occur at tower locations, work areas, staging areas, wire pulling/splicing locations, substation sites, regen sites, and access roads. Potential soil impacts to prime farmland from transmission line construction include soil erosion, disruption of drainage patterns, mixing of topsoil and subsoil, potential loss of topsoil, and soil compaction. Acres of prime farmland soils that would be temporarily disturbed during construction are identified in Table D.15-1 in Appendix D. The reclamation measures presented in Appendix C-2 would be used to keep prime farmland soil losses to a minimum. Areas not also used for operations would be reclaimed as soon as possible following construction.

Most prime farmland in the Analysis Area is privately owned and actively cultivated. Potential impacts to cropland common to all action alternatives are discussed below under crop production.

Livestock Grazing

Construction could affect livestock grazing by temporarily reducing forage and displacing livestock. In addition, increased dust in areas adjacent to construction sites could reduce forage palatability. Construction could also affect grazing in locations where new access roads provide additional access for both humans and livestock. This type of additional access could result in harassment of livestock by humans, or allow livestock to access areas they were previously unable to access. This may occur, for example, if an access road crosses a ravine that livestock had previously not been able to cross, or if a fence is cut or a gate left open. Construction crews would be required to maintain all fences and gates to allow normal activities to occur as much as possible. Mitigation measures identified by the Agencies also include the installation of temporary fences and gates as needed to control livestock and public access in coordination with affected landowners.

AGRI-5 Maintain landowner and tenant access across construction areas for farm equipment and livestock to fields isolated by construction activities and install temporary fences and gates across the construction area.

Transmission line construction is linear in nature with periods of intense activity separated by relatively long intervals of little or no activity. Disturbance in any one area would, however, generally last for most of one construction season, given that there are several sequential steps required. In some situations, disturbance may begin in one season and, due to weather or timing restrictions, not be completed until the next year. During intense construction periods some areas currently used for livestock grazing would be temporarily off limits.

Potential impacts to livestock grazing from construction are presented below for the Proposed Route and Route Alternatives in terms of temporary reductions of forage and expressed in acres. In all cases, the potentially affected acres represent a small share of the total acres used for livestock grazing within the Analysis Area and surrounding area, and would result in relatively small temporary reductions in AUMs. An AUM is the amount of forage required to sustain one cow for one month. Data available for Wyoming identify AUM ratios for BLM-managed and State lands of 0.11 AUM per acre and 0.28 AUM per acre, respectively (BLM 2008a; Wyoming OSLI 2009).

Certain state and federal programs provide financial assistance to agricultural operations as incentives to promote agriculture. The Wyoming OSLI has indicated that if some lands become off-limits to grazing during construction they may need to change scheduled payments to agricultural lessees (Parks 2010). Other potential economic impacts related to livestock grazing are discussed in Section 3.4 – Socioeconomics.

Crop Production

Construction could affect crop production by temporarily reducing the area available for cultivation. Temporary construction-related impacts would depend on the type of crop, the season, and whether the land was in use or fallow. Without proper coordination

between the Proponents and farm operators, impacts associated with ingress and egress to the ROW, damage to irrigation systems, timing notification, segregation and protection of topsoil, and compaction could be potentially significant.

The effects to farming operations could also result in impacts outside the areas where soil would be disturbed as part of construction activities. These effects could include damage to or loss of crops, decreases in crop yield, restrictions to farm vehicle access or aerial spraying operations, and disruption of drainage and irrigation systems. These types of potential effects are difficult to quantify and would likely be determined through negotiation with landowners. As a result, the affected acres analyzed in this section refer to areas where the soil would be directly disturbed by the Project, and do not include other areas that might be indirectly affected. These types of additional potential impacts are assumed for the purposes of analysis to be proportional to the direct estimated impacts based on surface disturbance. Potential economic impacts related to cropland are discussed in Section 3.4 – Socioeconomics.

Crop Spraying

Construction of the transmission line could reduce the area of crops that could be treated by aerial spraying. Transmission towers or construction cranes could interfere with the flight paths of aerial applications. This potential effect would vary, depending on the location of tall structures relative to crop planting patterns, the presence of other tall structures, and the comfort level of the individual pilot. Aerial spraying is also sometimes used to control large-scale insect infestations on public and private land. The short-term inability to use aerial spraying could reduce productivity and cause economic effects to farming or rangeland operations. The presence of construction workers could also delay applications.

CRP Lands

The Power County Task Force (2010) has expressed concern that the proposed Project would result in CRP lands being removed from the CRP. The Agencies recommend that the Proponents address this concern by consulting with the FSA and landowners to determine if construction would affect the CRP status of the land or if special construction or revegetation techniques would be necessary.

AGRI-18 Consult with the FSA and landowners to determine if construction would affect the CRP status of the land currently enrolled in CRP or if special construction or revegetation techniques would be necessary.

The FSA Handbook for the Agricultural Resource Conservation Program for State and County Offices (USDA 2008, p. 12-8) provides the following guidance:

> *Following is the procedure for continuing CRP-1 on land being used by public utilities for installing gas lines, pipes, cable, telephone poles, etc., materials used by an entity of the State for road building or Federally funded pipeline projects.*

CRP-1's may be continued without reduction in payment if:

- *the participant gives COC [the County Committee] details of proposed use, including length of use*
- *COC authorizes the use*
- *NRCS or TSP [Technical Service Provider] certifies usage will have minimal effect, such as:*
  - *erosion is kept to a minimum*
  - *minimum effect on wildlife and wildlife habitat*
  - *minimum effect on water and air quality*
- *the participant restores cover, at the participant's expense, to disturbed land in timeframe set by COC.*

  Note: No payment reduction will be made for compensation received by the participant from the public agency.

NRCS or TSP will determine whether the disturbance will have an adverse effect on the land. If NRCS or TSP determines that public use will have an adverse effect on CRP acreage, affected acreage shall be terminated and refunds assessed.

When landowners sign a CRP Contract (for a set term) they agree to refund payments received, plus applicable interest, and pay liquidated damages if the contract is not upheld. Payments received in this context include the contract payments for the duration of the contract, as well as any cost-sharing payments. Liquidated damages are equivalent to 25 percent of the rental rate per acre multiplied by the number of acres subject to the CRP contract. Rental rates per acre are based on the average cash rental rate, or equivalent, per acre for dryland cropland at the time the contract is signed. Average cash rental rates per acre for dryland cropland in Idaho were $60 per acre in 2010 (USDA 2010b).

If the Project were to result in lands being removed from the CRP program, the amount that would be due to the FSA per acre for land removed from the CRP would vary depending on the length of time the land in question had been in the program and the amount of cost-sharing payments received. The Power County Task Force (2010) stated that one of their members had the FSA calculate the liquidated damages for removing 18 acres from the CRP and damages were estimated to be $9,834. Assuming that liquidated damages are equivalent to 25 percent of the rental rate (see above), this suggests a per acre value of approximately $2,185, which is substantially higher than the current average of $60, and may in fact represent the total amount that could be owed: a refund of all payments received plus interest, as well as liquidated damages.

In addition to financial penalties, if lands were removed from the CRP contract, future income that would otherwise be generated from that contract would also be lost. The economic costs to private agricultural landowners that would be incurred if the Project resulted in land being removed from the CRP would be mitigated by the Proponents on

a case-by-case basis, most likely through negotiated terms of easements between the landowner and the Proponents.

Agricultural Construction Mitigation Plan

The Proponents' proposed Framework Reclamation Plan for Construction Activities (Appendix C-2) identifies measures that would help reduce potential impacts to agricultural operations. For the purposes of analysis and mitigation, agricultural land is defined as annually cultivated or rotated cropland, land in perennial field crops, improved pasture, hayfields, and CRP land. EPMs proposed by the Proponents that would mitigate potential impacts to agriculture include REC-13, REC-18, REC-21, and OM-29. These EPMs are addressed in Section 3.6 – Vegetation (REC-13), Section 3.9 – Wetlands and Riparian Areas (REC-18, REC-21), and Section 3.11 – Special Status Wildlife and Fish Species (OM-29).

In addition, the Agencies have identified the following measures as means to substantially reduce impact. Implementation of an effective agricultural mitigation plan would help reduce or eliminate impacts.

AGRI-1 Provide for a qualified Agricultural Specialist to assist construction planning, construction, restoration, post-construction monitoring, and follow-up restoration.

AGRI-2 Maintain an active program of liaison with landowners and tenants, including specific points of contact whose responsibilities shall include pre-construction inventory, notices, complaint resolution, damage assessment, and negotiation and compensation.

AGRI-3 Establish procedures for determining ingress and egress routes with landowners and tenants, protection methods for off-ROW roads over agricultural lands and on ROW pads, including methods such as geotextile matting to segregate temporary rock fill.

AGRI-4 Establish the location of temporary roads to be used for construction purposes through negotiation with the landowner, with existing farm lanes or two tracks as preferred temporary access roads. Restore temporary access roads to pre-construction condition and leave temporary access roads intact through mutual agreement with the landowner and tenant unless located in flood areas or drainage hazard areas, or otherwise restricted by federal, state, or local regulations.

AGRI-5 Maintain landowner and tenant access across construction areas for farm equipment and livestock to fields isolated by construction activities and install temporary fences and gates across the construction area, as necessary, to facilitate agricultural operations.

AGRI-6 Protect topsoil by stripping and segregating topsoil in the disturbance area on agricultural lands unless negotiated differently with the landowner or tenant. Prevent segregated topsoil from being mixed with cut-and-fill materials, rock, construction debris, excavated materials, or other subsoil.

AGRI-7 Restrict the operation of vehicles and heavy equipment, or take other appropriate action, so that deep rutting does not result in mixing of topsoil and subsoil on excessively wet soils on the portion of the construction work area in agricultural land where the topsoil is not stripped.

AGRI-8 Protect irrigation operations and drain tiles by: 1) contacting landowners and tenants to identify the location of irrigation systems and wells, identified underground irrigation water pipes, well systems, and drain tiles that intersect the construction area; 2) repairing disrupted irrigation and drain tile systems as soon as possible; 3) maintaining the flow of irrigation water during construction or coordinating a temporary shutoff with affected parties; and 4) compensating affected parties for crop losses that result from irrigation and drain tile system interruptions due to construction.

AGRI-9 Protect agricultural lands from dewatering activities by pumping into a constructed energy-dissipating structure that shall minimize damage to adjacent agricultural land, drainage systems, and crops.

AGRI-10 Restore affected agricultural land to the pre-construction condition or provide compensation.

AGRI-11 Decompaction of exposed subsoil before topsoil replacement shall be accomplished utilizing an agricultural subsoiler or other appropriate implement. After decompaction and prior to topsoil replacement, a disc or harrow shall be utilized, as necessary, to smooth the subsoil surface.

AGRI-12 Following final grading and topsoil replacement in agricultural lands, deep tillage shall be used to relieve soil compaction in construction areas or the Proponents shall test soils for compaction at regular intervals. Where soil compaction is tested, construction areas shall be compared to adjacent areas not disturbed by construction.

AGRI-13 Decompact agricultural lands where topsoil has not been removed by using a non-inversion, deep-tillage agricultural subsoiler specifically designed for soil decompaction and designed to minimize surface disturbance and the mixing of subsoil with topsoil.

AGRI-14 Existing range improvements that are damaged or modified during construction shall be repaired. Additionally, temporary fences and gates shall be removed after construction if requested by landowner or land-management agency.

AGRI-15 If a dairy farm reports problems with stray voltage, complete a free, on-site investigation and determine the level of voltage and fix any problems resulting from the transmission line to less than 1 volt.

AGRI-16 Align the transmission line to avoid the CAFO approximately 14.5 miles east of the proposed Cedar Hill Substation if this route is approved.

AGRI-17 Realign the transmission line route during final design to avoid affecting any CAFOs.

AGRI-18 Consult with the FSA and landowners to determine if construction would affect the CRP status of the land currently enrolled in CRP or if special construction or revegetation techniques would be necessary.

According to the Wyoming OSLI, any agricultural construction plan on Wyoming state land should be approved by the Wyoming OSLI (Parks 2010).

Operations

As noted with respect to construction impacts common to all action alternatives, the total estimated Project-related operations disturbance represents a small share of the 17 million acres of land in farms in the 21 potentially affected counties and is unlikely to noticeably affect overall agricultural production and employment in any of the affected counties. The Proponents have stated, however, that they recognize that construction of the proposed Project has the potential to have detrimental impacts on farms and would negotiate damage-related issues, such as reductions in the acreage available for cultivation, with affected farmers during the easement acquisition process.

ROWs for transmission line facilities on private agricultural lands would be obtained in fee simple or perpetual easement by the Proponents. The effect that a transmission line easement may have on agricultural property values is a damage-related issue that would be negotiated between the landowner and Proponents during the fee simple or easement acquisition process. The easement acquisition process is designed to provide fair compensation to the landowner for the right to use the property for transmission line construction and operation. The easement value in theory is equal to the difference in value of the affected property before and after easement acquisition and construction of the proposed facilities. Property values are discussed in more detail in Section 3.4 – Socioeconomics.

Prime Farmland

Reclamation after construction would reduce long-term effects to prime farmland. Estimated acres of prime farmland soils that would be disturbed during Project operations are identified by segment in Table D.15-2 in Appendix D. Impacts to prime farmland during Project operations would primarily be related to those areas that would be occupied by tower structures and not available for agricultural use. The prime farmland soils under those structures would no longer be available for agricultural use.

Livestock Grazing

During Project operations, rangeland and pasture occupied by support structures, substations, regeneration stations, or access roads would no longer be available for grazing. As discussed above with respect to construction, the estimated acres of lands used for livestock and grazing that would be permanently affected by the Proposed Route and Route Alternatives represent a small share of the total acres used for livestock grazing within the Analysis Area and surrounding area, and would result in relatively small temporary and permanent reductions in AUMs.

Long-term impacts to private grazing landowners or public land grazing permittees would need to be mitigated, likely through negotiated terms of land leases or easements. In some cases, the acres of individual grazing allotments contracted through the Forest Service or BLM may need to be reduced. Other operations and maintenance activities would not affect livestock grazing.

Crop Production

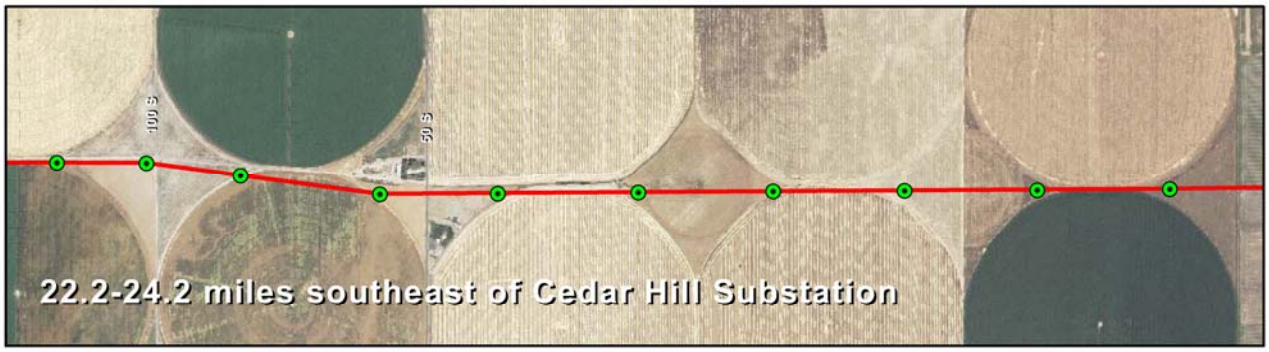
During Project operations, croplands occupied by support structures, substations, regeneration stations, or access roads would no longer be available for crop production. Crop production that involves mechanical irrigation, automated farming methods, or farming equipment with large spans (up to 100 feet) could also be adversely affected by the placement of overhead conductors and support structures. Production costs increase in cases where farmers have to divert their equipment around structures, make additional passes, take additional time to maneuver, reconfigure surface drainage, skip acres, or re-treat acres. Micrositing the transmission line should allow the Proponents to avoid crossing most fields and reduce the potential for this type of disruption. If crossing a field is necessary, structures would be placed on the outside edges of the field or parallel to the rows, and diagonal field crossings would be avoided where possible.

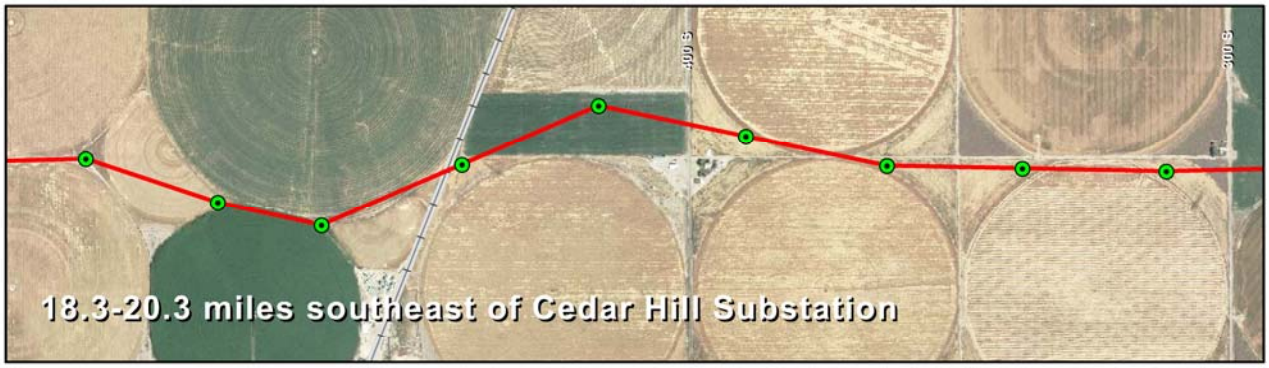
Structures located near the edge of a field may prevent equipment from reaching the edge of the field, as shown in the case of an existing transmission line crossing through pivot irrigation field approximately 8 miles west of Midpoint Substation in Figure 3.18-1. However, in most cases the structures can be located strategically to allow existing pivots to continue to operate without adverse effects.

Figure 3.18-1. Transmission Line Structures Located along the Edge of a Center Pivot Irrigation Field, Approximately 8 Miles West of the Midpoint Substation

Note: The black arrows indicate the structure locations.

Figure 3.18-2 shows the Proponents' proposed structure locations through an area of existing center pivots in Cassia County. In this case, impacts would occur to several small pivots while the larger pivots would be able to continue to operate. There is additional loss of production when structures are set close enough to the edge of a field so that farm equipment cannot fit between the structure and the edge of the field.





0 1,000 2,000
Feet

NATIONAL SYSTEM OF PUBLIC LANDS

Legend

- Proposed Tower Location
- Transmission Line (Design Centerline)

see Appendix A Figure A-10 for overview of area

Gateway West
Transmission Line Project
Idaho, Wyoming, Nevada

Example of Transmission Line Layout (Segment 7)

FIGURE 3.18-2

Last Saved: March 2, 2010

Structures that cross a field diagonally may also affect the efficient use of some large equipment (Figure 3.18-3). Potential economic impacts to crop production are discussed in Section 3.4 – Socioeconomics.

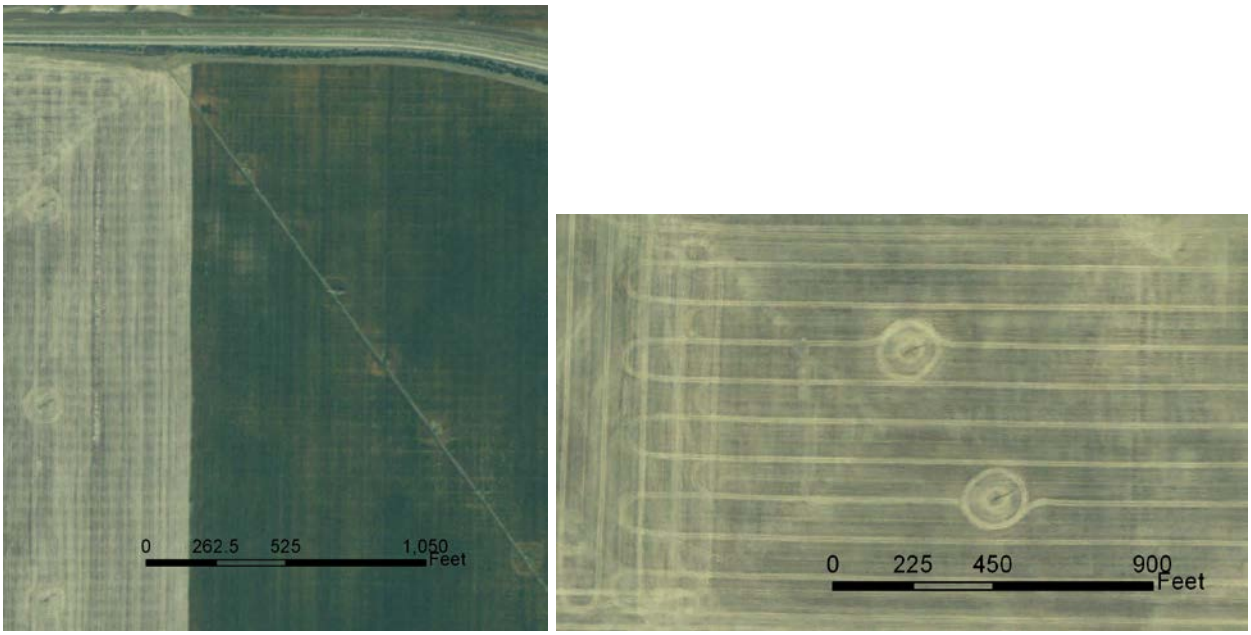


Figure 3.18-3. Transmission Line Structures Crossing Dryland Farming at a Diagonal and Structures in Line with the Rows

GPS Interference – Concern has been expressed by the Power County Task Force (2010) that the proposed transmission line could interfere with irrigation guidance systems and GPS guidance systems used to guide tractors during planting, cultivation, and harvesting. The comment notes that reports indicate that presence of an electric transmission line can affect the accuracy of GPS systems, leading to them being "off" by 1½ to 4½ feet. If this were to occur, the resulting inefficiencies could result in wasted fuel, increased labor costs, and under- or over-fertilizing resulting in reduced productivity (Power County Task Force 2010).

The Proponents report that they do not specifically track reports of interference with GPS tractor navigation systems; however, these systems are widely used in the Magic Valley area of Idaho, which is crossed by several existing transmission lines, with voltages up to 500 kV. The Proponents report that while users of these systems have expressed concerns about the possibility of interference from powerlines, no specific instances have been reported (IPC 2010).

GPS accuracy can be affected by many factors including atmospheric conditions, satellite constellation, and geometry; the design, quality, and position of the GPS antennas and receivers; signal interference; and multipath. Of these factors, a transmission line and its structures could conceivably contribute to signal interference and multipath. Signal interference occurs when other signals at the same frequency as the satellite signal are present. Multipath occurs when objects such as buildings or

parts of the tractor itself reflect the GPS satellite signal so that the satellite signal arrives at the receiver later than it would have if it had followed a straight line from the satellite.

A study commissioned by the Electric Power Research Institute (EPRI) found that signal interference from transmission line structures is "unlikely" based on the design of GPS receivers and their ability to separate the GPS signal from background noise (Silva and Olsen 2002). Another study compared the accuracy of Real-Time Kinematic GPS receivers at different locations with respect to transmission lines and towers (Gibblings et al. 2001). This study concluded that multipath from transmission towers could result in GPS system initialization errors (i.e., the system reports the wrong starting location) 1.1 percent to 2.3 percent of the time. This study also reported that the GPS system software was able to identify and correct these initialization errors within the normal startup time. This study reported initialization errors due to electromagnetic radiation from energized overhead transmission lines when the GPS receiver was located outside the vehicle, but concluded that "most, if not all of this effect can be eliminated by shielding the receiver and cables." Placing the receiver inside the vehicle used in the study reduced the bad initializations.

The potential for the proposed Project to result in electromagnetic interference to GPS and other communication systems is discussed further in Section 3.21 – Electrical Environment.

Irrigation System Electrolysis – The Power County Task Force (2010) also raised a concern that the location of electric transmission lines near irrigation systems speeds the electrolysis and degradation of those systems, so that they have to be repaired more often and replaced more frequently than they would if the transmission lines were not present.

Electrolysis is a process in which direct current (DC) voltage is deliberately applied from an external power source to combinations of materials and electrolytes in order to produce an otherwise non-spontaneous electrochemical reaction or to accelerate a spontaneous electrochemical reaction. Electrolysis is used in some metal plating processes and to separate hydrogen and oxygen from water. The proposed transmission line would operate using AC voltage and current, which does not produce or accelerate these reactions.

Given the nature of the expressed concern, it is possible that the process the Task Force is referring to is galvanic corrosion. Galvanic corrosion is a spontaneous electrochemical reaction that can occur when a single material such as an aluminum pipe is placed in different electrolytes along its length, or when different materials, such as brass and galvanized steel, are physically in contact with each other and placed in a single electrolyte such as condensation on a cold water pipe and its associated valves. This process will occur whether or not a transmission line is present and is not influenced by the presence of the AC electrical system.

DC voltage is, however, deliberately applied to many underground metallic pipelines to counter the effects of galvanic corrosion. These galvanic protection systems can produce DC voltages between different points on nearby metallic structures, which can accelerate the galvanic corrosion reaction in these structures, as described above.

Electric transmission towers do not utilize these active galvanic corrosion suppression systems; however, in some instances pipeline ROWs are located close to transmission line ROW, which may give the impression that accelerated galvanic corrosion is due to the presence of the transmission line.

Induced Current – Another concern raised by the Power County Task Force (2010) relates to voltage causing shocks to humans. The Task Force contends that many farmers and farm workers are reluctant to work on irrigation systems near transmission lines because of the history and potential for shock from stray voltage.

This concern, as described in the comment, appears to relate to the voltage that may be present between the earth and some object as a result of the electric field around a transmission line. This is sometimes described as an induced voltage. The Proponents have received reports of shocks from fences near transmission lines. In these cases the fences were electric fences that were insulated from the earth. Persons working on the insulated fence wire could in some instances experience a shock when they contacted the fence wire. This phenomenon is due to the fact that the fence wire is insulated from the earth, while being surrounded by an electric field. Similar shocks can be experienced when contacting vehicles or irrigation pivots located close to a transmission line. The shock is similar to a static shock.

The National Electric Safety Code (NESC) addresses this issue, limiting the steady-state current that can flow between an object and the earth near a transmission line to 5 milliamperes (mA). This is considered to be a safe level. In the cases where this has been reported to Proponents, engineers have responded by checking the voltage at the fence or other object to ensure that the 5 mA limit is not exceeded and then providing suggestions to the customer on ways to eliminate the issue while working on their equipment. This issue is well understood and can be mitigated with proper grounding of the equipment or structure. The transmission line clearances are designed to prevent the 5 mA limit described above from being exceeded at objects such as vehicles with rubber tires that would be difficult to ground.

The potential for the proposed Project to result in field induction—induced current and nuisance shocks—is discussed further in Section 3.21 – Electrical Environment.

Crop Spraying

Crop dusting is most common in the Idaho portion of the Analysis Area. A field can receive up to 5 to 10 applications per year depending on the type of crop and preferences of individual operators. Aerial spraying can involve dry applications (usually fertilizer) and liquid applications of fungicides and pesticides. While there are several different makes of crop-spraying aircraft, a typical product load weighs approximately 275 to 300 pounds with an effective range of 25 to 30 miles. To improve efficiency, satellite landing strips are used to resupply the aircraft and reduce “dead time.” Spraying operations occur during both daylight and nighttime conditions, depending on the time of season, with nighttime operations occurring when bees are pollinating crops during daylight hours.

Pilots typically spray with the aircraft 8 to 15 feet above the ground level, with the greater height occurring when crops are taller. Taking into account height above

ground, size of the aircraft and the nose-down flying angle, the maximum height of the tail of the aircraft is approximately 20 to 25 feet above the ground surface. The presence of a transmission line could result in increased risk to crop duster pilots or others on the ground. Larger transmission lines like those proposed as part of this Project are typically easier to see than smaller-voltage lines and provide enough clearance between the ground and maximum sag of the conductors to allow pilots to fly under. The presence of a transmission line could also affect spray coverage. Spray is applied at a downward angle to reduce over-spray and, as a result, areas immediately adjacent to the towers could receive less product than desired.

The extent of the farmed land in the Analysis Area that currently receives aerial crop spraying is unknown, but this type of spraying is most likely to occur in areas where crops are grown, and to a much lesser degree, in areas of range where herbicides and insecticides are applied to control noxious weeds and insects such as crickets. As a result, the miles of croplands and range in each segment and alternative are an indication of the potential risk posed by the Proposed Route and each Route Alternative.

The National Transportation Safety Board (NTSB 2008) maintains a database of aviation accidents. This database indicates that over a 6-year period, from January 1, 2003 to December 19, 2008, nationwide, there was a total of 484 agriculture-related accidents investigated, of which 49 (10 percent) were fatal. Most of these accidents were related to electrical power lines, but not all of them were. Some were related to telephone wires, other aerial wires, or guy wires on other utility poles. The investigation reports reviewed do not specify the type of transmission line that was involved, but considering details such as the height from the ground, the number of lines in one location, and visibility, these reports suggest that smaller lines are much more involved in aviation accidents than the 230-kV and 500-kV lines proposed for the Gateway West Project.

During the 6 years evaluated, there were 68 accidents that involved overhead wires and 9 (13 percent) were fatal. Twelve of the aircraft involved were helicopters, the rest were airplanes. One was a helicopter that started to crash and hit a powerline on the way down. None of the overhead wire-related accidents occurred in Wyoming; three occurred in Idaho (Midvale, Teton, and Caldwell), none of which were fatal. None of these accidents occurred within the Analysis Area identified for agriculture.

The recent history of past aviation accidents near the Analysis Area suggests that approximately one agricultural aviation accident related to overhead wires could occur within the Analysis Area every 5 years (not necessarily from the Gateway West Project). The Gateway West Project would, however, be larger and more visible than smaller overhead lines, and, therefore, higher and likely to be more visible to pilots. As noted above, based on past national data, approximately 13 percent of agricultural aviation accidents associated with overhead wires could be expected to be fatal (NTSB 2008).

According to the Power County Task Force (2010), aerial applicators and farmers who currently work near existing lines, smaller than those proposed for the Gateway West Project, have stated that pilots are very reluctant to even fly in the vicinity of transmission lines. These applicators and farmers have expressed concern that this

reluctance would be increased with respect to the Gateway West Project because of the relatively large size of the structures, and, as a result, aerial applicators could refuse to apply on fields near, bordered by, or containing structures and lines. This type of scenario, the Power County Task Force notes, would be more likely to occur in cases where the proposed transmission line crosses a field at an odd angle. Farmers have indicated that an inability to aerially apply would result in increased costs, reduced efficiency, unnecessary over application or under application, damaged crops from field application, and overall lower crop yields (Power County Task Force 2010). Potential economic impacts identified by the Task Force are discussed in Section 3.4 – Socioeconomics.

Idaho Power's existing electric transmission system, which includes lines in Power and Cassia Counties, the counties where most concerns have been expressed with respect to potential impacts to agricultural operations, includes 1,162 total miles of 230-kV lines and 576 total miles of 345-kV lines, with a combined total of 513 miles (411 miles of 230-kV and 102 miles of 345-kV lines) located over crop or pasture land. In addition, Idaho Power operates 1,209 miles of smaller-voltage lines (36 miles of 161-kV, 480 miles of 138-kV, 416 miles of 69-kV, and 277 miles of 46-kV lines) that cross crop or pasture land. Idaho Power reports that it has not received any complaints regarding the impact of these existing transmission lines and structures on the aerial application of agricultural chemicals.

Herbicide spraying for weed control along the transmission line ROW could affect organic farmers; however, the requirement to coordinate with the landowner when determining which treatments to use should reduce the risk that organic crops would be adversely affected.

CRP Lands

As noted with respect to construction, the Agencies recommend that the Proponents consult with the FSA and landowners to determine if construction would affect the CRP status of the land or if special construction or revegetation techniques would be necessary. If the Project were to result in lands being removed from the CRP, the economic costs to private agricultural landowners would be mitigated by the Proponents on a case-by-case basis, most likely through negotiated terms of easements between the landowner and the Proponents.

CAFOs

CAFOs, including dairy farms, could be subjected to stray voltage during Project operations. Stray voltage in this context refers to a phenomenon that is primarily of concern in wet environments, such as a dairy barn or feedlot. Stray voltage occurs when an animal makes contact with a metal object that is at a different electrical potential than another point in contact with the animal, i.e., the nearby ground or earth. This may occur when there is poor grounding or bonding of the metal object to the earth and the electrical ground. Most often, this arises from electrical equipment on the farm and local electrical wiring, not because of the operation of nearby transmission lines. Metal fences or large metal objects adjacent to, running parallel to, or passing under the proposed Gateway West transmission lines may develop a different potential than the surrounding ground if not properly grounded. Most cows would need a current of 3 to 4

volts before behavioral changes could be noticed. More than 4 volts is needed before the most sensitive cows resist drinking water (Lefcourt 1991).

Idaho has established rules for the measurement of stray current or voltage (IDAPA 31.61.001.002), which apply to dairy producers, public utilities, and anyone measuring or remediating stray current or voltage in Idaho. Wyoming does not have these types of rules.

Appendix C-4 describes routine maintenance activities. The plan is not specific with respect to routine measures to ensure that stray voltage concerns are resolved quickly. The Agencies have, therefore, identified the additional mitigation measure AGRI-15 as a means to substantially reduce impact.

Decommissioning

Project facilities would be removed at the end of the operational life of the transmission line. Conductors, structures, and related facilities would be removed. Foundations would be removed to below the ground surface level. Post-operations decommissioning of the transmission line would cause similar levels of disturbance and disruption as construction. However, once reclamation is complete, areas would be restored to the prior condition.

3.18.2.3 Proposed Route and Alternatives by Segment

This section evaluates the impacts of the Proposed Route and the differences between the Proposed Route and Route Alternatives on prime farmland, livestock grazing, crop production, CRP lands, and dairy farms.

Segment 1E

Segment 1E, as proposed, would link the Windstar and Aeolus Substations in south-central Wyoming with a 100.6-mile 230-kV single-circuit transmission line. Twenty acres of the expansion of Windstar and Aeolus Substations and 0.5 acre for one regeneration site are attributed to Segment 1E. Alternative 1E-A is a 16.1-mile alternative along the north end of Segment 1E, which was the Proponents' initial proposal before moving the Proposed Route at the suggestion of local landowners to avoid the more settled area around Glenrock. Alternative 1E-B is 21.4 miles longer than the Proposed Route but is being considered by the Proponents because it would avoid a Wyoming-designated sage-grouse core area to the east. The BLM has required the consideration of Alternative 1E-C, which parallels Segment 1W 230-kV lines into the Aeolus Substation (see Appendix A, Figure A-2).

Prime Farmland

There is no prime farmland in Segment 1E (Table 3.18-2).

Livestock Grazing

Approximately 25,095 acres or 93 percent of the Analysis Area for Segment 1E is rangeland and pasture (Table 3.18-1). Construction of the Proposed Route would temporarily disturb an estimated 983 acres of rangeland and pasture (Table 3.18-5), with an estimated 248 acres permanently disturbed (Table 3.18-6). Alternatives 1E-A and 1E-C would disturb less rangeland than the comparison portion of the Proposed

Route.[1] Alternative 1E-B would disturb more rangeland than the Proposed Route (Tables 3.18-5 and 3.18-6).

Table 3.18-5. Agricultural Land Disturbed during Construction – Segment 1E

Segment or Alternative	Acres Disturbed by Segment			
	Total	Rangeland and Pasture	Irrigated Farming	Dryland Farming
Proposed – Total Length	**1,084**	983	1	–
Proposed – Comparison Portion for Alternative 1E-A	**208**	196	–	–
Alternative 1E-A	**124**	118	–	–
Proposed – Comparison Portion for Alternative 1E-B	**388**	371	–	–
Alternative 1E-B	**727**	710	–	–
Proposed – Comparison Portion for Alternative 1E-C	**825**	748	1	–
Alternative 1E-C	**326**	297	–	–

Acreages are rounded to nearest acre.

Table 3.18-6. Agricultural Land Disturbed during Operations – Segment 1E

Segment or Alternative	Acres Disturbed by Segment			
	Total	Rangeland and Pasture	Irrigated Farming	Dryland Farming
Proposed – Total Length	**281**	248	–	–
Proposed – Comparison Portion for Alternative 1E-A	**51**	46	–	–
Alternative 1E-A	**39**	36	–	–
Proposed – Comparison Portion for Alternative 1E-B	**88**	83	–	–
Alternative 1E-B	**164**	160	–	–
Proposed – Comparison Portion for Alternative 1E-C	**215**	191	–	–
Alternative 1E-C	**97**	89	–	–

Acreages are rounded to nearest acre.

Crop Production

Cropland within the Analysis Area for Segment 1E is limited to an estimated 11 acres of irrigated cropland (Table 3.18-1). An estimated 1 acre of irrigated cropland would be temporarily disturbed during construction under the Proposed Route and Route Alternatives 1E-A and 1E-B (Table 3.18-5). This land would not be disturbed under Alternative 1E-C.

CRP Lands

There are no CRP lands within the Analysis Area for Segment 1E (Table 3.18-4).

Dairy Farms

No dairy farms or CAFOs were identified within the Analysis Area for Segment 1E.

Segment 1W

Segment 1W is composed of two parts, Segment 1W(a) and 1W(c), both of which would consist of a new 230-kV line for part of their length and a reconstruction of an existing 230-kV line for the remaining part. Segment 1W(a) would be about 76.5 miles long, and would extend from the Windstar Substation to the Aeolus Substation. Segment 1W(c) would be about 70.6 miles long, and would extend from the Dave Johnston Power Plant

[1] The portion of the Proposed Route that starts and ends at the same nodes as the Route Alternative.

to the Aeolus Substation. Alternative 1W-A is a 16.2-mile alternative located near the town of Glenrock, which was the Proponents' initial proposal before moving the Proposed Route at the suggestion of local landowners in order to avoid the more settled area around Glenrock. Twenty acres of the proposed expansion at the Windstar and Aeolus Substations are attributed to Segment 1W(a) and 3 acres of the expansion at the Heward Substation and 17 acres of the expansion at the Windstar and Aeolus Substations are attributed to Segment 1W(c). There are no Route Alternatives proposed south of that point (see Appendix A, Figure A-2).

Prime Farmland

There is no prime farmland in Segment 1W (Table 3.18-2).

Livestock Grazing

Approximately 18,005 acres or 91 percent of the Analysis Area for Segment 1W is rangeland and pasture (Table 3.18-1). Construction of the Proposed Route for Segment 1W(a) would temporarily disturb an estimated 578 acres of rangeland and pasture (Table 3.18-7), with an estimated 165 acres permanently disturbed (Table 3.18-8). Alternative 1W-A would temporarily disturb approximately 68 acres less than the comparison portion of the Proposed Route, and permanently disturb 5 acres less.

Construction of Segment 1W(c) would temporarily disturb an estimated 746 acres of rangeland and pasture (Table 3.18-7), with an estimated 129 acres permanently disturbed (Table 3.18-8).

Table 3.18-7. Agricultural Land Disturbed during Construction – Segment 1W

Segment or Alternative	Acres Disturbed by Segment			
	Total	**Rangeland and Pasture**	**Irrigated Farming**	**Dryland Farming**
Proposed 1W(a) – Total Length	**621**	578	–	–
Proposed – Comparison Portion for Alternative 1W-A	**210**	197	–	–
Alternative 1W-A	**136**	129	–	–
Proposed 1W(c) – Total Length	**811**	746	–	–

Acreages are rounded to nearest acre.

Table 3.18-8. Agricultural Land Disturbed during Operations – Segment 1W

Segment or Alternative	Acres Disturbed by Segment			
	Total	**Rangeland and Pasture**	**Irrigated Farming**	**Dryland Farming**
Proposed 1W(a) – Total Length	**182**	165	–	–
Proposed – Comparison Portion for Alternative 1W-A	**47**	42	–	–
Alternative 1W-A	**40**	37	–	–
Proposed 1W(c)– Total Length	**144**	129	–	–

Acreages are rounded to nearest acre.

Crop Production

Segments 1W(a) and 1W(c) would cross less than 0.1 acre of irrigated farmland.

CRP Lands

There are no CRP lands within the Analysis Area for Segment 1W (Table 3.18-4).

Dairy Farms

No dairy farms or CAFOs were identified within the Analysis Area for Segment 1W.

Segment 2

Segment 2, as proposed, would link the Aeolus and Creston Substations in southeast Wyoming with two 500-kV circuits on one structure. One circuit would be operated at 230 kV during the initial phase of the Project. Its total proposed length is 96.7 miles. Fifty-two acres of the expansion of the Aeolus Substation and the construction of the Creston Substation and 0.5 acre for one regeneration site are attributed to Segment 2. There are three Route Alternatives, two of which are near the community of Fort Fred Steele. Alternative 2A at 28.4 miles long is being considered by the BLM because it remains in the WWE corridor nearer the town and the state historic site, and Alternative 2B, at 6.2 miles, is closer to the community than the comparison portion of the Proposed Route and was the initially proposed route before the Proponents responded to local suggestions and relocated the Proposed Route farther to the south. Alternative 2C is a 24.4-mile alternative located north of Hanna, Wyoming. It is being evaluated at the recommendation of the Wyoming Governor's office to follow a utility corridor approved by that office for minimizing effects to sage-grouse (see Appendix A, Figure A-3).

Prime Farmland

There is no prime farmland in Segment 2 (Table 3.18-2).

Livestock Grazing

Approximately 16,649 acres or 96 percent of the Analysis Area for Segment 2 is rangeland and pasture (Table 3.18-1). Construction of the Proposed Route would temporarily disturb an estimated 1,472 acres of rangeland and pasture (Table 3.18-9), with an estimated 377 acres permanently disturbed (Table 3.18-10). Alternative 2A would disturb more acres of rangeland and pasture than the comparison portion of the Proposed Route; Alternatives 2B and 2C would disturb less (Tables 3.8-9 and 3.10-10).

Table 3.18-9. Agricultural Land Disturbed during Construction – Segment 2

Segment or Alternative	Acres Disturbed by Segment			
	Total	**Rangeland and Pasture**	**Irrigated Farming**	**Dryland Farming**
Proposed – Total Length	**1,540**	1,472	–	–
Proposed – Comparison Portion for Alternative 2A	**397**	387	–	–
Alternative 2A	**445**	425	–	–
Proposed – Comparison Portion for Alternative 2B	**104**	101	–	–
Alternative 2B	**79**	73	–	–
Proposed – Comparison Portion for Alternative 2C	**368**	359	–	–
Alternative 2C	**315**	307	–	–

Acreages are rounded to nearest acre.

Crop Production

There is no irrigated cropland or dryland farming within the Analysis Area for Segment 2 (Table 3.18-1).

CRP Lands

There are no CRP lands within the Analysis Area for Segment 2 (Table 3.18-4).

Table 3.18-10. Agricultural Land Disturbed during Operations – Segment 2

Segment or Alternative	Acres Disturbed by Segment			
	Total	**Rangeland and Pasture**	**Irrigated Farming**	**Dryland Farming**
Proposed – Total Length	**400**	377	–	–
Proposed – Comparison Portion for Alternative 2A	**74**	72	–	–
Alternative 2A	**90**	84	–	–
Proposed – Comparison Portion for Alternative 2B	**16**	16	–	–
Alternative 2B	**18**	17	–	–
Proposed – Comparison Portion for Alternative 2C	**77**	74	–	–
Alternative 2C	**52**	49	–	–

Acreages are rounded to nearest acre.

Dairy Farms

No dairy farms or CAFOs were identified within the Analysis Area for Segment 2.

Segment 3

Segment 3, as proposed, would link the Creston and Anticline Substations in southeast Wyoming with two 500-kV circuits on one structure. One circuit would be operated at 230 kV during the initial phase of the Project. Its total proposed length between those two substations is 46.7 miles. Sixty-nine acres of the construction of the Anticline and Creston Substations are attributed to Segment 3. Segment 3 would also link the Anticline and Jim Bridger Substations with a 4.3-mile 230-kV line and a 5.5-mile 345-kV line and includes the 10-acre expansion of the Jim Bridger 345-kV Substation. There are no alternatives proposed along this segment (see Appendix A, Figure A-4).

Prime Farmland

There is no prime farmland in Segment 3 (Table 3.18-2).

Livestock Grazing

Approximately 6,507 acres or 95 percent of the Analysis Area for Segment 3 is rangeland and pasture (Table 3.18-1). Construction of the Proposed Route for this segment would temporarily disturb an estimated 811 acres of rangeland and pasture, with an estimated 204 acres permanently disturbed. There are no alternatives to the Proposed Route for this segment.

Crop Production

There is no irrigated cropland or dryland farming within the Analysis Area for Segment 3.

CRP Lands

There are no CRP lands within the Analysis Area for Segment 2 (Table 3.18-4).

Dairy Farms

No dairy farms or CAFOs were identified within the Analysis Area for Segment 3.

Segment 4

Segment 4, as proposed, would link the Anticline Substation near the Jim Bridger Power Plant in southwestern Wyoming with the Populus Substation in Idaho with two 500-kV circuits on one structure. Its total proposed length is 203 miles. Eighty-nine acres of the construction of the Anticline Substation and the expansion of the Populus Substation and 1.5 acres for three regeneration sites are attributed to Segment 4. It has six Route Alternatives in the middle portion of its route but the first 52 miles to the east and the last 61 miles to the west (in Idaho) do not have any Route Alternatives. The middle section of the Proposed Route is 90.2 miles long, and its Route Alternatives vary from 85 to 102 miles long. These alternatives were proposed by the Wyoming Governor's office (4A, paralleling the existing 345-kV lines throughout); by the BLM Kemmerer FO (4B through 4E, including edits from various cooperating agencies), with the intent to avoid impacts to cultural resources to the extent practical; and by the Proponents (4F, attempting to avoid impacts to cultural resources while still remaining north of the existing lines) (see Appendix A, Figures A-5 and A-6).

Prime Farmland

There is no prime farmland in Segment 4 (Table 3.18-2).

Livestock Grazing

Approximately 43,975 acres or 86 percent of the Analysis Area for Segment 4 is rangeland and pasture (Table 3.18-1). Construction of the Proposed Route would temporarily disturb an estimated 2,294 acres of rangeland and pasture (Table 3.18-11), with an estimated 541 acres permanently disturbed (Table 3.18-12). Alternatives 4A through 4F would all disturb more rangeland and pasture than the comparison portion of the Proposed Route (Tables 3.18-11 and 3.18-12).

Table 3.18-11. Agricultural Land Disturbed during Construction – Segment 4

Segment or Alternative	Acres Disturbed by Segment			
	Total	Rangeland and Pasture	Irrigated Farming	Dryland Farming
Proposed – Total Length	**2,822**	2,294	50	108
Proposed – Comparison Portion for Alternative 4A,B,C,D,E,F	**1,228**	1,089	5	–
Alternative 4A	**1,247**	1,149	7	–
Alternative 4B	**1,480**	1,362	15	22
Alternative 4C	**1,474**	1,398	3	–
Alternative 4D	**1,502**	1,391	12	22
Alternative 4E	**1,491**	1,415	3	–
Alternative 4F	**1,258**	1,145	19	–

Acreages are rounded to nearest acre.

Table 3.18-12. Agricultural Land Disturbed during Operations – Segment 4

Segment or Alternative	Acres Disturbed by Segment			
	Total	Rangeland and Pasture	Irrigated Farming	Dryland Farming
Proposed – Total Length	**649**	541	7	16
Proposed – Comparison Portion for Alternative 4A,B,C,D,E,F	**262**	234	2	–
Alternative 4A	**276**	255	2	–
Alternative 4B	**347**	323	3	3
Alternative 4C	**340**	323	1	–

Table 3.18-12. Agricultural Land Disturbed during Operations – Segment 4 (continued)

Segment or Alternative	Acres Disturbed by Segment			
	Total	Rangeland and Pasture	Irrigated Farming	Dryland Farming
Alternative 4D	**355**	330	3	3
Alternative 4E	**344**	327	1	–
Alternative 4F	**279**	257	3	–

Acreages are rounded to nearest acre.

Crop Production

Approximately 681 acres or 1 percent of the Analysis Area for Segment 4 is irrigated cropland, and approximately 1,017 acres or 2 percent is used for dryland farming (Table 3.18-1). Approximately 50 acres of irrigated cropland and 108 acres of dryland faming would be temporarily disturbed during construction (Table 3.18-11), with 7 acres of irrigated cropland and 16 acres of dryland farming permanently disturbed (Table 3.18-12). Alternatives 4A, 4B, 4D, and 4F would temporarily and permanently disturb more irrigated farmland than the comparison portion of the Proposed Route; Alternatives 4C and 4E would disturb slightly less. In all cases the difference in temporary disturbance would be less than 15 acres and the difference in permanent disturbance would be about 1 acre (Tables 3.18-11 and 3.18-12). Alternatives 4B and 4D would temporarily and permanently disturb more dryland farming than the comparison portion of the Proposed Route; Alternatives 4A, 4C, 4E, and 4F would disturb the same amount as the comparison portion (i.e., zero acres).

CRP Land

Estimates provided by the FSA indicate that the Proposed Route for this segment would cross an estimated 6.1 miles of land enrolled in CRP (Table 3.18-4). This land is entirely located along the Idaho portion of this segment, and west of the Route Alternatives. None of the Route Alternatives would cross CRP land.

The Agencies recommend that the Proponents work with the FSA and landowners to determine potential impacts to the continued participation of the affected land in the CRP (AGRI-18).

Dairy Farms

No dairy farms or CAFOs were identified within the Analysis Area for Segment 4.

Segment 5

Segment 5, as proposed, would link the Populus and Borah Substations with a 54.6-mile single-circuit 500-kV line. Forty-four acres of the expansion of the Populus and Borah Substations are attributed to Segment 5. There are five Route Alternatives including two proposed by the BLM to avoid the Deep Creek Mountains (5A and 5B, 8 miles and 19 miles longer than the comparison portion of the Proposed Route), one preferred by Power County that crosses the Fort Hall Indian Reservation (5C, 6 miles shorter than the comparison portion of the Proposed Route), one originally proposed by the Proponents (5D, 2 miles shorter than the comparison portion of the Proposed Route but located within more agricultural lands), and one proposed by Power County as an

alternative approach to the Borah Substation (5E, 0.5 mile shorter than the comparison portion of the Proposed Route) (see Appendix A, Figure A-7).

Prime Farmland

Approximately 8,215 acres or 41 percent of the Analysis Area for Segment 5 is prime farmland (Table 3.18-2). Approximately 400 acres of prime farmland would be temporarily disturbed during construction of the Proposed Route, and 54 acres would be permanently disturbed (Tables D.15-1 and D.15-2 in Appendix D). Alternatives 5A and 5B would result in more disturbance of prime farmland than the comparison portion of the Proposed Route, Alternatives 5C and 5D would disturb less, and Alternative 5E would temporarily disturb less prime farmland during construction, but would result in slightly more permanent disturbance during Project operations.

Livestock Grazing

Approximately 11,855 acres or 59 percent of the Analysis Area for Segment 5 is rangeland and pasture (Table 3.18-1). Construction of the Proposed Route would temporarily disturb an estimated 596 acres of rangeland and pasture (Table 3.18-13), with an estimated 119 acres permanently disturbed (Table 3.18-14). Alternatives 5A and 5B would temporarily and permanently disturb more rangeland and pasture than the comparison portion of the Proposed Route; Alternatives 5C, 5D, and 5E would disturb less. Differences in permanent disturbance to rangeland and pasture would range from 12 acres less under Alternative 5D to 22 acres more under Alternative 5B (Table 3.18-14).

Table 3.18-13. Agricultural Land Disturbed during Construction – Segment 5

Segment or Alternative	Acres Disturbed by Segment			
	Total	**Rangeland and Pasture**	**Irrigated Farming**	**Dryland Farming**
Proposed – Total Length	**979**	596	69	141
Proposed – Comparison Portion for Alternatives 5A,B	**439**	247	15	70
Alternative 5A	**552**	357	1	101
Alternative 5B	**681**	436	7	192
Proposed – Comparison Portion for Alternative 5C	**589**	350	6	96
Alternative 5C	**432**	330	–	68
Proposed – Comparison Portion for Alternative 5D	**409**	253	35	56
Alternative 5D	**364**	154	48	67
Proposed – Comparison Portion for Alternative 5E	**136**	69	30	13
Alternative 5E	**102**	50	26	1

Acreages are rounded to nearest acre.

Table 3.18-14. Agricultural Land Disturbed during Operations – Segment 5

Segment or Alternative	Acres Disturbed by Segment			
	Total	**Rangeland and Pasture**	**Irrigated Farming**	**Dryland Farming**
Proposed – Total Length	**175**	119	7	15
Proposed – Comparison Portion for Alternative 5A,B	**73**	42	1	9
Alternative 5A	**87**	51	–	13
Alternative 5B	**99**	64	2	23
Proposed – Comparison Portion for Alternative 5C	**94**	54	–	10
Alternative 5C	**56**	42	–	7

Table 3.18-14. Agricultural Land Disturbed during Operations – Segment 5 (continued)

Segment or Alternative	Acres Disturbed by Segment			
	Total	Rangeland and Pasture	Irrigated Farming	Dryland Farming
Proposed – Comparison Portion for Alternative 5D	**63**	43	2	5
Alternative 5D	**53**	31	2	8
Proposed – Comparison Portion for Alternative 5E	**24**	17	2	1
Alternative 5E	**24**	16	2	–

Acreages are rounded to nearest acre.

Crop Production

Approximately 1,070 acres or 5 percent of the Analysis Area for Segment 5 is irrigated cropland, and approximately 4,130 acres or 21 percent is used for dryland farming (Table 3.18-1). Approximately 69 acres of irrigated cropland and 141 acres of dryland faming would be temporarily disturbed during construction (Table 3.18-13), with 7 acres of irrigated cropland and 15 acres of dryland farming permanently disturbed (Table 3.18-14). The proposed alternatives would temporarily and permanently disturb similar amounts of irrigated cropland as the comparison portions of the Proposed Route. The alternatives would also disturb similar amounts of dryland farming with the exception of Alternative 5B, which would temporarily and permanently disturb approximately twice as much dryland farming as the comparison portion of the Proposed Route (Tables 3.18-13 and 3.18-14).

Power County, which is participating as a cooperating agency in the Gateway West Project, has made recommendations with respect to route preferences for Segment 5 (Alternatives 5C and 5E), as noted above. In addition, the Power County Task Force (2009c) has provided an assessment of the potential economic impacts of the proposed Project on different types of agricultural land in Power and Cassia Counties, Idaho. This assessment is discussed in Section 3.4 – Socioeconomics.

CRP Land

Estimates provided by the FSA indicate that the Proposed Route for this segment would cross an estimated 18.4 miles of land enrolled in CRP (Table 3.18-15). Alternatives 5A, 5B, 5D, and 5E would all cross slightly more miles of CRP land than the comparison portions of the Proposed Route, ranging from 0.7 mile more to 4.8 miles more under Alternatives 5E and 5B, respectively (Table 3.18-15).

Table 3.18-15. CRP Lands Crossed by Segment 5

Segment or Alternative	Total Length (miles)	CRP Lands (miles)
Proposed – Total Length	**54.6**	18.4
Proposed – Comparison Portion for Alternative 5A,B	**25.3**	6.5
Alternative 5A	**33.7**	9.5
Alternative 5B	**44.4**	11.3
Proposed – Comparison Portion for Alternative 5C	**33.2**	5.5
Alternative 5C	**26.1**	2.5
Proposed – Comparison Portion for Alternative 5D	**19.4**	5.6
Alternative 5D	**17.5**	6.5
Proposed – Comparison Portion for Alternative 5E	**5.8**	0.3
Alternative 5E	**5.3**	1.0

Acreages are rounded to nearest acre.

The Agencies recommend that the Proponents work with the FSA and landowners to determine potential impacts to the continued participation of the affected land in the CRP (AGRI-18).

Dairy Farms

No dairy farms or CAFOs were identified within the Analysis Area for Segment 5.

Segment 6

Segment 6 is an existing transmission line linking the Borah and Midpoint Substations; it is now operated at 345 kV but would be changed to operate at 500 kV. This segment has no Route Alternatives. Existing support structures would be used and impacts would be limited to within approximately 0.25 mile from each substation to allow for moving the entry point into the substation to the new 500-kV bay. Thirty-one acres of the expansion of the Borah and Midpoint Substations are attributed to Segment 6. Changes in the two substations would allow it to be operated at 500 kV (see Appendix A, Figure A-8).

Installation of these structures would temporarily and permanently disturb an estimated 55 acres. Approximately 75 percent or 41 acres of this total would be rangeland and pasture. No irrigated cropland or dryland farming would be affected.

Segment 7

Segment 7, as proposed, would link the Populus and Cedar Hill Substations with a 118.1-mile single-circuit 500-kV line. Forty-two acres of the expansion of the Populus and the construction of the Cedar Hill Substations and 1 acre for two regeneration sites are attributed to Segment 7. In addition to the Proposed Route, which is principally on private lands, Route Alternatives have been proposed by the BLM to avoid the Deep Creek Mountains (7A and 7B, which are 5 miles and 11 miles longer than the comparison portion of the Proposed Route), by local landowners (7C, 7D, 7E, 7F, and 7G, which all represent minor adjustments proposed to address local issues), by local landowners to avoid private agricultural lands (7I or the State Line Route, which is 55 miles longer than the Proposed Route and would require 0.5 acre for an additional regeneration site), and by the Proponents to avoid the State Line Route (7H, which is 10 miles longer than the Proposed Route). Alternative 7J, which is a variant of the State Line Route also proposed by local landowners, would not terminate at the Cedar Hill Substation. This alternative, referred to as the Rogerson Alternative, would require a different substation be constructed near a 345-kV existing transmission line (approximately 24 miles southwest of the Cedar Hill Substation; see Appendix A, Figure A-9). The tables and discussion in this document compare 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

Prime Farmland

Approximately 20,115 acres or 39 percent of the Analysis Area for Segment 7, is prime farmland (Table 3.18-2). Approximately 1,077 acres of prime farmland would be temporarily disturbed during construction of the Proposed Route, and 108 acres would be permanently disturbed (Tables D.15-1 and D.15-2 in Appendix D). Alternatives 7A, 7B, 7D, and 7G would result in more disturbance to prime farmland during construction than the comparison portions of the Proposed Route; Alternatives 7A and 7B would also

result in more permanent disturbance. Permanent disturbance under Alternatives 7D and 7G would be similar to the comparison portions of the Proposed Route.

Alternatives 7C, 7E, 7F, 7H, and 7I would result in less disturbance to prime farmland during construction than the comparison portions of the Proposed Route. Alternatives 7C, 7F, 7H, and 7I would also result in less permanent disturbance. Permanent disturbance under Alternative 7E would be similar to the comparison portion of the Proposed Route.

Livestock Grazing

Approximately 37,717 acres or 74 percent of the Analysis Area for Segment 7 is rangeland and pasture (Table 3.18-1). Construction of the Proposed Route would temporarily disturb an estimated 953 acres of rangeland and pasture (Table 3.18-16), with an estimated 132 acres permanently disturbed (Table 3.18-17). Alternatives 7A through 7J would all temporarily disturb more rangeland during construction than the comparison portions of the Proposed Route (Table 3.18-16). Alternatives 7C through

Table 3.18-16. Agricultural Land Disturbed during Construction – Segment 7

Segment or Alternative	Acres Disturbed by Segment			
	Total	**Rangeland and Pasture**	**Irrigated Farming**	**Dryland Farming**
Proposed – Total Length	**1,799**	953	381	369
Proposed – Comparison Portion for Alternative 7A,B	**498**	278	9	141
Alternative 7A	**617**	375	22	113
Alternative 7B	**745**	455	12	233
Proposed – Comparison Portion for Alternative 7C	**288**	167	39	80
Alternative 7C	**289**	214	8	63
Proposed – Comparison Portion for Alternative 7D	**112**	71	35	2
Alternative 7D	**125**	84	36	1
Proposed – Comparison Portion for Alternative 7E	**67**	52	14	–
Alternative 7E	**78**	64	12	–
Proposed – Comparison Portion for Alternative 7F	**201**	131	41	25
Alternative 7F	**169**	137	2	27
Proposed – Comparison Portion for Alternative 7G	**48**	41	7	–
Alternative 7G	**72**	55	17	–
Proposed – Comparison Portion for Alternative 7H,I	**1,799**	953	381	369
Alternative 7H	**2,111**	1,672	94	164
Alternative 7I	**2,727**	2,273	95	163
Proposed– Comparison Portion 7/9 for Alternative 7J[1/]	**2,224**	1,268	468	369
Alternative 7J	**3,157**	2,721	95	163

Acreages are rounded to nearest acre.

1/ Alternative 7J connects with Segment 9 approximately 25.8 miles west of the proposed Cedar Hill Substation, which is the western terminus of Segment 7 and the beginning point for Segment 9. This table compares 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

Table 3.18-17. Agricultural Land Disturbed during Operations – Segment 7

Segment or Alternative	Acres Disturbed by Segment			
	Total	**Rangeland and Pasture**	**Irrigated Farming**	**Dryland Farming**
Proposed – Total Length	**231**	132	42	40
Proposed – Comparison Portion for Alternative 7A,B	**46**	24	–	13
Alternative 7A	**96**	53	3	14
Alternative 7B	**99**	63	2	23
Proposed – Comparison Portion for Alternative 7C	**36**	25	4	7
Alternative 7C	**28**	21	1	5
Proposed – Comparison Portion for Alternative 7D	**11**	9	2	–
Alternative 7D	**13**	10	2	–
Proposed – Comparison Portion for Alternative 7E	**6**	5	1	–
Alternative 7E	**8**	8	–	–
Proposed – Comparison Portion for Alternative 7F	**27**	16	5	4
Alternative 7F	**24**	18	1	4
Proposed – Comparison Portion for Alternative 7G	**6**	4	2	–
Alternative 7G	**6**	3	2	–
Proposed – Comparison Portion for Alternative7H,I	**231**	132	42	40
Alternative 7H	**340**	259	24	17
Alternative 7I	**451**	370	22	16
Proposed – Comparison Portion 7/9 for Alt. 7J[1/]	**294**	175	60	40
Alternative 7J[1/]	**511**	435	22	16

Acreages are rounded to nearest acre.

1/ Alternative 7J connects with Segment 9 approximately 25.8 miles west of the proposed Cedar Hill Substation, which is the western terminus of Segment 7 and the beginning point for Segment 9. This table compares 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

7G would permanently disturb similar amounts of rangeland and pasture as the Proposed Route. Alternatives 7A and 7B would permanently disturb 29 and 39 acres more than the Proposed Route, respectively. Alternatives 7H, 7I, and 7J would permanently disturb 126, 238, and 260 acres of rangeland and pasture more than their comparison portions of the Proposed Route, respectively (Table 3.8-17).

Crop Production

Approximately 3,406 acres or 7 percent of the Analysis Area for Segment 7 is irrigated cropland, and approximately 5,859 acres or 11 percent is used for dryland farming (Table 3.18-1). Construction of the Proposed Route would temporarily disturb 381 acres of irrigated cropland and 369 acres of dryland faming (Table 3.18-16), with 42 acres of irrigated cropland and 40 acres of dryland farming permanently disturbed (Table 3.18-17). The Proposed Route would be located north of an airstrip proposed by Tugaw Ranches, which could affect future crop spraying activities. Potential mitigation for impacts to this proposed airstrip is discussed in Section 3.17 – Land Use and Recreation.

Alternatives 7H and 7I would temporarily disturb substantially less irrigated cropland and dryland farming during construction than the comparison portion of the Proposed Route, with each alternative affecting one-quarter as many irrigated acres as the comparison portion of the Proposed Route and less than half as many dryland acres (Table 3.18-16). This would also be the case with Alternative 7J, which would affect less than one-quarter as many irrigated acres and less one-half as many dryland acres. Permanent impacts under these alternatives would also be lower than the Proposed

Route, but estimated permanent disturbance under the Proposed Route is low, and the difference between the comparison portion of the Proposed Route and Alternatives 7H, 7I, and 7J would be 18 acres, 20 acres, and 38 acres, respectively (Table 3.18-17).

The differences in estimated temporary disturbance between the other alternatives to the Segment 7 Proposed Route are much less, with the largest difference being the impact to dryland farming under Alternative 7B, which would temporarily impact 92 acres more than the comparison portion of the Proposed Route (Table 3.18-16). Permanent impacts to irrigated cropland and dryland farming under Alternatives 7A through 7G would be similar to those estimated for the comparison portion of the Proposed Route (Table 3.18-17).

As noted above with respect to Segment 5, the Power County Task Force (2009c) has provided an assessment of the potential economic impacts of the proposed Project on different types of agricultural land in Power and Cassia Counties, Idaho. This assessment is discussed in Section 3.4 – Socioeconomics.

CRP Land

Estimates provided by the FSA indicate that the Proposed Route for this segment would cross an estimated 25.6 miles of land enrolled in CRP (Table 3.18-18). Alternatives 7A, 7B, and 7C would cross slightly more miles of CRP land than their comparison portions of the Proposed Route. The miles of CRP land crossed would be similar to the Proposed Route under the other alternatives (Table 3.18-18). Information on the miles of Alternative 7J that would cross CRP land has been requested from the FSA and will be added to Table 3.18-18 upon receipt.

Table 3.18-18. CRP Lands Crossed by Segment 7

Segment or Alternative	Total Length (Miles)	CRP Lands (Miles)
Proposed – Total Length	**118.1**	25.6
Proposed – Comparison Portion for Alternatives 7A,B	**35.2**	12.5
Alternative 7A	**38.0**	14.6
Alternative 7B	**46.4**	16.8
Proposed – Comparison Portion for Alternative 7C	**20.1**	1.0
Alternative 7C	**20.3**	4.0
Proposed – Comparison Portion for Alternative 7D	**6.2**	0.4
Alternative 7D	**6.8**	0.2
Proposed – Comparison Portion for Alternative 7E	**3.8**	–
Alternative 7E	**4.5**	–
Proposed – Comparison Portion for Alternative 7F	**10.5**	0.8
Alternative 7F	**10.8**	0.2
Proposed – Comparison Portion for Alternative 7G	**3.1**	–
Alternative 7G	**3.2**	–
Proposed – Comparison Portion for Alternatives 7H, I	**118.1**	13.8
Alternative 7H	**127.5**	13.6
Alternative 7I	**173.4**	13.7
Proposed – Comparison Portion 7/9 for Alternatives 7J[1/ 2/]	**143.9**	TBD[2/]
Alternative 7J[1/]	**202.1**	TBD[2/]

Mileages are rounded to tenths of a mile.

1/ Alternative 7J connects with Segment 9 approximately 25.8 miles west of the proposed Cedar Hill Substation, which is the western terminus of Segment 7 and the beginning point for Segment 9. This table compares 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

2/ Information on the miles of Alternative 7J that would cross CRP land has been requested from the FSA and will be added to Table 3.18-18 upon receipt.

The Agencies recommend that the Proponents work with the FSA and landowners to determine potential impacts to the continued participation of the affected land in the CRP (AGRI-18).

Dairy Farms

The Proposed Route for Segment 7 would cross 0.4 mile of CAFO. Alternative 7I would cross 0.2 mile of CAFO. In this preliminary layout, two intermediate pivots would be affected. To substantially reduce impacts, the Agencies recommend that the Proponents realign the Proposed Route during final design to avoid these and other potentially affected CAFOs (AGRI-17).

Segment 8

Segment 8, as proposed, would link the Midpoint and Hemingway Substations. This 131-mile single-circuit 500-kV transmission line would stay north of the Snake River until crossing through the SRBOP parallel to an existing 500-kV transmission line before ending at the Hemingway Substation. Thirteen acres of the expansion of the Midpoint Substation and 0.5 acre for a regeneration site are attributed to Segment 8. There are five Route Alternatives: 8A, which follows the WWE corridor but crosses the Snake River and I-84 twice (while the Proposed Route would stay north of this area); 8B and 8C, which represent the old routes originally proposed by the Proponents but that have now been changed to avoid the cities of Kuna and Mayfield, respectively; 8D, which represents a small revision involving a rebuild of the existing transmission line to move both away from the National Guard Maneuver Area; and 8E, which was proposed by the BLM in order to avoid crossing the Halverson Bar nonmotorized portion of the Guffey Butte-Black Butte Historical Area (see Appendix A, Figure A-10).

Prime Farmland

Approximately 7,759 acres or 27 percent of the Analysis Area for Segment 8 is prime farmland (Table 3.18-2). Approximately 447 acres of prime farmland would be temporarily disturbed during construction of the Proposed Route, and 109 acres would be permanently disturbed (Tables D.15-1 and D.15-2 in Appendix D). Alternative 8A would result in less disturbance to prime farmland than the comparison portion of the Proposed Route; Alternative 8B would result in more disturbance. Alternative 8C would result in more temporary disturbance to prime farmland during construction than the comparison portion of the Proposed Route, but would not have any permanent impacts on prime farmland during Project operations. The construction and operations impacts of Alternative 8D on prime farmland would be approximately equal to the impacts of the comparison portion of the Proposed Route.

Livestock Grazing

Approximately 23,491 acres or 81 percent of the Analysis Area for Segment 8 is rangeland and pasture (Table 3.18-1). Construction of the Proposed Route would temporarily disturb an estimated 1,861 acres of rangeland and pasture (Table 3.18-19), with an estimated 219 acres permanently disturbed (Table 3.18-20). Alternatives 8B and 8C would temporarily disturb 190 acres and 27 acres of rangeland and pasture less than the Proposed Route, respectively; Alternative 8E would temporarily disturb 195 acres more than the comparison portion of the Proposed Route (Table 3.18-19).

Alternative 8B would permanently disturb 24 fewer acres than the comparison portion of the Proposed Route; Alternative 8E would permanently disturb 17 more acres than the comparison portion (Table 3.18-20). The amount of rangeland and pasture temporarily and permanently disturbed under the other alternatives would be similar to that disturbed by the Proposed Route (Tables 3.18-19 and 3.18-20).

Table 3.18-19. Agricultural Land Disturbed during Construction – Segment 8

Segment or Alternative	Acres Disturbed by Segment			
	Total	**Rangeland and Pasture**	**Irrigated Cropland**	**Dryland Farming**
Proposed – Total Length	**2,121**	1,861	219	–
Proposed – Comparison Portion for Alternative 8A	**813**	613	188	–
Alternative 8A	**823**	626	182	–
Proposed – Comparison Portion for Alternative 8B	**753**	705	29	–
Alternative 8B	**778**	515	213	–
Alternative 8B – Comparison Portion for Alternative 8C	**138**	136	–	–
Alternative 8C	**138**	109	12	–
Proposed – Comparison Portion for Alternative 8D	**123**	118	–	–
Alternative 8D	**142**	126	12	–
Proposed – Comparison Portion for Alternative 8E	**98**	87	9	–
Alternative 8E	**285**	282	–	–

Table 3.18-20. Agricultural Land Disturbed during Operations – Segment 8

Segment or Alternative	Acres Disturbed by Segment			
	Total	**Rangeland and Pasture**	**Irrigated Cropland**	**Dryland Farming**
Proposed – Total Length	**246**	219	16	–
Proposed – Comparison Portion for Alternative 8A	**99**	80	15	–
Alternative 8A	**102**	84	14	–
Proposed – Comparison Portion for Alternative 8B	**87**	80	–	–
Alternative 8B	**69**	55	9	–
Proposed – Comparison Portion for Alternative 8C	**15**	15	–	–
Alternative 8C	**16**	15	–	–
Proposed – Comparison Portion for Alternative 8D	**19**	16	–	–
Alternative 8D	**15**	12	2	–
Proposed – Comparison Portion for Alternative 8E	**10**	9	–	–
Alternative 8E	**27**	26	–	–

Acreages are rounded to nearest acre.

Crop Production

Approximately 4,658 acres or 16 percent of the Analysis Area for Segment 8 is irrigated cropland (Table 3.18-1). There is no dryland farming within the Analysis Area. Approximately 219 acres of irrigated cropland would be temporarily disturbed during construction (Table 3.18-19), with 16 acres permanently disturbed (Table 3.18-20). Alternative 8B would temporarily disturb 185 acres of irrigated cropland more than the comparison portion of the Proposed Route (Table 3.18-19). Permanent disturbance to irrigated cropland would be similar to the Proposed Route under all four alternatives, with the largest difference, 9 acres, associated with Alternative 8B (Table 3.18-20).

CRP Lands

There are no CRP lands within the Analysis Area for Segment 8 (Table 3.18-4). The FSA has been contacted to confirm that Alternative 8E would not cross CRP land. This section will be updated following receipt of this information.

Dairy Farms

The Segment 8 Proposed Route would not cross any CAFOs. Alternative 8A would cross approximately 0.2 mile of CAFO. Alternative 8D would cross approximately 0.1 acre of CAFO. The Agencies recommend that the Proponents realign the transmission line to avoid CAFOs if Alternatives 8A or 8D are selected (AGRI-17).

Segment 9

Segment 9, as proposed, would link the Cedar Hill and Hemingway Substations with a 161.7-mile single-circuit 500-kV transmission line which skirts the Jarbidge and Owyhee Military Operating Areas to the north, then follows the WWE corridor just north of the Saylor Creek Air Force Range, passing through Owyhee County before entering into the Hemingway Substation. Fifteen acres of the construction of the Cedar Hill Substation and 1 acre for two regeneration sites are attributed to Segment 9. There are eight Route Alternatives proposed, including 9A, which was the Proponents' Proposed Route until moving to avoid the Hollister area; 9B, which is being considered by the BLM because it follows the WWE corridor and parallels existing utility corridors; 9C, which was the Proponents' Proposed Route until moving to avoid the Castleford area; and 9D and 9E, proposed by the Owyhee County Task Force, that cross more public lands north and south of the Proposed Route, respectively, than the Proposed Route. Most of Alternative 9D would be within the SRBOP. Alternatives 9F, 9G, and 9H were proposed to avoid crossing the nonmotorized area south of C.J. Strike Reservoir. Alternatives 9G and 9H provide an alternate route location south of Alternative 8E (see Appendix A, Figure A-11).

Prime Farmland

Approximately 13,795 acres or 33 percent of the Analysis Area for Segment 9 is prime farmland (Table 3.18-2). Approximately 891 acres of prime farmland would be temporarily disturbed during construction of the Proposed Route, and 100 acres would be permanently disturbed (Tables D.15-1 and D.15-2 in Appendix D). Alternatives 9A, 9B, 9C, and 9D would result in more temporary and permanent disturbance to prime farmland than the comparison portions of the Proposed Route. Alternative 9E would result in less disturbance to prime farmland than the comparison portion of the Proposed Route during construction, and similar permanent disturbance.

Livestock Grazing

Approximately 37,985 acres or 91 percent of the Analysis Area for Segment 9 is rangeland and pasture (Table 3.18-1). Construction of the Proposed Route would temporarily disturb an estimated 2,240 acres of rangeland and pasture (Table 3.18-21), with an estimated 311 acres permanently disturbed (Table 3.18-22). Alternatives 9A, 9D, 9E, 9F, and 9H would temporarily disturb more acres of rangeland and pasture than the Proposed Route, with net increases in temporary disturbance ranging from 16 acres under Alternative 9A to 257 acres under Alternative 9E (Table 3.18-21).

Table 3.18-21. Agricultural Land Disturbed during Construction – Segment 9

Segment or Alternative	Acres Disturbed by Segment			
	Total	Rangeland and Pasture	Irrigated Cropland	Dryland Farming
Proposed – Total Length	**2,664**	2,240	356	–
Proposed – Comparison Portion for Alternative 9A	**117**	100	–	–
Alternative 9A	**133**	116	3	–
Proposed – Comparison Portion for Alternative 9B	**823**	759	45	–
Alternative 9B	**814**	599	193	13
Proposed – Comparison Portion for Alternative 9C	**238**	226	–	–
Alternative 9C	**272**	200	62	–
Proposed – Comparison Portion for Alternative 9D–H	**953**	731	199	–
Alternative 9D	**811**	770	19	–
Alternative 9E	**1,001**	989	3	–
Alternative 9F	**969**	828	109	–
Alternative 9G	**844**	794	26	–
Alternative 9H	**977**	832	111	–

Acreages are rounded to nearest acre.

Table 3.18-22. Agricultural Land Disturbed during Operations – Segment 9

Segment or Alternative	Acres Disturbed by Segment			
	Total	Rangeland and Pasture	Irrigated Cropland	Dryland Farming
Proposed – Total Length	**358**	311	34	–
Proposed – Comparison Portion for Alternative 9A	**15**	13	–	–
Alternative 9A	**18**	16	1	–
Proposed – Comparison Portion for Alternative 9B	**121**	118	–	–
Alternative 9B	**85**	71	12	–
Proposed – Comparison Portion for Alternative 9C	**26**	24	–	–
Alternative 9C	**28**	25	1	–
Proposed – Comparison Portion for Alternative 9D–H	**106**	87	13	–
Alternative 9D	**80**	74	2	–
Alternative 9E	**134**	132	1	–
Alternative 9F	**93**	81	7	–
Alternative 9G	**83**	76	3	–
Alternative 9H	**96**	82	8	–

Acreages are rounded to nearest acre.

Alternatives 9B and 9C would temporarily disturb 160 acres and 26 acres less rangeland and pasture than the comparison portions of the Proposed Route, respectively (Table 3.18-21).

Permanent disturbance to rangeland and pasture relative to the comparison portions of the Proposed Route would range from 47 acres less under Alternative 9B to 45 acres more under Alternative 9E (Table 3.18-22).

Crop Production

Approximately 3,197 acres or 8 percent of the Analysis Area for Segment 9 is irrigated cropland, with less than 20 acres used for dryland farming (Table 3.18-1). Construction of the Proposed Route would temporarily disturb 356 acres of irrigated cropland (Table 3.18-21), with 34 acres permanently disturbed (Table 3.18-22). Alternatives 9A, 9B, and 9C would temporarily disturb more irrigated cropland than the comparison portion of the Proposed Route, with estimated net increases ranging from 3 acres under

Alternative 9A to 148 acres under Alternative 9B (Table 3.18-21). Alternatives 9D, 9E, 9F, 9G, and 9H would disturb fewer acres of irrigated cropland than the comparison portion of the Proposed Route during construction, ranging from 88 acres to 196 acres less (Table 3.18-21). Permanent disturbance to irrigated cropland relative to the comparison portion of the Proposed Route would range from 12 acres less under Alternative 9E to 12 acres more under Alternative 9B (Table 3.18-22).

The Grindstone Airport is within 500 feet of Alternative 9B. The location of this alternative within proximity to an airstrip could have impacts on crop-spraying activities. Potential impacts to crop spraying are described in the Effects Common to All Action Alternatives section above.

CRP Lands

There are no CRP lands within the Analysis Area for Segment 9 (Table 3.18-4). The FSA has been contacted to confirm that Alternatives 9F, 9G, and 9H would not cross CRP land. This section will be updated following receipt of this information.

Dairy Farms

Segment 9 of the Proposed Route would not cross any CAFOs. Alternatives 9B and 9C would each cross less than 0.1 mile of CAFO. The Agencies recommend that the Proponents realign the transmission line to avoid CAFOs if Alternatives 9B or 9C are selected (AGRI-17).

Segment 10

Segment 10, as proposed, would link the Cedar Hill and Midpoint Substations with a 33.6-mile single-circuit 500-kV line, following a WWE corridor for most of its distance. Twenty-eight acres of the expansion of the Midpoint Substation and of the construction of the Cedar Hill Substation are attributed to Segment 10. There are no Route Alternatives proposed along this segment (see Appendix A, Figure A-12).

Prime Farmland

Approximately 1,436 acres or 35 percent of the Analysis Area for Segment 10 is prime farmland (Table 3.18-2). Approximately 145 acres of prime farmland would be temporarily disturbed during construction of the Proposed Route, and 13 acres would be permanently disturbed (Tables D.15-1 and D.15-2 in Appendix D).

Livestock Grazing

Approximately 2,009 acres or 49 percent of the Analysis Area for Segment 10 is rangeland and pasture (Table 3.18-1). Construction of the Proposed Route would temporarily disturb an estimated 253 acres of rangeland and pasture, with an estimated 37 acres permanently disturbed.

Crop Production

Approximately 1,866 acres or 46 percent of the Analysis Area for Segment 10 is irrigated cropland, with less than 20 acres used for dryland farming (Table 3.18-1). Construction of the Proposed Route would temporarily disturb 266 acres of irrigated cropland, with 33 acres permanently disturbed.

CRP Lands

There are no CRP lands within the Analysis Area for Segment 10 (Table 3.18-4).

Dairy Farms

The Segment 10 Proposed Route would cross 0.6 mile of CAFOs. The Proponents should realign the transmission line to avoid CAFOs on either the Proposed Route or Alternative 8A (AGRI-17).

3.18.2.4 Design Variation

A Design Variation is being considered that would consist of constructing two single-circuit lines in Segments 2 through 4 instead of a single double-circuit line (which is the design assessed above). The disturbance footprint of the two single-circuit towers is greater than that of the double-circuit tower, in part because the requested ROW would be wider, but also because helicopter-assisted construction could be implemented in these areas due to the lighter weight of the towers, which would require additional fly yards. The additional ROW space and the fly yards would cause additional temporary disturbance during construction. Across Segments 2, 3, and 4, the additional disturbance of the single-circuit tower alternative ranges from 25 to 30 percent greater than the comparable portions of the double-circuit tower disturbance under the proposed design. The two single circuits require more ground disturbance, but would be designed and constructed to the same standards as the Proposed Action. The Design Variation would require two mobilizations rather than one.

Construction under the Design Variation alternative would, therefore, result in greater ground disturbance and disruption to agricultural operations than the single tower option. This is discussed further in the following sections. Permanent ground disturbance would be the same under the Design Variation and single tower options.

Segment 2

Construction of the Design Variation for Segment 2 would temporarily disturb 428 acres more than the single tower option, with the majority (98 percent) of this additional disturbance affecting rangeland and pasture. No irrigated cropland or dryland farming would be affected by the Proposed Route or Route Alternatives for this segment. Increases in disturbed acres under Alternatives 2A and 2B would be similar to those under the Proposed Route. Construction of the Design Variation version of Alternative 2C would disturb approximately 30 fewer acres than the Proposed Route.

Segment 3

Construction of the Design Variation for Segment 3 would temporarily disturb 217 acres more than the single tower option, with the majority (97 percent) of this additional disturbance affecting rangeland and pasture. No irrigated cropland or dryland farming would be affected.

Segment 4

Construction of the Design Variation for Segment 4 would temporarily disturb 839 acres more than the single tower option, with the majority (81 percent) or 678 acres of this additional disturbance affecting rangeland and pasture. The Design Variation would

also temporarily impact an additional 50 acres of irrigated cropland and 36 acres of dryland farming.

Alternatives 4A through 4F would all temporarily disturb more additional rangeland and pasture under the Design Variation than the comparison portion of the Proposed Route, with net increases ranging from 29 acres under Alternative 4F to 122 acres under Alternative 4C. Alternative 4A would temporarily affect the same amount of additional irrigated cropland as the Proposed Route. Alternatives 4B to 4E would temporarily affect from 11 to 13 acres less irrigated cropland than the Proposed Route; Alternative 4F would affect 12 acres more. Additional temporary impacts to dryland farming would be the same as for the Proposed Route under Alternatives 4A, 4C, 4E, and 4F, with the other alternatives (Alternatives 4B and 4D) affecting an additional 12 acres.

3.18.2.5 Structure Variation

The proposed guyed Structure Variation would add four guy wires about 140 feet long from a point about 100 feet up in each tower to four guy anchors spaced in a square around the tower (Appendix B, Figure B-6). This would not change the amount of disturbance during construction or operations appreciably. These structures would not be used in actively farmed areas, adjacent to public roads, or in rural development areas. As a result, there would be no appreciable difference in impact on agriculture from the use of this Structure Variation when compared to the use of self-supporting lattice towers.

3.18.2.6 Schedule Variation

The Schedule Variation uses the two single-circuit Design Variation described above but extends construction over a longer timeframe. Initially, only one of the eventual two single-circuit lines would be constructed, with the second to be constructed at a later date. The Schedule Variation proposes that the first single-circuit transmission line in Segments 2, 3, and 4 would be built as soon as a ROW grant is issued, but that the second line would not begin construction until late 2018. This would mean nearly 2 years between the end of construction for the first line and the beginning of construction for the second line. Any staging areas and fly yards that had been used for the first stage would have been revegetated after construction was complete and would have to be cleared again. There would be two sets of construction disturbances adding movement, noise, and dust to the area of construction in two instances in any given area. The Schedule Variation would subject agricultural operations in Segments 2, 3, and 4 and the Route Alternatives to the effects of inconvenience, potential damage to facilities, and harassment of livestock, as described for the Proposed Route, twice instead of one time during construction.

3.18.3 Mitigation Measures

To minimize or avoid impacts on agriculture, the Proponents have stated that they will implement EPMs Project-wide, as outlined in this section (identified above) and in Appendix C.

In addition, the Agencies have identified the following measures as a means to substantially reduce impact. The Agencies recommend that the Proponents incorporate these measures into their EPMs and apply them Project-wide.

AGRI-1 Provide for a qualified Agricultural Specialist to assist construction planning, construction, restoration, post-construction monitoring, and follow-up restoration.

AGRI-2 Maintain an active program of liaison with landowners and tenants, including specific points of contact whose responsibilities shall include pre-construction inventory, notices, complaint resolution, damage assessment, and negotiation and compensation.

AGRI-3 Establish procedures for determining ingress and egress routes with landowners and tenants, protection methods for off-ROW roads over agricultural lands and on ROW pads, including methods such as geotextile matting to segregate temporary rock fill.

AGRI-4 Establish the location of temporary roads to be used for construction purposes through negotiation with the landowner, with existing farm lanes or two tracks as preferred temporary access roads. Restore temporary access roads to pre-construction condition and leave temporary access roads intact through mutual agreement with the landowner and tenant unless located in flood areas or drainage hazard areas, or otherwise restricted by federal, state, or local regulations.

AGRI-5 Maintain landowner and tenant access across construction areas for farm equipment and livestock to fields isolated by construction activities and install temporary fences and gates across the construction area, as necessary, to facilitate agricultural operations.

AGRI-6 Protect topsoil by stripping and segregating topsoil in the disturbance area on agricultural lands unless negotiated differently with the landowner or tenant. Prevent segregated topsoil from being mixed with cut-and-fill materials, rock, construction debris, excavated materials, or other subsoil.

AGRI-7 Restrict the operation of vehicles and heavy equipment, or take other appropriate action, so that deep rutting does not result in mixing of topsoil and subsoil on excessively wet soils on the portion of the construction work area in agricultural land where the topsoil is not stripped.

AGRI-8 Protect irrigation operations and drain tiles by: 1) contacting landowners and tenants to identify the location of irrigation systems and wells, identified underground irrigation water pipes, well systems, and drain tiles that intersect the construction area; 2) repairing disrupted irrigation and drain tile systems as soon as possible; 3) maintaining the flow of irrigation water during construction or coordinating a temporary shutoff with affected parties; and 4) compensating affected parties for crop losses that result from irrigation and drain tile system interruptions due to construction.

AGRI-9 Protect agricultural lands from dewatering activities by pumping into a constructed energy-dissipating structure that shall minimize damage to adjacent agricultural land, drainage systems, and crops.

AGRI-10 Restore affected agricultural land to the pre-construction condition or provide compensation.

AGRI-11 Decompaction of exposed subsoil before topsoil replacement shall be accomplished utilizing an agricultural subsoiler or other appropriate implement. After decompaction and prior to topsoil replacement, a disc or harrow shall be utilized, as necessary, to smooth the subsoil surface.

AGRI-12 Following final grading and topsoil replacement in agricultural lands, deep tillage shall be used to relieve soil compaction in construction areas or the Proponents shall test soils for compaction at regular intervals. Where soil compaction is tested, construction areas shall be compared to adjacent areas not disturbed by construction.

AGRI-13 Decompact agricultural lands where topsoil has not been removed by using a non-inversion, deep-tillage agricultural subsoiler specifically designed for soil decompaction and designed to minimize surface disturbance and the mixing of subsoil with topsoil.

AGRI-14 Existing range improvements that are damaged or modified during construction shall be repaired. Additionally, temporary fences and gates shall be removed after construction if requested by landowner or land-management agency.

AGRI-15 In the event a dairy farm reports problems with stray voltage, complete a free, on-site investigation and determine the level of voltage and fix any problems resulting from the transmission line to less than 1 volt.

AGRI-16 Align the transmission line to avoid the CAFO approximately 14.5 miles east of the proposed Cedar Hill Substation if this route is approved.

AGRI-17 Realign the transmission line route during final design to avoid affecting any CAFOs.

AGR-18 Consult with the FSA and landowners to determine if construction would affect the CRP status of the land currently enrolled in CRP or if special construction or revegetation techniques would be necessary.

3.19 TRANSPORTATION

This section provides a description of the existing transportation and traffic system and airports and analyzes the impacts that would be caused by the Proposed Route and Route Alternatives to the existing infrastructure. Effects on crop dusting are discussed in Section 3.18 – Agriculture. Potential impacts that would be caused by the Proposed Route and Route Alternatives relating to geologic hazards, soils, land use, and OHV use are discussed in Sections 3.14 – Geologic Hazards, 3.15 – Soils, and 3.17 – Land Use and Recreation, respectively.

3.19.1 Affected Environment

This section discusses those aspects of the environment that could be impacted by transportation issues associated with the Project. It starts with a discussion of the Analysis Area considered; identifies the issues that have driven the analysis; characterizes the existing conditions across the Proposed Route and Route Alternatives in Wyoming, Idaho, and Nevada; and lists impacts from the Project.

3.19.1.1 Analysis Area

The Analysis Area for transportation includes the existing transportation infrastructure that would be affected by construction and operations of the proposed Project or its Route Alternatives. Transportation facilities in the vicinity of the Project range from Interstate highways to two-track trails, bridges, railroads, and airports. In mountainous areas (Segments 4, 5, and 7), roads tend to be narrow and curvilinear. Roads throughout are managed by federal, state, and local agencies. Motorized recreational activities occur throughout the vicinity of the Project. On federal and state lands, these activities are managed by agencies through land use plans and policies, with some enforcement, while use of private lands for these types of activities is legally limited by the landowner. Airports and landing strips are used for transportation of passengers and cargo and agricultural use.

The Analysis Area for roads comprises four parts:

1. Existing state and county maintained roads within 1 mile of the Proposed Route and Route Alternatives that would be mostly unaffected except for traffic increases that could temporarily affect the level of service or could result in some road damage;
2. Off-ROW existing roads needing improvement to a standard to support construction traffic;
3. Off-ROW new roads needed to access individual structure locations or the ROW; and
4. Roads built within the ROW connecting structure locations.

The Analysis Area for airports includes portions of routes that intersect areas within 3 miles of an airport or airstrip, including the controlled airspace. The Analysis Area for railroads and pipelines is the point of intersection with the ROW. No railroads or pipelines closely parallel the Proposed Route or Route Alternatives.

3.19.1.2 Issues to be Analyzed

Comments made during scoping for this Project (Tetra Tech 2009a) and by agency staff, and regulatory requirements were used to determine which transportation-related issues would be analyzed in the EIS. Issues associated with transportation include the following:

- Whether a full map and inventory of all new temporary and permanent access roads for the Project would be developed;
- How vehicles taking materials and personnel to and from the Project site would affect traffic patterns;
- How roads, highways, railroads, and airports would be affected;
- How pipelines would be affected;
- Whether there would be an increase in off-highway vehicle use, and what the environmental impacts of this would be;
- Whether construction and operations of the Project would cut off access to any previously-accessible areas;
- How roads would affect livestock and grazing operations; and
- What the environmental effects of new temporary and permanent roads constructed for this Project would be.

3.19.1.3 Regulatory Framework

The Proponents and/or the construction contractor would be required to obtain use permits or similar legal agreements from the public agencies responsible for affected roadways and other applicable ROWs. The contractor would be responsible for all oversize and overweight permits required for delivery of construction materials and subcontractor components.

Federal

Federal Aviation Administration

Activities accompanied by helicopter flight operations would operate under the control of the FAA.

The Proponents would file a notice of construction activities (14 CFR Part 77) with the FAA. The FAA is concerned with:

- Any construction or alteration exceeding 200 feet above ground level; and
- Any construction or alteration:
  - within 20,000 feet (3.79 miles) of a public use or military airport that exceeds a 100:1 sloping surface from any point on the runway of each airport with at least one runway more than 3,200 feet;
  - within 10,000 feet (1.89 miles) of a public use or military airport that exceeds a 50:1 sloping surface from any point on the runway of each airport with its longest runway no more than 3,200 feet; and

- within 5,000 feet of a public use heliport that exceeds a 25:1 sloping surface.

These regulations do not apply to private landing strips.

BLM and Forest Service

On BLM-managed lands, new road construction and roads improved for Project use would meet or exceed the minimum standards of width, alignment, grade, surface, and other requirements found in BLM Manual Section 9113 (BLM 1985c). On NFS lands, FSH 7709.56 – Road Preconstruction Handbook (Forest Service 2010), FSH 7709.57 – Road Construction Handbook (Forest Service 1992), and 7709.58 – Transportation System Maintenance Handbook (Forest Service 2009b) would apply.

BLM RMPs and MFPs, and National Forest Plans provide direction on road management along with other resources that govern roads on federal lands. Both the Forest Service and the BLM have Travel Management Plans that designate areas for motorized use, prohibit some uses to protect resources, or limit road use to certain times of the year for resource protection.

State

Encroachment and ROW

The Wyoming Department of Transportation's *Utility Accommodation Regulation* (WYDOT 1990) and Idaho Transportation Department's *Guide for Utility Management* (ITD 2008) provide the permit, encroachment, and occupancy requirements for construction and operations activities. If the alternative that crosses into Nevada is selected, the Nevada Department of Transportation's regulations would apply.

Blasting

The transport, storage, and discharge of blasting materials shall be in accordance with the General Safety and Health Standards and Wyoming, Occupational Health & Safety – Construction, Chapter 21, Subpart U. If the alternative that crosses into Nevada is selected, the Nevada Occupational Safety and Health (NRS 618.890 and 898) would apply.

County and Other Agencies

Counties and other public agencies typically require an encroachment permit, road use permits, or other appropriate "license" for ROW occupancy for the placement of any structures on, over, or under roads.

In addition, prior to conducting work within or above a road ROW, an encroachment permit or similar authorization would be required from the applicable jurisdictional agency at locations where the construction activities would occur within or above the public road ROW. The specific requirements of the encroachment permit from the applicable transportation agencies are determined on a project-by-project basis. The encroachment permit issued by state and local jurisdictions may include the following requirements:

- Identify all roadway locations where special construction techniques (e.g., directional drilling or night construction) would be used to minimize impacts to traffic flow.

- Develop circulation and detour plans to minimize impacts to local street circulation. This may include the use of signing and flagging to guide vehicles through and/or around the construction zone.
- Schedule truck trips outside of peak morning and evening commute hours.
- Limit lane closures during peak hours to the extent possible.
- Include detours for areas potentially affected by project construction.
- Install temporary traffic control devices as specified in the *Manual of Uniform Traffic Control Devices for Streets and Highways* (FHWA 2003).
- Store construction materials only in designated areas.

Encroachment permit requirements would be specified by the agency having jurisdiction. Enforcement of the terms of an encroachment permit would reduce impacts associated with short-term road closures.

The design of higher standard roads (project constructed and other agency) also would conform to the most current edition of the American Association of State Highway and Transport Officials (AASHTO) *Guidelines for Geometric Design of Very Low-Volume Local Roads (ADT ≤400).* A low standard road is generally a single lane, unsurfaced and constructed of native materials, and without permanent drainage structures whereas a road providing smooth traffic flow with limited access is considered a high standard road.

Any railroad/overhead utility crossing would conform to the NESC*:*

- The height of rail car should be assumed to be 23 feet.
- Structures supporting power must be 50 feet out from the centerline of main running tracks, Centralized Traffic Control sidings, and heavy tonnage spurs. Locations adjacent to industry tracks must provide at least 30 feet of clearance from centerline of track when measured at right angles. If located adjacent to curved track, clearance must be increased at the rate of 1.5 inches per degree of curved track.
- Regardless of the voltage, unguyed poles must be located a minimum distance from the centerline of any track equal to the height of the pole above the groundline plus 10 feet. If guying is required, the guys must be placed in such a manner as to keep the pole from leaning/falling in the direction of the tracks.
- Structures for 34.5-kV and higher lines must be located off a railroad ROW.
- Crossings would not be installed within 500 feet of the end of railroad bridges or 300 feet from the centerline of culverts or switch areas.

3.19.1.4 Methods

Data for the transportation network were collected and analyzed from highway maps, GIS coverage, route alignment maps, and other maps from various reports and websites of the affected state and local agencies. Specific GIS data used were the ESRI StreetMap Streets data layer for roads and highways; the ESRI Airports layer,

derived from the FAA National Airspace System Resource Aeronautical Data Product (dated January 18, 2007); the Railroads layer from the Bureau of Transportation Statistics (dated 2007); and a bridges layer taken from the U.S. Department of Transportation, Federal Highway Administration. Traffic volume data were obtained from Wyoming Department of Transportation and Idaho Transportation Department databases. Locations of airports and landing strips were obtained from 2007 Bureau of Transportation Statistics Airport database and aerial photography. Travel management analyses have been completed for the Medicine Bow-Routt, Sawtooth, and Caribou-Targhee NFs. These analyses provide information to the decision-maker regarding possible new road construction and use, and are located in the Administrative Record.

3.19.1.5 Existing Conditions

Highways, Roads, Bridges, and Railroads

Many federal and state highways intersect the Proposed Route and Route Alternatives; however, most roads are low standard roads, often little more than two tracks. Table D.19-1 in Appendix D shows the miles of federal-, state-, and county-maintained roads and bridges within 1 mile of the Proposed Route and Route Alternatives. In Wyoming, major highways near the Project are I-80 and U.S. Highway 30. I-80 had about 5,000 to 7,000 vehicles per day on average in the vicinity of the Project in 2008, while Highway 30 had about 1,000 to 2,000 vehicles per day (WYDOT 2008). Major roads near the Project in Idaho include U.S. Highway 30 (less than 1,000 vehicles per day) and I-84 (more than 10,000 vehicles per day; ITD 2010). Mainline rail lines operating in the region include Burlington Northern Santa Fe and UPRR.

Airports

There are public airports and heliports (for hospitals) within 3 miles, and private airstrips within 1 mile, of the Proposed Route and Route Alternatives that could be affected by the construction and operation of the Project. Table 3.19-1 lists these.

Table 3.19-1. Public Airports, Landing Strips, and Heliports Within the Analysis Area

Segment	Facility Type	Facility Name	Facility Use
1E	Airport	Robbins	Private
	Airport	Ellis Ranch	Private
1W(a)	Airport	Ellis Ranch	Private
1W(c)	Airport	Ellis Ranch	Private
2	Airport	Ellis Ranch	Private
	Heliport	Memorial Hospital	Private
3	None	None	None
4	Airport	Downey/Hyde Memorial	Public
	Airport	Bear Lake County	Public
	Heliport	Bear Lake Memorial Hospital Helipad	Private
5	Airport	Downey/Hyde Memorial	Public
6	None	None	None
7	Airport	Downey/Hyde Memorial	Public

Table 3.19-1. Public Airports, Landing Strips, and Heliports Within the Analysis Area (continued)

Segment	Facility Type	Facility Name	Facility Use
8	Airport	Gooding Municipal	Public
	Ultralight	Oasis Strip	Private
9	Airport	Ez Lope Ranch	Private
	Airport	Murphy	Public
10	None	None	None

The Proposed Route for Segment 7 would be located 0.8 mile north of an airstrip proposed by Tugaw Ranches (see Figure 3.17-9 in Section 3.17 – Land Use and Recreation).

3.19.2 Direct and Indirect Effects

This section is organized to present effects to existing transportation facilities from construction, then operations, followed by decommissioning activities for the Proposed Route and its alternatives. Each segment is analyzed in detail below in Section 3.19.2.3. There is a Design Variation involving use of two single-circuit structures proposed by the Proponents for Segments 2, 3, and 4 (see Section 2.2 for details), which is analyzed below in Section 3.19.2.4, and a Structure Variation that is analyzed in Section 3.19.2.5. The Proponents have also proposed a Schedule Variation, analyzed in Section 3.19.2.6, in which one of the two single circuits in Segments 2, 3, 4; Segment 1W(c); and modifications of some substations would be built at a later time than the rest of the Project, between approximately 2017 and 2020.

Mitigation measures or EPMs are presented in detail within this section only if it is the first time they have been discussed in Chapter 3; all other measures are referenced or summarized. A comprehensive list of all Proponent-proposed EPMs and Agency-required mitigation measures can be found in Table 2.7-1 of Chapter 2.

Plan Amendments

Plan amendments are proposed for areas on BLM-managed and NFS land where the Project would not be consistent with the land use plans. Proposed amendments are summarized in Table 2.2-1 of Chapter 2 and detailed in Appendices F and G. Proposed plan amendments that could directly impact transportation include the following:

- Medicine Bow Forest Plan: If Segment 1E is approved, Sections 13, 14, 23, and 24, T30N R78W, and the west halves of sections 18 and 19, T30N R77W would be allocated to MA 8.3 Utility Corridors and Electronic Sites. If Alternative Route 1E-C is selected instead of 1E, only Sections 13, 14, 23, and 24, T30N R78W would be allocated to MA 8.3 Utility Corridors and Electronic Sites.
- Caribou Forest Plan: Segment 4 - Designate a new corridor of Management Prescription 8.1 Concentrated Development Area. The corridor will be 9.2 miles long by 300 feet wide the area within 500 feet of the transmission line and new access roads will have an ROS of Roaded Natural.

- Kemmerer RMP: Segment 4 and alternatives- Mitigation measures included in proposed amendments require that "in specific sensitive areas (such as VRM class II, erosive soils, steep slopes, areas near NHT trails) the access road used for construction will be restored and an alternative access route for operations designated"
- Sawtooth Forest Plan: Alternative 7H and 7I - permit the crossing of Modification and Partial Retention VQOs by the Project as a one-time allowance without changing the management prescription and designate at least 500 feet on each side of the transmission line and along new permanent roads as Roaded Natural.
- SRBOP RMP:
  - Segment 8 - permit the Project to cross Halverson Bar nonmotorized area (the BLM has stated they would not approve this amendment);
  - Alternatives 9D and 9G - permit the Project to cross Cove nonmotorized area (The BLM has stated they would not approve this amendment)

Segment 9 of the Proposed Route would not be in conformance with the Twin Falls MFP and Jarbidge RMP due to crossing of the Salmon Falls Creek ACEC, which restricts motorized vehicle access and the crossing of a WSR eligible segment of Salmon Falls Creek. No amendment was proposed because the BLM does not have the authority to change WSR management.

3.19.2.1 No Action Alternative

Under the No Action Alternative, the proposed Project would neither be constructed nor operated. No Project-related impacts on roads, airports, airstrips, or OHV use would occur.

3.19.2.2 Effects Common to All Action Alternatives

Construction

Highways, Roads, Bridges, and Railroads

Roads other than state and federal highways and improved county roads would be used to provide access for personnel, material, and equipment to staging areas. “Other roads” include those privately owned (e.g., ranch, oil and gas, power company, private land access) as well as BLM, Forest Service, and county or other agency roads. Most construction sites and many helicopter fly yards would use these “other roads,” most of which are low standard and require improvement. Where no suitable road already exists, new roads to otherwise inaccessible sites would be required. Based on the current Project facility layout, approximately 979 miles of existing roads would be improved and 1,013 miles of new roads would be constructed for the Proposed Route (Table B-7 in Appendix B).

The Proponents have identified the minimum access road requirements for transmission line and substation construction, determined by the largest piece of equipment involved: a 14-foot-wide road top with a 16- to 20-foot width at corners (see Appendix B, Section 1.5). A minor amount of additional disturbance would occur in association with cut and fill methods or the installation of temporary or permanent culverts should they be

required where roads cross streams. The critical vehicle for tower construction is an aerial lift crane. A typical unit is shown in Figure 3.19-1. Typical minimum road construction requirements for improvements to existing roads and for new roads are shown in Figure 3.19-2. To the maximum extent possible, the Proponents would use existing roads, improving them as necessary to accommodate construction equipment. Construction of new access roads would be limited to reduce the overall impact of road construction. Figures 3.19-3 and 3.19-4 illustrate how existing roads, including those associated with parallel transmission lines, would be used to minimize the length of new access roads that would be required.

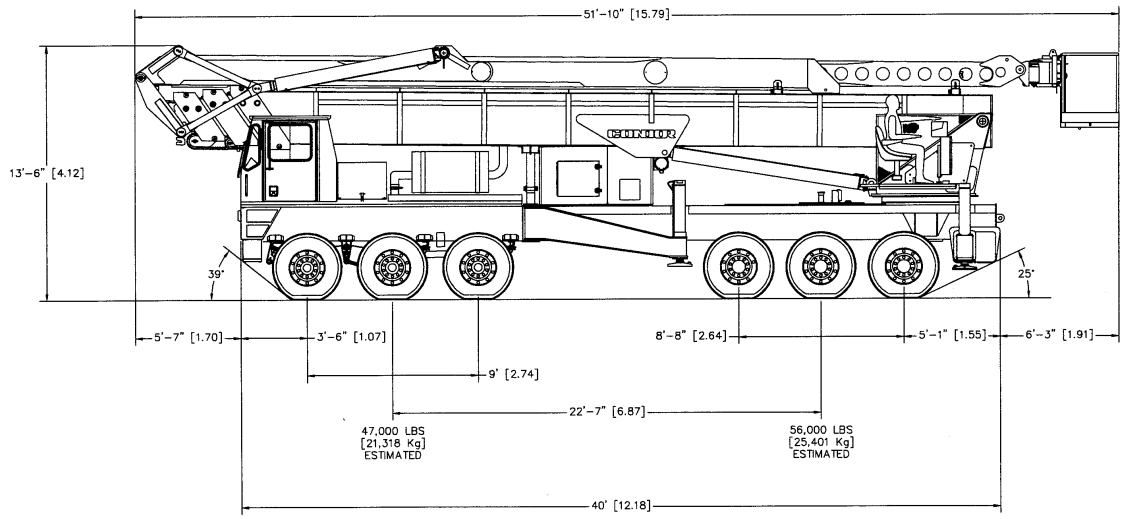


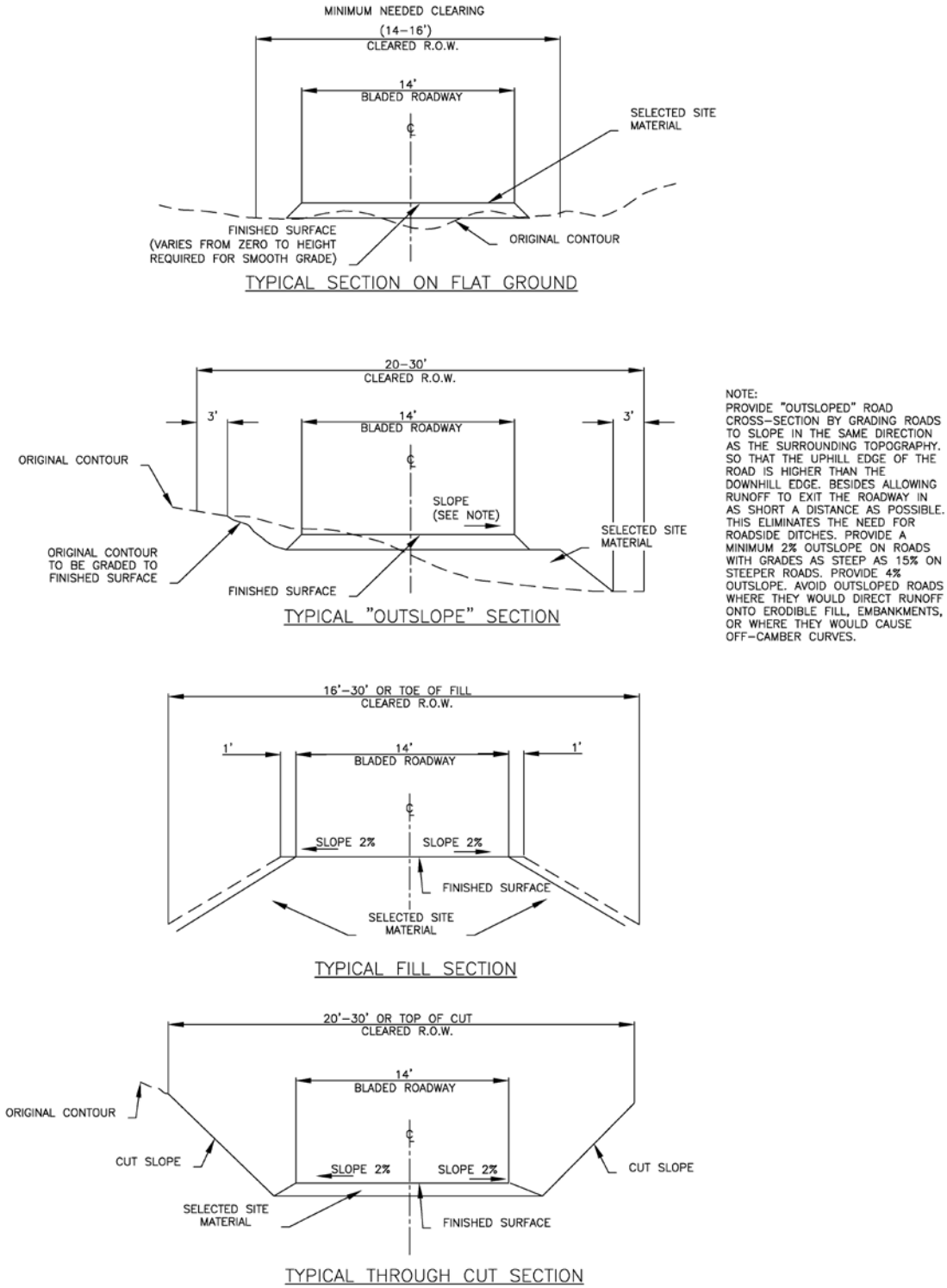
Figure 3.19-1. Condor 201S Aerial Lift Crane That Would Be Used During Construction Activities (roadable length 52 feet; width 8 feet 6 inches)

Construction activities could conflict with improvement projects. Complying with local permits and agreements would ensure appropriate coordination between the Proponents and the affected agencies so that conflicts would be avoided or minimized. To minimize impacts to local roads used during Project activities, the Proponents have proposed the following EPMs:

TR-9 All temporary culverts and associated fill material will be removed from stream crossings after construction, and banks will be recontoured to their pre-disturbance conditions.

TR-13 Roads negatively affected by construction and as identified by the Agencies will be returned to pre-construction condition.

A transmission line project could affect the ground transportation system (roads and railroads) during construction, particularly during the installation of structures and the stringing of conductors. Transportation of water for dust control and concrete batching, particularly for substations, would require multiple truck trips per day. The Proponents have estimated a total of 102 million gallons of water use across the entire Project. Substations would require between 200 and 2,800 truckloads of water for dust control alone during construction. Construction could result in roadway closures where construction activities and deliveries are located within public road and highway ROWs. Vehicles and equipment (e.g., overhead line cranes, concrete trucks, construction



NATIONAL SYSTEM OF PUBLIC LANDS

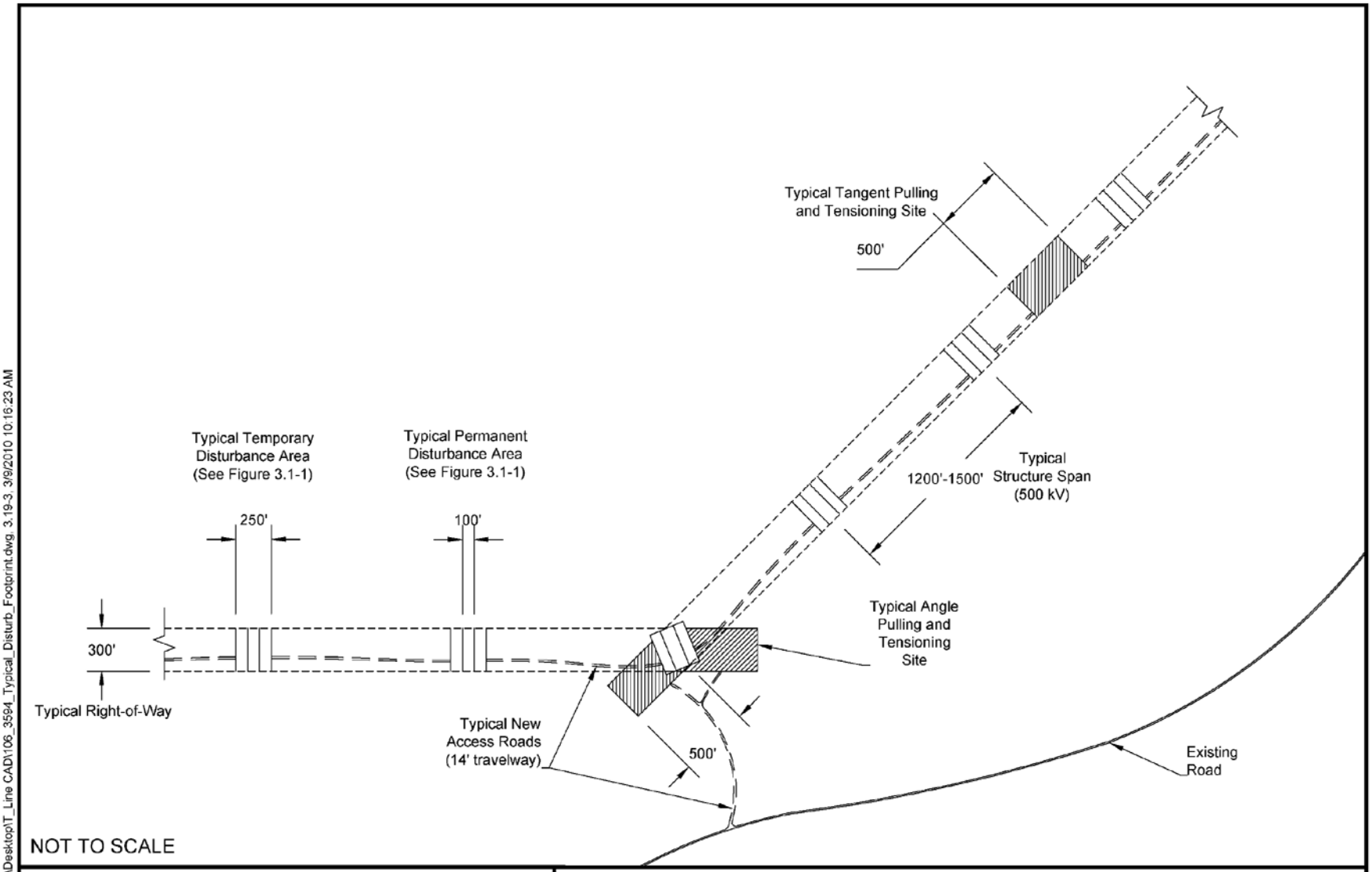
From PacifiCorp Transmission Construction Standards
TA 501, 2008

Gateway West
Transmission Line Project
Idaho, Wyoming, Nevada

Typical Road Sections for Different Terrains

FIGURE 3.19-2

C:\Documents and Settings\ben.starr\Desktop\T_Line CAD\106-3594_RoadSections.dwg, 3.19-2, 3/9/2010 10:35:26 AM

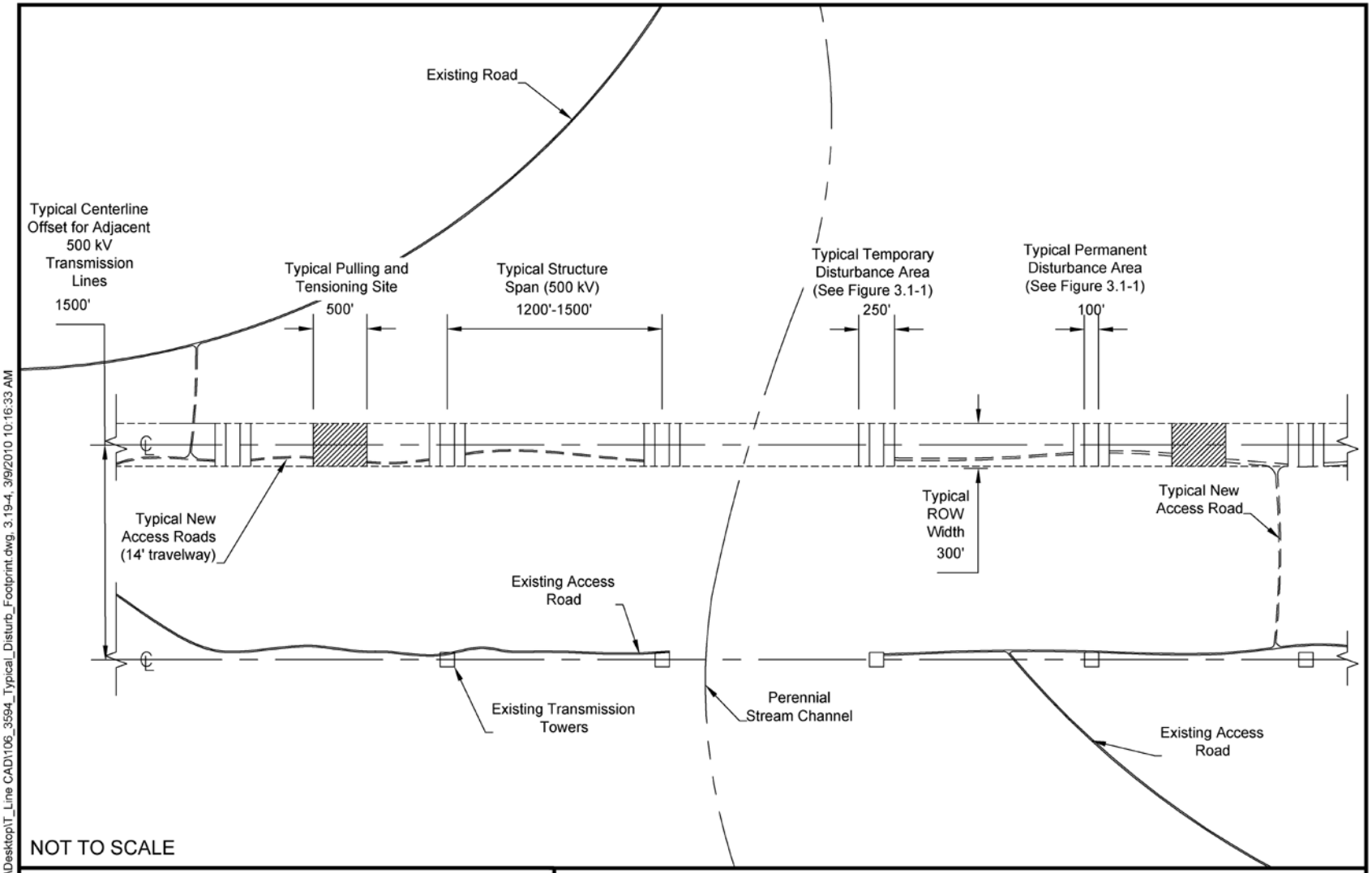


NATIONAL SYSTEM OF PUBLIC LANDS

Gateway West
Transmission Line Project
Idaho, Wyoming, Nevada
Typical Disturbance Footprint
Double 500 kV Circuit with Pulling and Tensioning Sites
Greenfield Line

FIGURE 3.19-3

C:\Documents and Settings\ben.starr\Desktop\T_Line CAD\106_3594_Typical_Disturb_Footprint.dwg, 3.19-3, 3/9/2010 10:16:23 AM



C:\Documents and Settings\ben.starr\Desktop\T_Line CAD\106_3594_Typical_Disturb_Footprint.dwg, 3.19-4, 3/9/2010 10:16:33 AM

NATIONAL SYSTEM OF PUBLIC LANDS

Gateway West
Transmission Line Project
Idaho, Wyoming, Nevada

Typical Disturbance Footprint
Double 500 kV Circuit with Pulling and Tensioning Sites
Parallel Existing Transmission Line

FIGURE 3.19-4

equipment, materials delivery trucks) could damage roads and bridges, shortening the life of the pavement and eventually leading to rutting and cracking. This would especially be true for heavy equipment, which does more damage to road surfaces than lighter passenger vehicles. Road use permits or similar documents would stipulate that it is the responsibility of the construction contractors and Proponents to rehabilitate or reconstruct roadways and structures during and after use.

The Proponents have committed to preparing a detailed transportation plan (including road maps) that would be developed to consider road conditions, wear and tear on roads, bridges, stream crossings, traffic control, and post-construction repair, reclamation, and access control. This plan would be approved by the appropriate federal, state, and local agencies prior to any Notice to Proceed to construction. Road construction, improvement, use, and decommissioning on BLM-managed lands would meet RMPs (as amended) design criteria, BMPs, and mitigation requirements. Forest Plan Standards and Guidelines (as amended) would apply on NFS lands. Ground-disturbing and vegetation management activities would comply with all Agency-wide and regional BMPs. In addition, the Proponents have proposed the following EPMs:

TR-1 A Traffic and Transportation Management Plan will be developed and implemented to provide site-specific details showing how the Project will comply with the EPMs listed in this attachment (Attachment A of Appendix C-1). This plan will be submitted to and approved by the appropriate federal, state, and local agencies with authority to regulate use of public roads, and approved, prior to the issuance of a Notice to Proceed with construction.

TR-3 If the Project proposes to obtain water from wells or surface water sources to suppress dust, written approval from the landowner or regulatory agency will be obtained prior to appropriation.

To minimize impacts to traffic loads and access issues on roads used by Project staff, the Proponents have proposed the following EPMs:

TR-5 On county- and state-maintained roads, caution signs will be posted on roads, where appropriate, to alert motorists of construction and warn them of slow traffic. Traffic control measures such as traffic control personnel, warning signs, lights, and barriers will be used during construction to ensure safety and to minimize traffic congestion.

TR-6 To reduce traffic congestion and roadside parking hazards, an equipment yard will be provided for primary parking for employee personal vehicles.

TR-10 Landowners will be notified at least 48 hours prior to the start of construction within 0.25 mile of a residence.

TR-12 Roads in residential areas will be restored as soon as possible, and construction areas near residences will be fenced off at the end of the construction day.

These EPMs only address roads near residences and existing roads and do not address either trying to use two-track trails instead of constructing new roads or how temporary roads would be constructed. Therefore, the Agencies have identified the following mitigation measures and the Proponents have adopted these measures and agreed to apply them when the land management agency or landowner requests it.

TRANS-1 The Proponents will attempt to identify existing two-track trails as preferred temporary access roads for construction.

TRANS-2 Temporary roads will be designed so proper drainage is not impaired and will be built to minimize soil erosion on or near the temporary roads. Consult with appropriate Agencies on additional design measures.

TRANS-3 Permanent and temporary roads on NFS lands and BLM-administered lands will be consistent with appropriate National Forest and BLM Transportation Management Plans, as amended, and other applicable rules. Permanent roads built for the Project on NFS lands and BLM-administered lands shall be closed to the public. Signs shall indicate the restriction or regulation, location, penalty for violation, and appropriate contact information for reporting violations. Signage shall be maintained and replaced as part of the routine maintenance. Proponents will monitor permanent roads on NFS land and BLM-administered lands yearly, and the applicable land-managing agency shall be provided with annual monitoring reports. Roads will be maintained as required by the Special Use Permit.

Overhead construction activities could interfere with emergency response by ambulance, fire, paramedic, and police vehicles. Roadway segments that would be most impacted are two-lane roadways that provide one lane of travel per direction. Additionally, there is a possibility that emergency services would be needed at a location where access is temporarily blocked by the construction zone. The Proponents would implement a program that requires them to coordinate in advance with emergency services such as wildland fire, paramedics, and essential services such as mail delivery and school buses if a closure would exceed 1 hour. The Proponents developed the following EPMs to address these conditions:

TR-4 If a construction method requires the closure of a state- or county-maintained road for more than 1 hour, a plan will be developed to accommodate traffic as required by a county or state permit.

TR-11 Emergency vehicle access to private property will be maintained.

Construction or expansion of the nine substations associated with the Project could cause temporary road and lane closures that could disrupt traffic flow. Construction activities could disrupt pedestrian movement and safety on local roads, restrict access to properties, and damage local roads and bridges. If construction requires an encroachment permit, the permit requirements would be specified by the agency having jurisdiction. Enforcement of the terms of an encroachment permit would reduce impacts of construction to the limits specified by the permit and would be the responsibility of the

permitting agency and the Proponents. Construction of the regeneration sites would have minimal transportation impacts.

The proposed Project would generate a temporary increase in daily trips on the regional and local roadways. Worker-generated traffic would occur primarily in the early morning and late afternoon, while general deliveries likely would occur throughout the day. At any single location, this increase in traffic would be short-term as crews move over any individual construction spread along the transmission line. Workers may be commuting to the Project site from as far as 2 hours away, from outside the Analysis Area (see Section 3.4 – Socioeconomics). However, the effects from the comparatively small number of workers using the high standard, high-volume highways surrounding the Analysis Area is expected to be negligible. Areas in the vicinity of the Project generally have light existing traffic volumes, considerably below the theoretical traffic capacity of the primary highways and local roads. Table B-15 in Appendix B, Section 2.6.2, shows the average and peak daily traffic caused by the Project. Estimates range from approximately 24 average round trips a day for Segments 1W(a) and 1W(c), to 63 a day for Segments 2, 3, and 4, peaking at 93 trips a day along Segments 2, 3, and 4. This assumes that:

- 50 percent of the workers would be assigned to ground activities supporting tower construction and conduit stringing,
- Workers would be housed in commercial or temporary housing in nearby cities (see Section 3.4 – Socioeconomics),
- Workers would commute to the job site (where heavy equipment would remain overnight), and
- Workers would travel in crew cabs averaging 2.5 workers per vehicle.

The Proponents' Traffic and Transportation Management Plan (TR-1) and the requirements of state and county encroachment permits would provide adequate measures to ensure that traffic disruption and delay are minimized. This measure would ensure that Project trips are planned in accordance with existing road conditions. The Proponents would obtain permits that would describe circulation and detour routes, limit lane closures, and so on. Another potential impact of increased traffic on roads in the vicinity of the Project is public safety. All workers would be expected to obey local speed limits and traffic restrictions and it is assumed that local and state law enforcement would enforce traffic regulations throughout the Project area as they normally would. In addition, the Proponents have identified the following EPM:

TR-8 Construction vehicles will follow a 25 mph speed limit on unposted project roads.

Vehicles and equipment entering paved roads from unpaved areas would also carry some sediment and mud onto the roadway. Impacts from roads on other resources are addressed in their respective sections, for example, Section 3.6 – Vegetation Communities, Section 3.9 – Wetlands and Riparian Areas, Section 3.10 – General Wildlife and Fish, Section 3.15 – Soils, and Section 3.16 – Water Resources.

On January 12, 2001, the Forest Service issued the final NFS Road Management Rule. This rule revises regulations concerning the management, use, and maintenance of the National Forest Transportation System. The final rule is intended to help ensure that additions to the NFS road network are needed for resource management and use; that construction, reconstruction, and maintenance of roads minimize adverse environmental impacts; and that unneeded roads are identified and decommissioned. Impacts from Project construction on NFS roads would be similar to those described above for other roads.

Travel management planning (as required by FSH 7709.55 – Travel Planning Handbook [Forest Service 2009c]) has been completed for the Medicine Bow-Routt, Sawtooth, and Caribou-Targhee NFs. These analyses are designed to provide decision-makers with information to manage road systems that are safe and responsive to public needs and desires, are economically and efficiently managed, and have minimal negative ecological effects on the land. The travel management plan for each NF was one tool used to identify whether the proposed road construction and reconstruction would be consistent with management standards for each NF.

Airports and Airstrips

Construction of the Proposed Route or Route Alternatives would not affect airports or existing airstrips. Construction equipment is not high enough to interfere with these facilities. The Proposed Route would be located 0.8 mile north of an airstrip proposed by Tugaw Ranches, along Segment 7. To minimize potential impacts to this airstrip, the Proponents have proposed mitigation measure LU-8 (see Section 3.17 – Land Use and Recreation).

Operations

Project operations would involve periodic inspection and maintenance of the transmission line and associated facilities. Impacts to transportation infrastructure from Project operations are described below.

Highways, Roads, Bridges, and Railroads

During Project operations, maintenance crews and vehicles would conduct inspection and maintenance activities. Aerial inspection would be conducted by helicopter annually. Detailed ground inspections of the entire transmission line system would take place on a semi-annual basis using four-wheel-drive trucks or all-terrain vehicles. The Proponents plan to conduct maintenance on the critical 500-kV and 230-kV system using live-line maintenance with equipment as large as the aerial lift crane illustrated in Figure 3.19-1. These activities would increase wear and tear on transportation infrastructure components. Personnel and equipment traveling to and from the site for operations purposes would also temporarily, though very slightly, increase traffic loads on local roads. These impacts are not expected to be substantial.

Roads built or improved to a 14-foot-wide traffic surface for construction would be reduced in width to 8 feet for operations. This 8-foot-wide area would be revegetated with low plants such as grasses and forbs but still be drivable. The remainder of the width would be restored in accordance with Appendix C-2 (Framework Reclamation Plan for Construction Activities). Roads used during construction and not needed during

operations would be decommissioned and revegetated, as required by the land management agency. The Proponents have included the following EPM in Appendix C-1 to specifically address closure of temporary construction roads.

TR-14 Roads developed specifically for this project that are identified by the Proponents as no longer necessary will be reclaimed as specified in the Reclamation, Revegetation, and Weed Management Plan.

Additional restoration requirements may be imposed by individual land management agencies.

If major maintenance and repair work requires lane restrictions and/or roadway or railroad closures, the Proponents have committed to EPMs (TR-4 and TR-11) that require an access plan and allowances for emergency access to private property. In addition, all maintenance activities would be performed in accordance with the Proponents' Revised Plan for Operations, Maintenance, and Emergency Response that is presented in full in Appendix C-4.

The Agencies are concerned that the improved existing and new access roads would result in increased use of the Public Lands because they would open up new access points. This concern relates to all vehicles but is particularly a concern for OHVs. This problem would be minimized because gates would be installed at all Project-related roads and closed to public use. This is discussed and evaluated in detail in Section 3.17 – Land Use and Recreation.

Airports and Airstrips

Air traffic patterns would not be affected by the placement of new structures or conductors, as no vertical obstruction prohibitions would be violated.

Helicopter flights associated with Project operations may affect several airports, public and private, and three heliports. These flights may occur within the controlled zones throughout the Analysis Area. All flight operations are FAA controlled. Impacts would include increased traffic load at these airports, though this is expected to be temporary and negligible due to the few flights that Project operations would require (only a few per year). Impacts to some private airports are discussed in detail in Section 3.17 – Land Use and Recreation.

Decommissioning

Project facilities would be removed at the end of the operational life of the transmission line. Structures and foundations would be removed to below the ground surface level. They would not be removed in their entirety due to the large ground disturbance this would create. Soil and plants would be restored over the top of these underground foundation structures. Traffic generated during decommissioning would be similar to that created during facility construction. Decommissioning would involve heavy vehicles for removal and disposal of materials, as well as personal vehicles used by the construction work force to both commute to and from the work site and to move around within the work site during the day. Decommissioning of roads would be performed in accordance with agency direction and in NF areas in accordance with Forest Service publication *A Guide for Road Closure and Obliteration in the Forest Service* (Moll 1996).

The Proponents would be responsible for the reclamation of service roads following abandonment. Reclamation of service roads would not affect the transportation system. Service roads would be decommissioned and reclaimed following removal of the structures and lines and may be decommissioned and reclaimed while the lines are in-service if they are determined to no longer be necessary. The Proponents would comply with EPM TR-14.

While the Proponents' intent is to reclaim all roads used for construction and operations of the Project following decommissioning, this EPM (i.e., TR-14) does not recognize that some of these roads may have become important or convenient for other uses. Therefore, the Agencies have identified the following mitigation measure and the Proponents have agreed to adopt it where requested projectwide:

TRANS-4 Upon abandonment, temporary access roads may be left intact through mutual agreement of the land management agency, landowner, the tenant, and the Proponents, unless located in flood areas or drainage hazard areas or otherwise restricted by federal, state, or local regulations.

3.19.2.3 Proposed Route and Alternatives by Segment

Table 3.19-2 lists the number of highways, roads, and railroads crossed by the Proposed Route and Route Alternatives. Table D.19-1 in Appendix D summarizes the roads, railroads, and bridges within 1 mile of the Proposed Route and Route Alternatives. Impacts to transportation and infrastructure are expected to decrease with a greater number of existing roads in the area due to the diffusion of Project traffic. With more roads and access points to Project structures, the finite number of Project-related vehicles can disperse and thus not be forced to use one or a few access points or roads. This dispersal would also result in less noticeable increases in traffic loads, resulting in reduced emergency access and safety issues. Impacts on traffic would decrease with increasing quality and size of existing roads. However, the impacts would increase with higher numbers of crossings of Interstate highways, other highways and roads, and railways because of potential disruptions to traffic and damage to roads and railways. The number of bridges within a 1-mile corridor from the centerlines of the Proposed Route and Route Alternatives for each segment is also presented below, because these bridges would likely serve Project-related traffic, resulting in more wear on these structures than would occur otherwise. To assess impacts specifically by segment and alternative, the road density within the Analysis Area; the number of road, railroad, and bridge crossings; and whether these roads are small local roads or large highways are given below in Table 3.19-2 and by segment.

Table 3.19-2. Transportation Facilities Crossed by Route Alternatives Compared to Proposed Route

Segment Number	Segment/Alternative	Segment Length (Miles)[1/]	Interstate Highway Crossings	Other Highway / Road Crossings	Railroad Crossings
1E	Proposed – Total Length	100.6	1	102	2
	Proposed – Comparison Portion for Alternative 1E-A	17.6	1	26	2
	Alternative 1E-A	16.1	1	17	2
	Proposed – Comparison Portion for Alternative 1E-B	37.9	–	32	1
	Alternative 1E-B	59.3	–	50	1
	Proposed – Comparison Portion for Alternative 1E-C	75.4	–	67	1
	Alternative 1E-C	48.7	–	41	1
1W(a)	Proposed – Total Length	76.5	1	76	2
	Alternative 1W-A	20.3	1	27	2
	Proposed – Comparison Portion for Alternative 1W-A	16.2	1	25	2
1W(c)	Proposed – Total Length	70.6	1	75	1
2	Proposed – Total Length	96.7	1	99	4
	Proposed – Comparison Portion for Alternative 2A	28.8	1	30	2
	Alternative 2A	28.4	1	38	4
	Proposed – Comparison Portion for Alternative 2B	7.0	1	5	–
	Alternative 2B	6.2	1	8	–
	Proposed – Comparison Portion for Alternative 2C	28.4	–	42	2
	Alternative 2C	24.4	–	39	3
3	Proposed – Total Length	46.6	1	29	2
	Proposed – Total Length	4.3	–	4	1
	Proposed – Total Length	5.5	–	3	1
4	Proposed – Total Length	203.0	–	163	7
	Proposed – Comparison Portion for Alternatives 4A,B,C,D,E	90.2	–	92	3
	Alternative 4A	85.2	–	76	5
	Alternative 4B	100.2	–	106	6
	Alternative 4C	101.6	–	88	7
	Alternative 4D	100.8	–	101	6
	Alternative 4E	102.2	–	83	7
	Alternative 4F	87.5	–	71	4
5	Proposed – Total Length	54.6	2	45	1
	Proposed – Comparison Portion for Alternatives 5A,B	25.3	–	11	1
	Alternative 5A	33.7	–	19	1
	Alternative 5B	44.4	–	34	1
	Proposed – Comparison Portion for Alternative 5C	33.2	–	19	1
	Alternative 5C	26.1	–	22	1
	Proposed – Comparison Portion for Alternative 5D	19.4	1	21	1
	Alternative 5D	17.5	1	22	1
	Proposed – Comparison Portion for Alternative 5E	5.8	1	11	1
	Alternative 5E	5.3	1	11	1
6	Proposed – Total Length	0.5	–	1	1
7	Proposed – Total Length	118.1	2	112	1
	Proposed – Comparison Portion for Alternatives 7A,B	35.2	–	21	1
	Alternative 7A	38.0	–	25	1
	Alternative 7B	46.4	–	39	1
	Proposed – Comparison Portion for Alternative 7C	20.1	–	17	1
	Alternative 7C	20.3	–	17	1
	Proposed – Comparison Portion for Alternative 7D	6.2	1	11	1

Table 3.19-2. Transportation Facilities Crossed by Route Alternatives Compared to Proposed Route (continued)

Segment Number	Segment/Alternative	Segment Length (Miles) 1/	Interstate Highway Crossings	Other Highway / Road Crossings	Railroad Crossings
7	Alternative 7D	6.8	1	13	1
	Proposed – Comparison Portion for Alternative 7E	3.8	–	3	1
	Alternative 7E	4.5	–	4	1
	Proposed – Comparison Portion for Alternative 7F	10.5	–	9	1
	Alternative 7F	10.8	–	7	1
	Proposed – Comparison Portion for Alternative 7G	3.1	–	1	1
	Alternative 7G	3.2	–	4	1
	Proposed – Comparison Portion for Alternatives 7H,I,J	118.1	2	112	1
	Alternative 7H	127.5	2	119	1
	Alternative 7I	173.4	2	141	1
	Proposed– Comparison Portion 7/9 for Alternative 7J 2/	143.9	2	156	2
	Alternative 7J 2/	202.1	2	166	1
8	Proposed – Total Length	131.0	1	160	3
	Proposed – Comparison Portion for Alternative 8A	51.4	–	55	1
	Alternative 8A	53.6	2	60	2
	Proposed – Comparison Portion for Alternative 8B	45.3	1	69	2
	Alternative 8B	45.8	1	70	3
	Proposed – Compare to Alternative 8C	6.5	1	5	1
	Alternative 8C	6.4	1	7	1
	Proposed – Comparison Portion for Alternative 8D	6.9	–	12	1
	Alternative 8D	8.1	–	9	1
	Proposed – Comparison Portion for Alternative 8E	7.0	–	13	–
	Alternative 8E	18.5	–	30	–
9	Proposed – Total Length	161.7	–	217	1
	Proposed – Comparison Portion for Alternative 9A	7.8	–	12	1
	Alternative 9A	7.7	–	13	1
	Proposed – Comparison Portion for Alternative 9B	49.5	–	58	1
	Alternative 9B	53.2	–	81	1
	Proposed – Comparison Portion for Alternative 9C	14.7	–	18	1
	Alternative 9C	15.3	–	30	1
	Proposed – Comparison Portion for Alternatives 9D, E, F, G, and H	57.2	–	88	1
	Alternative 9D	58.4	–	91	1
	Alternative 9E	68.7	–	44	1
	Alternative 9F	62.9	–	120	–
	Alternative 9G	56.4	–	84	–
	Alternative 9H	61.0	–	112	–
10	Proposed – Total Length	33.6	–	66	2

1/ Mileages are rounded to nearest tenth.

2/ Alternative 7J connects with Segment 9 approximately 25.8 miles west of the proposed Cedar Hill Substation, which is the western terminus of Segment 7 and the beginning point for Segment 9. The table above compares 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

Segment 1E

Segment 1E, as proposed, would link the Windstar and Aeolus Substations in south-central Wyoming with a 100.6-mile 230-kV single-circuit transmission line. Twenty acres of the expansion of Windstar and Aeolus Substations and 0.5 acre for one

regeneration site are attributed to Segment 1E. Alternative 1E-A is a 16.1-mile alternative along the north end of Segment 1E, which was the Proponents' initial proposal before moving the Proposed Route at the suggestion of local landowners to avoid the more settled area around Glenrock. Alternative 1E-B is 21.4 miles longer than the Proposed Route but is being considered by the Proponents because it would avoid a Wyoming-designated sage-grouse core area to the east. The BLM has required the consideration of Alternative 1E-C, which parallels the Segment 1W 230-kV lines into the Aeolus Substation (see Appendix A, Figure A-2). This route and the alternatives traverse sparsely settled land with few roads and bridges. Alternatives 1E-A and 1E-C follow the route of 1W and could therefore use the same existing infrastructure.

For the Proposed Route, 104.3 miles of new road would be constructed and 124.9 miles of existing road would be improved. Within 1 mile to either side of the Proposed Route, there are 50.8 miles of roads and 14 bridges that would potentially serve as access points to reach the ROW (Table D.19-1, Appendix D). This equates to a 0.4 road mile per mile of transmission line. Existing infrastructure to support construction is fair. In order to develop the Aeolus Substation and move the necessary station equipment to the site, CR 121, a single-lane road about 20 feet wide and about 11 miles long from SR 30 to the Aeolus Substation, would need to be upgraded. In addition the existing metal deck bridge (see Figure 2.5-2) would need to be replaced. The improvements would result in approximately 64 acres of construction disturbance and 33 acres of new permanent roadway. Alternative 1E-A would have almost half of the miles of roads within 1 mile of the centerline as the comparison portion of the Proposed Route (i.e., the portion of the Proposed Route that starts and ends at the same nodes as the Route Alternative), though the road density would stay at 0.4. Alternatives 1E-B and 1E-C would both lie near a greater number of existing roads than the comparison portion of the Proposed Route and have road densities of 0.4 and 0.7 miles of road per mile of transmission line, respectively. Alternative 1E-A would result in fewer road crossings and bridges within 1 mile than the comparison portion of the Proposed Route or the other two alternatives. Alternative 1E-C would avoid one bridge, while Alternative 1E-B would be within 1 mile of two additional bridges.

Segment 1W

Segment 1W is composed of two parts, Segment 1W(a) and 1W(c), both of which would consist of a new 230-kV line for part of their length and a reconstruction of an existing 230-kV line for the remaining part. Segment 1W(a) would be about 76.5 miles long, and would extend from the Windstar Substation to the Aeolus Substation. Segment 1W(c) would be about 70.6 miles long, and would extend from the Dave Johnson Power Plant to the Aeolus Substation. Alternative 1W-A is a 16.2-mile alternative located near the town of Glenrock, which was the Proponents' initial proposal before moving the Proposed Route at the suggestion of local landowners in order to avoid the more settled area around Glenrock. Twenty acres of the proposed expansion at the Windstar and Aeolus Substations are attributed to Segment 1W(a) and 3 acres of the expansion at the Heward Substation and 17 acres of the expansion at the Windstar and Aeolus Substations are attributed to Segment 1W(c).

A good system of roads exists in the northern half of Segments 1W(a) and 1W(c) of the Proposed Routes. There are few roads in the southern half of the routes. For

Segment 1W(a), 68.9 miles of new road would be constructed and 66.7 miles of existing road would be improved. For Segment 1W(c), 56.3 miles of new road would be built, and 42.8 miles of existing roads would be improved. The construction of Segments 1W(a) and 1W(c) would result in some wear and tear on the existing road system. Within 1 mile of Proposed Route 1W(a), there are 39.6 miles of existing roads, which equates to 0.5 road mile per mile of transmission line route. Alternative 1W-A would cross fewer roads than the comparison portion of the Proposed Route. The amount of roads within 1 mile would increase by 6.3 miles and the road density would increase to 0.6 mile of road per mile of transmission line. Alternative 1W-A would lie within 1 mile of six more bridges than the comparison portion of the Proposed Route. Proposed Route 1W(c) would have 0.6 mile of road per road of transmission line route.

Medicine Bow-Routt NFs

Segments 1W(a) and 1W(c) cross the Medicine Bow-Routt NFs in Management 3.31 (backcountry) where new high standard roads would be inconsistent with Forest Plan direction. The Forest Plan reads: “Management Prescription 3.31: Allow uses and activities only if they do not degrade the primitive character of the area.” The Gateway West Project would need to construct approximately 4.1 miles of new access roads for construction and operations within this land use designation. A plan amendment has been proposed for these segments to make the Project consistent with the Forest Plan (see Appendix F). The requested amendment is: ”The Gateway West transmission line will be allowed and the land crossed by the Project will be allocated to MA 8.3 Roaded Natural.” Impacts to transportation infrastructure if this amendment is accepted could include additional roads being built if more Projects are approved. This would allow increased access to previously less accessible areas. Design, construction, decommissioning, restoration, and maintenance of new roads would be performed under direction of the Forest Service. Road Management Objectives (RMOs) would be developed for each road on NFS land as part of the final road design. The Medicine Bow Motor Vehicle Use Map (developed as part the Medicine Bow NF Travel Management Plan) does not include any open roads in the area crossed by the Project. All existing roads in Sections 13, 14, 23, and 24, Township 30 North Range 78 West, and Sections 18 and 19, Township 30 North Range 77 West, are closed to public access. Any additional roads needed for the Project would also be closed to the public.

Segment 2

Segment 2, as proposed, would link the Aeolus and Creston Substations in southeast Wyoming with two 500-kV circuits on one structure. One circuit would be operated at 230 kV during the initial phase of the Project. Its total proposed length is 96.7 miles. Fifty-two acres of the expansion of the Aeolus Substation and the construction of the Creston Substation and 0.5 acre for one regeneration site are attributed to Segment 2. There are three Route Alternatives, two of which are near the community of Fort Fred Steele. Alternative 2A at 28.4 miles long is being considered by the BLM because it remains in the WWE corridor nearer the town and the state historic site, and Alternative 2B, at 6.2 miles, is closer to the community than the comparison portion of the Proposed Route and was the initially proposed route before the Proponents responded to local suggestions and relocated the Proposed Route farther to the south. Alternative 2C is a 24.4-mile alternative located north of Hanna, Wyoming. It is being evaluated at

the recommendation of the Wyoming Governor's office to follow a utility corridor approved by that office for minimizing effects to sage-grouse (see Appendix A, Figure A-3).

The Proposed Route would generally follow I-25 and U.S. Highway 30; therefore, primary access near the Proposed Route would be good. For the Proposed Route, 93.2 miles of new road would be constructed, and 114.3 miles of existing roads would be improved. There are 45.7 miles of roads within 1 mile to either side of the 96.7-mile Proposed Route amounting to about 0.4 road mile per mile of transmission line route. Alternatives 2A and 2B are closer to infrastructure than the comparison portions of the Proposed Route. Alternative 2C crosses open country with few developments and only two-track roads as transportation infrastructure. Access to this alternative would not be good and congestion is likely. Alternatives 2A and 2B would cross more roads than the comparison portion of the Proposed Route whereas Alternative 2C would cross fewer. Alternatives 2A and 2C would increase the number of railroad crossings. Selection of any of the three alternatives would result in fewer bridges within 1 mile than the comparison portion of the Proposed Route. Alternatives 2A and 2C would decrease the miles of road per miles of transmission line to 0.3 and 0.2, respectively, while the road density for Alternative 2B would not be appreciably different from the comparison portion of the Proposed Route. In terms of transportation infrastructure, the Proposed Route and Route Alternatives would have very similar impacts.

Segment 3

Segment 3, as proposed, links the Creston, Anticline, and Jim Bridger Substations in southeast Wyoming with two 500-kV circuits on one structure. One circuit would be operated at 230-kV during the initial phase of the Project. Its total proposed length between those two substations is 46.7 miles. Sixty-nine acres of the construction of the Anticline and Creston Substations are attributed to Segment 3. Segment 3 would also link the Anticline and Jim Bridger Substations with a 4.3-mile 230-kV line and a 5.5-mile 345-kV line and includes the 10-acre expansion of the Jim Bridger 345-kV Substation. There are no alternatives proposed along this segment (see Appendix A, Figure A-4).

As in Segment 2, the Proposed Route also would follow the I-25 and U.S. Highway 30 corridors. For the Proposed Route, 59.2 miles of new road would be constructed and 31.5 miles of existing roads would be improved. There would be 68.8 miles of roads within 1 mile to either side of the 56.5-mile Proposed Route amounting to about 0.9 road mile per mile of transmission line route. Many of these roads would be private roads supporting the extensive oil and gas development in the surrounding area. Segment 3 would lie within 1 mile of 10 bridges. Access to the ROW would be good and potential road damage and other transportation impacts would be low because of the high road density, and good condition and large traffic capacity of the Interstate and highways in the area.

Segment 4

Segment 4, as proposed, would link the Anticline Substation near the Jim Bridger Power Plant in southwestern Wyoming with the Populus Substation in Idaho with two 500-kV circuits on one structure. Its total proposed length is 203 miles. Eighty-nine acres of the construction of the Anticline Substation and the expansion of the Populus

Substation and 1.5 acres for three regeneration sites are attributed to Segment 4. It has six Route Alternatives in the middle portion of its route but the first 52 miles to the east and the last 61 miles to the west (in Idaho) do not have any Route Alternatives. The middle section of the Proposed Route is 90.2 miles long, and its Route Alternatives vary from 85 to 102 miles long. These alternatives were proposed by the Wyoming Governor's office (4A, paralleling the existing 345-kV lines throughout); by the BLM Kemmerer FO (4B through 4E, including edits from various cooperating agencies), with the intent to avoid impacts to cultural resources to the extent practical; and by the Proponents (4F, attempting to avoid impacts to cultural resources while still remaining north of the existing lines) (see Appendix A, Figures A-5 and A-6).

For the Proposed Route, 199.8 miles of new road would be constructed and 172.5 miles of existing roads would be improved. The density of miles of existing road per mile of transmission line for the Proposed Route is 0.5. There would be few existing public roads within the 1-mile corridor followed by the eastern segment of the Proposed Route between the Anticline Substation and the Kemmerer area. However, this area is characterized by oil and gas fields as well as coal and trona mining. These uses are expected to provide dispersed construction vehicle access to the ROW through an extensive system of private roads. West of Kemmerer to the area just east of Montpelier, the existing road matrix is not well-developed and access to the ROW would be concentrated at a few points, increasing impacts at those locations.

There are six Route Alternatives for Segment 4. Alternatives 4A and 4F are shorter than the comparison portion of the Proposed Route, and each would have fewer road crossings than the Proposed Route and fewer miles of existing roads. Alternative 4F would have the least number of road crossings and therefore would likely require the fewest road closures or restrictions and similar interferences. Alternatives 4C and 4E also would have fewer road crossings than the comparison portion of the Proposed Route, whereas Alternatives 4B and 4D would have more. All six alternatives would have more railroads crossed and bridges within 1 mile than the comparison portion of the Proposed Route. None of the alternatives would have an appreciably different road density than the comparison portion of the Proposed Route, all having 0.4 to 0.5 mile of existing roads per mile of transmission line.

Mitigation measures included in amendments to the Kemmerer RMP require road reclamation after construction in certain areas. "In specific sensitive areas (such as VRM class II, erosive soils, steep slopes, areas near NHT trails) the access road used for construction will be restored and an alternative access route for operations designated" (Appendix F-1).

Caribou-Targhee NF

A portion of Segment 4 of the Proposed Route would cross approximately 9.2 miles through the Montpelier District of the Caribou-Targhee NF where it parallels two existing transmission lines. However, these lines are, on average, approximately 1 mile (0.3 mile to 1.2 miles) south of the Proposed Route. Representatives of the Caribou-Targhee NF and the Proponents conducted a joint reconnaissance to identify a preferred set of existing roads and minimum number of new or improved roads needed for construction

The Proposed Route would cross areas of the NF currently designated as 5.2 - Forest Vegetation Management, 2.7.2 (Elk and Deer Range), and 3.2 - Semi-Primitive Recreation. To be consistent with the Forest Plan, an amendment is proposed to designate a new corridor for the Proposed Route as Prescription 8.1 - Concentrated Development. The proposed corridor would be 9.2 miles long by 300 feet wide. The corridor and new access roads would have an ROS of RN. It is estimated that approximately 11.9 miles of new road would need to be built within the Caribou-Targhee NF (see the Travel Analysis prepared for the Project in the Analysis File). Design, construction, decommissioning, restoration, and maintenance of new roads on NFS lands would be performed under direction of the Forest Service. RMOs would be developed for each road on NFS land. The Montpelier Ranger District Motor Vehicle Use Map (developed as part the Caribou-Targhee NF Travel Management Plan) identifies three motorized trails (trails open to motorcycle use only) and six roads that are open to all vehicles along the Proposed Route on the Caribou-Targhee NF. Roads and trails not shown as open are closed to motor vehicle use. Most of the NFS land on the Caribou-Targhee NF that would be crossed by the Proposed Route is open for snowmobile use. However, the Proposed Route would cross an area closed to snowmobile use in Sections 2 and 3, Township 12 South Range 41 East. Any roads needed for the Project would be closed to the public and be gated or otherwise blocked. Portions of the existing road system are inadequate for supporting construction traffic and would require some rehabilitation.

Segment 5

Segment 5, as proposed, would link the Populus and Borah Substations with a 54.6-mile single-circuit 500-kV line. Forty-four acres of the expansion of the Populus and Borah Substations are attributed to Segment 5. There are five Route Alternatives including two proposed by the BLM to avoid the Deep Creek Mountains (5A and 5B; 8 miles and 19 miles longer than the comparison portion of the Proposed Route), one preferred by Power County that crosses the Fort Hall Indian Reservation (5C; 6 miles shorter than the comparison portion of the Proposed Route), one originally proposed by the Proponents (5D; 2 miles shorter than the comparison portion of the Proposed Route but located within more agricultural lands), and one proposed by Power County as an alternative approach to the Borah Substation (5E) (see Appendix A, Figure A-7).

For the Proposed Route, 54.6 miles of new road would be constructed and 66.5 miles of existing roads would be improved. In the valleys to either side of the Deep Creek Mountains, the Arbor Valley Highway to the east and SR 37 to the west would provide a backbone system to the Proposed Route and Route Alternatives. From these points, however, the approach to the ROW across the steep terrain and many drainages would mean that the ratio of existing road miles to transmission line miles would be low. The road density for the Proposed Route is 0.2 mile per mile of transmission line route. The selection of Alternative 5D would decrease the road density to 0.1, less than the comparison portion of the Proposed Route; none of the other alternatives would have a different road density than their comparison portions of the Proposed Route. All alternatives would increase the number of road crossings, except for Alternative 5E, which would not affect this number. The only alternative that would have an increase in the number of bridges impacted compared to the Proposed Route is 5D, by two bridges.

The biggest increase in roads crossed would be seen under Alternative 5B, with 23 more than the comparison portion of the Proposed Route. None of the alternatives would affect the number of railroads crossed. Based on infrastructure crossings, the Proposed Route would likely have the least impacts on transportation.

Segment 6

Segment 6 is an existing transmission line linking the Borah and Midpoint Substations; it is now operated at 345 kV but would be changed to operate at 500 kV. This segment has no Route Alternatives. Existing support structures would be used and impacts would be limited to within approximately 0.25 mile from each substation to allow for moving the entry point into the substation to the new 500-kV bay. Thirty-one acres of the expansion of the Borah and Midpoint Substations are attributed to Segment 6. Changes in the two substations would allow it to be operated at 500 kV (see Appendix A, Figure A-8).

The upgrading of these two substations is not expected to have substantial impacts on transportation infrastructure. No new roads would need to be constructed or existing roads improved. Because this segment is only 0.5 mile long, the density of road miles per miles of transmission line route is high (2.9). One road would be potentially impacted by Segment 6, and this route would not cross any railways.

Segment 7

Segment 7, as proposed, would link the Populus and Cedar Hill Substations with a 118.1-mile single-circuit 500-kV line. Forty-two acres of the expansion of the Populus and the construction of the Cedar Hill Substations and 1 acre for two regeneration sites are attributed to Segment 7. In addition to the Proposed Route, which is principally on private lands, Route Alternatives have been proposed by the BLM to avoid the Deep Creek Mountains (7A and 7B; which are 5 miles and 11 miles longer than the comparison portion of the Proposed Route), by local landowners (7C, 7D, 7E, 7F, and 7G, which all represent minor adjustments proposed to address local issues), by local landowners to avoid private agricultural lands (7I or the State Line Route, which is 55 miles longer than the Proposed Route and would require 0.5 acre for an additional regeneration site), and by the Proponents to avoid the State Line Route (7H, which is 10 miles longer than the Proposed Route). Alternative 7J, which is a variant of the State Line Route also proposed by local landowners, would not terminate at the Cedar Hill Substation. This alternative, referred to as the Rogerson Alternative, would require a different substation be constructed near a 345-kV existing transmission line (approximately 24 miles southwest of the Cedar Hill Substation; see Appendix A, Figure A-9). The tables and discussion in this document compare 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

Alternatives 7A, 7B, 7C, 7H, 7I, and 7J (see Appendix A, Figure A-9) would be influenced by the access provided by the Arbor Valley Highway, SR 37, and I-84 and the steep terrain of the Deep Creek Mountains in a way similar to Segment 5. From Rockland going west, federal-, state-, and county-maintained roads would increase in frequency.

For the Proposed Route, 108.6 miles of new road would be constructed and 61.7 miles of existing roads would be improved. The Proposed Route, because it is shorter than all of the alternatives, would have the least impact on the existing roads and bridges. The density of road miles per miles of transmission line along the Proposed Route is 0.2; the density among the alternatives would not change appreciably from this, all ranging from 0.1 to 0.2. The number of Interstate highways crossed would not vary by alternative. The number of other roads crossed would be greater under Alternatives 7A, 7B, 7D, 7E, 7G, 7H, and 7I than the comparison portion of the Proposed Route, whereas it would be less under Alternative 7F. The selection of Alternatives 7H, 7I, or 7J would avoid the one railroad crossing along the comparison portion of the Proposed Route. There would be fewer bridges within 1 mile with the selection of any of the alternatives than with the comparison portion of the Proposed Route, except for Alternative 7D, under which the number would not change. Alternatives 7H, 7I, and 7J are longer and would have a lower frequency of existing roads than the comparison portion of the Proposed Route. Therefore, they would require more new access road construction and repair of existing roads than the other alternatives, and have a greater impact on existing infrastructure. To the extent possible, existing roads, including two-track type roads, would be used to minimize the amount of disturbance.

Sawtooth NF

The Proposed Route would not cross the Sawtooth NF; however, Alternatives 7H, 7I, and 7J would. It is estimated that approximately 11.5 miles of new roads would need to be built on the Sawtooth NF under Alternative 7H, 30.2 miles under Alternative 7I, and 15.7 under Alternative 7J (see the Travel Analysis prepared for the Project in the administrative record). The construction of roads on NFS lands associated with Alternatives 7H, 7I, and 7J are inconsistent with Forest Plan direction, which specifies that in order to meet VQOs there “should be minimal distraction from scenic quality,” including from road construction and reconstruction. To make this Project consistent with the Forest Plan, an amendment would be requested that would allow new construction in areas designated as Partial Retention; additionally an amendment would be proposed to change the ROS to RN 500 feet to either side of the transmission line and new permanent roads. Mitigation measures would be applied to minimize visual impacts. Project-related roads would be closed to public use; therefore, effects on public access would be short-term.

Design, construction, decommissioning, restoration, and maintenance of new roads would be performed under direction of the Forest Service. RMOs would be developed for each road on NFS land. The Minidoka Ranger District Motor Vehicle Use Map (developed as part the Sawtooth NF Travel Management Plan) identifies five roads that are open to all vehicles along Alternatives 7H, 7I, and 7J in the Sublette Division of the Sawtooth NF. Alternative 7H would also cross the Albion Mountain Division of the Sawtooth NF. It would generally follow Forest Road 548, which is open to all motor vehicles. Some new road construction would be needed in Sections 6 and 12, Township 14 South, Range 23 East. Alternatives 7I and 7J would not cross the Albion Mountain Division but would cross the western portion of the Cassia Division. They would cross many roads open to motorized use, some of which have seasonal restrictions, especially in the northwestern portion of the Division (Alternative 7I). On all areas of the NF, roads and trails not shown as open on the Motor Vehicle Use Map are closed to public motor

vehicle use. All new roads needed for the Project would be closed to the public and would be gated or otherwise blocked.

Segment 8

Segment 8, as proposed, would link the Midpoint and Hemingway Substations. This 131-mile single-circuit 500-kV transmission line would stay north of the Snake River until crossing through the SRBOP parallel to an existing 500-kV transmission line before ending at the Hemingway Substation. Thirteen acres of the expansion of the Midpoint Substation and 0.5 acre for a regeneration site are attributed to Segment 8. There are five Route Alternatives: 8A, which follows the WWE corridor but crosses the Snake River and I-84 twice (while the Proposed Route would stay north of this area); 8B and 8C, which represent the old routes originally proposed by the Proponents but that have now been changed to avoid the cities of Kuna and Mayfield, respectively; 8D, which represents a small revision involving a rebuild of the existing transmission line to move both away from the National Guard Maneuver Area; and 8E, which was proposed by the BLM in order to avoid crossing the Halverson Bar nonmotorized portion of the Guffey Butte-Black Butte Historical District (see Appendix A, Figure A-10).

The Proposed Route, for most of its length along Segment 8 between points 8 and 8q (see Figure A-10, Appendix A), would follow a system of existing transmission lines that are intersected by existing roads. From point 8q west, it would cross the Orchard Training Area and be adjacent to an existing transmission line.

For the Proposed Route, 113.3 miles of new road would be constructed and 95.3 miles of existing roads would be improved. The Proposed Route and Alternatives 8A and 8B would have a ratio of miles of existing roads to miles of transmission line route of 0.2; Alternative 8C would have a road density of 0.1. Alternative 8A would cross two more Interstate highways than the comparison portion of the Proposed Route; none of the other alternatives would impact the number of Interstate highways crossed. Alternatives 8A, 8B, and 8C would slightly increase the number of other roads crossed; Alternative 8D would avoid three roads. Alternatives 8A and 8B would each also add one railroad crossing to the number that would be crossed by the comparison portion of the Proposed Route. Alternative 8E would have more than twice the number of road crossings as the comparison portion of the Proposed Route. Alternatives 8A and 8B would have more bridges within 1 mile than the comparison portion of the Proposed Route; the number would less under Alternative 8C and would not be affected by 8D. In terms of total crossings, Alternatives 8C or 8D would likely have the least impact on transportation infrastructure.

An amendment to the SRBOP RMP would be needed if the Proposed Route is selected to allow the Project to cross the Halverson Bar nonmotorized area. The BLM has stated that this amendment would not be approved. As noted above, Alternative 8E would avoid crossing this area.

Segment 9

Segment 9, as proposed, would link the Cedar Hill and Hemingway Substations with a 161.7 mile single-circuit 500-kV transmission line which skirts the Jarbidge and Owyhee Military Operating Areas to the north, then follows the WWE corridor just north of the

Saylor Creek Air Force Range, passing through Owyhee County before entering into the Hemingway Substation. Fifteen acres of the construction of the Cedar Hill Substation and 1 acre for two regeneration sites are attributed to Segment 9. There are eight Route Alternatives proposed, including 9A, which was the Proponents' Proposed Route until moving to avoid the Hollister area; 9B, which is being considered by the BLM because it follows the WWE corridor and parallels existing utility corridors; 9C, which was the Proponents' Proposed Route until moving to avoid the Castleford area; and 9D and 9E, proposed by the Owyhee County Taskforce, that cross more public lands north and south of the Proposed Route, respectively, than the Proposed Route. Most of Alternative 9D would be within the SRBOP. Alternatives 9F, 9G, and 9H were proposed to avoid crossing the nonmotorized area south of C.J. Strike Reservoir. Alternatives 9G and 9H provide an alternate route location south of Alternative 8E (see Appendix A, Figure A-11).

Between the Cedar Hill Substation and Salmon Fall Creek (see Figure A-11, Appendix A), portions of the Proposed Route and Route Alternatives 9A, most of 9B, and 9C would cross an area of well-developed and maintained section line roads that would provide good dispersed access to the transmission line routes. However, the Proposed Route and Route Alternatives west of this boundary to point 9n would be mostly on public land with fewer and less well-developed roads. From point 9n to the Hemingway Substation, the Proposed Route would parallel SR 78. From the highway there would be dispersed access from local roads to the ROW.

For the Proposed Route, 135.3 miles of new road would be constructed and 179.8 miles of existing roads would be improved. The road density of the Proposed Route would be 0.2 mile of existing road per mile of transmission line. In terms of road crossings, Alternative 9A would have similar impacts as the comparison portion of the Proposed Route; Alternative 9B, on the other hand, would cross 23 more roads than the comparison portion of the Proposed Route. The number of bridges within 1 mile of the route would not be affected depending on which alternative is chosen, except for Alternatives 9D and 9E, which would add one and two bridges, respectively. Alternative 9D would rely on a good system of roads to the north and south of the Snake River and then be on public land and parallel to an existing transmission line until it would again cross the Snake River. Alternative 9E would parallel the Proposed Route about 4 miles to its south and west. Primary access would still be from SR 78 but secondary access would concentrate on fewer existing roads, thereby increasing wear and tear, although only half the road crossings would be necessary. The Proposed Route would cross one railroad; this crossing would only be avoided if Alternative 9F, 9G, or 9H is selected. Alternatives 9D and 9G would result in approximately a similar number of road crossings as the comparison portion of the Proposed Route whereas Alternatives 9F and 9H would have 32 and 24 additional crossings, respectively. Alternative 9E would have half as many road crossings as the comparison portion.

An amendment to the SRBOP RMP would be needed if either Alternative 9D or 9G is selected to allow the Project to cross the Cove nonmotorized area, a nonmotorized area south of the C.J. Strike Reservoir. The BLM has stated that this amendment would not be approved. As noted above, Alternatives 9F and 9H would avoid crossing this area. Amendments to the Jarbidge RMP and Twin Falls MFP would also be needed to allow

the Proposed Route to cross the Salmon Falls ACEC, which does not allow motorized vehicles or surface disturbance; however, the BLM could not approve an amendment for this portion of the route at this time because it also crosses a WSR eligible section of Salmon Falls Creek. This crossing could not be allowed unless the section of river was determined to be unsuitable for WSR designation (see Appendix F-1), at which time an amendment to the Salmon Falls Creek ACEC could be proposed for review. The BLM has indicated this amendment would not be approved. The Proposed Route crossing of Salmon Falls Creek would cross a WSR eligible section. This crossing could not be allowed unless the section of river was determined to be unsuitable for WSR designation (see Appendix F-1), at which time an amendment to the Salmon Falls Creek ACEC could be proposed for review.

Segment 10

Segment 10, as proposed, would link the Cedar Hill and Midpoint Substations with a 33.6-mile single-circuit 500-kV line, following a WWE corridor for most of its distance. Twenty-eight acres of the expansion of the Midpoint Substation and of the construction of the Cedar Hill Substation are attributed to Segment 10. There are no Route Alternatives proposed along this segment (see Appendix A, Figure A-12).

Table D.19-1 in Appendix D and Table 3.19-2 summarize the roads, railroads, and bridges within 1 mile of the Proposed Route of Segment 10. New roads that would be constructed would total 19.5 miles, and 23.3 miles of existing roads would be improved. Segment 10 would cross 1 Interstate highway, 66 other roads and highways, and 2 railroads. The ratio of miles of existing roads within 1 mile of the route and miles of transmission line route is 0.4. There are seven bridges within 1 mile of Segment 10.

3.19.2.4 Design Variation

A Design Variation is being considered that would consist of constructing two single-circuit lines in Segments 2 through 4 instead of a single double-circuit line (which is the design assessed above). The disturbance footprint of the two single-circuit towers is greater than that of the double-circuit tower, in part because the requested ROW would be wider, but also because helicopter-assisted construction could be implemented in these areas due to the lighter weight of the towers, which would require additional fly yards. The additional ROW space and the fly yards would cause additional temporary disturbance during construction. Across Segments 2, 3, and 4, the additional disturbance of the single-circuit tower alternative ranges from 25 to 30 percent greater than the comparable portions of the double-circuit tower disturbance under the proposed design. The two single circuits require more ground disturbance, but would be designed and constructed to the same standards as the Proposed Action.

Impacts from the Design Variation would be the same as those from the Proposed Action for all transportation issues except airports and airstrips. Helicopters would not be used during construction under the Proposed Action because the double-circuit tower components are too heavy to airlift; however, helicopters may be used during construction of the Design Variation single-circuit towers. This could affect nearby airports and airstrips as they would create an additional aerial hazard between fly yards and erection sites. Table 3.19-1 indicates airports and airstrips within 3 miles of

Segments 2, 3, and 4 and their Route Alternatives. Helicopter operations would be conducted per FAA regulations and nearby airports would be notified of the activity, as required.

3.19.2.5 Structure Variation

The proposed guyed structure variation would add four guy wires about 140 feet long from a point about 100 feet up in each tower to four guy anchors spaced in a square around the tower (Appendix B, Figure B-6). There is no appreciable difference in impact on transportation infrastructure from the use of this Structure Variation when compared to the use of self-supporting lattice towers, given that the guyed structures would not be used adjacent to public roads or in agricultural or rural residential areas.

3.19.2.6 Schedule Variation

The Schedule Variation uses the two single-circuit design variation described above but extends construction over a longer time frame. Initially only one of the eventual two single-circuit lines would be constructed with the second to be constructed at a later date. The Schedule Variation proposes that the first single-circuit transmission line in Segments 2, 3, and 4 would be built as soon as a ROW grant is issued, but that construction of the second line would not begin until late 2018. This would mean nearly 2 years between the end of construction for the first line and the beginning of construction for the second line. Any staging areas and fly yards that had been used for the first stage would have been revegetated after construction was complete and would have to be cleared again. There would be two sets of construction disturbances adding movement, noise, and dust to the area of construction in two instances in any given area. The Schedule Variation would therefore have essentially double the adverse impacts on transportation infrastructure as the Proposed Action, including traffic loads, wear and tear on roads, and interference with emergency access..

3.19.3 Mitigation Measures

To minimize or avoid impacts on transportation, the Proponents have committed to EPMs that would be implemented Project-wide, as outlined in this section (identified above) and in Appendix C.

The following mitigation measures identified by the Agencies are required on federally managed lands, and the Proponents have committed to incorporating the measures into their EPMs and applying them Project-wide:

TRANS-1 The Proponents will attempt to identify existing two-track trails as preferred temporary access roads for construction.

TRANS-2 Temporary roads will be designed so proper drainage is not impaired and will be built to minimize soil erosion on or near the temporary roads. Consult with appropriate Agencies on additional design measures.

TRANS-3 Permanent and temporary roads on NFS lands and BLM-administered lands will be consistent with appropriate National Forest and BLM Transportation Management Plans, as amended, and other applicable rules. Permanent roads built for the Project on NFS lands and BLM-

administered lands shall be closed to the public. Signs shall indicate the restriction or regulation, location, penalty for violation, and appropriate contact information for reporting violations. Signage shall be maintained and replaced as part of the routine maintenance. Proponents will monitor permanent roads on NFS land and BLM-administered lands yearly, and the applicable land-managing agency shall be provided with annual monitoring reports. Roads will be maintained as required by the Special Use Permit.

TRANS-4 Upon abandonment, temporary access roads may be left intact through mutual agreement of the land management agency, landowner, the tenant, and the Proponents, unless located in flood areas or drainage hazard areas, or otherwise restricted by federal, state, or local regulations.

3.20 AIR QUALITY

This section addresses potential impacts from the Proposed Action and Action Alternatives during construction, operation, and decommissioning. Emissions of air pollutants from the proposed Project would primarily be generated from the following activities: 1) construction of on- and off-ROW access roads, 2) construction of the support structure pad sites and structure erection, and 3) post-construction activities involved with the ongoing use and maintenance of the transmission line, substations, and corridor. The Project is located in Wyoming, Idaho, and Nevada, and as such the air quality regulations of each state are applicable to construction and operation[1].

3.20.1 Affected Environment

This section discusses those aspects of the environment that could be impacted by the Project. It starts with a discussion of the Analysis Area considered, identifies the issues that have driven the analysis, and characterizes the existing conditions across the Proposed Route in Wyoming and Idaho.

3.20.1.1 Analysis Area

The Analysis Area for purposes of the air quality assessment encompasses the geographic areas defined by applicable state air quality plans, federal General Conformity thresholds, and local requirements within the geographic areas crossed by the Proposed Route and Route Alternatives.

3.20.1.2 Issues to be Analyzed

The following air quality-related issues were brought up by the public during public scoping (Tetra Tech 2009a), were raised by federal and state agencies during scoping and agency discussions, or are issues that must be considered as stipulated in law or regulation:

- Would the proposed Project be inconsistent with the applicable air quality plans?
- What would be the effects on human health of any increase in airborne pollutants caused by the Project?
- Would the proposed Project generate emissions of air pollutants that would exceed established thresholds, or cause adverse impacts on air quality?
- Would the proposed Project cause or contribute to any violation of any state or federal ambient air quality standards?
- Would the proposed Project expose sensitive receptors to substantial pollutant concentrations?
- What would be the methods used to control dust?
- What would be the steps taken to minimize air quality impacts?

[1] A 7-mile segment of Alternative 7I is located on the Nevada side of the Idaho-Nevada border in Elko County.

- How much greenhouse gas (GHG) emissions would be associated with this Project, and what would be the effect of the Project on climate change?

3.20.1.3 Regulatory Framework

Federal Level

Separate procedures have been established for federal pre-construction review of certain large proposed projects in attainment areas versus non-attainment areas. Federal pre-construction review for affected sources located in attainment areas is formally called Prevention of Significant Deterioration; the review process is intended to prevent a new source from causing air quality to deteriorate beyond acceptable levels. Federal pre-construction review for affected sources located in non-attainment areas is commonly referred to as New Source Review.

The emission threshold for "major stationary sources" varies between PSD and New Source Review (NSR) according to the type of facility and the attainment status of the area. The emissions calculations discussed later in this section indicate that none of the Gateway Project facilities during construction are considered stationary sources, nor would they be large enough, subsequent to construction, to trigger PSD or NSR requirements. Further information on the determination of applicability of PSD and/or NSR is presented below.

Prevention of Significant Deterioration—PSD thresholds apply to emissions of attainment pollutants from stationary sources. The proposed construction of the transmission line, substation expansion, and related additions at associated aboveground facilities are not considered to be stationary sources, and as such they are not subject to the provisions of the PSD regulations.

Federal New Source Review (Non-attainment)—Federal NSR provisions apply to emissions of nonattainment pollutants from stationary sources. The proposed construction of the transmission line, substation expansion, and related additions are not considered to be stationary sources, and as such they are not subject to the provisions of the NSR regulations.

New Source Performance Standards—Currently, there are no New Source Performance Standards applicable to construction activities pertaining to transmission lines and substation expansion.

National Emission Standards for Hazardous Air Pollutants—Currently, there are no National Emission Standards for Hazardous Air Pollutants (NESHAPs) applicable to construction activities pertaining to transmission lines and substation expansion.

Title V Operating Permits

Currently, there are no Title V regulations applicable to construction activities pertaining to transmission line and substation construction or expansion.

General Conformity

A federal agency must make a determination that permitting or approving an activity will conform to the state implementation plan in accordance with 40 CFR Part 93.150. A conformity determination is required for each pollutant when the total of direct and

indirect emissions caused by a federal action in a non-attainment area would equal or exceed threshold quantities specified in 40 CFR Parts 93.153(b) (1) and (2). The applicable conformity thresholds for the Project area are as follows:

- NSR – 100 tons per year for nitrogen oxides, carbon monoxide, volatile organic compounds, sulfur oxides, and particulate matter with a diameter of less than 10 microns (NO_x, CO, VOC, SO_x, and PM_{10}, respectively).
- PSD – 250 tons per year for NO_x, CO, VOC, SO_x, and PM_{10}.
- Title V – 100 tons per year for NO_x, CO, VOC, SO_x, and PM_{10}.
- Conformity Thresholds – 100 tons per year for NO_x, CO, VOC, SO_x, and PM_{10}.

Based upon the use of conservative emissions estimates, the emissions from the construction and operation of Gateway West, in the identified nonattainment areas, would be below the conformity thresholds; therefore, the Project would be exempt from performing a comprehensive conformity analysis.

State Level

Wyoming air emissions are regulated by the Wyoming Air Quality Standards and Regulations. Chapter 3 of the standards and regulations addresses emissions of particulates, NO_x, SO_x, CO, VOCs, hydrogen sulfide, and asbestos. This regulation also requires the control of fugitive dust generated during the construction phase.

Idaho air emissions are regulated by the IDAPA. IDAPA Chapter 58.01.01 presents the applicable regulations for criteria pollutants and fugitive dust control.

Nevada air emissions are regulated by the NRS 445B.100 through 445B.825, 486A.010 through 486A.180, and Nevada Administrative Code 445B.001 through 445B.899. Fugitive dust emissions from construction activities are regulated under Nevada Administrative Code Section 445B.22037.

Table 3.20-1 presents a summary of applicable regulations for each state.

Fugitive Dust Control

Sources, including construction projects, operating within Wyoming, Idaho, and Nevada are required to control fugitive dust emissions. Table 3.20-2 lists the fugitive dust regulations and control measures that apply to the Project.

Table 3.20-1. Regulatory Applicability Summary

General Regulatory Programs Applicable to the Gateway Project	Wyoming	Idaho	Nevada[4/]
New Source Review	No	No	No
Prevention of Significant Deterioration	No	No	No
NESHAPs – Title III	No	No	No
Title IV – Acid Rain	No	No	No
Title V – Part 70 Permits	No	No	No
General Permit Requirements[1/]	Yes	Yes	Yes
Dispersion Modeling	No	No	No
Impact Analysis	No	No	No
Fugitive Dust Mitigation Program	Yes[2/]	Yes[3/]	Yes[5/]

NESHAP = National Emissions Standards for Hazardous Air Pollutants

1/ Permits not required for construction activities or construction equipment use. Permits are not required for substation construction or operation. Permits may be required for the temporary siting and use of the portable concrete plants.

2/ Wyoming Air Regulations, Chapter 3, Section 2(f).

3/ Idaho Air Regulations, Sections 650 and 651.

4/ Included in table for the Nevada portion of Alternative 7I only.

5/ Nevada Air Regulations, Nevada Administrative Code Section 445B.22037.

Table 3.20-2. Fugitive Dust Regulations

Wyoming Regulations pursuant to Chapter 3, Section 2(f)
(f) Fugitive Dust. Sources operating within the State of Wyoming are required to control fugitive dust emissions. The following control measures or any equivalent method approved by the Division Administrator shall be considered appropriate for minimizing fugitive dust:
(i) Construction/Demolition Activities. (A) Any person engaged in clearing or leveling of land, earthmoving, excavation, or movement of trucks or construction equipment over access haul roads or cleared land shall take steps to minimize fugitive dust from such activities. Such control measures may include frequent watering and/or chemical stabilization. (B) Any person engaged in demolition activities including razing of homes, buildings, or other structures; or removing paving material from roads and/or parking areas shall take steps to minimize fugitive dust from such activities. Such control measures may include frequent watering and/or chemical stabilization. (C) Any person who is engaged in construction or demolition activities which tracks earth or other materials onto paved streets shall promptly remove such material by water or other means. (D) Any person engaged in sandblasting or similar operations shall take steps to minimize fugitive dust from such activities. Such control measures may include the installation and use of hood, fans and fabric filters to enclose and vent the handling of dusty materials.
***(ii) Handling and Transporting of Materials*.** (A) Any person owning, operating or maintaining a new or existing material storage, handling and/or hauling operation shall minimize fugitive dust from such an operation. Such control measures may include the application of asphalt, oil, water or suitable chemicals on unpaved roads, material stockpiles and other surfaces which can give rise to airborne dusts. Control measures for material handling may also include installation and use of hoods, fans and fabric filters to enclose and vent dusty materials. (B) When transporting materials likely to give rise to airborne dust, open bodied trucks shall be covered when in motion.

Table 3.20-2. Fugitive Dust Regulations (continued)

Idaho Regulations pursuant to Rules 650 and 651
650. RULES FOR CONTROL OF FUGITIVE DUST. The purpose of Sections 650 through 651 is to require that all reasonable precautions be taken to prevent the generation of fugitive dust. (5-1-94)
651. GENERAL RULES. All reasonable precautions shall be taken to prevent particulate matter from becoming airborne. In determining what is reasonable, consideration will be given to factors such as the proximity of dust emitting operations to human habitations and/or activities, the proximity to mandatory Class I Federal Areas and atmospheric conditions which might affect the movement of particulate matter. Some of the reasonable precautions may include, but are not limited to, the following: (3-30-07)
01. Use of Water or Chemicals. Use, where practical, of water or chemicals for control of dust in the demolition of existing buildings or structures, construction operations, the grading of roads, or the clearing of land. (5-1-94)
02. Application of Dust Suppressants. Application, where practical, of asphalt, oil, water or suitable chemicals to, or covering of dirt roads, material stockpiles, and other surfaces which can create dust. (5-1-94)
03. Use of Control Equipment. Installation and use, where practical, of hoods, fans and fabric filters or equivalent systems to enclose and vent the handling of dusty materials. Adequate containment methods should be employed during sandblasting or other operations. (5-1-94)
04. Covering of Trucks. Covering, when practical, open bodied trucks transporting materials likely to give rise to airborne dusts. (5-1-94)
05. Paving. Paving of roadways and their maintenance in a clean condition, where practical. (5-1-94)
06. Removal of Materials. Prompt removal of earth or other stored material from streets, where practical.

Nevada Regulations pursuant to Nevada Administrative Code 445B.22037
1. Apply for a surface disturbance permit pursuant to State of Nevada Department of Conservation and Environmental Resources, Division of Environmental Protection (NDEP) guidance. 2. Prepare a fugitive dust control plan pursuant to NDEP guidance. 3. Implement an ongoing program for fugitive dust control which relies upon Best Practical Methods as defined by NDEP/Bureau of Air Pollution Control. NDEP guidance documents: NDEP 2002, 2007

Permitting Exemptions for Portable Concrete Batch Plants

Wyoming – Chapter 6 of the Wyoming Air Quality Standards and Regulations does not contain any specific permitting exemptions applicable to portable concrete plants. Chapter 6, section (k) provides a general exemption based upon emissions rates and ambient impacts. Considering the remote location of the route and the emissions rate noted below, it would be reasonable to assume that the concrete batching activities may qualify for the Section (k) exemption in Wyoming. Additionally, the Wyoming Air Quality Standards and Regulations allow for the movement of portable sources which already have existing permits (Chapter 6, section (b)(ii). Any of the proposed portable batch plants which already have permits from the Wyoming Air Division under this provision would be allowed to utilize a “self issuance” permit to operate for new locations along the Wyoming portion of the route.

Idaho – IDAPA 58.01.01, sections 220 through 222, contain provisions for permit exemptions. The proposed portable concrete batch plants would in all likelihood meet the requirements for permit exemption under these provisions especially when considering that “fugitive emissions shall not be considered in determining whether a source meets the applicable exemption criteria unless required by federal law”, per

Section 220, and fugitive emissions would be the predominant emissions from such plants.

Nevada – Any portable concrete plants planned for use on the 7-mile segment of Alternative 7I would most likely be required to contact NDEP and obtain a decision on any required stationary or portable source permits.

3.20.1.4 Methods

The methods used to estimate emissions from the construction and operations phases of the proposed Project are explained in detail in the Air Quality Technical Report found in the Administrative Record. These methods represent currently accepted techniques for deriving emissions estimates from construction and operations activities. These methods consider:

- Construction disturbance areas within the Proposed Action or Action Alternatives, i.e., access road construction and use during the construction phase, tower construction areas, and substation construction areas;
- Construction equipment exhaust emissions;
- Use of portable concrete batch plants during the construction phase;
- Vehicle exhaust emissions associated with construction worker travel and construction supply delivery along the routes;
- Use of unpaved access roads during the operations phase; and
- Vehicle emissions used for inspection and maintenance during the operations phase.

3.20.1.5 Existing Conditions

Climate

Wyoming

The regional climate of the Analysis Area is predominantly classified as continental with some areas in Wyoming classified as semi-arid. Surface wind direction and precipitation in the Project area vary significantly due to differences in geographical location and geographical features. Annual average wind speeds within the Analysis Area range from 7.7 to 12.9 miles per hour. Annual average wind directions are predominantly from the southwest, with fluctuations from the west and southeast. Highest annual average temperatures range from 50°F to 55°F, while the lowest annual average temperatures range from 31°F to 34.3°F, within the Analysis Area. Summer temperatures in southern Wyoming can rarely exceed 100°F but average July temperatures range between 85°F and 95°F. January is typically the coldest month with minimum average temperatures of approximately 5°F and 10°F. However, low temperatures below 0°F are not uncommon (Curtis and Grimes 2008). Annual average precipitation amounts range from 12.7 to 19.0 inches per year within the Analysis Area.

The climate of any area in Wyoming is largely determined by its latitude, altitude, and local topography. These factors influence weather system airflow patterns, temperature variations, precipitation, and humidity as they migrate eastward. Surface elevations

range from the summit of Gannett Peak in the Wind River Mountains, at 13,804 feet, to the Belle Fourche River Valley in the state's northeast corner, at 3,125 feet. This difference in elevation explains why areas in the northern part of the state at 4,400 feet have mean annual July temperatures of about 7°F higher than areas in the southwest corner of the state, at 6,800 feet. Wyoming is located deep in the interior of the North American continent, away from any moderating influence of oceans, resulting in long winters and mild summers. In winter, Wyoming is often beneath the jet stream, or north of it, which accounts for its frequent strong winds, blasts of arctic air and precipitation. In summer, the jet stream retreats northward over Canada, leaving the state's weather mild and pleasant. Generally, summer daytime temperatures display a range in the 70s and 80s. Ninety degree days are rare anywhere in the state, and daily temperatures over 100˚F are rarely experienced.

Idaho

Idaho lies entirely west of the Continental Divide. The northern part of the state averages lower in elevation than the much larger central and southern portions, where numerous mountain ranges from barriers to the free flow of air from all points of the compass. In the north the main barrier is the rugged chain of Bitterroot Mountains forming much of the boundary between Idaho and Montana. The extreme range of elevation in the state is from 738 feet of the confluence of the Clearwater and Snake Rivers to 12,655 feet at Mt. Borah in Custer County. Comprising rugged mountain ranges, canyons, high grassy valleys, arid plains, and fertile lowlands, the state reflects in its topography and vegetation a wide range of climates.

To a large extent, the source of moisture for precipitation in Idaho is the Pacific Ocean. In summer, there are some exceptions to this when moisture-laden air is brought in from the south at high levels to produce thunderstorm activity, particularly in the eastern part of Idaho. Sizeable areas in the Clearwater, Payette, and Boise River Basins receive an average of 40 to 50 inches per year, with a few points or small areas receiving in excess of 60 inches. Large areas including the northeastern valleys, much of the Upper Snake River Plains, Central Plains, and the lower elevations of the Southwestern Valleys receive less than 10 inches annually. Snowfall distribution is affected both by availability of moisture and by elevation. Annual snowfall totals in North Idaho have reached nearly 500 inches in the past. The major mountain ranges of the state accumulate a deep snow cover during the winter months, and the release of water from the melting snowpack in late spring furnishes irrigation water for more than 2 million acres, mainly within the Snake River Basin above Weiser.

Nevada

Nevada is located in the Basin and Range physiographic province and its topography consists mainly of north-south trending mountains separated by structurally controlled valleys. The eastern part has an average elevation of between 5,000 and 6,000 feet. The western part is between 3,800 and 5,000 feet, the lower limit being in the vicinity of Pyramid Lake and Carson Sink. The southern part is generally between 2,000 and 3,000 feet. From the lower elevations of the western portion there is a fairly rapid rise westward toward the summits of the Sierra Nevada. The southwestern part slopes down toward Death Valley, California; the southern portion slopes toward the channel of the Colorado River, which is less than 1,000 feet above sea level. The northeastern

part slopes toward the north, draining into the Snake River and thence into the Columbia River Basin.

Nevada has great climatic diversity, ranging from scorching lowland desert in the south to cool mountain forests in the north. Its varied and rugged topography, mountain ranges, and narrow valleys range in elevation from about 1,500 to more than 10,000 feet above sea level. Wide local variations of temperature and rainfall are common. The principal climatic features are bright sunshine; small annual precipitation (averaging 9 inches in the valleys and deserts); heavy snowfall in the higher mountains; clean, dry air; and exceptionally large daily ranges of temperature.

The mean annual temperatures vary from the middle 40s in the northeast to about 50°F in the west and central areas and to the middle 60s in the south. There is strong surface heating during the day and rapid nighttime cooling because of the dry air, resulting in wide daily ranges in temperature. Even after the hottest days, the nights are usually cool. The average range between the highest and the lowest daily temperatures is about 30°F to 35°F. Daily ranges are larger in summer than the winter. Extreme temperatures have ranged from 120°F to 50°F below zero. The prevailing winds are from the west. The average annual number of days with precipitation of 0.01 inch or more varies considerably; Las Vegas averages 23 days, Reno 49, Winnemucca 67, Ely 72, and Elko 78.

Air Quality

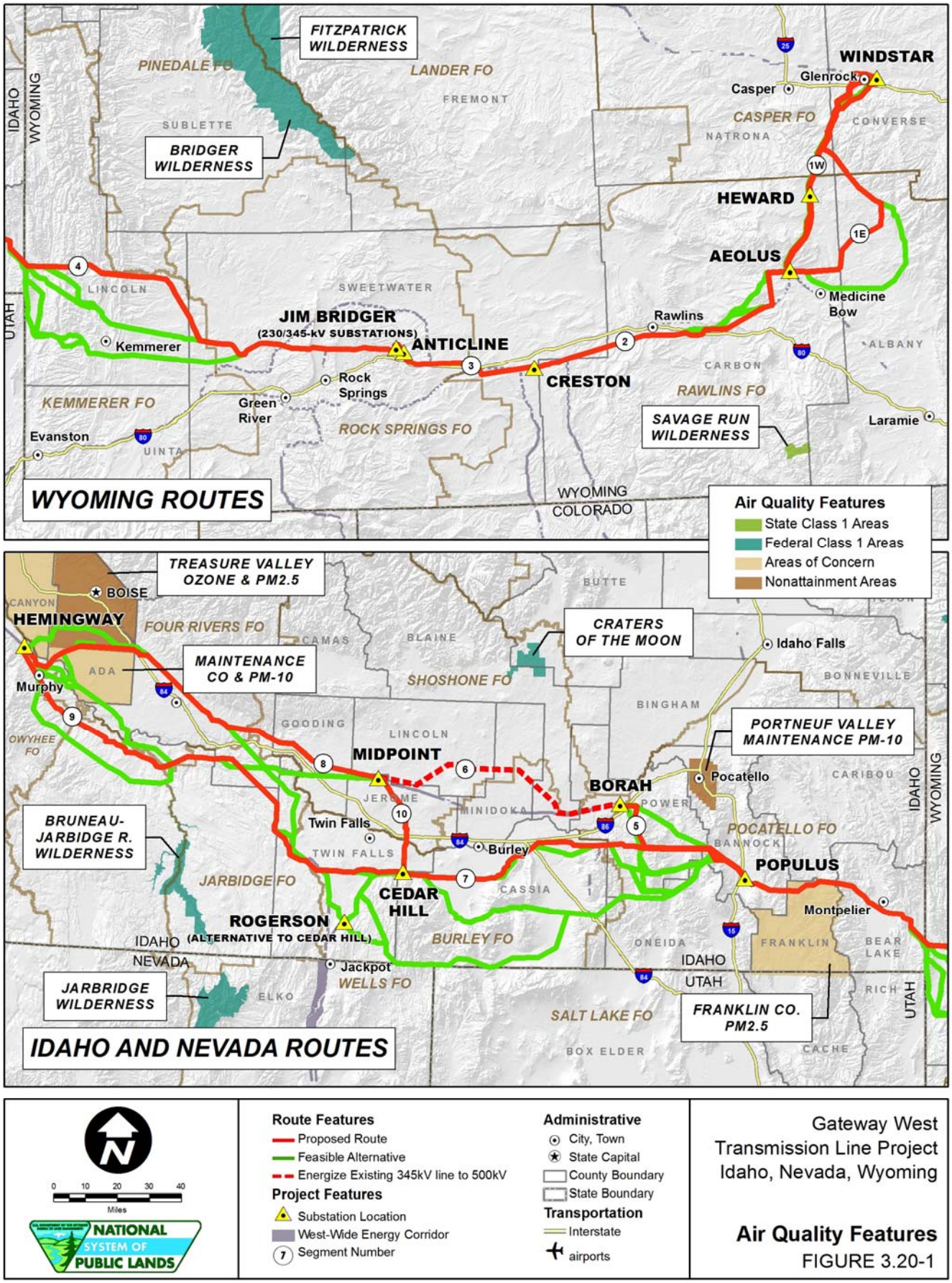
Federal and state air regulations are designed to ensure that ambient air quality, including background, existing, and new sources, are in compliance with the ambient standards. The USEPA has established National Ambient Air Quality Standards for criteria pollutants for the purpose of protecting human health (primary standards) and public welfare (secondary standards). These criteria pollutants are: nitrogen dioxide, CO, ozone, SO_2, lead, PM_{10}, and $PM_{2.5}$.

USEPA has designated all areas of the United States as “attainment,” “non-attainment,” or “unclassified” with respect to ambient air quality standards. Existing air quality in each of the states is generally good to excellent. Table 3.20-3 delineates the current federal and state-specific ambient air quality standards. Figure 3.20-1 shows the current locations of the Idaho and Wyoming nonattainment areas, and other areas of air quality concern. Idaho is in attainment with the exception of two PM_{10} nonattainment areas in the southeast corner of the state and the north Ada County CO and PM_{10} maintenance area. At present, there are no nonattainment areas in the State of Wyoming, although the WDEQ has proposed that an ozone nonattainment area be established in the Upper Green River Basin area (State of Wyoming 2009). Currently, there are no nonattainment or maintenance areas in the Elko County region of Nevada that would be affected by the construction of Alternative 7I. Each of the states in question has numerous Class I areas. Figure 3.20-1 shows the Class I area locations in Idaho and Wyoming. The closest Class I areas to the Project (both in Idaho) are: 1) the Craters of the Moon National Monument and Preserve area approximately 50 miles north of the route, and 2) the Sawtooth Class I area approximately 54 miles northeast of the route. The Jarbidge Wilderness Class I area in Nevada lies approximately 52 miles to the west-southwest of the 7-mile segment of Alternative 7I, which is on the south side of the Idaho-Nevada state border.

Table 3.20-3. Ambient Air Quality Standards

Pollutant	Averaging Time	Idaho Standards Concentration	Wyoming Standards Concentration	Nevada Standards Concentration	National Standards Concentration
Ozone	1 hour	0.12 ppm		0.12 ppm	
	8 hours		0.08 ppm		0.075 ppm (147 µg/m^3) (3-year average of annual 4th-highest daily maximum)
Carbon Monoxide	8 hours	9 ppm	9 ppm	9 ppm	9 ppm (10,000 ug/m^3)
	1 hour	35 ppm	35 ppm	35 ppm	35 ppm (40,000 ug/m^3)
Nitrogen Dioxide	Annual Average	0.05 ppm	0.05 ppm	0.053	0.053 ppm (100 µg/m^3)
	1 hour				
Sulfur Dioxide	Annual Average	80 µg/m^3	60 µg/m^3	80 µg/m^3	0.03 ppm (80 µg/m^3)
	24 hours	365 µg/m^3	260 µg/m^3	365 µg/m^3	0.14 ppm (365 µg/m^3)
	3 hours	1,300 µg/m^3	1,300 µg/m^3	1,300 µg/m^3	0.5 ppm (1,300 µg/m^3)
	1 hour				
PM_{10}	24 hours	150 µg/m^3	150 µg/m^3	150 µg/m^3	150 µg/m^3
	Annual Arithmetic Mean	50 µg/m^3	50 µg/m^3	50 µg/m^3	
$PM_{2.5}$	Annual Arithmetic Mean		15 µg/m^3		15 µg/m^3 (3-year average)
	24 hours		65 µg/m^3		35 µg/m^3 (3-year average of 98th percentiles)
Lead	Calendar Quarter	1.5 µg/m^3	1.5 µg/m^3	1.5 µg/m^3	1.5 µg/m^3

ppm = parts per million
µg/m^3 = micrograms per cubic meter


FITZPATRICK WILDERNESS
PINEDALE FO
LANDER FO
FREMONT
SUBLETTE
BRIDGER WILDERNESS
IDAHO
WYOMING
UTAH
WINDSTAR
Glenrock
Casper
CASPER FO
CONVERSE
NATRONA
HEWARD
AEOLUS
Medicine Bow
LINCOLN
SWEETWATER
JIM BRIDGER
(230/345-kV SUBSTATIONS)
ANTICLINE
Kemmerer
Rock Springs
Green River
CRESTON
Rawlins
CARBON
ALBANY
RAWLINS FO
KEMMERER FO
ROCK SPRINGS FO
SAVAGE RUN WILDERNESS
Laramie
Evanston
UINTA
WYOMING ROUTES
WYOMING
COLORADO
Air Quality Features
State Class 1 Areas
Federal Class 1 Areas
Areas of Concern
Nonattainment Areas
TREASURE VALLEY OZONE & PM2.5
BOISE
CANYON
HEMINGWAY
FOUR RIVERS FO
BUTTE
CAMAS
BLAINE
CRATERS OF THE MOON
Idaho Falls
ADA
MAINTENANCE CO & PM-10
Murphy
SHOSHONE FO
BONNEVILLE
BINGHAM
OWYHEE FO
GOODING
LINCOLN
PORTNEUF VALLEY MAINTENANCE PM-10
MIDPOINT
BORAH
Pocatello
CARIBOU
JEROME
MINIDOKA
POWER
BRUNEAU-JARBIDGE R. WILDERNESS
Twin Falls
TWIN FALLS
Burley
POCATELLO FO
BANNOCK
POPULUS
JARBIDGE FO
CEDAR HILL
CASSIA
Montpelier
ROGERSON
(ALTERNATIVE TO CEDAR HILL)
BURLEY FO
ONEIDA
FRANKLIN
BEAR LAKE
IDAHO
NEVADA
Jackpot
WELLS FO
IDAHO
UTAH
RICH
JARBIDGE WILDERNESS
ELKO
SALT LAKE FO
FRANKLIN CO. PM2.5
BOX ELDER
CACHE
IDAHO AND NEVADA ROUTES
0 10 20 30 40
Miles
NATIONAL SYSTEM OF PUBLIC LANDS
Route Features
Proposed Route
Feasible Alternative
Energize Existing 345kV line to 500kV
Project Features
Substation Location
West-Wide Energy Corridor
Segment Number
Administrative
City, Town
State Capital
County Boundary
State Boundary
Transportation
Interstate
airports
Gateway West
Transmission Line Project
Idaho, Nevada, Wyoming
Air Quality Features
FIGURE 3.20-1

Greenhouse Gas Emissions

Preliminary GHG emissions inventories have been prepared for each state via a cooperative effort between the Center for Climate Strategies and the Departments of Environmental Quality for each state. These inventories do not represent reporting from all identified sectors, so the inventories most likely do not represent a complete analysis capture of GHG emissions for each state. Table 3.20-4 presents a summary of GHG (CO_2 equivalent or CO_2e) emissions data for each state for reporting years 2005 and 2010. The year 2010 data represent the inventory year closest to the beginning of construction for the proposed Project.

Table 3.20-4. GHG Summary by State (CO_2e)

State	2005 tons[1/]	2010 tons[1/]
Idaho	40,920,000	43,560,000
Wyoming	61,160,000	66,330,000

1/ Values converted from metric tons to short tons.
Sources: CCS 2007, 2008

3.20.2 Direct and Indirect Effects

This section is organized to present first construction, then operation, followed by the decommissioning effects from the Proposed Action. For both construction and operation, there are sections summarizing emissions of criteria pollutants (NO_x, CO, SO_X, VOCs, and $PM_{10}/PM_{2.5}$), and greenhouse gases (CO_2, methane [CH_4], and NO_x) for the Proposed Action. Route Alternatives and the comparable portion of the Proposed Route are analyzed in detail below in Section 3.20.2.3. There is a Design Variation involving use of two single-circuit structures proposed by the Proponents for Segments 2, 3, and 4 (see Section 2.2 for details), which is analyzed below in Section 3.20.2.4. The Proponents have also proposed a Schedule Variation, analyzed in Section 3.20.2.5, in which one of the two single circuits to be constructed in Segments 2, 3, and 4 and a portion of Segment 1W would be built on an extended schedule with construction beginning approximately 2.5 years after completion of the initial construction.

Mitigation measures or EPMs are presented in detail within this section only if it is the first time they have been discussed in Chapter 3; all other measures are referenced or summarized. A comprehensive list of all Proponent-proposed EPMs and Agency-required mitigation measures can be found in Table 2.7-1 of Chapter 2.

Plan Amendments

Proposed amendments are summarized in Table 2.2-1 of Chapter 2 and detailed in Appendices F and G. Amendments are needed to permit the Project to cross various areas of BLM-managed and NFS lands. Effects described for areas requiring an amendment in order for the Project to be built would only occur if the amendment were approved. Amendments that alter land management designations could change future use of these areas. No amendments specific to air quality are proposed for the Project and no impacts to air quality resulting from approving the amendments beyond the impacts of the project are anticipated.

3.20.2.1 No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed or operated. No Project-related impacts to air quality would occur.

3.20.2.2 Effects Common to All Action Alternatives

Construction Emissions

Construction activities for the Proposed Action would take place in the following sequence: site preparation/trenching; foundation work; installation of structures and conductors; and ROW/site restoration. The anticipated construction periods for the various components of the proposed Project are described in Section 2 of Appendix B. Construction would occur over a 1- to 2-year period depending on the transmission segment length. All segments would be completed within 5.42 years (65 months) of the start of construction (assuming the shortest construction period option). The Proponents are considering longer and/or phased schedules, which would show lower emissions on a tons per normalized year basis. These longer periods were not used as the basis for the analysis because use of the shorter construction period results in the most conservative estimates of emissions on a normalized year basis for comparison to the applicable conformity threshold levels. The construction activities that would generate emissions include land clearing, ground excavation, and cut and fill operations. These construction activities would occur 6 days per week for up to 12 hours per day during the construction periods. The intermittent and short-term emissions generated by these activities would include dust from soil disruption and combustion emissions from the construction equipment. Emissions associated with construction equipment include PM_{10}, $PM_{2.5}$, NO_x, CO, VOCs, SO_x, and small amounts of air toxics. These emissions could result in minor, temporary impacts on air quality in the vicinity of the Proposed Action construction. Table 3.20-5 lists the estimated emissions of these criteria pollutants that would be generated by construction of the Proposed Action facilities by segment.

Table 3.20-5. Estimated Emissions of Criteria Pollutants from Project Construction

Segment	~Length miles	PM_{10} (tons) 1/	$PM_{2.5}$ (tons) 1/	NO_x (tons)	CO (tons)	SO_x (tons)	VOC (tons)
Segment 1 (1E, 1W(a), 1W(c))	248	136.7	46.1	466.9	201.9	2.2	49.5
Segment 2	97	53.5	18.0	182.6	79.0	0.9	19.4
Segment 3	56	30.9	10.4	105.4	45.6	0.5	11.2
Segment 4 [In Wyoming]	136	75.0	25.3	256.0	110.7	1.2	27.1
Total Emissions in Wyoming		*296.1*	*99.8*	*1,010.9*	*437.2*	*4.8*	*107.2*
Segment 4 [In Idaho]	67	40.2	13.5	137.1	59.3	0.6	14.5
Segment 5	55	33.0	11.1	112.6	48.7	0.5	11.9
Segment 6							
Segment 7	118	70.7	23.8	241.5	104.4	1.1	25.6
Segment 8	131	78.5	26.4	268.1	115.9	1.3	28.4
Segment 9	162	97.1	32.7	331.6	143.4	1.6	35.1
Segment 10	33	19.8	6.7	67.5	29.2	0.3	7.2
Total Emissions in Idaho		*339.3*	*114.2*	*1,158.4*	*500.9*	*5.4*	*122.7*
Total Project Emissions 2/		***635.4***	***214.0***	***2,169.3***	***938.1***	***10.2***	***229.9***

1/ PM_{10} and $PM_{2.5}$ include fugitive dust and equipment exhaust PM.
2/ Totals may not match other tables due to mileage multiplication and rounding.

Emissions from construction of the transmission line, substations, and regeneration facilities are not expected to cause or significantly contribute to a violation of an applicable ambient air quality standard or contribute substantially to an existing or projected air quality violation because the construction equipment would be operated on an as-needed basis during daylight hours only and the emissions from gasoline and

diesel engines would be minimized because the engines must be built to meet the standards for mobile sources established by the USEPA. Most of the construction equipment would be powered by diesel engines that would meet current USEPA emissions standards based upon engine size and date of manufacture, and Project-related vehicles and construction equipment would be required to use the new low sulfur diesel fuel as soon as it is commercially available. The Agencies have identified the following mitigation measures that would substantially reduce impact and recommend that the Proponents implement them Project-wide. The Proponents have agreed to incorporate these measures into their EPMs.

AIR-1 Minimize idling time for diesel equipment whenever possible.

AIR-2 Ensure that diesel-powered construction equipment is properly tuned and maintained, and shut off when not in direct use.

AIR-3 Prohibit engine tampering to increase horsepower.

AIR-4 Reduce construction-related trips as feasible for workers and equipment, including trucks.

None of the above related construction activities are required to have stationary or indirect source permits by any of the affected states, and the activities are exempt from the major regulatory programs such as NSR, PSD, NESHAPs, Title IV, and Title V. The construction activities must, however, comply with the applicable state fugitive dust control requirements (including a surface disturbance permit from the State of Nevada) as outlined in Table 3.20-3.

Fugitive dust emissions (e.g., PM_{10}/$PM_{2.5}$) would depend on the moisture content and texture of the soils that would be disturbed. The construction emissions would vary from day to day depending on the level of activity, the specific operations, and prevailing weather. The Air Quality Technical Report presents the support data and methodologies used to estimate emissions from the construction phase. The Proponents have included the following EPM for dust control:

TR-2 Dust suppression techniques will be applied, such as watering construction areas or removing dirt tracked onto a paved road as necessary to prevent safety hazards or nuisances on access roads and in construction zones near residential and commercial areas and along major highways and interstates.

Operation Emissions

Operations-related emissions would be from the following types of sources and activities:

- Use of motor vehicles to transport inspection and maintenance personnel along the final route to perform inspection and maintenance as required; and
- Travel on the unpaved access roads during the inspection and maintenance related activities.

The Air Quality Technical Report presents the emissions estimation methodologies and support data for the operations phase.

Table 3.20-6 presents the estimated emissions from inspection and maintenance activities (operations phase). The total emissions estimates for all phases are presented in Table 3.20-7.

Table 3.20-6. Operations Emissions (Inspection/Maintenance)

VOC (ROG) (tons/yr)	CO (tons/yr)	NO_x (tons/yr)	SO_x (tons/yr)	PM_{10} (tons/yr)	$PM_{2.5}$ (tons/yr)	CO_2 (tons/yr)
0.075	0.81	0.09	0.0007	13.6	2.9	68.9

Table 3.20-7. Total Project Estimated Emissions

VOC (ROG) (tons/yr)	CO (tons/yr)	NO_x (tons/yr)	SO_x (tons/yr)	PM_{10} (tons/yr)	$PM_{2.5}$ (tons/yr)	CO_2 (tons/yr)
CONSTRUCTION[1/], Tons per Construction Period						
229.9	938.1	2,169.3	10.2	635.4	214	245,532
OPERATIONS, Tons per Year						
0.075	0.81	0.09	0.0007	13.6	2.9	68.9

1/ Includes helicopter emissions, which may or may not occur.

Greenhouse Gas Emissions Estimates

Emissions of GHGs such as CO_2, CH_4, and NO_x from the construction and operation of the transmission line are derived primarily from the fuel combustion sources involved in construction and operations. Support data for the GHG analysis herein were derived from the California Climate Action Registry *General Reporting Protocol, Version 3.1* (2009a), and *Power Generation /Electric Utility Reporting Protocol, Version 1.1* (2009b). The Air Quality Technical Report presents the emissions calculations, methodologies, and support data for the GHG emissions.

Emissions Summary by State

Route and construction data supplied by the Proponents indicate that approximately 53.4 percent of the construction emissions will occur in Idaho, with the remaining 46.6 percent occurring in Wyoming. Emissions for construction and operation are broken down for each state based on these approximated values in Table 3.20-8. Emissions for the 7-mile portion of Alternative 7I (in Nevada) are included in the various emissions breakdowns for Idaho and are not presented in the state summaries that follow as a separate item. The emissions from this alternative route are presented in Table 3.20-13.

Table 3.20-8. Emissions Breakdown by State

Pollutant	Wyoming	Idaho
Construction	***(Tons per Period)***	***(Tons per Period)***
NO_x	1,010.9	1,158.4
CO	437.2	500.9
VOC	107.1	122.8
SO_x	4.8	5.4
PM_{10}	296.1	339.3
$PM_{2.5}$	99.7	114.3
CO_2	114,418.0	131,114.0
Operation	***(Tons per Year)***	***(Tons per Year)***
NO_x	0.042	0.048
CO	0.38	0.43
VOC	0.035	0.04
SO_x	0.00033	0.00037
PM_{10}	6.34	7.27
$PM_{2.5}$	1.35	1.55
CO_2	32.1	36.8

Operations emissions are essentially *de minimus*. Table 3.20-9 presents the construction emissions on a yearly basis assuming the Proposed Action construction period is 65 months (5.42 years).

Table 3.20-9. Annualized Construction Emissions Breakdown by State

Pollutant	Wyoming Tons per Year	Idaho Tons per Year
NO_x	186.5	213.7
CO	80.7	92.4
VOC	19.8	22.7
SO_x	0.9	1.0
PM_{10}	54.6	62.6
$PM_{2.5}$	18.4	21.1
CO_2	21,110.0	24,191.0

Table 3.20-10 presents the construction emissions as derived from Table 3.20-7 on a per mile basis.

Table 3.20-10. Construction Period Emissions per Mile Basis

Pollutant	Wyoming Average Emissions (Tons per Mile[1/])	Idaho Average Emissions (Tons per Mile[1/])
NO_x	1.88	2.05
CO	0.81	0.88
VOC	0.199	0.22
SO_x	0.009	0.01
PM_{10}	0.55	0.60
$PM_{2.5}$	0.19	0.20
CO_2	213.1	231.7

1/ Assumes route mileage is 1,103: approximately 537 miles in Wyoming and approximately 566 miles in Idaho.

Table 3.20-11 presents the construction emissions as derived from Table 3.20-10 on a per mile per year basis.

Table 3.20-11. Construction Period Emissions per Mile per Year Basis

Pollutant	Wyoming Average Emissions (Tons per Mile per Year[1/])	Idaho Average Emissions (Tons per Mile per Year[1/])
NO_x	0.35	0.38
CO	0.15	0.16
VOC	0.037	0.041
SO_x	0.0017	0.0018
PM_{10}	0.10	0.11
$PM_{2.5}$	0.035	0.037
CO_2	39.32	42.75

1/ Assumes route mileage is 1,103: approximately 537 miles in Wyoming and approximately 566 miles in Idaho. Construction period for each state is noted above.

For purposes of conformity, the values in Table 3.20-11 can be used to estimate the emissions from construction activities that occur in any identified nonattainment or maintenance area along the route. The only Proposed Action locations within nonattainment or maintenance areas are as follows:

- Approximately 20 miles of the centerline of Segment 4, Bridger to Populus, crosses the Franklin County $PM_{2.5}$ Area of Concern.
- Approximately 40 miles of the centerline of Segment 8, Midpoint to Hemingway, crosses Canyon and Ada Counties, which contain the Treasure Valley Ozone and $PM_{2.5}$ Area of Concern, and the Ada County CO and PM_{10} Nonattainment (Maintenance) Area.
- None of the proposed or alternative routes pass through the ozone nonattainment area being proposed by the WDEQ for the Upper Green River Basin area. The nearest route point to the southern extent of the proposed nonattainment area is approximately 20 miles distant. The ozone nonattainment area would not be affected.

Table 3.20-12 presents the estimated annualized emissions for the above noted areas of concern for purposes of conformity comparison.

Table 3.20-12. Annualized Construction Emissions Estimates for Areas of Concern

Pollutant	Franklin County Area	Canyon/Ada County Area
NO_x	7.6 tons/year	15.2 tons/year
CO	3.2 tons/year	6.4 tons/year
VOC	0.82 ton/year	1.64 tons/year
SO_x	0.04 ton/year	0.08 ton/year
PM_{10}	2.2 tons/year	4.4 tons/year
$PM_{2.5}$	0.74 ton/year	1.48 tons/year

Values presented in Table 3.20-12 indicate that emissions in the nonattainment or maintenance areas of concern would not trigger the need for a conformity determination.

Decommissioning

Project facilities would be removed at the end of the operational life of the transmission line. Structures and foundations would be removed to below the ground surface level. Removal of Project structures following decommissioning would result in temporary impacts to air quality.

Decommissioning activities would not be expected to result in air emissions similar in magnitude to those associated with construction. The types and numbers of equipment used in demolition and removal of the substations and tower structures would be far less than those proposed for use during construction. Demolition and removal time frames would be significantly less than construction time frames, and surface disturbance activities during demolition and removal would be significantly less than those associated with initial construction.

3.20.2.3 Proposed Route and Alternatives

The Route Alternatives are subject to the same air quality regulatory requirements and air quality standards as the Proposed Route.

Table 3.20-13 presents the emissions increases and/or decreases associated with the Proposed Route and Alternatives. It should be noted that not all of the Route Alternatives would be chosen to replace the comparable portion of the Proposed Route.

3.20.2.4 Design Variation

A Design Variation is being considered that would consist of constructing two single-circuit lines in Segments 2 through 4 instead of a single double-circuit line (which is the design assessed above). The disturbance footprint of the two single-circuit towers is greater than that of the double-circuit tower, in part because the requested ROW would be wider, but also because helicopter-assisted construction could be implemented in these areas due to the lighter weight of the towers, which would require additional fly yards. The additional ROW space and the fly yards would cause additional temporary disturbance during construction. Across Segments 2, 3, and 4, the additional disturbance of the single-circuit tower alternative ranges from 25 to 30 percent greater than the comparable portions of the double-circuit tower disturbance under the proposed design. The two single circuits require more ground disturbance, but would be designed and constructed to the same standards as the Proposed Action.

Construction of the Design Variation along Segments 2, 3, and 4 instead of the single double-circuit Proposed Action would increase the area of disturbance and number of structures to be constructed, thereby increasing vehicle emissions and dust. No additional impacts that have not already been described would occur under the Design Variation.

The Design Variation would result in slightly more fugitive emissions from tower pad construction activities for each of the identified segments, i.e., an approximately 6.5 percent increase. However, it is currently estimated that the differences in construction equipment use rates and emissions between the Proposed Action and Design Variation would be insignificant. The Proposed Action would result in slightly lower fugitive emissions than the Design Variation. Equipment exhaust emissions are expected to be similar.

3.20.2.5 Structure Variation

The proposed guyed Structure Variation would add four guy wires about 140 feet long from a point about 100 feet up in each tower to four guy anchors spaced in a square around the tower (Appendix B, Figure B-6). This would not change the amount of disturbance during construction or operation appreciably. Therefore, there is no appreciable difference in impact on air quality from the use of this Structure Variation when compared to the use of self-supporting lattice towers.

3.20.2.6 Schedule Variation

The Schedule Variation uses the two single-circuit design variation described above but extends construction over a longer timeframe. Initially only one of the eventual two single-circuit lines would be constructed with the second to be constructed at a later

Table 3.20-13. Alternative Route Emissions (tons)

Segment	Route Designation	Miles	PM_{10}	$PM_{2.5}$	NO_x	CO	SO_x	VOC	CO_2
1E	Proposed – Comparison Portion for Alternative 1E-A	17.6	9.70	3.27	33.13	14.33	0.16	3.51	3,750.0
	Alternative 1E-A	16.1	8.88	2.99	30.31	13.11	0.14	3.21	3,430.4
	Net Change	*-1.5*	*-0.83*	*-0.28*	*-2.82*	*-1.22*	*-0.01*	*-0.30*	*-319.6*
	Proposed – Comparison Portion for Alternative 1E-B	37.9	20.90	7.04	71.35	30.85	0.34	7.56	8,075.3
	Alternative 1E-B	59.3	32.70	11.01	111.63	48.27	0.52	11.83	12,635.0
	Net Change	*21.4*	*11.80*	*3.97*	*40.29*	*17.42*	*0.19*	*4.27*	*4,559.7*
	Proposed – Comparison Portion for Alternative 1E-C	75.4	41.57	14.00	141.94	61.38	0.67	15.04	16,065.4
	Alternative 1E-C	48.7	26.86	9.05	91.71	39.66	0.43	9.72	10,380.7
	Net Change	*-26.7*	*-14.71*	*-4.95*	*-50.22*	*-21.72*	*-0.24*	*-5.32*	*-5,684.7*
1W(a)	Proposed – Comparison Portion for Alternative 1W-A	28.8	15.88	5.35	54.22	23.45	0.25	5.75	6,136.4
	Alternative 1W-A	28.4	15.66	5.27	53.46	23.12	0.25	5.67	6,051.2
	Net Change	*-0.4*	*-0.22*	*-0.07*	*-0.75*	*-0.33*		*-0.08*	*-85.2*
2	Proposed – Comparison Portion for Alternative 2A	7.0	3.86	1.30	13.18	5.70	0.06	1.40	1,491.5
	Alternative 2A	6.2	3.42	1.15	11.67	5.05	0.05	1.24	1,321.0
	Net Change	*-0.8*	*-0.44*	*-0.15*	*-1.51*	*-0.65*	*-0.01*	*-0.16*	*-170.5*
	Proposed – Comparison Portion for Alternative 2B	28.4	15.66	5.27	53.46	23.12	0.25	5.67	6,051.2
	Alternative 2B	24.4	13.45	4.53	45.93	19.86	0.22	4.87	5,198.9
	Net Change	*-4.0*	*-2.21*	*-0.74*	*-7.53*	*-3.26*	*-0.04*	*-0.80*	*-852.3*
	Alternative 2C	28.8	15.88	5.35	54.22	23.45	0.25	5.75	6,136.4
	Net Change	*28.4*	*15.66*	*5.27*	*53.46*	*23.12*	*0.25*	*5.67*	*6,051.2*
4	Proposed – Comparison Portion for Alternative 4A	90.2	49.74	16.75	169.80	73.43	0.80	18.00	19,218.8
	Alternative 4A	85.2	46.98	15.82	160.39	69.36	0.75	17.00	18,153.5
	Net Change	*-5.0*	*-2.76*	*-0.93*	*-9.41*	*-4.07*	*-0.04*	*-1.00*	*-1,065.3*
	Proposed – Comparison Portion for Alternative 4B	90.2	49.74	16.75	169.80	73.43	0.80	18.00	19,218.8
	Alternative 4B	100.2	55.25	18.61	188.62	81.57	0.89	19.99	21,349.5
	Net Change	*10.0*	*5.51*	*1.86*	*18.82*	*8.14*	*0.09*	*2.00*	*2,130.7*
4	Proposed – Comparison Portion for Alternative 4C	90.2	49.74	16.75	169.80	73.43	0.80	18.00	19,218.8
	Alternative 4C	101.6	56.02	18.87	191.26	82.71	0.90	20.27	21,647.8
	Net Change	*11.4*	*6.29*	*2.12*	*21.46*	*9.28*	*0.10*	*2.27*	*2,429.0*
	Proposed – Comparison Portion for Alternative 4D	90.2	49.74	16.75	169.80	73.43	0.80	18.00	19,218.8
	Alternative 4D	100.8	55.58	18.72	189.75	82.06	0.89	20.11	21,477.3
	Net Change	*10.6*	*5.84*	*1.97*	*19.95*	*8.63*	*0.09*	*2.11*	*2,258.5*
	Proposed – Comparison Portion for Alternative 4E	90.2	49.74	16.75	169.80	73.43	0.80	18.00	19,218.8
	Alternative 4E	102.2	56.35	18.98	192.39	83.20	0.90	20.39	21,775.6
	Net Change	*12.0*	*6.62*	*2.23*	*22.59*	*9.77*	*0.11*	*2.39*	*2,556.8*

Table 3.20-13. Alternative Route Emissions (tons) (continued)

Segment	Route Designation	Miles	PM_{10}	$PM_{2.5}$	NO_x	CO	SO_x	VOC	CO_2
4	Proposed – Comparison Portion for Alternative 4F	90.2	49.74	16.75	169.80	73.43	0.80	18.00	19,218.8
	Alternative 4F	87.5	48.25	16.25	164.72	71.23	0.77	17.46	18,643.5
	Net Change	*-2.7*	*-1.49*	*-0.50*	*-5.08*	*-2.20*	*-0.02*	*-0.54*	*-575.3*
5	Proposed – Comparison Portion for Alternative 5A	25.3	15.17	5.11	51.78	22.39	0.24	5.49	5,860.8
	Alternative 5A	33.7	20.20	6.80	68.97	29.83	0.32	7.31	7,806.6
	Net Change	*8.4*	*5.04*	*1.70*	*17.19*	*7.43*	*0.08*	*1.82*	*1,945.9*
	Proposed – Comparison Portion for Alternative 5B	25.3	15.17	5.11	51.78	22.39	0.24	5.49	5,860.8
	Alternative 5B	44.4	26.62	8.96	90.87	39.30	0.43	9.63	10,285.3
	Net Change	*19.1*	*11.45*	*3.86*	*39.09*	*16.90*	*0.18*	*4.14*	*4,424.5*
	Proposed – Comparison Portion for Alternative 5C	33.2	19.90	6.70	67.95	29.38	0.32	7.20	7,690.8
	Alternative 5C	26.1	15.65	5.27	53.42	23.10	0.25	5.66	6,046.1
	Net Change	*-7.1*	*-4.26*	*-1.43*	*-14.53*	*-6.28*	*-0.07*	*-1.54*	*-1,644.7*
	Proposed – Comparison Portion for Alternative 5D	19.4	11.63	3.92	39.71	17.17	0.19	4.21	4,494.0
	Alternative 5D	17.5	10.49	3.53	35.82	15.49	0.17	3.80	4,053.9
	Net Change	*-1.9*	*-1.14*	*-0.38*	*-3.89*	*-1.68*	*-0.02*	*-0.41*	*-440.1*
	Proposed – Comparison Portion for Alternative 5E	5.8	3.46	1.16	11.81	5.11	0.06	1.25	1,336.6
	Alternative 5E	5.3	3.17	1.07	10.83	4.68	0.05	1.15	1,225.4
	Net Change	*-0.5*	*-0.29*	*-0.10*	*-0.98*	*-0.42*		*-0.10*	*-111.2*
7	Proposed – Comparison Portion for Alternative 7AB	35.2	21.10	7.11	72.04	31.15	0.34	7.63	8,154.1
	Alternative 7A	38.0	22.78	7.67	77.77	33.63	0.37	8.24	8,802.7
	Net Change	*2.8*	*1.68*	*0.57*	*5.73*	*2.48*	*0.03*	*0.61*	*648.6*
	Proposed – Comparison Portion for Alternative 7AB	35.2	21.10	7.11	72.04	31.15	0.34	7.63	8,154.1
	Alternative 7B	46.4	27.82	9.37	94.96	41.07	0.45	10.06	10,748.6
	Net Change	*11.2*	*6.71*	*2.26*	*22.92*	*9.91*	*0.11*	*2.43*	*2,594.5*
	Proposed – Comparison Portion for Alternative 7C	20.1	12.05	4.06	41.14	17.79	0.19	4.36	4,656.2
	Alternative 7C	20.3	12.17	4.10	41.55	17.97	0.20	4.40	4,702.5
	Net Change	*0.2*	*0.12*	*0.04*	*0.41*	*0.18*		*0.04*	*46.3*
	Proposed – Comparison Portion for Alternative 7D	6.2	3.72	1.25	12.69	5.49	0.06	1.34	1,436.2
	Alternative 7D	6.8	4.08	1.37	13.92	6.02	0.07	1.47	1,575.2
	Net Change	*0.6*	*0.36*	*0.12*	*1.23*	*0.53*	*0.01*	*0.13*	*139.0*
	Proposed – Comparison Portion for Alternative 7E	3.8	2.28	0.77	7.78	3.36	0.04	0.82	880.3
	Alternative 7E	4.5	2.70	0.91	9.21	3.98	0.04	0.98	1,042.4
	Net Change	*0.7*	*0.42*	*0.14*	*1.43*	*0.62*	*0.01*	*0.15*	*162.2*

Table 3.20-13. Alternative Route Emissions (tons) (continued)

Segment	Route Designation	Miles	PM_{10}	$PM_{2.5}$	NO_x	CO	SO_x	VOC	CO_2
7	Proposed – Comparison Portion for Alternative 7F	10.5	6.29	2.12	21.49	9.29	0.10	2.28	2,432.3
	Proposed – Comparison Portion for Alternative 7F	10.8	6.47	2.18	22.10	9.56	0.10	2.34	2,501.8
	Net Change	*0.3*	*0.18*	*0.06*	*0.61*	*0.27*		*0.07*	*69.5*
	Proposed – Comparison Portion for Alternative 7G	3.1	1.86	0.63	6.34	2.74	0.03	0.67	718.1
	Alternative 7G	3.2	1.92	0.65	6.55	2.83	0.03	0.69	741.3
	Net Change	*0.1*	*0.06*	*0.02*	*0.20*	*0.09*		*0.02*	*23.2*
	Proposed – Comparison Portion for Alternative 7H, 7I	118.1	70.80	23.84	241.71	104.53	1.14	25.62	27,357.9
	Alternative 7H	127.5	76.43	25.74	260.95	112.85	1.23	27.66	29,535.4
	Net Change	*9.4*	*5.64*	*1.90*	*19.24*	*8.32*	*0.09*	*2.04*	*2,177.5*
	Proposed – Comparison Portion for Alternative 7H, 7I	118.1	70.80	23.84	241.71	104.53	1.14	25.62	27,357.9
	Alternative 7I	173.4	103.95	35.01	354.89	153.47	1.67	37.61	40,168.2
	Net Change	*55.3*	*33.15*	*11.17*	*113.18*	*48.94*	*0.53*	*11.99*	*12,810.3*
	Proposed – Comparison Portion 7/9 for Alternative 7J[1/]	143.9	86.26	29.06	294.51	127.35	1.37	31.22	33,334.5
	Alternative 7J[1/]	202.1	121.15	40.81	413.63	178.85	1.93	43.85	46,816.5
	Net Change[1/]	*58.2*	*34.89*	*11.75*	*119.11*	*51.51*	*0.56*	*12.63*	*13,482.0*
8	Proposed – Comparison Portion for Alternative 8A	51.4	30.81	10.38	105.20	45.49	0.49	11.15	11,906.8
	Alternative 8A	53.6	32.13	10.82	109.70	47.44	0.52	11.63	12,416.5
	Net Change	*2.2*	*1.32*	*0.44*	*4.50*	*1.95*	*0.02*	*0.48*	*509.6*
	Proposed – Comparison Portion for Alternative 8B	45.3	27.16	9.15	92.71	40.09	0.44	9.83	10,493.8
	Alternative 8B	45.8	27.46	9.25	93.74	40.54	0.44	9.93	10,609.6
	Net Change	*0.5*	*0.30*	*0.10*	*1.02*	*0.44*		*0.11*	*115.8*
	Proposed – Comparison Portion for Alternative 8C	6.5	3.90	1.31	13.30	5.75	0.06	1.41	1,505.7
	Alternative 8C	6.4	3.84	1.29	13.10	5.66	0.06	1.39	1,482.6
	Net Change	*-0.1*	*-0.06*	*-0.02*	*-0.20*	*-0.09*		*-0.02*	*-23.2*
	Proposed – Comparison Portion for Alternative 8D	6.9	4.14	1.39	14.12	6.11	0.07	1.50	1,598.4
	Alternative 8D	8.1	4.86	1.64	16.58	7.17	0.08	1.76	1,876.4
	Net Change	*1.2*	*0.72*	*0.24*	*2.46*	*1.06*	*0.01*	*0.26*	*278.0*
	Proposed – Comparison Portion for Alternative 8E	6.95	4.17	1.40	14.23	6.15	0.07	1.51	1,610.9
	Alternative 8E	18.47	11.07	3.73	37.79	16.34	0.18	4.01	4,277.8
	Net Change	*11.51*	*6.90*	*2.32*	*23.56*	*10.19*	*0.11*	*2.50*	*2,666.9*
9	Proposed – Comparison Portion for Alternative 9A	7.8	4.68	1.57	15.96	6.90	0.08	1.69	1,806.9
	Alternative 9A	7.7	4.62	1.55	15.76	6.81	0.07	1.67	1,783.7
	Net Change	*-0.1*	*-0.06*	*-0.02*	*-0.20*	*-0.09*		*-0.02*	*-23.2*
	Proposed – Comparison Portion for Alternative 9B	49.5	29.67	9.99	101.31	43.81	0.48	10.74	11,466.7

Table 3.20-13. Alternative Route Emissions (tons) (continued)

Segment	Route Designation	Miles	PM_{10}	$PM_{2.5}$	NO_x	CO	SO_x	VOC	CO_2
9 (cont.)	Alternative 9B	53.2	31.89	10.74	108.88	47.09	0.51	11.54	12,323.8
	Net Change	*3.7*	*2.22*	*0.75*	*7.57*	*3.27*	*0.04*	*0.80*	*857.1*
	Proposed – Comparison Portion for Alternative 9C	14.7	8.81	2.97	30.09	13.01	0.14	3.19	3,405.3
	Alternative 9C	15.3	9.17	3.09	31.31	13.54	0.15	3.32	3,544.3
	Net Change	*0.6*	*0.36*	*0.12*	*1.23*	*0.53*	*0.01*	*0.13*	*139.0*
	Proposed – Comparison Portion for Alternative 9D, 9E, 9F, 9G, 9H	57.2	34.29	11.55	117.07	50.63	0.55	12.41	1,3250.4
	Alternative 9D	58.4	35.01	11.79	119.52	51.69	0.56	12.67	1,3528.4
	Net Change	*1.2*	*0.72*	*0.24*	*2.46*	*1.06*	*0.01*	*0.26*	*278.0*
	Proposed – Comparison Portion for Alternative 9D, 9E, 9F, 9G, 9H	57.2	34.29	11.55	117.07	50.63	0.55	12.41	1,3250.4
	Alternative 9E	68.7	41.18	13.87	140.61	60.80	0.66	14.90	1,5914.4
	Net Change	*11.5*	*6.89*	*2.32*	*23.54*	*10.18*	*0.11*	*2.49*	*2,664.0*
	Proposed – Comparison Portion for Alternative 9D, 9E, 9F, 9G, 9H	57.2	34.29	11.55	117.07	50.63	0.55	12.41	1,3250.4
	Alternative 9F	62.90	37.71	12.70	128.74	55.67	0.60	13.65	14,571.7
	Net Change	*5.74*	*3.44*	*1.16*	*11.76*	*5.08*	*0.05*	*1.25*	*1,330.7*
	Proposed – Comparison Portion for Alternative 9D, 9E, 9F, 9G, 9H	57.2	34.29	11.55	117.07	50.63	0.55	12.41	1,3250.4
	Alternative 9G	56.43	33.83	11.40	115.50	49.94	0.54	12.24	13,072.7
	Net Change	*-0.73*	*-0.44*	*-0.15*	*-1.49*	*-0.64*	*-0.01*	*-0.16*	*-168.3*
	Proposed – Comparison Portion for Alternative 9D, 9E, 9F, 9G, 9H	57.2	34.29	11.55	117.07	50.63	0.55	12.41	1,3250.4
	Alternative 9H	60.96	36.54	12.31	124.76	53.95	0.58	13.23	14,121.4
	Net Change	*3.80*	*2.28*	*0.77*	*7.78*	*3.36*	*0.04*	*0.82*	*880.4*

1/ Alternative 7J connects with Segment 9 approximately 25.8 miles west of the proposed Cedar Hill Substation, which is the western terminus of Segment 7 and the beginning point for Segment 9. The table above compares 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

date. The Schedule Variation proposes that the first single-circuit transmission line in Segments 2, 3, and 4 would be built as soon as a ROW grant is issued, but that the second line would not begin construction until late 2018. This would mean nearly 2 years between the end of construction for the first line and beginning of construction for the second line. Any staging areas and fly yards that had been used for the first stage would have been revegetated after construction was complete and would have to be cleared again. There would be two sets of construction disturbances adding movement, noise, and dust to the area of construction in two instances in any given area.

The basic emissions, in terms of amounts of fugitive dust and exhaust pollutants, would be essentially the same as under the Design Variation. The primary difference would be that the Schedule Variation construction emissions would be allocated over a period of approximately 96 months.

Additionally, the Schedule Variation would require multiple mobilizations (minimum of two) as compared to the Design Variation. Mobilization emissions have not been quantified here due to the inherent problems in defining and acquiring data about mobilization parameters. However, the Schedule Variation would have a slight increase in both fugitive and exhaust emissions due to mobilizations as compared to the Design Variation, but the difference is anticipated to be insignificant.

The Schedule Variation would result in some of the substations being constructed over a longer period of time as compared to the anticipated Proposed Action schedule of approximately 61 months. Substation construction fugitive emissions are based upon the acreage to be disturbed during construction, and as such, the only anticipated change as a result of the extended period would be that the same basic amount of fugitive emissions would be allocated out over a longer period of time. The amounts of equipment exhaust emissions associated with substation construction are not anticipated to change, but rather, they too would be allocated out over a longer period of time.

3.20.2.7 Proposed and Alternative Route Conclusions

Construction emissions are not anticipated to be significant in terms of ambient impacts to receptors along the Proposed Route, for the Proposed Action or the Design or Schedule Variations, due to the following:

- Implementation of the EPMs as listed in Section 3.20.2.2;
- Compliance with the Wyoming, Nevada, and Idaho fugitive dust rules per Table 3.20-2;
- Compliance with the construction EPMs per Appendix C;
- Short-term nature of the emissions at any single point along the construction corridor; and
- Overall remote locations of the corridor route and substation sites, i.e., the distances from these areas to population centers, either urban or rural.

Construction emissions data presented herein are estimated to reflect the anticipated worst-case emissions taking into account the action construction schedules. Table 3.20-14 presents a summary comparison of emissions for the Proposed Action, Design Variation, and Schedule Variation.

Table 3.20-14. Emissions Comparison for Proposed Action, Design Variation, and Schedule Variation for Segments 2 through 4

Segment Number	Option[1/]	Emissions[2/]	PM_{10}	$PM_{2.5}$	NO_x	CO	SO_x	VOC
2	Proposed Action	Tons/period	53.5	18.0	182.6	79.0	0.9	19.4
		Tons/month	0.82	0.28	2.81	1.22	0.014	0.3
	Design Variation	Tons/period	54.3	18.3	182.6	79.0	0.9	19.4
		Tons/month	0.84	0.28	2.81	1.22	0.01	0.3
	Schedule Variation	Tons/period	54.3	18.3	182.6	79.0	0.9	19.4
		Tons/month	0.57	0.19	1.9	0.83	0.01	0.2
3	Proposed Action	Tons/period	30.9	10.4	105.4	45.6	0.5	11.2
		Tons/month	0.48	0.16	1.62	0.7	0.008	0.17
	Design Variation	Tons/period	31.4	10.6	105.4	45.6	0.5	11.2
		Tons/month	0.48	0.16	1.62	0.7	0.008	0.17
	Schedule Variation	Tons/period	31.4	10.6	105.4	45.6	0.5	11.2
		Tons/month	0.33	0.11	1.1	0.48	0.005	0.12
4	Proposed Action	Tons/period	115.2	38.8	393.1	170.0	1.8	41.6
		Tons/month	1.77	0.6	6.0	2.6	0.03	0.64
	Design Variation	Tons/period	116.9	39.4	393.1	170.0	1.8	41.6
		Tons/month	1.80	0.61	6.0	2.6	0.03	0.64
	Schedule Variation	Tons/period	116.9	39.4	393.1	170.0	1.8	41.6
		Tons/month	1.22	0.41	4.1	1.77	0.02	0.43

1/ The Proposed Action period is 65 months. The Design Variation period is 65 months. The Schedule Variation period is 96 months. Schedule variations longer than 96 months would result in lower annualized emissions, i.e., lower values than those presented in Table 3.20-9.

2/ Emissions data are derived from Table 3.20-5.

3.20.3 Conclusions

The following conclusions are derived from the analysis presented herein and the support data presented in the Air Quality Technical Report (in the Administrative Record):

- At the present time, there is no known phase or activity proposed to be conducted during the Project that is not consistent with current air quality plans in Idaho, Wyoming, or Nevada.
- Neither the construction nor operations phase of the proposed Project is expected to: (1) exceed state or federal general conformity thresholds, (2) cause any adverse impacts to air quality related values, (3) cause any adverse impact to air quality-related values in a federal Class I area or state wilderness area, or (4) exceed the PSD emissions thresholds of 250 tons per year of any attainment pollutant.
- Neither the construction nor operations phase of the proposed Project is expected to: (1) contribute to any new violation of any state or federal ambient air

quality standard in the Project area, (2) interfere with the maintenance or attainment of any state or federal ambient air quality standard in the Project area, (3) increase the frequency or severity of any existing violations of any state or federal ambient air quality standard in the Project area, or (4) delay the timely attainment of any standard, interim emission reduction, or other air quality milestone promulgated by the USEPA or state air quality agency.

- Considering the Proposed Route location, and the fact that the impacts from construction and/or operations would occur overwhelmingly within the right-of-way corridor, no sensitive receptor impacts are expected.
- Construction GHG emissions are expected to be both temporary and insignificant when compared to the preliminary statewide GHG inventories. Operations GHG emissions would be *de minimus* and insignificant.

3.20.4 Mitigation Measures

To minimize or avoid impacts on air quality, the Proponents have committed to EPMs that would be implemented Project-wide as outlined in this section and in Appendix C.

The following mitigation measures have been identified by the Agencies and are required on federally managed lands. The Proponents have agreed to incorporate these measures into their EPMs and apply them Project-wide.

AIR-1 Minimize idling time for diesel equipment whenever possible.

AIR-2 Ensure that diesel-powered construction equipment is properly tuned and maintained, and shut off when not in direct use.

AIR-3 Prohibit engine tampering to increase horsepower.

AIR-4 Reduce construction-related trips as feasible for workers and equipment, including trucks.

3.21 ELECTRICAL ENVIRONMENT

This section provides a description of the electrical environment of the existing and proposed transmission lines. The predicted levels of electric and magnetic fields, audible noise, and radio noise are calculated for the Proposed Route and Route Alternatives. Potential induced or stray voltages from the transmission lines are discussed, as are potential impacts on equipment used near the lines such as satellite receivers, GPS units, and cell phones.

3.21.1 Affected Environment

This section discusses those aspects of the environment that could be impacted by the Project. It starts with a discussion of the Analysis Area considered, identifies the issues that have driven the analysis, and characterizes the existing conditions across the Proposed Route and Route Alternatives in Wyoming, Nevada, and Idaho.

3.21.1.1 Analysis Area

The affected environment includes the area of land directly under and adjacent to the proposed transmission lines and alternatives. By design, expected levels of electric and magnetic field, audible noise, and radio noise would be at or below accepted guidelines at the edge of the proposed ROWs (in the range of 60 to 150 feet from the centerline of the ROW for the proposed line designs). For informational purposes, profiles of these levels are calculated and plotted out to a distance of 300 feet beyond either side of the centerlines of the Proposed Route and Route Alternatives.

3.21.1.2 Issues to be Analyzed

Issues often associated with the electrical environment of proposed transmission projects that were considered consist of the following:

- Whether voltage on the conductors of the transmission lines would build up, for example in large vehicles or pivot irrigation systems, and produce nuisance shocks, or lead to fuel ignition;
- Whether EMF associated with transmission lines would cause health effects;
- Whether the audible noise during operations would be loud enough to be annoying or interfere with normal communication;
- Whether stray voltage would be a concern in the context of animal care where unwanted voltage on feeders, watering stations, or equipment such as milking machines, can lead to reduced food or water intake; and
- Whether services such as GPS receivers, satellite dish receivers, cell phones, AM/FM radio, television, and internet would be disrupted.

3.21.1.3 Regulatory Framework

Applicable guidelines or regulations at the federal, state, or local level that may apply to the electric and magnetic fields, audible noise, or radio noise of the proposed transmission lines are discussed in this section.

Electric and Magnetic Fields

No federal regulations or guidelines apply directly to the electric and magnetic field levels for the lines in Wyoming, Nevada, and Idaho proposed for the Gateway West Project. The federal government performed an extensive review of field related issues in the 1990s that resulted in the decision that regulatory actions were not warranted (NIEHS 1999).

Although there are no federal regulations on low frequency electric and magnetic fields in the United States, recommendations and guidelines exist within the international community. Table 3.21-1 lists electric and magnetic field guidelines recommended by the European Union, the International Committee on Electromagnetic Safety, and the International Commission on Non-Ionizing Radiation Protection, an affiliate of the World Health Organization (ICES 2002; ICNIRP 1998). Table 3.21-2 lists electric and magnetic field level regulations that have been set in other states.

Table 3.21-1. International Guidelines for AC Electric and Magnetic Field Levels

Agency	Location	Electric Field	Magnetic Field
European Union General Public Exposure	Edge of ROW	4.2 kilovolt per meter (kV/m)	0.833 G
International Committee on Electromagnetic Safety (ICES) Occupational Exposure 1/	Within ROW	10 kV/m	27.1 G
General Public Exposure	Edge of ROW	5 kV/m	9.04 G
International Commission on Non-Ionizing Radiation Protection (ICNIRP) Occupational Exposure	Within ROW	8.3 kV/m	4.17 G
General Public Exposure	Edge of ROW	4.2 kV/m	0.833 G

1/ 20 kV/m in controlled occupation setting
Magnetic fields are measured in Gauss (G) and milligauss (mG). Please note that 1 G = 1,000 mG.

Table 3.21-2. State Regulated AC Electric and Magnetic Field Levels

State	Location	Electric Field	Magnetic Field
Florida			
500-kV Lines	Within ROW	10 kV/m	NA
- single circuit	Edge of ROW	2 kV/m	200 mG
- double circuit		2 kV/m	250 mG
230 kV or less	Within ROW	8 kV/m	NA
	Edge of ROW	2 kV/m	150 mG
Minnesota	Within ROW	8 kV/m	NA
Montana	Within ROW – road crossing	7 kV/m	NA
	Edge of ROW	1 kV/m 1/	NA

Table 3.21-2. State Regulated AC Electric and Magnetic Field Levels (continued)

State	Location	Electric Field	Magnetic Field
New Jersey	Within ROW Edge of ROW	NA 3 kV/m	NA NA
New York	Within ROW – open Within ROW – public road Edge of ROW	11.8 kV/m 7 kV/m 1.6 kV/m	NA NA 200 mG
North Dakota	Within ROW Edge of ROW	9 kV/m NA	NA NA
Oregon	Within ROW Edge of ROW	9 kV/m NA	NA NA

1/ Can be waived by landowner.
NA = Not Applicable. No requirements.

Seven states have adopted limits for electric field strength either at the edge or within the ROW of the transmission line corridor. Only Florida and New York currently limit magnetic fields levels from transmission lines. The magnetic field levels set in those two states only apply at the edge of the ROW and were based on an objective of preventing field levels from increasing beyond levels currently experienced by the public.

Audible Noise

There are no federal regulatory requirements for the audible noise level from transmission lines. The USEPA has audible noise guidelines developed for the protection of public health and welfare that are widely accepted by state and local governments for the long-term exposure to environmental noise (USEPA 1974). The USEPA employs the equivalent sound level (L_{eq}) and day-night sound level (L_{dn}) metrics in its guidelines. The L_{eq} is the energy averaged sound level over a specified time, whereas the L_{dn} is a 24-hour average sound level that includes a 10 dBA penalty to sound levels during nighttime hours (10:00 pm – 7:00 am). The USEPA guideline lists an L_{dn} of 55 dBA to protect the public from interference to activity or annoyance outdoors in residential areas.

Table 3.21-3 provides a summary of the USEPA audible noise guidelines.

Neither Idaho, Nevada, nor Wyoming has environmental noise regulations with dBA limits applicable to the Gateway West Project.

Table 3.21-3. Summary of USEPA Guidelines for Audible Noise

Location	Level	Concern
All public accessible areas with prolonged exposure	70 A-weighted decibels (dBA) $L_{eq(24h)}$	Protection for safety/hearing loss
Outdoor at residential structures or other noise sensitive areas where large amounts of time spent	55 dBA L_{dn}	Protection against annoyance and activity interference
Outdoor areas where limited amounts of time are spent (parks, school yards, golf courses, etc.)	55 dBA $L_{eq(24h)}$	
Indoor residential	45 dBA L_{dn}	
Indoor non-residential	45 dBA $L_{eq(24h)}$	

Radio Noise

Neither Idaho, Nevada, nor Wyoming nor any other state has limits for either radio interference or television interference. Electromagnetic interference from power transmission systems in the United States is governed by the Federal Communication Commission (FCC) Rules and Regulations (FCC 1988). A power transmission line is categorized by the FCC as an "incidental radiation device." It is defined as "a device that radiates radio frequency energy during the course of its operation although the device is not intentionally designed to generate radio frequency energy." Such a device "shall be operated so that the radio frequency energy that is emitted does not cause harmful interference. In the event that harmful interference is caused, the operator of the device shall promptly take steps to eliminate the harmful interference." In this case, "harmful interference" is defined as "any emission, radiation or induction which endangers the functioning of a radio navigation service or of other safety services or seriously degrades, obstructs or repeatedly interrupts a radio communication service operating in accordance with this chapter" (FCC 1988).

Complaints related to corona-generated interference are infrequent. The advent of cable or satellite television with the move to digital broadcast television in June 2009 also reduces the possibility of corona-generated interference. Cable, satellite, and digital broadcast are generally not subject to corona-generated interference. Electric power companies have been able to work quite well under the present FCC rule because harmful interference can generally be eliminated or effectively mitigated.

3.21.1.4 Methods

Algorithms developed by BPA that have been validated and used by engineers and scientists for many years were used to calculate the expected levels of electric field, magnetic field, audible noise, and radio noise that may be produced by the proposed Gateway West transmission lines. These calculation techniques are contained in the CAFÉ (Corona and Field Effects) program from BPA (n.d.). The inputs to the model are line voltage, load flow (current), and the physical dimensions of the line (conductor diameter, spacing, and height). The electric and magnetic field values were calculated at a reference height of one meter above ground. For modeling purposes, it was assumed that the maximum voltage of the 500-kV circuits was 10 percent above the nominal 500-kV value and voltage of the lower voltage 230-kV circuits was 5 percent above the nominal value. Proposed and alternative ROW dimensions, location of existing and proposed lines, and electrical loading were provided by the Proponents.

Table 3.21-4 lists the Gateway West proposed design line segments with the characteristics and the peak loadings used for calculation of the magnetic fields. In some cases such as Segment 1W and a portion of Segments 1E, 2, 4, 5, 8, and 9, the proposed transmission line runs in parallel with other lines but at a separation of at least 1,500 feet[1]. Although the lines would be in parallel, this separation distance is great enough that the electric and magnetic fields and audible and radio noise levels from the

[1] The proposed single-circuit 500-kV line between Cedar Hill and Hemingway and for one alternative would parallel but be offset 175 feet from an existing 138 kV line. In this case the peak electric and magnetic fields would be due primarily to the 500-kV line due to the large difference in line voltage and design.

Table 3.21-4. Line Segments

Segment Designation	Connecting Point A – Point B	Line Description	Line Status	Type	Peak Loading
1E (1-2)	Windstar – Aeolus	Single Circuit – 230 kV	New	H-frame pole	280 MW
1W(a) (1-2)	Windstar – Aeolus	Single Circuit – 230 kV	New and Rebuilt	H-frame pole	318 MW
1W(c) (1-2)	Dave Johnston – Aeolus	Single Circuit – 230 kV	New and Rebuilt	H-frame pole	327 MW
2 (2-3)	Aeolus – Creston	Double Circuit 500/230 kV	New	Dbl Circuit lattice tower	1,500 MW/ 350 MW
3 (3-4)	Creston – Bridger	Double Circuit 500/230 kV	New	Dbl Circuit lattice tower	1,500 MW/ 350 MW
4 (4-5)	Bridger – Populus	Double Circuit 500/500 kV	New	Dbl Circuit lattice tower	1,500 MW/ 1,500 MW
5 (5-6)	Populus – Borah	Single Circuit – 500 kV	New	Lattice Tower	1,500 MW
6 (6-8)	Borah – Midpoint	Single Circuit – 500 kV	No construction	Lattice tower	1,500 MW
7 (5-9)	Populus – Cedar Hill	Single Circuit – 500 kV	New	Lattice tower	1,500 MW
8 (8-10)	Midpoint – Hemingway	Single Circuit – 500 kV	New	Lattice tower	1,500 MW
9 (9-10)	Cedar Hill – Hemingway	Single Circuit – 500 kV	New	Lattice tower	1,500 MW
10 (8-9)	Midpoint – Cedar Hill	Single Circuit – 500 kV	New	Lattice tower	1,500 MW

lines would not be affected by the presence of the other line and thus can be treated and shown separately. This is illustrated in Figure 3.21-1 and Figure 3.21-2.

Figure 3.21-1 illustrates the electric field profile for Segment 1W, which has two parallel transmission lines (1W[a] and 1W[c], both of which require a reconstruction of an existing 230-kV line as well as the construction of a new line for portions of their length). Segments 1W(a) and 1W(c) are 1,500 feet from each other. Both lines have been considered in the calculation of the electric field profile across the distance of 1,500 feet plus 500 feet on either side of the lines for a total plot width of 2,500 feet.

Figure 3.21-2 is a plot of the electric field over the same distance but the electric field has been calculated individually for each line as if it was the only line present and then plotted on the graph. As can be seen by comparing Figure 3.21-1 and Figure 3.21-2, there is little if any difference in the plots for the two cases when the lines are separated by 1,500 feet. Comparisons for magnetic field, audible noise, and radio noise show similar results when the transmission lines are separated by 1,500 feet.

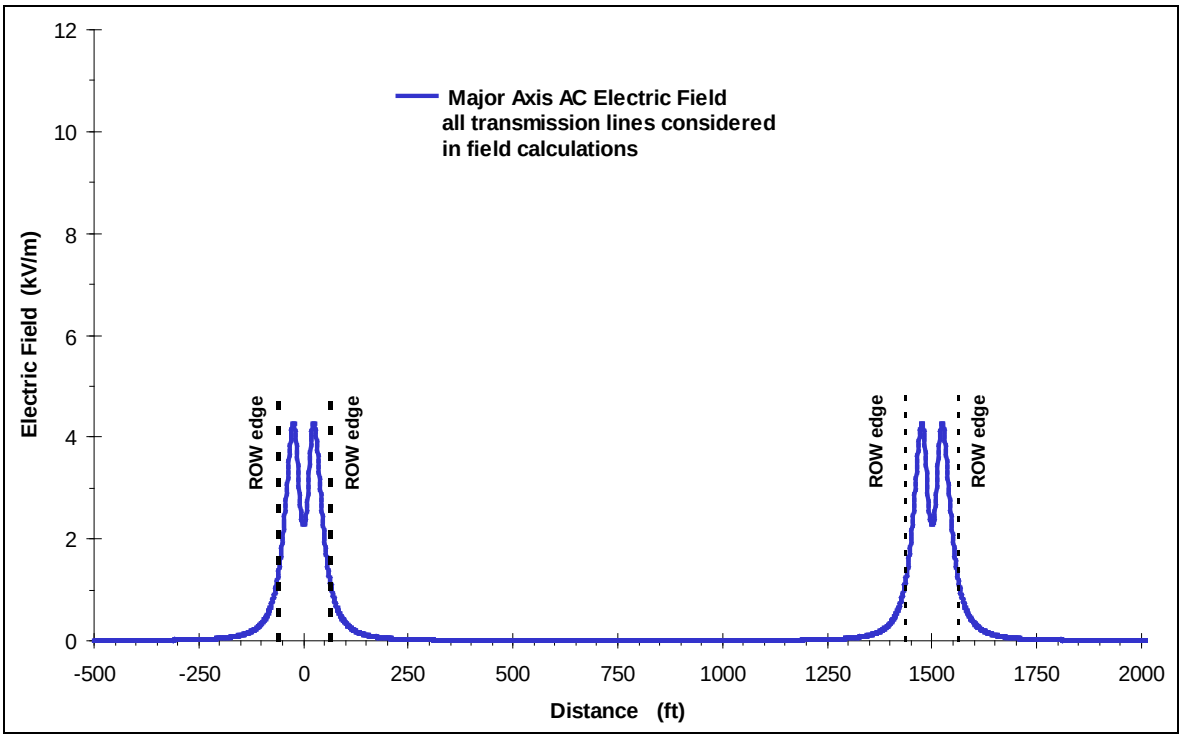


Figure 3.21-1. Plot of the Electric Field for Segment 1W Considering Two Parallel Lines 1W(a) and 1W(c) Separated from Each Other by 1,500 Feet in the Electric Field Calculations

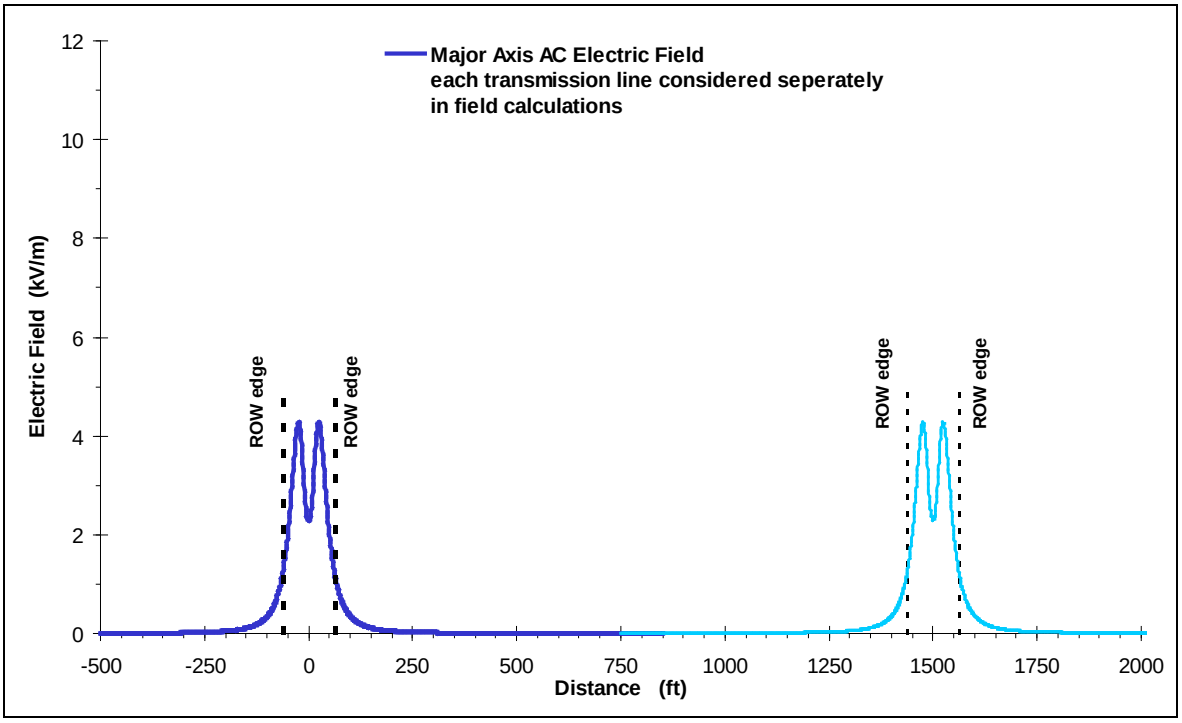


Figure 3.21-2. Plot of the Electric Field for Segment 1W Calculating the Electric Fields Separately for each of the Two Parallel Lines 1W(a) and 1W(c)

A 35-mile segment of the Segment 1W corridor would have a third 230-kV line (Segment 1E) parallel but separated by 1,500 feet. Similar to two 230-kV lines separated by 1,500 feet, a third line would result in little difference for the magnetic field, audible noise, and radio noise.

Existing Conditions

Existing levels of audible noise, radio noise, and electric and magnetic field are generally at ambient levels since there are no existing high-voltage transmission lines near the proposed Gateway West facilities (due to the required 1,500 feet of separation). Exceptions occur where existing and proposed transmission lines converge on substations and the short segment of 138-kV line paralleled on Segment 9. See Table 3.21-5 for a list of existing ambient levels of audible noise, radio noise, and electric and magnetic field.

Table 3.21-5. Existing Ambient Levels

Electric Field (kV/m)	Magnetic Field (mG)	Audible Noise (dBA in rain)	Radio Noise dB (1μV/m in rain)
0.1 kV/m to 10 kV/m Earth's static field	500 to 600 mG Earth's static field	30 to 55 dBA depending on terrain, vegetation, and wind and rain intensity	30 to 45 dB(1μV/m) depending on season and atmospheric activity

Existing electric and magnetic fields are essentially the static natural electric field of the earth, which is due to atmospheric conditions and can range from a few hundred volts/meter to kilovolts/meter, and the natural magnetic field of the earth, which is in the range of 500 milligauss (mG) to 600 mG; however, both of the fields are essentially static or slowly varying instead of oscillating 60 times per second like AC electric and magnetic field associated with a typical AC powerline. Much of the area crossed is open range and cultivated fields. Smaller areas of desert, forest, and scattered residential conditions also occur. Existing general levels of audible noise levels are at ambient conditions that range from 20 to 40 dBA due to air movement through brush and trees depending on local terrain and vegetation conditions (see Section 3.23 for more discussion of noise). Local individual sources such as animal calls or human activity can produce audible noise levels exceeding 60 dBA. Existing ambient levels of radio noise are due to atmospheric activity and are at approximately 30 to 40 dB (1 microvolt per meter [μV/m]) at 1 megahertz (MHz) depending on season and the amount of storm activity.

Electric and Magnetic Fields

Electric and magnetic fields are associated with the operation of AC powerlines or devices supplied with AC electricity. Electric and magnetic fields are sometimes referred to as EMF. These fields describe properties of a location or point in space and its electrical environment, including the forces that would be experienced by a charged body in that space by virtue of its charge or the movement of charges. The voltage, which is the "pressure," produces an electric field that moves the electricity through wires. The current produces a magnetic field, which is a measure of how much electricity is flowing. Thus, wherever there is electric current flowing (including through any type of wiring), there is both an electric and a magnetic field.

The standard unit for measuring the strength of an electric field is volts per meter (V/m). The unit in which magnetic field levels are measured is mG. Electric and magnetic fields are characterized by the frequency at which their direction and magnitude oscillate each second. The fields produced by the use of electricity oscillate at a frequency of 60 cycles per second, or 60 hertz (Hz). Electric and magnetic fields collectively are sometimes referred to as EMF although the term EMF is often used in reference to just the magnetic field.

Typical sources of these fields include powerlines (both transmission and distribution lines), home and office appliances, tools, building wiring, and currents flowing on water pipes. The importance of these sources to overall exposure varies considerably. For example, if a residence is very close, such as within 50 feet to a transmission line or even a distribution line (which runs near most everyone's residence), these sources could be the dominant, but not necessarily the only, source of magnetic fields in the home. Depending on the circumstances, other sources may be of equal or greater importance. For example, a random survey of 1,000 residences in the United States reported that currents flowing on water pipes and on other components of house grounding systems are twice as likely as outside powerlines to be the source of the highest magnetic fields measured in homes (Zaffanella 1993).

Electric-field levels depend primarily on the line's voltage; the higher the voltage on the line, the higher the electric field levels associated with that line. Little variation is expected with electric field levels from a powerline because a line's voltage does not vary significantly. Conducting objects including fences, shrubbery, and buildings easily block electric fields. Magnetic-field levels depend primarily on the current, or load, flowing on the line; as electricity demand increases and the current on the line increases, the magnetic field levels associated with the line generally increase. The transmission of electric power at a higher voltage (e.g., at 500 kV) reduces the current flow on the line to a level below that required to transport the same amount of power over lower-voltage lines. Both electric and magnetic field levels decrease rapidly with distance from a distribution or transmission line.

Audible and Radio Noise

Audible and radio noise occur when the 60 Hz electric fields at the surface of powerline conductors are large enough to cause a local breakdown in the insulating properties of the air. This electrical breakdown of the air or ionization of the air, at the surface of the conductor is called corona. Corona is a small "spark" or electrical breakdown in the air surrounding the conductor. This small "spark" into the air produces audible and radio noise. If there is sufficient corona activity, audible noise and radio/television noise can be noticeable within a few hundred feet of the transmission line, and small amounts of ozone and nitrous oxide can be released. These effects are most pronounced directly underneath the line conductors, and decrease with distance from the transmission line.

Corona activity depends on a number of factors such as altitude, line voltage, conductor size, conductor geometry, and weather conditions. The breakdown strength of air is 30 kV per centimeter at sea level and decreases with increasing altitude. For a particular altitude, conductor size and line voltage are taken into consideration when designing a transmission line so that the electric fields at the conductor surface do not exceed the breakdown potential of air. However, for lines with a voltage equal to or

greater than typically 345 kV, any irregularities on the conductor surface (e.g., nicks, water droplets, or debris) may create points where the electric field is intensified sufficiently to produce corona. In inclement weather, moisture such as raindrops or snowflakes accumulating on the conductor surface would also act as points for corona inception. Corona activity is, therefore, most likely to occur on high-voltage transmission lines at higher altitudes during inclement weather if it occurs. High-voltage transmission lines are designed to avoid corona levels that would be likely to cause electronic or audible interference. These factors can be addressed and mitigated if necessary through design choices for the transmission line such as conductor size and bundling as well as general geometry of the transmission.

Audible Noise – The air breakdown, or small spark caused by corona at the surface of a transmission line conductor, is accompanied by a snapping sound. If there is sufficient corona activity on a high-voltage line, many small snaps from corona sources along a conductor may be sufficient, in combination, to produce discernible audible noise or crackle at the edge of the ROW. At lower system voltages (voltages below 230 kV), audible noise from the transmission-line conductors is typically not formally evaluated because of the very low levels of corona activity and correspondingly low occurrence of corona effects. For lines at higher voltages (345 kV and above) with higher conductor-surface gradients, corona activity is more likely and audible noise more frequent, particularly in inclement weather, and is therefore taken into account in the design of the transmission line.

Sound intensity is measured in decibels referenced to 20 micropascals, which is approximately the pressure threshold of human hearing at 1 kilohertz (kHz). The range of audible frequencies for the human ear is from approximately 20 Hz to 20 kHz, with peak sensitivity near 1 kHz. The change in sensitivity of the human ear with frequency is reflected in measurements by weighting the contribution of sound at different frequencies. The weighting of sound over the frequency spectrum to account for the sensitivity of the human ear is called the A-weighted sound level. When the A-weighting scale is applied to a sound-pressure measurement, the level is often reported as dBA.

The sound intensity of typical human speech is approximately 60 to 70 dBA, and background levels of noise in rural environments are about 30 to 40 dBA. Specific identifiable noises such as birdcalls, neighborhood activity, and traffic can produce background audible noise levels of 50 to 70 dBA or higher.

Radio Noise – The impulsive corona currents cause wide-band electric and magnetic “noise” fields. This radio noise spans the frequency spectrum from below 100 kHz to approximately 1,000 MHz. Inclement weather and high altitude increase radio noise levels. This noise from transmission lines can produce interference to an AM signal such as a commercial AM radio audio signal (i.e., radio noise) or the video portion of a TV station (i.e., TV noise). FM radio stations and the audio portion of a TV station signal (which is also frequency modulated) are generally not affected by noise from a transmission line. Radio noise is measured in units of dB based on its field strength referenced to a signal level of 1 μV/m (IEEE 1986). Like audible noise, since it is due to corona activity, radio noise is more likely for lines at higher voltages (345 kV and above) with higher conductor-surface gradients, particularly at higher altitudes and in inclement

weather. Radio noise performance is considered in the design of higher voltage lines at 345 kV and above.

Other Conditions

Electromagnetic Interference to GPS, Satellite Receivers, Cell Phones, and Community Communication Systems – GPS units, satellite receivers, cell phones, and community communication systems typically operate at high frequencies in the tens to hundreds of megahertz or even into the gigahertz range. These systems also often use FM or digital coding of the signals so that they are relatively immune to the electromagnetic interference from transmission line corona.

GPS units are used in a wide range of activities including several important agricultural activities in the study area such as monitoring pivot irrigation, tracking wheeled and tracked equipment movements during farming operation, and checking the orientation of aerial spraying aircraft. GPS units operate in the frequency range of 1.2 to 1.6 gigahertz. Tests with satellite receivers operate at frequencies from 3.4 gigahertz to 7 gigahertz and have shown no effect from transmission lines unless the receiver was trying to view the satellite through the transmission tower or the conductor bundle of the transmission line. Repositioning the receiver by a few feet was sufficient to eliminate the obstruction and reduced signal. Mobile phones operate in the radiofrequency range of about 800 million Hz, 1,900 million Hz, or higher frequencies. A million hertz is 1 MHz. Electric and magnetic fields at these high frequencies have very different physical characteristics from 60 Hz power frequency electric and magnetic fields. Due to the frequencies used by these devices and the modulation and processing techniques used, interference effects are unlikely.

Modern farming equipment uses GPS to guide tractors used for planting, cultivation, and harvesting. Modern guidance systems have an accuracy of 1 to 2 inches. Comments from local farmers indicate that powerlines can interfere with these GPS guidance systems, make them far less accurate, being off from 1½ to 4½ feet. If so, inefficiencies could result in wasted fuel, increased labor costs, and under- or over-fertilizing resulting in reduced productivity.

The Proponents report that they do not specifically track reports of interference with GPS tractor navigation systems; however, in the Magic Valley area of Idaho these systems are widely used and there are several existing transmission lines up to 500 kV crossing the area. They report that over the last 10 years they have not been contacted about interference with tractor GPS navigation systems. Users of these systems have expressed concerns about the possibility of interference, but no specific examples have been reported (IPC 2010).

It should be noted that GPS accuracy can be impacted by many factors including atmospheric conditions; satellite constellation and geometry; the design, quality, and position of the GPS antennas and receivers; signal interference; and “multipath.” Of these, a transmission line and its structures could conceivably contribute to signal interference and multipath.

Signal interference occurs when other signals at the same frequency as the satellite signal are present. Multipath occurs when objects such as buildings or parts of the tractor itself reflect the GPS satellite signal so that the satellite signal arrives at the

receiver later than it would have if it had followed a straight line from the satellite. A study commissioned by the Electric Power Research Institute found that signal interference is "unlikely" based on the design of GPS receivers and their ability to separate the GPS signal from background noise (Silva and Olsen 2002). Another study compared the accuracy of real-time kinematic GPS receivers at different locations with respect to transmission lines and towers (Gibblings et al. 2001). This study concluded that multipath from transmission towers could result in GPS system initialization errors (i.e., the system reports the wrong starting location) 1.1 percent to 2.3 percent of the time. This study also reported that the GPS system software was able to identify and correct these initialization errors within the normal startup time. This study reported initialization errors due to electromagnetic interference from energized overhead transmission lines when the GPS receiver was located outside the vehicle, but concluded that "most, if not all of this effect can be eliminated by shielding the receiver and cables." Placing the receiver inside the vehicle used in the study significantly reduced the initialization errors.

Field Induction (induced currents and nuisance shocks) – The electric fields associated with a transmission line can induce small electric currents in metallic objects adjacent to or under transmission lines. Metallic roofs, vehicles, equipment, and fences are examples of objects that can develop a small electric charge when in proximity to high-voltage transmission lines. The amount of induced charge depends on the characteristics and size of the object, its grounding, and the electric field strength. An electric current can flow when an object has an induced charge and a path to ground. The amount of current flow is determined by the impedance of the object to ground and the voltage induced between the object and ground. The amount of induced current that can flow is important for evaluating the potential for nuisance shocks to people and the possibility of other effects such as fuel ignition.

The threshold of perception is approximately 1 mA for humans (Dalziel and Mansfield 1950). If the current is increased sufficiently beyond a person's perception threshold, it can become bothersome and possibly startling. Larger currents can cause the muscles of the arm and hand to involuntarily contract so that a person cannot let go of an object. The value at which 99.5 percent of men, women, and children can still let go of an object is approximately 9, 6, and 5 mA, respectively. Transmission lines are designed such that the maximum amount of current induced on the largest metallic object normally expected under the line would be less than 5 mA.

In the process of establishing contact with a vehicle or metallic object under a transmission line, a small arc may occur. This is often called a nuisance shock since it can be annoying. Nuisance shocks and induced currents can be eliminated by proper grounding of the object, shielding it from electric fields, or positioning it farther from the transmission line.

Idaho Power has received reports of shocks from fences near transmission lines. In these cases, the fences were electric fences that were insulated from the earth. Persons working on the insulated fence wire could in some instances experience a shock when they contacted the fence wire. This phenomenon is due to the fact that the fence wire is insulated from the earth, while being surrounded by an electric field.

Similar shocks can be experienced when contacting vehicles or irrigation pivots located close to a transmission line. The shock is similar to a static shock. The NESC addresses this issue, limiting the steady-state current that can flow between an object and the earth near a transmission line to 5 mA. This is considered to be a safe level. In the cases reported to Idaho Power, engineers have responded by checking the voltage at the fence or other objects to ensure that the 5 mA limit is not exceeded, and then providing suggestions to the customer on ways to eliminate the issue while working on their equipment. This issue is well understood and can be mitigated with proper grounding of the equipment or structure. The transmission line clearances are designed to prevent the 5 mA limit described above from being exceeded at objects such as vehicles with rubber tires that would be difficult to ground.

Stray Voltage –.Stray voltage refers to a phenomenon that is primarily of concern in wet environments usually involved with an AC distribution system. Transmission lines such as the one proposed are not normally associated with the phenomenon of stray voltage because the transmission line is a balanced, three-phase line without any direct electrical connection to end-user facilities.

In the Gateway West study area, wet environments may include dairy barns or feedlots. Stray voltage issues may occur when an animal makes contact with a metal object that is at a different potential from another point in contact with the animal (i.e., the nearby ground or earth potential). This may occur when there is poor grounding or bonding of the metal object to the earth and the electrical ground. For example, faulty or improperly wired motorized appliances, portable electric heaters, and fluorescent lights can lead to stray voltage issues. Metallic fences or large metallic object that are adjacent to, run parallel, or pass under the proposed Gateway West transmission lines may develop a different potential than the surrounding ground if not properly grounded; however, this is easily resolved by grounding the object.

Grounding practices required by the National Electric Code for dairies and similar agricultural facilities are specifically designed to prevent stray voltage issues from impacting these facilities. The Proponents expect to continue to receive and respond to questions about stray voltage and transmission lines and have programs in place to provide on-site testing and education to address these concerns.

Cardiac Pacemakers – Electric and magnetic fields from a variety of sources, including some industrial equipment, automobile ignition wiring, anti-theft devices in stores, magnetic resonance imaging machines, slot machines, cell phones, and certain medical procedures (e.g., radiation therapy, electrocautery, and defibrillation), have been reported to affect the operation of implanted cardiac pacemakers and defibrillators. In theory, pacemaker interference from the electric fields associated with high-voltage transmission lines might be possible depending upon the type of pacemaker, the person's location and orientation under the conductors of the transmission line, and the voltage and design of the transmission line. The manufacturers of pacemakers have designed their devices in various ways to minimize potential interference from external sources, including powerline EMF. For example, the increasingly prevalent bipolar pacemaker models are virtually immune to interference. Medtronic, a leading producer of pacemakers, notifies users of its products to limit their exposure to power frequency

fields to below 6 kilovolts per meter (kV/m) and 1,000 mG to protect against possible electrical interference (Medtronic 2006).

Electrolysis – Electrolysis is a process in which DC voltage is deliberately applied from an external power source to combinations of materials and electrolytes to produce an otherwise non-spontaneous electrochemical reaction or to accelerate a spontaneous electrochemical reaction. For example, electrolysis is used in some metal plating processes and to separate hydrogen and oxygen from water. The transmission system operates using AC voltage and current, which does not produce or accelerate these reactions. Based on the concern raised (see Section 3.21.1.2), it is likely that the commenter is referring to galvanic corrosion, which is a spontaneous electrochemical reaction. Galvanic corrosion may occur when a single material such as an aluminum pipe is placed in different electrolytes along its length, or when different materials such as brass and galvanized steel are physically in contact with each other and are placed in a single electrolyte such as condensation on a cold water pipe and its associated valves. This process will occur whether or not a transmission line is present and is not influenced by the presence of the AC electrical system.

DC voltage is deliberately applied to many underground metallic pipelines to counter the effects of galvanic corrosion. These galvanic protection systems can produce DC voltages between different points on nearby metallic structures, which can accelerate the galvanic corrosion reaction in these structures as described above. Utility transmission towers do not utilize these active galvanic corrosion suppression systems; however, in some instances pipeline ROWs are located close to a transmission line ROW, which may give the impression that accelerated galvanic corrosion is due to the presence of the transmission line.

3.21.2 Direct and Indirect Effects

This section is organized to present first construction, then operation, followed by decommissioning effects from the proposed Project. Route Alternatives are analyzed in detail below in Section 3.21.2.3. There is a Design Variation involving use of two single-circuit structures proposed by the Proponents for Segments 2, 3, and 4 (see Section 2.2 for details), which is analyzed below in Section 3.21.2.4. The Proponents have also proposed a Schedule Variation, analyzed in Section 3.21.2.6, in which one of the two single circuits to be constructed in Segments 2, 3, and 4 and a portion of Segment 1W would be built on an extended schedule with construction beginning approximately 2.5 years after completion of the initial construction.

Mitigation measures or EPMs are presented in detail within this section only if it is the first time they have been discussed in Chapter 3; all other measures are referenced or summarized. A comprehensive list of all Proponent-proposed EPMs and Agency-required mitigation measures can be found in Table 2.7-1 of Chapter 2.

<u>Plan Amendments</u>

Proposed amendments are summarized in Table 2.2-1 of Chapter 2 and detailed in Appendices F and G. Amendments are needed to permit the Project to cross various areas of BLM-managed and NFS lands. Effects described for areas requiring an amendment in order for the Project to be built would only occur if the amendment were

approved. Amendments that later land management designations could change future use of these areas. No amendments specific to the electrical environment are proposed for the Project and no impacts to the electrical environment resulting from approving the amendments beyond the impacts of the project are anticipated.

3.21.2.1 No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed or operated. No Project-related changes in the electrical environment would occur.

3.21.2.2 Effects Common to All Action Alternatives

Electric and Magnetic Fields

Electric Field

During construction of the proposed transmission line, the electric field levels would be at background or ambient levels since the proposed lines would not be energized and are not near pre-existing transmission lines along most of the Proposed Route. Once the lines are energized, the AC electric field levels would increase.

The various segments of the Gateway West Project, as proposed, consist of three line structures: a 230-kV H-frame structure (Appendix B, Figure B-1); a 500-kV single-circuit lattice structure (Figure B-2); and a 500-kV double-circuit lattice structure (Figure B-3). The 500-kV double-circuit lattice structure is further distinguished by its application with either two 500-kV circuits, as designed, or with a 500-kV circuit and the second circuit operated at 230-kV. The conductor location, spacing, and type for the 230-kV circuit on the structure would be physically designed as though for a 500-kV circuit, allowing its operating voltage to be increased to 500-kV at some future point as growth demanded, but for the present time would be operated at 230 kV. Please note that when multiple circuits exist in close proximity (such as with two adjacent structures or with a double-circuit structure) the particular phasing of the conductor bundles in relation to each other will affect the resulting levels of electric field, magnetic field, audible noise, and radio noise and the phasing of all conductor bundles of all the circuits will have to be factored in the calculations. The phase of a particular conductor bundle is indicated as either A, B, or C and the order and phasing of the conductor bundles of a circuit that are used to calculate the electrical levels are indicated as ABC. ABC for a single horizontal circuit indicates that the left conductor bundle is phase A, the middle conductor is phase B, and the right conductor bundle is phase C. CAB would indicate that the left conductor bundle is phase C, the middle conductor bundle is phase A, and the right conductor bundle is phase B.

The major-axis electric field profiles at midspan were calculated at a 1 meter height above ground (IEEE 1994) for these four line types and are plotted in Figure 3.21-3 through Figure 3.21-6. The electric field was calculated at the point of minimum

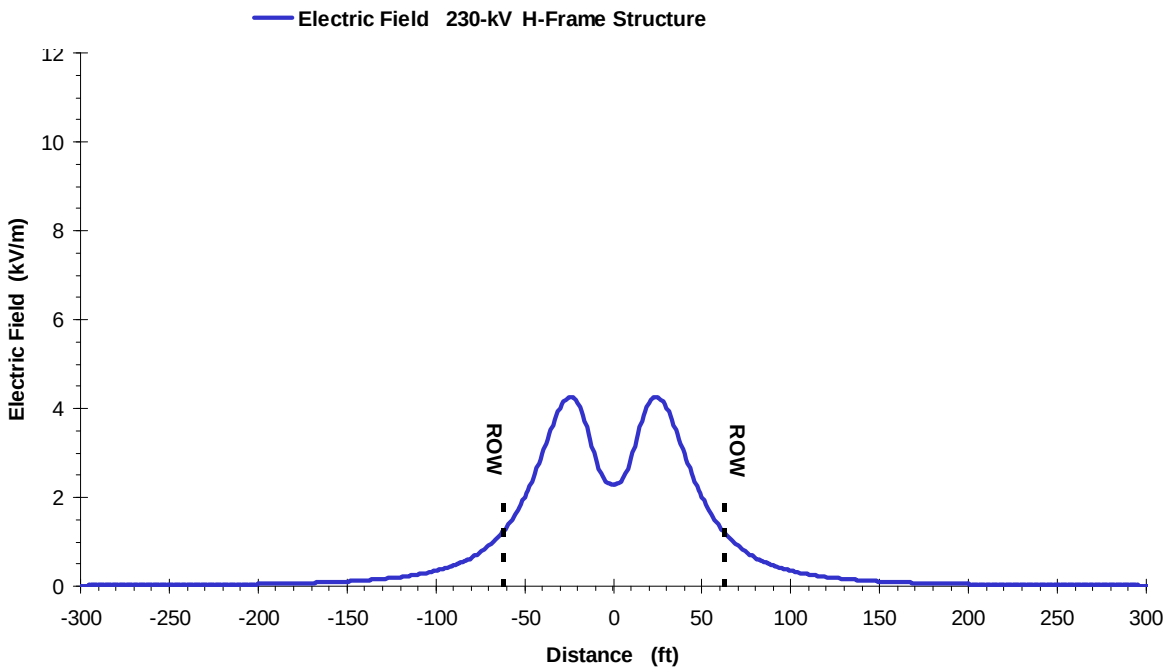


Figure 3.21-3. Electric Field Profile at Midspan for 230-kV H-frame Structure.
Note: Major axis electric field calculated at standard height of 1 meter.

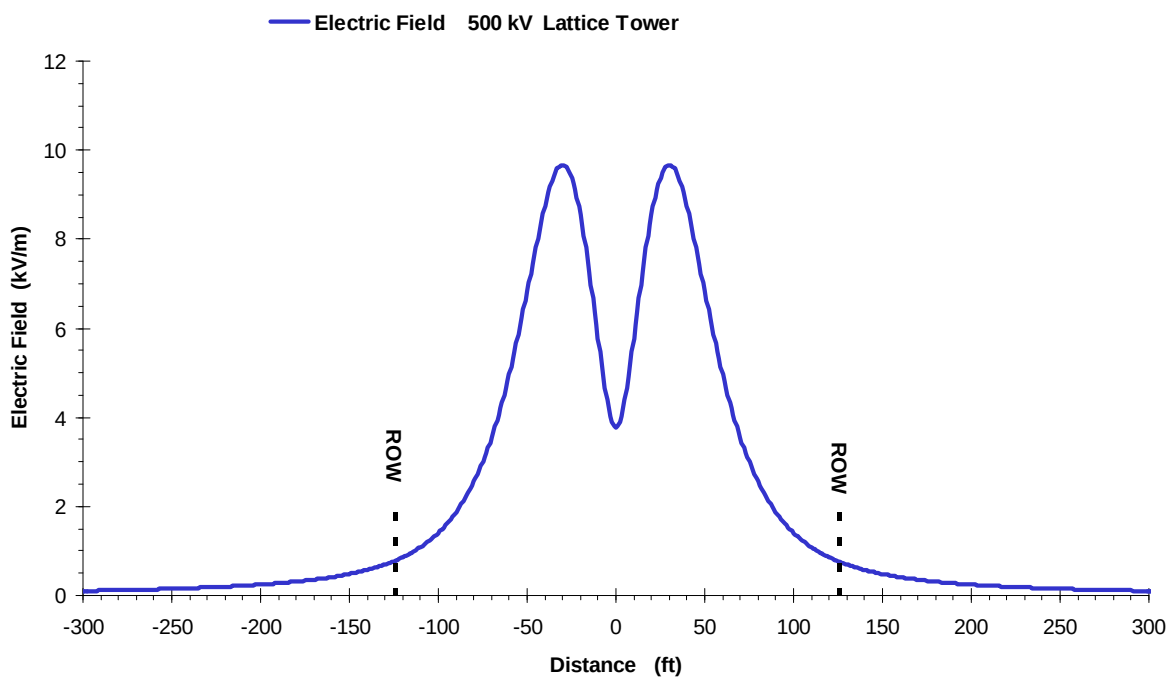


Figure 3.21-4. Electric Field Profile at Midspan for Single-Circuit 500-kV Lattice Structure
Note: Major Axis electric field calculated at standard height of 1 meter above ground.

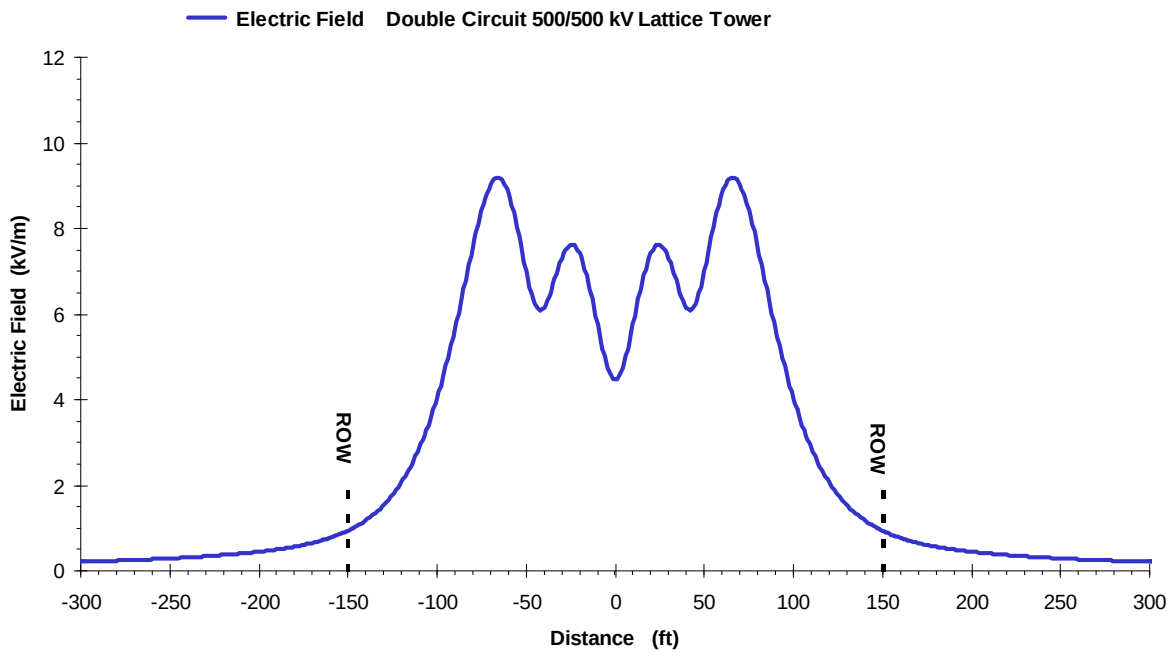


Figure 3.21-5. Electric Field Profile at Midspan for Double-Circuit 500-kV Lattice Structure with two 500-kV Circuits

Note: Conductor phasing from left to right is ABC-ABC. Major Axis electric field calculated at standard height of 1 meter above ground.

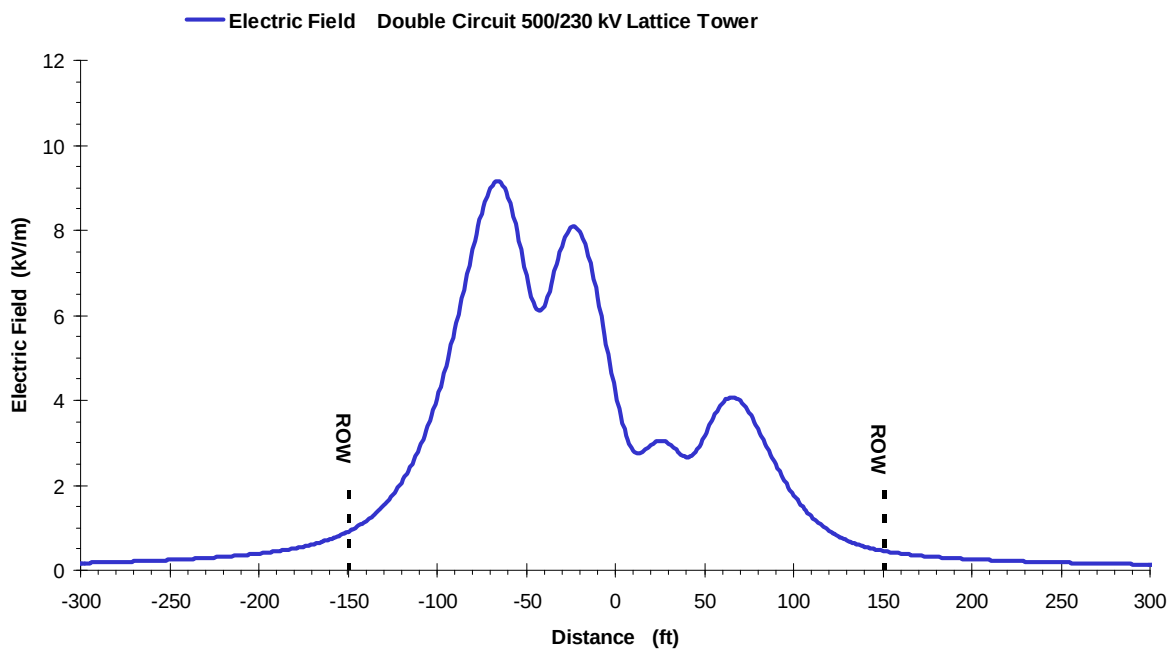


Figure 3.21-6. Electric Field Profile at Midspan for Double-Circuit 500-kV Lattice Structure with a 500-kV Circuit and a 230-kV Circuit

Note: Conductor phasing from left to right is ABC-ABC. Major Axis electric field calculated at standard height of 1 meter above ground.

clearance between the lowest conductor and ground. This occurs at midspan for level terrain. The conductor height used for the 500-kV lines was 35 feet and 28 feet was used for the 230-kV lines (Appendix B, Section 1.1.2). The line height above ground increases as one moves from midspan back toward the tower, which results in lower electric fields under the line. The electric field was calculated with a 10 percent overvoltage for 500-kV lines and a 5 percent overvoltage on 230-kV lines.

The electric fields at the edges of the ROWs and the highest electric field found within the ROW for each of the line segments in the Gateway West Project are listed in Table 3.21-6. The largest electric field calculated at the edge of the ROW was 1.23 kV/m. This level was found along the 230-kV line segments that had ROW widths of 125 feet. Electric fields of 0.94 kV/m or less were found at the ROW edge of the line segments with double-circuit 500-kV structures. Fields of 0.77 kV/m were found at the ROW edge of the single-circuit 500-kV line segments (Segments 5 through 10). The highest electric field found within the ROW was 9.67 kV/m for the single-circuit 500-kV segments (Segments 5 through 10). Slightly lower electric fields (approximately 9.2 kV/m) were found within the ROW for the segments with double-circuit 500-kV structures (Segment 2 and 3 with 500-kV and 230-kV circuits and Segment 4 containing two 500-kV circuits).

Table 3.21-6. Electric Fields

Segment	ROW Width (ft)	South/East ROW Edge (kV/m)	Maximum within ROW (kV/m)	North/West ROW Edge (kV/m)
Segment 1E (230 kV)	125	1.23	4.26	1.23
Segment 1W				
Line 1W(a) (230 kV)	125	1.23	4.26	1.23
Line 1W(c) (230 kV)	125	1.23	4.26	1.23
Segment 2 (500/230 kV)	300	0.91	9.15	0.46
Segment 3 (500/230 kV)	300	0.91	9.15	0.46
Segment 4 (500/500 kV)	300	0.94	9.19	0.94
Segment 5 (500 kV)	250	0.77	9.67	0.77
Segment 6 (500 kV)	250	0.77	9.67	0.77
Segment 7 (500 kV)	250	0.77	9.67	0.77
Segment 8 (500 kV)	250	0.77	9.67	0.77
Segment 9 (500 kV)	250	0.77	9.67	0.77
Segment 10 (500 kV)	250	0.77	9.67	0.77

Major Single Axis Electric Field at standard height of 1 meter.
Ground Clearance: 35 feet for 500-kV lines; 28 feet for 230-kV lines.
Electric fields are calculated at a standard height of 1 meter above ground.
Field levels along the route are within state requirements.

Magnetic Field

The magnetic field levels during the construction phase of the proposed Project would be at background or ambient levels since the proposed lines would not yet be energized except for portions of Segment 1W(a) and 1W(c). For 1W(a) and 1W(c), the portion of these routes that would consist of an existing 230-kV line would be rebuilt as part of the Project. Once the lines are energized, the AC magnetic fields would increase to those described in Table 3.21-7. The major-axis magnetic field profiles at midspan (point of closest approach of conductors to ground) were calculated for the four line types and are plotted in Figures 3.21-7 through 3.21-10. The magnetic fields at the edges of the

Table 3.21-7. Magnetic Fields (Peak Loading)

Segment	ROW Width (ft)	South/East ROW Edge (mG)	Maximum within ROW (mG)	North/West ROW Edge (mG)
Segment 1E (230 kV)	125	41	171	41
Segment 1W				
Line 1W(a) (230 kV)	125	47	194	47
Line 1W(c) (230 kV)	125	47	196	47
Segment 2 (500/230 kV)	300	48	258	32
Segment 3 (500/230 kV)	300	48	258	32
Segment 4 (500/500 kV)	300	53	249	53
Segment 5 (500 kV)	250	37	311	37
Segment 6 (500 kV)	250	37	311	37
Segment 7 (500 kV)	250	37	311	37
Segment 8 (500 kV)	250	37	311	37
Segment 9 (500 kV)	250	37	311	37
Segment 10 (500 kV)	250	37	311	37

Major Single Axis Magnetic Field at standard height of 1 meter.
Peak Loading on 500-kV circuits is 1,500 MW (0.95 load factor assumed).
Peak Loading on 230-kV circuits: 350 MW for Segment 2 and 3.
Segment 1E: 280 MW
Segment 1W(a): 318 MW
Segment 1W(c): 327 MW
Typical loading used as 70 percent of peak load. Magnetic field level for typical load taken as 70 percent of Magnetic Field under peak load conditions.

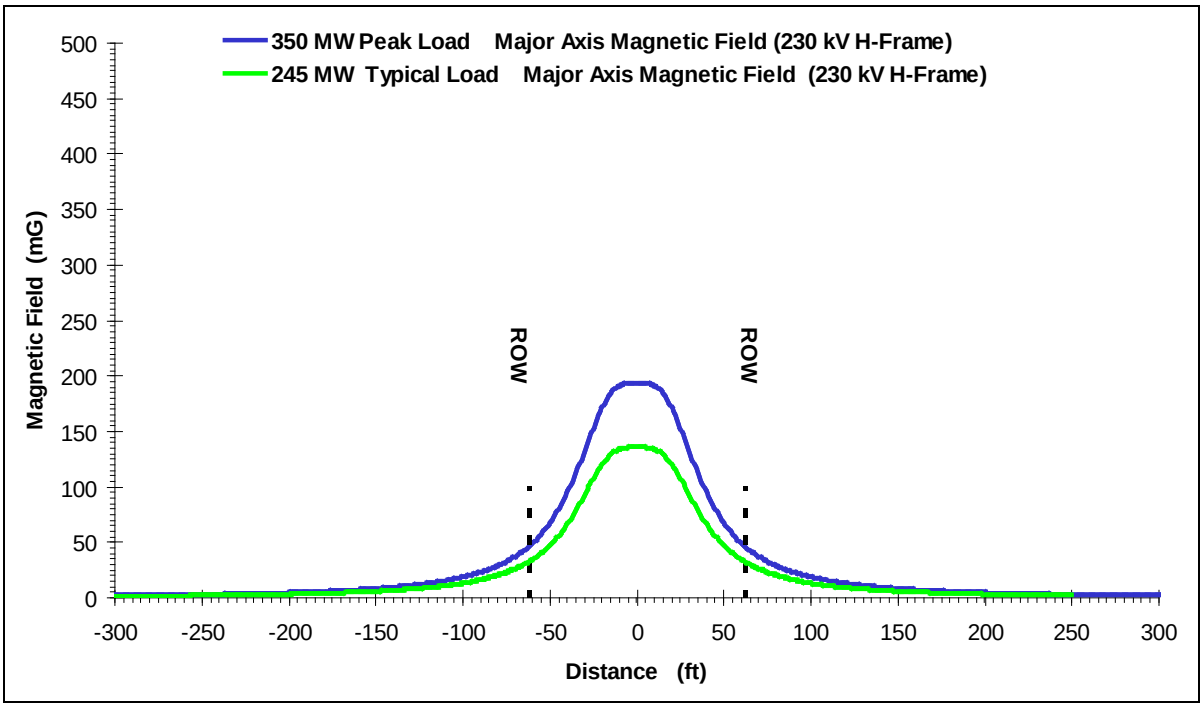


Figure 3.21-7. Magnetic Field Profile at Midspan for 230-kV H-frame Structure
Note: Magnetic field plotted for peak load of 350 MW and typical load of 245 MW. Major Axis magnetic field calculated at standard height of 1 meter.

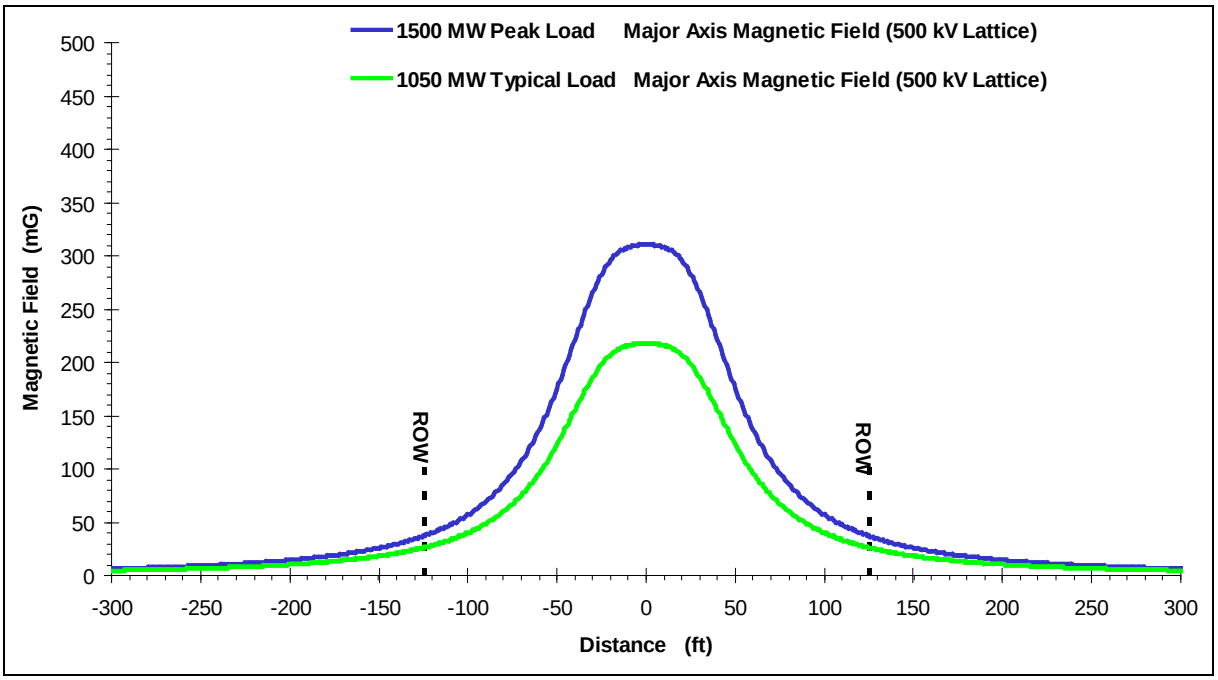


Figure 3.21-8. Magnetic Field Profile at Midspan for 500-kV Lattice Structure
Note: Major Axis magnetic field calculated at standard height of 1 meter.

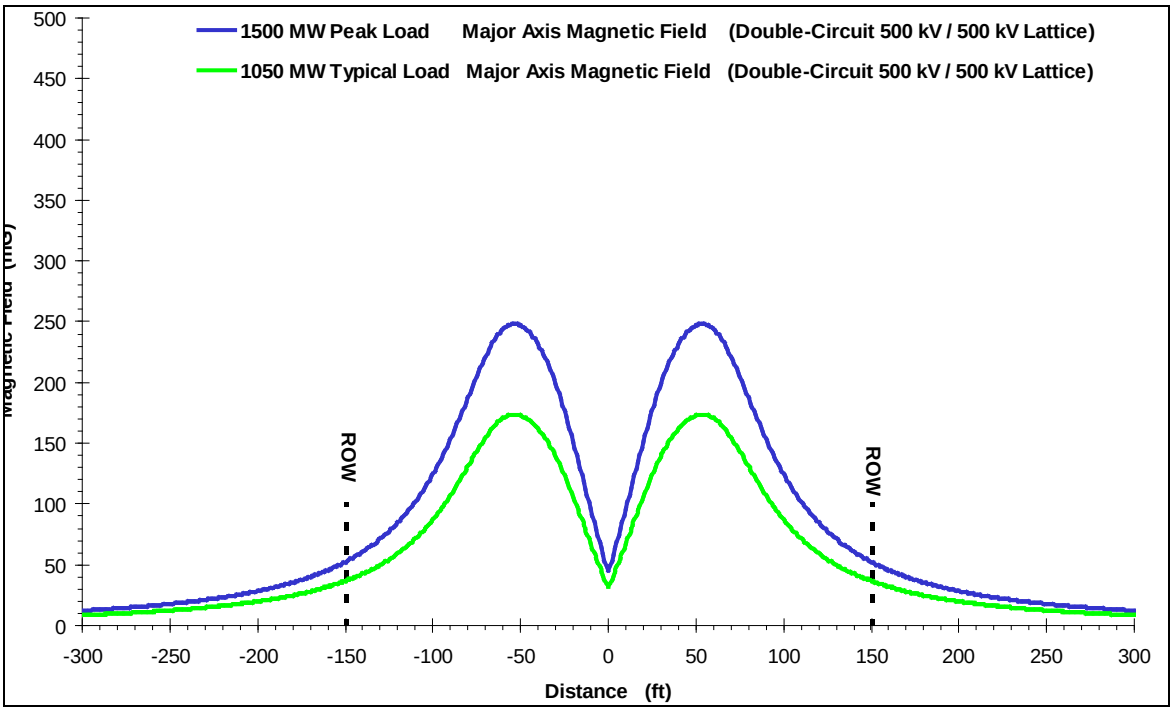


Figure 3.21-9. Magnetic Field Profile at Midspan for Double-Circuit 500-kV Lattice Structure with Two 500-kV Circuits
Note: Major Axis Magnetic Field Calculated at Standard Height of 1 Meter. Conductor Phasing from Left to Right is ABC-ABC.

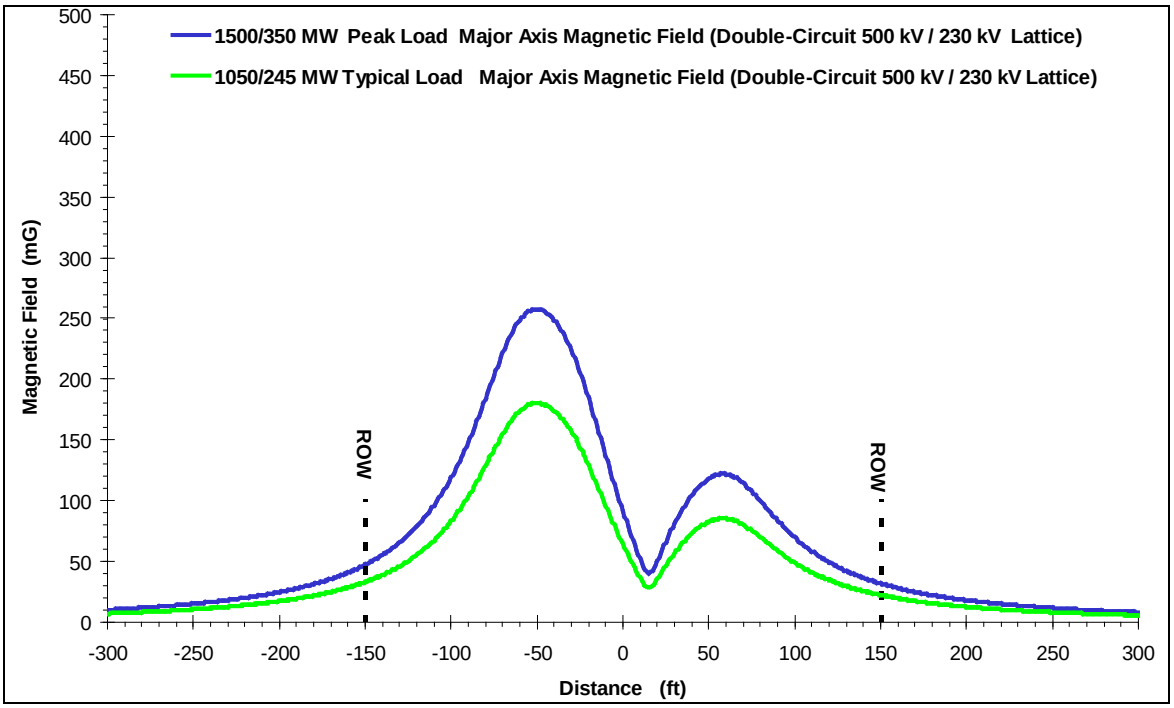


Figure 3.21-10. Magnetic Field Profile at Midspan for Double-Circuit 500-kV Lattice Structure with a 500-kV Circuit and a 230-kV Circuit

Note: Major Axis Magnetic Field Calculated at Standard Height of 1 meter. Conductor Phasing from Left to Right is ABC-ABC.

ROWs and the highest magnetic field found within the ROW for each of the Line Segments in the Gateway West Project are listed in Table 3.21-6. The largest magnetic field calculated at the edge of the ROW was 53 mG. This level was found along Segment 4 with the double-circuit 500-kV lines. The highest magnetic field found within the ROW was 311 mG for the ROWs containing the single-circuit 500-kV line (Segments 5 through 10).

Electric and Magnetic Field Effects

The interaction of electric and magnetic fields with humans or animals near or underneath high-voltage lines can be categorized as short-term or long-term effects. Short-term effects can generally be perceived and may be considered a nuisance, such as induced currents or shocks. Long-term effects for EMF generally relate to health concerns.

Short-Term Effects

Short-Term Electric Field Effects

Short-term electric field effects involve potentials and currents that may be induced on objects such as conductive roofs or buildings, fences, vehicles, or agricultural equipment near high-voltage lines. These potentials and currents may result in perceptible shocks or current flow if sufficiently large. The magnitude of induced currents and potentials on objects or equipment under the proposed lines would depend on the magnitude of the electric field, the size and shape of the object, and the object's connection (resistance) to ground. Grounding the object would reduce the induced potential to essentially zero and

eliminate the object as a source of shocks or currents. Objects that are not grounded or poorly grounded may be a source of currents or shocks.

Fences or metal objects that are within the ROW should be grounded. Grounding would eliminate induced currents or potentials on these objects as a concern. Unlike fences or buildings, mobile equipment such as vehicles and agricultural machinery cannot be permanently grounded. The NESC requires that for high-voltage powerlines, such as the 230-kV and 500-kV lines proposed for the Gateway West Project, sufficient conductor clearance to ground be maintained to limit the short-circuit current induced in the largest anticipated vehicle under the line to 5 mA or less (NESC 2007). If necessary, this can be accomplished at locations where large vehicles are anticipated by increasing the line height, providing shielding of the electric field, or by limiting access.

The relation between short-circuit current and electric field for several vehicles and agriculture related pieces of equipment has been measured and is listed in Table 3.21-8 (EPRI 1982).

Table 3.21-8. Induced Current Factors

Object	I_{sc}/E (mA/kV)
Car L 4.6 m x W 1.78 m x 1.37 m	0.088
Pickup Truck L 5.2 m x W 2.0 m x H 1.7m	0.11
Tractor-Semitrailer (40-foot trailer) L 15.75 m x W 2.4 m x H 3.7m	0.64
Farm Tractor pulling Crop Wagon Tractor L 3.7 m x W 1.95 m x H 1.5 m Crop Wagon L 5.65 m x W 2.11 m x H 2.5 m Total Length 9.55 m	0.30

I_{sc} = short-circuit current
E = AC electric field
mA/kV = milliampere per kilovolt

Multiplying the factors listed in Table 3.21-8 by the electric field yields the short-circuit current expected under conditions that are expected to produce the greatest magnitude short-circuit currents. The highest electric field calculated within the ROW for the proposed Gateway West lines was 9.67 kV/m. The vehicles and equipment listed in Table 3.21-8 would have short-circuit currents that are less than the 5 mA current required by the NESC except for the tractor-semitrailer where the induced current would be 6.2 mA if the entire length of the tractor-semitrailer were in a 9.67 kV/m electric field (e.g., parallel to the line). Tractor-semitrailers would generally not be anticipated under the line except at line road crossings. At locations where large vehicles are anticipated, the line height would be increased if necessary (or the line design altered) so that the line complies with the NESC 5 mA safety requirement.

Although transmission lines are designed to limit induced currents on objects underneath the lines to a safe level (5 mA or less), this level of current or the contact

electric shock may still occur and be perceived when an object is contacted. This may be considered a nuisance depending on the magnitude of the current or shock. The peak electric field found under the 500-kV lines is sufficient that currents and potentials induced on vehicles and farm equipment operated within the ROW might be perceived. Most of the area under the lines has lower fields and only a small area under the 500-kV lines where the conductors come closest to ground near midspan would be likely to induce perceivable currents or potentials on conductive objects such as vehicles or farm equipment. Ground cover and vegetation in contact with the equipment would partially ground it and further reduce the likelihood of perceivable currents or potentials. Perceived currents or potentials on vehicles or farm equipment can be mitigated if they occur by using a ground strap on the vehicle or equipment or if the vehicle or equipment avoids stopping while under the lines. Since a spark and current may occur between objects under the line if the objects are not properly connected and grounded, refueling a vehicle while it is under the line should be avoided.

Direct perception of the electric field has been reported in the instance of raising the back of the hand overhead toward a transmission line. The perception, which was due to movement of the hair on the back of the hand, occurred for a median electric field of 7 kV/m (EPRI 1982). For the proposed 500-kV lines, the electric field in a limited area of the ROW under the conductors near midspan would exceed the reported perception levels.

The electric fields from the proposed 230-kV and 500-kV lines for the Gateway West Project are comparable to those for other 230-kV and 500-kV lines. Electric field impacts can be reduced or eliminated by grounding practices and adherence to the NESC. In practice, unintentional grounding and shielding by vegetation and nearby objects would reduce the levels of induced current and shocks that have been considered for adverse safety conditions.

Short-Term Magnetic Field Effects

Magnetic fields associated with transmission lines can induce voltage and current in long conducting objects that are parallel to the transmission line. As with electric-field induction, these induced voltages and currents are a potential source of shocks. A fence, irrigation pipe, pipeline, electrical distribution line, or telephone line forms a conducting loop when it is grounded at both ends. The earth forms the other portion of the loop. The magnetic field from a transmission line can induce a current to flow in such a loop if it is oriented parallel to the line. If only one end of a fence is grounded (possible loop), then an induced voltage appears across the open end of the loop. The possibility for a shock exists if a person closes the loop at the open end by contacting both the ground and the conductor. The magnitude of this potential shock depends on the following factors: the magnitude of the magnetic field; the length of the object (the longer the object, the larger the induced voltage); the orientation of the object to the transmission line (parallel as opposed to perpendicular; no induction occurs on perpendicular loops); and the amount of electrical resistance in the loop (high resistance limits the current flow).

Magnetically induced currents from powerlines have been investigated for many years. Mitigating measures have been developed and are available. Studies of gas pipelines

near transmission lines have developed prediction methods and mitigation techniques for induced voltages on pipelines (Dabkowski and Taflove 1979; Taflove and Dabkowski 1979). Similar techniques and procedures are available for irrigation pipes and fences. Grounding policies employed by utilities for long fences reduce the potential magnitude of magnetically induced voltage and currents.

Magnetic fields can cause distortion of the image on older style video display terminals and computer monitors (cathode-ray tubes). The threshold magnetic field for interference depends on the type and size of monitor and the frequency of the magnetic field. Interference has been observed for certain monitors at fields at or below 10 mG (Baishiki et al. 1990; Banfai et al. 2000). The problem typically arises when cathode-ray tube computer monitors are in use near electrical distribution or transmission facilities in large office buildings. This is becoming less of a concern with the advent of flat screen monitors, such as used in laptop computers. Flat screen monitors are not susceptible to AC magnetic fields. Some specialized equipment (for instance, certain medical equipment such as a magnetic resonance imaging machine or test equipment such as a scanning electron microscope) may be sensitive to even lower levels of magnetic field. However, equipment that is very sensitive to magnetic fields typically has shielding and is installed in a protected environment, to shield them from the magnetic fields of 1 to 10 mG or higher that can be found in buildings due to their wiring, lights, and other equipment. Mitigation methods for magnetic fields are available and involve grounding practices, shielding, device geometry, and distance.

Long-Term Effects

For more than 30 years, questions have been asked about the potential effect of EMF from powerlines on people. Early studies focused on electric fields. Magnetic fields began receiving increased attention in the late 1970s. A substantial amount of research has been conducted in the United States and around the world over the past several decades examining whether exposures to power frequency EMF have health or environmental effects.

Epidemiology studies have addressed many of the issues raised about EMF and health. Multidisciplinary reviews express the consensus in the scientific community that the epidemiologic evidence is insufficient to demonstrate a causal relationship between extremely low frequency (ELF; pertaining to power frequency) EMF and any health effect (NIEHS 1998, 1999; HCN 2001; NRPB 2001, 2004; IARC 2002; HCN 2004).

Several organizations responsible for health decisions including national and international organizations have convened groups of scientists to review the body of EMF research. These expert groups, including the National Institute of Environmental Health Sciences, the International Agency for Research on Cancer, the National Radiological Protection Board of Great Britain, and the Health Council of the Netherlands, have included dozens of scientists with diverse skills that reflect the different research approaches required to answer questions about health. Their conclusions are listed in Table 3.21-9.

The assessments by International Agency for Research on Cancer, the National Institute of Environmental Health Sciences, the National Academy of Science, the National Radiological Protection Board of Great Britain, and the Health Council of the

Table 3.21-9. EMF Conclusions of Multidisciplinary Review Groups

Organization	Conclusions
National Institute of Environmental Health Sciences (NIEHS 1999)	"The scientific evidence suggesting that ELF-EMF exposures pose any health risk is weak. The strongest evidence for health effects comes from associations observed in human populations with two forms of cancer: childhood leukemia and chronic Lymphocytic leukemia in occupationally exposed adults. While the support from individual studies is weak, the epidemiological studies demonstrate, for some methods of measuring exposure, a fairly consistent pattern of a small, increased risk with increasing exposure that is somewhat weaker for chronic lymphocytic leukemia than for childhood leukemia. In contrast, the mechanistic studies and the animal toxicology literature fail to demonstrate any consistent pattern across studies although sporadic findings of biological effects have been reported. No indication of increased leukemias in experimental animals has been observed. The lack of connection between the human data and the experimental data (animal and mechanistic) severely complicates the interpretation of these results. The human data are in the "right" species, are tied to "real life" exposures and show some consistency that is difficult to ignore. This assessment is tempered by the observation that given the weak magnitude of these increased risks, some other factor or common source of error could explain these findings. However, no consistent explanation other than exposure to ELF-EMF has been identified. Epidemiological studies have serious limitations in their ability to demonstrate a cause and effect relationship whereas laboratory studies, by design, can clearly show that cause and effect are possible. Virtually all of the laboratory evidence in animals and humans and most of the mechanistic work done in cells fail to support a causal relationship between exposure to ELF-EMF at environmental levels and changes in biological function or disease status. The lack of consistent, positive findings in animal or mechanistic studies weakens the belief that this association is actually due to ELF-EMF, but it cannot completely discount the epidemiological findings. The NIEHS concludes that ELF-EMF exposure cannot be recognized at this time as entirely safe because of weak scientific evidence that exposure may pose a leukemia hazard. In my opinion, the conclusion of this report is insufficient to warrant aggressive regulatory concern. However, because virtually everyone in the United States uses electricity and therefore is routinely exposed to ELF-EMF, passive regulatory action is warranted such as a continued emphasis on educating both the public and the regulated community on means aimed at reducing exposures. The NIEHS does not believe that other cancers or noncancer health outcomes provide sufficient evidence of a risk to currently warrant concern."
National Academy of Sciences (NAS 1999)	"An earlier Research Council assessment of the available body of information on biologic effects of power-frequency magnetic fields (NRC 1997 http://www.nap.edu/catalog.php?record id=5155#toc) led to the conclusion 'that the current body of evidence does not show that exposure to these fields presents a human health hazard. Specifically, no conclusive and consistent evidence shows that exposure to residential electric and magnetic fields produces cancer, adverse neurobehavioral effects, or reproductive and developmental effects'. The new, largely unpublished contributions of the EMF-RAPID program are consistent with that conclusion. We conclude that no finding from the EMF-RAPID program alters the conclusions of the previous NRC review on the Possible Effects of Electromagnetic Fields on Biologic Systems (NRC 1997). In view of the negative outcomes of EMFRAPID replication studies, it now appears even less likely that MFs [magnetic fields] in the normal domestic or occupational environment produce important health effects, including cancer."

Table 3.21-9. EMF Conclusions of Multidisciplinary Review Groups (continued)

Organization	Conclusions
National Radiological Protection Board of Great Britain (NRPB 2001) (NRPB 2004)	"Laboratory experiments have provided no good evidence that extremely low frequency [ELF] electromagnetic fields are capable of producing cancer, nor do human epidemiological studies suggests that they cause cancer in general. There is, however, some epidemiological evidence that prolonged exposure to higher levels of power frequency magnetic fields is associated with a small risk of leukemia in children. In practice, such levels of exposure are seldom encountered by the general public in the UK [or in the US]." "Because of the uncertainty… and in absence of a 'dose-response' relationship, NRPB has concluded that the data concerning childhood leukemia cannot be used to derive quantitative guidance on restricting exposure."
Health Council of the Netherlands (HCN 2001) (HCN 2004)	"Because the association is only weak and without a reasonable biological explanation, it is not unlikely that it [an association between ELF exposure and childhood leukemia] could also be explained by chance… The committee therefore sees no reason to modify its earlier conclusion that the association is not likely to be indicative of a causal relationship." "The Committee, like the IARC itself, points out that there is no evidence to support the existence of a causal relationship here. Nor has research yet uncovered any evidence that a causal relationship might exist."
International Agency for Research on Cancer (IARC 2002)	"Studies in experimental animals have not shown consistent carcinogenic or co-carcinogenic effects of exposures to ELF [extremely low frequency] magnetic fields, and no scientific explanation has been established for the observed association of increased childhood leukemia risk with increasing residential ELF magnetic field exposure." IARC categorized EMF as a "possible carcinogen" for exposures at high levels, based on the meta-analysis of studies of statistical links with childhood leukemia at levels above 3-4 mG.

Netherlands agree that there is little evidence to suggest EMF is associated with adverse health effects, including most forms of adult and childhood cancer, heart disease, Alzheimer's disease, depression, and reproductive effects. However, all of the assessments concluded that epidemiology studies *in total* suggest an association between magnetic fields at higher time-weighted average exposure levels (greater than 4 mG) and childhood leukemia. Nevertheless, all agree that the experimental laboratory data do not support a *causal* link between EMF and any adverse health effect, including leukemia, and have not concluded that EMF is, in fact, the cause of any disease.

The exposure of animals to electric and magnetic fields has also been investigated for over 30 years. Vegetation in the form of grasses, shrubs, and small trees largely shields small ground-dwelling species such as mice, rabbits, foxes, and snakes from electric fields. Species that live underground, such as moles, woodchucks, and worms, are further shielded from electric fields by the soil; aquatic species are shielded from electric fields by water. Large species such as deer and domestic livestock have greater potential exposures to electric fields since they can stand taller than the surrounding vegetation. However, the duration of exposure for deer and other large animals is limited to foraging bouts or the time it takes them to cross under the line. All species would be exposed to higher magnetic fields under or near a transmission line than elsewhere, because vegetation and soil do not provide shielding from this aspect of the transmission-line electrical environment.

Field studies have been performed to monitor the behavior of large mammals in the vicinity of high-voltage transmission lines. No effects of electric or magnetic fields were evident in two studies from the northern U.S. on big game species, such as deer and elk, exposed to a 500-kV transmission line (Goodwin 1975; Picton et al. 1985).

Much larger populations of animals that might spend time near a transmission line are livestock that graze under or near transmission lines. To provide a more sensitive and reliable test for adverse effects than informal observation, scientists have studied animals continuously exposed to fields from high-voltage lines in relatively controlled conditions. For example, grazing animals such as cows and sheep have been exposed to high-voltage transmission lines and their reproductive performance examined (Lee et al. 1996). No adverse effects were found among cattle exposed to a 500-kV direct-current overhead transmission line over one or more successive breeding events (Angell et al. 1990). Compared to unexposed animals in a similar environment, the exposure to 50 Hz fields did not affect reproductive functions or pregnancy of cows (Algers and Hennichs 1985; Algers and Hultgren 1987). Sheep and cattle exposed to EMF from transmission lines exceeding 500 kV were examined and no effect was found on the levels of hormones in the blood, weight gain, onset of puberty, or behavior (Stormshak et al. 1992; Lee et al. 1993; Lee et al. 1995; Thompson et al. 1995; Burchard et al. 1998; Burchard et al. 2004).

Greenberg et al. (1981) studied honeybee colonies placed near 765-kV transmission lines. They found that hives exposed to AC electric fields of 7 kV/m had decreased hive weight, abnormal amounts of propolis (a resinous material) at hive entrances, increased mortality and irritability, loss of the queen in some hives, and a decrease in the hive's overall survival compared to hives that were not exposed. Placing the hive farther from the line, shielding the hive, or using hives without metallic parts eliminates this problem.

Numerous studies have been carried out to assess the effect of exposure of plants to transmission-line electric and magnetic fields. These studies have involved both forest species and agriculture crops. Researchers have found no adverse effects on plant responses, including seed germination, seedling emergence, seedling growth, leaf area per plant, flowering, seed production, germination of the seeds, longevity, and biomass production (Lee et al. 1996).

Electric and Magnetic Field Summary

The EMF for the proposed lines meets international, federal, and Wyoming, Nevada, and Idaho guidelines. The electric fields calculated at the edge of the ROW for the 500-kV lines are less than 1 kV/m for the 500-kV line and less than 1.25 kV/m for the 230-kV lines (see Section 3.21.1.3 for the respective international, federal, and state guidelines). The electric fields at the edges of the ROWs and the highest electric field found within the ROW for each of the line segments in the Gateway West Project are listed in Table 3.21-6. The largest electric field calculated at the edge of the ROW was 1.23 kV/m. This level was found along the 230-kV line segments that had ROW widths of 125 feet. Electric fields of 0.94 kV/m or less were found at the ROW edge of the line segments with double-circuit 500-kV structures. Fields of 0.77 kV/m were found at the ROW edge of the single-circuit 500-kV line segments (Segments 5 through 10). The highest electric field found within the ROW was 9.67 kV/m for the single-circuit 500-kV

segments (Segments 5 through 10). Slightly lower electric fields (approximately 9.2 kV/m) were found within the ROW for the segments with double-circuit 500-kV structures (Segments 2 and 3 with 500-kV and 230-kV circuits and Segment 4 containing two 500-kV circuits). Segments 2 through 10 have peak electric fields ranging from 9.15 kV/m to 9.67 kV/m, while the 230-kV lines in Segment 1 peak at 4.26 kV/m (Table 3.21-6).

The magnetic fields calculated at the edge of the ROW for the 500-kV lines are 53 mG or less and 47 mG or less for the 230-kV lines (Table 3.21-7). For magnetic fields within the ROW, the 500-kV line segments (Table 3.21-7: Segments 2 through 10) have peak magnetic fields ranging from 249 to 311 mG. Segments 1E, 1W(a), and 1W(c) have peak magnetic fields ranging from 171 to 196 mG.

Mitigation techniques such as grounding practices and shielding exist to address any short-term effects that might be reported. The scientific consensus is that there is little evidence suggesting that EMF is associated with adverse health effects, and no exposure standards have been recommended.

Audible Noise

Audible noise levels from the transmission line itself would not occur until the line is energized. During construction audible noise related to the line would consist of construction noise and be limited to localized areas that have active construction activities. Once the lines are energized, the AC audible noise would vary depending on the weather conditions, with foul weather producing increased levels of audible noise. Two-hundred thirty (230)-kV lines contribute little or no audible noise in fair weather and, although their audible noise may increase in foul weather, it is less than the audible noise produced by rain and wind.

The audible noise profiles in fair and foul weather at midspan were calculated for the four line types and are plotted in Figures 3.21-11 through 3.21-14. The audible noise levels at the edges of the ROWs and the highest levels found within the ROW for each of the line segments in Gateway West are listed in Table 3.21-10 for foul weather conditions and Table 3.21-11 for fair weather conditions.

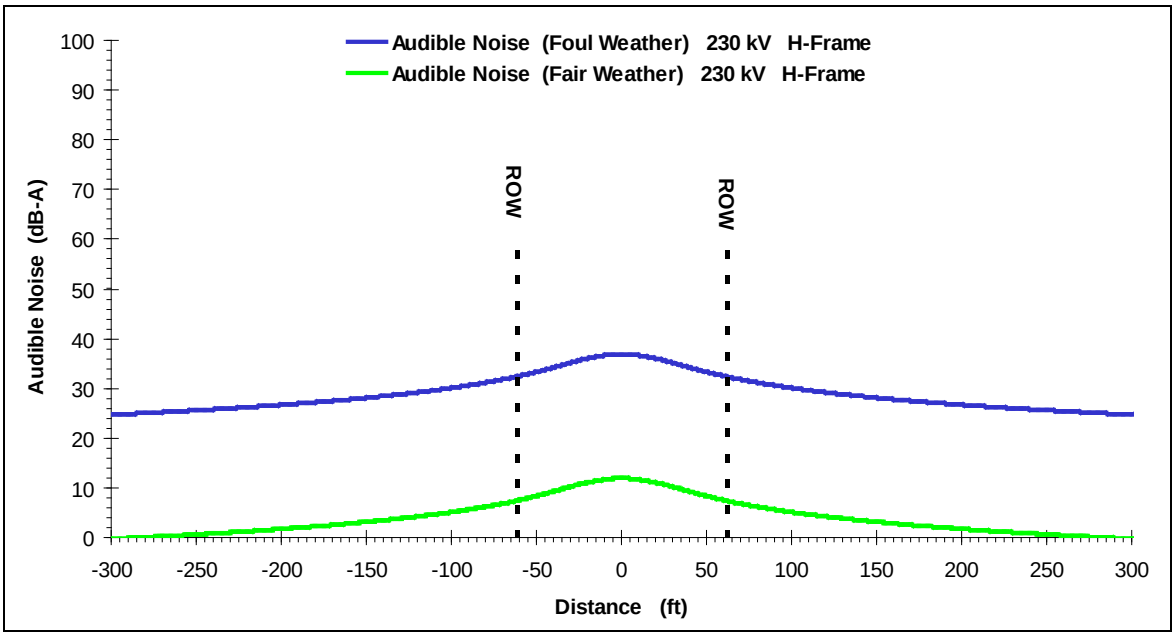


Figure 3.21-11. Audible Noise Profile at Midspan for Single-Circuit 230-kV H-frame Structure

Note: Audible noise profile calculated for fair and foul weather conditions. Conductor phasing from left to right is ABC.

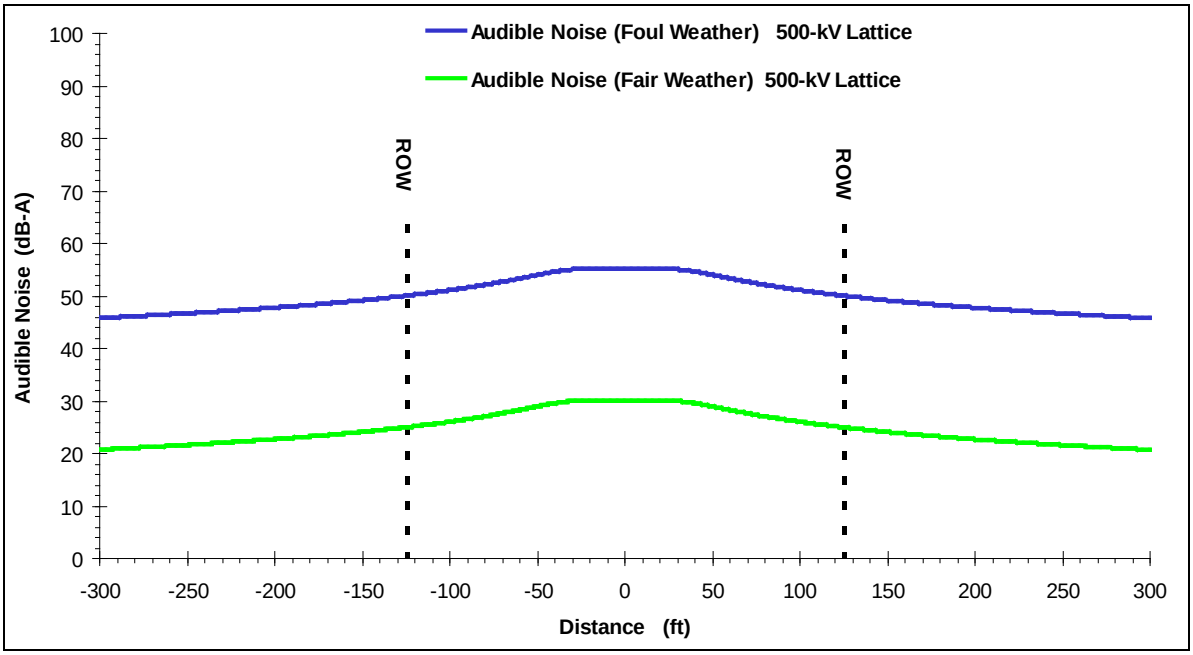


Figure 3.21-12. Audible Noise Profile at Midspan for Single-Circuit 500-kV Lattice Structure

Note: Audible noise profile calculated for fair and foul weather conditions. Conductor phasing from left to right is ABC.

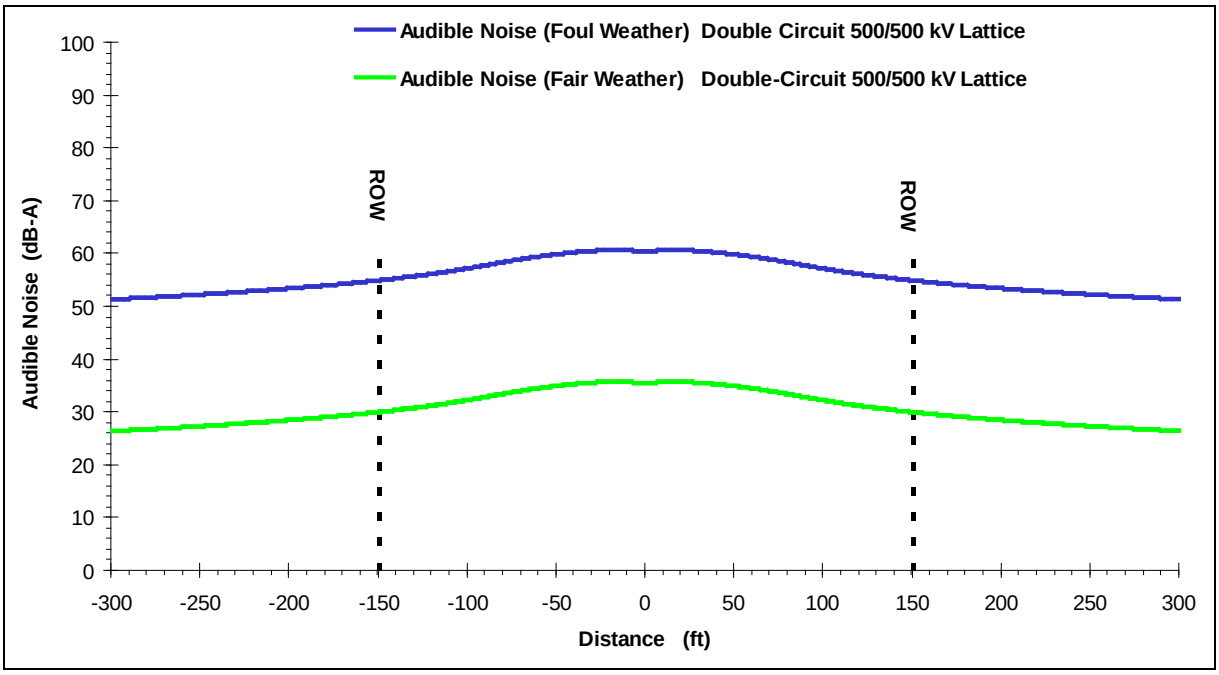


Figure 3.21-13. Audible Noise Profile at Midspan for Double-Circuit 500-kV Lattice Structure with Two 500-kV Circuits

Note: Audible noise profile calculated for fair and foul weather conditions. Conductor phasing from left to right is ABC-ABC.

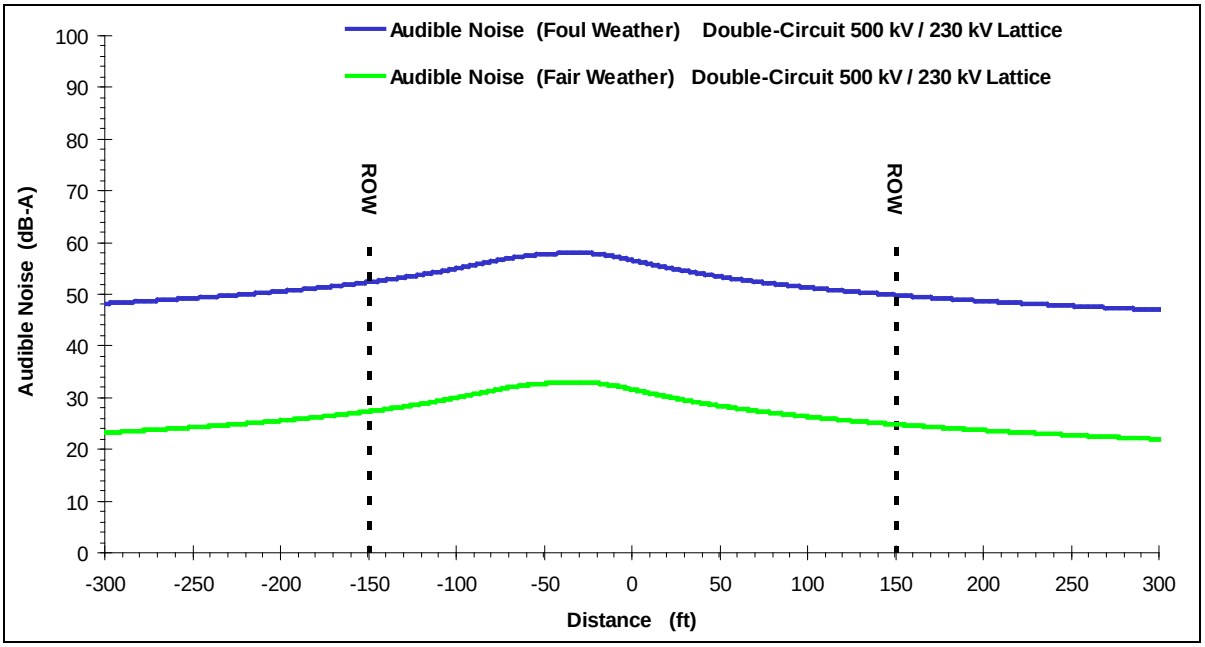


Figure 3.21-14. Audible Noise Profile at Midspan for Double-Circuit 500-kV Lattice Structure with a 500-kV Circuit and a 230-kV Circuit

Note: Audible noise profile calculated for fair and foul weather conditions. Conductor phasing from left to right is ABC-ABC.

Table 3.21-10. Audible Noise in Foul Weather

Segment	ROW Width (feet)	South/East ROW Edge (dBA)	Maximum within ROW (dBA)	North/West ROW Edge (dBA)
Segment 1E (230 kV)	125	32	37	32
Segment 1W				
Line 1W(a) (230 kV)	125	32	37	32
Line 1W(c) (230 kV)	125	32	37	32
Segment 2 (500/230 kV)	300	52	58	50
Segment 3 (500/230 kV)	300	52	58	50
Segment 4 (500/500 kV)	300	55	61	55
Segment 5 (500 kV)	250	50	55	50
Segment 6 (500 kV)	250	50	55	50
Segment 7 (500 kV)	250	50	55	50
Segment 8 (500 kV)	250	50	55	50
Segment 9 (500 kV)	250	50	55	50
Segment 10 (500 kV)	250	50	55	50

Median audible noise in foul weather measured in dB with A weighting referenced to 20 microPascals.
A weighting chosen to match response of human ear.
Altitude of 7,000 feet (audible noise would be less for altitude lower than 7,000 feet).

Table 3.21-11. Audible Noise in Fair Weather

Segment	ROW Width (ft)	South/East ROW Edge (dBA)	Maximum within ROW (dBA)	North/West ROW Edge (dBA)
Segment 1E (230 kV)	125	7	12	7
Segment 1W				
Line 1W(a) (230 kV)	125	7	12	7
Line 1W(c) (230 kV)	125	7	12	7
Segment 2 (500/230 kV)	300	27	33	25
Segment 3 (500/230 kV)	300	27	33	25
Segment 4 (500/500 kV)	300	30	36	30
Segment 5 (500 kV)	250	25	30	25
Segment 6 (500 kV)	250	25	30	25
Segment 7 (500 kV)	250	25	30	25
Segment 8 (500 kV)	250	25	30	25
Segment 9 (500 kV)	250	25	30	25
Segment 10 (500 kV)	250	25	30	25

Median audible noise in foul weather measured in dB referenced to 20 microPascals with A weighting.
A weighting chosen to match response of human ear.
Altitude of 7,000 feet (audible noise would be less for altitude lower than 7,000 feet).

Audible noise levels for foul weather conditions calculated at the edge of the ROW for the line segments ranged from 32 dBA to 55 dBA. Fifty-five dBA in foul weather was only found for the edges of the ROW of Segment 4 that has the double-circuit 500-kV lines. The audible noise levels in fair weather were less than in foul weather and ranged from 7 dBA to 30 dBA at the edge of the ROW. The audible noise levels would depend on the altitude of the line, with the noise increasing with the altitude. An altitude

of 7,000 feet was used for all audible noise calculations. This is the highest estimated altitude expected along the line route thus producing the largest levels of audible noise. Line segments at lower altitudes would have lower levels of audible noise.

Table 3.21-12 lists common sources of audible noise and the associated sound level in dBA. Conversation is carried out at sound level of approximately 60 to 70 dBA. Traffic and equipment noise can range from 70 dBA to above 100 dBA; well in excess of the audible noise levels expected from the proposed Gateway West transmission lines. The levels found at the edge of the ROW during fair weather (30 dBA or less – Table 3.21-11) are similar to the noise levels found in a library or a bedroom at night and are likely to be masked by ambient audible noise levels from vegetation movement in breezes and animal and insect activity. Higher levels of audible noise may occur during foul weather but these levels are still at or below the level of conversational speech, and the audible noise from rain and wind during foul weather would help mask these levels.

Table 3.21-12. Common Audible Noise Levels

Sound Level (dBA)	Condition	Sound Level (dBA)	Condition
140 ---	Threshold of Pain	70 ---	Conversational Speech
130 ---	Pneumatic Chipper	60 ---	Business Office
120 ---	Automobile Horn (40 feet away)	50 ---	Suburban Living Room
110 ---		40 ---	Library
100 ---	Inside New York Subway	30 ---	Bedroom at Night
90 ---	Inside Bus	20 ---	Broadcast Studio
80 ---	Average Traffic on Street Corner	10 ---	
70 ---		0 ---	Threshold of Hearing

The audible noise levels from the proposed Gateway West lines are similar to the audible noise levels of other 230 and 500-kV lines. The levels of audible noise expected at the edge of the ROW during fair or foul weather for the proposed Gateway West transmission lines meet codified federal and state audible noise levels for Wyoming, Nevada, and Idaho.

Radio Noise

Radio noise from the proposed transmission lines would not occur until the lines are actually energized. During the construction phase there would be no radio noise from the lines since the conductors do not have voltage on them. Once the lines are energized, the AC radio noise would vary depending on the weather conditions with foul weather producing higher levels of radio noise than fair weather.

Portions of Segments 1W(a) and 1W(c) (230 kV) would consist of a rebuild of an existing 230-kV line. The radio noise levels associated with these portions of Segment

1W(a) and 1W(c) would be low because 230-kV lines have low levels of radio noise that are similar or below existing ambient radio noise levels due to atmospheric conditions.

The radio noise profiles in fair and foul weather at midspan were calculated for the four line types and are plotted in Figure 3.21-15 through Figure 3.21-18. The radio noise levels at the edges of the ROWs and the highest levels found within the ROW for each of the line segments in the Gateway West Project are listed in Table 3.21-13 for foul weather conditions and Table 3.21-14 for fair weather conditions.

Radio noise levels for foul weather conditions calculated at the edge of the ROWs for the line segments ranged from 42 dB (1 μV/m) to 58 dB (1 μV/m). Fifty-eight dB (1 μV/m) in foul weather was only found for the edges of the ROW of Segment 4 that has the double-circuit 500-kV lines. The radio noise levels in fair weather were less than in foul weather and ranged from 25 dB (1 μV/m) to 41 dB (1 μV/m) at the edge of the ROW.

The radio noise levels at the edge of the ROW in fair weather ranged from 25 dB (1 μV/m) for the 230-kV line segments to 41 dB (1 μV/m) or less for the line segments containing 500-kV lines. The Institute of Electrical and Electronic Engineers (IEEE) Radio Noise Design Guide (1986) identifies an acceptable fair-weather radio noise level of 40 dB at 100 feet from the outside conductor of a line. The fair weather radio noise at the edge of the ROW for the Segments 2 through 4 is calculated to be 41 dB; however, the proposed edge of ROW for Segments 2 through 4 containing the double-circuit 500-kV structures is less than 100 feet from the outside conductors. For these segments, the ROW edge is at approximately 88 feet from the outside conductor. When the location is increased to 100 feet from the outside conductor the fair weather radio noise decreases to below 40 dB and does meet the guideline. The 41 dB at the edge of the ROW is also calculated for an altitude of 7,000 feet. Lower altitudes will produce lower levels of radio noise. For line Segments 2 through 4 at 6,000 feet altitude or below, the fair weather radio noise decreases to below 40 dB meeting the IEEE Radio Noise Design Guideline even at the reduced distance of the edge of the ROW. Levels during foul weather would generally be 16 to 22 dB higher than in fair weather conditions though increased atmospheric radio noise would mask a portion of this increase.

The radio noise levels from the proposed lines are comparable to those of other 230-kV and 500-kV lines. There are no state limits for radio noise and no set federal limits. Radio noise is governed by the FCC under the general rule (47 CFR Part 15) that states “that the radio frequency energy that is emitted does not cause harmful interference. In the event that harmful interference is caused, the operator of the device shall promptly take steps to eliminate the harmful interference.” Power utilities have been able to work well under the FCC rule because the lines are designed to avoid complaints and mitigation methods exist to address specific complaints if they occur.

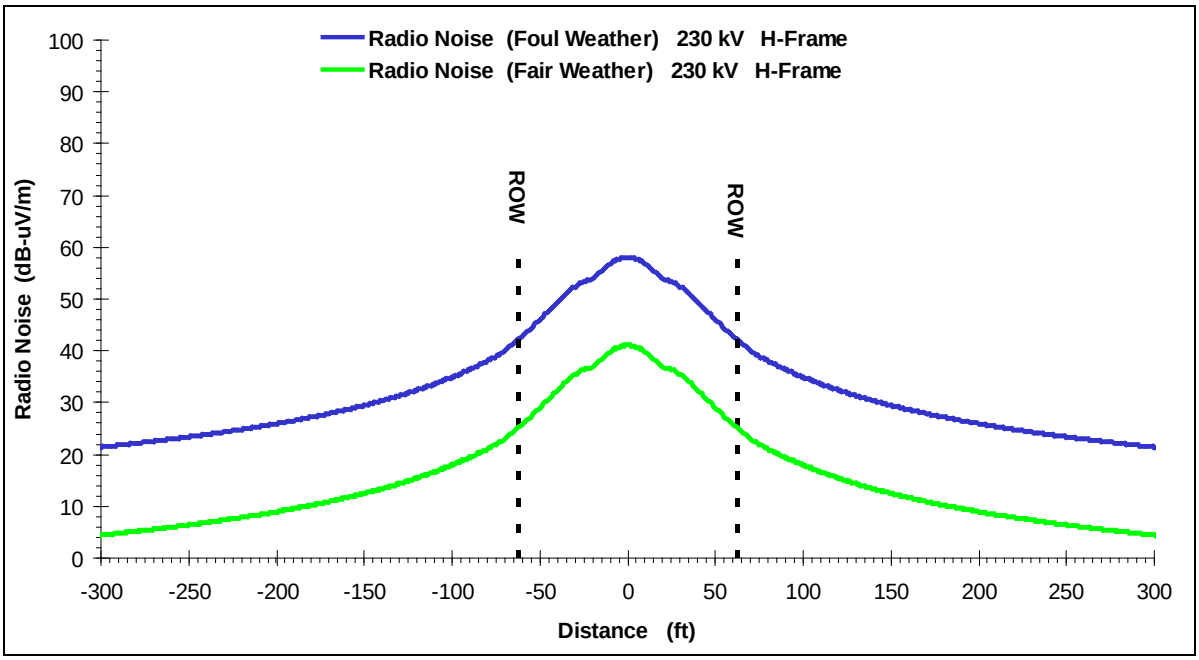


Figure 3.21-15. Radio Noise Profile at Midspan for Single-Circuit 230-kV H-frame Structure

Note: Radio noise profile calculated for fair and foul weather conditions. Conductor phasing from left to right is ABC.

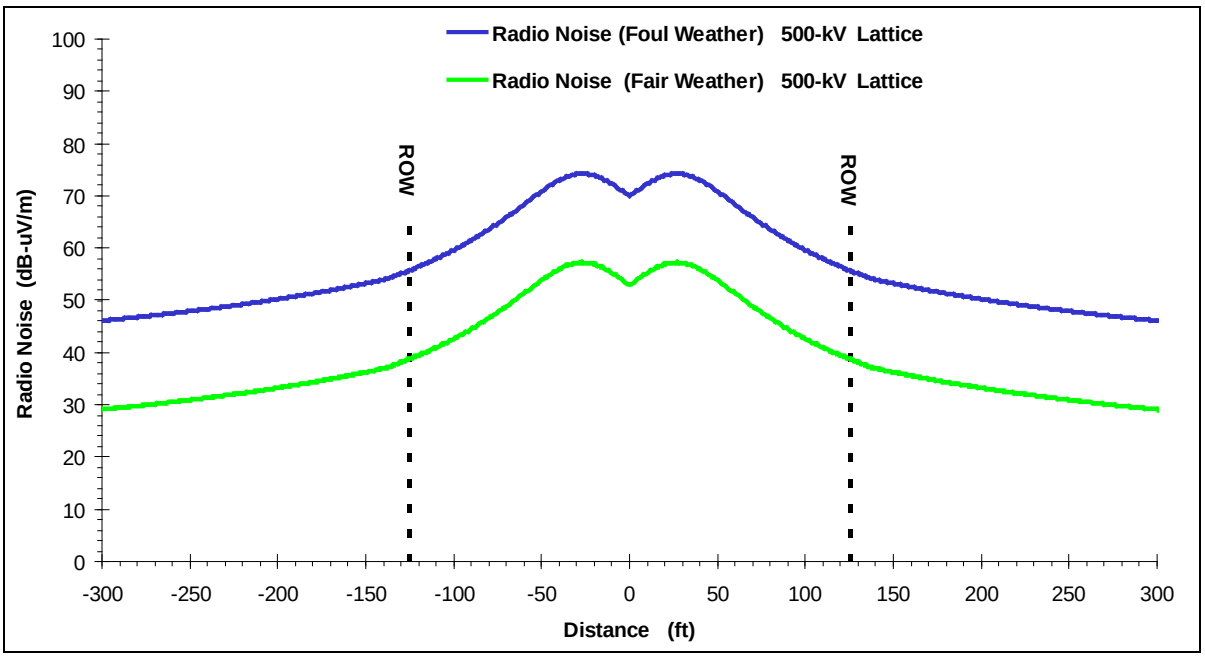


Figure 3.21-16. Radio Noise Profile at Midspan for Single-Circuit 500-kV Lattice Structure

Note: Radio noise profile calculated for fair and foul weather conditions. Conductor phasing from left to right is ABC.

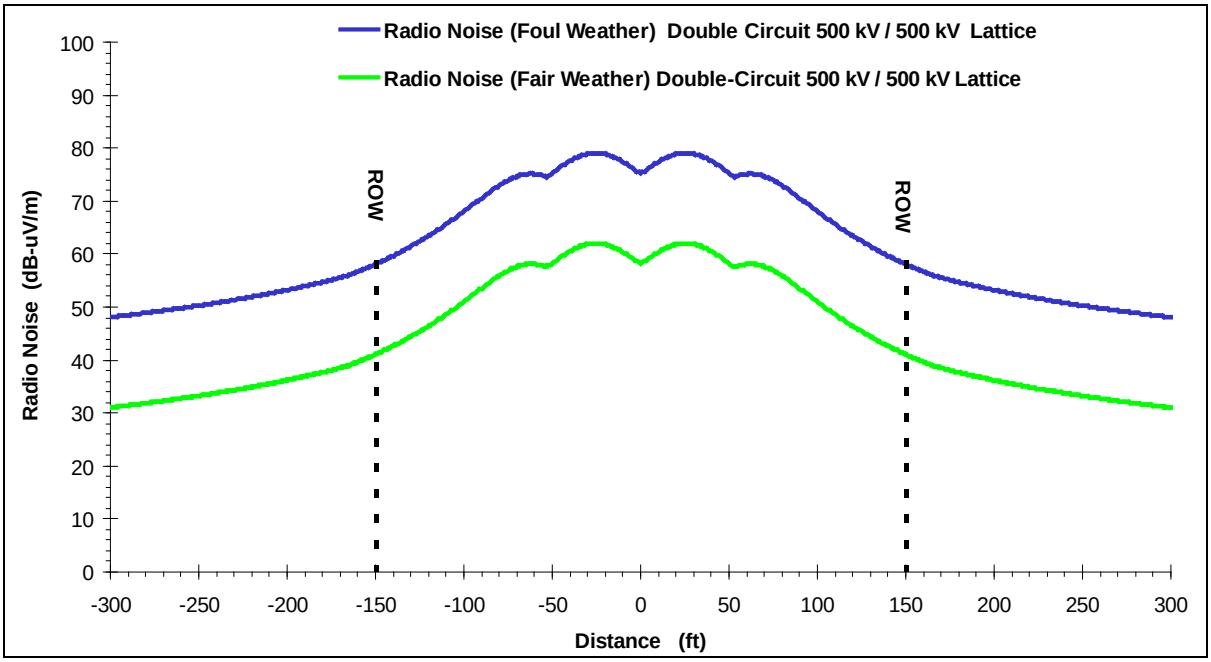


Figure 3.21-17. Radio Noise Profile at Midspan for Double-Circuit 500-kV Lattice Structure with Two 500-kV Circuits

Note: Radio noise profile calculated for fair and foul weather conditions. Conductor phasing from left to right is ABC-ABC.

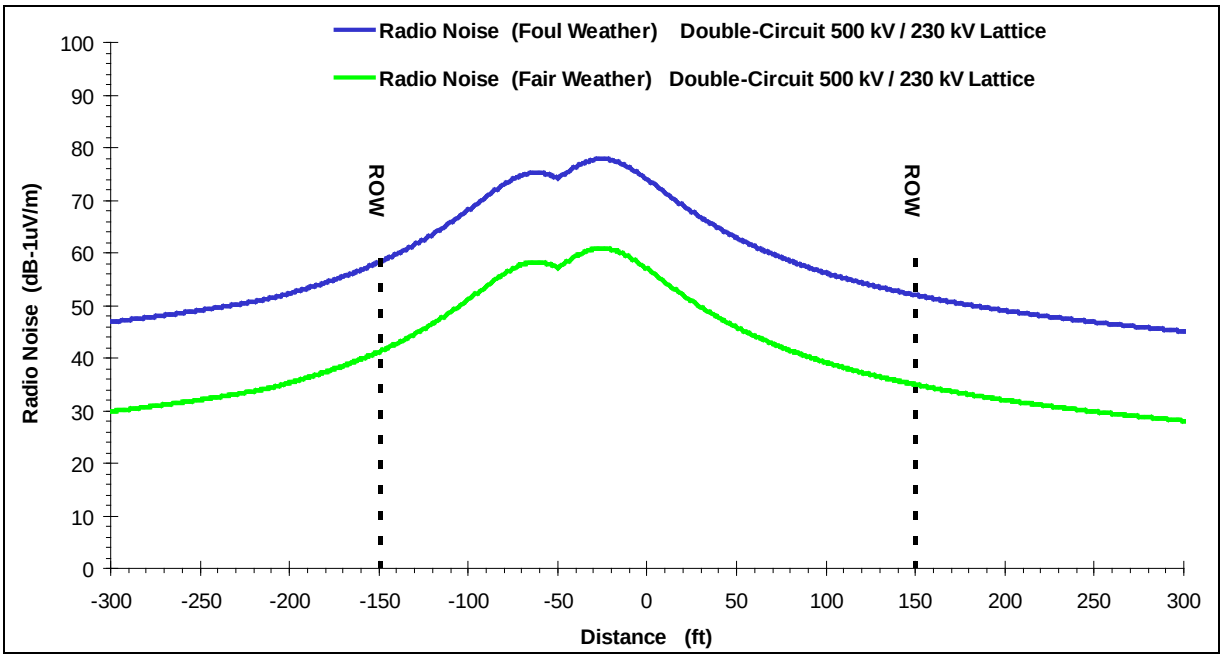


Figure 3.21-18. Radio Noise Profile at Midspan for Double-Circuit 500-kV Lattice Structure with a 500-kV Circuit and a 230-kV Circuit

Note: Radio noise profile calculated for fair and foul weather conditions. Conductor phasing from left to right is ABC-ABC.

Table 3.21-13. Radio Noise in Foul Weather

Segment	ROW Width (ft)	South/East ROW Edge (dB)	Maximum within ROW (dB)	North/West ROW Edge (dB)
Segment 1E (230 kV)	125	42	58	42
Segment 1W				
Line 1W(a) (230 kV)	125	42	58	42
Line 1W(c) (230 kV)	125	42	58	42
Segment 2 (500/230 kV)	300	58	78	52
Segment 3 (500/230 kV)	300	58	78	52
Segment 4 (500/500 kV)	300	58	79	58
Segment 5 (500 kV)	250	56	74	56
Segment 6 (500 kV)	250	56	74	56
Segment 7 (500 kV)	250	56	74	56
Segment 8 (500 kV)	250	56	74	56
Segment 9 (500 kV)	250	56	74	56
Segment 10 (500 kV)	250	56	74	56

Median radio noise measured in dB referenced to 1 μV/m.
Altitude of 7,000 feet (radio noise would be less for altitude lower than 7,000 feet).

Table 3.21-14. Radio Noise in Fair Weather

Segment	ROW Width (ft)	South/East ROW Edge (dB)	Maximum within ROW (dB)	North/West ROW Edge (dB)
Segment 1E (230 kV)	125	25	41	25
Segment 1W				
Line 1W(a) (230 kV)	125	25	41	25
Line 1W(c) (230 kV)	125	25	41	25
Segment 2 (500/230 kV)	300	41	61	35
Segment 3 (500/230 kV)	300	41	61	35
Segment 4 (500/500 kV)	300	41	62	41
Segment 5 (500 kV)	250	39	57	39
Segment 6 (500 kV)	250	39	57	39
Segment 7 (500 kV)	250	39	57	39
Segment 8 (500 kV)	250	39	57	39
Segment 9 (500 kV)	250	39	57	39
Segment 10 (500 kV)	250	39	57	39

Median radio noise measured in dB referenced to 1 μV/m.
Altitude of 7,000 feet (radio noise would be less for altitude lower than 7,000 feet)

Other Effects

Other effects from the proposed Gateway West transmission lines may include visible corona, ozone, field induction, stray voltage, and interference with electronic devices such as GPS systems, cell phones, or satellite receivers. These effects would be localized to the area of the transmission line if they occur. These factors are generally due to the field strength at the surface of the conductor (visible corona, ozone, and interference with electronic devices) or the field strength at ground level (field induction and stray voltage).

The following mitigation measures are recommended by the Agencies for reducing impacts.

EE-1 During final design, limit the conductor surface gradient in order to meet the IEEE Radio Noise Guideline.

EE-2 During construction, identify objects such as fences, metal buildings, pipelines, and other metal objects within or near the proposed ROW that have the possibility for induced potentials and currents and implement electrical grounding of these objects according to the utility's and National Electric Code standards.

EE-3 During final design and construction, identify areas where large equipment is anticipated and provide sufficient conductor clearance to ground to meet the NESC 5 mA rule or limit size or access of large equipment.

Visible Corona – Corona is sometimes visible as a faint bluish glow near the conductors on high-voltage lines. Any corona on the conductors would be visible only under the darkest conditions and after the eyes had time to dark adapt. It is unlikely it would be noticed or affect the local environment.

Ozone – Small amounts of ozone and other oxidants can be produced around the conductors when there is corona present. Ozone accounts for the majority of the oxidants with nitrous oxide accounting for the remainder. Ozone is a naturally occurring part of the air with levels of 10 to 30 parts per billion (ppb) at night in rural settings, increasing during daylight to approximately 70 to 100 ppb. Ozone levels exceeding 100 ppb can be found in urban areas and cities. Ozone is also produced by many common appliances such as copy machines, battery chargers, air fresheners, and welding equipment. The ozone levels from a 500-kV line are at the single digit parts per billion level or below. The ozone from the high-voltage lines is at the limit of ozone detection equipment and well below even the fluctuations of ambient levels and would not affect the ambient air quality.

Field Induction (induced currents and potentials/nuisance shocks) – Induced potentials and currents are present under high-voltage lines due to the electric fields. Grounding of fences and large metal structures under or near the lines would eliminate these objects as sources of potentials or currents. Agricultural activities can occur near or under transmission lines. However, mobile objects like vehicles or pieces of farm equipment cannot be grounded permanently and thus can develop a potential and currents while under or near the transmission line. A tractor pulling a wagon under the double-circuit 500-kV line of Segment 4 at the point of highest electric field (9.67 kV/m) can develop a current of 2.9 mA (Table 3.21-8). A pickup truck at the same location can develop a current of 1 mA. These are currents that are likely to be perceived. The actual currents would likely be much lower due to the line height being higher and inadvertent grounding of the vehicle by field vegetation and non-ideal insulation by the tires. Placing a ground strap on vehicles or equipment would help ground the vehicle, mitigating induced currents or potentials. Dragging a log chain from large equipment that passes under high-voltage lines can be used to provide grounding. Simply avoiding stopping to enter or exit vehicles while under high-voltage lines is another common sense way to avoid concern with induced potentials or currents.

Stray Voltage – Stray voltage or current is a problem whereby currents or potentials on conductive objects and metal work can come in contact and flow through humans or animals. Stray voltage is often a concern involving the farm electrical system and the local utility distribution system where a potential is developed on the grounded neutral system of the farm or utility. If an animal or human comes in contact with metal equipment that is at a different potential than the ground on which they are standing, a current may flow through the animal, or person, to ground and the potential be detected. Usually if this potential difference exists, it is too small to generate any physical or behavioral changes. In the case of nearby transmission lines, fences or piping that pass under or near the transmission line and connect back to a farm can be the source of currents and potentials on the farm. Stray voltage may be the result of corrosion or broken ground connections. Good grounding practices would reduce or eliminate this concern. The Proponents maintain programs for on-site investigation of stray voltage concerns.

Cardiac Pacemakers – Concern has focused on potential interference to cardiac pacemakers and defibrillators. A cardiac pacemaker monitors the electrical activity of the heart. If the heart fails to beat, the pacemaker administers a small stimulus to trigger the “missing” beats. An implanted cardiac defibrillator similarly monitors the electrical activity of the heart but is designed to block disorganized contractions of the heart (arrhythmias) by administering a strong electrical shock to restore normal heart rhythms. Exposure to electric and magnetic fields could affect the function of these devices if induced signals on sensing leads are interpreted as natural cardiac activity (Griffin 1986; CCOHS 1988; Barold et al. 1991). However, the opportunities for exposure and interference from powerlines are lower than for contact with ordinary household appliances.

Due to recent design improvements, many pacemakers in use would not be particularly susceptible to electrical fields. There remains a small possibility that some pacemakers, particularly those of older designs, and with single-lead electrodes, may sense potentials induced on the electrodes and leads of the pacemaker and provide unnecessary stimulation to the heart.

There are two general types of pacemakers: asynchronous and synchronous. The asynchronous pacemaker pulses at a predetermined rate. It is practically immune to interference because it has no sensing circuitry and is not exceptionally complex. The synchronous pacemaker, on the other hand, pulses only when its sensing circuitry determines that pacing is necessary. Interference resulting from transmission line electric or magnetic fields can cause a spurious signal in the pacemaker’s sensing circuitry. However, when these pacemakers detect a spurious signal, such as a 60 Hz signal, they are programmed to revert to an asynchronous or fixed pacing mode of operation and return to synchronous operation within a specified time after the signal is no longer detected. The potential for pacer interference depends on the manufacturer, model, and implantation method, among other factors. Studies have determined thresholds for interference of the most sensitive units to be about 2,000 to 12,000 mG for magnetic fields and about 1.5 to 2.0 kV/m for electric fields. The magnetic fields from the transmission lines are well below these values, even for the peak magnetic field of 311 mG found on the ROW (Table 3.21-7). The electric fields expected at the edges of the ROW (1.23 kV/m or less) are below the threshold level of 1.5 kV/m for the

most sensitive pacemaker. The proposed transmission lines would not have an effect on pacemakers outside the ROW.

Cardiovascular specialists do not consider prolonged asynchronous pacing to be a problem. Periods of operation in this mode are commonly induced by cardiologists to check pacemaker performance. Although the electric field within areas of the transmission line ROW may affect the operation of some models of pacemakers by causing them to revert to asynchronous pacing, this would only be for short duration while walking under the transmission lines and is not considered harmful. The vehicle compartment of a car or truck or the cab of agricultural equipment (combine or tractor) shields the occupant from the electric field and thus there would not be an effect on a pacemaker while in a vehicle or cab while under the transmission line. Pacemakers in areas outside the transmission line ROW would not be affected. Before walking under the conductors of a high-voltage transmission line on the ROW, those with pacemakers or defibrillators should check with their physician if they have concerns.

GPS, Satellite Receivers, and Cell Phones – Corona-generated radio interference may cause disruption on AM communications bands in addition to AM radio such as the citizen's band and some mobile bands. However, mobile-radio communications are not susceptible to transmission-line interference because they are generally FM. Similarly, cellular telephones operate at a frequency of 900 MHz or higher, which is well above the frequency where corona-generated radio noise is prevalent. GPS systems operate at a frequency of 1.57 gigahertz and have been shown to be unaffected by radio noise from high-voltage transmission lines (Silva and Olsen 2002). Satellite receivers operate at even higher frequencies in the 3 to 6 gigahertz band. For these higher frequency devices, the receiver has to be essentially looking directly at the conductor before it may be affected (Chartier et al. 1986). In the unlikely event that interference occurs with these or other communications, mitigation would be easily achieved with the techniques used for AM radio interference such as a slight antenna relocation or orientation. As digital signal processing has been integrated into these communication systems, the potential interference impact of corona-generated radio noise has decreased.

Decommissioning

Upon decommissioning, the Project would be de-energized. This would result in no current and no voltage on the transmission lines. There would be no physical changes in the lines or structures that would occur associated with de-energization. Once de-energized there would not be any short-term or long-term impacts from the lines.

3.21.2.3 Proposed Route and Alternatives by Segment

For a given overhead line design and ROW width, there is no strong geographical or route preference driven by the electrical environment. Expected levels of electric field, magnetic field, audible noise, and radio noise found at the edge of the transmission corridor meet or are below accepted federal and state guidelines. The expected impacts of the electrical environment would be similar for the Route Alternatives.

3.21.2.4 Design Variation

An alternate design is proposed for Segments 2, 3, and 4 that would replace the double-circuit single structure with two single-circuit structures. The width of the ROW would also be increased by 50 feet, from 300 feet for the proposed double-circuit single

structure to 350 feet with a separation between the two single-circuit structures of 175 feet (Figure 3.21-19). The other line segments would remain the same.

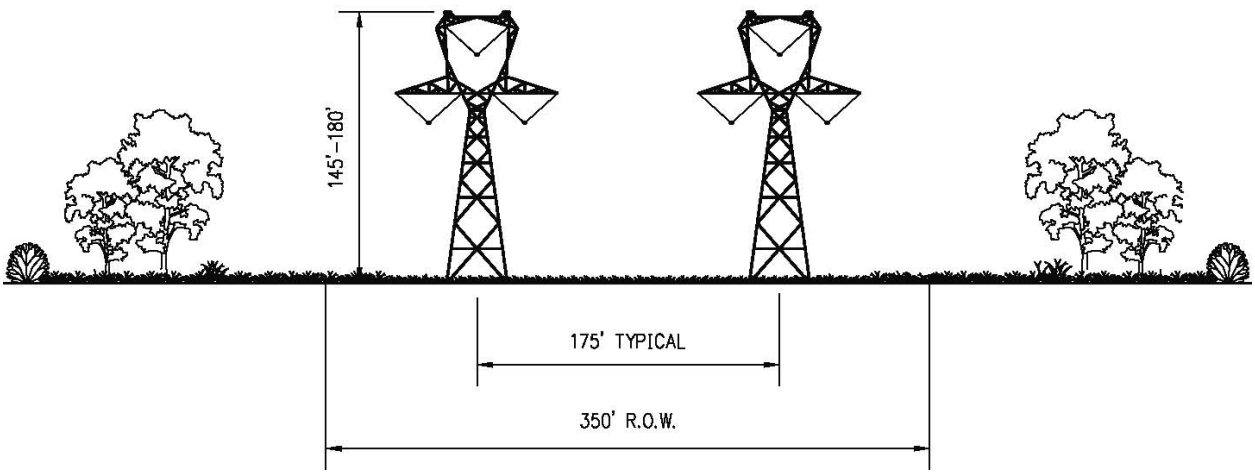


Figure 3.21-19. Proposed Design Variation for Two 500-kV Single Circuits

The different geometry used for the two 3-phase circuits in the alternate design changes the expected electrical environment for Segments 2, 3, and 4. The electric and magnetic fields, audible noise levels, and radio noise levels expected for this alternative are presented below.

Electric and Magnetic Fields

Electric Field – The electric field was calculated at a standard height of 1 m above ground at midspan where the conductors have their closest approach to ground. The electric field values at the edge of the ROW and at the peak of the profile within the ROW are listed in Table 3.21-15 for the design variation of Segments 2, 3, and 4. Plots of the electric field profiles are shown in Figure 3.21-20 and Figure 3.21-21 for Segments 2, 3, and 4 and Segments 2 and 3 under the final and initial energization plans. The Design Variation configuration using two single-circuit structures results in a slightly higher peak electric field of 9.69 kV/m within the ROW versus the 9.19 kV/m calculated for the Proposed Action single double-circuit structure, with both circuits energized at 500 kV. Higher electric fields are found at the edges of the ROW for the Design Variation versus the Proposed Action with both circuits energized at 500 kV.

Table 3.21-15. Electric Fields: Two Single-Circuit 500-kV Structures Alternative

Segment	ROW Width (ft)	South/East ROW Edge (kV/m)	Maximum within ROW (kV/m)	North/West ROW Edge (kV/m)
Initial Energization				
Segment 2 (230 kV/500 kV)	350	2.03	9.68	0.91
Segment 3 (230 kV/500 kV)	350	2.03	9.68	0.91
Final Energization				
Segments 2, 3, and 4 (500 kV/500 kV)	350	2.04	9.69	2.04

Major Single Axis Electric Field at standard height of 1 meter.
Ground Clearance: 35 feet for 500-kV lines.
Electric fields are calculated at a standard height of 1 meter above ground.

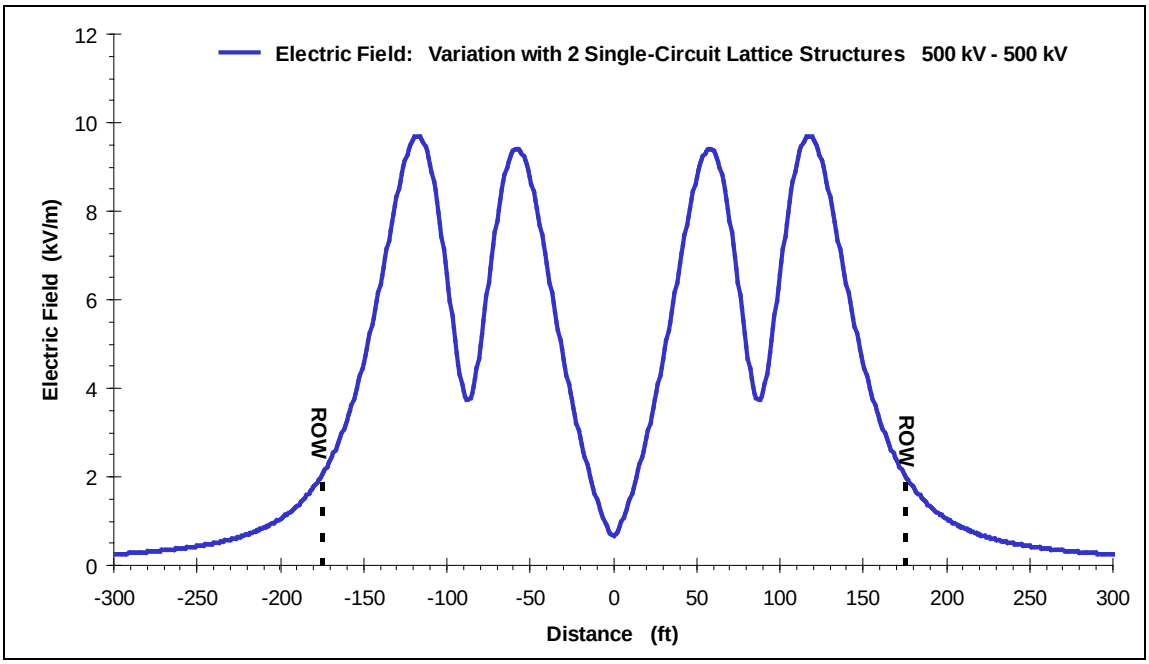


Figure 3.21-20. Electric Field Profile at Midspan for Two Single-Circuit 500-kV Lattice Tower Structures Both Energized at 500 kV (Segments 2, 3, and 4 under final energization plan)

Note: Major Axis electric field calculated at standard height of 1 meter. Conductor phasing from left to right is ABC-ABC.

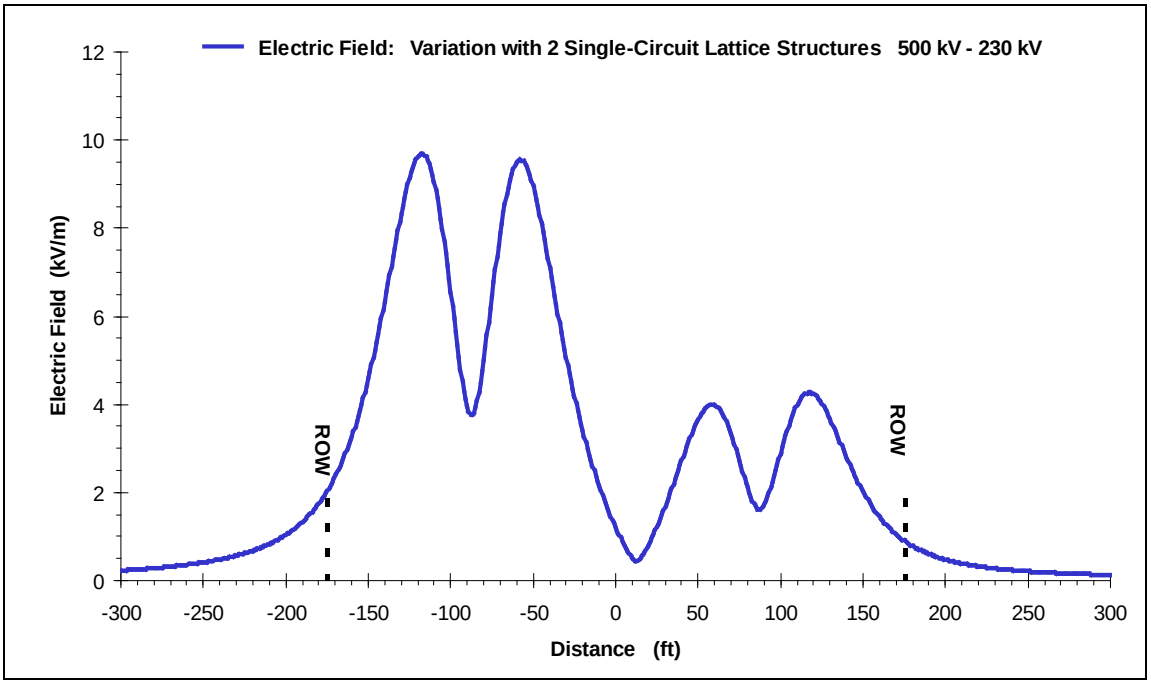


Figure 3.21-21. Electric Field Profile at Midspan for Two Single-Circuit 500-kV Lattice Tower Structures

Note: One circuit is energized at 500 kV while the other circuit is energized at only 230 kV (Segments 2 and 3 under initial energization plan). Major Axis electric field calculated at standard height of 1 meter. Conductor phasing from left to right is ABC-ABC.

Magnetic Field – The magnetic field was calculated at a standard height of 1 meter above ground at midspan where the conductors have their closest approach to ground. The magnetic field values at the edge of the ROW and at the peak of the profile within the ROW are listed in Table 3.21-16 for the alternate Segments 2, 3, and 4. Plots of the magnetic field profiles are shown in Figure 3.21-22 and Figure 3.21-23 for Segment 4 and Segments 2 and 3. The Design Variation using two single-circuit structures results in a higher peak magnetic field of 303 mG within the ROW of Segment 2 and 3 versus the 258 mG calculated for the proposed double-circuit structure. The peak magnetic field in the design variation of Segments 2, 3, and 4 for the final energization plan is 296 mG. Higher magnetic fields are found at the edges of the ROW for the design variation versus the proposed configuration (Table 3.21-16 versus Table 3.21-7).

Table 3.21-16. Magnetic Fields: Two Single-Circuit 500-kV Structures Alternative

Segment	ROW Width (ft)	South/East ROW Edge (mG)	Maximum within ROW (mG)	North/West ROW Edge (mG)
Initial Energization Plan				
Segment 2 (230 kV/500 kV)	350	77	303	44
Segment 3 (230 kV/500 kV)	350	77	303	44
Final Energization Plan				
Segments 2, 3, and 4 (500 kV/500 kV)	350	80	296	80

Major Single Axis Magnetic Field at standard height of 1 meter.
Peak Loading on 500-kV circuits is 1,500 MW (0.95 load factor assumed).
Typical loading used as 70 percent of peak load.
Magnetic field level for typical load taken as 70 percent of magnetic field under peak load conditions.

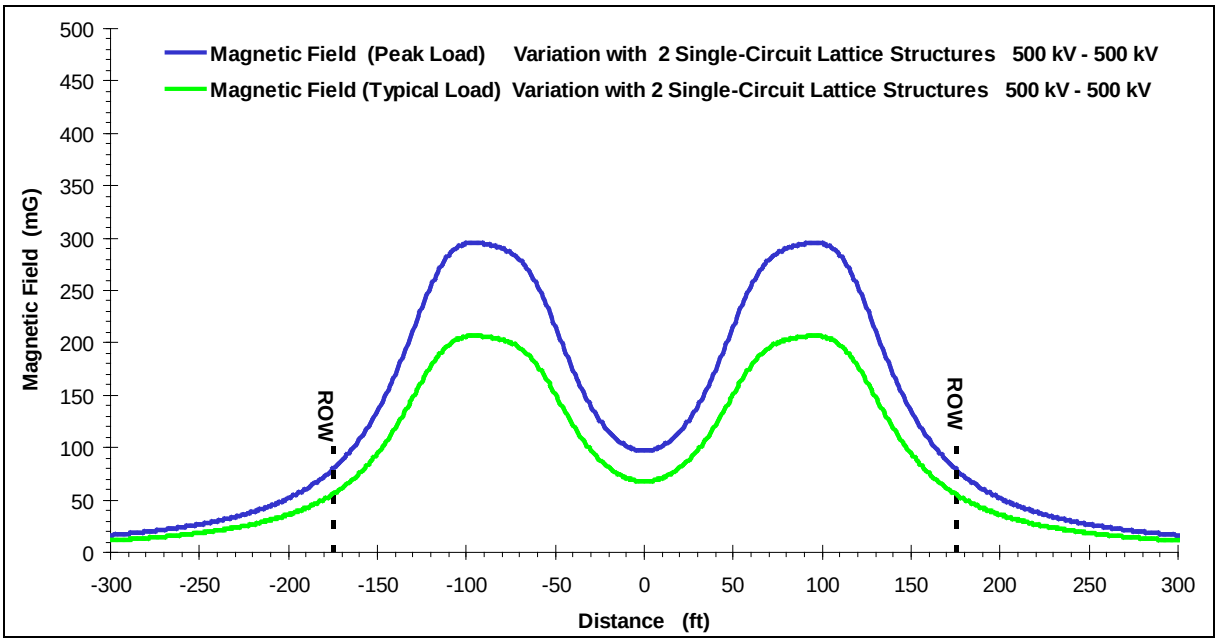


Figure 3.21-22. Magnetic Field Profile at Midspan for Two Single-Circuit 500-kV Lattice Structures

Note: Both circuits are energized at 500 kV. (Segments 2, 3, and 4 under final energization plan). Major Axis magnetic field calculated at standard height of 1 meter. Conductor phasing from left to right is ABC-ABC.

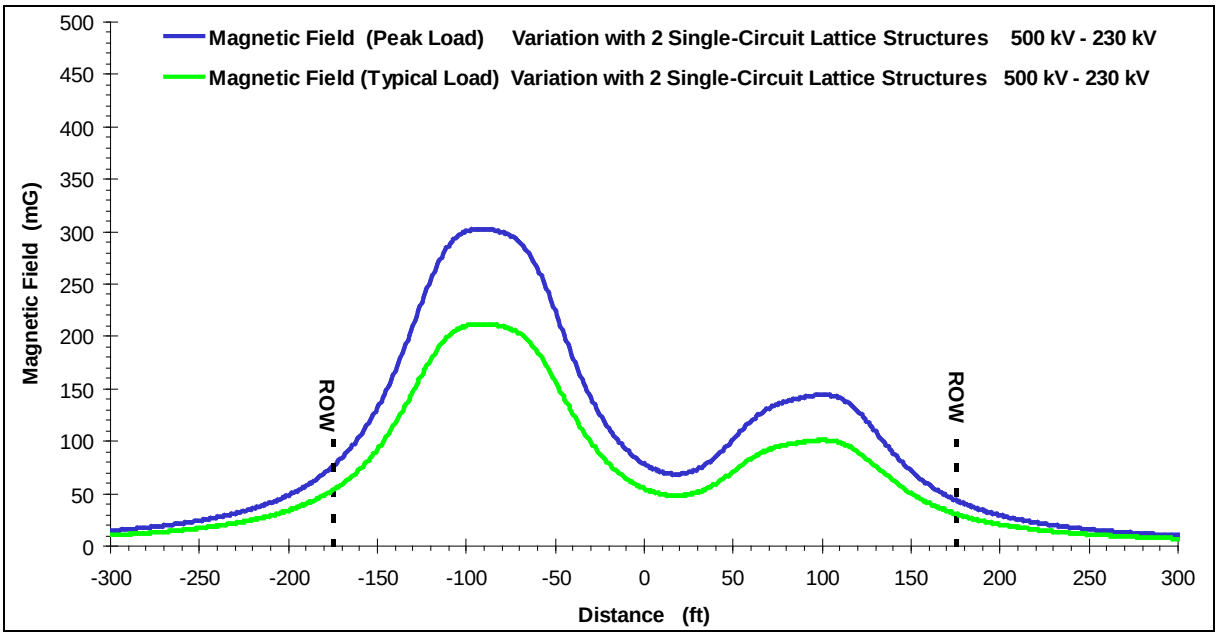


Figure 3.21-23. Magnetic Field Profile at Midspan for Two Single-Circuit 500-kV Lattice Structures

Note: One circuit is energized at 500 kV while the other circuit is energized at only 230 kV (Segments 2 and 3 under initial energization plan). Major Axis magnetic field calculated at standard height of 1 meter. Conductor phasing from left to right is ABC-ABC.

Audible Noise

The audible noise was calculated at a height of 1.5 meters above ground at midspan for the alternate design of two single-circuit structures on Segments 2, 3, and 4. The audible noise values at the edge of the ROW and at the peak of the profile within the ROW are listed in Table 3.21-17 for the Design Variation. Plots of the audible noise profiles are shown in Figure 3.21-24 and Figure 3.21-25 for final and initial energization plans. The Design Variation results in a slightly lower audible noise peak of 56 dBA within the ROW of Segment 2, 3, and 4 for the final energization plan versus the 61 dBA calculated for the Proposed Action single double-circuit structure. Similar or slightly lower audible noise levels are found at the edges of the ROW for the alternate configuration versus the proposed configuration (Table 3.21-17 versus Table 3.21-10).

Table 3.21-17. Audible Noise (Foul Weather): Two Single-Circuit 500-kV Structures Alternative

Segment	ROW Width (ft)	South/East ROW Edge (dBA)	Maximum within ROW (dBA)	North/West ROW Edge (dBA)
Initial Energization Plan				
Segment 2 (230 kV/500 kV)	350	52	55	47
Segment 3 (230 kV/500 kV)	350	52	55	47
Final Energization Plan				
Segments 2, 3, and 4 (500 kV/500 kV)	350	53	56	53

Notes:
Median Audible noise in foul weather measured in dB with A weighting referenced to 20 microPascals.
A weighting chosen to match response of human ear.
Altitude of 7,000 feet (audible noise would be less for altitude lower than 7,000 feet).

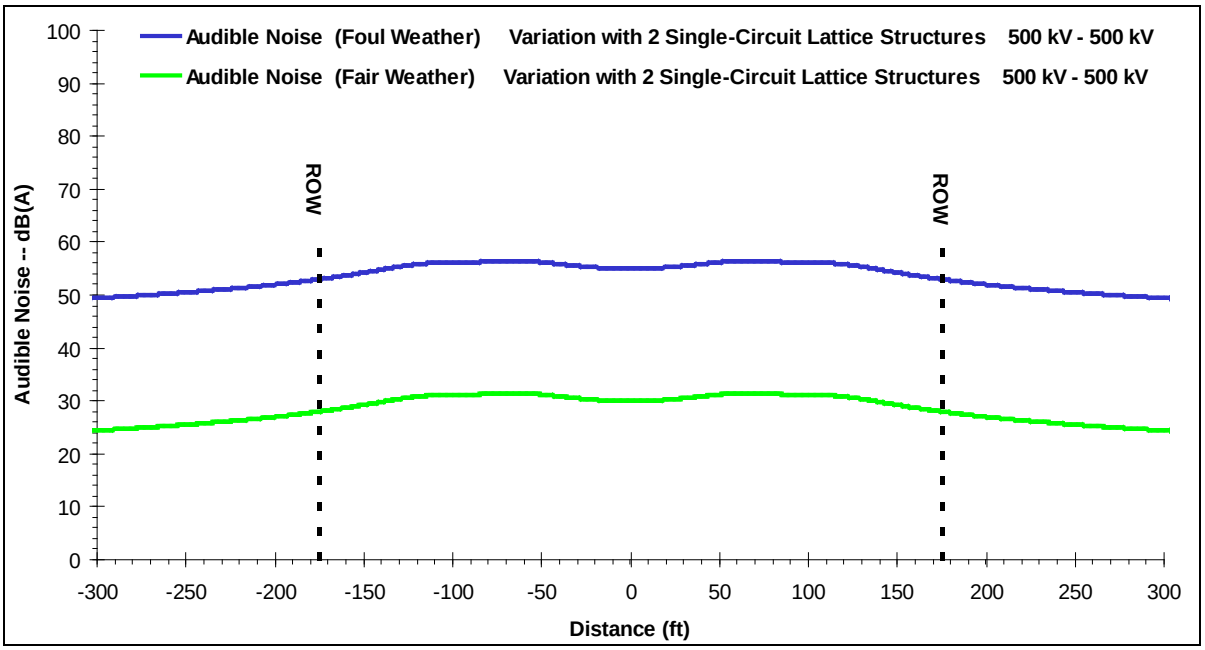


Figure 3.21-24. Audible Noise Profile at Midspan for two Single-Circuit 500-kV Lattice Structures

Note: Both circuits are energized at 500 kV (Segments 2, 3, and 4 under final energization plan). Audible noise profile calculated for fair and foul weather conditions.

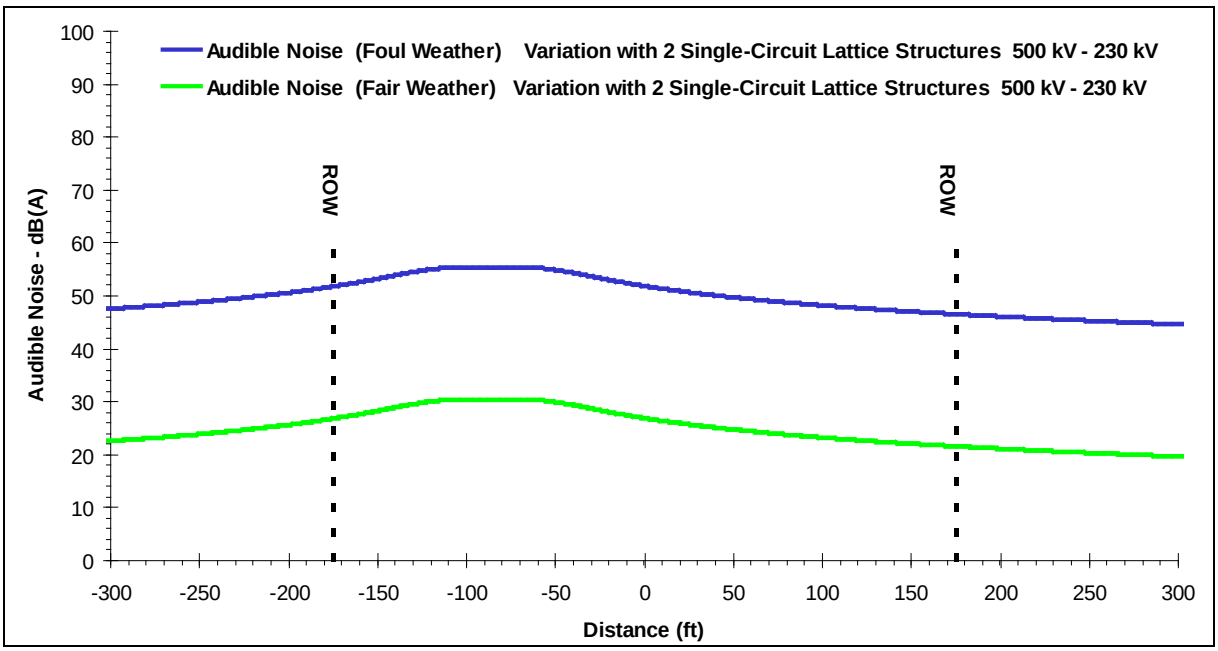


Figure 3.21-25. Audible Noise Profile at Midspan for two Single-Circuit 500-kV Lattice Structures

Note: One circuit is energized at 500 kV while the other circuit is energized at only 230 kV (Segments 2 and 3 under initial energization plan). Audible noise profile calculated for fair and foul weather conditions.

Calculated fair weather audible noise values at the edge of the ROW and at the peak of the profile within the ROW are listed in Table 3.21-18 for the design variation structures on Segments 2, 3, and 4. The Design Variation configuration using two single-circuit structures results in a lower fair weather audible noise peak of 31 dBA within the ROW of Segment 4 versus the 36 dBA calculated for the proposed double-circuit structure. Similar or slightly lower fair weather audible noise levels are also found at the edges of the ROW for the Design Variation configuration versus the proposed configuration (Table 3.21-18 versus Table 3.21-11). The audible noise levels at the edge of ROW during both foul and fair weather are below federal and state guidelines. The audible noise levels for the Design Variation are only 2 to 3 dBA lower at the edge of the ROW than the proposed design. Fluctuations in measured audible noise levels often exceed this. This difference would likely be unnoticed.

Table 3.21-18. Audible Noise (Fair Weather): Two Single-Circuit 500-kV Structures Alternative

Segment	ROW Width (ft)	South/East ROW Edge (dBA)	Maximum within ROW (dBA)	North/West ROW Edge (dBA)
Initial Energization Plan				
Segment 2 (230 kV/500 kV)	350	27	30	22
Segment 3 (230 kV/500 kV)	350	27	30	22
Final Energization Plan				
Segments 2, 3, and 4 (500 kV/500 kV)	350	28	31	28

Median Audible noise in foul weather measured in dB referenced to 20 microPascals with A weighting.
A weighting chosen to match response of human ear.
Altitude of 7,000 feet (audible noise would be less for altitude lower than 7,000 feet).

Radio Noise

Radio noise was calculated at a height of 3 meters above ground at midspan for the Design Variation of two single-circuit structures on Segments 2, 3, and 4. The radio noise values at the edge of the ROW and at the peak of the profile within the ROW are listed in Table 3.21-19 for the Design Variation on Segments 2, 3, and 4. Plots of the radio noise profiles are shown in Figure 3.21-26 and Figure 3.21-27 for the final and initial energization plans. The Design Variation using two single-circuit structures

Table 3.21-19. Radio Noise (Foul Weather): Two Single-Circuit 500-kV Structures Alternative

Segment	ROW Width (ft)	South/East ROW Edge (dB)	Maximum within ROW (dB)	North/West ROW Edge (dB)
Initial Energization Plan				
Segment 2 (230 kV/500 kV)	350	62	74	47
Segment 3 (230 kV/500 kV)	350	62	74	47
Final Energization Plan				
Segments 2, 3, and 4 (500 kV/500 kV)	350	62	75	62

Median radio noise measured in dB referenced to 1 µV/m.
Altitude of 7,000 feet (radio noise would be less for altitude lower than 7,000 feet)

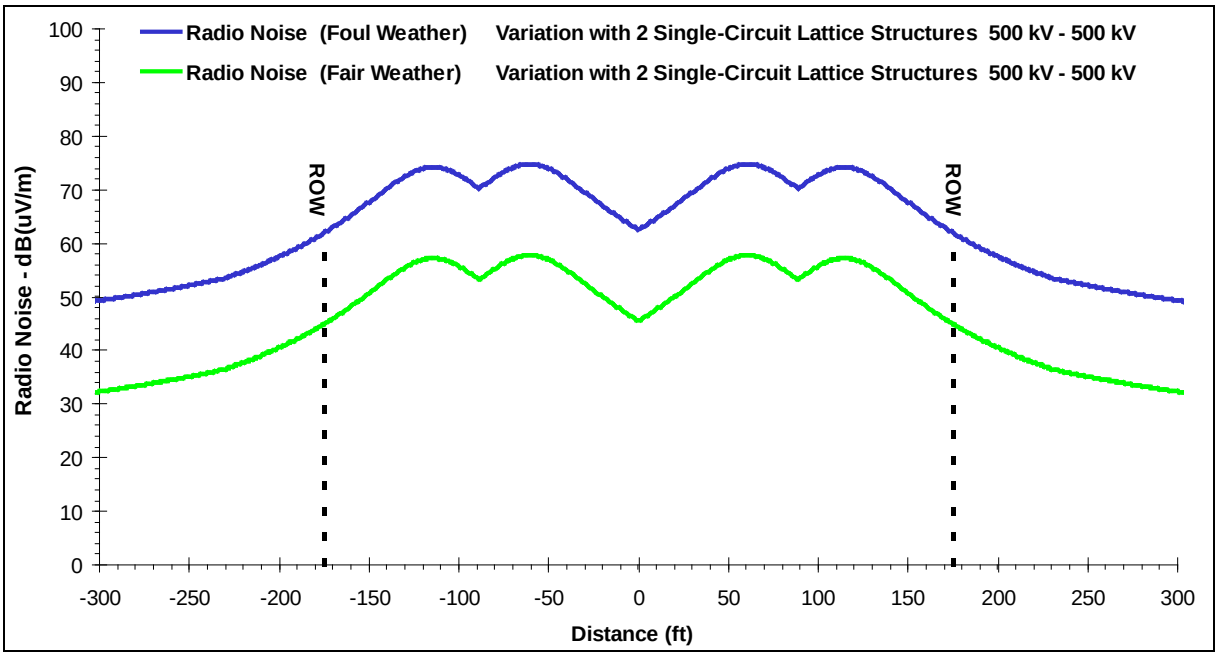


Figure 3.21-26. Radio Noise Profile at Midspan for Two Single-Circuit 500-kV Lattice Structures both Energized at 500 kV

Note: Radio noise profile calculated for fair and foul weather conditions.

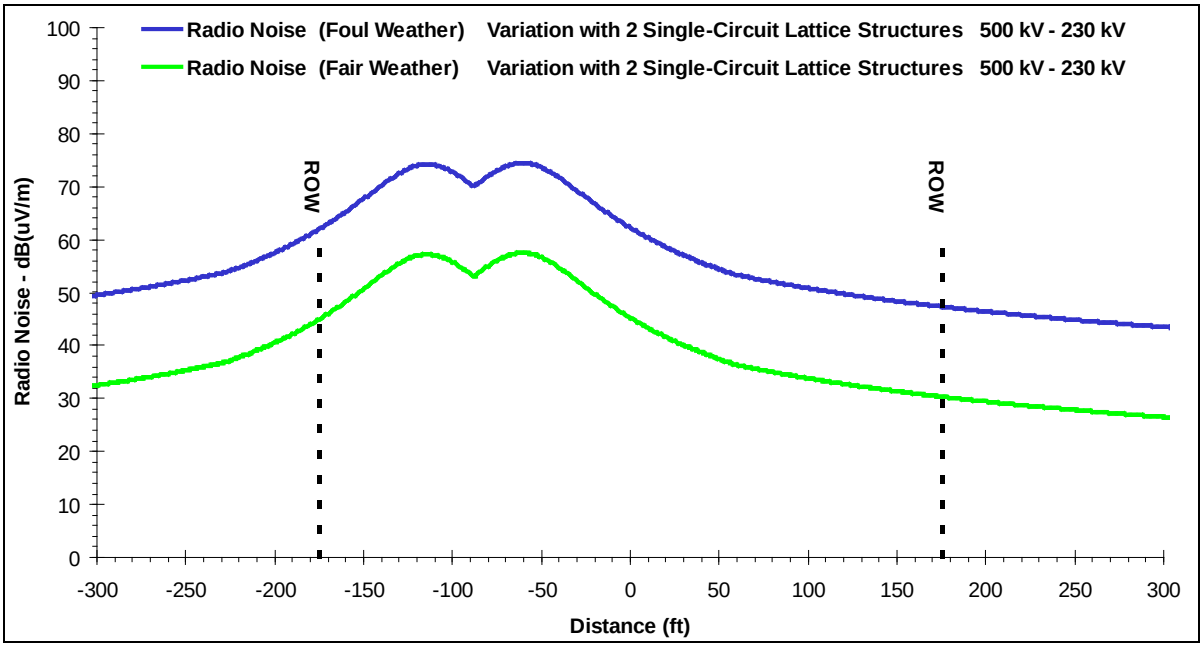


Figure 3.21-27. Radio Noise Profile at Midspan for Two Single-Circuit 500-kV Lattice Structures

Note: One circuit is energized at 500 kV while the other circuit is energized at only 230 kV (Segments 2 and 3). Radio noise profile calculated for fair and foul weather conditions.

results in a slightly lower radio noise peak of 76 dB (1 µV/m) within the Design Variation ROW of Segments 2, 3, and 4 versus the 79 dB (1 µV/m) calculated for the Proposed Action single double-circuit structure.

Higher radio noise levels are found at the edges of the ROW for the Design Variation versus the Proposed Action (Table 3.21-19 versus Table 3.21-13).

Calculated fair weather radio noise values at the edge of the ROW and at the peak of the profile within the ROW are listed in Table 3.21-20 for the Design Variation on Segments 2, 3, and 4. The Design Variation using two single-circuit structures results in a slightly lower fair weather radio noise peak of 58 dB (1 µV/m) within the ROW of Segments 2, 3, and 4 versus the 62 dB (1 µV/m) calculated for the Proposed Action single double-circuit structure. Higher fair weather radio noise levels are found at the edges of the ROW for the Design Variation versus the Proposed Action (Table 3.21-20 versus Table 3.21-14). The Design Variation meets the IEEE Radio Noise Guidelines of 40 dB (1 µV/m) for fair weather at 100 feet from the nearest conductor. The ROW edge is approximately 60 feet from the nearest conductor for the Design Variation. The radio noise levels for the Design Variation at the edge of the ROW are 4 to 5 dB (1 µV/m) higher than the Proposed Action design. Fluctuations in measured radio noise levels often exceed this.

Table 3.21-20. Radio Noise (Fair Weather): Two Single-Circuit 500-kV Structures Alternative

Segment	ROW Width (ft)	South/East ROW Edge (dB)	Maximum within ROW (dB)	North/West ROW Edge (dB)
Initial Energization Plan				
Segment 2 (230 kV/500 kV)	350	45	57	30
Segment 3 (230 kV/500 kV)	350	45	57	30
Final Energization Plan				
Segments 2, 3, and 4 (500 kV/500 kV)	350	45	58	45

Median radio noise measured in dB referenced to 1 µV/m.
Altitude of 7,000 feet (radio noise would be less for altitude lower than 7,000 feet).

Summary

The Design Variation would consist of constructing two single-circuit lines in Segments 2 through 4 instead of a single double-circuit line. The disturbance footprint of the two single-circuit towers is greater than that of the double-circuit tower, in part because the requested ROW would be wider, but also because helicopter-assisted construction could be implemented in these areas due to the lighter weight of the towers, which would require additional fly yards. The additional ROW space and the fly yards would cause additional temporary disturbance during construction. Across Segments 2, 3, and 4, the additional disturbance of the single-circuit tower alternative ranges from 25 to 30 percent greater than the comparable portions of the double-circuit tower disturbance under the proposed design. The two single circuits require more ground disturbance, but would be designed and constructed to the same standards as the Proposed Action.

The Design Variation requires 50 feet more ROW width and results in higher electric and magnetic fields but slightly lower audible noise levels and radio noise levels within the ROW. The differences in levels at the edge of the ROW, either up or down, would

probably not be perceived. The increase in the peak electric field with the Design Variation could result in higher line heights being required at road crossings where large semi-trailer trucks are anticipated than for the proposed design.

3.21.2.5 Structure Variation

The proposed guyed Structure Variation would add four guy wires about 140 feet long from a point about 100 feet up in each tower to four guy anchors spaced in a square around the tower (Appendix B, Figure B-6). This would not change the amount of disturbance during construction or operation appreciably. The conductors would be at about the same spacing and distance above ground on cross-arms approximately the same height as for the self-supporting lattice towers. Therefore, there would be no appreciable difference in the electrical environment from the use of this Structure Variation when compared to the use of self-supporting lattice towers.

3.21.2.6 Schedule Variation

The Schedule Variation uses the two single-circuit design variation described above but extends construction over a longer timeframe. Initially only one of the eventual two single-circuit lines would be constructed with the second to be constructed at a later date. The Schedule Variation proposes that the first single-circuit transmission line in Segments 2, 3, and 4 would be built as soon as a ROW grant is issued, but that the second line would not begin construction until late 2018. This would mean nearly 2 years between the end of construction for the first line and beginning of construction for the second line. Any staging areas and fly yards that had been used for the first stage would have been revegetated after construction was complete and would have to be cleared again. There would be two sets of construction disturbances adding movement, noise, and dust to the area of construction in two instances in any given area.

The Schedule Variation assumes that two single circuits for Segments 2, 3, and 4 are operated at 500 kV at the time they are installed. The result, after the second 500-kV circuit is built, would produce no different effects than the final energization plan for the Design Variation. During the time between the in-service date of the first 500-kV line and the in-service date of the second 500-kV line, the EMF, audible noise, and radio noise levels found within the ROW of Segment 4 and at its edges would be different than the levels discussed in Section 3.21.2.4 although they would fall within the same general range of the levels previously discussed.

3.21.3 Mitigation Measures

The Agencies have identified the following mitigation measures as a means for reducing impacts. They recommend that the Proponents incorporate these measures into their EPMs and apply them Project-wide.

EE-1 During final design, limit the conductor surface gradient in order to meet the IEEE Radio Noise Guideline.

EE-2 During construction, identify objects such as fences, metal buildings, pipelines, and other metal objects within or near the proposed ROW that have the possibility for induced potentials and currents and implement

electrical grounding of these objects according to the utility's and National Electric Code standards.

EE-3 During final design and construction, identify areas where large equipment is anticipated and provide sufficient conductor clearance to ground to meet the NESC 5 mA rule or limit size or access of large equipment.

3.22 PUBLIC SAFETY

This section discusses the potential effects on public safety and inconveniences that are commonly associated with transmission lines.

3.22.1 Affected Environment

This section discusses those aspects of the environment that could be impacted by the Project. It starts with a discussion of the Analysis Area considered, identifies the issues that have driven the analysis, and characterizes the existing conditions across the Proposed Route in Wyoming, Idaho, and Nevada.

3.22.1.1 Analysis Area

The Analysis Area is 0.25 mile on either side of the centerline for the Proposed Route and Route Alternatives. This area was selected because it is where workers would operate, soil disturbance would occur, and public safety impacts from operation of the transmission line would occur.

3.22.1.2 Issues to be Analyzed

The following public safety issues were brought up by the public during public scoping (Tetra Tech 2009a), were raised by federal and state agencies during scoping and agency discussions, or are issues that must be considered as stipulated in law or regulation:

- Whether the Project would cause environmental contamination or expose workers or the public to contamination;
- What the effects of electric and magnetic fields would be;
- Whether the transmission line would withstand wind and ice storms;
- Whether the transmission line would cause fires or create a fire hazard;
- Whether workers or the public would be safe from electrocution;
- What the effects would be of the transmission line on human health;
- What the Proponents would do to prevent the dangers of downed lines and tower failure;
- How the Proponents would protect against potential vandalism or acts of terrorism to Project structures; and
- Whether electrical safety procedures would be followed.

Other issues related to public health and safety include health risks associated with EMF; powerline-induced voltages and currents on conductive objects, such as metal roofs or buildings, fences, and vehicles; and interference with radio/television signals, GPS equipment, and cardiac pacemakers. Impacts relating to EMF issues are discussed in detail in Section 3.21 – Electrical Environment.

3.22.1.3 Regulatory Framework

The subsequent section discusses the regulatory requirements associated with public safety issues that are applicable to the Project. A regulatory review was completed at the federal and state levels.

Environmental Contamination

Hazardous substances are defined as having specific chemical, physical, or infectious properties that cause them to be considered hazardous. Hazardous substances are defined in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 101(14) as the following:

> *A hazardous material is a substance or combination of substances which, because of its quantity, concentration, or physical, chemical or infectious characteristics, may either (1) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (2) pose a substantial present or potential hazard to human health or environment when properly treated, stored, transported or disposed of or otherwise managed.*

Remediation of hazardous wastes discovered at a site is required if the material is excavated. If soils or groundwater at a site found to be contaminated do not have the characteristics required to be defined as hazardous, remediation may still be required and such requirements are typically evaluated on a case-by-case basis by the presiding agency.

Federal

The Federal Toxic Substances Control Act (1976) and the Resource Conservation and Recovery Act of 1976 (RCRA) established a program administered by the USEPA for the regulation of the generation, transportation, treatment, storage, and disposal of hazardous waste. The RCRA was amended in 1984 by the Hazardous and Solid Waste Act, which affirmed and extended the “cradle to grave” system of regulating hazardous wastes. The use of certain techniques for the disposal of some hazardous wastes was specifically prohibited by the Hazardous and Solid Waste Act. These techniques include land disposal of untreated hazardous waste unless migration of the hazardous constituents is not possible for as long as the waste remains hazardous or if the waste has been treated to meet USEPA levels or methods of treatment, which substantially diminish the toxicity of the waste or likelihood of migration of the hazardous constituents.

State

The WDEQ, Solid and Hazardous Waste Division, provides assistance on federal and state regulations and the proper management of the following waste types: hazardous waste, municipal solid waste, industrial waste, petroleum contaminated solids, asbestos, polychlorinated biphenyls, and others. The WDEQ has adopted regulations that parallel the federal hazardous waste regulations (Wyoming Hazardous Waste Rules and Regulations, WDEQ Chapter 1 *et seq.).* Releases of hazardous substances that enter the waters of the state or are determined to be a threat to waters of the state must be reported to WDEQ immediately (Wyoming Water Quality Rules and

Regulations, Chapter 4). As defined by WDEQ, a hazardous substance is any substance or waste that, after release, constitutes a threat to public health or welfare, or other aquatic life or wildlife, because of its quantity, concentration, chemical, corrosive, flammable, reactive, toxic, infectious, or radioactive characteristics.

The IDEQ has incorporated, by reference, the federal hazardous waste regulations (Idaho Rules of Practice and Procedures 58.01.05). Effective July 1, 1997, the name of the State Emergency Response Commission was changed to Idaho Bureau of Hazardous Materials. The Idaho Bureau of Hazardous Materials carries out the requirements of the USEPA Emergency Planning and Community Right-to-Know Act (EPCRA) and the Idaho Hazardous Substance Emergency Response Act (Idaho Code 39-7101 through 39-7115). It serves as an emergency response coordination and liaison organization for Idaho and works in cooperation with state and federal agencies to prepare for, respond to, and recover from hazardous materials incidents. The Idaho Bureau of Hazardous Materials keeps records concerning hazardous material storage, transport, and release within Idaho, including the toxics release inventory reports. Any person who has responsibility for reporting a release of CERCLA hazardous materials or EPCRA extremely hazardous substances must, as soon as practicable after gaining knowledge of the reportable release, notify the Idaho Bureau of Hazardous Materials (Idaho Code 38-7108).

The NDEP, Bureau of Waste Management (BWM) has adopted by reference the federal hazardous waste regulations, with certain modifications, for persons who generate, transport, treat, store, dispose, or otherwise manage hazardous waste or used oil, including 40 CFR Part 2, Subpart A; Part 124, Subparts A and B; Parts 260 to 270, inclusive; Part 273; and Part 279. Nevada's regulations for the storage and transportation of hazardous materials within the state are codified in NRS 459.400. The purpose of the hazardous waste program is "to protect human health, public safety and the environment from the effects of improper, inadequate or unsound management of hazardous waste; establish a program for regulation of the storage, generation, transportation, treatment and disposal of hazardous waste; and ensure safe and adequate management of hazardous waste." In addition to enforcing state and federal hazardous waste requirements, BWM is responsible for permitting and inspecting hazardous waste generators and disposal, transfer, storage, and recycling facilities. BWM also carries out the requirements of the USEPA EPCRA. This includes requiring owners and operators of facilities, which meet applicable thresholds, to report to the Toxic Chemical Release Inventory.

Wind and Ice Storm

The IPUC Construction Standards (provided under Statute 61), the Wyoming PSC's Title 37 Public Utilities Statutes, the Public Utilities Commission of Nevada (provided under NRS Chapter 704), and the NESC include loading requirements related to wind conditions. NESC Rule 230B specifies ice and wind loading for clearance purposes according to the geographical region (or zone as termed in the Code) where the overhead lines are located. Sagging of overhead lines resulting from such conditions must be checked at identified temperatures according to zone. Maintenance of Clearance and Spacings (Rule 230I of the NESC) would require that conductors be

resagged if an excessive ice or wind storm stretches conductors to the point of a clearance violation (Marne 2007).

Fire Hazards

Design codes that prevent fire hazards are given in the IPUC Construction Standards (provided under Statute 61) and the Wyoming PSC's Title 37 Public Utilities Statutes, and the Public Utilities Commission of Nevada (provided under NRS Chapter 704). These design codes and the NESC include requirements pertaining to the prevention of fire hazards related to outdoor public utility installations. NESC Rule 152A requires that energized parts of power transformers be enclosed or physically isolated and that the enclosure of a substation transformer and regulator be effectively grounded. In addition, details are provided pertaining to minimizing fire hazards related to liquid-filled power transformers and regulators installed in outdoor substations such as using less flammable liquids, specifics on space separation, fire-resistant barriers, automatic extinguishing systems, absorption beds, and enclosures.

The National Fire Protection Association Uniform Fire Code Handbook also gives guidance related to the clearance of brush and vegetative growth in and around transmission lines. For instance, for line voltages of 230 kV and 500 kV, a minimal radial clearance between the conductor and vegetation at the time of clearing is listed as 10 feet and 15 feet, respectively. There are separate minimum clearance requirements that must be maintained between the placement of electrical lines. The National Fire Protection Association Code also directs the utility company to perform the required work to the extent necessary to clear the hazard in the event of an electrical power line emergency.

Electrocution

Occupational Safety and Health Administration (OSHA) regulation 29 CFR 1926 Subpart V specifically pertains to safe work practices related to power transmission and distribution. The regulation includes specific requirements including assessing existing conditions prior to starting work such as determining if lines are energized, condition of poles, and the locations of circuits and equipment. For the protection of all employees, all conductors and equipment are treated as energized until tested and otherwise determined to be de-energized or until grounded. Minimum working clearance distances are established corresponding to the voltage range of the transmission line. Appropriate personal protective equipment is detailed, including rubber insulating gear. Provisions are given for both overhead and underground power lines, and energized substations.

3.22.1.4 Methods

The public safety assessment is based on an evaluation of the following measures to be taken during design, pre-construction, construction, and operations phases of the Project.

- Are all aspects of the Project being designed in accordance with applicable federal, state, and industry codes to minimize the potential for wind, ice, or fire to affect public safety?

- Will an environmental database search be conducted covering the area where ground will be broken to identify sites with known environmental contamination; sites with underground storage tanks; or sites that store, use, and dispose of hazardous materials off site with reported incidents of spills or inadequacies during inspections or in hazardous material records prior to construction?
- Have the Proponents committed to preparation and implementation of spill prevention, control and containment, notification protocols, immediate spill response procedures, hazardous material handling, and fire management plans during construction?
- Are plans covering routine and emergency measures planned to govern operations and maintenance?

3.22.1.5 Existing Conditions

Environmental Contamination

The Project is located on public land, or private land in largely rural areas. These areas would generally contain a lower density of existing environmentally contaminated sites compared to areas of higher human occupancy and more commercial or industrial use. Rural facilities that sometimes contain contamination could include active or abandoned mining sites, municipal solid waste landfills, aerial crop dusting facilities, railroads, oil or gas well sites, and/or petroleum pipelines. The routes were sited to avoid these types of facilities where possible. None of the Proposed or Alternative Routes are located in areas known to contain environmental contamination and the risk of encountering existing environmental contamination would be low.

Wind and Ice Storm

Wyoming

Surface wind direction and precipitation in the Project Analysis Area vary significantly due to differences in geographical location and features. Annual average wind speeds within the Analysis Area range from 7.7 to 12.9 miles per hour. Annual average wind directions are predominately from the southwest, with fluctuations from the west and southeast. The highest annual average temperatures range from 50°F to 55°F and the lowest annual average temperatures range from 31°F to 34.3°F within the Analysis Area. The annual average precipitation amounts range from 12.7 to 19.0 inches per year within the Analysis Area. The climate of any area in Wyoming is largely determined by its latitude, altitude, and local topography. These factors influence weather system airflow patterns, temperature variations, precipitation, and humidity as they migrate eastward. During the winter there are frequent periods when the wind reaches 30 to 40 miles per hour with gusts to 50 or 60 miles per hour. Prevailing directions in the different localities vary from west-southwest through west to northwest.

Hailstorms are the most destructive type of local storm for this state. Tornadoes occur, but records show they are much less frequent and destructive than those that occur in the Midwest. The relatively small amount of destruction from tornadoes is partly due to the fact that most of Wyoming is open range country and sparsely populated. However, records show that tornadoes that occur in Wyoming are somewhat smaller and have a

shorter duration. Many of them touch the ground for only a few minutes before receding into the clouds. The season extends from April through September. June has the greatest number on the average with May next and most occur in the eastern part of the state (University of Wyoming 2009).

FEMA lists 20 declared disasters and emergencies in Wyoming from 1963 through 2006. These events included 2 winter storms, 2 tornadoes, one drought, 11 fires, and 4 weather-related phenomena (rain, hail, mudslides, and flooding) (FEMA 2009).

Idaho

The mean monthly temperatures for January range from approximately 18°F at Montpelier, near the Idaho-Wyoming border, to 27°F throughout south-central Idaho, and 29°F at Caldwell in southwestern Idaho near the western terminus of the Project. The average annual wind speed ranges from 12 to 16 miles per hour.

In Idaho there are 28 declared disasters and emergencies on record occurring between 1956 and 2007. These events included 16 rainfall/snowmelt/flooding-related events, 8 fires, one drought, one dam collapse, one earthquake, and one other (FEMA 2009). In addition, disasters or emergencies related to wind or ice storms are recorded in Idaho.

Nevada

Nevada consists of mostly desert and semiarid climate regions. Daytime summer temperatures sometimes may rise as high as 115 F and nighttime winter temperatures may reach as low as −10 F. The mean annual temperature in the northeastern section of Nevada, which falls within the Project Analysis Area, is in the mid-40s. The average monthly wind speed ranges from 7 miles per hour typically in December to 11 miles per hour in April and June. The prevailing wind direction is generally from the west.

Most parts of Nevada receive scarce precipitation during the year; however, the Project Analysis Area is wetter than most with an average annual number of days with precipitation of 0.01 inch or more. Snowfall is usually heavy in the mountains, particularly in the north. Twenty-four hour snowfall can amount to over 45 inches, while seasonal totals of over 300 inches have been recorded. The average annual number of thunderstorms in the Project Analysis Area is 33. Instances of tornadoes are rare but have occurred in the months from April to September.

According to FEMA, there were 50 declared disasters and emergencies in Nevada from 1954 to 2008. These events included 29 fire management assistance declarations, one earthquake, one wildland fire, one drought, 17 weather-related events (snow, flooding, severe storm, heavy rains), and the Hurricane Katrina evacuation.

3.22.2 Direct and Indirect Effects

This section is organized to present effects to public safety from construction, then operation, followed by decommissioning activities for the proposed Project. Route Alternatives are discussed in Section 3.22.2.3. There is a Design Variation involving use of two single-circuit structures proposed by the Proponents for Segments 2, 3, and 4 (see Section 2.2 for details), which is analyzed below in Section 3.22.2.4 and a Structure Variation that is analyzed in Section 3.22.2.5. The Proponents have also

proposed a Schedule Variation, analyzed in Section 3.22.2.6, in which one of the two single circuits to be constructed in Segments 2, 3, and 4 and a portion of Segment 1W would be built on an extended schedule with construction beginning approximately 2.5 years after completion of the initial construction.

Mitigation measures or EPMs are presented in detail within this section only if it is the first time they have been discussed in Chapter 3; all other measures are referenced or summarized. A comprehensive list of all Proponent-proposed EPMs and Agency-required mitigation measures can be found in Table 2.7-1 of Chapter 2.

Plan Amendments

Proposed amendments are summarized in Table 2.2-1 of Chapter 2 and detailed in Appendices F and G. Amendments are needed to permit the Project to cross various areas of BLM-managed and NFS lands. Effects described for areas requiring an amendment in order for the Project to be built would only occur if the amendment were approved. Amendments that alter land management designations could change future use of these areas. No amendments specific to public safety are proposed for the Project and no impacts to public safety resulting from approving the amendments beyond the impacts of the project are anticipated.

3.22.2.1 No Action Alternative

Under the No Action Alternative, the Project would not be constructed nor operated. No Project-related exposure to environmental contamination, risk from wind, ice, and fire hazard or potential electrocution would occur. Impacts would continue at the present level as a result of natural conditions and existing development in the Analysis Area.

3.22.2.2 Effects Common to All Action Alternatives

Construction

Environmental Contamination

Pre-existing environmental contamination is not expected, but isolated occurrences are possible along the transmission line route. The Agencies have identified the following mitigation measures in the event of discovery of environmental contamination:

ENV-1 After a route has been selected and before construction, the route would be reviewed for areas within 0.5 mile of petroleum or gas pipelines, oil or gas wells, municipal solid waste landfills, service stations, railroads, municipal landfills, caves, and active and abandoned mines. The locations intersected by the route and these facilities would be compared against state Department of Environmental Quality databases, which contain the locations of contaminated facilities and sites undergoing remediation. If contaminated sites are identified, further information would be obtained from Department of Environmental Quality personnel, and the authorized officer would be notified.

ENV-2 Construction crews would be trained to look for pre-existing environmental contamination. Indications of contamination could include mine waste rock stockpiles, drums or containers of unknown products, discolored soil,

or unusual soil odors. Should indications of contamination be encountered, all surface-disturbing activities in the vicinity of the contamination would cease. The location would be marked and project access restricted to eliminate the spread of contamination by construction equipment. The authorized officer would be notified, and the applicable Department of Environmental Quality personnel, and property owner or land management agency informed. To protect site workers and minimize environmental effects, no work would occur at this location until the environmental conditions have been resolved. The Proponents would not assume responsibility for discovery of pre-existing contamination.

During construction, hazardous materials such as vehicle fuels, oils, and other vehicle maintenance fluids would be used and stored in construction staging yards. All potentially hazardous materials stored in construction staging yards would be stored in accordance with OSHA and USEPA requirements. There is potential for incidents involving the release of gasoline, diesel fuel, oil, hydraulic fluid, and lubricants from vehicles or other equipment or the release of paints, solvents, adhesives, or cleaning chemicals from construction activities. Improperly maintained equipment could leak fluids. Spills and leaks of hazardous materials during construction could result in soil or groundwater contamination. This could result in exposure of the facility, maintenance workers, and the public to hazardous materials; and could result in contamination to soil and/or groundwater. However, development and implementation of the spill prevention plan would minimize exposures and the likelihood of groundwater contamination. Exposure to employees, contractors, and the public could also result from the use of required chemical substances like herbicides. Again, legal requirements to apply herbicides following label directions and the required used of licensed applicators minimize the risk that exposure would be a hazard to people or the environment.

Ground disturbance along the transmission line ROW consists primarily of excavation at and near transmission structures and grading of new access roads. No known environmentally contaminated sites have been identified along the transmission line segments; however, there remains the potential to encounter unknown contamination during construction. Unknown contamination may be present in developed areas near the ROW and in remote area roads due to illegal dumping. Uncovering contaminated sites could have adverse impacts on Project personnel and other individuals that may come into contact with the site. In addition, there is the potential presence of residual pesticide and herbicide contamination of the soil and/or groundwater in the agricultural areas along the alignment, which could pose potential health hazards to those who come into contact with the soil or groundwater.

The Proponents have committed to prepare an SPCC Plan for review and approval by the appropriate regulatory agencies. That plan will include site-specific implementation of cleanup procedures in the event of soil contamination from spills or leaks of fuels, lubricants, coolants, or solvents as outlined in Appendix C-1, Attachment C. Cleanup procedures will be conducted in accordance with the SPCC Plan by on-site contractors selected by the Proponents. The Proponents have also committed to prepare and implement procedures for refueling and equipment operation near waterbodies, procedures for emergency response and incident reporting, and training requirements.

Wind and Ice Storm

The occurrence of ice storm conditions during Project construction is not expected because construction is scheduled to take place during the spring, summer, and fall. Periods of elevated winds may cause delays in Project construction schedule due to worker safety concerns.

Fire Hazards

Construction of the new transmission line would take place during spring, summer, and fall. The construction season would be short, with the majority of activities occurring during summer when weather is hot and dry. The potential for fire is relatively high because of the vegetation in the vicinity of the ROW, and it increases with the use of vehicles, chainsaws, and other motorized equipment. In addition, fire hazards can be related to workers smoking, refueling, and operating vehicles and other equipment off roadways. Welding during construction of towers or support structures could also potentially result in the combustion of native materials near the welding site. To reduce the potential for construction-related fires, the has Agencies have identified measures to be taken by the Proponents and the contractors to ensure that fire prevention and suppression measures are carried out in accordance with federal, state, and local regulations. The plan shall address the specific requirements of applicable BLM and Forest Service handbooks and provide BMPs for fire management on privately owned lands. The final plan will incorporate input from the contractor to ensure coordination with local firefighters and emergency responders for effective emergency response. Measures shall include:

FIRE-1 Train all personnel about the measures to take in the event of a fire including fire dangers, locations of extinguishers and equipment, and individual responsibilities for fire prevention and suppression.

FIRE-2 Equip all construction equipment operating with internal combustion engines with spark arresters.

FIRE-3 Restrict motorized equipment, including worker transportation vehicles, to the designated and approved work limits.

FIRE-4 Clear equipment parking areas, the ROW, staging areas, and designated vehicle-parking areas of all flammable material.

FIRE-5 Require all motor vehicles and equipment to carry, and individuals using handheld power equipment to have, specified fire prevention equipment.

FIRE-6 Provide a list of equipment capable of being adapted to fighting fires to local fire protection agencies.

FIRE-7 Notify the appropriate fire suppression agencies of scheduled road closures.

FIRE-8 Prohibit burning of slash, brush, stumps, trash, explosives storage boxes, or other Project-generated debris unless authorized by the applicable land management agency.

FIRE-9 Designate a Fire Guard on each construction crew prior to the start of construction activities each day and providing a communications system for maintaining contact with fire control agencies.

FIRE-10 Restrict or cease operations on federal lands during periods of high fire danger at the direction of the responsible land-managing agency representative.

FIRE-11 Use direct control for emergency wildland fire control. When possible, where fire suppression is necessary, use techniques that minimize soil and vegetation disturbance.

Electrocution

Electrocution poses a potential hazard to those who come in close contact with overhead transmission lines during energization and commissioning, especially those doing construction using mobile equipment. It is recommended that mandatory worker safety training, as required by OSHA, be part of any contract between the Proponents and the contractors.

Operations

Environmental Contamination

Electrical equipment, such as transformers, reactors, and circuit breakers, is filled with an insulating mineral oil. The SPCC Plan would require containment structures to prevent oil from this equipment from getting into the groundwater or surface water bodies in the event of a rupture or leak. Installation of containment structures would minimize the potential for release of hazardous materials from operation of substations. Another source of environmental contamination during Project operations would result from accidental releases of gasoline, diesel fuel, oil, hydraulic fluid, and lubricants from vehicles or other equipment during regular Project maintenance activities. The amount of released material (should it occur) is expected to be minimal and would not pose a risk to human health or the environment.

Wind and Ice Storms

Transmission line structures used to support overhead transmission lines must meet the requirements of the IPUC Construction Standards, the Wyoming PSC Public Utilities Statutes, the Public Utilities Commission of Nevada, and the NESC.

These structures are typically constructed on steel lattice towers or tubular steel poles. Transmission support structures are designed to withstand different combinations of loading conditions, including extreme winds. These design requirements include the use of safety factors that consider the type of loading as well as the type of material used (e.g., steel or concrete). Failures of transmission line support structures are extremely rare and are typically the result of anomalous loading conditions such as ice storms or tornadoes. In addition to structure strength, overhead transmission lines consist of a system of support structures and interconnecting wire that is inherently flexible and is designed for dynamic loading under variable wind conditions that may exceed earthquake loads. The Project has been designed so that the public safety impact of wind and ice storm effects on transmission towers would be minimized.

The Proponents have developed a Plan for Operations, Maintenance, and Emergency Response Activities (Appendix C-4). This plan provides for routine air patrols from a helicopter to inspect for structural and conductor defects, conductor clearance problems, and hazardous trees.

Fire Hazards

Transmission line structures used to support overhead transmission lines must meet the requirements of the IPUC Construction Standards, the Wyoming PSC Public Utilities Statutes, the Public Utilities Commission of Nevada, and the NESC.

Fire hazards causing wildfire ignitions are more prevalent for distribution and lower-voltage transmission lines than for higher-voltage transmission lines, such as those being employed for the proposed Project. The preferred support structure types selected for the 500-kV segments are both single-circuit and double-circuit lattice steel type (delta configuration), whereas an H-frame steel structure was selected for the 230-kV segments. Steel towers do not burn easily and are designed to protect against lightning strikes. Under the Plan for Operations, Maintenance, and Emergency Response, the integrity of the grounding would be tested on a regular basis during scheduled maintenance visits made by a contractor, thereby minimizing fire ignitions.

The energized conductors on distribution and lower-voltage transmission lines are much closer together than those on higher-voltage transmission lines. Fallen or wind-blown tree limbs and debris can more easily come into contact with and bridge two distribution conductor phases, which can cause electrical arcs that can set fire to debris. Regulatory requirements for vegetation clearance in proximity to 230-kV and 500-kV lines minimize fire hazard risk related to tree limb debris, because tree clearance requirements are designed to create an adequate separation distance from conductors to prevent any contact or flashover. Other transmission line–related ignition sources may include airborne debris (e.g., kites) coming into contact with conductors or insulators, dust or dirt on insulators, and accidents related to weapons, airplanes, and helicopters coming into contact with conductors, poles, and towers. Transmission line protection and control systems are designed to detect faults (such as arcing from debris contacting the line) and rapidly shut off power flow in 1/60th to 3/60th of a second.

Birds perched on power poles or flying between poles can simultaneously contact two conductors, causing an electrical flashover. This electrocutes the bird and occasionally causes its feathers to catch fire. The bird may fall to the ground and ignite nearby vegetation. These types of flashovers are expected to be impossible for transmission lines of the proposed Project due to the large conductor separation distance of distribution lines to substations and regeneration stations. The primary ignition threats associated with higher-voltage transmission lines like those used in the proposed Project are indirect, consisting of human-caused accidents during construction and maintenance activities. Construction and maintenance activities that may ignite fires include blasting, the use of equipment such as chainsaws, and the presence of personnel who may inadvertently ignite fires while smoking. The Proponents have identified the following EPMs (see Appendix C-1, Attachment E) to ensure blasting is conducted safely:

BLA-1 The Blasting Plan will identify blasting procedures including safety, use, storage, and transportation of explosives that will be employed where blasting is needed, and will specify the locations of needed blasting.

BLA-2 All blasting will be performed by registered licensed blasters who will be required to secure all necessary permits and comply with regulatory requirements in connection with the transportation, storage, and use of explosives, and blast vibration limits for nearby structures, utilities, wildlife, and fish (where blasting is conducted in waterbodies).

BLA-3 Appropriate flags, barricades, and warning signals will be used to ensure safety during blasting operations. Blast mats will be used when needed to prevent damage and injury from fly rock.

BLA-4 Blasting in the vicinity of pipelines will be coordinated with the pipeline operator, and will follow operator-specific procedures, as necessary.

BLA-5 Damages that result from blasting will be repaired or the owner fairly compensated.

To reduce the potential for operations-related fires, the Proponents would liaison with the local fire, police, and public officials to define the resources and responsibilities of each emergency response organization and to coordinate mutual assistance in the event of a fire incident.

Electrocution

Similar to potential effects during Project construction, electrocution poses a potential hazard in the operations phase to those who come in close contact with overhead transmission lines. Such groups include Project workers during regular maintenance, but could also include other off-site trade contractors such as tree trimmers, roofers, siding and sheet metal workers, and utility/communication workers.

Intentional Destructive Acts

Transmission lines, substations, and associated facilities could be targets of intentional destructive acts, such as sabotage, terrorism, vandalism, and theft. Such acts include firing at insulators, powerlines, transmission towers, or substation equipment; vandalism; and theft of equipment, supplies, tools, or materials. Of these acts, vandalism and thefts are most common. Depending on the size, voltage, and configuration of the transmission line, destroying towers or other equipment could disrupt electrical service. The impacts of destroying towers could range from no noticeable effect on electrical service to large areas being without power for a period of time.

Transmission support structures would be constructed in such a way that displacement would be extremely difficult. Physical deterrents such as regular line inspections, fencing, cameras, and signs at substations would be employed to prevent theft, vandalism, and unauthorized access. In the event of intentional destructive acts being directed at the proposed Project, operational protocols would be implemented with detailed procedures in accordance with the Proponents' emergency response procedures (POD).

Decommissioning

Potential impacts related to public health and safety are expected to be similar to those that could occur during the Project construction phase.

3.22.2.3 Proposed Route and Alternatives

For the Proposed Route or Route Alternatives, there is no strong geographical distinction driven by public safety. If the protective measures proposed by the Proponents and additional measures identified by BLM are incorporated into the Project design, construction, and operation, the expected public safety impacts would be low.

3.22.2.4 Design Variation

A Design Variation is being considered that would consist of constructing two single-circuit lines in Segments 2 through 4 instead of a single double-circuit line (which is the design assessed above). The disturbance footprint of the two single-circuit towers is greater than that of the double-circuit tower, in part because the requested ROW would be wider, but also because helicopter-assisted construction could be implemented in these areas due to the lighter weight of the towers, which would require additional fly yards. The additional ROW space and the fly yards would cause additional temporary disturbance during construction. Across Segments 2, 3, and 4, the additional disturbance of the single-circuit tower alternative ranges from 25 to 30 percent greater than the comparable portions of the double-circuit tower disturbance under the proposed design. The two single circuits require more ground disturbance, but would be designed and constructed to the same standards as the Proposed Action.

Construction

Potential effects related to public health and safety would be the same as those described in the Effects Common to All Action Alternatives section. The primary differences associated with a support structure configuration of two single-circuit lines is that a helicopter would be used for the construction of single circuits. Using a helicopter during the construction of the single-circuit line could increase the potential of a fire hazard if the helicopter were to crash.

Operation

Operational effects would be the same as those described for the double-circuit line above.

3.22.2.5 Structure Variation

The proposed guyed Structure Variation would add four guy wires about 140 feet long from a point about 100 feet up in each tower to four guy anchors spaced in a square around the tower (Appendix B, Figure B-6). This would not change the amount of disturbance during construction or operation appreciably. The guy wires might offer a small collision hazard for unobservant pedestrians or OHV users off-road. However, these structures would not be used adjacent to public roads or in rural development areas. Therefore, there is no appreciable difference in impact on public safety from the use of this Structure Variation when compared to the use of self-supporting lattice towers.

3.22.2.6 Schedule Variation

The Schedule Variation uses the two single-circuit design variation described above but extends construction over a longer timeframe. Initially only one of the eventual two single-circuit lines would be constructed with the second to be constructed at a later date. The Schedule Variation proposes that the first single-circuit transmission line in Segments 2, 3, and 4 would be built as soon as a ROW grant is issued, but that the second line would not begin construction until late 2018. This would mean nearly 2 years between the end of construction for the first line and beginning of construction for the second line. Any staging areas and fly yards that had been used for the first stage would have been revegetated after construction was complete and would have to be cleared again. There would be two sets of construction disturbances adding movement, noise, and dust to the area of construction in two instances in any given area.

The Schedule Variation would therefore have essentially double the adverse impacts on public safety for construction as the simultaneous construction or double-circuit alternative, even though operational disturbance overall would not be any greater.

3.22.3 Mitigation Measures

To minimize or avoid impacts on public safety, the Proponents have committed to EPMs that would be implemented Project-wide as outlined in this section and in Appendix C.

The following mitigation measures identified by the Agencies are required on federally managed lands. The Agencies recommend that the Proponents incorporate the measures into their EPMs and apply them Project-wide.

FIRE-1 Train all personnel about the measures to take in the event of a fire including fire dangers, locations of extinguishers and equipment, and individual responsibilities for fire prevention and suppression.

FIRE-2 Equip all construction equipment operating with internal combustion engines with spark arresters.

FIRE-3 Restrict motorized equipment, including worker transportation vehicles, to the designated and approved work limits.

FIRE-4 Clear equipment parking areas, the ROW, staging areas, and designated vehicle-parking areas of all flammable material.

FIRE-5 Require all motor vehicles and equipment to carry, and individuals using handheld power equipment to have, specified fire prevention equipment.

FIRE-6 Provide a list of equipment capable of being adapted to fighting fires to local fire protection agencies.

FIRE-7 Notify the appropriate fire suppression agencies of scheduled road closures.

FIRE-8 Prohibit burning of slash, brush, stumps, trash, explosives storage boxes, or other Project-generated debris unless authorized by the applicable land management agency.

FIRE-9 Designate a Fire Guard on each construction crew prior to the start of construction activities each day and providing a communications system for maintaining contact with fire control agencies.

FIRE-10 Restrict or cease operations on federal lands during periods of high fire danger at the direction of the responsible land-managing agency representative.

FIRE-11 Use direct control for emergency wildland fire control. When possible, where fire suppression is necessary, use techniques that minimize soil and vegetation disturbance.

In consideration of pre-existing environmental contamination, the Agencies recommend that the Proponents incorporate the following measures into their EPMs and apply them Project-wide:

ENV-1 After a route has been selected and before construction, the route would be reviewed for areas within 0.5 mile of petroleum or gas pipelines, oil or gas wells, municipal solid waste landfills, service stations, railroads, municipal landfills, caves, and active and abandoned mines. The locations intersected by the route and these facilities would be compared against state Department of Environmental Quality databases, which contain the locations of contaminated facilities and sites undergoing remediation. If contaminated sites are identified, further information would be obtained from Department of Environmental Quality personnel, and the authorized officer would be notified.

ENV-2 Construction crews would be trained to look for pre-existing environmental contamination. Indications of contamination could include mine waste rock stockpiles, drums or containers of unknown products, discolored soil, or unusual soil odors. Should indications of contamination be encountered, all surface-disturbing activities in the vicinity of the contamination would cease. The location would be marked and project access restricted to eliminate the spread of contamination by construction equipment. The authorized officer would be notified, and the applicable Department of Environmental Quality personnel, and property owner or land management agency informed. To protect site workers and minimize environmental effects, no work would occur at this location until the environmental conditions have been resolved. The Proponents would not assume responsibility for discovery of pre-existing contamination.

3.23 NOISE

This section addresses the potential noise impacts on the human environment and alternatives from the construction, operations, and decommissioning of the Proposed Action. The effect of construction and operation noise on wildlife is discussed in Sections 3.10 – General Wildlife and Fish and Section 3.11 – Special Status Wildlife and Fish Species. The effect of transmission line audible noise is also discussed in Section 3.21 – Electrical Environment.

3.23.1 Affected Environment

The following subsections include a discussion of the Analysis Area considered for environmental impacts by the Project, the issues that have driven the analysis, and the existing conditions across the Proposed Route and Route Alternatives in Wyoming, Idaho, and Nevada.

3.23.1.1 Analysis Area

The Analysis Area included potential noise sensitive areas (NSAs) including residences, schools and day care facilities, hospitals, long-term care facilities, places of worship, libraries, and parks and recreational areas specifically known for their solitude and tranquility such as wilderness areas. Generally, the Analysis Area was less than 1,000 feet from the proposed edge of the ROW, or from the boundary fence of the substations.

3.23.1.2 Issues to be Analyzed

The following noise-related issues were identified by the public during the public scoping (Tetra Tech 2009a), were raised by federal and state agencies during scoping and agency discussions, or are issues that must be considered as stipulated in law or regulation.

- Exposure of persons to or generation of noise levels in excess of standards as established within existing regulations, ordinances, and standards;
- Substantial temporary or permanent increase in ambient noise levels in the Project vicinity above levels existing prior to Project construction and operation; and
- Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels.

3.23.1.3 Regulatory Framework

A review of existing federal, state, county, and local noise regulations, ordinances, and guidelines was conducted and used to establish significance criteria for assessing Project compliance at identified noise sensitive areas (e.g., residences, schools, hospitals). The Project acoustic study area traverses three states, numerous counties, and several municipalities. With exception of the United States Occupational Health and Safety Administration regulations that describe worker health and safety limits for noise exposure, there are no other overarching federal or state noise regulations or

requirements specific to this Project or to transmission line operation in Idaho, Wyoming, or Nevada. Furthermore, there are no standardized regulatory impact criteria for the assessment of construction noise and vibration directly applicable to this Project. If new dBA limitations and hours of operation are developed as a part of the special use permitting process and found to be applicable to the Project, the Project would address these requirements at that time. The regulatory framework at the federal, state, and local levels is presented below.

Federal

The USEPA has developed widely accepted recommendations for long-term exposure to environmental noise with the goal of protecting public health and safety. Noise guidelines for similar linear construction projects have been developed by the USDOT.

U.S. Environmental Protection Agency

In 1974, the USEPA published *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety* (USEPA 1974). This report represents the only published study that includes a large database of community reaction to noise to which a proposed project can be readily compared. This publication evaluates the effects of environmental noise with respect to health and safety, and provides information for state and local governments to use in developing their own ambient noise standards.

For outdoor residential areas and other locations in which “quiet” is a basis for use, the recommended USEPA guideline is an L_{dn} of 55 dBA. Provided that Project operations meet this criterion, adjacent NSAs would regard the noise levels as generally acceptable. The USEPA also suggests an L_{eq} of 70 dBA (24-hour) limit to avoid adverse effects on public health and safety at publicly accessible property lines or extents of work areas where extended public exposure is possible. The USEPA criteria are summarized in Table 3.23-1, which identifies levels of environmental noise below which there is no evidence that the general population would be at risk to USEPA identified health effects.

Table 3.23-1. Summary of USEPA Noise Levels

Location	Level	Effect
All public accessible areas with prolonged exposure	70 dBA $L_{eq\ (24h)}$	Safety/hearing loss concerns
Outdoor at residential structure and other NSAs where a large amount of time is spent	55 dBA L_{dn}	Protection against annoyance and activity interference
Outdoor areas where limited amounts of time are spent, i.e., park areas, school yards, golf courses, etc.	55 dBA $L_{eq\ (24h)}$	
Indoor residential areas	45 dBA L_{dn}	
Indoor non-residential areas	45 dBA $L_{eq\ (24h)}$	

L_{eq} = equivalent sound level

U.S. Department of Transportation

The USDOT has identified criteria for the assessment of short- and long-term construction activities for both stationary and mobile projects, and specifically for linear projects. The Federal Highway Administration recommends abatement of construction noise that exceeds maximum levels at NSAs. These Project construction noise criteria

take into account the diurnal pattern of construction activities, the absolute noise levels during construction activities, the duration of the construction, and the adjacent land use. While these criteria were not developed to specifically address construction noise impact for power transmission line projects, the guidelines shown in Table 3.23-2 provide reasonable criteria for noise assessment. If these criteria are exceeded, adverse community reaction may result.

Table 3.23-2 Summary of USDOT Short Duration Construction Noise Guidelines

Location	Daytime	Nighttime
Short Duration Noise Guidelines		
NSAs (Residences)	90 dBA $L_{eq\ (8h)}$	80 dBA $L_{eq\ (8h)}$
Commercial	100 dBA $L_{eq\ (8h)}$	100 dBA $L_{eq\ (8h)}$
Industrial	100 dBA $L_{eq\ (8h)}$	100 dBA $L_{eq\ (8h)}$
Moderate Duration Noise Guidelines		
NSAs (Residences)	80 dBA $L_{eq\ (8h)}$	70 dBA $L_{eq\ (8h)}$
Commercial	85 dBA $L_{eq\ (8h)}$	85 dBA $L_{eq\ (8h)}$
Industrial	90 dBA $L_{eq\ (8h)}$	90 dBA $L_{eq\ (8h)}$

The USDOT has also established guidelines for vibration levels for estimating the potential for vibration impacts from construction activities. These criteria are reported in peak particle velocity for describing the threshold for damage. Annoyance or interference with vibration-sensitive equipment is typically reported in velocity decibels referenced to 1 micro-inch per second. Typical levels from construction do not have the potential for any structural damage. Specific construction activities, such as pile driving and blasting, may produce vibration levels that have the potential to damage vibration-sensitive structures if performed within 100 feet of the structure. The USDOT recommends that the maximum peak particle velocity levels remain below 0.2 inch per second at the nearest structures. Vibration levels above 0.2 inch per second have the potential to cause architectural damage to normal dwellings. The USDOT also states that vibration levels above 0.015 inch per second may be perceptible to people. Table 3.23-3 summarizes the levels of vibration and the usual effect on people and buildings.

Table 3.23-3. Summary of Vibration Impact Guidelines

Effects on Humans	Effects on Buildings	Vibration Level (ppv) inch/sec
Imperceptible	No effect	<0.005
Barely perceptible	No effect	0.005 to 0.015
Level at which continuous vibrations begin to annoy in buildings	No effect	0.02 to 0.05
Vibrations considered unacceptable for people exposed to continuous or long-term vibration	Minimal potential for damage to weak or sensitive structures	0.12 to 0.2
Vibrations considered bothersome by most people, however tolerable if short-term in length	Threshold at which there is a risk of architectural damage to buildings with plastered ceilings and walls.	0.2 to 1.0
Vibrations considered unpleasant by most people	U.S. Bureau of Mines data indicate that blasting vibration in this range will not harm most buildings. Most construction vibration limits are in this range.	1.0 to 2.0
Vibration is unpleasant	Potential for architectural damage and possible minor structural damage	>3.0

ppv = peak particle velocity

State

The States of Wyoming, Idaho, and Nevada do not have environmental noise regulations with numerical decibel limits directly applicable to the Project. The only noise regulations or statutes provided by the WDEQ and the IDEQ are related to noise nuisance complaints and are not applicable to the proposed Project.

County and Local Ordinances and Bylaws

Of the 22 counties and the one municipality crossed by the Proposed Route and Route Alternatives, 19 have no relevant noise ordinances, relying instead upon the state noise nuisance regulations. Ordinances and standards for the remaining counties are described in Table 3.23-4. County noise ordinances, where they exist, are focused on permanent site development, which would include substations and transmission line operations only. Typically, daytime construction is exempt from local noise ordinances and standards. However, nighttime construction noise may also be subject to regulatory requirements or noise nuisance clauses enforceable under state or local penal code. The City of Kuna has noise abatement ordinances applicable to highway construction.

Table 3.23-4. Applicable County Noise Ordinances and Standards

County	Ordinances and Standards	Description
Oneida, ID	Oneida County Development Code (Appendix C)	Operating developments can generate a maximum of 70 dBA at the property boundary in commercial/industrial areas and either 50 dBA (10:00 p.m. to 7:00 a.m.) or 60 dBA (7:00 a.m. 10:00 p.m.) in residential areas. Temporary construction noise is exempt from this standard during the daytime hours of 7:00 a.m. to 10:00 p.m.
Franklin, ID	Franklin County Development Code	Operating developments can generate a maximum of 70 dBA at the property boundary in commercial/industrial areas and either 50 dBA (10:00 p.m. to 7:00 a.m.) or 60 dBA (7:00 a.m. 10:00 p.m.) in residential areas. Temporary construction noise is exempt from this standard during the daytime hours of 7:00 a.m. to 10:00 p.m.
Sweetwater, WY	Sweetwater County Nuisance Regulations	Operating developments can generate a maximum of 70 dBA at the property boundary in commercial/industrial areas and 60 dBA in residential areas. Temporary construction noise is exempt from this standard during daytime the hours of 7:00 a.m. to 10:00 p.m.

3.23.1.4 Methods

Sound is described as a rapid fluctuation or oscillation of air pressure above and below atmospheric pressure creating a sound wave. Sound energy is characterized by the properties of sound waves, which include frequency, wave length, period, amplitude, and velocity. Noise is highly subjective and defined as unwanted sound. It is largely dependent on the magnitude or intensity of noise, the duration of the Project, the proximity of noise-sensitive land use to noise source, and the time of day the incidence noise occurs (i.e., higher sensitivities would be expected during the quieter overnight periods).

The range of frequencies that humans hear can span from 20 to 20,000 Hz; however, humans have varying sensitivities to noise at different frequencies, even though the energy content is the same. The amplitude of a sound wave is measured in terms of its sound pressure level where a logarithmic decibel scale is used. To reflect the sensitivity of the human ear across the audio spectrum, the sound pressure level readings are

based on the “A-weighted scale”, which is a standard weighting system that accounts for human hearing response. The measurements used for the “A-weighted scale” are decibels, and are designated as dBA.

To take into account sound fluctuations, environmental noise is commonly described in terms of equivalent sound level (L_{eq}). The L_{eq} value, conventionally expressed in dBA, is the energy-averaged, A-weighted sound level for the complete time period. It is defined as the steady, continuous sound level, over a specified time, which has the same acoustic energy as the actual varying sound levels over that same time. Another common noise descriptor used when assessing environmental noise is the day-night sound level (L_{dn}), which is calculated by averaging the 24-hour hourly L_{eq} levels at a given location and adding 10 dB to noise emitted during the nighttime period (10:00 p.m. to 7:00 a.m.) to account for the increased sensitivity of people to noises that occur at night. The L_{max} is the maximum instantaneous sound level as measured during a specified time period. It can also be used to quantify the time-varying maximum instantaneous sound pressure level (as generated by equipment or an activity) or a manufacturer maximum source emission level.

The analysis conducted for activities associated with construction and operation of the proposed Project was evaluated using criteria and guidelines discussed in the previous section. The analysis methods included determining a critical distance from Project construction and operations for both the Proposed Route and Route Alternatives, where an NSA may experience received sound levels in excess of the selected criteria. Critical distances would vary greatly depending on what Project activity is being considered. For instance, during the construction phase, heightened received sound levels would result from use of heavy equipment and helicopters, whereas noise associated with transmission line operation (termed corona discharge) would be substantially lower. Critical distances were also assessed for operation of the new Project electrical substations. Transformers generally are the major sources of audible noise within a substation. In all cases, after analysis of impacts was complete and where impacts were identified, Proponent-proposed measures to reduce impacts were reviewed for sufficiency. Where those measures were determined to be insufficient, additional measures were identified.

3.23.1.5 Existing Conditions

A wide range of noise settings occur within the Project acoustic area. Variations in acoustic environment are due in part to existing land uses, population density, and proximity to transportation corridors. Elevated existing ambient noise levels in the region occur near major transportation corridors (i.e., I-84, I-86, I-15, and I-80) and in areas with higher population densities (i.e., Casper, Boise, Pocatello, and Twin Falls). There are also 21 rural airstrips and small airports (10 public, 10 private, and 1 proposed), located within 3 miles of the Project transmission line route, which also contribute to ambient noise levels in both surrounding urban and rural areas. The unincorporated areas and communities that would intersect the proposed transmission line are predominantly open land or rural in nature, and have comparatively lower ambient sound levels. Ambient noise levels are also low in BLM-managed and NFS lands and other open areas. These lands range from very quiet with natural sounds

such as birds, insects, and wind dominating to noisy in localized areas during periods of off-road recreational use, shooting, oil and gas, and other outdoor activities.

3.23.2 Direct and Indirect Effects

This section is organized to present construction, operation, and decommissioning effects from the proposed Project. Route Alternatives are analyzed in detail in Section 3.23.2.3. The Design Variation involves the use of two single-circuit structures proposed by the Proponent for Segments 2, 3, and 4 (see Section 2.2 for details), which is analyzed in Section 3.23.2.4. The Proponents have also proposed a Schedule Variation (see Section 3.23.2.5) in which one of the two single circuits to be constructed in Segments 2, 3, and 4 and a portion of Segment 1W would be built on an extended schedule, with construction beginning approximately 2.5 years after completion of the initial construction.

Mitigation measures or EPMs are presented in detail within this section only if it is the first time they have been discussed in Chapter 3; all other measures are referenced or summarized. A comprehensive list of all Proponent-proposed EPMs and Agency-required mitigation measures can be found in Table 2.7-1 of Chapter 2.

Plan Amendments

Proposed amendments are summarized in Table 2.2-1 of Chapter 2 and detailed in Appendices F and G. Amendments are needed to permit the Project to cross various areas of BLM-managed and NFS lands. Effects described for areas requiring an amendment in order for the Project to be built would only occur if the amendment were approved. Amendments that alter land management designations could change future use of these areas. No amendments specific to noise are proposed for the Project and no impacts to noise resulting from approving the amendments beyond the impacts of the Project are anticipated.

3.23.2.1 No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed or operated. Therefore, no Project impacts related to noise would occur.

3.23.2.2 Effects Common to All Action Alternatives

Construction

Construction of Project transmission lines would be completed in five stages: site access and preparation; installation of structure foundations; erecting of support structures; stringing of conductors, shield wire and fiber optic ground wire; and cleanup and site reclamation. Transmission line construction would occur as a series of sequential events distributed over several miles along the Project route at any one time. Twelve substations would be constructed or modified.

The Project construction phase would produce noise as heavy equipment would be required to build the proposed transmission line routes and electrical substations. Short-term use of equipment such as backhoes, cranes, front-end loaders, bulldozers, graders, excavators, compressors, generators, and various trucks would be needed for mobilizing crew, transporting and use of materials, line work, and site clearing and

preparation. Use of drill rigs, large augers, and rock drills would be required for the poured-in-place foundations at each tower location. It is not expected that pile driving would be needed during construction. Spur roads and access roads would require use of earthmoving equipment such as bulldozers and graders. Construction noise is usually made up of intermittent peaks and continuous lower levels of noise from equipment cycling through use. Noise levels associated with individual pieces of equipment would generally range between 70 and 90 dBA (USDOT 2006). Maximum instantaneous construction noise levels would range from 80 to 90 dBA at 50 feet from any work site. Table 3.23-5 provides typical noise level data for construction equipment potentially used during Project construction of the transmission line and electrical substations.

Table 3.23-5. Typical Noise Levels from Construction Equipment

Equipment Type	Measured L_{max} Noise Level at 50 feet (dBA)
Crane	88
Backhoe	85
Pan Loader	87
Bulldozer	89
Fuel Truck	88
Water Truck	88
Grader	85
Roller	80
Mechanic Truck	88
Flat Bed Truck	88
Dump Truck	88
Tractor	80
Concrete Truck	86
Concrete Pump	82
Front End Loader	83
Scraper	87
Air Compressor	82
Average Construction Site	85

Noise would be generated along the Project route, access roads, structure sites, pull sites, staging and maintenance areas, fly yards, and substation sites. Additional noise sources may include commuting workers, and trucks and helicopters moving material to and from the work sites.

The noise impacts at NSAs from construction would depend on the type of equipment used, the mode of operation of the equipment, the length of time the equipment is in use, the amount of equipment used simultaneously, and the distance between the sound source and NSA. All of these factors are expected to vary regularly throughout the construction period, making the calculation of a specific received sound level value at each NSA location difficult. The critical distances corresponding to the USEPA noise guidelines and other criteria developed by the Project to assess construction noise impacts were calculated. Sound generation was modeled according to the grouping of construction equipment provided in Table 3.23-5. The results of the modeling determined the distance from the construction site where sound levels would attenuate to the criteria levels. These distances included the following:

- A critical distance of 407 feet corresponding to the USEPA 70 dBA $L_{eq\ (24h)}$ guideline, and

- A critical distance of 280 feet corresponding to the USDOT 80 dBA $L_{eq\ (8h)}$ guideline.

Thus, NSAs situated within these critical distances may experience a short-term impact as a result of Project construction noise. While Project construction would generate unavoidable noise impacts at some NSAs, impacts would be temporary and intermittent.

Construction activities at the substations could last from several weeks to several months on an intermittent schedule. Construction equipment would be operated on an as-needed basis during this period and activities would occur for limited lengths of daytime hours at a specific location to minimize impacts at NSAs. In addition, the majority of construction activities would occur away from population centers; therefore, the potential for the Project to result in a substantial temporary or periodic increase in ambient noise levels in the acoustic environment surrounding the Project would be low. The Proponents would comply with all established noise ordinances and suggested noise guidelines; therefore, the potential for adverse noise impacts at NSAs resulting from Project construction would be minimized. The subsequent sections discuss specific construction techniques that the Project may use, including blasting and rock breaking, implosive devices during conductor stringing, and helicopter operations.

The Agencies have identified measures during construction that would substantially reduce impact in the vicinity of NSAs:

NOISE-1 Provide notice by mail prior to construction to all sensitive receptors and residences within 300 feet of construction sites, staging areas, and access roads. The announcement will state specifically where and when construction will occur in the area.

NOISE-2 Identify and provide a public liaison person before and during construction to respond to concerns of neighboring receptors, including residents, about noise construction disturbance.

NOISE-3 Establish a toll-free telephone number for receiving questions or complaints during construction and develop procedures for responding to callers.

Blasting and Rock Breaking

Modern blasting techniques include electronically controlled ignition of multiple small explosive charges in an area of rock 8/1000ths of a second apart resulting in a total event duration of approximately 3/10ths of a second. The detonations are timed so that the energy from individual detonations destructively interferes with each other, which is called wave canceling. As a result, very little of the kinetic energy is wasted as ground vibration and audible noise. Impulse (instantaneous) noise from blasts could reach up to 140 dBA at the blast location or over 90 dBA for NSAs within 500 feet.

Blasting may be required during Project construction if hard rock is encountered that cannot be loosened or fractured by other means. Blasting locations would not be identified until an investigative geotechnical survey study area is conducted during the detailed design. However, areas where blasting may potentially take place have been identified on a geologic basis. As described in Section 3.14 – Geologic Hazards, areas

of shallow bedrock exist along the Proposed Route and Route Alternatives. Depth to bedrock varies considerably along the routes, ranging from 1 to 4 feet below ground to greater than 12 feet below ground. Table 3.23-6 shows the number of NSAs along the Proposed Route and Route Alternatives that are located in areas of shallow bedrock and therefore may potentially be subjected to blasting during Project construction. The number of potentially impacted NSAs is directly related to the critical distance determined from the blasting criteria described in Section 3.23.3. These distances include the following:

- A critical distance of 131 feet corresponding to the USDOT vibration threshold for the potential for minor architectural damage, and
- A critical distance of 377 feet corresponding to the USDOT vibration threshold for annoyance.

Though noise generated during blasting can cause concern among nearby NSAs, blasting is a relatively short duration event compared to rock removal methods such as using track rig drills, rock breakers, jack hammers, rotary percussion drills, core barrels, and/or rotary rock drills. The Proponents intend to prepare a site-specific Blasting Plan prior to construction that covers blasting procedures, use of qualified blasters, site control and protection measures, and compensation for repair of damage (see EPMs BLA-1 through BLA-5, Appendix C-1, Attachment E)

Implosive Devices

Compression or implosive devices are used to make connections between conductors, which is the current industry-preferred method in contrast to previously used conventional hydraulic compression fittings. Use of implosive devices would vary depending on what segment of the transmission line is under construction and the number of conductors per bundle. A three-conductor bundle (see Appendix B, Figure B-3) is used for each phase and there are three phases per 500-kV circuit. At each single-circuit 500-kV dead-end structure and at in line sections where reel ends need to be connected, 18 implosive dead-end sleeves (six per phase, one for each of the three subconductors on each of the three phases, and on each side of the structure) would be required. Additionally, 18 compression or implosive sleeves would be required to fabricate and install the jumpers that connect the conductors from one side of the dead-end structure to the other, for a total of 36 sleeves for each single-circuit dead-end structure. Each double-circuit 500-kV dead-end structure would require twice as many sleeves as the single-circuit structure would because there are twice as many conductors to dead-end and jumpers to be fabricated, for a total of 72 sleeves for each double-circuit dead-end structure. The 230-kV single-circuit lines would require a two conductor bundle. Each 230-kV dead-end structure would require 12 implosive or compression type sleeves to dead-end the conductors and 12 sleeves to fabricate the jumpers, for a total of 24 sleeves at each dead-end structure.

Implo Technologies is a company that manufactures the implosive dead-end and sleeve compression connectors comparable to technologies that would be used during construction. They reported an average sound level measurement between 118 and 122 dBA at an approximate distance of 200 feet. The duration of sound emitted from

detonation of an implosive device is short, ranging from approximately 210 to 360 milliseconds. Since the potential for noise "startle" effects at NSAs at these distances exists, the use of implosive devices would be limited to daytime periods.

Helicopter Operations

To allow the construction contractor flexibility in the construction methods that may be used, the Project construction specification would be written to allow the contractor the option of using ground-based or helicopter construction methods, or a combination thereof for single-circuit structure erection. In particular, helicopters would be used in areas where access is limited or where there are environmental constraints to accessing the Project area with standard construction vehicles or equipment. Project activities that would be facilitated by helicopters include delivery of construction laborers, equipment and materials to structure sites, structure placement (except tubular steel poles), hardware installation, and wire stringing operations. When helicopter construction methods are employed, activities would be based at a fly yard, which is a Project-material staging area. The fly yards would be approximately 10 to 15 acres and would be sited at locations to permit a maximum fly time of 4 to 8 minutes to reach structure locations, typically at about 5-mile intervals.

Helicopters generally fly at low altitudes; therefore, potential temporary increases to ambient sound levels would occur in the area where helicopters are operating as well as along their flight path. Typically, helicopters may generate noise levels of 89 to 99 dBA at 50 feet when in flight at 200 feet. Light-duty helicopters would also be used during the stringing phase of construction. It is anticipated that helicopter stringing activities would proceed at a rate of approximately 2,000 feet per day using 4-hour days. Light-duty helicopters would generate noise levels of approximately 80 dBA at 200 feet.

Worst-case sound emissions generated from helicopter use during Project construction were assessed along the proposed transmission line route by segment. Under the Proposed Action developed by the Proponents, helicopter operations would be a contractor option for all segments except 2, 3, and 4. Segments 2, 3, and 4 could not effectively use helicopters for structure transportation and installation because the double-circuit structures proposed for these segments are too heavy for helicopters to manage. The critical distance where noise impacts were assessed for helicopter noise include the following:

- A critical distance of 90 feet corresponding to the USDOT 90 dBA $L_{eq\ (24h)}$ guideline for short-term construction activities,
- A critical distance of 280 feet corresponding to the USDOT 80 dBA $L_{eq\ (24h)}$ guideline for moderate-term construction activities, and
- A critical distance of 890 feet corresponding to the USEPA 70 dBA $L_{eq\ (24h)}$ guideline for public accessible areas with prolonged exposure.

At any one location along the Proposed Route and Route Alternatives, helicopter operations would occur for short periods several times per day. Therefore, the USDOT 90 dBA one-hour $L_{eq\ (1h)}$ is the most appropriate criteria to assess the potential for adverse noise impacts. Operations would be limited to daytime working hours only and

would be fairly short-term in nature. Therefore, short-term construction noise impacts from helicopter operations would be minor.

Operations

Transmission Line

Transmission lines have the potential to emit environmental noise under certain operating and environmental conditions. Transmission line noise (also called corona noise) is caused by the partial electrical breakdown of the insulating properties of air around the electrical conductors and overhead power lines (see Section 3.21 – Electrical Environment). When audible, corona-generated noise is often described as a raspy hum or buzz. Corona noise is primarily affected by weather and (to a lesser degree) by altitude and temperature. It is generated when the atmosphere ionizes near isolated irregularities (i.e., nicks, scrapes, and insects) on the conductor surface of operating transmission lines. Modern transmission lines are designed, constructed, and maintained to minimize corona-related noise during dry conditions. During precipitation events, corona humming noise is predominantly at the frequency of 120 Hz.

Modern transmission lines (such as those used for the Project) are designed, constructed, and maintained so that during dry conditions they would operate below the corona inception voltage. During dry weather conditions, noise from the proposed transmission lines would be generally indistinguishable from background sound levels at locations beyond the edge of the ROW. During rainfall events or high humidity, the noise level at the edge of the ROW would remain at a low level, but elevated when compared to dry conditions.

Sound levels emitted from transmission lines are related to line voltage. A 230-kV single-circuit transmission line would typically result in a worst-case sound pressure level of approximately 40 dBA at a distance of 90 feet. A 500-kV single-circuit line would produce a maximum sound pressure level of approximately 51 dBA at 90 feet. Using standard sound propagation calculation methodologies and representative sound source levels for transmission line operation, the number of potentially impacted NSAs were determined based on the following critical distances, corresponding to the 55 L_{dn} USEPA guideline criteria protective of health and human welfare (see Table 3.23-6).

Table 3.23-6. Critical Distances by Project Transmission Line Voltage

Line Voltage/Structure	Critical Distance 55 L_{dn} dBA USEPA Guideline (feet)
230-kV Single Circuit	20
500-kV Single Circuit	135
500/230-kV Double Circuit	144
500-kV Double Circuit	225

Substations

Typical equipment that would be installed at the Project substations would include circuit breakers, switches, bus supports, controls, reactors and series capacitors, and transformers. The principal noise sources in the substations are the transformers. Only the Windstar, Aeolus, Difficulty, Bridger, Anticline, Populus, Borah, Midpoint, and Hemingway Substations would have transformers. Transformer noise would propagate and attenuate at different rates depending on the transformer size, voltage rating, and

design. Transformer noise is principally a result of core vibration and is a function of the surface area, whether the transformer is air-filled or oil-filled, and the power rating. In addition to core vibration noise, transformer cooling fans and oil pumps at larger transformer stations generate broadband noise, but are limited to periods when additional cooling is required. The fan noise is relatively low and is generally considered secondary to the core vibration noise source.

For purposes of estimating potential impacts, it was assumed that each new substation included 500-kV transformers rated at 78 dBA by the National Electrical Manufacturers Association. The actual number of transformers and actual National Electrical Manufacturers Association rating would be confirmed during final Project design.

The Agencies have identified the following measure to be followed during operations that would substantially reduce impact in the vicinity of NSAs:

NOISE-4 Implement and maintain a noise complaint review process to deal with residents' or other potential queries and complaints as they arise. Such complaints would be logged and investigated on an individual basis to facilitate resolution of the issue of concern.

Decommissioning

Decommissioning noise impacts would be generally shorter term and lower than construction impacts. For instance, no blasting or rock breaking would be required.

3.23.2.3 Proposed Route and Alternatives by Segment

Construction

Table 3.23-7 shows the number of potentially impacted receptors that may exceed the USDOT and USEPA guidelines for helicopter construction, general construction, and blasting in areas with shallow bedrock at substations and along the proposed transmission line route and alternatives.

Table 3.23-7. Noise Sensitive Areas within Construction Analysis Area of Proposed Route and Route Alternatives

Segment Number	Proposed Route and Alternatives	Length (miles)	Number of NSAs and Distance from Centerline For General and Helicopter Construction (feet)				Number of NSAs within Potential Blasting Vibration Architectural Damage Zone (131 feet)	Number of NSAs within Blasting Vibration Annoyance Zone (377 feet)
			90	280	407	890		
1E	Proposed – Total Length	100.6	–	–	–	8	–	–
	Comparison Portion for Alternative 1E-A	17.6	–	–	–	7	–	–
	Alternative 1E-A	16.1	–	1	2	4	–	1
	Comparison Portion for Alternative 1E-B	37.9	–	–	–	1	–	–
	Alternative 1E-B	59.3	–	–	1	2	–	–
	Comparison Portion for Alternative 1E-C	75.4	–	–	–	1	–	–
	Alternative 1E-C	48.6	–	–	–	1	–	–

Table 3.23-7. Noise Sensitive Areas within Construction Analysis Area of Proposed Route and Route Alternatives (continued)

Segment Number	Proposed Route and Alternatives	Length (miles)	Number of NSAs and Distance from Centerline For General and Helicopter Construction (feet)				Number of NSAs within Potential Blasting Vibration Architectural Damage Zone (131 feet)	Number of NSAs within Blasting Vibration Annoyance Zone (377 feet)
			90	280	407	890		
1W(a)	Proposed – Total Length	76.5	–	1	1	5	–	1
	Comparison Portion for Alternative 1W-A	20.3	–	1	1	5	–	1
	Alternative 1W-A	16.2	–	–	–	2		
1W(c)	Proposed – Total Length	70.6	2	5	11	23	2	10
2	Proposed – Total Length	96.7	–	–	–	–	–	–
	Proposed – Comparison Portion for Alternative 2A	28.8	–	–	–	–	–	–
	Alternative 2A	28.4	–	–	–	–	–	–
	Proposed – Comparison Portion for Alternative 2B	7.0	–	–	–	–	–	–
	Alternative 2B	6.2	–	1	1	5	–	1
	Proposed – Comparison Portion for Alternative 2C	28.4	–	–	–	–	–	–
	Alternative 2C	24.4	–	–	–	–	–	–
3	Proposed – Total Length	46.6	–	–	–	–	–	–
	Proposed, from Creston to Anticline Substation	46.6	–	–	–	–	–	–
	230-kV Line between Anticline and Bridger Substations	4.3	–	–	–	–	–	–
	345-kV Line between Anticline and Bridger Substations	5.5	–	–	–	–	–	–
4	Proposed – Total Length	203.0	2	4	4	10	2	4
	Comparison Portion for Alternative 4A, B,C, D,E	90.2		1	1	3	–	1
	Alternative 4A	85.2	–	–	–	2	–	–
	Alternative 4B	100.2	–	–	–		–	–
	Alternative 4C	101.6	–	–	1	1	–	1
	Alternative 4D	100.8	–	–	–	–	–	
	Alternative 4E	102.2	–	–	1	1	–	1
	Alternative 4F	87.5	–	–	1	3	–	1
5	Proposed – Total Length	54.6	–	2	2	20	–	–
	Comparison Portion for Alternative 5A,B	25.3	–	1	1	8	–	–
	Alternative 5A	33.7	–	1		3	–	1
	Alternative 5B	44.4	–	2		4	–	2
	Comparison Portion for Alternative 5C	33.2	–	–	–	2	–	–
	Alternative 5C	26.1	–	–	–	–	–	–
	Comparison Portion for Alternative 5D	19.4	–	–	–	8	–	–
	Alternative 5D	17.5	–	2	6	18	–	5
	Comparison Portion for Alternative 5E	5.8	–	–	–	8	–	–
	Alternative 5E	5.3	–	–	–	2	–	–

Table 3.23-7. Noise Sensitive Areas within Construction Analysis Area of Proposed Route and Route Alternatives (continued)

Segment Number	Proposed Route and Alternatives	Length (miles)	Number of NSAs and Distance from Centerline For General and Helicopter Construction (feet)				Number of NSAs within Potential Blasting Vibration Architectural Damage Zone (131 feet)	Number of NSAs within Blasting Vibration Annoyance Zone (377 feet)
			90	280	407	890		
6	Proposed – Total Length	0.5	–	–	–	–	–	–
7	Proposed – Total Length	118.1	–	6	8	18	–	7
	Proposed – Comparison Portion for Alternatives 7A,B	35.2	–	1	1	3		1
	Alternative 7A	38.0	–	–	–	2	–	–
	Alternative 7B	46.4	–	1	1	3	–	1
	Proposed – Comparison Portion for Alternative 7C	20.1	–				–	
	Alternative 7C	20.3	–	–	–	2		
	Proposed – Comparison Portion for Alternative 7D	6.2	–	–	–	–	–	–
	Alternative 7D	6.8	–	–	–	–	–	–
	Proposed – Comparison Portion for Alternative 7E	3.8		1	1	6	–	1
	Alternative 7E	4.5	–	1	1	3	–	1
	Proposed – Comparison Portion for Alternative 7F	10.5	–	1	1	6	–	1
	Alternative 7F	10.8	–	–	–	–	–	–
	Proposed – Comparison Portion for Alternative 7G	3.1	–	–	–	–	–	–
	Alternative 7G	3.2	–	1	1	1	–	1
	Proposed – Comparison Portion for Alternative 7H, I	118.1	–	6	8	18	–	7
	Alternative 7H	127.5	–	1	3	5	–	2
	Alternative 7I	173.3	–	2	5	6	–	4
	Proposed – Comparison Portion 7/9 for Alt. 7J[1/]	143.9	–	7	9	20	–	8
	Alternative 7J[1/]	202.1	–	2	5	7	–	4
8	Proposed – Total Length	131.0	–	4	8	22	–	8
	Proposed – Comparison Portion for Alternative 8A	51.4	–	2	5	12	–	5
	Alternative 8A	53.6	2	6	19	40	2	17
	Proposed – Comparison Portion for Alternative 8B	45.3	–	1	2	9	–	2
	Alternative 8B	45.8	9	22	30	51	11	28
	Alternative B-Comparison Portion for Alternative 8C	6.5	–	–	–	–	–	–
	Alternative 8C	6.4	–	–	–	1	–	–
	Proposed – Comparison Portion for Alternative 8D	6.9	–	–	–	–	–	–
	Alternative 8D	8.1	–	1	1	1	--	1
	Proposed – Comparison Portion for Alternative 8E	7.0	–	–	–	–	–	–
	Alternative 8E	18.5	–	–	–	–	–	–

Table 3.23-7. Noise Sensitive Areas within Construction Analysis Area of Proposed Route and Route Alternatives (continued)

Segment Number	Proposed Route and Alternatives	Length (miles)	Number of NSAs and Distance from Centerline For General and Helicopter Construction (feet)				Number of NSAs within Potential Blasting Vibration Architectural Damage Zone (131 feet)	Number of NSAs within Blasting Vibration Annoyance Zone (377 feet)
			90	280	407	890		
9	Proposed – Total Length	161.7	2	9	10	20	4	10
	Proposed – Comparison Portion for Alternative 9A	7.8	1	1	1	1	1	1
	Alternative 9A	7.7	–	–	1	1	–	1
	Proposed – Comparison Portion for Alternative 9B	49.5	–	–	–	–	–	–
	Alternative 9B	53.2	1	1	1	5	1	1
	Proposed – Comparison Portion for Alternative 9C	14.7	–	–	–	–	–	–
	Alternative 9C	15.3	1	1	2	4	1	2
	Proposed – Comparison Portion for Alternatives 9D, E, F, G, H	57.2	1	6	7	9	3	7
	Alternative 9D	58.4	–	–	–	–	–	–
	Alternative 9E	68.7	–	–	–	–	–	–
	Alternative 9F	62.9	–	2	3	5	1	3
	Alternative 9G	56.4	–	–	–	–	–	–
	Alternative 9H	61.0	–	2	3	5	1	3
10	Proposed – Total Length	33.6	3	6	7	19	3	7

1/ Alternative 7J connects with Segment 9 approximately 25.8 miles west of the proposed Cedar Hill Substation, which is the western terminus of Segment 7 and the beginning point for Segment 9. The table above compares 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

The number of potential NSAs at the various construction distance zones is very small. Noise impacts would range from none to a minor inconvenience, given the measures proposed by the Proponents and additional measures identified by the Agencies.

Operations

The permanent noise sources associated with the Project consist of low-level noise due to transmission line corona effects and noise generated from electrical substations, as described in Section 3.23.5.2. Table 3.23-8 lists NSAs in the operation Analysis Area.

Table 3.23-8. Noise Sensitive Areas within Operation Analysis Area of Proposed Route and Route Alternatives

Segment Number	Proposed Route and Alternatives	Length (miles)	NSAs from Centerline of 230-kV Single-Circuit ROW (20 Feet)	NSAs from Centerline of 500-kV Single-Circuit ROW (135 feet)	NSAs from Centerline of 500-kV Double Circuit ROW (225 feet)
1E	Proposed – Total Length	100.6	–	–	–
	Comparison Portion for Alternative 1E-A	17.6	–	–	–
	Alternative 1E-A	16.1	–	–	–
	Comparison Portion for Alternative 1E-B	37.9	–	–	–

Table 3.23-8. Noise Sensitive Areas within Operation Analysis Area of Proposed Route and Route Alternatives (continued)

Segment Number	Proposed Route and Alternatives	Length (miles)	NSAs from Centerline of 230-kV Single-Circuit ROW (20 Feet)	NSAs from Centerline of 500-kV Single-Circuit ROW (135 feet)	NSAs from Centerline of 500-kV Double Circuit ROW (225 feet)
1E (cont.)	Alternative 1E-B	59.3	–	–	–
	Comparison Portion for Alternative 1E-C	75.4	–	–	–
	Alternative 1E-C	48.6	–	–	–
1W(a)	Proposed – Total Length	76.5	–	–	–
	Comparison Portion for Alternative 1W-A	20.3	–	–	–
	Alternative 1W-A	16.2	–	–	–
1W(c)	Proposed – Total Length	70.6	–	–	–
2	Proposed – Total Length	96.7	–	–	–
	Proposed – Comparison Portion for Alternative 2A	28.8	–	–	–
	Alternative 2A	28.4	–	–	–
	Proposed – Comparison Portion for Alternative 2B	7.0	–	–	–
	Alternative 2B	6.2	–	–	–
	Proposed – Comparison Portion for Alternative 2C	28.4	–	–	–
	Alternative 2C	24.4	–	–	–
3	Proposed – Total Length	46.6	–	–	–
	Proposed, from Creston to Anticline Substation	46.6	–	–	–
	230-kV Line between Anticline and Bridger Substations	4.3	–	–	–
	345-kV Line between Anticline and Bridger Substations	5.5	–	–	–
4	Proposed – Total Length	203.0	–	–	3
	Comparison Portion for Alternative 4A, B,C, D,E	90.2	–	–	1
	Alternative 4A	85.2	–	–	–
	Alternative 4C	100.2	–	–	–
	Alternative 4D	101.6	–	–	–
	Alternative 4E	100.8	–	–	–
	Alternative 4F	102.2	–	–	–
5	Proposed – Total Length	87.5	–	–	–
	Comparison Portion for Alternative 5A,B	25.3	–	–	–
	Alternative 5A	33.7	–	–	–
	Alternative 5B	44.4	–	–	–
	Comparison Portion for Alternative 5C	33.2	–	–	–
	Alternative 5C	26.1	–	–	–
	Comparison Portion for Alternative 5D	19.4	–	–	–
	Alternative 5D	17.5	–	–	–
	Comparison Portion for Alternative 5E	5.8	–	–	–
	Alternative 5E	5.3	–	–	–

Table 3.23-8. Noise Sensitive Areas within Operation Analysis Area of Proposed Action and Route Alternatives (continued)

Segment Number	Proposed Action and Alternatives	Length (miles)	NSAs from Centerline of 230-kV Single-Circuit ROW (20 Feet)	NSAs from Centerline of 500-kV Single-Circuit ROW (135 feet)	NSAs from Centerline of 500-kV Double Circuit ROW (225 feet)
6	Proposed – Total Length	0.5	–	–	–
7	Proposed – Total Length	118.1	–	1	–
	Proposed – Comparison Portion for Alternatives 7A,B	35.2	–	–	–
	Alternative 7A	38.0	–	–	–
	Alternative 7B	46.4	–	–	–
	Proposed – Comparison Portion for Alternative 7C	20.1	–	–	–
	Alternative 7C	20.3	–	–	–
	Proposed- Comparison Portion for Alternative 7D	6.2	–	–	–
	Alternative 7D	6.8	–	–	–
	Proposed – Comparison Portion for Alternative 7E	3.8	–	–	–
	Alternative 7E	4.5	–	1	–
	Proposed – Comparison Portion for Alternative 7F	10.5	–	–	–
	Alternative 7F	10.8	–	–	–
	Proposed – Comparison Portion for Alternative 7G	3.1	–	–	–
	Alternative 7G	3.2	–	–	–
	Proposed – Comparison Portion for Alternative 7H, I	118.1	–	1	–
	Alternative 7H	127.5	–	–	–
	Alternative 7I	173.3	–	–	1
	Proposed – Comparison Portion 7/9 for Alt. 7J[1/]	143.9	–	1	
	Alternative 7J[1/]	202.1	–	–	–
8	Proposed – Total Length	131.0	–	–	–
	Proposed – Comparison Portion for Alternative 8A	51.4	–	–	–
	Alternative 8A	53.6	–	2	–
	Proposed – Comparison Portion for Alternative 8B	45.3	–	–	–
	Alternative 8B	45.8	–	12	–
	Alternative B –Comparison Portion for Alternative 8C	6.5	–	–	–
	Alternative 8C	6.4	–	–	–
	Proposed- Comparison Portion for Alternative 8D	6.9	–	–	–
	Alternative 8D	8.1	–	–	–
	Proposed – Comparison Portion for Alternative 8E	7.0	–	–	–
	Alternative 8E	18.5	–	–	–
9	Proposed – Total Length	161.7	–	5	–
	Proposed – Comparison Portion for Alternative 9A	7.8	–	1	–
	Alternative 9A	7.7	–	–	–

Table 3.23-8. Noise Sensitive Areas within Operation Analysis Area of Proposed Action and Route Alternatives (continued)

Segment Number	Proposed Action and Alternatives	Length (miles)	NSAs from Centerline of 230-kV Single-Circuit ROW (20 Feet)	NSAs from Centerline of 500-kV Single-Circuit ROW (135 feet)	NSAs from Centerline of 500-kV Double Circuit ROW (225 feet)
9 (cont.)	Proposed – Comparison Portion for Alternative 9B	49.5	–	–	–
	Alternative 9B	53.2	–	1	–
	Proposed – Comparison Portion for Alternative 9C	14.7	–	–	–
	Alternative 9C	15.3	–	1	–
	Proposed – Comparison Portion for Alternative 9D, E, F, G, H	57.2	–	3	–
	Alternative 9D	58.4	–	–	–
	Alternative 9E	68.7	–	–	–
	Alternative 9F	62.9	–	1	–
	Alternative 9G	56.4	–	–	–
	Alternative 9H	61.0	–	1	–
10	Proposed – Total Length	33.6	–	3	–

1/ Alternative 7J connects with Segment 9 approximately 25.8 miles west of the proposed Cedar Hill Substation, which is the western terminus of Segment 7 and the beginning point for Segment 9. The table above compares 7J (202 miles) with the corresponding portion of Segment 7/9 (118.1 miles of Segment 7 and 25.8 miles of Segment 9, for a total of 143.9 miles). All other Segment 7 alternatives are compared to Segment 7 of the Proposed Route (118.1 miles) only.

Noise levels from the eight substation expansions are expected to remain consistent (±3 dB) with existing present equipment noise emission levels. Three new substations are proposed for the Creston, Anticline, and Cedar Hill sites. Each would have circuit breakers, transformers, and other equipment common to substations.

The proposed Creston Substation would be located approximately 4 miles south of Wamsutter, Wyoming. Accompanying the substation itself, approximately 13 acres would be developed in an open undeveloped area with the closest NSA approximately 37 miles away. The proposed Anticline Substation would be located within proximity to the existing Jim Bridger Power Plant and substations. There are no NSAs within approximately 29 miles of the proposed station. No significant new noise would be created as a result of operations at this station. The proposed Cedar Hill Substation would be located approximately 20 miles southeast of Twin Falls, Idaho. An area of 45 acres would be developed for substation facilities. The closest NSA is approximately 1,400 feet from the proposed facility fence line. The critical distance corresponding to the USEPA 55 dBA L_{dn} guideline is 330 feet from the substation fence line. There are no NSAs located within the critical distance identified for noise generated during substation operation.

3.23.2.4 Design Variation

A Design Variation is being considered that would consist of constructing two single-circuit lines in Segments 2 through 4 instead of a single double-circuit line (which is the design assessed above). The disturbance footprint of the two single-circuit towers is greater than that of the double-circuit tower, in part because the requested ROW would be wider, but also because helicopter-assisted construction could be implemented in

these areas due to the lighter weight of the towers, which would require additional fly yards. The additional ROW space and the fly yards would cause additional temporary disturbance during construction. Across Segments 2, 3, and 4, the additional disturbance of the single-circuit tower alternative ranges from 25 to 30 percent greater than the comparable portions of the double-circuit tower disturbance under the proposed design. The two single circuits require more ground disturbance, but would be designed and constructed to the same standards as the Proposed Action.

The only disadvantage of this variation is an increase in the ROW width where the distance to NSAs from the edge of the ROW would be slightly reduced. This would be an insignificant change in terms of construction noise levels. The two single-circuit ROW configuration would also have a slightly reduced operations noise level.

3.23.2.5 Structure Variation

The proposed guyed structure variation would add four guy wires about 140 feet long from a point about 100 feet up in each tower to four guy anchors spaced in a square around the tower (Appendix B, Figure B-6). This would not change the amount of disturbance during construction or operation appreciably. The conductors would be at about the same spacing and distance above ground on cross-arms approximately the same height as for the self-supporting lattice towers. Therefore, there is no appreciable difference in impact on noise from the use of this Structural Variation when compared to the use of self-supporting lattice towers.

3.23.2.6 Schedule Variation

The Schedule Variation uses the two single-circuit design variation described above but extends construction over a longer timeframe. Initially only one of the eventual two single-circuit lines would be constructed with the second to be constructed at a later date. The Schedule Variation proposes that the first single-circuit transmission line in Segments 2, 3, and 4 would be built as soon as a ROW grant is issued, but that the second line would not begin construction until late 2018. This would mean nearly 2 years between the end of construction for the first line and beginning of construction for the second line. Any staging areas and fly yards that had been used for the first stage would have been revegetated after construction was complete and would have to be cleared again. There would be two sets of construction disturbances adding movement, noise, and dust to the area of construction in two instances in any given area.

In the short term, the interim overall impacts on NSAs would be reduced when compared to the Proposed Action and Design Variation due to the single smaller tower used and the greater distance to NSAs. However, in the future any short-term reduction in noise impacts would be lost with construction of the second line.

3.23.3 Mitigation Measures

The following mitigation measures identified by the Agencies are required on federally managed lands. The Agencies recommend that the Proponents incorporate the measure into their EPMs and apply them Project-wide.

NOISE-1 Provide notice by mail prior to construction to all sensitive receptors and residences within 300 feet of construction sites, staging areas, and access roads. The announcement will state specifically where and when construction will occur in the area.

The Proponents have accepted the following Agency-proposed mitigation measures:

NOISE-2 Identify and provide a public liaison person before and during construction to respond to concerns of neighboring receptors, including residents, about noise construction disturbance.

NOISE-3 Establish a toll-free telephone number for receiving questions or complaints during construction and develop procedures for responding to callers.

NOISE-4 Implement and maintain a noise complaint review process to deal with residents' or other potential queries and complaints as they arise. Such complaints would be logged and investigated on an individual basis to facilitate resolution of the issue of concern.

4.0 CUMULATIVE EFFECTS

Cumulative effects are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions" (40 CFR Part 1508.7). This section presents a discussion of the potential cumulative effects associated with Gateway West and is presented in the following four parts:

- The basis for the assessment, including the regulatory framework, the list of potentially relevant actions, and the process and criteria used in selecting relevant actions for this evaluation;
- A summary table and brief descriptions of the relevant past, present, and reasonably foreseeable actions that could contribute to a cumulative effect when considered with the effects from Gateway West;
- The potential cumulative effects associated with the Proposed Route or its Route Alternatives, Design Variation, Structural Variation, or Schedule Variation when considered together with the relevant past, present, and reasonably foreseeable actions; and
- The conclusions reached in this evaluation.

Based on the regulatory framework, the assessment area, the issues raised during and after scoping, and the list of projects presented here, a cumulative impact analysis was conducted for each resource analyzed in Chapter 3. The conclusions reached in each of those analysis segments are presented here. This chapter also addresses the cumulative effects of proposed RMP, MFP, or Forest Plan amendments where the proposed amendment would change land use allocations.

4.1 Basis for Assessment

4.1.1 Regulatory Framework

This evaluation of potential cumulative effects from the Proposed Action is consistent with the following regulations and guidance:

- CEQ *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* (40 CFR Part 1500-1508, 1978 as amended) (CEQ 1986);
- USEPA's *Procedures for Implementing the Requirements of the Council on Environmental Quality on the National Environmental Policy Act* (40 CFR Part 6 [2009]);
- CEQ's *Considering Cumulative Effects under the National Environmental Policy Act* (January 1997) (CEQ 1997b);
- USEPA's *Consideration of Cumulative Impacts in EPA Review of NEPA Documents,* EPA 315-R-99-002 (May 1999); and

- *Bureau of Land Management National Environmental Policy Act Handbook*, H-1790-1 (2008h).
- *Forest Service National Environmental Policy Act Handbook,* FSH 1909.15[1].

4.1.2 Scope of the Analysis

For the purposes of this analysis, the **temporal extent** of the projects to be considered is the expected physical operational service life of this Project (50 years), plus the estimated 10 years needed for substantial site rehabilitation after decommissioning is completed. Past and present events and projects are generally identified and their ongoing impacts discussed. "Reasonably foreseeable actions" are proposed projects or actions that have applied for a permit from local, state, or federal authorities or which are publicly known.

The **spatial extent** of the projects considered in the cumulative effects analysis varies by the project and by resource. In several cases, the Cumulative Impact Analysis Area (CIAA) for a resource is substantially larger than the corresponding project-specific Analysis Area in order to consider an area large enough to encompass likely effects from other projects on the same resource.

The Project "footprint" or direct construction ground disturbance extent is defined in Appendix B and summarized in Chapter 2. The CIAA for direct disturbance starts with an area defined as 500 feet on either side of the centerline of the Proposed Route or Route Alternatives and 25 feet on either side of indicative road location centerlines and includes the actual footprint of other Project-related facilities outside the 1,000-foot-wide area, including temporary facilities such as fly yards and laydown areas. For the purposes of this chapter, that set of polygons is called the Direct Impact Cumulative Impact Analysis Area (DICIAA). That set of polygons was then used to overlay various resource extents. If that set of polygons intersected a larger polygon (for example, a polygon defining big game winter range), then the *entire* larger polygon was included as the CIAA for the Project. For each resource, the CIAA included the set of larger polygons intersected as well as the buffered footprint area. Table 4.1-1 defines the larger polygons considered for each resource as part of the CIAA.

Table 4.1-1. Cumulative Impact Analysis Area by Resource

Resource	Definition of Cumulative Impact Area	Rationale for Area
Visual	5 miles from the DICIAA	Furthest distance within which this Project is generally visible, given visual attenuation in this Project area.
Cultural	DICIAA for cultural resources without TCP or visual components; for resources for which setting is a component of eligibility, up to 5 miles from the DICIAA.	Likely area impacted includes the proposed maximum ROW width (350 feet) and a buffer for direct effects and the area from which this Project could be viewed for visual impacts.
Socioeconomics	Counties crossed by Proposed Route and Route Alternatives.	Corresponds with the direct and indirect socioeconomic Analysis Area and includes the constituent municipalities and potentially affected populations.

[1] Available on the Internet at http://www.fs.fed.us/cgi-bin/Directives/get_dirs/fsh?1909.15 (accessed 6/6/11)

Table 4.1-1. Cumulative Effects Analysis Area by Resource (continued)

Resource	Definition of Cumulative Impact Area	Rationale for Area
Environmental Justice	Counties and Census Block Groups crossed by Proposed Route and Route Alternatives.	Corresponds with the direct and indirect environmental justice Analysis Area.
Vegetation	DICIAA.	Adequately covers the proposed disturbance footprint.
Special Status Plants	DICIAA and any area of known plant population or suitable habitat crossed by the DICAA.	Potential to damage sensitive plant populations or reduction of habitat available for plants
Invasive Plant Species	Counties crossed by the DICIAA.	Area in which introduction or spread of invasive plant species from this Project could interact with weeds already present or introduced or spread by other projects; political unit where weed control is required and regulated.
Wetlands and Riparian Areas	DICIAA and the extent of each mapped wetland or riparian area crossed by the DICIAA.	Dredge or fill in wetlands, impact to riparian areas.
General Wildlife and Fish: *Big game wintering and parturition habitat*	Mapped extent of herd unit areas of crucial wintering and parturition crossed by the DICIAA.	Area of potential critical stress for ungulate populations.
General Wildlife and Fish: *Raptor nests*	Raptor nests within 1 mile of the DICIAA.	Reasonable distance beyond which construction or operation of this or other projects is unlikely to disturb nesting birds.
General Wildlife and Fish: *Migratory birds*	DICIAA plus 0.5-mile buffer	Reasonable distance beyond which construction or operations of this or other projects is unlikely to disturb nesting birds.
Special Status Wildlife and Fish: *Bald eagle*	Known locations of eagle nests and suitable winter roosting habitat within 10 miles of the DICIAA.	Potential habitat
Special Status Wildlife and Fish: *Black-footed ferret*	Non-block-cleared areas that meet USFWS criteria as potential black-footed ferret habitat (USFWS 1989) crossed by the DICIAA.	Areas where presence of ferrets has not been ruled out and where ground disturbance from this or other projects could eliminate, damage, or fragment habitat.
Special Status Wildlife and Fish: *BLM / Forest Service Sensitive Fish Species*	Water bodies within or crossed by the DICIAA that contain BLM / Forest Service sensitive fish species.	Potential habitat.

Table 4.1-1. Cumulative Effects Analysis Area by Resource (continued)

Resource	Definition of Cumulative Impact Area	Rationale for Area
Special Status Wildlife and Fish: *Burrowing owl*	Known extent of breeding populations and identified suitable habitat for the species that are overlapped by the DICIAA.	Potential habitat.
Special Status Wildlife and Fish: *Canada lynx*	Lynx Analysis Units that are overlapped by the DICIAA.	Area required for a female home range (published on July 19, 2006).
Special Status Wildlife and Fish: *Colorado and Platte River fish and other associated aquatic and riparian species*	The watersheds of both rivers where crossed by the DICIAA and where new water withdrawals have been determined to represent an adverse impact on downstream flows.	As mandated by the USFWS in its programmatic consultation on water withdrawals in both basins.
Special Status Wildlife and Fish: *Columbian sharp-tailed grouse*	Distance from leks: 0.25 mile of the DICIAA	BLM "no surface occupancy" land use designation across Wyoming, as designated within the various BLM RMPs at the time of initial Project design (2008).
	Distance from leks: 0.6 mile of the DICIAA	Based on current "no surface occupancy" requirements.
	Distance from leks: 2 miles of the DICIAA	Based on the average distance (or more) that nesting and brood rearing usually occurs in relation to leks (Giesen and Connelly 1993; Meints 1991; UDNR 2002).
Special Status Wildlife and Fish: *Columbia spotted frog and northern leopard frog*	Mapped riparian and wetland polygons that are overlapped by the DICIAA.	Potential habitat.
Special Status Wildlife and Fish: *Federally listed invertebrate species*	Designated recovery areas for these species that are overlapped by the DICIAA.	Extent of occupied habitat.
Special Status Wildlife and Fish: *Gray wolf*	Mapped wolf pack polygons that are overlapped by the DICIAA.	Known locations of wolf packs mapped by the Idaho CDC and the WYNDD.

Table 4.1-1. Cumulative Effects Analysis Area by Resource (continued)

Resource	Definition of Cumulative Impact Area	Rationale for Area
Special Status Wildlife and Fish: *Greater sage-Grouse*	Core area polygons that are crossed by the DICIAA (Wyoming).	Areas most recently mapped and published on by the WGFD as important habitat for greater sage grouse in Wyoming.
	Key and restoration habitat polygons that are crossed by the DICIAA (Idaho).	Areas most recently mapped and published by IDFG as crucial to the protection and recovery of greater sage grouse in Idaho.
	Distance from leks: area within 0.25 mile of known greater sage-grouse lek	Based on BLM "no surface occupancy" land use designation applicable across Wyoming, as designated within the various BLM RMPs at the time of initial Project design (2008).
	Distance from leks: area within 0.6 mile of known greater sage-grouse lek	Based on the assumption made at the time of initial Project design (2008) that the "no surface occupancy" requirement would increase from 0.25 mile to 0.6 mile. As of this date, the BLM "no surface occupancy" restriction has been increased to 0.6 mile.
	Distance from leks: area within 1 mile of known greater sage-grouse lek	The Proponents chose to also assess impacts to leks at a distance of 1 mile, given the uncertainty regarding regulatory requirements for greater sage-grouse lek avoidance.
	Distance from leks: area within 2 miles of known greater sage-grouse lek	Based on Conservation Plan for the Greater Sage-grouse in Idaho (Connelly et al. 2000).
	Distance from leks: area within 3 miles of known greater sage-grouse lek	The Proponents chose to also assess leks at a distance of 3 miles, given the uncertainty regarding potential lek disturbances at varying distances.
	Distance from leks: area within 4 miles of known greater sage-grouse lek	As required by Wyoming Governor Executive Order 2011-5, and on the requirements of the BLM Instructional Memorandum (BLM 2009c).
	11 mile buffer around the Project (22-mile-wide analysis corridor)	Based on the requirements of the BLM Instructional Memorandum (BLM 2009c), and the Framework for Sage-Grouse Impacts Analysis for Interstate Transmission Lines (BLM 2011a).
Special Status Wildlife and Fish: *Grizzly bear*	Primary Conservation Area (PCA) crossed by the DICIAA	Minimum seasonal habitat components necessary to support grizzly bear populations, as part of the 1993 Grizzly Bear Recovery Plan.
	Distinct Population Segment (DPS) crossed by the DICIAA	Boundary of the grizzly bear's Yellowstone Distinct Population Segment.

Table 4.1-1. Cumulative Effects Analysis Area by Resource (continued)

Resource	Definition of Cumulative Impact Area	Rationale for Area
Special Status Wildlife and Fish: *Proposed Critical Habitat for the Jarbidge River Bull Trout*	The extent of the proposed critical habitat for the Jarbidge River bull trout that is crossed by the DICIAA.	Extent of proposed critical habitat.
Special Status Wildlife and Fish: *Mountain plover*	Known extent of breeding populations as well as identified suitable habitat for the species that are crossed by the DICIAA.	Potential habitat.
Special Status Wildlife and Fish: *Preble's meadow jumping mouse*	Known occurrences and identified suitable habitat for the species crossed by the DICIAA.	Potential habitat.
Special Status Wildlife and Fish: *Pygmy rabbit*	Known occurrences and identified suitable habitat for the species crossed by the DICIAA.	Areas of known occurrences mapped by the BLM, as well as suitable habitat mapped by Project-specific remote sensing.
Special Status Wildlife and Fish: *White- and black-tailed prairie dog*	Known occurrences, identified suitable habitat, and mapped colonies crossed by the DICIAA.	Potential habitat.
Special Status Wildlife and Fish: *Wyoming pocket gopher*	Mapped areas of possible gopher presences within Wyoming (based on WYNDD data), crossed by the DICIAA.	Database maintained by the WYNDD (most recent edition, see maps in Appendix E for date of edition).
Special Status Wildlife and Fish: *Yellow-billed cuckoo*	Extent of suitable habitats, mapped through remote sensing crossed by the DICIAA.	Potential habitat.
Special Status Wildlife and Fish: *Other BLM sensitive, Forest Service MIS, or Forest Service sensitive species not addressed individually.*	Extent of suitable habitats, mapped through remote sensing, that are crossed by the DICIAA.	Potential habitat.

Table 4.1-1. Cumulative Effects Analysis Area by Resource (continued)

Resource	Definition of Cumulative Impact Area	Rationale for Area
Geologic hazards	A distance of 100 miles on either side of the transmission line. All other hazards (landslide, subsidence, shallow depth to bedrock), the geologic unit with hazard where that extent is overlapped by the DICIAA.	Likely earthquakes in the Project area would not affect transmission lines more than 100 miles from an epicenter. Other hazards are based on the geologic unit in which they occur.
Minerals	Areas of active resource extraction for coal, trona, phosphate, oil, and gas where that extent is overlapped by the DICIAA.	Potential for impact on mining of coal, trona, phosphate, or on oil and gas extraction, and the potential for resource extraction impacts to interact with ground-disturbing effects from this and other projects.
Paleontology	Fossil-bearing formations where the formation is overlapped by the DICIAA.	Potential for impact to fossil-bearing formations.
Soils	Sensitive soil areas (highly erodible, highly susceptible to compaction) that are overlapped by the DICIAA.	Impact restricted to immediate Project area.
Water	Watersheds of waterbodies overlapped by the DICIAA with impacts in or adjacent to the waterbody.	Impact from Project may affect areas lower in watershed; all projects in watershed need to be considered.
Land Use	BLM: Resource Management Plan Area crossed by DICIAA. Forest Service: National Forest crossed by DICIAA. Private: County and municipality crossed by DICIAA.	Level at which land use regulations, plans, or authorizations are in effect.
Agriculture	Irrigated and dryland farming areas where crossed by DICIAA.	Areas of contiguous farmland, while not necessarily under one ownership, typically are part of a local community.
Transportation	Airports within 3 miles of transmission line centerline. Length and number of existing roads used for Project. Length and number of existing roads to be reconstructed or new roads to be built for the Project.	Airport distance defined by controlled airspace; roads area varies by type of road.
Air Quality	Statewide air quality areas.	To provide an understanding of current air quality in Wyoming and Idaho, to identify present projects that contribute to air quality degradation, and to understand how the electric generation carried by the Gateway West and other transmission lines, present and proposed, contribute to air quality issues.
Electric Effects	ROW width.	Electrical effects, including magnetic field and stray voltage, do not occur outside the ROW (see Section 3.21).

Table 4.1-1. Cumulative Effects Analysis Area by Resource (continued)

Resource	Definition of Cumulative Impact Area	Rationale for Area
Public Health and Safety	Areas occupied by people where crossed by DICIAA.	Construction and operation of the transmission line may affect the health and safety of people.
Noise	Construction: 900 feet from construction noise sources; Operation: ROW width.	Areas beyond which no noise from construction or operation of Gateway West would be detectable above USEPA recommended levels (see Section 3.23).

4.1.3 Land Management Plan Amendments

In several cases, the Proposed Route or Route Alternatives would be incompatible with land allocation classifications (frequently but not exclusively VRM classifications) assigned to the federal lands they would cross. Chapter 2 summarizes all plan amendments, Appendix F-1 contains details and analysis of each proposed amendment to BLM land management plans, Appendix F-2 contains details and analysis of each proposed amendment to Forest Service land management plans, and Appendix G contains maps and visual analysis documentation, including photographs and simulations, in support of the amendments analyses.

In most cases, the amendments to the land management plans are designed to allow the Project to be constructed and operated without changing the underlying land allocations. Where that is the case, there are no cumulative effects of the plan amendment that are not fully captured in the cumulative effects of the Project itself. Those amendments are considered in detail by resource, below, but not addressed further in this section. Where that is not the case, the resultant plan amendment could have cumulative effects in addition to the cumulative effects of the proposed Project itself. For land use plan amendments, in addition to considering the cumulative effects of the Project itself, the impact of the underlying land use allocation revision is analyzed in this section across the extent of the polygon proposed for revision. For example, if a polygon mapped as VRM Class II is proposed to be changed to VRM Class III, the impact of that change is taken into consideration as part of the cumulative effects.

4.1.3.1 Casper Resource Management Plan

To consider permitting the construction and operations of the Segment 1W(a) and 1W(c) Proposed Routes and the Segment 1E Proposed Route, an amendment for the Casper RMP would also need to be considered. There are four areas of nonconformance along the Proposed Routes in the Casper FO—in three areas the Project would be permitted through a plan amendment that would not change the underlying VRM classification. In one case, in the Deer Creek Mountains area, the RMP amendment would reclassify an isolated 630-acre parcel of Public Land from VRM Class II to Class III.

This parcel of BLM-managed land abuts private land to the west, north, and east, and abuts the Medicine Bow-Routt NFs to the south. This parcel would be crossed by the Segment 1W(a), 1W(c), and 1E Proposed Routes, all 230-kV, H-frame construction transmission lines. In this area, the Segment 1W(a) Proposed Route would be located

in the ROW for the existing transmission line, which also forms the centerline of WWE Corridor 78-255. That corridor occupies over half the BLM parcel. No other proposed projects are known in this area.

However, the cumulative effects of this RMP amendment beyond those of the proposed Project itself are negligible because the parcel is isolated and adjacent to private lands not similarly managed, and the two new lines, in addition to the reconstruction of the existing line, would effectively occupy virtually all of the developable land in BLM management, leaving very little room for additional linear or other industrial development.

4.1.3.2 Medicine Bow National Forest Land and Resource Management Plan

To consider permitting the construction and operations of the Segment 1E Proposed Route (prior to where Alternative 1E-B would diverge and therefore also necessary for Alternative 1E-B) and Alternative Route 1E-C, an amendment for the Medicine Bow Forest Plan would also need to be considered. A plan amendment is required because the Segment 1E Proposed Route, which crosses MA 3.31 (Back Country Recreation-Year-round motorized with a Moderate SIO) for approximately 2.7 miles is not consistent with the SIO. Similarly, Alternative 1E-C, which crosses MA 3.31 for approximately 1.3 miles, is not consistent with the SIO. Forest Plan direction states the SIO of Moderate is “Management activities remain visually subordinate to the characteristic landscape being viewed. Activities may repeat form, line, color, or texture common to the characteristic landscape but may not change in their qualities of size, amount, intensity, direction, pattern, etc.” Transmission lines are considered inconsistent with the SIO of Moderate.

If the Segment 1E Proposed Route (or Alternative 1E-B) is approved, Sections 13, 14, 23, and 24, T.30 N., R.78 W. and the west half of Sections 18 and 19, T.30 N., R.77 W. would be allocated to MA 8.3 Utility Corridors and Electronic Sites. If Alternative 1E-C is selected instead of the Proposed Route, only Sections 13, 14, 23, and 24, T.30 N., R.78 W. would be allocated to MA 8.3 Utility Corridors and Electronic Sites. The ROS classification for MA 8.3 is Roaded Natural; under this classification, modifications may be easily noticed and strongly dominant to observers within the area.

Changing the classification for these areas (approximately 3,200 acres in the case of the Segment 1E Proposed Route or Alternative 1E-B and approximately 2,560 acres in the case of Alternative 1E-C) would permit additional utilities and supporting roads in these areas of the NF.

This portion of the NF abuts either private land or isolated BLM-managed parcels on the north, west, and south. If the Project is approved, two additional transmission lines as well as an entirely reconstructed transmission line would cross this portion of the NF. These transmission lines are separated from one another by at least 1,500 feet. There are no known additional projects proposed in this area but other transmission lines could be proposed without requiring a plan amendment for the NF. The area is also crossed by WWE Corridor 78-255, which would be entirely occupied by the Project if approved. The cumulative effects of this amendment beyond those of the proposed Project itself would be small because the two new lines, in addition to the reconstruction of the existing line, would effectively occupy much of the area. It would be feasible for

additional transmission lines to be routed in the listed parcels of NF without requiring a management plan amendment. Wind farms could be located in the area as well without a management plan amendment. However, no other transmission lines or wind farms are proposed for this area. Therefore, cumulative impacts due to reasonably foreseeable future actions are likely to be negligible.

4.1.3.3 Rawlins Resource Management Plan

To consider permitting the construction and operations of Proposed 1E and Alternative 1E-B, an amendment for the Rawlins RMP would also need to be considered. In AOI-R-2, near the Rock Creek and Fort Fetterman Road, the amendment would alter the VRM classification of four isolated parcels of public lands from VRM Class II to III—one parcel of approximately 80 acres and two parcels of approximately 40 acres each, all largely surrounded by private lands without land use limitations due to VRM. Additional amendments would be one-time allowances for this Project only and therefore would have no additional cumulative effects beyond those of the Project itself.

These parcels are relatively small and isolated from other parcels of public land. If Alternative 1E-B is approved, the ROW would occupy a portion of the parcels, and the transmission line separation criteria would preclude inclusion of other lines across these parcels. The cumulative effects of this RMP amendment beyond those of the proposed Project itself would be negligible because the parcels are isolated and adjacent to private lands not similarly managed, and the two new lines, in addition to the reconstruction of the existing line, would effectively occupy virtually all of the developable land in BLM management, leaving very little room for additional linear or other industrial development. Other development such as wind power is unlikely in such close proximity to the transmission towers and on small, isolated parcels. No wind projects or transmission lines are proposed in the area.

4.1.3.4 Green River Resource Management Plan

The Proposed Route along Segment 4, if selected, would require a plan amendment to the Green River RMP regarding visual and wildlife resources, while Segment 3 of the Proposed Route and Alternatives 4B, 4C, 4D, and 4E would require an amendment related to wildlife resources (raptor nests and sage-grouse leks). These amendments would be needed if either Proposed Segments 3 and 4, or Segment 3 and Alternatives 4B/4C/4D/4F are approved in order to grant of a ROW for the Project across lands managed under the Green River RMP. All of these amendments would be one-time allowances for this Project only and therefore would have no additional cumulative effects beyond those of the Project itself.

4.1.3.5 Kemmerer Resource Management Plan

To consider permitting the construction and operations of Alternatives 4B, 4C, 4D, and 4E, an amendment for the Kemmerer RMP would also need to be considered. Amendments that would be needed for the Proposed Route and other alternatives would be one-time allowances for this Project only and therefore would have no additional cumulative effects beyond those of the Project itself.

Amendments are needed because the Project as proposed is not in conformance with the RMP. The Proposed Route and portions of several Route Alternatives would not be in conformance with requirements of the Kemmerer RMP. The Kemmerer RMP Decisions 6051, 6053, and 6054 protect visual resources and determine visual management objectives for VRM Class II areas and Historic Trails and Places. These decisions would be rewritten to allow the development of this project. In two places, this would include reclassifying approximately 281,187 acres to VRM III to allow for the Project construction, as follows:

> Alternative routes 4B, 4C, 4D, and 4E: *Reclassify the VRM Class designation to VRM Class III in the portion of the planning area south and west of U.S. highway 30 (the highway) beginning on a north-south line along the high ridgeline approximately ¼ mile west of the current active coal leases (west of the town of Kemmerer); south along the high ridgeline to the ridgeline behind the active coal leases in T21N, R117W, Sec 25; then west following the high points of the topography approximately 3 miles south of the highway to T21N, R118W, Sec 28; then north-west following the high points of the topography within approximately 3 miles of the highway to T21N, R118 W, Sec 18; then north-west following the high points to within approximately ½ mile of the highway in T21N, R118W, Sec 12; then west to the junction of U.S. Highway 30/State Highway 89.*

Although not required to approve these Route Alternatives, the FO recommends designating a corridor for future utility placement if either Alternative 4B or 4D is approved:

> *Designate a utility corridor 1 mile in width, generally centered on the transmission line if either Alternative Route 4B or 4D is selected.*

This would impact 64,603 acres if Alternative 4B is chosen and 64,974 acres if Alternative 4D is chosen. Additional amendments that are required would be one-time allowances for this Project (Proposed or various Alternative Routes) only and therefore would have no additional cumulative effects beyond those of the Project itself.

Changes in the VRM designation and the possible designation of a utility corridor along either Alternative 4B or 4D, if they are chosen and constructed, would have the effect of encouraging further transmission development to be sited in this corridor. Two proposed transmission lines, a 500-kV DC (TransCanada's Zephyr line) and a 500-kV DC or AC line (Jade Energy's Overland Intertie) were originally proposed to follow the Gateway West alignment. Both projects are on hold as of June 2011. If either moves forward in the future, they would likely be built along this alignment and in the designated utility corridor if this Project were approved and constructed in this location. The change in designation would not affect currently authorized coal mining taking place in the area. No other reasonably foreseeable projects would be located within the area proposed for VRM amendment. Therefore, the impact of the change would largely be to encourage future transmission development, if any, to follow the Gateway West alignment through the Kemmerer FO. Cumulative impact of additional transmission line construction is analyzed by resource in Section 4.4, below.

4.1.3.6 Caribou National Forest Land and Resource Management Plan

Portions of Segment 4 of the Project cross portions of the Caribou-Targhee NF currently designated as Prescription 5.2—Forest Vegetation Management, Prescription 2.7.2 (Elk and Deer Winter Range), and Prescription 3.2—Semi-Primitive Recreation. This portion of Segment 4 is in Idaho and in an area where no alternatives are being considered. If the Proposed Route or any of the Route Alternatives in Segment 4 are approved, an amendment would be needed to be consistent with Forest Plan direction to designate the ROW for the proposed double-circuit 500-kV line as Prescription 8.1—Concentrated Development Areas. The corridor would be 9.2 miles long by 300 feet wide (335 acres) and would have a VQO of Modification. An area 1,000 feet wide and centered on the transmission line and new access roads would have an ROS of Roaded Natural. This corridor is too small to accommodate any additional transmission lines or other utility infrastructure. Any additional transmission proposed through this area would need a separate plan amendment. Therefore, the amendment would have no additional cumulative impacts beyond those of the Project itself, discussed in Section 4.4, below.

4.1.3.7 Malad Management Framework Plan

Land use plan amendments in the area of the Malad MFP would be needed if the Proposed Routes for Segments 5 and 7 or Alternatives 7A, 7B, 5A, or 5B are selected. Segments 5 and 7 as well as Alternatives 7A, 7B, 5A, and 5B would all require an amendment for ROW allowance[2]. Segment 5 would cross 2 miles of VRM Class II and 2.8 miles of VRM Class III land and would not conform to the visual management goals for these parcels. Segment 7 would cross 1.3 miles of VRM Class II and 2.9 miles of VRM Class III land and would not conform to the visual management goals for these parcels.

Segment 5 would also cross a VRM II parcel adjacent to the Snake River. If it is selected, the VRM Class II designation for the 35-acre parcel containing the pipeline recreation site (3 miles southwest of American Falls on the Snake River) would be changed to VRM Class IV (AOI M-2). A pipeline crossing of the Snake River is visible from that campground now. Reasonably foreseeable projects proposed include two proposed transmission lines, a 500-kV DC (TransCanada's Zephyr line) and a 500-kV DC or 500-kV AC line (Jade Energy's Overland Intertie), which were originally proposed to follow the Gateway West alignment. Both projects are on hold as of June 2011. If either moves forward in the future, they would likely be built along the approved Project alignment. The 35-acre designation change to VRM Class IV would not affect the approval process for these lines, because they would each need one or more land use plan amendments to be approved. Therefore, the cumulative impacts of the plan amendment that changes the VRM classification of the 35-acre parcel would be essentially identical to the cumulative effects of the Project itself.

[2] The Pocatello FO is in the process of preparing a new RMP; if approved, it would replace the Malad MFP. The ROW restriction is not carried forward in the proposed RMP; however until a new RMP is approved, the management direction in the 1981 Malad MFP applies.

4.1.3.8 Cassia Resource Management Plan

Because Segment 7 of the Proposed Route and Alternatives 7E, 7H, 7I, and 7J are not in conformance to the direction provided in the Cassia RMP, the land use plan would need to be amended if any of these routes is selected. The Project does not conform to VRM objectives in four areas depending on the route selected. Alternative 7H would cross VRM Class II and III areas, an isolated parcel managed as VRM Class II would be crossed by Alternative 7E, and VRM Class II and III areas within the Goose Creek Travel Zone would be crossed by Alternatives 7I and 7J.

For Alternative 7E:

> "VRM classes are designated as shown in the Cassia RMP*; however areas associated with the Gateway West Transmission Line Project will be reclassified as follows: 39 acres in the Spring Canyon area (AOI CA-3 in Appendix G-1) from VRM II to VRM III*

For Alternative 7H:

> *"VRM classes are designated as shown in the Cassia RMP; however areas associated with the Gateway West Transmission Line Project will be reclassified as follows: the area north of the ROW (122 acres) in the Jim Sage area (AOI CA-1 in Appendix G-1), and 806 acres Cottonwood Creek area (AOI CA-2 in Appendix G-1) from VRM III to VRM IV."*

Alternatives 7I and 7J would cross approximately 348 feet mapped as VRM Class II and approximately 1,241 feet mapped as Class III in the Goose Creek Travel Zone. The transmission line would not conform to these VRM classes in these two areas. The proposed amendment (changes in italics) would read:

> *"The area classified as VRM Class II in the Goose Creek Travel Zone (within one-half mile of the Goose Creek Road between Wilson Pass and the Utah border), will be reclassified as VRM Class III."*

For Alternatives 7E or 7H, the areas that would be reclassified are found on BLM-managed public lands that are adjacent to private lands that are not managed under a VRM system. In each case, they are near areas of irrigated agriculture, though none is immediately adjacent. There are no other transmission lines or other projects known in this area. However, if either Alternative 7H or 7E is selected, other transmission lines proposed for this general area could choose to follow this same route and would likely be located at least 1,500 feet from the Gateway West transmission lines. These lines could locate in these areas without further amendment of underlying land use plans.

For Alternatives 7I or 7J, a total of 21 acres of the Goose Creek Travel Zone would be reclassified to VRM Class III. This action would remove the scenic protection for this area. This area change is too small to accommodate any additional transmission lines or other utility infrastructure. Any additional transmission proposed through this area would need a separate plan amendment. Therefore, the impacts of the amendment would have no additional cumulative impacts beyond those of the Project itself, discussed in Section 4.4, below. Overall, the VRM class changes proposed for this area are small, isolated from one another, and often adjacent to private land not

managed for VRM objectives. Therefore, the cumulative effects of these plan amendments beyond those of the proposed Project itself would be negligible.

4.1.3.9 Sawtooth National Forest Land and Resource Management Plan

The Proposed Route does not cross the Sawtooth NF; however, three alternatives to Segment 7 of the Proposed Route (Alternative Routes 7H, 7I and 7J) do cross the NF.

Alternative 7H crosses two divisions of the Sawtooth NF—the Sublett and Albion Mountain Divisions—or a total distance of 11.4 miles, and passes within 0.5 mile of the northern boundary of the Black Pine Division. Alternative 7H crosses 7.2 miles of NFS lands allocated to MA 6.1 – Restoration and Maintenance Emphasis within Shrubland and Grassland Landscapes; 2.7 miles of land allocated to MA 4.2 – Roaded Recreation Emphasis; and 1.5 miles allocated to MA 5.1 – Restoration and Maintenance Emphasis within Forested Landscapes. If approved, it would cross the Albion Division along an existing road but between two roadless areas.

Alternative 7I crosses two divisions of the Sawtooth NF—the Sublett and Cassia Divisions—for a total distance of 29.6 miles, and passes within 0.5 mile of the northern boundary of the Black Pine Division. Alternatives 7H, 7I, and 7J share the same alignment where they cross the Sublett Division. An estimated 30.2 miles of new road would be required for the portion of Alternative 7I that crosses the Sawtooth NF. Alternative 7J shares the same alignment as 7I until MP 137.2, at which point it turns west, crossing approximately 0.2 additional mile of Sawtooth NF before leaving the NF and crossing BLM-managed and private lands.

The NEPA analysis for the Project indicates that approval of the special use permit would be inconsistent, in some instances, with Standards and Guidelines in the Forest Plan. Alternatives 7H, 7I, or 7J (if selected) would not meet Modification or Partial Retention VQOs where they cross the Sawtooth NF. If one of these alternatives is approved, a plan amendment would be needed to permit the crossing of these VQOs by the Project as a one-time allowance without changing the management prescription. This amendment would not change underlying land allocations, and the cumulative effect of the amendment would be the same as the cumulative effect of the Project itself.

Portions of Alternative 7H, 7I, or 7J, if selected, would not be consistent with the management standard for summer Primitive and Semi-Primitive motorized areas. The affected area (at least 500 feet on each side of the transmission line and along new permanent roads) would be designated (mapped) as Roaded Natural. This is equivalent to an estimated 1,234 acres for 7H and 8,465 acres for 7I/7J. However, this designation does not allow for additional infrastructure to be developed because the width of the resultant corridor is too narrow to accommodate any other utilities or developments. Therefore, the cumulative impacts of the plan amendment would be essentially identical to the cumulative effects of the Project itself.

4.1.3.10 Twin Falls Management Framework Plan

The Twin Falls MFP, covering a portion of the Burley FO, does not permit powerlines to the east or west of the two corridors, and the 1989 amendment restricts activities within the designated Salmon Falls Creek ACEC. Segment 9 of the Proposed Route and

Alternatives 9A, 7I, and 7J would not conform to the Twin Falls MFP. This amendment would not change underlying land allocations, and the cumulative effect of the amendment would be the same as the cumulative effect of the Project itself.

The Segment 9 Proposed Route would cross a portion of Salmon Falls Creek, currently designated as an ACEC, which is also an eligible WSR (evaluation conducted by the Burley District Office in 1992 and finalized in 2009). A plan amendment cannot be used to address the issues associated with crossing the eligible WSR segment and has not been proposed for this crossing. An alternative crossing of the river (Alternative 9C) would avoid the eligible WSR and the ACEC; therefore, the remaining portions of the Proposed Route are feasible. However, portions of the remaining route would not conform to visual resource direction in the MFP and an amendment would be required.

Seventy acres of previously VRM Class II land in the Rock Creek Area would be reclassified to VRM Class III. However, this reclassification would be adjacent to private land not managed for VRM objectives. When complete, the reclassification would make management consistent across the whole BLM parcel.

4.1.3.11 Jarbidge Resource Management Plan

The Jarbidge RMP designates utility avoidance/restricted areas for cultural features, designates VRM Class I and II areas, and establishes an ACEC along Salmon Falls Creek. The proposed Project would not conform to these requirements in the Jarbidge RMP; thus, amendments to the plan would be needed for Segment 9 Proposed Route or Alternatives 8A, 9B, 9D, or 9G, if any are selected.

The 1989 Amendment to the Jarbidge RMP designated the Salmon Falls Creek ACEC. Management requirements within this Amendment states:

> *No development in the Salmon Falls Creek ACEC.*

The Segment 9 Proposed Route would cross a portion of Salmon Falls Creek, currently designated as an ACEC, which is also an eligible WSR (evaluation conducted by the Burley District Office in 1992 and finalized in 2009). A plan amendment cannot be used to address the issues associated with crossing the eligible WSR segment and has not been proposed for this crossing. An alternative crossing of the river (Alternative 9C) would avoid the eligible WSR and the ACEC; therefore, the remaining portions of the Proposed Route are feasible.

The Segment 9 Proposed Route would cross 1.7 miles of VRM Class II within the WWE Corridor. Alternative 9B would cross 1.6 miles of VRM Class I within the WWE corridor. Alternative 9D/9G would cross 0.15 mile of VRM Class II following an existing transmission line route. The Jarbidge RMP protects visual resources. These RMP decisions would be rewritten to allow the development of this Project.

The amended VRM decision would read (new language in italics):

> "The degree of alterations to the natural landscape will be guided by the criteria established for the four Visual Resource Management Classes as outlined in BLM 8400; *however, the area within the WWE Corridor will be reclassified as VRM III (affects AOIs, J-2, BOP-1/J-3, J-4, and J-5)."*

The Segment 8 Proposed Route would cross VRM Class I land associated with the Oregon NHT. As a powerline would not conform to the VRM Class I objectives, the new VRM decision would read (new language in italics):

> "The visual or scenic values of the public lands will be considered whenever any physical actions are proposed on BLM lands. The Degree of alterations to the natural landscape will be guided by the criteria established for the four Visual Resource Management Classes as outlined in BLM 8400. VRM Classes will be managed as shown on Map 9. *The VRM decision and Map 9 are amended to accommodate a major powerline R/W. Approximately 5,200 acres of VRM Class I area associated with the Oregon Trail is Re-classified to VRM Class III."*

Alternative 8A would cross VRM I land associated with the Oregon NHT. As a powerline would not conform to the VRM I objectives, the new VRM decision would read (new language in italics):

> "The visual or scenic values of the public lands will be considered whenever any physical actions are proposed on BLM lands. The Degree of alterations to the natural landscape will be guided by the criteria established for the four Visual Resource Management Classes as outlined in BLM 8400. VRM Classes will be managed as shown on Map 9. *The VRM decision and Map 9 are amended to accommodate a major powerline R/W. Approximately 2,800 acres of VRM Class I area associated with the Oregon Trail is Re-classified to VRM Class III."*

Segment 8 of the Proposed Route would require a plan amendment to the Jarbidge RMP if it were selected. The amended text would read (changes in italics):

> "The existing ruts of the main route, north and south alternate routes of the Oregon Trail and Kelton Road will be protected by not allowing incompatible uses to occur within 0.5 mile corridor through which these routes pass, *except where within the WWEC, where no surface disturbance will be allowed within 330 feet of the trail."*

In areas where the VRM class is changed from Class I or II to Class III, an amendment would result in the area being managed at a lower protection level. Amending the RMP to lower the VRM classification may encourage additional development in these areas.

In the area near the Oregon NHT in the Jarbidge FO, ownership is complex, with primarily private lands in the Glenns Ferry area and along the Snake River and BLM-managed lands predominating in the foothills. Changes in VRM class within the WWE corridor would allow additional utilities to be installed in the corridor without an additional plan amendment. The revision of VRM classes along the Proposed Segment 8 would also allow for an additional transmission line (assuming WECC-mandated spacing) immediately parallel to the proposed Project without additional plan amendments. However, the areas that would be changed are isolated from one another and often adjacent to private land not managed for VRM objectives. Therefore, the cumulative effects of these plan amendments beyond those of the proposed Project itself would be negligible.

4.1.3.12 SRBOP Resource Management Plan

The SRBOP RMP, approved in September 2008, guides decisions made by the Four Rivers FO regarding actions that occur in the SRBOP MA. A plan amendment would be needed if Segment 8 of the Proposed Route or Alternatives 8D, 8E, 9D, 9F, 9G, or 9H are selected. Portions of all these routes are located in an area where motorized vehicle use is restricted to designated routes. A review of RMP objectives and consultation with the Boise District staff indicates that the areas closed to motorized vehicles cannot be amended for Segment 8 (Halverson Bar – 1,150 acres) or Alternative 9D/9F (Cove – 1,600 acres) and still meet the Management Objective to: "Provide motorized vehicle access to the majority of the NCA while reducing the number of unnecessary routes and increasing the non-motorized opportunities."

Spanning the canyon in these areas would not be feasible, and restrictions on crossing Cove and Halverson Bar cannot be amended to meet RMP objectives; therefore, Segment 8 of the Proposed Routes and Alternative Routes 9D and 9F cannot be approved as currently designed (alternatives to these crossings have been developed and are included in the analysis). Amendments are proposed for routes that cross the SRBOP area for visual resources, cultural resources, new corridor restrictions, and for SRMAs, as follows.

For the Proposed Route in Segment 8 (proposed change in italics):

> "Manage the areas along the Oregon Trail and the Snake River Canyon as VRM Class II, the OTA as Class IV and remaining areas as Class III. *Approximately 6,400 acres of Class II areas associated with the Oregon Trail and scenic values associated with the Oregon Trail and scenic values associated with the Snake River Canyon would be designated as Class III to accommodate a major powerline R/W.*

For Alternatives 8E, 9D, and 9F (proposed change in italics):

> "Manage the areas along the Oregon Trail and the Snake River Canyon as VRM Class II, the OTA as Class IV and remaining areas as Class III*. Approximately 3,100 acres of Class II areas associated with the Oregon Trail and scenic values associated with the Snake River Canyon is designated as Class III to accommodate a major powerline R/W*

For Alternative 9G/9H (proposed change in italics):

> *"VRM Class II areas within 250 of the Route centerline would be reclassified to VRM Class III, taking into account the need for a 0.5 mile buffer from NHTs. Mitigation will include adjusting the alignment to ensure a 0.5 mile buffer from NHTs is maintained"*

The Proposed Route for Segment 8 would pass through the Snake River SRMA. This use is not in conformance with the SRMA designation based on "recreational, scenic or cultural values." An amendment reducing the designated area is proposed for the Project to be in conformance with the RMP (changes in italics):

> "This SRMA consists of *15,900* acres in the Snake River Canyon downstream from Grandview, Idaho that is managed for the protection of cultural and scenic

> values. *The SRMA designation has been reduced by approximately 6,400 acres to accommodate a major powerline."*

Alternatives 9D and 9G would pass through the C.J. Strike SRMA. This use is not in conformance with the SRMA designation based on "recreational, scenic or cultural values." An amendment reducing the designated area is proposed for the Project to be in conformance with the RMP (changes in italics):

> "C.J. Strike SRMA: This SRMA consists of *16, 900* acres surrounding C.J. Strike Reservoir along the Snake River. The purpose of the SRMA is to provide enhanced recreation management associated with the reservoir, and protection of the Oregon Trail adjacent to the reservoir. *The SRMA designation has been reduced by approximately 3,100 acres to accommodate a major powerline R/W."*

Alternatives 9D and 9G would pass through Cove, a non-motorized area within the portion of the C.J. Strike SRMA that would be affected by the proposed amendment. The BLM Boise District has stated that they would not approve an amendment for a route through the Cove Non-motorized Area. Therefore, while the current alignment for these alternatives would not be permitted due to the restrictions in the Cove Non-motorized Area, the amendment for the C.J. Strike SRMA is presented to document the degree of change that would otherwise occur if this route were approved.

The amendments reducing the area of the SRMA would affect a large block of BLM-managed lands within the SRBOP. This change would allow additional development in the area withdrawn from the SRMA without additional plan amendments. It is likely that any additional transmission lines seeking to interconnect from the east into the Hemingway Substation would follow the route that is approved for this Project. The cumulative effect of the plan amendment would not differ substantially from the effect of the Project itself, particularly given that no projects other than possible future transmission lines are proposed for the area.

4.1.3.13 Bennett Hills/Timmerman Hills Management Framework Plan

The Bennett Hills/Timmerman Hills MFP (1980) provides direction for management of public land under the jurisdiction of the Shoshone FO in south-central Idaho. The Segment 8 Proposed Route crossing of the Oregon NHT would impact visual resources and archeological resources; thus, the Project would not be in conformance with the Bennett Hills/Timmerman Hills MFP.

One amendment would have an extent larger than the transmission line ROW itself because of reclassification of visual management areas.

The visual resource protection would be rewritten to allow development of this Project. The amended MFP decision (changes in italics) would read:

> "No management activity should be allowed to cause any evident changes in the form, line color or texture that is characteristic of the landscape within this Class II area. *The area within 3,000 feet to the north of the existing transmission line ROW will be reclassified from VRM II to VRM III (including the existing ROW).*"

The amendment changing the VRM II classification to VRM Class III would change the classification of lands within 3,000 feet of an existing transmission line. This may result

in additional up to two additional transmission lines being located along this route, which would result in additional impacts to resources managed under the MFP. The cumulative effect of the plan amendment would not differ substantially from the effect of the Project itself, particularly given that no projects other than possible future transmission lines are proposed for the area.

4.1.3.14 Wells Resource Management Plan

Actions that occur on lands managed by the Wells FO of the Elko District, including the granting of ROW under Title V of the FLPMA, are guided by decisions recorded in the Wells RMP approved in 1985. The RMP currently restricts new utilities to identified corridors. Thus, the Project would not conform to the Wells RMP as currently written. Approximately 8.7 miles of Alternatives 7I and 7J would affect areas managed under the Wells RMP. The two alternative routes are co-located in this area.

The proposed amendment to the Wells RMP would be a one-time allowance to accommodate Alternatives 7I or 7J and therefore would have no additional cumulative effects beyond those of the Project itself.

4.1.3.15 Bruneau Management Framework Plan

Portions of Segment 9 of the Proposed Route and Alternatives 9E and 9F/H would cross through the Bruneau MA. The Bruneau MFP includes management objectives for visual resources. A 1,000-foot section of the Proposed Route would cross an area within the WWE corridor that is classified as VRM Class II; therefore, an amendment to the MFP to allow impacts to visual resources is needed.

Segment 9 of the Proposed Route would cross a parcel designated as VRM Class II near Castle Creek. The recently completed Visual Inventory recognizes this parcel as VRM Class III for inventory purposes. With these factors in mind, the visual resource restrictions would be rewritten to reclassify the area.

> *The 282-acre parcel of VRM Class II designated land adjacent to Castle Creek will be reclassified to VRM Class III. This designation is reflective of the presence of the WWE corridor, which comprises 177 acres of the VRM II parcel.*

Changing the VRM class would also facilitate siting future utility lines within the WWE corridor, which would add to cumulative effects in the area. The cumulative effect of the plan amendment would not differ substantially from the effect of the Project itself, particularly given that no projects other than possible future transmission lines are proposed for the area.

4.1.3.16 Kuna Management Framework Plan

The Kuna MFP, approved on March 22, 1983, guides actions that occur with its planning area on lands managed by the Four Rivers FO. Because the Project does not conform to the current direction provided in the Kuna MFP for cultural resources and following existing corridors, the land use plan would need to be amended if the Segment 8 of the Proposed Route or Route Alternatives 8B, 8C, or 8D is selected.

The amendments that are required would be one-time allowances for this Project only and therefore would have no additional cumulative effects beyond those of the Project itself.

4.2 Projects or Actions with Potential for Cumulative Effect with Gateway West

Projects within the resource CIAAs with potential to add to the direct and indirect effects of the Gateway West Project were considered. Those projects most likely to cause cumulative effects are those that have effects similar to those of Gateway West since they tend to impact all the same resources across multiple jurisdictions in ways similar to those of Gateway West. Other projects also affect one or more resources and are considered together with the effects from Gateway West. For ease of analysis, projects with the potential for cumulative effects are presented in the following categories:

- Other transmission lines in or near the Project area or serving similar generation or load areas (Figures E.24-1 and E.24-2 in Appendix E);
- Other linear projects in or near the Project area, such as roads and pipelines;
- Energy generation projects, including coal, gas, wind, geothermal, and hydroelectric (Figure E.24-3 in Appendix E);
- Oil, gas, and mineral extraction, including trona, coal, and phosphate (Figure E.24-4 in Appendix E);
- Other development, including subdivision of lands for commercial, industrial, or residential development; and
- Existing and proposed land uses or restrictions on land uses, including timber harvest or vegetation management, hunting, and OHV use.

4.2.1 Past and Present Actions

Past and present actions have contributed to the affected environment or the context of the proposed Gateway West Project. While the sections describing the affected environment (Chapter 3) take these actions or events into consideration in a general way, the list and description below provide details on the location, scale, and duration of a variety of actions that have effects on some of the same resources that would be affected by the Project.

4.2.1.1 Existing Transmission Lines

High-voltage (typically 115-, 230-, 345-, or 500-kV) transmission lines carry electricity long distances and begin and end in substations that serve either generation or load centers. In some cases a formal utility corridor has been designated where these transmission lines cross public lands, but in other cases the lines are recognized as utility crossings not in a corridor.

Major transmission lines in the CIAAs for Gateway West are found in Table 4.2-1 and are shown in Figures E.24-1 and E-24.2 of Appendix E. These transmission lines vary from 115 kV to 500 kV. Several of the high-voltage transmission lines carry electricity

Table 4.2-1. Existing Transmission Lines that Parallel or Cross Gateway West

Proponent	Project	Gateway Segment	Gateway Proposed Route Mileposts (parallel)	Gateway Proposed Route Milepost (crossed)
PacifiCorp	230-kV Johnston to Casper	1E, 1W(a)		1.1 (Segment 1E); 7.7 (Segment 1W[a])
PacifiCorp and Western	230-kV Spence to Johnston	1E, 1W		9.8 (Segment 1E); 12.8 (Segment 1W[a]); 3.4 (Segment 1W[c])
PacifiCorp	230-kV Difficulty to Dave Johnston	1W(c)	Proposed Action is to reconstruct this line	multiple crossings of 1Wc
Western	115-kV Medicine Bow to Miracle Mile and 115-kV Miracle Mile to Tap	1E, 1W, 2		70.5 (Segment 1W[c]); 100.4 (Segment 1E); 0.1 (Segment 2)
Western	115-kV Tap to Miners	2	16.6–18.3	
PacifiCorp	230-kV Miners to Difficulty	2	16.6–18.3	
PacifiCorp	115-kV Medicine Bow Coal Co. to Miners	2		18.6
PacifiCorp	230-kv Platte to Miners	2	18.3–22.0, 36.8–50.5	multiple crossings of 2
Tri-State G&T Ass.	115-kV Rawlins to Trowbridge	2		40.6
PacifiCorp	230-kV Platte to Bar X	2, 3	50.6–95.42 (Segment 2); 0–3.2 (Segment 3)	
PacifiCorp	230-kV Mustang to Bridger	3		2.9 (along 345 kV)
PacifiCorp	230-kV Bar X to Point of Rocks	3	3.2–18.4	18.4
PacifiCorp	230-kV Rock Springs to Bridger	3, 4	2.1–2.3 (Segment 3 230 kV)	2.1 (Segment 4)
PacifiCorp	230-kV Point of Rocks to Bridger	3, 4	2.1–2.3 (Segment 3 230 kV)	2 (Segment 4)
Idaho Power	345-kV Bridger to Goshen	4	2.7–46.2, 57.5–67.8, 134.4–143.0, 147–148.2	68.2 and 148.5
PacifiCorp	230-kV Rock Springs to Atlantic City SW Station	4		25.1
PacifiCorp	230-kV Chappel Creek to Tap	4		110.4
PacifiCorp	138-kV Oneida to Ovid	4		157.9
PacifiCorp	Three 138-kV lines from Grace to Oneida	4		182.5
PacifiCorp	345-kV Bridger to Kinport	4, 5, 7	2.7–46.2, 57.5–67.8, 134.4–143.0, 147–187, 200.0–202.9 (Segment 4); 0–15.2 (Segment 5); 0–15.5 (Segment 7)	68.2 (Segment 4); 15.2 (Segment 5); 9.2 (Segment 7)
PacifiCorp	345-kV Bridger to Borah	4, 5, 7	2.7–46.2, 57.5–67.8, 134.4–143.0, 147–187, 200.0–202.9 (Segment 4); 0–15.2, 48.9–54.2 (Segment 5); 0–15.5 (Segment 7)	68.2 (Segment 4); 15.2 & 54.4 (Segment 5); 9.2 (Segment 7)
PacifiCorp	230-kV Treasureton to Brady	4, 5, 7	200.0–202.9 (Segment 4); 0–15.2 (Segment 5); 0–15.5 (Segment 7)	15.2 (Segment 5); 9.2 (Segment 7)

Table 4.2-1. Existing Transmission Lines that Parallel or Cross Gateway West (continued)

Proponent	Project	Gateway Segment	Gateway Proposed Route Mileposts (parallel)	Gateway Proposed Route Milepost (crossed)
PacifiCorp	345-kV Ben Lomond to Borah	4, 5, 7	200.0–202.9 (Segment 4); 0–15.2, 48.9–54.2 (Segment 5); 0–15.5 (Segment 7)	15.2 & 54.3 (Segment 5); 9.2 (Segment 7)
PacifiCorp	500-kV AC Populus to Ben Lomond (to Terminal) in Utah	4,5,7	last mile	
PacifiCorp	138-kV Malad to Borah	5, 7	48.9–54.2 (Segment 5)	26.2 (Segment 5); 26.4 (Segment 7)
Idaho Power	138-kV Brady to Tap	5	48.9–50.8	
Idaho Power	230-kV Borah to Brady	5	53.0–54.6	
Idaho Power	345-kV Kinport to Borah	5	53.0–54.6	
Bonneville Power	138-kV Heglar to Raft	7		58.5
Raft River Rural Electric Coop	138-kV Yale to Tap	7		72.5
Raft River Rural Electric Coop	138-kV Tap to Tap	7		72.7
Bonneville Power	138-kV Tap to Jackson	7		76.2
Bonneville Power	138-kV Second Lift to Tap	7	76.3–78.1	78.4
Bonneville Power	138-kV Tap to East Hills	7	78.3–80.9	78.2 & 80.9
Idaho Power	345-kV Midpoint to Humbolt	7, 9, 10	0–8.1 (Segment 9); 0.0–11.5, 17.0–33.5 (Segment 10)	117.9 (Segment 7); 1.6 (Segment 10)
Idaho Power	138-kV Wells to Upper Salmon Falls	9	27.8–34.0	32.1
Idaho Power	138-kV Blue Gulch to Upper Salmon Falls	9	27.8–34.0	32.1
PacifiCorp	500 kV Burns to Midpoint	8, 9	0–7.0, 49.5–56.0, 58.0–87.0, 90.1–117.3, 126.0–131.0 (Segment 8)	49.5 and 127.1 (Segment 8); 161.3 (Segment 9)
Idaho Power	230-kV Micron to Midpoint	8	0–7.0, 49.0–89.4	49.0
Idaho Power	230-kV Midpoint to Unknown	8	0–47.7	47.7
Idaho Power	138-kV Toponis to Upper Malad	8		18.8
Idaho Power	138-kV Upper Malad to Tap	8		22.3
Idaho Power	138-kV Tap to Sailor Creek	8		54.8
Idaho Power	138-kV Tap to Glens Ferry Pipeline	8		59.9
Bonneville Power	115-kV Mountain Home to Anderson Ranch	8	68.0–70.0	

Table 4.2-1. Existing Transmission Lines that Parallel or Cross Gateway West (continued)

Proponent	Project	Gateway Segment	Gateway Proposed Route Mileposts (parallel)	Gateway Proposed Route Milepost (crossed)
Idaho Power	230-kV Boise Bench to Mountain Home	8	68.0–86.0	
Idaho Power	138-kV Mountain Home to Lucky Peak	8	68.0–86.0	
Idaho Power	138-kV Glenns Ferry Cogeneration to Mountain Home	8	54.5–62.5	
Idaho Power	138-kV Bowmont to Tap	8		113.6
Idaho Power	138-kV Hunt to Tap	10		17.9
Idaho Power	138-kV Tap to Tap	10		17.9
Idaho Power	345-kV Midpoint to Adelaide	10	0–1.2	
Idaho Power	230-kV Hunt to Midpoint	10	0–11.5, 16.0–17.9	
Idaho Power	138-kV Tap to Hunt	10		18
Idaho Power	138-kV Hunt to Eden	10	17.9–23.2	
Idaho Power	230 kV AC Hemingway-Bowmont	8	last mile	

Source: Ventyx 2010

from the coal-fired power plants located in Wyoming to interconnection points in Wyoming and Idaho, where they feed the western grid. Others carry hydroelectric energy from the power plants along the Platte and Snake Rivers, among others, to interconnection points with the western grid. These transmission lines have been in service for variable amounts of time, but generally between 20 years and 40 years.

Idaho Power reports that hundreds of miles of their system currently cross irrigated crop or pasture lands. They report that of the 1,162 miles of existing 230-kV lines in service, 411 miles cross irrigated lands, and of the 576 miles of existing 345-kV lines in service, 102 miles cross irrigated lands. They further report hundreds of miles of lower-voltage transmission and sub-transmission lines across irrigated agriculture (IPC 2010b).

4.2.1.2 Existing Pipelines

Large-diameter pipelines (12 inches or larger for liquids and 24 inches or larger for natural gas) are used to transport liquid petroleum products and natural gas long distances. These networks typically start at an initial injection station where product is injected into the line and end at a final delivery station where the product is distributed. Other major pipeline components include compressor stations for natural gas or pump stations for liquids used to help move the product through the pipe, block valves capable of isolating portions of the pipeline should a leak occur, and other valves and stations used for regulating pressure within the pipeline or allowing the product being transported to be delivered or inspected. Pipelines are typically buried within a

designated ROW. The permanent ROW varies in width depending on the easement, the pipeline system, the presence of other nearby utilities, and the land use. These ROWs are kept clear of deep-rooted vegetation to allow the pipeline to be safely operated, aerially surveyed, and properly maintained. For larger diameter pipelines, a system of access roads is required to facilitate maintenance. Table 4.2-2 summarizes existing pipelines in the CIAA.

Pipeline corridors that parallel Gateway West are most important for cumulative effects because of their contribution to habitat fragmentation and to land use limitations. There are several pipelines that parallel Gateway West. A 24-inch pipeline operated by Williams Northwest Pipeline parallels Gateway West for the longest distance along Segments 7 and 8, a distance of approximately 85 miles. Two pipelines operated by the Wyoming Interstate Limited and Colorado Interstate Pipeline Company, respectively, parallel Segment 2; the latter also parallels Segment 3. A pipeline operated by ExxonMobil Pipeline Company parallels Segment 4, as does one operated by Rocky Mountain Pipeline System LLC. Segment 4A and 4B are paralleled by a pipeline operated by the Chevron Corporation; Segment 4B is also paralleled by a pipeline owned by Rocky Mountain Pipeline Systems LLC. The Overland Pass natural gas liquids pipeline is the most recently constructed in the vicinity of the Gateway West Project. It parallels Gateway West in Segments 2, 3, and 4 as a 16-inch pipeline from about MP 30 west to the Creston Substation area, and then as a 14-inch pipeline from there another 20 miles west along the beginning of Segment 3. The Gateway West southern alternatives for Segment 4, Alternatives 4B through 4E, parallel the Overland Pass pipeline from MP 15 to MP 35. Table 4.2-2 provides the approximate distances each of these pipelines parallels Gateway West.

Table 4.2-2. Existing Large Diameter Pipelines within the Gateway West Study Area

Operator	Diam. (in)	Product Transported	Parallels Gateway		Comments
			Segment/ Alternative	Mileposts	
Kinder Morgan Canada	20	Crude	1W(a)	1.5-7.4	Crosses Segments 1W(a), Alt 1W-A, 1W(c), 1E, and Alt 1E-A
Colorado Interstate Gas Company	24	Natural Gas	2, 2A, 3, 4	12.7-14.3 (Alternative 2 Alt2A); 41-61 (Segment 2); 29.8-46.6 (Segment 3); 0–5.4 (Segment 4)	Crosses Segment 2,3
Rockies Express Pipeline LLC	42	Natural Gas	2	12.7-15.2, 41-61 (Segment 2)	Crosses Segment 2
Wyoming Interstate Limited	36	Natural Gas	2, 3, 4	29.8-61 (Segment 2); 29.8-46.6 (Segment 3); 0–5.4 (Segment 4)	Crosses Segment 3
Rockies Express Pipeline LLC	36	Natural Gas			Crosses Segment 3
ExxonMobil Pipeline Company	20	Crude			Crosses Segment 4

Table 4.2-2. Existing Large Diameter Pipelines within the Gateway West Study Area (continued)

Operator	Diam. (in)	Product Transported	Parallels Gateway		Comments
			Segment/ Alternative	Mileposts	
Rocky Mountain Pipeline System LLC	16	Crude			Crosses Segment 4
Chevron Corporation	16	Crude	4, 4A, 4F	61.3–67.9 (Segment 4); 9.3–18.5 (Alternatives 4A,4F)	Crosses Segments 4, 4A, 4B, 4C, 4D, 4E, 4F
Williams Northwest Pipeline	26	Natural Gas	4B,4C, 4D, 4E	36–45 (Alternatives 4B, 4C, 4D, 4E); 52-59 (Alternatives 4B, 4C)	Crosses Segment 4 and Alternatives 4C, D, and E
Williams Energy Services LLC	30	Natural Gas			Crosses Segment 4 and Alternatives 4A, 4B, 4C, 4D, 4E, 4F
Williams Northwest Pipeline	24	Natural Gas	7, 8, 8A	60–65 (Segment 7); 36.2–47.5 (Alternative 8A); 10–17 (Alternative 8B); 24–36.4 (Alternative 9B)	Crosses Segment 5, Alternatives 5D & 5E, Segment 7, Alternatives 7C & 7D, Segment 8, Alternative 8A & 8B, Alternative 9B, and Segment 10.

Source: Ventyx 2010

Large-diameter pipelines are typically associated with networks of smaller distribution pipelines designed to transport product to consumers, tanks, or storage facilities. They are smaller in diameter and do not require the infrastructure (e.g., roads) associated with larger pipelines.

4.2.1.3 Existing Roads

Roads within the Gateway West area include interstate highways, U.S. highways, state highways, county roads, as well as numerous rural roads. The Project area is primarily rural with the greatest densities of roads occurring near cities and towns. Existing road densities range from 1.3 to 2.2 miles per square mile. Major roads that parallel the proposed transmission line are of greatest interest for cumulative effects because of their linear nature and thus contribution to habitat fragmentation and their potential to inhibit movement by wildlife. Table 4.2-3 summarizes locations where existing interstate highways, U.S. highways, and state highways parallel the proposed transmission line ROW.

There are also numerous county and other rural roads within the Project area. A landscape connectivity analysis was conducted to meaningfully summarize the effects of existing roads on the landscape. Fragment sizes were assessed for habitats

Table 4.2-3. Locations Where Existing Major Roads (Interstate, U.S., and State Highways) Parallel Gateway West

Transmission Line Segment/Alternative	Length (Miles)[1/]	Mileposts Paralleled[2/]
Segment 1E	100.6	2.7–6.2
Alternative 1E-A	16.1	2.4–4.9
Alternative 1E-B	59.3	4–6.4
Alternative 1E-C	48.7	20.3–34.1
Segment 1W(a)	76.5	48.2–62
Alternative 1W-A	16.2	2.7–4.2
Segment 1W(c)	70.6	1.4–4.4; 42.5–56.4
Segment 2	96.7	6.6–8.6;16–34.3;42–46.7
Alternative 2A	28.4	0–4.6
Segment 3	56.5	31.9–46.6
Segment 4	203.0	21.3–28.2; 53–58; 86.5–89.8; 197–199
Alternative 4A	85.2	1–6.0;
Alternatives 4B, 4C	100.2, 101.6	55–60; 64–66; 68–72
Alternative 4D	100.8	64.5–67; 68.5–72
Alternative 4E	102.2	64.5–83.5
Segment 5	54.6	No Parallel Roads
Alternative 5C	26.1	0.5–6.5
Segment 7	118.1	22.9–24.5; 67–70.4
Alternative 7H	127.4	75.5–82
Segment 8	131.0	57–58; 88.2–91; 123.8–124.8; 125.9–128.5;
Alternative 8A	53.6	0.3–4.8;
Alternative 8B	45.8	2.4–6.5; 21.4–23.8; 40–43; 44.3–45.1
Segment 9	161.7	103–104.5; 106.8–108; 136–152
Alternative 9E	68.7	150–151.2
Segment 10	33.6	15–19

1/ Mileages are rounded to the nearest tenth of a mile.
2/ Within 1 mile of route centerline.
Source: ESRI 2009

extending up to 4 miles from either side of the centerline of the Proposed Route and its alternatives. A detailed analysis, including a comparison of alternatives, is provided in Appendix D and discussed in Section 3.10 – General Wildlife and Fish.

4.2.1.4 Existing Power Generation Facilities

The generation of power is the first process in the delivery of electricity to consumers. Electricity is most often generated at a power station by electromechanical generators, primarily driven by heat engines. The combustion of fossil fuels (coal, natural gas, and petroleum) supplies most of the heat to these engines. Other sources of heat in the Project area include geothermal power. Electricity is also generated by harnessing the energy of flowing water (hydropower) and the wind. The following discussion describes the power generation facilities within Gateway West area.

Existing Coal-fired Power Plants

Coal-fired power plants generate energy through the combustion of coal, one of the major fossil fuels. These plants are designed on a large scale for continuous operation, and typically have a lifespan of 30 to 50 years. Byproducts of coal-fired power plants include waste heat; flue gas from fossil fuel combustion containing carbon dioxide and water vapor, as well as nitrogen, nitrous oxides, sulfur oxides, fly ash, mercury; and solid waste ash. Greenhouse gas and particulate emissions from coal-fired plants have been identified as major contributors to air pollution and acid rain, and have been linked to both human health issues and climate change.

For the cumulative effects analysis, coal-fired power plants must be considered for their impacts on air quality in the Project area. The Analysis Area for air quality includes the states of Idaho and Wyoming. There are 17 operating coal-fired power plants in the Analysis Area (3 in Idaho and 14 in Wyoming; see Table 4.2-4 and Figure E.24-3). The Amalgamated Sugar plants are located north of Segment 8 and south of Segment 7, respectively; the Don Plant is located north of Segment 5. Coal-fired plants closest to Gateway West in Wyoming include the Naughton, located along Segment 4; Jim Bridger, located 3 miles from the proposed Anticline Substation where Segment 3 terminates and Segment 4 begins; Johnston, where Segment 1W(c) begins, located 2 miles from the Windstar Substation where Segments 1E and 1W(a) begin; and the Green River plant, located south of Segment 3. The other plants in Wyoming are located northeast (in the Gillette area) or east of the Project area (Figure E.24-3, Appendix E). These plants have contributed to the existing air quality in the Analysis Area and will continue to do so as long as they operate.

Table 4.2-4. Existing Coal-Fired Power Plants in Idaho and Wyoming

Project	Proponent	Production Capacity	County Crossed by Gateway	General Location
Wyoming				
Dave Johnston	PacifiCorp	762 MW	Y	Converse County near Windstar Substation
Dry Fork Station	Basin Electric Power Cooperative	385 MW	N	Campbell (Gillette area)
Jim Bridger	PacifiCorp	2,120 MW	Y	Sweetwater County near Bridger 500-kW Substation
Naughton	PacifiCorp	700 MW	Y	Lincoln County near town of Kemmerer
Green River Wyoming	General Chemical Soda Ash Partners	30 MW	Y	Sweetwater County
Laramie River	Basin Electric Power Coop	1,710 MW	N	Platte County
Neil Simpson 1	Black Hills Power Inc.	22 MW	N	Campbell County
Neil Simpson 2	Black Hills Power Inc.	120 MW	N	Campbell County
Osage (BKH)	Black Hills Power Inc.	35 MW	N	Weston County
SF Phosphates Limited Co.	SF Phosphates, Ltd. Co.	12 MW	Y	Sweetwater County
Wygen I	Black Hills Wyoming, Inc.	80 MW	N	Campbell County

Table 4.2-4. Existing Coal-Fired Power Plants in Idaho and Wyoming (continued)

Project	Proponent	Production Capacity	County Crossed by Gateway	General Location
Wygen II	Cheyenne Light, Fuel & Power Co.	90 MW	N	Campbell County
Wygen III	Black Hills Generation, Inc.	110 MW	N	Campbell County
Wyodak	PacifiCorp	362 MW	N	Campbell County
Idaho				
Amalgamated Sugar – Nampa	Amalgamated Sugar Co.	9 MW	Y	Canyon County
Simplot Don Plant	Simplot Leasing Corp	16 MW	Y	Power County
Amalgamated Sugar Twin Falls	Amalgamated Sugar Co.	10 MW	Y	Twin Falls County

Source: WDEQ no date; Ventyx 2010; Platts 2009

Existing Oil-fired and Diesel-fired Power Plants

Power plants that burn oil (petroleum or diesel) to produce electricity are similar in general principle and operation to other fossil-fueled plants including coal-fired and natural gas-fired plants and are a minor component of power production in the Analysis Area. Oil or diesel is burned to produce steam to power a steam turbine and generator. Byproducts from combustion include carbon dioxide, water vapor, nitrogen, nitrous oxides, and sulfur oxides.

There are five existing oil- or diesel-fired power plants in the Analysis Area (Table 4.2-5). The closest is the Blacks Fork plant, located north of Segment 8. The other plants are located in the Idaho panhandle and the northwest corner of Wyoming, respectively.

Table 4.2-5. Existing Oil-Fired Power Plants in Idaho and Wyoming

Project	Proponent	Production Capacity	County Crossed by Gateway West	County
Wyoming				
Blacks Fork Gas Processing Plant	Questar Gas Management Co.	1 MW	N	Uinta
Grant Village	Clark Fork & Blackfoot, LLC	3 MW	N	Teton
Lake Diesel	Clark Fork & Blackfoot, LLC	3 MW	N	Teton
Old Faithful	Clark Fork & Blackfoot, LLC	2 MW	N	Teton
Idaho				
Salmon Diesel	Idaho Power	5 MW	N	Lemhi

Source: Ventyx 2010; Platts 2009

Existing Natural Gas-fired Power Plants

Natural gas-fired power plants are an important source of power generation in the Project area involving a process that begins with the extraction of natural gas, continues with its treatment and transport to the power plants, and ends with its combustion in boilers and turbines to generate electricity. By-products of natural gas-fired power plants include ethane, propane, butanes, pentanes and higher molecular weight hydrocarbons, elemental sulfur, and sometimes helium and nitrogen. However, compared to other fossil fuels such as petroleum and coal, natural gas is cleaner burning and produces less carbon dioxide per unit energy released (e.g., approximately

45 percent less carbon dioxide than coal-fired plants and 30 percent less than petroleum-fired plants for an equivalent amount of heat [EIA 1999]). There are 10 existing natural gas-fired power plants over 20 MW in size in the Analysis Area that are considered in relation to cumulative effects due to their impacts on existing air quality (4 in Idaho and 6 in Wyoming; see Table 4.2-6 and Figure E.24-3 in Appendix E). Several of these turbines serve dedicated industrial needs and do not supply electricity to the public.

Table 4.2-6. Existing Natural Gas-Fired Power Plants 20 MW or Larger in Idaho and Wyoming

Project	Proponent	Production Capacity	County Crossed by Gateway West	Location
Wyoming				
Anschutz Ranch East	BP American Production Company	51 MW	N	Uinta
Arvada	Basin Electric Power Cooperative	23 MW	N	Campbell
Barber Creek	Basin Electric Power Cooperative	23 MW	N	Campbell
Hartzog	Basin Electric Power Cooperative	23 MW	N	Campbell
La Barge	ExxonMobil Corporation	107 MW	Y	Lincoln
Neil Simpson Gas Turbine 2	Black Hills Power Inc.	40 MW	N	Campbell
Idaho				
Bennett Mountain	Idaho Power	173 MW	Y	Elmore
Mountain Home Generation Station	Idaho Power	270 MW	Y	Elmore
Rathdrum	Avista	166 MW	N	Kootenai
Rathdrum Power LLC	Rathdrum Power LLC	299 MW	N	Kootenai

Source: Ventyx 2010; Platts 2009

Existing Geothermal Facilities

Geothermal energy generation is the process of using the heat of the earth to produce useable energy. The geothermal plants in the Project area generate electricity, which requires water temperatures above 200°F. Wells are drilled into a geothermal reservoir which brings the geothermal water to the surface, where its heat energy is converted into electricity at a geothermal power plant. Geothermal power production requires the construction of large-scale power plants, which emit nitrous oxide, hydrogen sulfide, sulfur dioxide, particulate matter, and carbon dioxide, although these levels are low relative to fossil fuel emissions (BLM 2008g). The expected lifespan of a geothermal plant is 20 to 30 years.

The first geothermal power plant in Wyoming came online in September 2008. The co-production, non-commercial demonstration project consists of a 250 kilowatt organic rankine cycle power unit. There are no commercial geothermal power plants in Wyoming (GEA 2009).

In January 2008, the first geothermal power plant began commercial operations in Idaho (Idaho Office of Energy Resources 2009). The Raft River Phase I geothermal project,

owned and operated by U.S. Geothermal, is located in southern Idaho, approximately 200 miles southeast of Boise. The Raft River facility has a nameplate production capacity of 15.8 MW. Currently, net electrical power output is between 10.5 and 11.5 MW. This project is under a 20-year contract with Idaho Power (DOE 2009).

Existing Wind Energy Facilities

Wind energy facilities consist of a collection of turbines that are used for production of electric power. Turbines have power ratings ranging from 250 watts to 5 MW; however, most in use at utility-scale facilities range from 700 kW to 3 MW. At utility-scale facilities, the turbines are interconnected by a communications network and a medium voltage (34.5-kV) collection system, typically buried underground, which carry power generated by the turbines to a substation. At the substation, this medium-voltage electrical current is increased in voltage with a transformer for connection to the high voltage transmission system which feeds into the existing grid. A large wind farm may consist of a few dozen to several hundred individual wind turbines, and cover an extended area of hundreds of square miles. Turbines can be added to an existing facility as electricity demand grows. Other components of wind energy facilities include a permanent system of access roads used for routine maintenance, operations and maintenance facilities, and a transmission line connecting the facility to the grid. Usually the existing land uses on site can be maintained during facility operation. The typical lifespan of a utility-scale wind energy facility is 20 to 30 years.

There are multiple wind energy facilities in Wyoming and Idaho ranging in capacity from 1.3 to 200 MW. Table 4.2-7 lists facilities 10 MW and higher, and Figure E.24-3, Appendix E, illustrates their locations.

Wind energy projects have virtually no impact on air quality compared to conventional fossil fuel-power plants (natural gas, coal, and petroleum) because they emit no air pollutants or greenhouse gases; however, there are concerns over the noise produced by the rotor blades, visual impacts, and bird and bat mortality associated with collisions with rotors, as well as displacement of wildlife from habitats in the vicinity of the wind facility. Thus, they must be considered in relation to their contribution to cumulative effects to these resources.

Table 4.2-7. Existing Wind Energy Facilities 10 MW and Larger In Wyoming and Idaho

Project	Proponent	Production Capacity (MW)	Location
Idaho			
Bennett Creek Windfarm	Energy Vision, LLC	21	Elmore
Burley Butte	Exergy	19.5	Cassia
Camp Reed Wind Farm	Exergy	22.5	Elmore
Cassia Gulch Wind Park	Cassia Gulch Wind Park, LLC	19	Twin Falls
Cassia Wind Farm	Cassia Wind Farm, LLC	30	Twin Falls
Fossil Gulch Wind Park	Exergy Development Group, LLC	11	Twin Falls
Golden Valley Wind Park LLC	Exergy Development Group, LLC	11	Cassia
Goshen North Project	BP Wind Energy / Ridgeline	83	Bonneville
Hot Springs Windfarm	Energy Vision, LLC	21	Elmore
Milner Dam Wind Park	Exergy Development Group, LLC	20	Cassia
Mountain Home	John Deere Wind	42	Elmore

Table 4.2-7. Existing Wind Energy Facilities 10 MW and Larger In Wyoming and Idaho (continued)

Project	Proponent	Production Capacity (MW)	Location
Oregon Trail Wind Park LLC	Exergy Development Group, LLC	13.5	Twin Falls
Paynes Ferry Wind Farm	Exergy Development Group, LLC	21	Twin Falls
Pilgrim Stage Station Wind Farm	Exergy Development Group, LLC	11	Twin Falls
Salmon Falls Wind Park LLC	Exergy Development Group, LLC	21	Twin Falls
Thousand Springs Wind Park LLC	Exergy Development Group, LLC	11	Twin Falls
Tuana Springs	John Deere Wind	17	Twin Falls
Wolverine Creek Energy (Goshen Wind)	Ridgeline Airtricity Energy LLC	65	Bonneville
Yahoo Creek Wind Farm	Exergy Development Group, LLC	21	Twin Falls
Wyoming			
Campbell Hill	Duke Energy North America	99	Natrona
Casper Wind Farm	Chevron Global Power	17	Natrona
Dunlap	PacifiCorp	111	Carbon
Foote Creek I	SeaWest Windfarms, Inc.	41	Carbon
Foote Creek III	SeaWest Windfarms, Inc.	25	Carbon
Foote Creek IV	SeaWest Windfarms, Inc.	17	Carbon
Glenrock Wind Energy Project	PacifiCorp	138	Converse
Happy Jack	Duke Energy North America	30	Laramie
High Plains Wind	PacifiCorp	99	Albany
McFadden Ridge Wind	PacifiCorp	29	Albany
Mountain Wind Energy Center I	Mountain Wind Power, LLC	61	Unita
Mountain Wind Energy Center II (Bridger Butte)	Mountain Wind Power, LLC	80	Uinta
Natrona County Wind Farm	Chevron Global Power Co.	17	Natrona
Reno Junction Wind Farm	Third Planet Windpower, LLC	200	Campbell
Rock Creek I (SEENGR)	SeaWest Energy Group, Inc.	50	Albany/Carbon
Rock River	Shell Wind Energy	50	Arlington/Carbon
Rolling Hills Wind	PacifiCorp	99	Converse
Seven Mile Hill Wind	PacifiCorp	119	Carbon
Silver Sage Windpower	Duke Energy North America	42	Laramie
Top of the World – GE	Duke Energy North America	99	Converse
Top of the World - Siemens	Duke Energy North America	101	Converse
Wyoming Wind Energy Center	NextEra Energy Resources	144	Uinta

Existing Hydroelectric Projects

Hydroelectric power generation is the process of using water's energy as it flows from higher to lower elevation, rotating hydraulic turbines to create electricity. It is the most widely used form of renewable energy. Some hydroelectric projects are associated with reservoirs and generate energy by opening intake gates and allowing the water to flow through a pipeline that leads to the turbine. Projects that do not use reservoirs are called "run-of-river" projects because they rely on the normal river flow to generate energy. Energy generated at hydroelectric facilities is then transformed to a higher voltage and distributed via powerlines to the grid.

Once a hydroelectric project is constructed, the project produces no direct waste, and has a considerably lower output level of greenhouse gases than fossil fuel-powered energy plants. However, concerns associated with hydroelectric projects include blockage of fish passage, impacts to stream flow due to water diversion which can adversely affect aquatic and riparian habitats, impacts to water quality by lowering the amount of dissolved oxygen in the water, and increased sediment and nitrification in the reservoir behind the dam due to lack of water flow. In Idaho, most existing hydroelectric projects are located along the mainstem of the Snake River and its tributaries (Figure E.24-3, Appendix E; Table 4.2-8). In Wyoming, existing major hydroelectric projects are located along the Green, Shoshone, North Platte, and Wind Rivers.

Table 4.2-8. Existing Hydroelectric Projects 10 MW and Larger in Idaho and Wyoming

Project	Proponent	Production Capacity (MW)	Waterbody
Idaho			
Albeni Falls	USACE Portland District	42	Pend Oreille River
American Falls	Idaho Power	112	Snake River
Anderson Ranch	U.S. Bureau of Reclamation	40	South Fork, Boise River
Black Canyon	U.S. Bureau of Reclamation	10	Payette River
Bliss	Idaho Power	80	Snake River
Brownlee	Idaho Power	728	Snake River
Bypass Hydro	Bypass, Ltd.	10	Bypass Canal
C.J. Strike	Idaho Power	89	Snake River
Cabinet Gorge	Avista	265	Clark Fork River
Cascade	Idaho Power	14	Payette River
Dworshak	USACE Portland District	400	North Fork Clearwater River
Gem State Hydroelectric	Idaho Falls Electric Light Division	23	Snake River
Grace	PacifiCorp	33	Bear River
Hells Canyon	Idaho Power	450	Snake River
Lower and Upper Malad	Idaho Power	24	Malad River
Lower Salmon	Idaho Power	54	Snake River
Lucky Peak Power Plant Project	Boise-Kuna Irrigation District	101	Boise River
Milner	Idaho Power	60	Snake River
Minidoka	U.S. Bureau of Reclamation	28	Snake River
Oneida	PacifiCorp	30	Bear River
Oxbow Dam	Idaho Power	220	Snake River
Palisades	U.S. Bureau of Reclamation	176	South Fork Snake River
Post Falls	Avista	15	Spokane Rover
Shoshone Falls	Idaho Power	13	Snake River
Smith Creek	Eugene Water & Electric Board	38	Little Wood River
Smith Falls Hydroelectric Project	Smith Falls Hydropower	38	Smith Creek, ID
Soda	PacifiCorp	14	Bear River
South Forks Hydro	Ida West Energy Co.	8	Twin Falls Canal Company irrigation canals
Swan Falls	Idaho Power	25	Snake River

Table 4.2-8. Existing Hydroelectric Projects 10 MW and Larger in Idaho and Wyoming (continued)

Project	Proponent	Production Capacity (MW)	Waterbody
Twin Falls	Idaho Power	53	Snake River
Upper Salmon Falls A	Idaho Power	70	Snake River
Upper Salmon Falls B	Idaho Power	39	Snake River
Wyoming			
Alcova	U.S. Bureau of Reclamation	41	North Platte River
Boysen	U.S. Bureau of Reclamation	15	Wind River
Buffalo Bill	U.S. Bureau of Reclamation	18	Shoshone River
Fontenelle	U.S. Bureau of Reclamation	10	Green River
Fremont Canyon	U.S. Bureau of Reclamation	67	North Platte
Glendo	U.S. Bureau of Reclamation	38	North Platte River
Kortes	U.S. Bureau of Reclamation	36	North Platte
Seminoe	U.S. Bureau of Reclamation	52	North Platte

Source: Platts 2009; IPC 2011; Bureau of Reclamation 2011

Existing Biomass and Cogeneration Facilities

Biomass is any organic non-fossil material of biological origin. Biomass can be utilized for the production of bio-fuels and bio-products, as well as the generation of alternative energy at biomass energy facilities. Biomass facilities can generate energy through the combustion of biomass and subsequent heating of boilers. Biomass energy production requires the burning of substances that can emit carbon dioxide and other air pollutants; however, when burned efficiently, biomass can be a cleaner burning fuel than petroleum or coal (WSFD 2007).

In general, biomass energy facilities consist of facilities whose sole purpose is the conversion of biomass to energy; however, some facilities can convert the biomass that is created as a byproduct of their primary function into energy (e.g., lumber mills that burn sawdust/wood-chips in a boiler). These types of facilities are referred to as cogeneration plants. Privately owned cogeneration plants can generate the electric power necessary to run the facilities' mills and factories, thereby reducing the facilities dependence on public utilities, or in some cases they can provide additional power to the energy grid. Cogeneration facilities would have similar impacts on air quality as biomass facilities, but would have less impact on lands as these facilities are built within the footprint of existing buildings.

Biomass and cogeneration facilities are not common in Wyoming. Currently, the only facility in Wyoming consists of a demonstration project funded by the Western Governor's Association and implemented by the Wyoming State Forestry Division at the Wyoming Honor Conservation Camp (located in Newcastle, Wyoming). This camp has been fitted with a wood boiler that heats the 7,500-square-foot Forestry Building and the 3,000-square-foot Department of Corrections building. This boiler replaced the propane heater that was originally used to heat the facility (WGA 2010). Information on the amount of energy generated at this facility is not available.

Biomass and cogeneration facilities are more common in Idaho than in Wyoming. There are 22 existing biomass and cogeneration facilities within Idaho, with power

generated at these facilities ranging from 0.9 to 113 MW of energy (Crockett 2010; Huffman 2010; IOER 2009). The largest of these is the Potlatch Corporation facility (located in Lewiston and operated by Avista Corp), which currently generates 113 MW of energy (see Table 4.2-9).

Table 4.2-9. Existing Biomass and Cogeneration Projects 10 MW and Larger in Idaho

Project	Proponent	Production Capacity (MW)	Location
Don Plant - Phosphate Fertilizer	Idaho Power Co	16	Pocatello
Magic West - Glenns Ferry	Idaho Power Co	10	Elmore Co.
Potlatch Corporation	Avista Corp	113	Lewiston
Renewable Energy of Idaho	Idaho Power Co	18	Gem Co.
Rupert Cogen	Idaho Power Co	10	Minidoka Co.
Simplot Pocatello	Idaho Power Co	12	Power

Existing Solar Facilities

Solar power generation is the process of converting solar energy into electricity. Multiple methods are used at existing solar facilities to convert solar energy to electricity, including photovoltaics (using semiconductors that exhibit the photovoltaic effect) and concentrated solar thermal (focusing solar energy to produce steam). Most utility-scale solar facilities in the U.S. are located in the southern portion of the country where solar light is more intense and the light regime is more predictable. Solar facilities have low impacts on air quality compared to conventional fossil fuel-power plants; however, due to the large area of ground disturbance associated with utility-scale solar facilities, they contribute to habitat loss and fragmentation. In addition, there is some concern regarding the impact that these facilities could have on avian species (due to burns or collisions with project mirrors); however, very little post-construction data are available regarding this potential effect.

There are no existing solar facilities in Idaho or Wyoming.

4.2.1.5 Existing Resource Extraction Activities

Wyoming is the source of the majority of the nation's coal and trona and a major source of crude oil, petroleum products, and natural gas. Idaho has some phosphate extraction activities but has very little coal and no trona mining. Figure E.24-4, Appendix E, illustrates the existing and proposed resource extraction activities in the vicinity of Gateway West, while Table 4.2-10 summarizes the existing resource extraction activities crossed by the Proposed and Alternative Routes by milepost. Proposed and Alternative Routes in the same row cross the same bed or mining area.

Table 4.2-10. Existing Non-Renewable Resource Extraction Activities

Proposed Route	Mileposts Crossed		Route Alternative	Mileposts Crossed		Route Alternative	Mileposts Crossed	
	Min.	Max.		Min.	Max.		Min.	Max.
Phosphate								
2	8.2	14.8	–	–	–	–	–	–
	68.1	71.9	–	–	–	–	–	–
	84.2	85.0	–	–	–	–	–	–

Table 4.2-10. Existing Non-Renewable Resource Extraction Activities (continued)

Proposed Route	Mileposts Crossed		Route Alternative	Mileposts Crossed		Route Alternative	Mileposts Crossed	
	Min.	Max.		Min.	Max.		Min.	Max.
3	40.9	43.0	–	–	–	–	–	–
3a	4.4	5.5	–	–	–	–	–	–
4	3.9	4.9	–	–	–	–	–	–
	44.4	51.8	4B,C,D,E	48	48.7	–	–	–
	54.1	54.3	4A,F	54.1	54.3	4B,C,D,E	2.2	11.4
Trona								
1E	–	–	Alt 1E-B	39.6	42	–	–	–
4	40.3	64.6	4A,F	0	12.5	4B,C,D,E	0	15.6
Coal								
2	2	24.6	–	–	–	–	–	–
	79.7	85.4	–	–	–	–	–	–
	95.2	96.6	–	–	–	–	–	–
3	0.0	18.7	–	–	–	–	–	–
4	7.9	23.7	–	–	–	–	–	–
	–	–	4A,F	42.2	45.8	4B,C,D,E	41.2	44.9

Source: BLM and Forest Service no date

Oil and gas extraction, in addition to more recent coalbed methane extraction, has been a major industry in Wyoming for over 40 years. Figure E.24-4, Appendix E, shows the existing wells and oil and gas lease areas in Wyoming and Idaho (note that virtually all activity is in Wyoming). Table 4.2-11 summarizes the number of active and inactive (capped) oil and gas wells within 10 miles of Gateway West.

Table 4.2-11. Oil and Gas Wells within 10 Miles of Gateway West

Segment	Active	Inactive	Total
1E	73	117	190
1W	83	120	203
2	737	136	873
3	674	174	848
4	1,018	126	1,144

Source: Wyoming Oil and Gas Conservation Commission 2010

4.2.1.6 Existing Agricultural Areas, including Livestock Grazing, Cropland, and CAFOs

Please see Section 3.17 – Land Use and Recreation, and Section 3.18 – Agriculture, for details of these activities.

4.2.1.7 Existing Residential, Commercial, and Industrial Developments

Please see Section 3.18 – Land Use and Recreation for details of these activities.

4.2.1.8 Existing Forest Activities

The Medicine Bow-Routt NFs would be crossed by Proposed Segment 1W and by either the Segment 1E Proposed Route or Alternative 1E-C. The Caribou-Targhee NF would be crossed by Segment 4 Proposed Route where no alternatives are proposed.

The Sawtooth NF would be crossed by Alternatives 7H and 7I, and would need to be crossed by 7I if 7J were selected. These three NFs each produce a Schedule of Proposed Actions (SOPA) to alert interested parties regarding both short-term and long-term projects. These activities have in the past included road decommissioning, vegetation management for weed control and for fire management, salvage timber sales, and recreation trail maintenance.

The SOPA for the three NFs includes the following activities near the Gateway West Project area. If carried out on schedule and as proposed, these activities would contribute to cumulative effects along with the Gateway West Project. Other activities included in the SOPA that are not near the Project are not listed here.

Medicine Bow-Routt NFs, Douglas and Thunder Basin Ranger District

Segment 1, Proposed Routes 1W(a), 1W(c), and 1E, and Alternative 1E-C.

Projects listed in the Douglas and Thunder Basin Ranger District SOPA for April 1, 2011[3].

- **North Laramie Range Aspen Restoration:** Treatments aimed at regenerating select aspen stands and associated habitat. Laramie Peak Unit, approximately 6 miles east of Segment 1E. Planned for 2011.

Caribou-Targhee NF, Montpelier Ranger District

Segment 4.

Projects listed in the Caribou-Targhee SOPA for April 1, 2011[4]:

- **Main Canyon Vegetation Management Project:** Use prescribed fire and timber harvest to change species composition and structure on 3,600 acres in several different vegetation cover types in the Main Canyon area, within the proposed Gateway West Project area. Planned for 2012.
- **Strawberry Aspen Treatment:** Use prescribed fire and mechanical thinning to reduce conifer encroachment in aspen forest (1,400 acres), improving wildlife habitat and reducing fuel loading in the 2,600-acre project area, within 5 miles of the Gateway West Project area. Planned for 2012.
- **Cache Roads Hazardous Fuels Treatment:** Treat hazardous fuels within 100 feet of all open forest roads on the portion of Cache NF that is administered by the Caribou-Targhee NF. Smaller diameter conifer and dead and down fuels would be cut, piled, and burned to reduce hazardous fuels. Could affect 800 to 900 acres within 5 miles of the Gateway West Project area. Planned for 2012.

Sawtooth NF, Minidoka Ranger District

The April 1, 2011, SOPA for the Sawtooth NF[5] lists several activities planned that are within the Analysis Area for Alternatives 7H, 7I, and 7J. These are:

[3] http://www.fs.fed.us/sopa/components/reports/sopa-110206-2011-04.pdf
[4] http://www.fs.fed.us/sopa/components/reports/sopa-110415-2011-04.pdf

For Alternatives 7H, 7I, and 7J:

- Wildlife Conservation Strategy: The Sawtooth NF is developing short- and long-term management strategies and priorities for maintaining and restoring habitats associated with terrestrial wildlife species. This strategy, when completed, will constitute a forest plan amendment and will help define standard mitigation measures for large projects that cross the Sawtooth. However, it is in the early planning stages and no documentation is yet available to consider for cumulative effects.
- Sublett Fuels-Vegetation project: This project encompasses treatment of selected aspen and Douglas-fir stands on approximately 3,373 acres of the Sublett Division, which would be crossed by any of Alternatives 7H, 7I, and 7J. Implementation is expected no earlier than 2012.

For Alternative 7I:

- ENXCO temporary meteorological towers for wind energy evaluation: These towers will be located, if approved, in Section 25, T14S, R19E, and Section 15, T15S, R19E. Implementation is expected in 2011. These sections are not crossed by any of the alternatives. The towers themselves would therefore have no direct or indirect cumulative effect when considered together with the impacts from Alternatives 7I.

Kemmerer FO

The Kemmerer FO has identified six ongoing or foreseeable commercial timber projects:

- **Van Tassel Post and Pole Boundary:** In-progress timber sale harvest of mainly dead lodgepole pine post- and pole-size trees.
- **Tokewana Timber Sale:** In-progress timber sale harvest of mainly dead lodgepole pine (estimated through October 2013).
- **Proposed Aspen Front:** Removal of competing subalpine fir from aspen stands and salvage of dead lodgepole pine (planning process).
- **Proposed Commissary White Bark Sanitation Project Area:** Removal of competing subalpine fir from whitebark pine stands (planning process).
- **Proposed Little Beaver Thinning:** Douglas fir thinning (pre-planning process)
- **Proposed Wheat_Creek Aspen Treatment:** Removal of competing subalpine fir from aspen stands (pre-planning process).

Conifer forests would be removed in areas where the Proposed Route and Route Alternatives cross these projects. The proposed Aspen Front project is crossed by Segment 4 (54 acres cleared during construction) and Alternative 4F (26 acres cleared during construction). The proposed Commissary White Bark Sanitation project would be crossed by Segment 4 (1 acre cleared during construction). The proposed Wheat Creek Aspen Treatment project is also crossed by Segment 4 (1 acre cleared during

[5] http://www.fs.fed.us/sopa/components/reports/sopa-110414-2011-04.pdf

construction). The proposed Little Beaver Thinning project is located 2 miles south of Alternative 4A and the Van Tassel Post and Pole Boundary project and Tokewana Timber Sale are both more than 45 miles south of Alternatives 4B, 4C, 4D, and 4E. The Kemmerer FO is in the early stages of developing a Travel Management Plan for the Dempsey-Rock area and an Allotment Management Plan for the Slate Creek area. Both areas would be crossed by the Project.

Pocatello FO

The Pocatello FO also administers forested lands. Of the 105,119 acres of forested land within the Pocatello FO, the BLM has estimated that 27,028 acres are suitable for commercial management activities with no limiting factors, but considers the timber base to consist of 45,708 acres. The annual probable sale quantity for the planning area is 600 MBF based on the forest land base of 45,708 acres. According to the Final EIS for the Pocatello RMP (BLM 2006b), approximately a quarter of all Douglas-fir trees greater than 8 inches in diameter have died in the past 15 years as a result of bark beetles. Existing and additional mortality will increase the risk of catastrophic wildfire that threatens forest resources.

Although the Project crosses areas mapped as being suitable for commercial management activities, these mapped areas in many cases are based, according to the Pocatello BLM, on 50-year old stand inventories and have also been affected by bark beetle infestation, thus making them no longer representative of current commercial forest conditions (Swan 2010). However, on the Pocatello FO there are two upcoming salvage sale areas, scheduled for summer 2011. One is approximately 59 acres, located approximately 0.5 mile north of Alternative 5A. The other is approximately 56 acres and is crossed by Alternatives 7B and 5B. Alternative 7B would impact approximately 0.3 acre of conifer forest in this area and Alternative 5B would impact 5.2 acres. Given that under both alternatives less than 10 percent of the salvage sale would be impacted, there would be no appreciable reduction in the timber base. In addition, roads constructed by the Project (one would pass through the salvage sale area) would provide the BLM with access to these areas, which would off-set any loss of timber acreage.

The BLM has also identified four other potential areas in the Deep Creek Mountains where commercial forestry activities will be a future focus (Swan 2010). These are broad areas, ranging in size from roughly 4,950 acres to 10,320 acres and accessible by roads, in which commercial forest projects would be considered. Four transmission line segments traverse these areas and would require clearing of conifer forest including the Segment 5 Proposed Route (13 acres cleared during construction), Alternative 5A (70 acres cleared during construction), Segment 7 Proposed Route (25 acres cleared during construction), and Alternative 7A (73 acres cleared during construction), including acreage disturbed for facilities as well as within the cleared ROW.

4.2.2 Reasonably Foreseeable Actions

This section lists activities that are known to the public through formal announcement and includes projects that have applied for a permit from a federal, state, or local agency. In some cases those projects are “on hold” and are not being actively pursued

because of the economic downturn and financial uncertainty. However, if the project proponent has not withdrawn the application for a permit, those projects are still listed in this section and considered in this analysis.

4.2.2.1 Needed Studies to Support NEPA and Engineering Analysis

The Proponents of the Gateway West Project requested permission from the BLM and the Forest Service to conduct geotechnical investigations on Public Lands and NFS lands. These studies are being conducted to assist the Proponents in designing the proposed Project. The Proponents have limited their studies to areas with no identified alternatives but will likely request additional permission to conduct further studies as a preferred alternative is identified by the agencies. These studies, while related to the design of the Project, are not connected actions to the larger Gateway West Project because they are conducted independently of the approval of the Gateway West Project. They were therefore evaluated under a separate NEPA process and approved after a Finding of No Significant Impact was signed by the BLM Authorized Officer.

Similarly, other construction projects, whether for pipelines, transmission lines, power plants, wind farms, and so on, would likely also request permission to conduct similar studies. The BMPs required for approval of these studies ensure that their impact on the environment is minimal and that, when taken together with the impact of other projects in the vicinity, would not contribute substantially to cumulative effects.

4.2.2.2 Proposed Transmission Lines

The PEIS for the WWE corridors anticipated the proposal and construction, not of individual projects, but of interstate electric transmission lines and natural gas and product pipelines in general (DOE and BLM 2008).

Where linear facilities are proposed that would cross federally managed lands, the environmental analysis for each project would determine areas of incompatibility with underlying land management classifications. If the approval of the Gateway West Project preceded those other facilities, and that approval included one or more land management plan amendments that changed management classifications, then additional projects could be permitted in that area without their own plan amendments. If approval of this Project were accompanied by a land management plan amendment that only allowed this Project to be constructed and operated but did not change the underlying land allocation, then approval of any additional project proposed for that land classification area would have to be accompanied by a project-specific analysis and land management plan amendment.

This section includes transmission lines that have been proposed but now are on hold awaiting a better economic climate. They are still being taken into account for cumulative effects, but are less certain to move forward than the projects being actively pursued. These “on-hold” projects are indicated by gray shading in Table 4.2-12, which summarizes the known proposed transmission lines. Figures E.24-1 and E.24-2 in Appendix E show where the proposed transmission lines would parallel the proposed Gateway West Project. While it is unlikely that there would be sufficient generation or load to justify all the lines proposed, the BLM and the Forest Service must treat each

Table 4.2-12. Proposed Transmission Lines

Name	Proponent	Voltage	Length (miles)	In-Service Date	Start	End	Parallels Gateway		Comment
							Segment	Mileposts	
Boardman to Hemingway	Idaho Power	500 kV AC	298	2014	Boardman Substation, OR	Hemingway Substation, ID	8	0	Arrives from northwest to Hemingway Substation.
							9		
							9	1–10	
Gateway South	PacifiCorp	500 kV AC	1,200	2017 – 2019	Aeolus Substation, WY	Las Vegas, NV	2	all	Depending on alternative chosen, the Gateway South line could parallel (but located about 5 miles south of) Segments 2 and 3 of the Gateway West Project, between the Aeolus and Creston Substations.
							3	1–5	
Hemingway to Captain Jack	PacifiCorp	500 kV AC	320	tentative	Hemingway Substation, ID	Captain Jack Substation, OR	8,9	0	Leaves from Hemingway towards Captain Jack near Malin, OR, on the CA border.
High Plains Express Transmission Project (HPX)	Trans-Elect Development Company; Western Area Power Administration; several others; and Wyoming Infrastructure Authority	500 kV AC	1,280	2017-2018	Windstar Substation, WY	Palo Verde, AZ	1E	0–1	Leaves from Windstar, heads away from Segment 1E immediately.

Table 4.2-12. Proposed Transmission Lines (continued)

Name	Proponent	Voltage	Length (miles)	In-Service Date	Start	End	Parallels Gateway		Comment
							Segment	Mileposts	
Mountain States Transmission Intertie (MSTI)	Northwestern Energy	500 kV AC	430	2013	Townsend Substation, MT	Midpoint Substation, ID	6	all	Preferred route parallels Borah to Midpoint.
Overland Intertie	Jade Energy Associates (subsidiary of LS Power)	500 kV AC or DC	560	2015	Chugwater, WY	Midpoint Substation, ID	2,3,4,5,6,7	all	Planned to be located up to 1,500 feet off existing lines (including proposed route for Gateway West).
Southwest Intertie Project (SWIP), north portion	Great Basin Transmission (subsidiary of LS Power)	500 kV AC or DC	515	2015	Midpoint Substation, ID	Southern NV	10	all	Second open season announced April 15, 2009. It is likely that only one line will be built—either SWIP or Segment 10—but no agreement has been signed.
TransWest Express Transmission Project (TWE)	Transwest Express, LLC, an affiliate of Anschutz Corporation	600 kV DC	725	2015	A new substation located near the town of Rawlins, WY	Las Vegas, NV	2 3	last half 1–5	Depending on alternative chosen, the TWE line could parallel Segments 2 and 3 of the Gateway West Project, between the town of Rawlins and the Creston Substation.
Two Elk Transmission Project	PacifiCorp	230 kV AC	50	unknown	2 Elk #1 unit power plant	Windstar Substation, WY	1E 1W	0	Comes into Windstar.

Table 4.2-12. Proposed Transmission Lines (continued)

Name	Proponent	Voltage	Length (miles)	In-Service Date	Start	End	Parallels Gateway		Comment
							Segment	Mileposts	

Table 4.2-12. Proposed Transmission Lines (continued)

Name	Proponent	Voltage	Length (miles)	In-Service Date	Start	End	Parallels Gateway		Comment
							Segment	Mileposts	
Wind Spirit transmission line project (WSP)	Grasslands Renewable Energy, LLC	Unknown	Uncertain	2017	Multiple substations in Montana, North Dakota, Alberta, and Saskatchewan	Medicine Bow, WY	1W, 1E	all	This project would collect and aggregate wind power from multiple points in the U.S. and Canada.
Wyoming-Colorado Intertie Transmission Project (WCI)	Trans-Elect; Western Area Power Administration; Wyoming Infrastructure Authority	345 kV AC	180	2014-2015	Laramie River Substation, WY	Pawnee Substation, CO	1E	0	Approaches the Gateway West Project at the Windstar Substation along Segment 1E.
Zephyr Project	TransCanada	500 kV DC	850	2015	Aeolus Substation, WY	Las Vegas, NV	2 3 4 5	all	Planned to establish a converter AC-DC station at Borah.

Note: Gray shading indicates projects proposed but on hold.
Sources: Information from Web sites for the following: Northwestern Energy, PacifiCorp, Great Basin Transmission LLC, TransWest Express LLC, Grasslands Renewable Energy LLC, LS Power, Wyoming Infrastructure Authority

complete application for a ROW equally, provided that it is submitted by a responsible, financially capable entity with demonstrated ability to complete the proposed project. Where additionally proposed transmission lines are inconsistent with the underlying land management plans, it is assumed for the purposes of this analysis that one or more plan amendments will be approved that would either allow the additional projects without changing underlying land allocations or would change those allocations in some areas. Therefore, and for the purposes of a cumulative impacts analysis, the agencies are assuming that all lines would be built and that all additional land management plan amendments would be approved to permit their construction and operation.

There are several lines that would parallel Gateway West for a substantial distance. LS Power's Overland Intertie (presently on hold) would parallel Gateway West for the longest distance, sharing a corridor from Aeolus to Midpoint, a distance of over 500 miles. Based on the WECC criteria for common corridor, one or more of these lines may require 1,500 feet or more separation from Gateway West. TransCanada's proposed Zephyr line (presently on hold) would parallel Gateway West from Aeolus to Borah, a distance of about 310 miles. Lines that would parallel at least Segment 2 include Gateway South and Transwest Express. Mountain States Transmission Intertie (Northwestern Energy) is proposing to parallel Segment 6 and SWIP North would parallel or replace Segment 10. Table 4.2-12 shows proposed transmission lines that begin or end at substations used or constructed by Gateway West.

These transmission lines vary in voltage from 230 kV to 600 kV and may be AC or DC. Several are proposed by regulated utilities (those listed as Idaho Power or PacifiCorp proponents) while the remainder are proposed by unregulated, or "merchant," transmission line ventures. Most are proposed with some version of a lattice tower for the 500-plus-kV lines and H-frame steel pole structure for the 230-kV lines. All propose ROWs at least 200 feet wide, with similar access roads, staging areas, fly yards, regeneration stations, and new or expanded substations as for Gateway West.

4.2.2.3 Proposed Pipelines

There is one large pipeline proposed in the vicinity of the Project area. It is a 30-inch-diameter natural gas pipeline owned and operated by the Anadarko Petroleum Corporation that runs north to south through the center of Wyoming from its northern border. This pipeline crosses the proposed transmission line in Segment 4 approximately between MPs 30 and 40, where it connects with an existing natural gas pipeline. Pipeline installation includes construction of access roads, ROW clearing, trenching, pipeline placement, construction and installation of compressor stations and metering stations, and site restoration.

Williams and TransCanada have proposed a large 42-inch natural gas pipeline in the Sunstone Pipeline Project application; the ROW has been filed with the BLM for an alignment that would closely parallel Gateway West along Alternatives 4B through 4E from Opal to the Wyoming border, then along Segments 4, 5, 6, and 8 from the Wyoming border to south of Hemingway. This project has been suspended as of April 2009.

4.2.2.4 Proposed Roads

For the purpose of this analysis, the Agencies assume that new roads would most likely be constructed in areas with high population density, or areas with projected increases in population growth. See the summary of residential development for additional discussion. Both the Idaho and Wyoming Departments of Transportation list future projects but none is listed for the analysis area. No additional new roads or major changes to existing roads have been proposed.

4.2.2.5 Proposed Energy Generation Facilities

This section includes facilities that have been proposed but now are on hold awaiting a better economic climate. These "on-hold" projects are indicated by gray shading in the tables. They are still being taken into account for cumulative effects, but are less certain to move forward than the projects being actively pursued.

Proposed Coal-fired Power Plants

There are two proposed coal-fired power plants in the Analysis Area, both in northeastern Wyoming (Table 4.2-13 and Figure E.24-3, Appendix E). Production capacities for these plants range from 325 MW up to 750 MW. These plants may have a lifespan of 50 years or more.

Table 4.2-13. Proposed Coal-Fired Power Plants in Idaho and Wyoming

Project	Proponent	Production Capacity	Location
Wyoming			
Two Elk I	Two Elk Power	325 MW	Campbell (north of Windstar)
Two Elk II	Two Elk Power	600–750 MW	Campbell (north of Windstar)
Idaho			
None			

Proposed Oil-fired Power Plants

There are no known proposed oil-fired power plants in Idaho or Wyoming.

Proposed Natural Gas-fired Power Plants

There are two natural gas-fired power plants proposed within the Analysis Area, both of which are in Idaho (Figure E.24-3, Appendix E). The Gateway plant, operated by Mountain View Power, Inc., is a 180-MW plant that would be located north of Segment 8 in Ada County. The Wendell Plant, operated by the EnviroDyne Corporation, would be a 12-MW plant located along Segment 7 in Gooding County. The installation of new natural gas energy generation facilities may require associated elements such as the construction and drilling of wells, access roads, pipelines, production facilities, and transmission lines to collect the natural gas from its source, transfer it to the production facility, and transmit power to the grid.

In 2010, ICF published Phase 2 of its wind energy study in Wyoming and examined the possible future need for additional natural gas power plants. This study is discussed below under Proposed Wind Energy Facilities.

Proposed Geothermal Facilities

Currently, there are no proposed geothermal facilities in Wyoming. According to the Idaho Office of Energy Resources, and referencing the Geothermal Energy Association, an expansion to the existing Raft River plant, as well four other projects around the state, is underway as of 2009 (GEA 2009). Three additional projects were proposed in 2010. These proposed geothermal projects are summarized in Table 4.2-14. In addition to these sites, there are more than 20 additional locations within Idaho are suitable for potential geothermal energy development and are currently undergoing testing (GEA 2009).

Table 4.2-14. Proposed Geothermal Projects in Idaho

Project	Proponent	Production Capacity	Phase of Development[1/]	Location
Crane Creek	Agua Caliente	175 MW	1	Washington County
Idaho Falls	Idatherm LLC	100 MW	1	Bingham and Bonneville County
Raft River Expansion	U.S. Geothermal	32 MW	3	Southern Cassia County
Preston Area	Idatherm LLC	50 MW	1	Unknown
Soda Springs	Idatherm LLC	100 MW	1	Cassia County

1/ Development Phase: 1—Identifying site, secured rights to resource, initial exploration drilling; 2—Exploratory drilling and confirmation being done; Power Purchase Agreement (PPA) not secured; 3—Securing PPA and final permits; 4—Production Drilling Underway/Facility Under Construction.

The BLM and Forest Service prepared a joint PEIS to analyze the leasing of BLM-managed and NFS lands with moderate to high potential for geothermal resources in 11 western states. The ROD, signed in 2008 1) allocates BLM-managed lands as open to be considered for geothermal leasing or closed for geothermal leasing, and identifies those NFS lands that are legally open or closed to leasing; 2) develops a reasonably foreseeable development scenario that indicates a potential for 12,210 MW of electrical generating capacity from 244 power plants by 2025, plus additional direct uses of geothermal resources; and 3) adopts stipulations, BMPs, and procedures for geothermal leasing and development (BLM 2008g).

Proposed Wind Energy Facilities

Wind energy is one of the fastest growing energy sectors in the United States. There are 25 proposed wind energy facilities in Idaho, ranging in size from 11 MW to 450 MW (Table 4.2-15) located in the southern and eastern portions of the state (Figure E.24-3, Appendix E). There are also 7 proposed wind energy facilities in Wyoming (Table 4.2-15) located in the southern and eastern portions of the state (Figure E.24-3, Appendix E); the largest of which are the combined Sierra Madre and Chokecherry projects proposed by Anschutz in Carbon County (about 2,000 MW total). Note that this wind farm is located in mapped sage-grouse core area, which has been declared by the Wyoming Governor in EO 2011-5 to be incompatible with wind development, but the proposal is still current. New wind projects will require clearing for turbine pads, access roads, and associated facilities.

Table 4.2-15. Proposed Wind Energy Facilities in Idaho and Wyoming

Project	Proponent	Production Capacity (MW)	Location
Idaho			
Alkali	Rick Koebbe	18	Elmore
Alpha Wind	Alpha Wind LLC	29.9	
American Falls	Ridgeline-Airtricity	200	Power
Black Canyon Rim	Intermountain Wind	20	Bonneville
Bravo Wind	Bravo Wind LLC	29.9	
Cedar Creek Wind	Western Energy Corp.	199	Bingham
Charlie Wind	Charlie Wind LLC	27.6	
China Mountain Wind	RES America Developments, Inc.	425	Twin Falls and Owyhee, ID and Elko, NV
Cotterel Mountains Wind	Windland, Inc.	200	Cassia
Delta Wind	Delta Wind LLC	29.9	
Echo Wind	Echo Wind LLC	29.9	
Goshen South / Wolverine Canyon	Ridgeline Energy / BP Wind Energy	450	Bingham
Grouse Creek Wind Park	Wasatch Wind	21	
Grouse Creek Wind Park II	Wasatch Wind	21	
Horse Butte Wind Project	Utah Associated Municipal Power Systems	58	Bonneville
Lava Beds Wind Park LLC	Exergy Development Group, LLC	18	Bingham
Magic Wind Park	Magic Wind Park, LLC	20	Twin Falls
Notch Butte Wind Park LLC	Exergy Development Group, LLC	18	Lincoln
Rockland Wind Farm	Ridgeline Energy, LLC	300	Power
Schwendiman Family Wind	Schwendiman Wind, LLC	20	Bonneville
Sawtooth Wind	Idaho Winds LLC	21	Elmore
XRG-DP-10	XRG	10	Cassia
XRG-DP-7	XRG	20	Cassia
XRG-DP-8	XRG	20	Cassia
XRG-DP-9	XRG	20	Cassia
Wyoming			
Black Mountain Wind Project	Wasatch Wind Intermountain, LLC	109	Natrona
Chokecherry Wind Farm	Power Co. of Wyoming	1,350	Carbon
Pioneer Wind Park	Wasatch Wind	100	Converse
Sierra Madre Wind Farm	Power Co. of Wyoming	650	Carbon
Bridger Butte Wind Project	Mountain Wind Power, LLC	240	Uinta
Chugwater Flats Energy Project	Novelution Wind	215	Platte County
White Mountain Wind	Teton Power, LLC	350	Sweetwater

Sources: AWEA no date; Ventyx 2010; WDEQ no date

Transmission for Proposed Wind Energy Facilities

In 2010, ICF International published a report conducted for the Wyoming Infrastructure Authority called the Wyoming Collector and Transmission System Conceptual Design (ICF 2010a). This report considered two wind resource development scenarios—one

that included wind resources west of the Laramie Range, and one that included wind resources primarily on the east side of the Laramie Range. The intent was to provide a conceptual design for up to 12 gigawatts (GW) of renewable capacity. The report concluded that it was conceptually feasible to provide for this capacity under both resource scenarios.

Since the ICF report was published, Governor Mead has published EO 2011-5 that replaces but does not substantially change EO 2010-4, an executive order published by his predecessor Governor Freudenthal, that in turn replaced the 2008 order. EO 2011-5 changed the boundaries of several of the core areas, and specified that wind development is not recommended in sage-grouse core areas. The second resource development scenario, with most wind development east of the Laramie Range, best matches the likely permissible pattern of wind development in Wyoming.

In Resource Scenario 2, the study further examined the likely development of both Wind Hubs and Transmission Export Hubs (TEHs) under three design scenarios:

- A radial feed design in which each wind hub would be connected by a transmission line to the nearest TEH, which would in turn carry the energy out of state;
- A design in which wind hubs are networked among themselves as well as to the nearest TEH; and
- A fully networked design including both the wind hubs and the TEH.

The conclusions drawn by this study were that development of the full capacity for wind generation would require between 1,709 and 2,039 miles of new high-voltage transmission lines (230 kV and above) to interconnect the wind energy to the TEH. While the number of projects currently in the permitting process or under construction represents only a small fraction of the total 12 GW of development potential, it is likely that, given the current demand for renewable energy by many states in the Western Interconnection, additional wind farms will be proposed and some of those will be permitted and built. Interconnecting those wind farms to the TEH will also be constrained by EO 2011-5 to existing corridors or to the designated 2-mile-wide corridors in sage-grouse core areas, possibly restricting the development of new wind generation in Wyoming.

The American Wind Energy Association (AWEA) reports that Wyoming currently has 1,101 MW of existing installed wind capacity, with an additional 311 MW under construction as of July 20, 2010 (AWEA 2010a). This represents about 12 percent of the estimated 12 GW renewable capacity in the state. AWEA also reports that development of wind energy in 2010 is likely to be much less than the record-setting 2009 year, due to the economic downturn, uncertainties in federal incentives, and the slowed development of new production facilities in the U.S. (AWEA 2010b). Because the report does not assume specific locations for any of the theoretical collection lines, and because future projects for which proposals have not yet been developed are speculative and not quantifiable, the possible cumulative impacts of full wind energy development, with its accompanying transmission interconnection system, are not analyzed here.

In a follow-up study, ICF was asked to map opportunities and constraints for possible future transmission corridors in the southeast portion of Wyoming. ICF states in that report (ICF 2010b): "The original objective for ICF's Task 1 (Energy Corridor Constraints and Opportunities) was to update Map 11 in the NationalGrid report. However, during the initial phase of completing this task, SEO and WIA adjusted the scope of this task to focus on identifying opportunity and constraint criteria that could subsequently (outside of this study) be used to identify potential energy corridors in Wyoming. Therefore, rather than developing a map, the goal of this task was modified to developing an opportunity/constraint criteria table and environmental constraint protocol."

The protocol was similar to that developed for siting the Gateway West transmission line, except that it did not take advantage of a LRT and used each constraint layer as static. It consisted of gathering data, putting it all into the same format and projection, overlaying the data, and interpreting the results to assign areas of high, medium, and low constraint for routing transmission lines. They further constrained their analysis to the southeastern counties of Wyoming and did not include the west half of Wyoming, where some of the largest constraints exist, including but not limited to sage-grouse habitat and important national historic resources.

The study was then used in response to a commission from the Western Area Power Administration (Western) to develop a map of constraints for transmission in that same southeast corner of Wyoming (ICF 2010c). These maps show areas of very high, high, medium, and low constraints for transmission line siting in several counties in the study area. Instructions to the contractors were changed after meetings with the Wyoming Infrastructure Authority (WIA) and Western, and the final deliverables were five maps, each adding a layer of information to the last. The first map shows the areas of different levels of constraints but does not list those constraints.

Backup Energy for Firming Intermittency in Wind Generation

The WIA commissioned a study from ICF to better understand the likely alternatives and accompanying costs for "firming" wind energy (ICF 2010b). Because wind energy generation is intermittent, some additional source or generation or storage is needed to make the aggregate generation at least 99 percent reliable and to ensure that the total energy can be scheduled in advance with a high degree of reliability. This study looked at 10 scenarios that examined the need to firm up to 12 GW of Wyoming wind energy with up to 3 GW of either backup generation (e.g., natural gas) or energy storage (e.g., pumped water storage or compressed air storage). The intent of the study was to develop and display the range of capital costs associated with firming the wind energy potential in Wyoming.

Wind projects are still in development in Wyoming, but many appear to be on hold (see Table 4.2-15, above). According to AWEA, an industry association, there are 1,412 MW of installed capacity in Wyoming, of which 310 MW were added in 2010[6]. Several projects were located in areas with good wind resources but also in areas listed by the State of Wyoming as Core Habitat for sage-grouse, where the Governor of Wyoming has stated (EO 2011-5) that wind development is inappropriate[7]. It is therefore not clear

[6] http://www.awea.org/learnabout/publications/upload/1Q-11-Wyoming.pdf accessed 6/7/2011
[7] http://governor.wy.gov/Documents/Sage-Grouse%20EO.pdf

how much wind energy will be developed in Wyoming, or where that development will occur.

In its study, ICF assumed either Wyoming or California natural gas-based generation, with variations based on location of natural gas storage for Scenarios 1-3 and assumed some form of electrical energy storage for Scenarios 4 and 5. In developing these scenarios, ICF stated:

> *… these scenarios do not cover all possible backup options, nor are the scenarios presented intended to predict, recommend, or influence the timing, location, or amount of wind energy backup that might be developed to firm wind resources in Wyoming.*

Because these scenarios were developed to better understand the range of capital costs that firming might entail rather than to predict any one project, the cumulative effects of scenarios mentioned in this study cannot be realistically determined. However, pumped water storage is one of the methods contemplated for storage of electric energy, and there are six pumped water storage projects in early study stage in Idaho and Wyoming. These projects are considered, to the extent their impacts can be determined, in this cumulative effects analysis.

Proposed Hydroelectric Projects

There are no conventional new hydroelectric projects proposed in the Analysis Area. However, there are six new pumped storage projects contemplated in Idaho and Wyoming.

Pumped Storage

Developers have proposed several pumped storage projects in Idaho and Wyoming. The intent of these projects is to provide firming capability to intermittent energy generation sources, principally wind. For example, Gridflex states, in its application for pre-permit approval for the Medicine Bow Pumped Storage Project:

> *The Project will be operated to provide support to new renewable resources being interconnected to the regional transmission grid currently and in the future. These resources—predominantly wind energy—are emissions-free and increase energy security, but are variable and intermittent in nature. The Project will use the dynamic capabilities of pumped storage to aid in the efficient integration of wind resources from both an operational and economic standpoint.*[8]

According to FERC,

> *Pumped-storage projects differ from conventional hydroelectric projects. They normally pump water from a lower reservoir to an upper reservoir when demand for electricity is low. Water is stored in an upper reservoir for release to generate power during periods of peak demand. For example, in the summer water is released during the day for generating power to satisfy the high demand for electricity for air conditioning. At night, when demand decreases, the water is pumped back to the upper reservoir for use the next day.*

[8] http://elibrary.ferc.gov/IDMWS/common/opennat.asp?fileID=12424750 accessed 6/7/2011

> *These projects are uniquely suited for generating power when demand for electricity is high and for supplying reserve capacity to complement the output of large fossil-fueled and nuclear steam-electric plants. Start-up of this type of project is almost immediate, thus serving peak demand for power better than fossil-fueled plants that require significantly more start-up time. Like conventional projects, they use falling water to generate power, but they use reversible turbines to pump the water back to the upper reservoir. This type of project is particularly effective at sites having high heads (large differences in elevation between the upper and lower reservoir).*[9].

In order to establish priority for desirable sites and to initiate the permitting process with the FERC, a pumped storage developer must first file a pre-permit application. Assuming the application is complete, FERC then issues a 3-year permit to complete studies and to submit a full license application. The studies include engineering and financial feasibility as well as environmental baseline studies. The FERC hydro licensing process takes at least 5 years, and construction, if permitted, would take another 3 years.

As of June 7, 2011, there was one pre-permit pending in Wyoming. It is a submittal made by Gridflex, LLC, on January 26, 2011, for the Black Canyon Pumped Storage Project (FERC docket 14087). It is proposed to use the existing Seminoe and Kortes reservoirs and to have a 700 MW capacity[10]. Table 4.2-16 lists the pre-permit approvals as of June 7, 2011, in Idaho and Wyoming.

Table 4.2-16. Pumped Storage Projects with 3-year Pre-Permits Approved

Docket Number	Project Name	Licensee	Waterway	State	Authorized Capacity KW	Issue Date	Expiration Date
13303	Little Potlatch Creek Pumped Storage	BPUS Generation Development LLC	Clearwater River	ID	1,340,000	02/06/09	01/31/12
13314	Corral Creek South Pumped Storage	Corral Creek South Hydro, LLC. (Riverbank Power, Inc.)	groundwater	ID	1,100,000	04/28/09	03/31/12
13468	Champion Ridge	Champion Ridge Hydro, LLC (Riverbank Power)	groundwater, Johnson County	WY	700,000	12/07/09	11/30/12
13836	Medicine Bow Pumped Storage	Medicine Bow Hydro, LLC (Gridflex)	groundwater sources, the Medicine Bow River, or the Seminoe Reservoir	WY	400,000	12/03/10	11/30/13
13862	Deer Creek Pumped Storage	Deer Creek Hydro, LLC (Gridflex)	Deer Creek or groundwater sources	WY	650,000	03/28/11	02/28/14

Source: http://www.ferc.gov/industries/hydropower/gen-info/licensing/issued-pre-permits.xls (accessed 6/7/2011)

[9] http://www.ferc.gov/industries/hydropower/gen-info/regulation/pump.asp#skipnav accessed 6/7/2011
[10] http://www.ferc.gov/industries/hydropower/gen-info/licensing/pending-pre-permits.xls accessed 6/7/2011

These projects are all in the early study stage. No project has yet filed an application for licensing with FERC. Their financial feasibility depends in large part on the development of sufficient wind energy in the vicinity to justify the substantial expense ($1.5 to 2 billion) of the development.[11] In the future they may proceed to the environmental study phase of a formal license application, in which case there will be enough information to better determine the cumulative effects.

Proposed Biomass and Cogeneration Facilities

Biomass feasibility studies are currently being conducted in the western states (including Idaho and Wyoming), and multiple biomass and cogeneration projects are currently being considered. However, at this time, formally proposed projects are limited due to current economic feasibility. No projects have been formally proposed in Wyoming; however, eight projects have been proposed in Idaho, with estimated power production ranging from 1.2 to 13 MW. Only two projects are currently proposed that would generate at least 10 MW of energy: the Adams County Electrical Biomass Facility that would generate 10 to 13 MW of energy, and the Yellowstone Tower Combined Heat and Power Plant that would generate 10 MW of energy (Crockett 2010; Huffman 2010).

Proposed Solar Facilities

There are no solar facilities proposed for construction in Wyoming; however, one facility (the Mid Point Energy facility) is proposed for construction in Jerome County, Idaho. This solar facility (as currently proposed) would encompass about 405 acres of land, consist of about 150,000 solar panels, and could generate 75 MW of energy (Magic Valley Times-News 2010; SIEDO 2010). In the 12 months since the initial announcement, no further progress has been documented and it is likely that the project is on hold.

4.2.2.6 Proposed Resource Extraction Activities

Proposed Oil and Gas Extraction

There are many thousands of acres of oil and gas leases that have not yet been fully developed. Oil and gas exploration, extraction, and development are likely to continue throughout the life of Gateway West. The intensity of development and the degree to which less productive fields are exploited are dependent on the international and domestic market for petroleum products as well as any government incentives (e.g., depletion allowance) or disincentives (e.g., carbon tax). Although the leases are in place and development could technically take place at any time, the market drivers to exploit them are unknown now. Therefore, it is not possible to quantify the additional amount of environmental impact due to future oil and gas development. The existence of a robust electric grid will continue to support oil and gas extraction by providing the power for the extraction pumps. The Creston Substation is proposed in part to serve a future load from oil and gas extraction both north and south of the proposed Gateway West transmission line in the areas of Segments 2 and 3.

[11] http://www.energyprospects.com/cgi-bin/package_display.pl?packageID=3499 (accessed 6/7/2011)

Proposed Mining (coal, trona, phosphate, other)

Existing leases and mines are likely to continue to operate throughout the life of Gateway West. Existing mines that could expand include the Kemmerer coal mine, crossed by Alternatives 4B through 4E, and the FMC Green River trona mine, crossed by Segment 4 in the eastern portion of the segment where there are no Route Alternatives. The existence of a robust electric grid will continue to support mining activities by providing the power for them.

4.2.2.7 Proposed Residential, Commercial, and Industrial Developments

There are known proposed subdivisions for residential, commercial, and light industrial purposes in or near Segments 2, 3, 8, and 10. The largest area of potential future development near Gateway West in Idaho is in the area of Ada County south of Boise traversed by Segment 8, while a smaller area of subdivision and active development is occurring east of the city of Twin Falls in Idaho. In Wyoming, subdivisions are being platted and developed in the areas of Glenrock and Medicine Bow.

The potentially affected area south of Boise includes land that has been recently annexed by the city of Kuna to include the proposed Osprey Ridge development and other proposed developments. Exact details of the proposed developments are not available but Alternative 8B would cross approximately 6 miles of the city of Kuna, as well as 3 miles of its city impact area. This proposed development is discussed further in Section 3.17 – Land Use and Recreation, and shown in Figure 3.17-10.

4.2.2.8 Proposed New Forest Resource Activities

It is reasonable to expect that the Forest Service and the BLM will continue their programs of vegetation management for fire control, salvage timber harvest, and road maintenance and decommissioning. However, no site-specific information on activities scheduled more than 2 years in the future was either found on the SOPA for the Medicine Bow-Routt, Caribou-Targhee, or Sawtooth NFs or available for the Kemmerer or Pocatello FOs.

4.3 Activities and Potential Shared Resource Impacts

Table 4.3-1 summarizes the resources with the potential for cumulative impacts from Gateway West when considered together with the listed types of activities. The construction of additional transmission lines, particularly those proposed to follow the same route with an approximate 1,500-foot offset from the proposed Project, are likely to have the potential for cumulative impacts for all resources analyzed in this document with the exception of environmental justice.

Table 4.3-1. Types of Activities and Areas of Shared Resource Impacts with Gateway West

Type of Activity	Resources Affected
Construction of other new transmission lines	Cultural, socioeconomic, vegetation, special-status plants and animals, weeds, wetlands, wildlife, minerals, paleontologic resources, soils, water, land use, agriculture, transportation, air quality, public safety, noise
Operation of existing and new transmission lines	Visual, vegetation, weeds, wildlife (avian), geologic hazards, soils, water, agriculture, EMF, public safety
Construction of New Pipeline	Visual, cultural, socioeconomic, vegetation, special-status plants and animals, weeds, wetlands, wildlife, minerals, paleontologic resources, soils, water, land use, agriculture, transportation, public safety, noise
Operation of existing and new pipelines	Visual, vegetation, weeds, geologic hazards, soils, water, agriculture, public safety
Construction of new roads	Visual, cultural, socioeconomic, vegetation, special-status plants and animals, weeds, wetlands, wildlife, minerals, paleontologic resources, geologic hazards, soils, water, land use, agriculture, transportation, air quality, public safety, noise
Maintenance and use of new and existing roads	Visual, weeds, wildlife, geologic hazards, soils (if unsurfaced), water, land use, agriculture, transportation, public safety
Construction of new fossil fuel power generation facilities	Soil, water, visual, cultural
Operation of existing fossil fuel power generation facilities	Air quality, water
Operation of existing hydroelectric facilities	Wildlife (aquatic species), water, public safety
Construction of new wind facilities	Visual, cultural, socioeconomic, vegetation, special-status plants and animals, weeds, wetlands, wildlife, paleontologic resources, geologic hazards, soils, water, land use, agriculture, transportation, air quality, noise
Operation of existing wind facilities	Visual, wildlife (avian species), land use, agriculture
Expansion of existing, opening of new mines	Visual, cultural, socioeconomic, vegetation, special-status plants and animals, weeds, wetlands, wildlife, minerals, paleontologic resources, geologic hazards, soils, water, land use, agriculture, transportation, air quality, public safety, noise
Operation of existing mines	Visual, socioeconomic, vegetation, special-status plants and animals, weeds, wetlands, wildlife, minerals, geologic hazards, soils, water, air quality, public safety, noise
Additional oil and gas extraction	Visual, cultural, socioeconomic, vegetation, special-status plants and animals, weeds, wetlands, wildlife, minerals, paleontologic resources, geologic hazards, soils, water, land use, agriculture, transportation, air quality, public safety, noise
Operation of existing oil and gas wells	Vegetation, special-status plants and animals, weeds, wildlife, minerals, soils, water, land use, agriculture, public safety, noise
Expansion of residential development	Visual, cultural, socioeconomic, vegetation, special-status plants and animals, weeds, wetlands, wildlife, minerals, paleontologic resources, geologic hazards, soils, water, land use, agriculture, transportation, air quality, public safety, noise
Ongoing forest management activities	Visual, vegetation, special-status plants, weeds, wetlands, wildlife, soils, water, air quality, public safety, noise

4.4 Cumulative Impact Analysis

4.4.1 Introduction

Note that each of the following resource areas has been analyzed in its respective section of Chapter 3. This analysis relies on the analysis of direct and indirect impacts from the Gateway West Project, as proposed, and considers them in conjunction with the past, present, and reasonably foreseeable projects (listed in Section 4.3), to determine the cumulative impact of all projects taken together. It follows the same order of resources as found in Chapter 3.

4.4.2 No Action Alternative

Under the No Action Alternative, the BLM would not issue a ROW grant to the Proponents of the Gateway West Transmission Line Project and the Project would not be constructed. No land management plans would be amended to allow for the construction of this Project. All of the activities indicated in Section 4.2.2 would likely continue—that is, new energy generation, including but not limited to wind farms, would be constructed; other transmission lines would be permitted and built; oil and gas extraction would continue and would expand geographically; coal, trona, phosphate, and other mines would continue to extract mineral resources and to expand geographically; residential, commercial, and industrial development projects in or near the project Study Area would be implemented; and demand for electricity, especially for renewable energy, would continue to grow in the Proponents' service territories.

New generation sources in Wyoming currently in the queue for transmission on Gateway West, and those that otherwise would have also requested transmission service in the future, would have to find another means of transmitting their energy to market, but they would likely still be constructed. Other transmission lines currently proposed for construction may be permitted and constructed.

Domestic production of oil, gas, coal, and other mineral resources will likely continue and continue to expand where economically feasible (EIA 2010). Extraction facilities in Wyoming and Idaho are likely to continue and to expand.

Continued expansion of residential, commercial, and industrial developments is predicted by and planned for by various county and city comprehensive plans in the Project Study Area. While the current economic recession may slow or postpone these developments, there is no evidence or change in local regulation that would indicate that they will not eventually be constructed.

Demand for additional electricity in Western cities would likely continue to grow, based on recent trends and continuing even with the current economic recession. The U.S. Energy Information Administration estimates demand for electricity will increase an average of 1.0 percent per year, or 25 percent from 2010 to 2035 (EIA 2010). They further state, "Generation from wind power increases from 1.3 percent of total generation in 2008 to 4.1 percent in 2035" in their base case analysis" (EIA 2010).

If the Gateway West Project is not permitted, the demand for transmission services to which its purpose and need refers would not be met with this Project and would have to

turn to other proposals. These proposals, especially if responding to interconnection requests from existing, under construction, and proposed wind farms in Wyoming, would likely also cross federally managed lands and would be subject to a similar permitting process as for Gateway West. If the same concerns that prohibited the permitting of the Gateway West Project were to also stop the construction of these other transmission projects, the utilities responsible for meeting their service area demand might need to consider other options, either for permitting or for generation, to meet their consumers' demands. According to McBride et al. (2008), the lack of construction of these transmission lines could result in substantial adverse impacts on the economic growth, including loss of jobs, in the Pacific Northwest region, which includes Idaho as well as Washington, Oregon, Montana, and several Canadian provinces.

4.4.3 Visual Resources

The 10-mile-wide CIAA for visual resources includes a variety of landscapes such as mountainous areas, broad agricultural valleys, expanses of shrub steppe that have been or are still used for livestock grazing, areas of intensive mining, coal and gas development extraction and, for most of the Proposed Route and Route Alternatives, one or more existing transmission lines that occur within a half mile. Section 3.2 – Visual Resources discusses the direct and indirect effects of the Proposed Route and Route Alternatives on visual resources. The Proposed Route was designed to take advantage of existing utility corridors to minimize the introduction of a new transmission facility into a previously undisturbed landscape and reduce the visual impact on the landscape. Segment 9 is the longest exception to this general rule and the Proposed Route crosses areas without other major existing transmission lines for most of the its length. Segment 1E also crosses landscapes without existing high-voltage transmission lines for 88 miles. However, even with careful siting and the implementation of additional mitigation measures required or recommended by the Agencies, the Proposed Route and Route Alternatives are expected to have a substantial adverse visual impact on the landscape in certain locations.

Within the CIAA, existing energy facilities and activities that define the character of the rural, but not primitive landscape include oil and gas extraction sites, open-pit mining sites, power generation facilities, wind and geothermal energy facilities, as well as existing transmission lines. New activities that would add to the industrial character of the landscape prevalent in Wyoming include the establishment of new energy and mineral extraction sites as well as construction of new transmission lines, pipelines, and other linear facilities. Most prominent of the new energy facilities would be the proposed wind energy parks, given the strong vertical contrast of the turbines and blades (300 to 400 feet) against the generally flat to rolling terrain of the area.

Idaho landscape varies within the CIAA from mountainous terrain with agricultural valleys and scattered rural residences to expanses of sagebrush and grass rangelands south of the Snake River. Most of the Proposed Routes and Route Alternatives in Idaho west of the Deep Creek Mountains either travel through agricultural valleys associated with the Snake River plain, with some residential development or across the foothills to the north and south of the Snake River valleys. There is very little oil, gas, or other extractive industry in this area, and the landscape has a strongly agricultural or ranching character. Exceptions are found near urban expansion areas, south of Boise, north and

south of Twin Falls, and to a lesser extent on the outskirts of smaller towns, where the landscape is developing suburban characteristics.

The Segment 1E Proposed Route or Alternative 1E-A would be the first high-voltage transmission line crossing much of the area south of I-25 other than the existing 230-kV line proposed for reconstruction as part of Segment 1W. In this general area there are two proposed transmission lines: the High Plains Express and the Wyoming-Colorado Intertie, which may parallel a portion of the Segment 1E Proposed Route or Alternative 1E-A for a short distance before heading southeast. Wasatch Wind has proposed the 100-MW Pioneer Wind Farm in the area, located south of Glenrock and outside of designated core area.

In the Windstar area, the combination of the Gateway West Segment 1W(a) and 1E new 230-kV lines, the High Plains Express 500-kV line (presently on hold), the Wyoming-to-Colorado Intertie 345-kV line, and the Two Elk Transmission Line coming in from the north in conjunction with existing wind facilities and their transmission lines would substantially increase the industrial landscape surrounding the Dave Johnston Power Plant north of the river and north of I-25. South of the river and the interstate, the proposed Pioneer Wind Farm would add to the industrial nature of the landscape and would add cumulatively to the impact of Segment 1.

EO 2011-5 delineates sage-grouse core areas and prescribes analysis methods and disturbance restrictions. It also designates two types of corridors in Wyoming and in sage-grouse core areas where Wyoming state agencies would be directed to find a proposed new transmission line siting in compliance with the EO. One type of corridor is 2,640 feet on either side of existing transmission 115 kV and larger in voltage, while the other type of corridor is 10,560 feet wide and designated by mapping through several core areas to allow for new transmission lines. While the former corridor type would accommodate Segment 1W, the Proposed Route for Segment 1E and the Alternative 1E-C are outside that corridor for portions of each of those routes. Alternative 1E-C can feasibly be adjusted for about 7 miles to fall within the corridor, but the Segment 1E Proposed Route cannot be feasibly made to conform to EO 2011-5 from MPs 57 to 80. Wind energy has been declared incompatible with sage-grouse core areas unless research can show that there would be no population decline from locating wind energy projects within core areas. It is unlikely that wind farms will be permitted under EO 2011-5 in core areas in the foreseeable future. There is no known proposed wind farm in the CIAA within core areas.

Because EO 2011-5 effectively ends new wind development on private and state lands within core areas, limits new transmission to the designated corridors, and may constrain what can be approved on federal lands (if the project needs approval from the state of Wyoming, as most energy projects do in some form), there are virtually no further opportunities for transmission lines within the designated corridors along the Segment 1W route. Alternative 1E-B would be consistent with EO 2011-5 (after a minor adjustment where the Proposed Route in Segment 1E departs from the Segment 1W[c] Proposed Route) and it is possible that future projects could follow that alignment if they stayed to the east of that route.

From Aeolus to Creston along Segment 2, there is an existing 230-kV H-frame transmission line. In addition to that line and the proposed Gateway West double-circuit 500-kV towers and transmission line, four additional transmission lines have been proposed—Gateway South, TransWest Express, TransCanada's Zephyr line (presently on hold), and LS Power's Overland Intertie (presently on hold), all 500 kV. The additional proposed lines would be located at least 1,500 feet away and perhaps farther from Gateway West and the existing transmission line. Also in this area there is considerable existing and proposed oil and gas development and considerable potential wind development north and south of Rawlins. If all of these energy facilities were constructed, this industrial energy corridor could grow substantially in the CIAA.

Although this is an existing utility energy corridor, and the WWE corridor is designated north of the I-80/U.S. 30 freeway on federally managed lands, there are areas of concern, particularly the Fort Fred Steele area, where local residents have raised issues regarding the visual impact resulting from the proposed Gateway West Project. If all the transmission lines were to be located south of the I-80/U.S. 30 freeway, the visual impact to the Fort Steele community would be lessened. If all the proposed transmission lines, in addition to the existing transmission line, were located north of the freeway, the impact to the visual setting of the historic fort and the surrounding community could be substantial.

The Wyoming Governor's EO 2011-5 has designated a 2-mile-wide corridor across a portion of the Hanna Core Area, and the WWE corridor also crosses the Hanna Core Area following existing transmission lines, allowing for an additional 1-mile-wide corridor under EO 2011-5. The proposed transmission lines, in addition to Gateway West, could all be accommodated in the EO 2011-5 corridors provided that minimum separation was still around 1,500 feet.

While Gateway South and TransWest Express would turn south near Creston, Overland Intertie and Zephyr (both presently on hold) would continue, probably following the route selected by the BLM (as yet undetermined) for the Gateway West Project, through Segments 3 and 4. There also appears to be potential wind development in both segments and extensive mining and oil and gas development in all of Segment 2 and the eastern part of Segment 4. In the vicinity of the town of Kemmerer there could be substantial development in addition to Gateway West, but the amount of existing development and expanse of the landscape should visually accommodate the existing and new development.

From Kemmerer west, it appears that in the foreseeable future Gateway West and two other proposed transmission lines would comprise the bulk of development and that adding three sets of structures to the existing two or three sets would create a major visual impact crossing historic trails, crossing the Bear River Valley near Cokeville and Montpelier, and crossing through the Caribou-Targhee NF.

The Wyoming Governor's EO 2011-5 has designated a 2-mile-wide corridor across the Sage Core Area, containing the three 345-kV transmission lines from the Jim Bridger Power Plant. Alternative 4A is 1,500 feet to the northeast of the existing transmission line and would be considered consistent with EO 2011-5. There would be room in that

corridor, assuming all are separated by 1,500 feet, for both of the additionally proposed transmission lines.

In proceeding from Populus to Borah (Segment 5), the cumulative visual impact of the proposed corridor would involve six or seven lines exiting the Populus Substation, with four lines and three lines traversing south and west, respectively, of the Fort Hall Indian Reservation. In some locations this would result in a substantial impact. If two of the proposed lines traversed the reservation, it would substantially reduce the potential visual impact outside the reservation but would increase the impact within the reservation.

In Segment 6, Gateway West proposes very limited facilities outside the existing substations. The cumulative impact would result from construction and operations of the Overland Intertie and Zephyr projects (both presently on hold). However, the visual quality of the area is already defined in part by existing transmission lines and though the new facilities would add to the impact, they would not change the local character.

From Midpoint to Hemingway (Segment 8), there are numerous existing transmission lines in a broad agricultural setting. For the Proposed Route, the addition of one set of 500-kV structures would not change the character of the area but could have a site-specific visual impact in agricultural or residential areas. There are no known future projects or actions that could add to the impacts of the Proposed Route. For Alternative 8B, the impact would be moderate to high because of the higher concentrations of residences. The cumulative visual impact of Alternative 8B when considered together with the likely continued development in that area would be substantial. The impacts of the Proposed and Alternative Routes given the present landscape and its activities are addressed in Section 3.2 – Visual Resources.

For Segment 7, the proposed Gateway West single-circuit 500-kV line in conjunction with two or more additional transmission lines would create a new, wide corridor in an area that does not now have a major transmission corridor. The magnitude of the visual impact is partially reduced by the expanse of the landscape, the variety of the topography, the more developed nature of the area, and the proximity of one line to the next. In a corridor, these three lines would have substantial visual impact, particularly in areas of residential development or developed recreation areas. In addition to the visual impact of the other transmission lines, there are three existing wind farms (total of 60 MW) and nine proposed wind farms (127 MW proposed in eight wind farms and 425 MW proposed for China Mountain, part of which is proposed for Elko County, Nevada).

If Alternative 7I is chosen and a transmission corridor developed along that route, impacts to historic trails and to some of the landscapes visible from the City of Rocks National Reserve would be substantial. Similar to the Proposed Route, a major transmission corridor would be established in an area that does not now have any transmission lines. There would be fewer viewers in the more remote area along the boundary between Idaho and Nevada, but the visual impact would be greater than that of the comparison portion of the Proposed Route and additional transmission lines because of the undeveloped nature of the landscape along either Alternative 7I or 7H and the presence of important historic resources for which setting is an crucial component.

Segment 9 is proposed as a single-circuit 500-kV line with two major alternatives, one north and one south of the Proposed Route. The Proposed Route is largely in the WWE corridor across public lands. There are no known future projects or actions that could add to the impacts of this segment. The impacts of the Proposed and Alternative Routes given the present landscape and its activities are addressed in Section 3.2.

Segment 10 would include one set of single-circuit 500-kV structures next to an existing line and both may be paralleled by two future transmission lines. This would create a major corridor and change the local visual quality and may cause considerable visual impact particularly near the Snake River and I-80 crossings because these areas have the highest concentration of residences along this segment. The potential for two additional future transmission projects in the CIAA along Segment 10 would further increase the likelihood of adverse impacts in the areas identified above, as well as in the area of the Minidoka National Historic Site.

4.4.4 Cultural Resources

In some areas, the construction of the Gateway West transmission line could lead to the establishment of a corridor in which other lines may be installed in the future. There is a potential that cumulative impacts to the visual settings for some cultural resources would occur due to the establishment of a corridor and the subsequent construction of additional transmission lines.

The Gateway West Project could result in direct damage to historical or cultural NRHP-eligible properties such as prehistoric or historic archaeological sites, districts, buildings, trails, roads, and landscapes due to construction or other ground-disturbing activities. Other current and reasonably foreseeable activities with ground-disturbing activities (essentially all those listed in Section 4.2) have the potential for additional effects on these resources.

Because Gateway West would have both adverse visual impacts (as defined in 36 CFR 800.5[a]) and possible noise impacts on the setting for historical trails where it crosses, establishment of a corridor would increase visual and noise impacts in settings of NHTs and other historic properties. Some of the other proposed transmission lines have already requested to use some or all of the Gateway West segments or alternative routes (TransWest Express, Zephyr, and Overland Intertie). Most of the proposed transmission lines would require a federal ROW grant, thereby triggering consideration of impact to historic properties and mitigation of adverse impacts under Section 106.

An indirect effect of Gateway West is that potential for increased access due to new access roads may encourage unauthorized site access, artifact collection, and vandalism. This is the case with all of the current and reasonably foreseeable projects that have new or improved access roads associated with them.

The Wyoming Governor's EO 2011-5 has designated a 2-mile-wide corridor across the Sage Core Area, containing the three 345-kV transmission lines from the Jim Bridger Power Plant. Alternative 4A is 1,500 feet to the northeast of the existing transmission and would be considered consistent with EO 2011-5. There would be room in that corridor, assuming all are separated by 1,500 feet, for both of the additionally proposed transmission lines. If all three transmission lines proposed for this area were to be

placed in the same corridor, cumulative impacts of the Gateway West Project, when taken together with the other projects, would be significant. The cumulative impact of multiple transmission lines would also vary by alternative in Segment 2 near the Fort Fred Steele State Historic Site (see discussion in Section 4.4.3, above).

Gateway West and the rest of the current and reasonably foreseeable actions would result in significant cumulative adverse effects to known historic properties. All projects with a Section 106 nexus would complete surveys and record sites, contributing to the knowledge base in the CIAA. Each project also has the potential for inadvertent damage to previously undetected resources during construction, though all reasonable precautions would be built into each PA or MOA governing monitoring of and compliance with avoidance, minimization, and reporting requirements.

4.4.5 Socioeconomics

Within the Socioeconomic CIAA, past, present, and reasonably foreseeable activities that could combine with the Gateway West Project and result in cumulative effects to the socioeconomic environment include projects with the potential to affect population, the economy and employment, housing, property values, education, public services, and tax revenues.

The effects from past and present activities are generally accounted for in the baseline socioeconomic environment characterized in Section 3.4.1. These past and present activities generally include construction and operation of existing transmission line and other linear projects, development and operation of energy generation projects, past and present oil and gas operations, and other residential and commercial development (see Section 4.2.1). Ongoing and reasonably foreseeable projects with the greatest potential to combine with the proposed Gateway West Project and result in cumulative impacts include 1) current construction projects that would continue through 2011 and beyond, or 2) reasonably foreseeable actions that would be in construction between September 2011 and December 2018, when the majority of construction activities would occur on Gateway West. Cumulative effects on socioeconomic resources do not differ substantially by alternative.

Section 4.2.2 identifies a large number of reasonably foreseeable projects proposed within the Socioeconomic CIAA, including other transmission lines, pipelines, roads and highway improvement projects, and energy generation facilities. In cases where other construction activities coincide in space and time with Gateway West, there would be an increase in the projected influx of temporary workers and increased demand for temporary housing resources and other goods and services. Peak temporary population increases for Gateway West are expected to range from less than 0.1 percent to 1.9 percent of the existing 2009 populations for the affected counties. These potential impacts and associated cumulative effects would be short-term and temporary. Operation of the Gateway West Project would require an estimated permanent staff of approximately 12 employees, all of whom are expected to be hired locally. As a result, the Gateway West Project is not expected to result in any permanent changes in population and would have no effect on short- or long-term population trends.

Local Project-related expenditures, employment, and construction-related earnings from the Gateway West Project would have a positive impact on the local economy and

employment for the duration of construction. These impacts would be increased if ongoing and other reasonably foreseeable construction activities were to coincide in time with the proposed project. The resulting cumulative effects would be positive and short-term. Long-term economic impacts from the Gateway West Project would be primarily associated with operation and maintenance-related expenditures on materials and supplies. These impacts would be small, especially when compared to the construction-related impacts, and the incremental addition of these impacts to other ongoing and reasonably foreseeable projects would be relatively minor.

A temporary influx of construction workers associated with other ongoing and reasonably foreseeable construction projects that coincide in time with the Gateway West Project, could result in shortages in housing for temporary construction workers in some locations depending on actual construction schedules (which would be affected by permitting processes, prevailing economic conditions, and the availability of construction contractors), as well as demand from other sectors of the economy, including the oil and gas and travel and tourism industries. This potential housing shortage could affect not only other project construction workers, but also local residents and visitors vying for the same facilities. As described in Section 3.4.3, the Proponents would prepare a housing plan (SOC-1) that adequately demonstrates mitigation of any projected housing shortages during construction. This plan would take into account other projected demands for housing resources that are likely to exceed typical baseline demand. In Wyoming, the ISC will likely require that other large projects also prepare and execute a housing plan designed to reduce adverse impacts on temporary housing availability, and large projects in Idaho are also likely to develop temporary housing plans to ensure that temporary accommodation is available for their workers. Construction-related cumulative impacts on housing would be short-term and temporary. The Gateway West Project would require an estimated permanent staff of approximately 12 employees, all of whom are expected to be hired locally, and would not add cumulatively to long-term housing demand.

The temporary relocation of construction workers to the socioeconomic CIAA would create increased demand for community services such as education, medical facilities, municipal services, police, and fire. Other ongoing and reasonably foreseeable construction projects that coincide in time with the Gateway West Project could add cumulatively to this demand. These potential cumulative effects would be short-term and temporary.

Construction of the Gateway West Project would generate sales and use tax revenues through Project expenditures on construction supplies and equipment. Total construction-related sales and use taxes are estimated to be about $53.7 million for Wyoming and $39.4 million for Idaho. In Wyoming these estimated revenues would be divided between the state and county of origin and would be equivalent to about 14.8 percent of total state and local sales and use tax revenues in 2008 (Table 3.4-30). In Idaho, projected sales and use tax revenues would be equivalent to about 0.2 percent of the state total in 2008 (Table 3.4-31). Construction of the other reasonably foreseeable projects identified in Section 4.2.2 would likely result in similar short-term increases in tax revenues, depending on the size and nature of the project.

Following construction of the project, projected ad valorem (property) tax revenues in Wyoming would range from 0.2 percent (Natrona County) to 4.7 percent (Carbon County) of total ad valorem tax revenues in the affected counties in 2008. In Idaho, projected property tax revenues would range from 0.1 percent (Ada County) to 21.1 percent (Bear Lake County) of 2008 property tax revenues. Operation of Gateway West would also generate sales and use tax revenues from local operation and maintenance expenditures. Other reasonably foreseeable projects, if constructed and not tax-exempt, would also result in increases in ad valorem and property tax revenues in the counties where they are located.

The City of Kuna has developed estimates of the financial impact of Alternative 8B on the municipality based on a number of assumptions regarding mixed-use development that would otherwise occur within 660 feet of the centerline of the proposed transmission line. Kuna estimates that this foregone development, along with a 10 percent permanent reduction in value for potential development within 660 feet to 1,000 feet from the proposed centerline, would result in an annual loss of $2.3 million in property tax revenues that would otherwise be generated over the next 15 years with additional losses assumed from foregone permit and utility fees (City of Kuna 2009b). This assessment and the difficulties of projecting these types of impacts is discussed in more detail in Section 3.4 – Socioeconomics.

Details of the proposed development are not available, but City of Kuna planning documents anticipate that the city's population will more than double over the next 15 years, with a total population of 35,670 projected for 2025 and much of the expansion expected to occur in the area annexed to the south (see Figure 3.17-10). If this development were to occur, based on impact estimates provided by the City of Kuna, it would generate a substantial increase in ad valorem tax revenues for Kuna. The City of Kuna believes, as noted above, that Alternative 8B would result in a net reduction of these potential revenues. The actual extent of this potential impact is unknown but, based on the acreages Kuna assumes would be affected versus the total development, this reduction would be a relatively small share of the projected net increase that would result if this potential development were to take place.

4.4.6 Environmental Justice

Data compiled by the U.S. Census at the block group level indicate the potential presence of minority and low income communities in the vicinity of the Project. The Project is not expected to generate high or adverse human health or environmental effects on nearby communities. The Project would, however, have high, long-term visual impacts in some locations where the structures and overhead conductors would be visible from private residences, including parts of the Census Block Groups that have potential minority and low income communities. While these potential impacts exist, overall, the proposed Project does not appear to exhibit systematic bias toward placing the Project in minority or low income communities (see Section 3.5 – Environmental Justice). Cumulative effects on visual resources are discussed above in Section 4.4.3. Local construction expenditures for materials and supplies and spending by workers directly employed by the Project are expected to benefit local economies.

4.4.7 Vegetation Communities

The major ecological changes to vegetation that have occurred, and that continue to occur, in the CIAA due to past and present actions include changes in vegetation composition and conditions due to fire, grazing, mining, oil and gas development, agriculture, infrastructure development, and other forms of development. Of particular concern is the continuing degradation of shrub-steppe habitat, primarily due to increased abundance and dominance of non-native species. Planned activities, including construction of infrastructure, mining, and expansion of residential development, would contribute to this overall loss of native vegetation, increase habitat for noxious weeds, and result in the potential loss of rare plant occurrences and habitat (see Sections 3.7 and 3.8 discussion). Grazing, which is prevalent along Gateway West in Wyoming and parts of Idaho, may also affect vegetation by increasing habitat and distribution of noxious weeds and other non-native plants and by causing shifts in native species composition because of differential selection of food plants. These processes will continue into the foreseeable future.

Permanent vegetation removal and disturbance associated with Gateway West transmission line structures, access roads, and associated facilities under all alternatives would incrementally add to these effects. As noted below, mechanisms for weed distribution would be minimized by implementing mitigation measures listed in Section 3.6 – Vegetation Communities. However, unauthorized road use could introduce weeds outside the ROW. In addition, by providing increased access, project roads could contribute to the potential for OHV use. Off-road vehicle use could result in further degradation of native vegetation, which is compounded by the effects of habitat fragmentation (see Section 3.10 – General Wildlife and Fish for a discussion of fragmentation effects).

As documented for sage grouse and other native habitat-dependent species (e.g., Connelly et al. 2004), there has been a massive reduction in native vegetation in Wyoming and Idaho over the last 200 years, and remnant patches of native vegetation are further threatened by invasive species, grazing pressure, and removal during construction and operation of resource extraction, mining, residential development, and energy infrastructure projects, including transmission lines. The cumulative impact of past and present land uses is considerable and has reduced the native vegetation types through which the Gateway West Project would pass to small and often discontinuous patches. While the impact of the Gateway West Project would be minor compared to the much larger past events, when taken together with various proposed developments as specified earlier in Section 4.2, and when added to the impacts from past and present land use changes, the overall cumulative impact would be substantial.

4.4.8 Special Status Plants

Suitable habitat for sensitive plants occurs in Segment 4 (blowout penstemon, Ute ladies'-tresses) and Segments 1E, 1W, and 2 (western prairie fringed orchid and Ute ladies'-tresses). There is also one known population of slickspot peppergrass within 0.5 mile of Segment 8 and Alternatives 8B and 8C. These are the only segments where the Project may impact sensitive plant species, and therefore are the focus of the cumulative effects discussion. As for general vegetation (Section 4.4.6), past and

present actions in the Project area have substantially reduced habitat for many plant species, including those mentioned. Planned projects within these segments of Gateway West include power generation facility development, three transmission lines, and ongoing nonrenewable resource extraction, all of which involve ground disturbance. Ground-disturbing activities have the potential to impact special status plant species either directly or by disturbing habitat. Projects on federal lands or requiring federal permits would be required to conduct preconstruction surveys to identify and avoid the locations of sensitive plant populations. However, projects not requiring federal permits probably would not conduct surveys and might not avoid habitat or populations entirely. Transmission lines would typically avoid or span wetland and riparian habitats required by both orchid species but access roads could impact habitat, as could access roads for other new development activities. Slickspot peppergrass habitat would be surveyed and avoided for the Gateway West Project and for other projects with a federal nexus.

Impacts to rare plants do not differ substantially by alternative in segments where rare plants or their habitats are present. Therefore, cumulative effects of the Gateway West Project would not vary by alternative. Although the Gateway West Project impact to rare plants would be minor due to survey and avoidance measures, its impacts when added to possibly substantial (but largely unknown) impacts from non federally licensed activities on remnant habitat for these species could contribute to a substantial impact.

As noted in Section 3.7 – Special Status Plants, the western prairie fringed orchid may be affected by projects that require water depletions within the North Platte River drainage. Transmission lines would be designed to avoid or span wetland habitats, but access roads could have minor wetland impacts. Water depletions from Gateway West, if sourced from the North Platte River, could contribute to adverse effects to prairie fringed orchids within the watershed if combined with depletions from all other ground-disturbing activities requiring temporary dust control during construction. New water supplies for rural residential development could substantially contribute to water depletions. Water withdrawals from both the Platte River and Colorado River watersheds needed to control dust during construction for the Gateway West Project and for all other probable future projects would not appreciably or noticeably change the water levels in either river downstream of the existing intakes for the municipal and agricultural water withdrawals from which these projects would purchase water. It is reasonable to expect that any activities requiring a federal permit would be required to fully mitigate any withdrawals, as would Gateway West, reducing cumulative impact to the sensitive plant species associated with riparian areas on the two rivers.

4.4.9 Invasive Plant Species

Noxious weeds and invasive non-native plant species are locally prevalent across the CIAA, but there are areas that are relatively weed-free or have only limited invasive species presence. With the EPMs proposed by the Proponents and the additional mitigation measures required or recommended by the Agencies, the potential spread of existing weed populations would likely be decreased. It is assumed that additional new construction activities would carry similar requirements.

Within the CIAA, present activities that could also introduce or spread weeds include the operation, use, and maintenance of existing transmission lines, oil and natural gas

pipelines, roads, existing oil and gas extraction activities. They also include livestock grazing, OHV access to native habitats (whether authorized or not), existing subdivisions and developments that are adjacent to native habitats, as well as the increased potential for wildland fires due to increased human activities. New activities that could add to the introduction or spread of weeds include the construction of new transmission lines, pipelines, energy and mineral extraction facilities, and power plants of all fuel sources; new or relocated grazing; and residential, commercial, and industrial development.

Existing and new operations on public lands would be accompanied by weed prevention and control measures as requirements for use of the public lands. The effectiveness of those measures is greater where the activities are relatively short duration and are followed by required monitoring and mitigation activities if new weed populations are found. Measures are also effective for activities that require an operations and maintenance plan and adherence to its terms and conditions such as operations and maintenance of utility ROWs for transmission lines and pipelines, grazing on public lands, and operations and maintenance of oil, gas, and mineral extraction facilities.

Private landowners vary in the interest and emphasis they put on weed control on their lands and do not necessarily view introduced forage species as weeds. Noxious weeds that are poisonous or reduce the quality of rangeland are more likely to be targeted for control on private lands. Gateway West and other linear projects that cross private lands would be subject to landowner weed control requirements and would be subject to county and state weed control regulations where applicable. Introduction and spread of invasive plants are important regardless of land use, and therefore the impacts of Gateway West Project on invasive plants do not vary substantially by alternative. Cumulative effects on the introduction and spread of invasive plants do not differ substantially by alternative, except by length of alternative—longer routes have greater ground disturbance, more access roads, and therefore additional opportunity for introduction or spread of weeds. Given recent concern for introduction and spread of weeds on both public and private lands, and requirements for the prevention of introduction or spread of weeds imposed on all projects, the cumulative impact of reasonably foreseeable projects, including Gateway West, is not anticipated to be substantial.

4.4.10 Wetlands

Section 3.9 – Wetlands and Riparian Areas describes the locations of existing wetlands and riparian habitat in the CIAA, which comprise a minor portion of the total. Past and planned activities in the CIAA that have likely affected, or have the potential to affect, wetlands and riparian areas include oil and gas extraction, mining, infrastructure development, and other types of development including grazing and residential development. Any of these types of land development in previously undeveloped areas typically result in an increase in impervious surface area and may lead to increases in erosion and sedimentation, which can have negative effects on wetlands and riparian areas. Alteration of water flow in wetlands, through increases in impervious surfaces or changes to the soils ability to hold water (by compaction), reduces the time that water resides in wetlands or streams in a watershed and can lead to greater flooding or more dry spells in streams. Grazing may also affect the physical structure of wetlands and

riparian habitats in areas where cattle have direct access to streams. Grazing leases cover nearly the entire Gateway West Project in Wyoming, and there are also leases and private land grazing along part of the route in Idaho.

Regardless of the Route Alternative chosen, Gateway West would result in a minor contribution to the amount of impervious surface in the Analysis Areas as a result of the installation of new structures and the surrounding compacted work area, and the maintenance of permanent access roads. Unpaved roads, when used over the long term, would compact soils and reduce their ability to hold water. In the past, many human activities have affected riparian vegetation and wetland areas. Streams in the Project area have been affected by diversions of water, dams, dikes, and development, including roads that have altered natural hydrologic functions. Grazing, agriculture, and development, including construction of roads, mines, and oil and gas extraction facilities, have altered or destroyed wetlands and riparian vegetation. More recent development activities have been more carefully controlled, with limited impacts on wetlands and riparian vegetation due to requirements for compliance with the CWA. Gateway West, when taken together with other reasonably foreseeable proposed projects, would, in complying with their federal permits, avoid and minimize impacts to wetlands and riparian areas to the extent feasible and would provide compensatory mitigation where impacts were unavoidable. Cumulative effects for vegetative communities would not vary substantially by alternative except to the extent that the longer the alternative in native communities, the more impact it would have. If an alternative with larger impacts on native communities were chosen and additional transmission lines were also sited to follow that alternative, larger cumulative effects on native habitats would be expected. Therefore, given the minor individual impacts and the requirement for compensatory mitigation, Gateway West, when taken together with other projects that could adversely impact wetlands and riparian areas, would have a minor additional impact on these features.

4.4.11 General Wildlife and Fish

Construction of the Gateway West transmission line and associated facilities would occur in areas that have already been altered by infrastructure development, natural resource extraction activities, and other development, all of which may adversely affect wildlife through direct mortality, disturbance, or habitat removal. Infrastructure development includes both linear (e.g., powerlines, major roads, railroads, and oil and gas pipelines) and non-linear (e.g., wind energy facilities, fossil fuel exploration and extraction, thermal-operated power plants, and geothermal developments) features. Linear features can result in irretrievable losses of habitat; habitat fragmentation and the creation of travel barriers; the spread of invasive species along access roads, ROWs, and disturbed areas; and the facilitation of mammalian predator movement along corridors. Powerline structures also provide perches and nesting substrates for raptors and ravens, thus potentially facilitating predation for some species (e.g., prairie dogs, grouse). The presence of major roads is associated with the increased risk of mortality from collisions with vehicles, an increased chance of poaching, and the increased risk of human-caused fires which can lead to the loss of sagebrush habitat and introduction of invasive species, including cheatgrass. Changes in habitat and other environmental variables such as noise resulting from human disturbance and presence may also

influence wildlife behavior during key periods such as lekking, breeding and young rearing, and overwintering. Non-linear features can also disrupt wildlife behavior due to associated increases in human activities. The discovery and extraction of natural gas, oil, and minerals such as trona, coal, and phosphate has also resulted in direct loss of sagebrush habitat. Finally, grazing, farming, and other development (e.g., residential, commercial, and industrial), though limited in the Project area, has also caused direct loss of habitat as well as resulted in habitat fragmentation. While Gateway West, and other projects requiring federal permits, would be located to minimize impacts to important habitats and particularly to waterbodies, there is an unavoidable long-term loss of habitat and fragmentation of habitat caused by these projects. When considered together with the massive habitat alteration already caused by past and present actions, the cumulative impact of Gateway West would be substantial.

4.4.11.1 Habitat

Existing past and present actions have substantially fragmented or occupied habitat, especially native shrub steppe and grasslands. Remnant patches of shrub and grassland habitats are very important for the survival of many species of animals, including but not limited to migratory birds, large ungulates, small rodents and lagomorphs, mammalian and avian predators, reptiles, and, for riparian and wetland areas, amphibians and aquatic species including fish. The past and present activities that limit habitat quantity and quality for these species include identified ground-disturbing activities (Table 4.3-1). Reasonably foreseeable activities in addition to Gateway West would also continue to remove habitat and fragment remaining habitat patches with roads and other linear facilities. Because native habitats have been both eliminated and reduced in their function through introduction of invasive plant species and changes in fire regime, the additional removal and fragmentation of habitat due to the Gateway West Project, when added to the already considerable impacts of past and present actions, would be substantial. Cumulative effects for habitat would not vary substantially by alternative except to the extent that the longer the alternative in native habitats, the more impact it would have. If an alternative with larger impacts on habitat were chosen and additional transmission lines were also sited to follow that alternative, larger cumulative effects on native habitats would be expected.

4.4.11.2 Big Game

The size and extent of big game herd units now present in the CIAA were influenced by past and present actions, including mining, oil and gas extraction, and grazing, as well as the systematic elimination of wolves and mountain lions. Although big game species are generally mobile and will move away from disturbance, the reduction in habitat availability and the prevalence of disturbances from roads and other developments has limited areas that can support big game, especially during critical times (crucial wintering and parturition). Therefore, disturbances during these times can have large adverse impacts on both individuals and entire herds. BLM and the state wildlife agencies have developed seasonal restrictions that are applied to all activities on federal and state lands (respectively) and would likely be applicable on private lands for projects subject to the Wyoming Infrastructure Authority approval process. These seasonal restrictions would

reduce the impact from construction noise and visual disruption during critical periods from any development project in the area.

Table 4.4-1 lists the past, present, and reasonably foreseeable actions within big game winter range units that are crossed by Gateway West. Effects would be greatest in small, isolated units if development precludes their use by big game. Such units occur along Segments 2, 3, 7, and 9. Most of the wintering and parturition habitat units crossed by Gateway West are large. Big game would likely to continue to use these areas since the habitat loss associated with Gateway West and the other past, present, and reasonably foreseeable future actions would be relatively minor compared to the size of the big game habitat area and would be concentrated in areas of prior disturbance.

Because these limitations on activities would be imposed on Gateway West and on other transmission lines and pipelines, the additional cumulative impact on big game species from Gateway West activities during sensitive periods would be reduced to a minor level. There would still be the removal and fragmentation of habitat attributable to past, present, and reasonably foreseeable activities, to which even the minor impacts of Gateway West would contribute cumulatively to substantial adverse effects.

Table 4.4-1. Existing and Planned Actions within Big Game Wintering and Parturition Habitat Units Crossed by Gateway West

Species	Gateway West Segment/ Alternative	Approximate Gateway West Mileposts Crossed	Existing Projects within Big Game Habitat[1/]	Proposed Projects within Big Game Habitat[1/,2/]
Winter Range Units				
Pronghorn	1W, 1E, 1E-A	3-8 (1W); 0-2, 7-20 (1E); 10-12 (1E-A)	-transmission line	-transmission (WTI, HPE)
			-active oil and gas wells	-non-renewable resource extraction
			- I-25	-platted subdivisions
			-residential/commercial development	
Mule deer and elk (2 overlapping units)	1W, 1E-C	15-21 (1W); 43-49(1E-C)	-transmission line	-transmission (NLI)
			-active oil and gas wells	
			-State Highway 253	
Pronghorn	1W, 1E, 1E-C	50-60 (1W); 72-79 (1E); 29-35(1E-C)	-transmission line	-transmission (SWM, NLI)
			-active oil and gas wells	
			-U.S. 30, State Highway 77	
Mule deer and Pronghorn (2 overlapping units)	1W, 2, 1E, 1E-C	68-72 (1W); 0-8 (2); 82-87 (1E); 48-49 (1E-C)	-transmission line -active oil and gas wells	-transmission (GWS, OI)
				-non-renewable resource extraction
				-wind energy (pending/authorized)
				-platted subdivisions
Mule deer	1E-A	19-24	-transmission line	-transmission (WCI, HPE)
Mule deer and Pronghorn (2 overlapping units)	2, 2A, 2B	28-42 (2); 11-14, 15.5-22.5 (2A); 0-3 (2B)	-transmission line	-transmission (ZE, TWE, OI)
			-active oil and gas wells	-non-renewable resource extraction
			-non-renewable resource extraction	
			- U.S. 287	

Table 4.4-1. Existing and Planned Actions within Big Game Wintering and Parturition Habitat Units Crossed by Gateway West (continued)

Species	Gateway West Segment/ Alternative	Approximate Gateway West Mileposts Crossed	Existing Projects within Big Game Habitat[1/]	Proposed Projects within Big Game Habitat[1/,2/]
Pronghorn	2	48-55	-transmission line	- transmission (ZE, TWE, OI)
			- I-80	-non-renewable resource extraction
				-wind energy (pending)
Pronghorn	2	66.5-71	-transmission line	- transmission (ZE, TWE, OI)
			-active oil and gas wells	-non-renewable resource extraction
			-non-renewable resource extraction	
			-I-80	
Mule deer	3, 4, 4A, B, C, D	19-45(3); 0-1, 5-16, 20-21, 25.5-31.5, 52-58 (4); 0.5-6.5 (4A); 1-5 (4B, C, D, E)	-transmission lines	-transmission (GS, NLI, SWM, ZE, TWE, OI)
			-active oil and gas wells	-non-renewable resource extraction
			-non-renewable resource extraction	-authorized wind
			- I-80, U.S. 191, State Highway 377	-Jim Bridger expansion
			-existing residential/commercial (Green River, Rock Springs)	
Pronghorn	4, 4B, 4C, 4D, 4E	84-86 (4), 15-23 (4B, C, D, E)	-transmission lines	-transmission (ZE, TWE, OI)
			-active oil and gas wells	-non-renewable resource extraction
			-I-80, U.S. 30, State Highway 530	
			-existing residential (Kemmerer)	
Pronghorn	4, 4A	105.5-107 (4); 53-55 (4A)	-transmission lines	-transmission (ZE, TWE, OI)
			-active oil and gas wells	-non-renewable resource extraction
Moose, elk, mule deer (3 overlapping units)	4, 4A, 4B, 4C, 4D, 4E	119-128 (4); 63.5-71 (4A); 64-72 (4B, 4D); 64-84 (4C, 4E)	-transmission lines	-transmission (SWM, ZE, TWE, OI)
			-U.S. 30	-non-renewable resource extraction
				-wind energy (pending)
Mule deer	4, 4A, 4B, 4C, 4D, 4E	132-137 (4); 82.5-85 (4A); 97-100 (4B, 4C, 4D, 4E)	-transmission lines	-transmission (ZE, TWE, OI)
			-U.S. 30	-non-renewable resource extraction
Elk	4	144-147	-transmission line	-transmission (SWM, NLI, ZE, TWE, OI)
			-U.S. 30	-non-renewable resource extraction

Table 4.4-1. Existing and Planned Actions within Big Game Wintering and Parturition Habitat Units Crossed by Gateway West (continued)

Species	Gateway West Segment/ Alternative	Approximate Gateway West Mileposts Crossed	Existing Projects within Big Game Habitat[1/]	Proposed Projects within Big Game Habitat[1/,2/]
Mule deer	5, 5c,5e 7	7-9 (5); 0-1 (5c); 7-8 (7)	-transmission lines	-transmission (SWM, NLI)
Mule deer	5, 5a, 7, 7A	19-20 (5); 12-13 (5a); 19-21(7), 12-13)	-transmission lines	-transmission (NLI, ZE, TWE, OI)
Mule deer	5,7, 7A	24-25 (5), 23-25 (7A), 34-35(7)	-transmission lines	-transmission (ZE, TWE, LS)
Elk	5c	10-16	-transmission lines -U.S. 15	-transmission (SWM)
Mule deer	7C	4-6		
Mule deer	7, 7g, 9	154-157 (7); 1-3 (7g); 0-9 (9)	-transmission line	-transmission (SWI, SWM) -wind energy (pending/authorized)
Mule deer	8, 8a	0-1 (8 and 8a)	-transmission line -US 26	-transmission (SWM) -Notch Butte wind park
Mule deer	8	24-25	-transmission lines -Interstate 86, State Highway 30	-transmission (NLI)
Parturition Units				
Elk	4, 4f	110-112, 120-125 (4); 58-60, 63-69 (4f)	-transmission lines	-transmission (SWM)

1/ Non-renewable resource extraction includes coal, trona, and phosphate mining.
2/ Transmission lines: WCI (Wyoming to Colorado Intertie), HPE (High Plains Express), ZE (Zephyr), SWM (Southern Wyoming to Market Place), NLI (Northern Lights Inland), TWE (Transwest Express), OI (Overland Intertie), GS (Gateway South), SWI (Southwest Intertie)

4.4.11.3 Migratory Birds and Raptors

Effects of the Gateway West Project on migratory birds would occur primarily during construction (see Section 3.10.2.2). Gateway West and all other projects, including but not limited to wind energy projects, oil and gas development, and timber harvest, are subject to the MBTA and would be expected to take appropriate precautions to avoid the take of individual birds or nests during construction. Preconstruction surveys would be required for Gateway West and avoidance of nests and nesting birds would be required during construction, with buffers on nests ranging from 10 meters for shrub-nesting species to up to a mile for sensitive raptor species. Projects with similar permitting structures would be expected to be similarly restricted, including wind energy projects, reducing the impact on nesting birds to a minor level even when taken together. Construction traffic would be limited to 25 miles per hour on unsurfaced roads for Gateway West and would likely be similarly limited for other projects, reducing the chances for direct mortality due to collisions with equipment and vehicles to a minor level.

The removal and fragmentation of habitat attributable to past, present, and reasonably foreseeable activities, to which even the minor impacts of Gateway West would

contribute cumulatively, would result in some adverse cumulative effects to migratory birds. It is assumed that all new transmission lines, wind farms, and other projects with the potential to incur avian mortality due to collision or electrocution would develop Avian Protection Plans that would include measures to reduce the potential for raptor collisions and electrocutions. The additional disturbance and operational effects associated with Gateway West would not result in measurable cumulative effects to raptors, regardless of the route chosen.

Two hundred thirty (230)-kV and 500-kV transmission lines, such as those proposed by Gateway West and others, offer no electrocution hazard to birds because the conductors are separated by much more than the wingspan of the largest bird. However, they can present a collision hazard for all types of birds. This hazard is relatively low when compared to buildings but higher than for other identified sources of collision (Erickson et al. 2005). Avian mortality was estimated in 1987 to be over 250 birds per mile of transmission line per year in the Netherlands (as quoted in Erickson et al. 2005 and Manville 2005). It is difficult to compare to wind turbine mortality, which has been estimated roughly at 1 to 3 birds per MW per year. For the 2,700 MW planned for wind farms for Wyoming, for example, that would represent a mortality of 2,700 to 8,100 birds per year from wind farms. Though no known monitoring at either wind farms or at transmission line locations is being conducted, it is reasonable to assume that additional transmission lines and additional wind farms will add to migratory bird deaths from collision.

In April 2010, BLM signed an MOU with the USFWS regarding the management of public lands and the protection of migratory birds (BLM and USFWS 2010). BLM's obligations at a project level are to determine if the actions proposed in the project would have an adverse effect on migratory bird populations, habitats, ecological conditions, and/or significant bird conservation sites. The Gateway West Project would not have a measurable adverse effect on migratory bird populations or significant bird conservation sites but would have a small adverse effect on migratory bird habitats and ecological conditions through vegetation removal, fragmentation of native habitats, and possible increases in predation pressure due to adding perching substrate for avian predators and adding service roads sometimes used by canid predators. When taken together with the existing substantial habitat loss caused by past and present actions, including clearing for agriculture and development, fragmentation and habitat loss due to grazing, mining, logging, oil and gas production, road building, wildfires, and other energy infrastructure projects, as well as the potential future losses due to those same activities, the cumulative impact on migratory bird habitat and ecological conditions would be substantial.

4.4.11.4 Fish

The largest impact to fisheries from the construction of Gateway West was identified in Section 3.10 – General Wildlife and Fish as road crossings of watercourses—the greater the number of road crossings, the higher the potential for adverse impacts to fish resources. Assuming that parallel transmission lines would have similar access road densities, their potential impacts would add to those of Gateway West wherever they cross the same watercourse. While some access roads could be shared among projects, there would still be a substantial number of access roads, added to existing

roads, that would cross each waterbody. Gateway West, with established mitigation measures, would not introduce or spread aquatic invasive species and would therefore not contribute to the cumulative effect of the introduction or spread of invasive species.

Grazing can have negative effects on streambank condition, substrate embeddedness, pool frequency and quality, and riparian reserves due to bank damage caused by cattle, and trampling of riparian vegetation. This would be expected to continue under existing leases. Likewise, ground clearing for proposed projects can be a source of fine sediment and road crossings in general can present fish passage barriers. When features such as road are located near streams this can also reduce large wood debris recruitment and peak flows and drainage networks can be increased with the drainage from road surfaces. Requirements for limiting erosion, sedimentation, and in-water crossing work to non-critical seasons would reduce the impact of each of these projects on fish and other aquatic species. Cumulative impacts to fish would not vary substantially by alternative. Although Gateway West would implement mitigation measures for minimizing water quality effects and therefore would not contribute substantially to impacts on fish species, when considered together with the already considerable impacts of other past and present actions, the cumulative impact of Gateway West would be substantial.

4.4.12 Special Status Wildlife and Fish Species

The general discussion of conditions and potential impacts found within the General Wildlife and Fish section (Section 4.4.11) would be applicable to special status wildlife and fish species as well. The following discussion focuses on cumulative effects to particular special status wildlife and fish species.

4.4.12.1 Bald Eagle (*Forest Service and BLM Sensitive*)

Winter roost habitat for bald eagles is located within Segments 1E, 1W, 5, 8, 9, and 10. Nests have been identified along Segments 1E, 1W, 2, 4, and 5. Transmission lines are proposed for construction in these areas, in addition to the Gateway West Project (see Table 4.2-12). The exact placement of some of these lines is uncertain because they are still in the planning stage; however, any newly constructed lines would likely be separated from existing transmission lines by at least 1,500 feet. If these lines were constructed in addition to the Gateway West Project, there would be a small additional risk of disturbance to eagles and a small increased potential for collision with transmission lines during operation, though documented bald eagle collisions with transmission lines are not available for Wyoming, Idaho, or Nevada. Cumulative effects on the bald eagle would not differ substantially by alternative, except that some alternatives would impact considerably more habitat then others would. All projects, including but not limited to other transmission lines, would be sited to avoid nests and would be excluded from construction during nesting season near the nests. Implementation of each Proponent's Avian Protection Plan would reduce impacts to the bald eagle, including cumulative impacts, to a minor level.

4.4.12.2 Black-footed Ferret (*Endangered*)

Black-footed ferret non-block cleared areas, which comprise suitable habitat for the species, occur along Segments 2, 3, and 4. Substantial habitat loss in these areas has

already resulted from past and present actions including elimination of prairie-dog colonies by ranchers and construction and operation of existing pipelines (habitat in Segments 2 and 4), major roads (I-30 through habitats in Segments 2 and 3), and transmission lines (habitat in Segments 2, 3, and 4). In addition, there is a dense concentration of oil and gas wells in these non-block areas, as well as existing mining leases. Reasonably foreseeable actions that may result in additional losses of black-footed ferret habitat in the areas crossed by Gateway West include proposed transmission lines (see Table 4.2-12) as well as ongoing grazing and mining activities. The addition of transmission lines could provide new perching opportunities for raptors/ravens, thus increasing the potential for predation. This would be most likely to make a difference in predation levels within areas where existing transmission lines have not already provided multiple perching strata. The Agencies have identified mitigation measures aimed at reducing the potential increase in raptor and raven predation on prey species (see Section 3.11). While the permanent loss of black-footed ferret habitat is anticipated to be minor under the Proposed Route and Route Alternatives, given its scope in relation to the habitat available, additional habitat loss associated with future projects may have a substantial cumulative effect on the future availability of suitable habitat for recolonization by black-footed ferrets. In addition, cumulative effects on the black-footed ferret would not differ substantially by alternative.

4.4.12.3 BLM / Forest Service Sensitive Fish Species

Streams that support 16 Forest Service or BLM sensitive fish species could be impacted by the Project. These include six trout taxa; three suckers, two sculpin, and five minnow species (including four chubs and one dace). The waterbodies/watersheds that these fish could occur in, in relation to the Project, are discussed in Section 3.11 – Special Status Wildlife and Fish Species. The Project would both span stream habitats via the transmission line and cross these habitats with access roads. The Agencies have developed mitigation measures that would limit the impact of stream crossings by access roads, limit the risk of introducing aquatic invasive species into aquatic habitats, and establish requirements for water withdrawals in streams that contain sensitive fish to limit the risk of impingement.

Reasonably foreseeable actions that may result in additional impact to aquatic habitats include other linear projects that would span or cross waterbodies, projects that would require water withdrawals, or any project that could result in discharge or sediment loading to waterbodies. Cumulative effects on the sensitive fish species would not differ substantially by alternative, except that some alternatives would result in considerably more stream crossings (see Section 3.16 – Water Resources). As discussed in Section 4.4.11.4 for general fish species, although Gateway West would implement mitigation measures for minimizing water quality effects and therefore would not contribute substantially to impacts on fish species, when considered together with the already considerable impacts of other past and present actions, the cumulative impact of Gateway West would be substantial.

4.4.12.4 Burrowing Owl (*Forest Service and BLM Sensitive*)

Habitat for the burrowing owl occurs along all segments of the Gateway West Project. Potential effects of the Gateway West Project on the burrowing owl include direct

mortality, disturbance, and loss or modification of habitat. On federally managed lands, preconstruction surveys would be required to avoid burrows. As with Gateway West, other planned transmission lines could provide new perching opportunities for raptors/ravens, thus increasing the potential for predation. This would be most likely to make a difference in predation levels within areas where existing transmission lines have not already provided multiple perching strata. The Agencies have identified mitigation measures aimed at reducing the potential increase in raptor and raven predation on prey species that could result from the Gateway West Project (see Section 3.11 – Special Status Wildlife and Fish Species). Cumulative effects on the burrowing owl do not differ substantially by alternative, except that some alternatives would impact considerably more habitat than others would. The cumulative effect on habitat for burrowing owls from past, present, and reasonably foreseeable future projects, including oil and gas development, wind development, and other transmission lines, could be substantial on private lands and would be considerable on federal lands even if burrows were not impacted.

4.4.12.5 Canada Lynx (*Threatened*)

The analysis of cumulative effects for lynx focuses on activities within designated LAUs, which are considered core habitat for the species. Only Segment 4 of the Project crosses lynx habitat. The Project would not cross critical habitat for lynx, but would cross one LAU south of the mapped critical habitat in the Bridger-Teton NF on BLM-managed lands in the Kemmerer FO in Wyoming. The Proposed Route for Segment 4 would cross 10.3 miles of this LAU, causing 149 acres of habitat loss. Alternative 4F would cross 4.5 miles of the LAU with less than half that amount of habitat loss, out of an LAU of 2,204,851 acres. The amount of habitat loss is very small from Gateway West, though it is accompanied by habitat fragmentation, introduction of permanent service roads, the potential for additional access for OHV recreationists, and impacts to lynx linkage habitat. Construction and operations of the Project is not expected to result in direct mortality or disturbance, or create travel barriers, due to the large home range occupied by this species to the north of the CIAA. In addition, the Project is not expected to impact the Canada lynx's prey base. There are no existing transmission lines in the vicinity of the proposed LAU crossing, but two additional proposed transmission lines, the Zephyr and the Overland Intertie, may follow the Gateway West alignment though the LAU at a 1,500-foot offset from each. A very small portion of the LAU (south of Segment 4) is pending authorization for wind energy development. Such development could result in the additional removal of forested habitat. Future timber management activities may be authorized within the LAU.

Past activities have limited the range of lynx and reduced its population. Though much of its habitat is now being managed for its recovery, the population has not yet recovered. The lynx habitat crossed by the Proposed Route and Alternative 4F is at the southern end of areas managed for lynx habitat and adjacent to non-habitat elements such as roads, open sage-brush (part is core area for sage-grouse), and a reservoir. Because the Project would only cross lynx habitat along the Proposed Route of Segment 4 and one Route Alternative, and no Route Alternative currently considered would result in the complete avoidance of this habitat, cumulative effects on the Canada lynx would not differ substantially by alternative. Because the lynx is listed as

threatened, Gateway West's minor impacts, when taken together with other past, present, and future actions, may be considered an additional increment to an already considerable cumulative effect.

4.4.12.6 Colorado and Platte River Fisheries (*Endangered*)

Five fish species are listed as endangered in areas located downstream of the Gateway West Project (four in the Colorado River and one in the Platte River): Colorado pikeminnow, razorback sucker, humpback chub, bonytail, and pallid sturgeon. Project-related impacts that may affect local conditions (e.g., change in riparian habitat, sediment, accidental toxicant spills) would have no effect on these downstream habitats because the system where these species reside would be unchanged from local conditions. However, the Project would use water for dust control at about 16,000 to 25,000 gallons per day during construction (see Section 3.16 – Water Resources). While no direct or adverse effects to any of these listed fish species would result from Project-related water use during construction, the tiered BOs of the USFWS on the Colorado River or Platte River system indicate that any depletion from the Colorado or Platte River systems would be considered to adversely affect these species (note that these two systems are covered under different plans and BOs). The Proponents intend to draw this water from existing developed water rights (i.e., purchasing existing water rights and only drawing water in accordance with these existing water rights); therefore, if the entirety of this water use were diverted from existing rights, with no water depletion, then the Project would have no effect on the aforementioned species. However, at this time it is uncertain if the Proponents would be able to purchase enough existing water rights to cover the Project's needs and, as such, all of the water withdrawal may not come from existing rights. If reasonable foreseeable future projects also require water withdrawals from these water systems, and cannot ensure that all of the water would be derived from existing water rights, then the USFWS would consider this to be an adverse effect to downstream listed species as well. Therefore, the cumulative effects of water withdrawals from the Colorado and Platte Rivers from past, present, and reasonably foreseeable future projects could be substantial. It is reasonable to expect that any activities requiring a federal permit would be required to fully mitigate any withdrawals, as would Gateway West, thereby reducing impact to these species.

Because there is no Route Alternative that would completely avoid water withdrawals from these systems, the cumulative effects on downstream listed fish species would not differ substantially by alternative.

4.4.12.7 Columbian Sharp-tailed Grouse (*MIS, Forest Service Sensitive, BLM Special Status)*

Suitable habitat for Columbian sharp-tailed grouse occurs in Segments 4, 5, 6, 7, and 9. The Gateway West Project was sited to avoid known leks by at least 0.25 mile. The Project would, however, contribute to the permanent loss of suitable habitat located near leks, and possible disturbances to birds located within these areas. Planned projects along Segments 4, 5, and 7[12] include wind energy facilities, ongoing nonrenewable

[12] There are only limited proposed projects along Segment 9.

resource extraction, and transmission lines, all of which would, if constructed, permanently remove suitable Columbian sharp-tailed grouse habitat. The construction of additional transmission lines could provide new perching opportunities for raptors/ravens, thus increasing predation rates on the sharp-tailed grouse. Predation rates would most likely rise in areas where there are no existing transmission lines. The Agencies have identified mitigation measures aimed at reducing the potential increase in raptor and raven predation on prey species that could result from the Gateway West Project (see Section 3.11 – Special Status Wildlife and Fish Species). Although the Gateway West Project would be sited and constructed to minimize impact to Columbian sharp-tailed grouse, there would still be long-term loss and fragmentation of habitat associated with the Project. When added to the already considerable loss of habitat due to past and present activities, and the minor but cumulative impacts from proposed future projects, the cumulative effects on the Columbian sharp-tailed grouse from past, present, and reasonably foreseeable future projects would be substantial.

Because the Columbian sharp-tailed grouse may avoid areas that contain tall structures, the cumulative effects on this species may differ depending on which alternative is selected. Alternative 7H would pass through an area that would not accommodate additional transmission lines, indicating that no additional transmission lines could be collocated with this alternative. Because of this, if Alternative 7H is selected for Gateway West, other proposed transmission lines, such as the Zephyr and the Overland Intertie lines, would likely be built along Gateway West's Proposed Route or other Route Alternatives. Although this would limit the cumulative disturbances along Alternative 7H, it would result in multiple lines that are not co-located crossing through Columbian sharp-tailed grouse habitat in Cassia County. By co-locating these proposed lines, the effects of habitat displacement on grouse species by these various lines (resulting from the presence of tall structures) would overlap each other to some degree. However, if each line is located in a separate location within grouse habitat, then each could create a substantial and unique area that grouse would likely avoid. Therefore, cumulative effects on the Columbian sharp-tailed grouse would likely be greater under Alternative 7H than the other Route Alternatives considered along Segment 7.

4.4.12.8 Columbia Spotted Frog / Northern Leopard Frog (Candidate, Forest Service Sensitive / Petitioned, Forest Service Sensitive, BLM Special Status)

The Columbia spotted frog and northern leopard frog may occur in wetland and riparian habitats found along the Gateway West Project. Habitat for the northern leopard frog occurs along all segments of the Gateway West Project. Habitat for the Columbia spotted frog occurs along Segments 4, 7I, 8, and 9. The transmission line for the Gateway West Project would span wetlands and riparian habitats (thereby minimizing impacts); however, some loss of or degradation to these habitats could occur due to construction and maintenance of access roads. There are additional transmission line projects that have been proposed for areas adjacent to the Gateway West Project (see Table 4.2-12) with similar effects. Given that it is standard engineering practice for transmission lines to span riparian and wetland areas, and for such projects to include an SPCC Plan and SWPPP, it is assumed that removal of riparian habitat and

sedimentation contributions to wetlands and waterbodies would be minimized by these additional projects as well. However, the cumulative loss or degradation of wetland and riparian habitats could be locally important for Columbia spotted frogs and northern leopard frogs, given the limited availability of these habitats and their sensitivity to impacts.

Cumulative effects on the Columbia spotted frog and northern leopard frog would not differ substantially by alternative, except that some alternatives would impact different amounts of habitat than others would.

4.4.12.9 Federally listed Invertebrate Species (*Threatened and Endangered*)

There are five federally listed and one delisted aquatic invertebrate species that occur near the Gateway West Project: the Utah valvata snail (Endangered); Bliss Rapids snail (Threatened); Idaho springsnail (delisted); Banbury Springs limpet (Endangered); Snake River physa snail (Endangered); and Bruneau hot springsnail (Endangered). The designated recovery areas for some of these species (located along the Snake River) would be spanned by the Gateway West Project's transmission line along Segments 8 and 10; however, no access roads would cross through these areas. Other proposed transmission lines (see Table 4.2-12) may cross through these areas. However, it reasonable to expect that other transmission lines would span this habitat and would not build roads within this habitat. No other projects are known in the area that could adversely impact the Snake River habitat area. Therefore, no substantial adverse cumulative impacts are expected to federally listed invertebrate species, and cumulative effects on federally listed invertebrate species would not differ substantially by alternative.

4.4.12.10 Gray Wolf (*Nonessential Experimental Population–Wyoming; Forest Service Sensitive*)

Cumulative effects to gray wolves are assessed by comparing the known locations of wolf packs to proposed construction locations. There are multiple wolf packs in the vicinity of Gateway West (see Figure E.11-1, Appendix E). One pack is located northeast of Windstar and encompasses the first several miles of the various routes along Segment 1, including the Route Alternatives. Another large wolf pack area occupies much of central Natrona County. Much smaller packs are identified just north of the Creston Substation (Segments 2 and 3), south of Segment 4 and north of Alternatives 4B through 4E (near the town of Kemmerer), and at about MPs 70 to 80 along Alternative 4A (all in Wyoming). All known wolf packs in Idaho are north of the Project area, and there are no known wolf packs near the Project area in Nevada. The cumulative effects of disturbance resulting from the Gateway West Project and other existing or proposed activities would have negligible impacts to transient wolves given their broad habitat requirements and large home range. In addition, cumulative effects on wolves would not differ substantially by alternative.

4.4.12.11 Greater Sage-Grouse (*Candidate, MIS, Forest Service Sensitive, BLM Special Status)*

Habitat for the greater sage-grouse occurs along all segments of the Gateway West Project. In addition, Wyoming-designated Core Areas would be crossed by Segments

1,2, and 4, with amounts crossed and consistency with EO 2011-5 varying by alternative in these segments. Idaho-designated Key Habitat would be crossed by Segments 5, 7, 8, 9, and 10, with amounts crossed varying by alternative. The Proponents attempted to route the Project to avoid all leks by at least 0.25 mile (in accordance the BLM RMP requirements for "no surface occupancy," which were in place at the time of initial Project design in 2008). However, the centerline of the Project would come within 0.25 mile of a lek with an "undetermined" activity status along Segment 10. In addition, leks were avoided to the extent possible by 0.6 mile, based on the assumption made at the time of initial Project design (2008) that the "no surface occupancy" requirement would increase from 0.25 mile to 0.6 mile (as of this date, the BLM "no surface occupancy" restriction has been increased to 0.6 mile). However, not all leks could be avoided by this distance (see Table 3.11-3 in Section 3.11) due to the need to avoid other sensitive resources (e.g., high-altitude mountain habitats that contain species listed under the ESA, or sensitive cultural resources that are protected by the various SHPOs).

The Project would contribute to the permanent loss of suitable sage-grouse habitat and possible disturbances to birds. The Project design includes minimization measures such as seasonal restrictions on construction, and mitigation measures such as offsite compensatory mitigation. The Agencies assume that similar measures would be proposed by or imposed upon other projects proposed in the area. In addition, as was discussed for other species that are preyed upon by raptors and ravens, the construction of additional transmission lines could provide new perching opportunities for raptors/ravens, thus increasing the potential for predation rates on the sage-grouse. This would be most likely to occur within areas where there are no existing transmission lines.

Table 4.4-2 lists the existing and proposed activities within designated core/key areas. Additional transmission projects, located outside of core/key areas, are listed in Table 4.2-11. Habitat for these species would also be impacted by non-linear projects such as ongoing oil and gas extraction, ongoing grazing and OHV use, and wind energy development. Losses of birds would also continue to occur due to hunting, illegal poaching, and the spread of diseases such as West Nile Virus. The cumulative effects of the Gateway West Project on the greater sage-grouse when taken together with past, present, and reasonably foreseeable future projects would be substantial.

Governor Mead has published EO-2011-5, which replaces but does not substantially change EO 2010-4, an executive order published by his predecessor Governor Freudenthal, which established boundaries of several of the core areas. EO 2011-5 also designated two types of corridors in Wyoming and in sage-grouse core areas where Wyoming state agencies would be directed to find a proposed new transmission line siting in compliance with the EO. One type of corridor is 2,640 feet on either side of existing transmission 115 kV and larger in voltage, while the other type of corridor is 10,560 feet wide and designated by mapping through several core areas to allow for new transmission lines Wind energy has been declared incompatible with sage-grouse core areas unless research can show that there would be no population decline from locating wind energy projects within core areas. It is unlikely that wind farms will be

permitted under EO 2011-5 in core areas in the foreseeable future. There is no known proposed wind farm in the CIAA within core areas.

Because EO 2011-5 effectively ends new wind development on private and state lands within core areas, limits new transmission to the designated corridors, and may constrain what can be approved on federal lands (if the project needs approval from the state of Wyoming, as most energy projects do in some form), it is unlikely that additional development would occur in core areas in Wyoming as long as the EO is in place.

Table 4.4-2. Existing and Proposed Activities within Sage-Grouse Key and Core Habitat Units

Sage-Grouse Core/Key Units Identified by Gateway Segments	Approximate Gateway Mileposts	Existing Projects within Core/Key Sage-Grouse Habitat[1/]	Proposed Projects within Core/Key Habitat Unit[1/,2/]	Relationship to Gateway Project
1W, Alternative 1E-A, 1E, Alternative 1E-C	19-22, 35-49 (1W[a]), 29-44, 70-71(1W[c]), 17-18, 58-72 (1E), 50-56 (1E-A), 5-7 (1E-B), 7-21.1(1E-C)	• WWE transmission line corridor • State Highway 253, State Highway 91, Rock Creek and Fort Fetterman Road • Existing Dave Johnston to Difficulty transmission line (to be reconstructed as 1W(c))	Wind lease, two authorized, and segment proposed	Segment 1W would closely parallel existing transmission line; Alternative 1E-A would parallel Rock Creek and Fort Fetterman Road.
2, Alternative 2B, Alternative 2A	0-34, 65-81 (2), 0-17 (Alternative2A)	• One (1) transmission line	Transmission	Segment 2 would closely parallel the existing transmission line and pipelines for full length and U.S. 287 for approximately 10 miles; other proposed transmission lines are planned to parallel the Gateway West alignment.
		• Two (2) large-diameter natural gas pipelines	Multiple proposed (NLI, SWM, GS, ZE, TWP, NOI)	
		• U.S. 287, State Highway 72, I-80, U.S. 30, railroad	Nonrenewable resource extraction	
		• WWE corridor • Active oil and gas development • Nonrenewable resource extraction • 1 product pipeline	Multiple proposed wind leases	
4	32-45, 54-55, 58-67, 136-137, 141-150	• Transmission line	Transmission (SWM, ZE, OI, TWP)	Gateway would parallel existing transmission line and one pipeline; Gateway is on the southern edge of the habitat polygon.
		• Three (3) large-diameter pipelines • U.S. 91 • Nonrenewable resource extraction	Non-renewable resource extraction	

Table 4.4-2. Existing and Proposed Activities within Sage-Grouse Key and Core Habitat Units (continued)

Sage-Grouse Core/Key Units Identified by Gateway Segments	Approximate Gateway Mileposts	Existing Projects within Core/Key Sage-Grouse Habitat[1/]	Proposed Projects within Core/Key Habitat Unit[1/,2/]	Relationship to Gateway Project
4, 4A, 4B, 4C, 4D	0-15(4A); 0-12 (4B, C, D, E)	• One (1) pipeline	Transmission (SWM, ZE, OI, TWP)	Gateway West would parallel pipeline for approximately 10 miles and State Highway 372 for approximately 5 miles; Gateway West is on the very northern edge of the habitat polygon.
		• State Highway 372, I-30 • Dense active oil and gas development • Nonrenewable resource extraction	Nonrenewable resource extraction	
4, 4A, 4B, 4C, 4D, 4E	50-68 (4A); 32-40, 50-80 (4B, C, D, E)	• Three (3) transmission lines	Transmission (SWM, ZE, OI, TWP)	Gateway West would closely parallel one transmission line and the pipeline; Alternatives 4C, 4D, 4E would parallel I-30.
		• One (1) large diameter pipeline • I-30, U.S. 182 • Active oil and gas development • Nonrenewable resource extraction	Nonrenewable resource extraction	
4, 4A	90-95 (4A)	• Two (2) transmission lines	Transmission (SWM, ZE, OI, TWP)	Gateway West would closely parallel one transmission line and I-30.
		• One (1) large diameter pipeline • I-30	Nonrenewable resource extraction	
4	161-166	• One (1) transmission line	Transmission (SWM, ZE, OI, TWP)	Gateway West would parallel existing transmission line.
Alternatives 5A and 7A	10-13	• One (1) transmission line	Transmission line (OI)	Gateway West would result in new development along the northwestern edge of the polygon.
Alternatives 5B and 7B	10-11	• One (1) transmission line	Transmission line (OI)	Gateway West would result in new development along the northwestern edge of the polygon.
7	75-85	• Two (2) large-diameter pipelines (Williams and Chevron)	None	Gateway West would parallel and cross these existing pipelines.

Table 4.4-2. Existing and Proposed Activities within Sage-Grouse Key and Core Habitat Units (continued)

Sage-Grouse Core/Key Units Identified by Gateway Segments	Approximate Gateway Mileposts	Existing Projects within Core/Key Sage-Grouse Habitat[1/]	Proposed Projects within Core/Key Habitat Unit[1/,2/]	Relationship to Gateway Project
7, 9	115-120 (7), 0-19 (9)	• Several small BLM-approved wind energy leases	Transmission (SWI) Several small pending BLM wind energy leases	Gateway West would result in new development along the northern edge of the polygon.
8	30-34 and	• Two (2) existing transmission lines	Several small pending BLM wind energy leases	Gateway West would parallel transmission lines along southern edge of habitat polygon.

1/ Non-renewable resource extraction includes coal, trona, and phosphate mining.
2/ Transmission lines: WCI (Wyoming to Colorado Intertie), HPE (High Plains Express), ZE (Zephyr), SWM (Southern Wyoming to Market Place),, TWE (Transwest Express), OI (Overland Intertie), GS (Gateway South), SWI (Southwest Intertie)

Because the greater sage-grouse may avoid areas that contain tall structures, the cumulative effects on this species may differ depending on which alternative is selected. Alternative 7H would pass through an area that would not accommodate additional transmission lines, indicating that no additional transmission lines could be co-located with this alternative. Because of this, if Alternative 7H is selected for Gateway West other proposed transmission lines, such as the Zephyr and the Overland Intertie lines, would likely be built along Gateway West's Proposed Route or other Route Alternatives. As was discussed for the Columbian sharp-tailed grouse, although this would limit the cumulative disturbances along Alternative 7H, it would result in multiple lines that are not co-located crossing through greater sage-grouse habitat in Cassia County. By co-locating these proposed lines together, the effects of habitat displacement on grouse species by these various lines (resulting from the presence of tall structures) would overlap each other to some degree. However, if each line is located in a separate location within grouse habitat, then each could create a substantial and unique area which grouse would likely avoid. Therefore, cumulative effects on the greater sage-grouse would likely be greater under Alternative 7H than the other Route Alternatives considered along Segment 7.

4.4.12.12 Grizzly Bear (*Threatened, Forest Service Sensitive*)

The Project would not cross through the grizzly bear PCA designated in the 1993 Grizzly Bear Recovery Plan, or through areas designated as suitable habitat for the grizzly bear by the USFWS; however, it would cross through the southern border of the Yellowstone DPS. This crossing would occur adjacent to Highway 80, I-30, and the town of Kemmerer. The cumulative effects of disturbance resulting from the Gateway West Project and other existing or proposed activities would have negligible impacts to the grizzly bear given their broad habitat requirements and large home range, and cumulative effects on the grizzly bear would not differ substantially by alternative.

4.4.12.13 Jarbidge River Bull Trout Proposed Critical Habitat

On January 14, 2010, the USFWS proposed revising the designation of critical habitat for the bull trout. In total, approximately 22,679 miles of streams and 533,426 acres of reservoirs or lakes were proposed for the revised critical habitat designation. The Gateway West Project would span a portion of this newly proposed critical habitat along Alternative 9E (near point 9n); however, no road crossings would occur across proposed bull trout critical habitat. In addition, the vegetation located adjacent to this crossing of proposed critical habitat consists of low shrubs and disturbed habitat, indicating that vegetative clearing would not be necessary in this area. Because only Alternative 9E would cross this proposed critical habitat, selection of any other alternative along Segment 9 would completely avoid impacting this habitat; thereby eliminating any cumulative effects that the Project could have on this habitat. If Alternative 9E is selected, the cumulative effects on proposed critical habitat resulting from the Gateway West Project and other existing or proposed activities would be negligible.

4.4.12.14 Mountain Plover (*Forest Service Sensitive, BLM Special Status*)

Habitat for the mountain plover occurs along Segments 1E, 1W, 2, 3, and 4. The Gateway West Project has the potential to result in a permanent loss of habitat, as well as contributing to new perch opportunities for raptors and ravens (as discussed for other prey species such as the black-footed ferret). The BLM and cooperating agencies have identified mitigation measures aimed at reducing the potential increase in raptor and raven predation on prey species that could result from the Gateway West Project (see Section 3.11 – Special Status Wildlife and Fish Species). Planned activities that involve road construction such as infrastructure development, mining, and residential development, in combination with the access roads proposed for Gateway West, could result in substantial nest disturbance and habitat fragmentation. The cumulative effects of the Gateway West Project on the mountain plover when considered together with the effects of past, present, and reasonably foreseeable future projects would be substantial; however, the cumulative effects on the mountain plover would not differ substantially by alternative.

4.4.12.15 Piping Plover/Whooping Crane (Threatened/Endangered)

No habitat for the piping plover or the whooping crane occurs near the Gateway West Project; however, these species do occur in downstream areas along the Colorado River. Project construction and operation are unlikely to result in adverse changes to these species habitats. However, as was discussed for the federally listed fish species, any water withdrawals from the Colorado River for construction of the Gateway West, or other reasonable foreseeable project, would be considered by the USFWS as an adverse effect to listed species located in downstream areas. Therefore, the cumulative effects of water withdrawals from the Colorado and Platte Rivers from past, present, and reasonably foreseeable future projects could be substantial. It is reasonable to expect that any activities requiring a federal permit would be required to fully mitigate any withdrawals, as would Gateway West, thereby reducing cumulative impact to these species.

Because there is no Route Alternative that would completely avoid water withdrawals from the Colorado River system, the cumulative effects on downstream species would not differ substantially by alternative.

4.4.12.16 Preble's Meadow Jumping Mouse (*Forest Service Sensitive, BLM Special Status*)

The Preble's meadow jumping mouse could occur within wetland and riparian areas along Segments 1 and 2. Cumulative effects of past, present, and reasonably foreseeable future projects would be similar to those discussed for the northern leopard frog and could be locally important for this species.

4.4.12.17 Pygmy Rabbit (*Forest Service Sensitive, BLM Special Status*)

The pygmy rabbit could occur within sagebrush habitats found along Segments 2, 3, 4, 5, 6, 7, 8, 9, and 10. The Gateway West Project would result in permanent habitat loss, and could result in direct mortality and an increased opportunity for predation by raptors and ravens (as was discussed for other prey species such as the black-footed ferret). The Agencies have identified mitigation measures aimed at reducing the potential increase in raptor and raven predation on prey species that could result from the Gateway West Project (see Section 3.11 – Special Status Wildlife and Fish Species). The cumulative effects of the Gateway West Project on the pygmy rabbit when considered together with the effects of past, present, and reasonably foreseeable future projects would be substantial; however, the cumulative effects on the pygmy rabbit would not differ substantially by alternative.

4.4.12.18 White-tailed and Black-tailed Prairie Dog (*Forest Service Sensitive, BLM Special Status*)

Habitat for the white-tailed prairie dog occurs along Segments 1E, 1W, 2, 3, and 4; and colonies were mapped along Segments 1E, 1W, and 4. Black-tailed prairie dog colonies were mapped along Segments 1E and 1W. The Gateway West Project would result in some permanent habitat loss, as well as the possibility of direct mortality and an increased opportunity for predation by raptors and ravens (as was discussed for other prey species such as the black-footed ferret). The Agencies have identified mitigation measures aimed at reducing the potential increase in raptor and raven predation on prey species that could result from the Gateway West Project (see Section 3.11 – Special Status Wildlife and Fish Species). The cumulative effects of the Gateway West Project on habitat for both species of prairie dog when considered together with the effects of past, present, and reasonably foreseeable future projects would be substantial; however, the cumulative effects on the pygmy rabbit would not differ substantially by alternative.

4.4.12.19 Wyoming Pocket Gopher (*Forest Service Sensitive, BLM Special Status*)

The Wyoming pocket gopher is only located in Carbon and Sweetwater Counties within Wyoming. Based on a habitat model created by the WYNDD, the Gateway West Project would cross suitable habitat for this species along Segments 2, 3, and 4. The Gateway West Project would result in some permanent habitat loss, as well as the possibility of direct mortality and an increase opportunity for predation by raptors and

ravens (as was discussed for other prey species such as the black-footed ferret). The Agencies have identified mitigation measures aimed at reducing the potential increase in raptor and raven predation on prey species that could result from the Gateway West Project (see Section 3.11 – Special Status Wildlife and Fish Species). The cumulative effects of the Gateway West project on habitat for of the Wyoming pocket gopher when considered together with the effects of past, present, and reasonably foreseeable future projects would be substantial; however, the cumulative effects on the pygmy rabbit would not differ substantially by alternative.

4.4.12.20 Yellow-billed Cuckoo (*Candidate, Forest Service Sensitive*)

The yellow-billed cuckoo may occur within riparian and wetland habitats along Segments 1E, 1W, 5, 7, 8, 9, and 10. Potential effects of Gateway West include habitat removal, direct mortality due to collisions with construction vehicles, and disturbance during construction. Past actions in the CIAA have removed riparian and wetland habitats and additional losses are possible due to planned transmission lines. However, the cumulative loss of riparian habitat would likely be low under all alternatives, given that it is standard engineering practice to design transmission lines to span riparian habitats and avoid placing ancillary facilities within them. The existence of multiple transmission lines through riparian habitats would also present increased risk of collisions. However, this risk would remain low given that yellow-billed cuckoos are agile flyers. The cumulative effects from the Gateway West Project on the yellow-billed cuckoo when considered together with the effects of past, present, and reasonably foreseeable future projects would be minor.

4.4.12.21 Other Forest Service Sensitive, MIS, or BLM Sensitive Species

With the exception of the species listed above, construction and operations of the Gateway West Project are not expected to substantially add to the cumulative effect of past, present, and reasonably foreseeable future projects on Forest Service sensitive, MIS, or BLM special status species in ways that are different than those listed in Section 4.4.11, where cumulative effects are shown to be considerable for wildlife generally. In general, cumulative effects on sensitive species would not differ substantially by alternative, except for the specific species/instances discussed above (e.g., see discussion in Section 4.4.12.7).

4.4.13 Minerals

The continued operation of existing coal, trona, and phosphate mines in the CIAA for Gateway West and the possible expansion of existing or opening of new mines would maintain and add to part of the load demand for Gateway West and other transmission lines in the area. Operation and expansion of trona mines, together with their potential for creating subsidence issues for surface infrastructure like transmission lines, already has and could continue to constrain the proposed locations of future transmission lines. This in turn could limit the ability to reduce impact to surface resources by creating a routing restriction point along the east-west alignment. The open-pit coal mine along Segment 4 may continue to expand, providing additional siting challenges to future transmission lines and constraining their options for east-west routing. It is assumed that, like Gateway West, the proponents of additional transmission lines would

coordinate with the mine owners and operators and would avoid areas of high probability of future subsidence and route around active mining areas.

Oil and gas extraction also maintains and adds to part of the load demand for Gateway West and other transmission lines. The existence of the oil and gas wells and leased areas partially constrains the location of this and other proposed transmission lines, but this effect is minor because the project can span individual oil and gas extraction facilities.

The cumulative impact of the Gateway West Project when taken together with past, present, and reasonably foreseeable activities would not have a cumulative impact on oil and gas production.

4.4.14 Paleontological Resources

There are several concentrations of known fossil-bearing formations close to or at the surface in the CIAA for Gateway West. Based on the indices reported in Section 3.13, which discusses paleontological resources for the Project, the most sensitive of these areas are found along Alternative Routes 4B through 4E, near Fossil Butte National Monument, and near Alternatives 8A and 9A, which pass near to the boundary of Hagerman Fossil Beds National Monument. In the area of high fossil sensitivity, the additional ground-disturbing activities with potential to degrade fossil-bearing formations include the two proposed transmission lines, Zephyr and Overland Intertie; no other projects are proposed in this area. These projects have the potential to uncover fossils of potential scientific importance. However, the relatively small footprint of the several projects when compared with the large extent of the fossil-bearing formations indicates that the cumulative impact of Gateway West would be minor.

4.4.15 Geologic Hazards

Some of the Projects listed in Section 4.3 have the potential to create geologic hazards (e.g., mining activities creating subsistence, leaving unstable walls, and sinkholes). In addition, multiple crossings of earthquake zones and areas of high landslide potential by various proposed transmission lines could contribute to the possibility of catastrophic failure of several lines at once.

The Proposed Route and all Route Alternatives for Segments 4, 5, and 7 would cross areas of high earthquake risk (see Section 3.14 – Geologic Hazards, for details). Project structures could be damaged or collapse in the event of fault rupture beneath or adjacent to a tower due to inaccurate fault location during project design. Collapse of Project structures would potentially result in power outages, damage to nearby roads or structures, and injury or death to people. In addition to Gateway West, three existing 345-kV transmission lines and the proposed Overland Intertie and Zephyr transmission line projects would cross high earthquake risk areas in Segments 4, 5, and 7, as well as crossing areas of high landslide potential in the western end of Segment 4.

BLM would require proponents of all new transmission lines to conduct geotechnical exploration and avoid locating any project facilities on earthquake traces or in areas of active land movement. Prudent engineering design and compliance with national building standards would reduce the risk for each of the transmission lines to a minor level. Taken together, the risks to each line and to the existing 345-kV lines would raise

the chances that at least one of them might fail in an earthquake or landslide event. However, the cumulative risk would still be low provided that standard engineering practices for design and construction, and the proposed operations and maintenance activities for Gateway West were also practiced by other proponents.

4.4.16 Soils

Effects on soils from Gateway West that would contribute cumulative effects include soil loss due to wind erosion, soil mixing, soil compaction, and soil contamination. Soils in the CIAA have been affected by past activities such as pipelines, transmission lines, roads, oil and gas development, OHV use, and grazing. During construction of any of the current or reasonably foreseeable projects, vegetation would be removed exposing the soil to erosional forces, soil compaction could occur from vehicle traffic, and soil excavation would cause soil mixing, although BMPs (minimizing bare soil exposed to wind, water, and steep slopes, and stockpiling topsoil for use during reclamation) are or would be used to minimize the extent of effects. Soil contamination could occur from chemical or petroleum spills, although the risk is not great. Soil disturbance will remain during the life of the projects. These effects are short-term, occurring during the construction period, as disturbed areas are required to be reclaimed.

Loss of production due to sites occupied by facilities (transmission line structures energy generation facilities, commercial development, and the access roads to all of these) would remain during the life of the projects. Effects on soils could occur from unauthorized off-road vehicle use from construction on projects with inadequate access control.

Decommissioning and reclamation can recover some of the soil productivity, but is not 100 percent effective. Large construction projects, mining, roads, and pipelines are the projects that have the most of these types of effects on soils. The implementation of BMPs and reclamation on all projects would minimize soil impacts.

The cumulative impact of Gateway West, when taken together with the already substantial impact of past and present activities and proposed future action on some sensitive soils, could be substantial even with expected erosion control measures fully effective.

4.4.17 Water Resources

The impacts to surface waters from the Gateway West Project include potential for sedimentation and temperature increases due to road crossing construction and ROW clearing. These impacts would be minimized but not entirely eliminated by the conditions of the SWPPP and additional mitigation measures. It is reasonable to assume that other construction projects would also minimize but not eliminate their impact. However, when taken together with the substantial degradation to surface water resources from grazing, fires, and invasive species, the additional minor impacts of Gateway West and other proposed projects would contribute to a substantial cumulatively impact. Construction of Gateway West and any other project could affect groundwater if an accidental chemical spill occurred near an open excavation for a foundation on any of the planned projects that occur in the same area of shallow groundwater found in Segments 4, 5, and 7. The risk is relatively small because these

types of spills rarely occur and because the Proponents have committed to enforce the terms of their SPCC Plan.

Water usage would also occur for most facility construction projects in the CIAA, mostly for dust control and mixing concrete for other transmission line facilities, energy generation facilities, commercial developments, and roads. This water usage is important because of federally listed threatened and endangered fish and plants in these watershed and the cumulative effects are discussed in Section 4.4.8. Because Gateway West would not require any water rights, there would be no cumulative effects on water rights.

4.4.18 Land Use

The WWE Corridor PEIS (DOE and BLM 2008) designates corridors on federal lands within 11 western states (Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming) for oil, gas, and hydrogen pipelines, as well as electricity transmission and distribution facilities. However, it does not take into account the current federal land use plans (such as the Forest Service Forest Plans or the BLM RMPs) that still exclude those uses along many parts of the corridor. As a result, the siting of these types of facilities within the WWE corridor may still require amendments to existing federal land management plans (Forest Plans, RMPs, and MFPs) that could change existing land use allocations for the affected lands. In addition, the Gateway West Project is only partially located within this designated corridor. The Gateway West Project would cumulatively add to the changes made to these federal land use plans by the past, present, and reasonably foreseeable future projects. The Route Alternatives (such as Alternatives1E-C and 7I) that cross more public lands or would impact more sensitive resources on federal lands would have a greater contribution to this cumulative effect on public land use plans than the Proposed Route.

Long linear projects such as the Gateway West Project, as well as many of the other reasonably foreseeable projects within the CIAA (see Table 4.2-12), typically cross multiple land management types such as federal, state, and privately held lands. There are currently conflicting sentiments regarding the placement of these types of projects. Many feel that projects designed for the greater good of the public should be placed on public lands to the greatest extent practical, because they feel that this is consistent with the original purpose of these lands. However, others feel that public lands were designated to protect sensitive resources and should be excluded from developments whenever practical (indicating that these projects should be placed on private lands to the extent practical). Although public lands were established for a variety of reasons, and the various federal and state land management agencies manage their respective lands for different goals, this conflicting sentiment regarding the proper placement of projects meant for the public good will likely continue. The Gateway West Project would cumulatively add to this debate, which has resulted from the past, present, and reasonably foreseeable future projects.

The differential cumulative effects of Gateway West when taken together with other reasonably foreseeable future actions as well as past and present actions and management is most obvious in Segments 5, 7, 8, and 9. In those segments, the

Proposed Route crosses mostly private lands and various Route Alternatives cross larger proportions of public lands than the Proposed Route. If other transmission lines were to follow the same alignment selected for Gateway West, the cumulative effects of the location of the Gateway West Project on the lands it crosses would be substantial regardless of land ownership.

Section 4.1.3, above, details the federal land management plan amendments that would be needed to change land classification or VRM class if a particular route were selected. Table 4.4-3, below, summarizes those amendments by segment and alternative route.

Table 4.4-3. Summary of Plan Amendments by Route

Segment	Alternative	Land Management Plan	Change	Location
1	Proposed 1W(c), 1E; Alternative 1E-C	Casper RMP	Reclassify 630 acres of BLM-managed surface lands and 799 acres of federal mineral estate from VRM Class II to Class III.	1W(c): MP 26-27.2; 1E: 29-29.2; 1E-C: 4.1-4.3 (may also include parcel from MP 2.0-2.5)
	Proposed 1E	Medicine Bow Forest Plan	Reallocate 3,200 acres from MA 3.31 to MA 8.3.	1E: MP 29.9-32.6
	Alternative 1E-C		Reallocate 2,560 acres from MA 3.31 to MA 8.3.	1E-C: MP 5.0-6.1
	Alternative 1E-B	Rawlins RMP	Reclassify three isolated parcels of public land from VRM Class II to Class III, 177 acres total.	1E-B: MP 3.6-4.1, 4.4-4.6, 7.7-8.2, 10.8-11.3
4	Alternative 4B, 4D	Kemmerer RMP	Decision #6008: Designate a utility corridor 1 mile in width, generally centered on the transmission line if either Alternative route 4B or 4D is selected	MP 10.4-91.9
	Alternative 4B, 4C		Decision #6051: Reclassify the VRM class to Class III in a specified location.	VRM: 4B/4C: MP 52.3-54.5, 56.7-61, 62.3-63.4
	Alternative 4D, 4E		Decision #6051: Reclassify the VRM class to Class III in a specified location.	VRM: 4D/4E: MP 52.3-54.7, 62.9-64
	Proposed Route Segment 4	Caribou Forest Plan	The area within 500 feet of the transmission line and new roads would be classified with an ROS of roaded natural.	MP 173.1 – 174.7
	Proposed Route Segment 4	Caribou Forest Plan	Reclassify 335 acres of lands currently classified as Forest Vegetation Management, Elk and Deer Winter Range, and Semi-Primitive Recreation, to Prescription 8.1, Concentrated Development Areas with ROS of Roaded Natural.	4: MP 175.6-166.4

Table 4.4-3. Summary of Plan Amendments by Route (continued)

Segment	Alternative	Land Management Plan	Change	Location
7	Alternative 7H	Sawtooth Forest Plan	Reclassify 1,234 acres from Semi-Primitive Motorized to Roaded Natural.	
	Alternative 7I		Reclassify 8,465 acres from Semi-Primitive Motorized to Roaded Natural.	
	Alternatives 7I, 7J	Cassia RMP	Reclassify VRM II to VRM III in Goose Creek Travel Zone.	between MP 115.1 and 115.2
	Alternative 7E		Reclassify 39 acres in the Spring Canyon area from VRM Class II to Class III.	between MP 3.6 and 3.9
	Alternative 7H		Jim Sage area, reclassify 122 acres of VRM Class II to Class III.	MP 79.3-80.2
			Cottonwood Creek area, reclassify 806 acres of VRM Class III to Class IV.	MP 109.4-112.2
	Alternative 7I, 7J	Twin Falls MFP	Reclassify 70 acres in Rock Creek area from VRM Class II to Class III	MP 169.6-169.9
	Alternative 7I, 7J	Sawtooth Forest Plan	Reclassify 2,613 acres from Semi-Primitive motorized to roaded natural	
8	Proposed 8	Jarbidge RMP	Amend to specify that within the WWEC, no surface disturbance within 330 feet of the Oregon Trail and Kelton Road	Reclassification areas: MP 45.3-47.6; MP 49.8-50.7; NHT: Between 55.6 and 55.7
	Alternative 8A		Reclassify 5,200 acres of VRM Class I reclassified to class III along the Oregon Trail.	
	Proposed 8		Reclassify 2,800 acres of VRM Class I to Class III along the Oregon Trail.	MP 36.2-38; 43.3-45.6; MP 52-53
	Alternative 8A		MUA-7: change to no surface disturbance within 330 feet of the Oregon trail and historic sites.	
	Proposed 8, Alternative 8A		MUA-3; Reclassify areas for areas within T04S R09E Sect 35 and T05S R09E Sect 2 currently designated as restricted to avoidance to accommodate GW .	8: between 45.3-52.1, (check 54.4-55.2); 8a: between MP 32.8-34.1, 35.1-39.8, 43.3-45.6
	Alternative 8E	SRBOP RMP	Approximately 3,100 acres associated with the Oregon Trail and scenic values associated with the Snake River Canyon is designated as Class III to accommodate a major powerline R/W.	Alternative 8E: MP 10.2-11.5; 17.3-18.4

Table 4.4-3. Summary of Plan Amendments by Route (continued)

Segment	Alternative	Land Management Plan	Change	Location
8	Proposed 8	SRBOP RMP	Reduce the Snake River Canyon SRMA area by approximately 6,400 acres to accommodate a major powerline.	MP: 119.2-123.3
			Reclassify approximately 6,400 acres associated with the Oregon trail and Snake River canyon to VRM Class III.	
	Proposed 8	Bennett Hills MFP	Reclassify VRM II to VRM III 3,000 feet north of existing transmission line ROW, including the existing ROW.	MP 33.9-38, 36.7-37.3, between 39.4-39.5, 39.9-41, 40.4-42.8, 43.8-44.8
			Prohibit all land-disturbing developments within 330 feet of the Oregon Trail and manage archeological sites as required.	
9	Proposed 9, Alternatives 9B	Jarbidge RMP	Reclassify the area within the WWE Corridor to VRM III.	MP: 12.3-14.4
	Alternative 9D/9G		Reclassify 1,204 acres of VRM II to VRM III near CJ Strike Reservoir (**This is land included in both the Jarbidge and SRBOP RMPs; the Cove non-motorized area (designated under the SRBOP RMP) occurs within this location and the BLM has stated the plan could not be amended to permit the TL through Cove).	MP: 12.3-14.4
	Alternative 9D/9G	SRBOP RMP	Reduce the C.J. Strike SRMA area by approximately 3,100 acres to accommodate a major powerline.	MP: 9.4-15.8
			Reclassify 1,204 acres of VRM II to VRM III near C.J. Strike Reservoir (**This is land included in both the Jarbidge and SRBOP RMPs; the Cove non-motorized area [designated under the SRBOP RMP] occurs within this location and the BLM has stated the plan could not be amended to permit the TL through Cove).	MP: 12.3-14.4

Table 4.4-3. Summary of Plan Amendments by Route (continued)

Segment	Alternative	Land Management Plan	Change	Location
9	Alternatives 9D, 9F		Approximately 3,100 acres associated with the Oregon Trail and scenic values associated with the Snake River Canyon is designated as Class III to accommodate a major powerline R/W.	Alt 9D: MP 46.2-47.5, 53.2-56.9; Alternate 9F: MP 50.8-52.1 59.7-61.6
	Alternative 9G/9H		Reclassify VRM II areas within 250 of route centerline to VRM Class III (maintain 0.5 mile buffer from historic trails).	9G: MP 43.4-44.3, 44.4-49.5, 49.9-55.2; 9H: MP 47.9-48.7, 48.9-54, 54.4-59.7
	Proposed 9	Bruneau MFP	Reclassify VRM parcel adjacent to Castle Creek from VRM II to VRM III.	between MPs 130.8-131

In all cases of public land reclassification listed in Table 4.4-3, more activities in addition to the construction and operations of the Gateway West Project would be permissible without additional land management plan amendments. In several cases, where the parcel being reallocated is small there is no additional activity that could reasonably fit within the parcel in addition to the Gateway West Project and therefore the cumulative impact of the RMP amendment would be negligible.

Similarly, reclassification of only the ROW width on the Caribou-Targhee NF would not allow for additional utility construction in the area, but would allow for more motorized vehicle use. That use is already discussed under the impacts of the Gateway West Project itself and is taken into account as an indirect effect of the Project. No additional cumulative effects are expected for that amendment.

However, in some areas where reclassification is proposed, the amount of land being reclassified is large enough that at least some additional utility development or possibly wind development could occur on those reclassified lands. The assumption made under the various individual resource sections, above, is that up to two additional transmission lines could be constructed parallel to and about 1,500 feet away from the Gateway West Project along much of its length. In Segment 1 across the Medicine Bow-Routt NFs, the reclassification of lands would allow for additional transmission to be sited without an additional Forest Plan amendment.

Projects are sited to avoid impacting sensitive resources to the greatest extent practical. As more projects are constructed through areas located adjacent to sensitive resources, the possible paths that can be taken to avoid these resources become limited. For example, currently there are several projects that have been proposed for the same general route as used by the Gateway West Project (due to the limited number of ways to travel through this area without impacting sensitive resources), leading to potential congestion in these areas.

Because rangelands are the most common land use within the CIAA, the past, present, and reasonably foreseeable projects have and will continue to affect it to a considerable

degree. The other land use types found within the CIAA have experienced fewer impacts than rangeland, due either to their rarity in the CIAA or because developers avoid them. Much of the forested lands found within the CIAA are located on terrain that is least desirable for development (such as high elevations or mountain ridges); while wetlands and riparian areas are both rare in the CIAA, developers typically avoid these areas due to the added restrictions and regulations applicable to developments within them.

The change of cover type from forested to lower-growing vegetation on the transmission ROW removes acres in some cases from the timber production land base, resulting in loss of future revenue from loss of commercial timber acreage.

OHV use is increasing on Public Lands. OHV riders may have more opportunities available as a result of the Project. New access roads used for construction and maintenance provide additional avenues for riders to gain access to locations that were previously off limits or unavailable. Both increasing authorized and unauthorized OHV use is likely to result in increasing complaints from landowners and the Public. As reasonably foreseeable projects increase road density at the same time OHV use increases, there will be a need for additional enforcement and physical barriers to protect some areas.

Gateway West would contribute to cumulative effects along with reasonably foreseeable projects through energy development and use of designated utility corridors as specific areas are avoided and more development occurs but would not reduce the capacity of public or private lands to support existing land uses.

4.4.19 Agriculture

Within the Agriculture CIAA, past, present, and reasonably foreseeable activities that could combine with the Gateway West Project and result in cumulative effects to agriculture include projects with the potential to affect prime farmland, livestock grazing, crop production, CRP lands, and dairy farms. The effects from past and present activities that have shaped current patterns of agricultural use are generally accounted for in the existing conditions overview presented in Section 3.18.1.5. The analysis area used for the direct and indirect effects analysis is the same area as the Agriculture CIAA.

Prime farmland comprises about 19 percent of the CIAA. Construction and operation of the proposed Project would have temporary and permanent effects on prime farmland, as would other projects developed within the CIAA. Potential impacts from the proposed Project would be reduced with implementation of the proposed reclamation methods identified in Appendix C-2. Segments 5, 7, 8, 9, and 10 would affect prime farmland. In all cases, the amount of prime farmland affected represents a very small share of the prime farmland located with the CIAA. Overall impacts to prime farmland in the CIAA are also likely to represent a relatively small share of the prime farmland within the CIAA.

As indicated in Table 3.18-1, the majority of the CIAA, more than 80 percent, consists of rangeland and pasture. Construction and operations of the proposed Project would have temporary and permanent effects on rangeland and pasture in the CIAA, as would

the development of other reasonably foreseeable projects. Overall impacts to pasture and rangeland and livestock grazing are likely to represent a small share of the rangeland and pasture within the CIAA.

Irrigated and dryland cropland is concentrated in the Idaho portion of the CIAA, and ranges from about 3 percent of the CIAA for Segment 4 to 46 percent of the CIAA for Segment 10. Construction and operations of the proposed Project would have temporary and permanent effects on the area available for crop production in the CIAA. Other potential effects to cropland could include damage to or loss of crops, decreases in crop yield, restrictions to farm vehicle access or aerial spraying operations, and disruption of drainage and irrigation systems. As discussed in Section 3.18 – Agriculture, these types of potential effects are difficult to quantify and would likely be determined through negotiation with landowners.

Reasonably foreseeable actions including Gateway West would continue to affect farmland by removing acres from production either through development or commercial facilities, or through the construction of transmission line facilities and access roads.

The impact in Segment 1 would be small and would not vary substantially by alternative. There is no pivot irrigation in or near the Project area, very small amounts of other irrigated agriculture, and a predominance of extensive grazing. Similarly, Segment 2 would have very little impact on agriculture because there is no cropland and a predominance of extensive grazing. Segment 3 has no alternatives and no irrigated agriculture. Cumulative effects of the Project to grazing in this area, when taken into consideration together with ongoing resource extraction and proposed additional transmission lines, would be negligible because of the expanses of available private and public grazing lands. Core areas delineated for sage-grouse in the vicinity of Segments 2 and 3 may limit or preclude additional development other than transmission lines allowed in EO 2011-5 corridors.

Alternatives 4B, 4C, 4D, and 4E would all cross areas currently flood- or sub-irrigated by the Bear River within the boundaries of, or immediately adjacent to, the Cokeville Meadows NWR. If one of these alternatives were selected and other proposed transmission lines were to follow the Project alignment in this area, but with a minimum of 1,500 feet of separation, there could be up to three transmission lines crossing irrigated lands in addition to the two existing 345-kV transmission lines. If the proponents of the future transmission lines each worked to locate the towers along field boundaries, the impact would be lessened.

The Proposed Route for Segment 4 in Idaho crosses areas currently flood- or sub-irrigated by the Bear River near the town of Montpelier, agricultural lands near Thatcher, and extensive dryland and irrigated agriculture near the town of Downey to the east of Populus. While there are no alternatives to this portion of Segment 4, if the Project is approved, any Wyoming alternative selected would also require the construction of this portion. In that area there are two existing 345-kV lines. If other proposed transmission lines were to follow the Project alignment in this area, but with a minimum of 1,500 feet of separation, there could be up to three transmission lines crossing crop and pasturelands in addition to the two existing 345-kV transmission lines. If the proponents of the future transmission lines each worked to locate the towers along field boundaries,

the impact would be lessened. While the number of acres that would be occupied for the duration of the operation of the Project is not large, the construction and operation of additional transmission lines in the same area (Zephyr and Overland Intertie), when taken together with the ongoing loss of agricultural land to residential, commercial, and industrial development, could have a cumulatively substantial impact on farming along the Idaho portion of Segment 4.

The Proposed Route for Segment 5 would cross agricultural lands as it leaves Populus and crosses the Marsh Valley. After crossing the Deep Creek Mountains, it would cross both dryland and irrigated agricultural lands in the Arbon Valley.

SWIP North (presently on hold) could affect lands in Segments 9 and 10. When taken together with the ongoing loss of agricultural land to residential, commercial, and industrial development, the small additional area lost to various transmission lines could be important to farmers.

4.4.20 Transportation

Linear facilities invariably need to cross other linear features such as highways and railroads. These crossings can interfere with use of the roads and railroads during project construction, sometimes including needing to reroute or delay traffic. However, these impacts would be temporary in nature and only last as long as construction activities occurred within the area. If other reasonably foreseeable projects are construction at the same time and location as the Gateway West Project, or immediately before or after this project, then there could be a minor temporary cumulative effect on traffic volumes on local roads, which would be mitigated by traffic controls required by both county and federal regulations. Cumulative impacts on transportation do not differ substantially by alternative, because the measures in place to protect the public during both construction and operations would apply both for Gateway West and other projects.

4.4.21 Air Quality

As stated in Section 3.20 – Air Quality, existing air quality in each of the states is generally good to excellent. Current air emissions in each of the states due to present activities, including power plant operation, residential use of wood for heating, use of gasoline- and diesel-powered cars and trucks for most transportation of people and cargo, and occasional wildfires in brush or forested areas, do not have a substantial cumulative adverse effect on air quality as demonstrated by the USEPA classification of “attainment” for all of Wyoming and Nevada and for most of Idaho. Proposed projects in the CIAA that could contribute to deterioration in air quality include five proposed coal-fired power plants in Wyoming, which will contribute to reductions in air quality once they are active. As noted in Section 3.20, these plants may have a lifespan of 50 years or more. In addition, the two small proposed new natural gas power plants in Idaho would contribute to reductions in air quality in southern Idaho, where there are two areas of non-attainment for PM_{10}.

Because the Gateway West Project would have no measurable impact on air quality for any of the three states in the CIAA, it would not contribute to the cumulative impact of other projects on air quality in the CIAA. This is the case across all alternatives.

Total estimated CO_2 equivalent emissions (total emissions of all greenhouse gases converted to equivalent of CO_2) from construction of the Project is 232,268 tons over the construction period. Approximately 54 percent of these emissions or 125,425 tons CO_2 equivalent is allocated to Wyoming, and 46 percent of these emissions, or 106,843 tons CO_2 equivalent, is allocated to Idaho. On an annual basis, the project construction CO_2 equivalent emissions for Wyoming and Idaho are 24,593 and 20,950 tons CO_2 equivalent per year respectively.

Predicted CO_2 equivalent emissions for 2010 in each state are 66,330,000 tons CO_2 equivalent for Wyoming, and 43,560,000 tons CO_2 equivalent for Idaho (CCS 2007, 2008). The construction CO_2 equivalent emissions from the Project represent approximately 0.037 percent of the annual total for Wyoming, and 0.048 percent of the annual total for Idaho. GHG emissions from operations activities would be on the order of less than 3 tons CO_2 equivalent per year. Therefore, construction and operations of the Gateway West Project would not add substantially to the cumulative effects of past, present, and reasonably foreseeable future projects in terms of greenhouse gas emissions.

4.4.22 Electrical Environment

The analysis of electrical effects determined that the Gateway West Project would have no effects on health or safety; therefore, there would be no cumulative effects to other past, present, or reasonably foreseeable future projects. This is the case across all alternatives. Cumulative effects of noise due to corona effects are treated in Section 4.4.24.

4.4.23 Public Safety

Like Gateway West, nearly all current and reasonably foreseeable construction and long-term operations projects have requirements to monitor and treat noxious weeds, which includes the use of herbicides in many cases. Use of herbicides does not pose a risk to public health and safety when label instructions are followed, as is required. Construction of any project also has the risk of uncovering previously unknown environmental contamination. Methods to remediate past environmental contamination would be applied to any that are found and would minimize the risk that the contamination would spread or affect public help.

Electrical projects (transmission and distribution lines, substations, etc.) pose a risk of electrocution; however, requirements for fencing and posting these sites where people might come in contact with them effectively minimizes the risk.

In the past, transmission and distribution lines have caused wildland fires. New construction techniques and equipment as well as ongoing maintenance standards result in newer lines posing much less of a risk than older and smaller electrical lines. Employment of current safety standards to the construction and operations of Gateway West would reduce the risk to public health and safety to minor. Cumulative impacts on public safety do not differ substantially by alternative because the measures in place to protect the public during both construction and operations would apply both for Gateway West and other projects. Assuming other present and future projects would also be

required to adhere to current safety standards, the cumulative impacts of these projects would not be substantial.

4.4.24 Noise

Cumulative impacts due to construction noise could occur within 1,000 feet of the Project area or ancillary facilities as other projects or activities add to the noise from the time of Gateway West construction. In some cases, other construction projects could be using the same roads as Gateway West and additional construction-related traffic noise could occur, though it is very unlikely that these projects would be constructed concurrently. No substantial long-term changes in the volume of traffic and resulting potential transportation noise impacts are expected. Therefore, Gateway West would not contribute substantially to adverse cumulative noise impacts during construction.

Operations noise from the Gateway West Project is limited to corona noise. Corona noise is not audible outside the ROW. Cumulative impacts on noise do not differ substantially by alternative because the measures in place to reduce noise of both construction and operations would apply both for Gateway West and other projects. With the exception of limited areas where the Gateway West Project crosses other transmission lines, there would be no cumulative effect when taken together with other transmission lines because of the separation distances and lack of sensitive receptors.

5.0 CONSULTATION AND COLLABORATION

The Gateway West Project stretches from northeast Wyoming near Casper to southwest Idaho near Boise. Given the distance spanned, public involvement in this Project is critical to the success of the NEPA process. This chapter highlights the consultation and collaboration process for the proposed Project, including the general public as well as Tribal governments, and federal, state, and local agencies and organizations.

5.1 PUBLIC INVOLVEMENT AND SCOPING

5.1.1 Scoping Period

In addition to the brief summary of scoping found in Chapter 2 – Alternatives, this section describes the public scoping process, including the techniques used to notify the public about the opportunity to comment at this stage in the NEPA process. The scoping comment period began on May 16, 2008, and concluded on July 3, 2008.

After the formal public scoping period and during an internal review by the BLM and cooperating agencies, non-federal cooperating agencies requested an extended period of time to develop additional alternatives. The BLM responded by incorporating all comments received by September 4, 2009, into a revised scoping report.

Comments received after September 4, 2009, will be addressed as comments on the Draft EIS.

The formal record of the scoping period can be found in the *Gateway West Transmission Line Project Scoping Summary Report*, available online at http://www.wy.blm.gov/nepa/cfodocs/gateway_west/documents.php.

5.1.1.1 Scoping Announcements

The scoping period was announced using a variety of tools:

- **Federal Register** – The BLM published a Notice of Intent in the Federal Register on May 16, 2008[1]. The Notice of Intent stated the BLM's intent to prepare an EIS and to support the BLM's consideration of the Proponents' application for a ROW grant to use public lands for portions of the proposed Project. The Notice of Intent also announced the BLM's intent to conduct public scoping meetings and collect scoping comments on the proposal.
- **Notification mailer** – The BLM prepared and distributed a tri-fold mailer to interested parties in the proposed and alternative Project corridors and to others interested in the proposed Project. Approximately 4,500 mailers were sent to a combination of BLM, Forest Service, and Project Proponent mailing list contacts.
- **Press releases** – The BLM prepared and distributed two press releases regarding the original scoping period. The first was distributed on May 16, 2008, to media sources throughout the proposed Project corridor to announce the start of the scoping period and encourage public participation. The second release

[1] Volume 73, Number 96, Pages 28,425 – 28,426.

was distributed on June 16, 2008, encouraging further public comment on the Project.

- **Paid advertisements** – Paid legal notices were published in newspapers of record. Table 5.1-1 shows the newspapers that printed the legal notice on the dates indicated.
- **Community calendar notifications** – In addition to paid legal notices, meeting notifications were also published in community calendar listings in local newspapers. Table 5.1-2 notes which papers published community calendar notices.
- **BLM Gateway West Project Web site** – The BLM established a Web site regarding the proposed Project at the beginning of the scoping period. The Web site was initially used to notify the public of the scoping meetings, provide general project overview information, as well as information to provide comments to the BLM regarding the proposed Project. The Web site currently serves as the electronic NEPA-related Project information source for all aspects and stages of the Project's NEPA process.

Table 5.1-1. Legal Notices in Newspapers of Record

Publication Date	Publication	Publication Location
May 18, 2008	*The Times News*	Twin Falls, Idaho
May 18, 2008	*The Casper Star Tribune*	Casper, Wyoming
May 18, 2008	*The Idaho State Journal*	Pocatello, Idaho
May 19, 2008	*The Idaho Statesman*	Boise, Idaho
May 20, 2008	*The Rocket-Miner*	Rock Springs, Wyoming
May 21, 2008	*The Rawlins Daily Times*	Rawlins, Wyoming
May 21, 2008	*The News Examiner*	Montpelier, Idaho
May 21, 2008	*The Owyhee Avalanche*	Murphy, Idaho
June 11, 2008	*The Little Chicago Review*	Kemmerer, Wyoming

Table 5.1-2. Community Calendar Notices in Newspapers

Publication	Publication Location
The Times News	Twin Falls, Idaho
The Casper Star Tribune	Casper, Wyoming
The Casper Journal	Casper, Wyoming
The Idaho State Journal	Pocatello, Idaho
The Idaho Statesman	Boise, Idaho
The Owyhee Avalanche	Murphy, Idaho
The Rocket-Miner	Rock Springs, Wyoming
The Rawlins Daily Times	Rawlins, Wyoming
The News Examiner	Montpelier, Idaho

5.1.1.2 Scoping Meetings

The BLM hosted nine public meetings in June 2008 to provide planning and NEPA information to the public and agencies to allow them to identify issues and concerns to the BLM. Public scoping and the scoping meetings were advertised as noted in the section above. As summarized in Table 5.1-3, a total of 140 members of the public attended the various public meetings.

Table 5.1-3. Public Scoping Meeting Dates, Locations, and Attendance

Meeting Date	Meeting Location	Attendance
June 3, 2008	Twin Falls, Idaho	20
June 3, 2008	Murphy, Idaho	13
June 4, 2008	Pocatello, Idaho	11
June 4, 2008	Boise, Idaho	22
June 5, 2008	Montpelier, Idaho	7
June 9, 2008	Casper, Wyoming	22
June 10, 2008	Rawlins, Wyoming	12
June 11, 2008	Rock Springs, Wyoming	16
June 12, 2008	Kemmerer, Wyoming	17
Total		**140**

The BLM also hosted a focused scoping meeting on July 10, 2008, in Kemmerer, Wyoming, with an integrated group of federal, state, and local agencies and elected officials to discuss specific issues regarding routing Gateway West Project corridors in southwest Wyoming and southeast Idaho, as well as a few alternative variations that potentially extend into Utah. The applicants also participated.

Federal agencies represented at that meeting included the BLM, the Forest Service, the USFWS, and the NPS. State agencies included the Wyoming Governor's Office, IDFG, the WGFD, Utah Division of Wildlife Resources, and the WDEQ—Industrial Siting Administration. Local governments included representatives from Lincoln and Sweetwater counties in Wyoming.

5.1.1.3 Scoping Period Comments

There were 62 individual letters submitted to the BLM during the scoping period, and included in those letters were 89 individual comments. In addition, during the extended scoping period, the BLM received 1,533 individual letters, and included in those letters were 1,613 individual comments. These letters and comments were reviewed by a team of analysts and logged into a database that will be used to track and sort comments throughout the Project's NEPA process.

Scoping period comments are addressed in the analysis of the Draft EIS.

5.1.2 Stakeholder Outreach

The BLM conducted stakeholder outreach with groups and organizations by request. This outreach was conducted through meetings and hosted by one of the following groups:

- **BLM** – The BLM hosted four stakeholder meetings with landowners, local jurisdictions, and special interest groups to inform them about the Project and the NEPA process.
- **Project Proponents** – The BLM attended 26 Project Proponent-hosted meetings with landowners along the study corridors. The Proponents requested the BLM attend these meetings to inform landowners about the NEPA process, and to answer any related questions.

- **Jurisdictions and Communities** – The BLM also attended several jurisdictional/community hosted meetings along the study corridors, as requested, to answer questions regarding the NEPA process.

Table 5.1-4 highlights which groups the BLM met with and when.

Table 5.1-4. Summary of Stakeholder Outreach

BLM-Hosted Meetings	
Oregon-California Trail Association Meeting	June 25, 2008
Kemmerer-Cokeville Stakeholders Meeting	July 10, 2008
Rock Springs Grazing Association Landowner Meeting	September 26, 2008
Burley Collaborative Work Session	October 23, 2009
Project Proponent-Hosted Meetings	
Fort Steele Landowner Meeting	January 23, 2009
Glenrock Landowner Meeting	March 16, 2009
Twin Falls Community Conversation	April 14, 2009
Burley Community Conversation	April 14, 2009
Gooding Community Conversation	April 15, 2009
Douglas Landowner Meeting	April 20, 2009
Cassia County Landowner Meeting	June 1, 2009
Melba Town Hall Meeting	June 3, 2009
Ada County Town Hall Meeting	June 11, 2009
Twin Falls County Town Hall Meeting	July 9, 2009
Elmore County Town Hall Meeting	July 16, 2009
Power County Town Hall Meeting (Arbon Valley)	July 20, 2009
Power County Town Hall Meeting (American Falls)	July 21, 2009
Jerome County Town Hall Meeting	July 21, 2009
Gooding County Town Hall Meeting	July 22, 2009
Ada County Task Force	August 4, 2009
Ada County Congressional Meeting	August 19, 2009
Kuna Task Force Working Session	August 28, 2009
Kemmerer Community Conversation	November 5, 2009
Twin Falls Community Conversation	November 9, 2009
Mountain Home Community Conversation	November 10, 2009
Kuna Community Conversation	November 12, 2009
Malta Community Conversation	December 14, 2009
Almo Community Conversation	December 15, 2009
Fort Hall Reservation Landowner Meeting	December 17, 2009
Fort Hall Tribal Staff Briefing	December 17, 2009

5.1.2.1 Oregon-California NHTs Association Meeting

The BLM, along with representatives from the Wyoming SHPO and OCTA met on June 25, 2008, near Kemmerer, Wyoming, for a field trip of National Historic Trails.

5.1.2.2 Kemmerer-Cokeville Stakeholders Meeting

The BLM met on July 10, 2008, with stakeholders in the Kemmerer-Cokeville area to discuss specific issues regarding routing in southwest Wyoming and southeast Idaho, as well as a few alternative variations extending into Utah.

5.1.2.3 Rock Springs Grazing Association Landowner Meeting

The BLM also met with a group of landowners near the Rock Springs, Wyoming area on September 26, 2008. The purpose of the meeting was to hear and discuss landowner concerns regarding the Project, with particular focus on cultural and historic resource surveys and potential mitigation measures.

5.1.2.4 Burley Collaborative Work Session

On October 23, 2009, the BLM met with cooperating agency representatives to ensure and verify that the BLM had the correct proposed and alternate routes to consider for full analysis in the Draft EIS and to review opportunities and constraints for routing Segment 7.

5.1.3 Routing Announcements

On January 4, 2009, the BLM announced the complete list of routes to be considered in the Draft EIS. BLM announcements were made as follows:

- Press release
- Print newsletter mailed to 8,356 individuals, organizations, and businesses
- Electronic newsletter sent to 1,909 individuals, organizations, and businesses
- Web site announcement and interactive route map

The Project Proponents also distributed a press release and provided updates on the Proponents' Project Web site.

5.2 CONSULTATION

Formal consultations required by law and agency policy were conducted between the BLM and other government entities, including federal and state agencies. The following section highlights these consultations and Table 5.2-1 highlights the list of consultation meetings.

Table 5.2-1. Summary of Consultation Meetings

Government-to-Government	Date
Shoshone-Bannock Tribes	April 10, 2008 March 18, 2009
Northern Arapaho Business Council	April 9, 2008 April 26, 2008 May 12, 2008 May 19, 2008 May 21, 2008
Ute Tribal Council	April 9, 2008 May 15, 2008 June 16, 2009 December 8, 2009
Northwest Shoshone Band	April 9, 2008 May 15, 2008

Table 5.2-1. Summary of Consultation Meetings (continued)

Government-to-Government	Date
Eastern Shoshone Business Council	April 9, 2008 May 12, 2008 May 13, 2008 May 19, 2008 December 18, 2009
Northern Cheyenne Tribal Council	April 9, 2008 May 15, 2008
Shoshone-Paiute Tribes	April 10, 2008 Monthly consultations thereafter under the Wings and Roots Program
Federal Agencies	**Date**
U.S. Fish and Wildlife Service	March 13, 2008 April 28, 2008 (level 1 meeting) May 14, 2008 (level 1 meeting)
State Agencies	**Date**
Wyoming State Historic Preservation Office	April 14, 2008
Idaho Fish and Game Department	August 29, 2008
Wyoming Department of Environmental Quality	October 6, 2008

5.2.1 Government-to-Government

In compliance with Section 106 of the NHPA (as amended) and the ACHP's revised regulations (36 CFR § 800), the BLM initiated government-to-government consultation with seven Native American Tribes in the Project area in April 2008 (Table 5.2-2). The consultation was conducted to inform the various Tribes of the proposed undertaking and solicit their concerns and/or comments regarding the possible presence of TCPs or places of cultural, traditional, or religious importance to the Tribes in the proposed Project area.

The BLM contacted the following Tribes by letter on April 9, 2008:

- Northern Arapaho Tribe, Fort Washakie, Wyoming
- Northwest Shoshone Band, Brigham City, Utah
- Eastern Shoshone Tribe, Fort Washakie, Wyoming
- Ute Tribe, Fort Duchesne, Utah
- Northern Cheyenne Tribe, Lame Deer, Montana

In lieu of an initial letter and following established consultation routines with these Tribes, Walt George (BLM Project Manager) conducted face-to-face meetings with the Shoshone-Bannock Tribes on April 10 and the Shoshone-Paiute Tribes on April 23, 2008. Periodic updates on routing changes have been provided to all of the Tribes. Following the established consultation routine under the Wings and Roots Program with the Shoshone-Paiute Tribes, the BLM Project Manager has conducted monthly Project updates by conference call with them.

As noted in Table 5.2-2, follow-up telephone calls have been made to many of the Tribes contacted. The Northern Arapaho Business Council and the Northern Cheyenne Tribal Council have expressed interest in the Project, but have not yet expressed

specific concerns. The Ute Tribal Council expressed their interest in participating in the development of a PA and receiving a copy of the literature review. The Shoshone-Bannock Tribes and Shoshone-Paiute Tribes have expressed concern over portions of the alignment that are not in the proposed WWE corridor. They indicated they would like this Project to follow it or other existing corridors and have posed several questions regarding the Project. The Eastern Shoshone Business Council expressed concern over remains found near the Wise Gravel Pit.

Table 5.2-2 lists the Native American Tribes that have been contacted and summarizes the concerns they have raised to date and the status of consultation.

Table 5.2-2. Status of Native American Consultation

Name of Tribe	Date of Initial Contact	Follow up Letters	Follow-up phone calls		Summary of Issues Raised during Consultation
Shoshone-Bannock Tribes	April 10, 2008	August 11, 2009	Date	To	Have continued to send ROW routing updates. The Tribes have expressed concern over the alignment, which is not in the proposed WWEC. They indicated they would like this Project to follow it or other existing corridors. They also expressed concern about treaty rights on unappropriated public lands affected by the project.
Northern Arapaho Business Council	April 9, 2008	June 11, 2009 August 11, 2009	Date	To	Have continued to send ROW routing updates. The Tribe requested a meeting.
			May 12, 2008	No response	
Ute Tribal Council	April 9, 2008	June 11, 2009 August 11, 2009	Date	To	Have continued to send ROW routing updates. The Tribe has expressed interest in the Project and informally requested ethnographic studies and a copy of the literature review. The Tribe has noted a sacred landscape between Pilot Butte, White Mountain Petroglyphs, Cedar Canyon Petroglyphs and Boars Tusk for the Teton Wind Project.
			May 15, 2008	No response	
			December 12, 2009	Betsy Chapoose	
			December 15, 2009	Betsy Chapoose	
Northwest Shoshone Band	April 9, 2008	June 11, 2008 August 11, 2008	Date	To	Have continued to send ROW routing updates, but have not received comments/concerns.

Table 5.2-2. Status of Native American Consultation (continued)

Name of Tribe	Date of Initial Contact	Follow up Letters	Follow-up phone calls		Summary of Issues Raised during Consultation
Eastern Shoshone Business Council	April 9, 2008	June 11, 2009 August 11, 2009	Date	To	Have continued to send ROW routing updates. The Tribe has expressed concern about the remains of "Deer Butte Man" and the related ethnographic studies.
			May 12, 2008	Ivan Posey	
			December 18, 2009	Judge Richard Ferris	
Northern Cheyenne Tribal Council	April 9, 2008	June 11, 2009 August 11, 2009	Date	To	Have continued to send ROW routing updates. The Tribe has expressed interest in the Project.
			May 15, 2008	Eugene Littlecoyote	
			June 19, 2009	Gerry Small	
Shoshone-Paiute Tribes	April 10, 2008	August 11, 2009	Date	To	Have continued to send ROW routing updates. The Tribes have expressed concern over the alignment which is not in the proposed WWE Corridor. They indicated they would like this Project to follow it or other existing corridors.
Southern Cheyenne	May 29, 2010				no response
Southern Arapaho	May 29, 2010				no response
Oglala Sioux	July 30, 2010		Date	To	Have continued to send ROW routing updates. The Tribe has expressed interest in the Project.
			December 9, 2010	Joyce Whiting	
			December 9, 2010	Joyce Whiting	
			January 3, 2011	Joyce Whiting	

5.2.1.1 Ethnographic Study Process/TCP

To date, no specific TCPs near the proposed Project route have been identified by any of the Tribes during the consultation process. Three of the Tribes—the Shoshone-Paiute Tribes, the Ute Tribal Council, and the Eastern Shoshone Tribal Council—have requested that ethnographic studies be conducted. In these studies, ethnographers will research historic sources and interview Tribal members to gain a better understanding of the cultural landscape near the Project route. They are intended to identify important locations and traditional uses of the area by the Tribes. Studies for the Shoshone-Paiute Tribes were started in the spring of 2009 and will be completed in time to allow for the findings to be incorporated in the Final EIS.

In addition, if the Class III cultural resource inventory identifies any sensitive site types, site-specific consultation may be conducted so that Tribal representatives may identify important locations.

5.2.2 Federal Agencies

5.2.2.1 U.S. Fish and Wildlife Service

Consultation with the USFWS under Section 7 of the Endangered Species Act began in March 2008 and has continued throughout the scoping and EIS analysis process. The USFWS is a cooperating agency in the preparation of the EIS.

The first meeting with USFWS in March 2008 was a discussion to begin the consultation process and included USFWS representatives from Wyoming and Idaho, the BLM Project Manager, BLM biologists, as well as members of the BLM's third-party contractor. The meeting provided USFWS staff a brief description of the Project, biology work done to date, a review of roles and responsibilities among the BLM and USFWS as well as a detailed discussion of the consultation process including how to initiate consultation, preliminary species to include, and other considerations.

Level I meetings were held in April, May, and November 2008 with USFWS staff in Idaho and Wyoming, respectively, to provide a general overview of the Project, discuss the Project's BA process and analysis, and to discuss any additional concerns from the USFWS.

5.2.3 State Agencies

5.2.3.1 State Historic Preservation Offices (Wyoming and Idaho)

Following consultation requirements of the National Historic Preservation Act, the BLM sent Project notification letters to the Idaho and Wyoming SHPOs in March 2008. The BLM met with the Wyoming SHPO on April 14 and discussed phasing of cultural and historic surveys and sampling. The BLM continues to coordinate with state SHPOs on the review of cultural reports and development of a Programmatic Agreement covering the project.

5.2.3.2 Wildlife Departments (Wyoming and Idaho)

Following consultation requirements of the Fish and Wildlife Coordination Act, the BLM has involved and notified the WGFD and the IDFG of the Project through mailing and focused stakeholder meetings.

In addition, the BLM met separately with the IDFG on January 30-31, 2008, and on August 29, 2008, to introduce the Project and present a status report on the Project, respectively. The discussions primarily focused on wildlife-related issues, in particular the state of Idaho's position on sage grouse and other species management.

5.2.3.3 Departments of Environmental Quality (Wyoming and Idaho)

The BLM met with the WDEQ on October 6, 2008, to discuss an emissions inventory for the state of Wyoming.

5.3 PREPARERS AND CONTRIBUTORS

This section contains the list of preparers and contributors for the Draft EIS.

5.3.1 Bureau of Land Management

Last Name	First Name	Responsibility	Affiliation	Education	Years of Experience
George	Walter	Project Manager	Wyoming State Office	M.S., Zoology	32
Bruce	Bonni	Project Cultural Resources Lead	Wyoming, Rawlins Field Office	B.A., Anthropology	17
Gorny	Bev	Project Public Affairs Lead	Wyoming State Office	B.S., Broadcast Journalism	33
Draheim	David	Outdoor Recreation Planner	Boise District Office	B.S., Wildlife Management	15
McCabe	Brian	Archaeologist	Boise District Office	M.A., Anthropology	15
McCoy	Matt	NEPA Specialist	Boise District Office	B.S., Fisheries Science M.S., Wildlife Management	26
Sampson	Dianna	GIS Specialist	Boise District Office	B.S., General Sciences	16
Shaw	Dean	Archaeologist	Boise District Office	B.A., Anthropology	20
Sullivan	John	Morley Nelson Snake River Birds of Prey National Conservation Area Manager	Boise District Office	M.S., Range Science	33
Werven	Cecil	Realty Specialist	Boise District Office	B.B.A., Marketing	9
Bission	Jeremy	Wildlife	Burley Field Office	M.S., Zoology	15
Henrikson	Lael	Cultural Resources	Burley Field Office	Ph.D. Anthropology	32
Steele	Jeff	District Office Project Lead	Burley Field Office	B.S., Bio-Agricultural Science	38
Thompson	Dennis	Recreation	Burley Field Office		21
Gray	Shane	Wildlife	Casper Field Office	B.S., Biology/Natural Resources	6
Sorenson	Randy	Field Office Lead / Realty	Casper Field Office	A.S. Business	34
Parmenter	Jan	Lands/Realty Specialist	Idaho Falls District	B.S., Natural Resource Economics	19
Carrigan	Tim	Renewable Energy Coordination Office –Wildlife Biologist	Idaho State Office	B.S., Wildlife Biology B.S., Range Management	30
Cooper	Natalie	Realty Specialist – Renewable Energy Coordination Office Team Lead	Idaho State Office	B.S., Forestry and Natural Resources	13
Fehlau	Robin	Recreation,	Idaho State	M.S., Outdoor Recreation	19

Last Name	First Name	Responsibility	Affiliation	Education	Years of Experience
		Wilderness, Wild and Scenic Rivers	Office	B.S., Physical Geography	
Gaston	Jenna	Cultural Resources	Idaho State Office	M.S., Anthropology/ Archaeology	30
Jakovac	Gloria	Realty Specialist – Renewable Energy Coordination Office Natural Resource Specialist	Idaho State Office	B.S., Range Mgt.	30
Lange	Rebecca	Geology/Minerals	Idaho State Office	B.S., Geology Graduate Non-Degree Natural Resources Management	26
Makela	Paul	Wildlife Biologist	Idaho State Office	M.S., Wildlife Biology	23
Mayes	Eric	NEPA Specialist	Idaho State Office	B.S., Geography	8
Ralston	Brent	Planning	Idaho State Office	B.S., Freshwater and Marine Fisheries	19
Ross	Jeff	Cultural Resources	Jarbidge Field Office	B.A., Anthropology	31
Yingst	William	Recreation	Jarbidge Field Office		44
Allred	Spencer	Rangeland Management	Kemmerer Field Office	M.S., Rangeland Management	4
Bezanson	Carl	Rangeland Management/ Invasive Non-native Weeds	Kemmerer Field Office	B.S., Botany/Range/Wildlife	33
Flanerty	Leanna	Cultural Resources	Kemmerer Field Office	M.A., Anthropology (in progress)	10
Harrell	Lynn	Cultural Resources	Kemmerer Field Office	M.A., Anthropology	36
Lamborn	Kelly	Field Office Lead / Realty	Kemmerer Field Office	Three years post high school – Business	24
Mierzejewski	Wally	Recreation Wilderness	Kemmerer Field Office	B.S., Environmental Science	30
Mitchell	Ron	Rangeland Management	Kemmerer Field Office	M.S., Range Science	30
Norelius	Erik	Wildlife	Kemmerer Field Office	B.S., Wildlife	12
Oles	Dan	GIS Specialist/Forestry	Kemmerer Field Office	B.S., Natural Resource Management	22
Aguirre	Candida	Lands/Realty	Pocatello Field Office	BLM Lands Academy	18
Chipman	Sara Jayne	Vegetation/Special Status Plants	Pocatello Field Office	B.S., Botany	9
Jorgensen	Michael	Vegetation/Range Resources	Pocatello Field Office	B.S., Range	20
Kumm	James	Wildlife Resources	Pocatello Field Office	M.A., Wildlife Biology	26
Lapp	Amy	Cultural Resources	Pocatello Field Office	M.A., Anthropology	6
Limbach	Eric	Vegetation/Range	Pocatello	Ph.D. Range Science	20

Last Name	First Name	Responsibility	Affiliation	Education	Years of Experience
		Resources	Field Office		
Newman	Blaine	Visual Resources	Pocatello Field Office	B.S., Wildland Recreation	20
Patterson	Charles	Recreation/Visual Resources	Pocatello Field Office	M.A., Community and Environmental Planning	17
Smith	Terry Lee	Land Use Plan Amendments	Pocatello Field Office	M.A., Range Science	28
Swan	Channing	Forestry	Pocatello Field Office	B.S., Forestry	6
Blomquist	Frank	Wildlife	Rawlins Field Office	B.S., Wildlife, Botany B.A., Natural Resources	29
Estvold	Bruce	Construction	Rawlins Field Office	B.S., Civil Engineering	20
Foley	Susan	Soil and Weeds	Rawlins Field Office	B.S., Rangeland Management	25
McCarthy	Lynn	GIS	Rawlins Field Office	M.A., Administration	18
Nino	Heather	Realty Specialists	Rawlins Field Office	Masters of Public Administration	5.5
Simons	Matt	Office Lead; Realty Specialist	Rawlins Field Office	B.S., Production and Operations Management	3
Toole Ben	Ben	Wildlife	Rawlins Field Office	M.S., Wildlife	
D'Ewart	Jay	Wild Horses	Rock Springs Field Office		
Doncaster	Dennis	Hydrology	Rock Springs Field Office		
Foster	Kimberlee	Planning and Environmental Coordination	Rock Springs Field Office		
Foster	Jo	Outdoor Recreation	Rock Springs Field Office		
Glennon	Jim	Botany	Rock Springs Field Office		
Hamilton	Patricia	Realty	Rock Springs Field Office		
Henderson	John	Fisheries	Rock Springs Field Office		
Keith	Lorraine	Wildlife	Rock Springs Field Office		
Kile	Doug	GIS	Rock Springs Field Office		
Mastny	Cherette	Rangelands	Rock Springs Field Office		
Miller	Kathy	Cultural Resources	Rock Springs Field Office		
Nara-Kloepper	Joanna	Mining Engineer/ Assistant Field Manager, Minerals and Lands	Rock Springs Field Office		
Cresswell	Lisa	Cultural Resources	Shoshone Field Office	B.A., Anthropology	20
Freiberg	David	Recreation	Shoshone	M.S., Environmental	10

Last Name	First Name	Responsibility	Affiliation	Education	Years of Experience
			Field Office	Studies	
Barker	Scott	Field Office Project Lead	Twin Falls District Office	B.S., Forest Management	36
Farrell	Kathy	Planning and Environmental Coordinator	Twin Falls District Office		25
Shaw	Elena	Range Management	Twin Falls District Office	B.S., Bio-Agricultural Science	29
Coffin	Patrick	Fisheries	Wells Field Office	B.S., Biology	50
Ferreira	Sara	Office Lead	Wells Field Office	A.A.	10
Hawthorne	Tamara	Recreation, Wilderness, Visual Resource Management	Wells Field Office	B.S., Environmental Planning	15
Jensen	Jill	Cultural Resources	Wells Field Office	M.A.	15
Willard	Janice	Rangelands	Wells Field Office	B.S., Range	7
Capron	Ranel	Deputy Preservation Officer	Wyoming State Office	M.S., Archaeological Resource Management	32
Goertel	Mark	Range Review	Wyoming State Office	M.S., Animal and Range Sciences	11
Mistarka	Vicky	Minerals	Wyoming State Office	M.S., Geology	32
Saville	Dennis	Wildlife Resources	Wyoming State Office	B.S., Wildlife Management	27
Schurman	Diane	Realty	Wyoming State Office	H.S., College: Business, Law and Geology	35

5.3.2 USDA Forest Service

Last Name	First Name	Responsibility	Affiliation	Education	Years of Experience
Davis	Bill	Project Manager	Caribou-Targhee National Forest		
Porter	Brent	BS	Caribou-Targhee National Forest	B.S., Forest Management and Recreation	39
Abusaidi	Ali	Archeologist	Caribou-Targhee National Forest	M.A., Anthropology	32
Lehman	Rose	Botanist	Caribou-Targhee National Forest	B.A., Botany	17
Laprevote	Jim	Hydrologist	Caribou-Targhee National Forest	M.S., Hydrology B.S., Geology	15
Andersen	Bart	Landscape Architect	Caribou-Targhee	B.S., Landscape Architecture and	32

Last Name	First Name	Responsibility	Affiliation	Education	Years of Experience
			National Forest	Environmental Planning	
Lott	John	Soil Scientist	Caribou-Targhee National Forest	M.S., Agronomy	33
Beck	Wayan	Forester/ Silviculturist	Caribou-Targhee National Forest	B.S., Forestry	22
Mousel	Martha	GIS Specialist	Caribou-Targhee National Forest	B.S., Forestry	13 yrs Forestry 18 yrs GIS
Hays	Misty	Deputy District Ranger	Medicine Bow National Forest	B.S., Range Science	22
Ritchie	Ian	Cultural Resources	Medicine Bow National Forest	M.A., Architectural Heritage Management	25
Roche	Kathy	Botany	Medicine Bow National Forest	B.S., Forest Management, Ecology, Chemistry	30
Anderson	Shawn	Fisheries	Medicine Bow National Forest	B.S., Ecology	8
Tupala	Jeff	Landscape Architect	Medicine Bow National Forest	M.L.A., Landscape Architecture B.S., Forestry	23
Tepler	Randy	Soils	Medicine Bow National Forest	B.S., Groundwater Management	15
Byer	Tim	Wildlife	Medicine Bow National Forest	B.S., Wildlife Management	25
Nannenga	Scott	District Ranger/ Reviewer	Sawtooth National Forest	B.S., Forestry	32
Chatel	John	Aquatics	Sawtooth National Forest	M.S., Environmental Studies	18

5.3.3 Third-Party Contractor Team

The following is the list of third-party contractor staff responsible for preparation of the Draft EIS.

Last Name	First Name	Responsibility	Affiliation	Education	Years of Experience
Adams	Diane	Consultation and Collaboration	EnviroIssues	M.S., Land Resources	17
Swanson	Ara	Consultation and Collaboration	EnviroIssues	B.A., Public Communication	6
Johnson	Gary	Electromagnetic Fields	Exponent	Ph.D., Electrical Engineering	28
Beazley	Patricia	Noise, Public Health and Safety	Tetra Tech	M.E.Sc, Chemical/Bio-chemical Engineering	4
Booth	Richard B.	Air Quality	Tetra Tech	B.A., Natural Science	34

Last Name	First Name	Responsibility	Affiliation	Education	Years of Experience
Bury	Andy	Geographic Information Systems Lead	Tetra Tech	B.A., Geological Sciences	24
Carver	Jesse	Geographic Information Systems	Tetra Tech	B.A., Geography	4
Crookston	John	Biology – Special Status Wildlife Species	Tetra Tech	M.S., Biology/Ecology	6
Dadswell	Matt	Socioeconomics, Land Use, Recreation	Tetra Tech	M.A., Economic Geography	16
Eckert	Penny Jennings	Original NEPA Lead	Tetra Tech	Ph.D., Sociology of Natural Resources	29
Evans	Robert	Visual Resources	Tetra Tech/URS	M.S., Landscape Architecture	3
Flood	Cameo	Land Use, Agriculture	Tetra Tech	B.S., Forest Management	23
Iozzi	Joe	NEPA Lead	Tetra Tech	B.S., Forest Management	29
Hawkins	Jennifer	Water	Tetra Tech	B.S., Environmental Science	15
Kalapinski	Erik	Noise	Tetra Tech	B.S., Civil and Environmental Engineering	13
Magrane	April	Water	Tetra Tech	B.A., Biology	14
Omdal	Morgan	Geographic Information Systems Coordinator	Tetra Tech	B.S., Zoology	6
Piasecke	Jessica	Wildlife	Tetra Tech	M.S., Wildlife Science	11
Spillers	Paul	Geologic Hazards, Geology and Minerals, Soils, Water	Tetra Tech	B.S., Geology	22
Vering	Walt	Biological Resources	Tetra Tech	M.S., Natural Resources	15
Weaver, P.E.	Walter	Transportation	Tetra Tech	B.S., Civil Engineering	47
Woeck	Brita	Vegetation	Tetra Tech	M.S., Wildlife Ecology	10
Chamberlain	Rich	Geographic Information Systems	URS	M.S., Geography	13
Dawson	Jeffrey	Vegetation, Wetlands	URS	M.S., Botany	32
Henderson	Kimberly	Cultural Resources	URS	M.A., Anthropology	10
Killam	William	Cultural / Historical Resources	URS	B.A., Sociology/ Anthropology/ Psychology	34
Mutaw	Robert	Cultural, Historic Resources	URS	Ph.D., Anthropology	31

Last Name	First Name	Responsibility	Affiliation	Education	Years of Experience
Stewart	Joe	Paleontology	URS	Ph.D., Biology	24
Stuhan	Richard	Visual Effects	URS	B.S., Applied Geography	11
Tucker	Gordon	Cultural Resources	URS	Ph.D., Anthropology	36

5.4 DRAFT EIS DISTRIBUTION

The Draft EIS is available in electronic PDF format on the BLM's Project Web site at http://www.wy.blm.gov/nepa/cfodocs/gateway_west/. In addition, the document is available on CD and a limited number of printed versions.

Some individuals, governments and organizations will receive a printed copy mailed directly to them. BLM sent a reply-requested postcard providing notice of the Draft EIS release and to offer a mailed CD copy of the document to the full, project-wide mailing list which includes approximately 9,000 individuals and organizations.

The following Draft EIS distribution lists highlights tribal and public entities who will receive a printed or CD copy of the document. A complete distribution list is available in the administrative record.

5.4.1 Native American Tribal Governments

- Cheyenne River Sioux Tribe
- Cheyenne/Arapahoe Tribes of Oklahoma
- Comanche Tribe of Oklahoma
- Confederated Salish and Kootenai Tribes
- Crow Creek Sioux Tribe
- Crow Tribe
- Eastern Shoshone Tribe
- Flandreau Santee Sioux Tribe
- Lower Brule Sioux Tribe
- Nez Perce Tribe
- Northern Arapaho Tribe
- Northern Cheyenne Tribe
- Northwest Shoshone Band
- Oglala Lakota Nation
- Oglala Sioux Tribe
- Rosebud Sioux Tribe
- Santee Sioux Tribe
- Shoshone-Bannock Tribes
- Shoshone-Paiute Tribes
- Southern Ute Indian Tribe
- Ute Tribe
- Ute Tribe of the Uintah and Ouray Reservation

5.4.2 Federal Agencies

- Advisory Council on Historic Preservation
- Bonneville Power Administration
- Bureau of Indian Affairs
- Bureau of Land Management (see full list of offices in Section 5.4.10)
- Bureau of Reclamation
- Federal Aviation Administration
- Federal Depository Library System, Government Printing Office
- Federal Energy Regulatory Commission
- Federal Highway Administration
- National Marine Fisheries Service
- National Park Service
- U.S. Air Force
- U.S. Army Corps of Engineers
- U.S. Department of Agriculture Forest Service (see full list of offices in Section 5.4.11)
- U.S. Department of Agriculture Natural Resources Conservation Service
- U.S. Department of Agriculture Rural Utilities Service
- U.S. Department of Energy
- U.S. Department of the Interior
- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service
- Western Area Power Administration

5.4.3 Local Governments

- City of Albion, Idaho
- City of American Falls, Idaho
- City of Bliss, Idaho
- City of Boise, Idaho
- City of Buhl, Idaho
- City of Burley, Idaho
- City of Casper, Wyoming
- City of Cokeville, Wyoming
- City of Declo, Idaho
- City of Dietrich, Idaho
- City of Douglas, Wyoming
- City of Downey, Idaho
- City of Eden, Idaho
- City of Filer, Idaho
- City of Glenns Ferry, Idaho
- City of Gooding, Idaho
- City of Grand View, Idaho
- City of Granger, Wyoming
- City of Green River, Wyoming

- City of Hagerman, Idaho
- City of Hansen, Idaho
- City of Hazelton, Idaho
- City of Heyburn, Idaho
- City of Hollister, Idaho
- City of Jerome, Idaho
- City of Kemmerer, Wyoming
- City of Kimberly, Idaho
- City of Kuna, Idaho
- City of LaBarge, Wyoming
- City of Laramie, Wyoming
- City of Lyman, Wyoming
- City of Marbleton, Wyoming
- City of Melba, Idaho
- City of Montpelier, Idaho
- City of Mountain Home, Idaho
- City of Murphy, Idaho
- City of Murtaugh, Idaho
- City of Nampa, Idaho
- City of Oakley, Idaho
- City of Pocatello, Idaho
- City of Rawlins, Wyoming
- City of Rock Springs, Wyoming
- City of Rockland, Idaho
- City of Rupert, Idaho
- City of Shoshone, Idaho
- City of Soda Springs, Idaho
- City of Superior, Wyoming
- City of Twin Falls, Idaho
- City of Wendell, Idaho
- Town of Bar Nunn, Wyoming
- Town of Diamondville, Wyoming
- Town of Elk Mountain, Wyoming
- Town of Evansville, Wyoming
- Town of Glenrock, Wyoming
- Town of Hanna, Wyoming
- Town of Medicine Bow, Wyoming
- Town of Mills, Wyoming
- Town of Opal, Wyoming
- Town of Rock River, Wyoming
- Town of Rolling Hills, Wyoming
- Town of Saratoga, Wyoming
- Town of Sinclair, Wyoming

5.4.4 County Governments

- Ada County, Idaho
- Albany County, Wyoming
- Bannock County, Idaho
- Bear Lake County, Idaho
- Blaine County, Idaho
- Canyon County, Idaho
- Carbon County, Wyoming
- Caribou County, Idaho
- Cassia County, Idaho
- Converse County, Wyoming
- Elko County, Nevada
- Elmore County, Idaho
- Franklin County, Idaho
- Gooding County, Idaho
- Jerome County, Idaho
- Lincoln Conservation District, Wyoming
- Lincoln County, Idaho
- Lincoln County, Wyoming
- Medicine Bow Conservation District, Wyoming
- Minidoka County, Idaho
- Natrona County, Wyoming
- Natrona County Conservation District, Wyoming
- Oneida County, Idaho
- Owyhee County, Idaho
- Power County, Idaho
- Saratoga-Encampment-Rawlins Conservation District, Wyoming
- Sweetwater County, Wyoming
- Sweetwater County Conservation District, Wyoming
- Twin Falls County, Idaho

5.4.5 U.S. House of Representatives and U.S. Senate

- U.S. House of Representatives
  - Rob Bishop, Utah, First Congressional District
  - Raul Labrador, Idaho, First Congressional District
  - Cynthia A. Lummis, Wyoming
  - Jim Matheson, Utah, Second Congressional District
  - Mike Simpson, Idaho, Second Congressional District
  - Nevada, Office of the Second Congressional District (vacant)
- U.S. Senate
  - John Barrasso, Wyoming
  - Mike Crapo, Idaho
  - Mike Enzi, Wyoming

- Dean Heller, Nevada
- Mike Lee, Utah
- Harry Reid, Nevada
- James E. Risch, Idaho

5.4.6 State of Idaho

- Idaho Office of Energy Resources
- Office of Governor C. L. “Butch” Otter
- House of Representatives
  - Brent Crane, Legislative District 13
  - Christy Perry, Legislative District 13
  - Clifford Bayer, Legislative District 21
  - John Vander Woude, Legislative District 21
  - Pete Nielson, Legislative District 22
  - Richard Wills, Legislative District 22
  - Stephen Hartgen, Legislative District 23
  - Jim Patrick, Legislative District 23
  - Leon Smith, Legislative District 24
  - Sharon Block, Legislative District 24
  - Wendy Jaquet, Legislative District 25
  - Donna Pence, Legislative District 25
  - Maxine Bell, Legislative District 26
  - John “Bert” Stevenson, Legislative District 26
  - Scott Bedke, Legislative District 27
  - Fred Wood, Legislative District 27
  - Ken Andrus, Legislative District 29
  - Jim Guthrie, Legislative District 29
  - Roy Lacey, Legislative District 30
  - Elaine Smith, Legislative District 30
  - Marc Gibbs, Legislative District 31
  - Tom Loertscher, Legislative District 31
- Senate
  - Patti Anne Lodge, Legislative District 13
  - Russell Fulcher, Legislative District 21
  - Tim Corder, Legislative District 22
  - Bert Brackett, Legislative District 23
  - Lee Heider, Legislative District 24
  - Michelle Stennett, Legislative District 25
  - Dean Cameron, Legislative District 26
  - Denton Darrington, Legislative District 27
  - Diane Bilyeu, Legislative District 29

- Edgar Malepeai, Legislative District 30
- John Tippets, Legislative District 31

5.4.7 State of Nevada

- Assembly
  - John Ellison, District 33
- Department of Conservation and Natural Resources
- Department of Wildlife
- Office of Governor Brian Sandoval
- Public Utilities Commission of Nevada
- State Historic Preservation Office
- Senate
  - Dean A. Rhoads, Rural Senatorial District

5.4.8 State of Wyoming

- Department of Agriculture
- Department of Environmental Quality
- Department of Revenue
- Department of Transportation
- Game and Fish Department
- House of Representatives
  - Richard L. Cannady, House District 6
  - Kermit C. Brown, House District 14
  - Bernadine L. Craft, House District 17
  - Allen Jaggi, House District 18
  - Kathy Davidson, House District 20
  - Bob Brechtel, House District 38
  - Kendall Kroeker, House District 35
  - Gerald Gay, House District 36
  - Steve Harshman, House District 37
  - Bob Brechtel, House District 38
  - Jeb Steward, House District 47
  - Joseph M. Barbuto, House District 48
  - Lisa Shepperson, House District 58
- Office of Governor Matt Mead
- Office of State Lands and Investments
- Senate
  - Jim Anderson, Senate District 2
  - Phillip A. Nicholas, Senate District 10
  - Larry S. Hicks, Senate District 11

    - Marty Martin, Senate District 12
    - Stan Cooper, Senate District 14
    - Charles K. Scott, Senate District 30
- State Geological Survey
- State Historic Preservation Office
- State Parks, Historic Sites and Trails
- Travel and Tourism
- Wyoming Business Council

5.4.9 Public Reading Rooms

- Ada County Library
- Albany County Public Library
- American Falls District Library
- Bear Lake County Library
- Boise Public Library
- Boise State University Library
- Bruneau Valley District Library
- Buhl Public Library
- Burley Public Library
- Carbon County Library System
- Casper College Goodstein Foundation Library
- College of Southern Idaho Library
- College of Western Idaho Library
- Converse County Library
- Demary Memorial Library
- Eastern Owyhee County Library
- Elko-Lander-Eureka Counties Library
- Filer Public Library
- Garden City Public Library
- George Fox University Library
- Glenns Ferry Public Library
- Gooding Public Library
- Grace District Library
- Great Basin College Library
- Hagerman Public Library
- Hansen District Library
- Idaho Commission for Libraries, Boise
- Idaho State University Library
- Jerome Public Library
- Kimberly Public Library

- Kuna District Library
- Laramie County Community College, Albany County Campus Library
- Larsen-Sant Public Library
- Lincoln County Library System
- Lizard Butte District Library
- Marshall Public Library
- Meridian District Library
- Mountain Home Public Library
- Nampa Public Library
- Natrona County Public Library
- Northwest Nazarene University, John E. Riley Library
- Oakley District Library
- Oneida County Library
- Patricia Romanko Public Library
- Portneuf District Library
- Rockland School Community Library
- Sherburn Smith Memorial Library
- Shoshone Public Library
- South Bannock District Library
- State of Wyoming Library
- Sweetwater County Library
- Twin Falls Public Library
- University of Wyoming Libraries
- Western Wyoming Community College, Hay Library

5.4.10 Bureau of Land Management Offices

- Boise District Office
- Bureau of Land Management, Libraries Systems/Cataloguing
- Burley Field Office
- Casper Field Office
- Craters of the Moon National Monument and Preserve
- High Desert District Office
- Idaho Falls District Office
- Idaho State Office
- Kemmerer Field Office
- Nevada State Office
- Owyhee Field Office
- Pocatello Field Office
- Rawlins Field Office

- Rock Springs Field Office
- Shoshone Field Office
- Twin Falls District Office
- Wells Field Office
- Wyoming State Office

5.4.11 U.S. Department of Agriculture Forest Service Offices

- Caribou-Targhee National Forest
- Caribou-Targhee National Forest – Montpelier Ranger District
- Intermountain Region
- Medicine Bow-Routt National Forests
- Medicine Bow-Routt National Forests – Douglas Ranger District
- Rocky Mountain Region
- Sawtooth National Forest
- Sawtooth National Forest – Minidoka Ranger District

6.0 GLOSSARY AND INDEX

GLOSSARY

100-year floodplain—The area that would be inundated by a flood with a recurrence interval of once in 100 years, on average. This can also be stated as areas that have a 1 percent chance of being flooded in a given year. (See **Floodplain**.)

A-weighted sound level—The weighting of sound over the frequency spectrum to account for the sensitivity of the human ear.

Access road—Roads constructed to each structure site first to build the tower and line, and later to maintain and repair it. Access roads are built where no roads exist. Where county roads or other access is already established, access roads are built as track roads to the structure site (see **track roads**). Access roads are maintained even after construction, except where they pass through cultivated land. There, the road is restored for crop production after construction is completed.

Agriculture—A habitat type characterized by land planted and kept in crops.

Alliance for Historic Wyoming (AHW)—Organized in 2005 as a 501(c)(3) nonprofit organization, AHW is a group of volunteers dedicated to the protection and preservation of Wyoming's cultural resources.

Alluvium—Deposits left by flowing water, usually clay, silt, sand, or gravel.

Alternative/Alternate—Options that a federal agency considers to address the significant issues and meet the purpose of and need for a proposed project in an environmental analysis. Also used to describe other routes under consideration.

American Indian Religious Freedom Act (AIRFA)—AIRFA was passed in 1978 to protect the rights of American Indians, Eskimos, Aleuts, and Native Hawaiians to engage in traditional cultural practices. Rights ensured under the law include the possession of sacred objects, the practice of traditional ceremonies, and the access to sacred sites. The Act requires federal agencies to provide access to and use of sacred sites (within specified limitations) and to eliminate interference in the practice of Native religions.

Ampere (A)—A unit of measurement of electric current, which is the rate that electrons flow in a wire; one ampere is 6.023 x 1023 electrons per second. The measurement is similar to gallons per minute of water in a pipe.

Analysis Area—A 1,000-foot-wide area centered over the Proposed Route and Route Alternatives, as well as a 50-foot-wide area centered over any access roads that extend outside of the 1,000-foot-wide area.

Archaeological Resources Protection Act (ARPA)—ARPA (16 U.S.C. 470) was signed into law in 1979. The purpose of the Act is:

> *…to secure, for the present and future benefit of the American people, the protection of archaeological resources and sites which are on public lands and Indian lands, and to foster increased cooperation and exchange of information between governmental authorities, the professional archaeological community, and private individuals having*

> *collections of archaeological resources and data which were obtained before the date of the enactment of this Act.*

The Act established a permitting process for the survey and excavation of archaeological materials on Federal and Tribal lands, stipulating that only qualified professionals meeting the Secretary of the Interior's guidelines may be lawfully authorized to conduct such work.

Area of Critical Environmental Concern (ACEC)—An area where special management attention is required to protect and prevent irreparable damage to important cultural, historic, or scenic values, fish and wildlife resources or other natural systems or processes, or to protect life and safety from natural hazards.

Area of Potential Effect (APE)—The geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist.

Attainment area—An area considered to have air quality as good as or better than the National Ambient Air Quality standards as defined in the Clean Air Act.

Aquatic—Occurring in, or closely associated with, water.

Bald and Golden Eagle Protection Act—A law that prohibits the take, possession, selling, purchasing, bartering, or transporting of live or dead bald or golden eagles, or any parts, nests, or eggs of these birds.

Bay (of a substation)—A substation "bay" is the physical location within a substation fenced area where the high-voltage circuit breakers and associated steel transmission line termination structures, high-voltage switches, bus supports, controls, and other equipment are installed.

Bedrock—Solid rock beneath the soil and superficial rock.

Best Management Practices (BMPs)—A practice or combination of practices that are the most effective and practical means of preventing or reducing the amount of environmental impact, including but not limited to, pollution generated by nonpoint sources to a level compatible with water quality goals.

Big game—Large mammals that may be taken by hunters, pursuant to local government restrictions and regulations.

Biological assessment—Information prepared by, or under the direction of, a Federal agency to determine whether a proposed action is likely to: (1) adversely affect listed species or designated critical habitat; (2) jeopardize the continued existence of species that are proposed for listing; or (3) adversely modify proposed critical habitat. Biological assessments must be prepared for "major construction activities." See 50 CFR §402.02. The outcome of this biological assessment determines whether formal consultation or a conference is necessary. [50 CFR §402.02, 50 CFR §402.12]

Biological opinion—Document which includes: (1) the opinion of the Fish and Wildlife Service or the National Marine Fisheries Service as to whether or not a Federal action is likely to jeopardize the continued existence of listed species, or result in the destruction or adverse modification of designated critical habitat; (2) a summary of the information

on which the opinion is based; and (3) a detailed discussion of the effects of the action on listed species or designated critical habitat. [50 CFR §402.02, 50 CFR §402.14(h)]

Blackout— The unplanned loss of all electrical service to a group of users in a geographical area.

Blading—Use of a bulldozer, grader, or other construction equipment to level or shape a travel surface.

Bog—Wet, spongy ground; a small marsh or swamp; one type of wetland.

Border zone—A zone on each side of the wire zone to the edge of the ROW, maintained to exclude vegetation more than 25 feet tall.

Bull trout—Members of the char subgroup of the salmon family (salmonids), which also include the Dolly Varden, lake trout, and Arctic char.

Bureau of Land Management (BLM)—A federal agency under the U.S. Department of the Interior that is responsible for carrying out a variety of programs for the management and conservation of resources on 258 million acres. The BLM manages multiple resources and uses, including energy and minerals, timber, forage, recreation, wild horse and burro herds, fish and wildlife habitat, wilderness areas, and archaeological, paleontological and historical sites. The BLM has been designated as the lead federal agency for the environmental review of the Gateway West Transmission Line Project.

Candidate species—Plant and animal taxa considered for possible addition to the List of Endangered and Threatened Species. These are taxa for which the Fish and Wildlife Service has on file sufficient information on biological vulnerability and threat(s) to support issuance of a proposal to list, but issuance of a proposed rule is currently precluded by higher priority listing actions. [61 FR 7596-7613 (February 28, 1996)]

Capacity—Refers to the amount of power a transmission facility (line, transformer, etc.) can reliably deliver. Capacity is measured in megawatts and is limited by the current (in amperes) that the facility can carry or the minimum voltage levels present at a substation (under either steady-state or outage conditions).

Carbon monoxide (CO)—An odorless and colorless gas formed from one atom of carbon and one atom of oxygen.

Census block—A subdivision of a census tract that typically contains between 600 and 3,000 people.

Census block group—Smallest area for which a census compiles sample data; composed of census blocks.

Census County Division (CCD)—A subdivision of a county that is a relatively permanent statistical area established cooperatively by the Census Bureau and state and local government authorities.

Census tract—A subdivision of a county smaller than a CCD that often follows visible features, but may also follow governmental boundaries and other non-visible features; homogenous with respect to population characteristics, economic status, and living conditions.

Centerline—A line on a map or flagged on the ground that indicates the location of a linear feature such as a road or a transmission line. The linear feature is further defined by its total width, either for construction or operation, which is bisected into two equal parts by the centerline.

Circuit—An electrical device that provides a path for electrical current to flow, or along which an electrical current can be carried. In the case of high-voltage transmission, a set of wires energized at transmission voltages extending beyond a substation which has its own protection zone and set of breakers for isolation.

Class 1 Waters (Wyoming)—Defined as waters within the state of Wyoming in which no further water quality degradations by point source discharges (other than from dams) will be allowed. Class 1 waters include all surface waters located within the boundaries of national parks and congressionally designated wilderness areas in Wyoming. It also includes the main-stems of various rivers within Wyoming.

Clean Water Act 303(d) list—List of waterbodies that do not meet water quality standards.

"Cold" rebuild—Rebuilding an existing transmission line without electricity flowing in the conductors during construction.

Colluvium—Rock fragments, sand, etc., that accumulate on steep slopes or at the foot of cliffs.

Common mode failure—An arrangement in which any failures are on lines adjacent to each other on a common transmission tower or two parallel transmission lines in close proximity to each other, transformers sharing the same breaker in a substation bay, etc.

Community of shared interest—Geographically dispersed individuals who could experience common conditions of environmental effect.

Conductor—The wire cable strung between transmission towers through which electric current flows.

Connected actions—Actions that are closely related and therefore should be discussed in the same impact statement. Defined by CEQ (40 CFR 1508.25) as actions that are automatically triggered which may require an EIS, cannot or will not proceed unless other actions are taken previously or simultaneously, or if the actions are interdependent parts of a larger action and depend on the larger action for their justification. Connected actions are limited to actions that are currently proposed.

Concentrated animal feeding operation (CAFO)—A lot or facility, together with any associated treatment works, where both of the following conditions are met: First, animals have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12-month period. And secondly, crops, vegetation, forage growth, or post-harvest residues are not sustained over any portion of the operation lot or facility.

Constraint—A resource or condition that potentially limits transmission line routes, including areas that are closed by regulations (e.g. municipal airports) or where impacts would be very difficult or impossible to mitigate due to resource protection and other legal requirements.

Cooperating agency—A federal, state, or local government agency that has accepted an invitation to participate in the NEPA process by the lead federal agency. The invitation is generally formal and accompanied by the signing of a Memorandum of Understanding. Typically, a cooperating agency has jurisdiction by law or special expertise with respect to any environmental issue which will be addressed by the NEPA analysis EISs (40 CFR 1508).

Corridor—For the purposes of this project, the corridor is either: 1) the geographic area within which a transmission line is located or planned to be located (typically used to develop a working alignment for the initial screening of alternatives); if an environmentally sensitive area is found, the transmission line alignment can be shifted within the corridor to avoid adverse impacts to the sensitive area; or 2) a linear area designated by law or in a land use plan that is the preferred location for placement of linear rights of way such as transmission lines.

Corona—Corona occurs in regions of high electric field strength on conductors, insulators, and hardware when sufficient energy is imparted to charged particles to cause ionization (molecular breakdown) of the air.

Council on Environmental Quality (CEQ)—Coordinates federal environmental efforts and works closely with agencies and other White House offices in the development of environmental policies and initiatives. CEQ was established within the Executive Office of the President by Congress as part of the National Environmental Policy Act of 1969 (NEPA) and additional responsibilities were provided by the Environmental Quality Improvement Act of 1970.

Critical habitat—For ESA-listed species consists of: (1) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 4 of the Act on which are found those physical or biological features (constituent elements) (a) essential to the conservation of the species and (b) which may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 4 of the Act, upon a determination by the Secretary that such areas are essential for the conservation of the species. [ESA §3 (5)(A)] Designated critical habitats are described in 50 CFR §17 and 226.

Crucial range—Can describe any particular seasonal range or habitat component (often winter or winter/yearlong range in Wyoming) but describes that component which has been documented as the determining factor in a population's ability to maintain itself at a certain level (theoretically at or above the WGFD population objective) over the long term. [*Report on Standardized Definitions for Seasonal Wildlife Ranges*, Wyoming Chapter of the Wildlife Society, July 1990]

Cultural resource—The term "cultural resource" includes all landscapes, buildings, sites, districts, structures, or objects that have been created by or associated with humans and are considered to have historical or cultural value. Cultural resources also include **Traditional Cultural Properties**.

Culvert—A corrugated metal or concrete pipe used to carry or divert runoff water from a drainage; usually installed under roads to prevent washouts and erosion.

Cumulative effects—Effects that result when the effects of an action are added to or interact with other effects in a particular place and within a particular time. Such impacts may individually have minor impacts, but collectively may have significant impacts.

Current—The amount of electrical charge flowing through a conductor (as compared to voltage, which is the force that drives the electrical charge), which is measured in amperes or amps.

Cushion plants—Forbs with stems and leaves densely aggregated near the ground surface.

Day-night sound level (L_{dn})—A value calculated by averaging the 24-hour hourly L_{eq} levels at a given location and adding 10 dB to noise emitted during the nighttime period (10:00 pm – 7:00 am) to account for the increased sensitivity of people to noises that occur at night.

Dead-end structures—Heavy towers designed for use where the transmission line loads the tower primarily in tension rather than compression, such as in turning large angles along a line or bringing a line into a substation.

Debris flow—Rapid movement of water-charged mixtures of soil, rock, and organic debris down steep stream channels.

Decibel—A decibel is a unit for expressing relative difference in power, usually between acoustic signals, equal to 10 times the common logarithm of the ratio of two levels.

Decommissioning—Removal of Project facilities at the end of the operational life of the transmission line.

Demand—1) The rate at which electric energy is delivered to or by a system or part of a system, generally expressed in kilowatts or megawatts, at a given instant or averaged over any designated interval of time. 2) The rate at which energy is being used by the customer.

Depressional areas—Wetland areas that receive water from overland runoff and precipitation.

Design Variation— The Design Variation offers the opportunity to utilize two parallel steel lattice structures in place of the double-circuit 500-kV lattice structures proposed for Segments 2, 3, and 4.

Dewatering—The elimination of water from waterways so that excavation can occur.

Direct effects—Direct effects are those caused by the Project at the same time and place as the impact, such as soil disturbance.

Distribution line—The structures, insulators, conductors, and other equipment used to deliver electricity directly to the customer, including commercial facilities, small factories or residences.

Distribution underbuild—Using transmission poles to also carry distribution conductors from existing system taps by situating the distribution lines on cross-arms below the transmission lines.

Double-circuit transmission line—A transmission line composed of six electrical phases (two independent circuits of three phases each) and two lightning protection shield wires. One of the lighting protection shield wires is a steel overhead ground wire (OHGW), and the other is an optical ground wire (OPGW).

Double-contingency—Utilities are required to conduct analyses for reliability that take into account more than a single event that could affect the grid. More formally, a double-contingency analysis takes into account at least two unlikely, independent, and concurrent changes in process conditions that could trigger a failure in the electrical generation and delivery system.

Early successional (or early seral)—An immature forest often characterized by a single-age class and open canopies; stands are between 1 and 30 years old.

Earthquake buffer—A specified area beyond which effects from earthquakes of a specified magnitude would not likely damage buildings or structures.

Easement—A grant of certain rights to the use of a piece of land. A grant of easement across a private parcel for a transmission line typically includes the right to enter the easement area to build, maintain, and repair transmission facilities, including access roads. Permission for these activities is included in the negotiation process for acquiring easements over private land. The land itself remains in private ownership.

Edge effect—Changes in vegetation and animal communities that are caused by one habitat type being immediately adjacent to a different habitat type. Edge effects can include changes in temperature, humidity, and plant and wildlife species present in the area.

Electric and magnetic fields (EMF)—Fields describing properties of a location or point in space and its electrical environment, including the forces that would be experienced by a charged body in that space by virtue of its charge or the movement of charges. The voltage, which is the “pressure,” produces an electric field that moves the electricity through wires. The current produces a magnetic field, which is a measure of how much electricity is flowing. Thus, wherever there is electric current flowing (including through any type of wiring), there is both an electric and a magnetic field.

Emergent—Plants that have their bases submerged in water.

Eminent Domain—When a utility company acquires property for public use through a court action, in which a court decides that the proposed subsequent use is in the public interest and also determines the compensation to be paid to the owner.

Encroachment Permit—Written permission from a landowner to enter a parcel of private property for the purposes of temporary activity, such as surveying, conducting environmental data gathering, etc.

Endangered Species Act of 1973 (ESA)—A law establishing a regulatory system to protect species that are at risk of extinction. NOAA Fisheries and the U.S. Fish and Wildlife Service decide whether to list species as Threatened or Endangered. Under the Act, federal agencies must avoid jeopardy to and aid the recovery of listed species.

Endangered species—Any species officially listed by the U.S. Fish and Wildlife Service or NOAA Fisheries as being in danger of extinction throughout all or a significant portion of their range

Energy—In the electric utility industry, it represents the amount of power used or transmitted over a given amount of time.

Environmental justice—A concept concerning disproportionately high and adverse human health or environmental effects of a federal agency's programs, policies, and activities on minority or low-income populations.

Environmental impact statement (EIS)—Part of compliance with the National Environmental Policy Act (NEPA), an EIS is a comprehensive public document that analyzes the impacts of a major federal action that may significantly affect the quality of the human environment. When complete, it is a tool for decision making as the EIS describes the positive and negative environmental effects of a proposed action, describes alternative actions and provides an analysis of environmental impacts and ways to mitigate such impacts across all alternatives considered in detail. An EIS examines physical and biological resources, resource uses, fire management, special designations, and social and economic conditions.

Environmental Protection Measures (EPMs)—Environmental protection measures have been developed by the Companies to maintain environmental quality and meet requirements of various land management plans. These measures apply project-wide unless modified through negotiations with individual landowners or superseded by permits granted by federal, state, or local agencies.

Ephemeral stream—One that flows only in direct response to precipitation and whose channel is at all times above the water table.

Equivalent sound level (L_{eq})—the steady, continuous sound level, over a specified time, which has the same acoustic energy as the actual varying sound levels over that same time.

Essential habitat—Those areas possessing the same characteristics as critical habitat for Threatened and Endangered but not species declared critical habitat by the Secretary of the Interior or Commerce. [Wyoming chap. of the Wildlife Society, 1990]

Exceedence levels (L levels)—The A-weighted sound level that is exceeded for a specified percentage of the time.

Executive Order 13007—This order was issued by President Clinton in 1996 in the interest of protecting and preserving Indian religious practices. The order established the responsibility of federal land managers to (to the extent practicable) to "accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners" and to "avoid adversely affecting the physical integrity of such sacred sites.**"**

Executive Order 13175 – Issued by President Clinton in 2006, this order was issued to: "…establish regular and meaningful consultation and collaboration with tribal officials in the development of Federal policies that have tribal implications, to strengthen the United States government-to-government relationships with Indian tribes, and to reduce

the imposition of unfunded mandates upon Indian tribes." The order set forth a set of guidelines for federal agencies, mandating consultation and coordination with tribal officials when formulating policy that has "substantial direct effect" on Indian tribes.

Experiential impact—Impact that could negatively affect the experience of using or viewing an area.

Extra-High Voltage Transmission Lines (230 kV; 345 kV; 500 kV)—Used for transmitting electrical energy over great distances.

- Higher voltage lines are more efficient than lower voltage lines. A higher voltage transmission line will result in fewer losses than a transmission line with a lower voltage.
- Higher voltage lines often have "bundled" conductors, meaning that multiple wires are hung from the same insulator. This increases the amount of power that can be carried on a single circuit.

Fault—An event occurring on an electric system such as a short circuit, a broken wire, or an intermittent connection.

Federally listed—Species listed as **Threatened** or **Endangered** by the U.S. Fish and Wildlife Service.

Feasible—Capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, regulatory, technical, and safety factors.

Firm Demand—That portion of the **demand** that a power supplier is obligated to provide except when system reliability is threatened or during emergency conditions.

Flashover—An electrical discharge through air around or over the surface of insulation, between objects of different potential, caused by placing a voltage across the air space that results in the ionization of the air space.

Floodplain—That portion of a river valley adjacent to the stream channel which is covered with water when the stream overflows its banks during flood stage.

Fly yard—A Project-material staging area used specifically to support helicopter use.

Fragmentation—The breaking up of contiguous areas of vegetation/habitat into smaller patches.

Forb—An herbaceous plant that is not a grass or not grasslike.

Forest/Woodland—A habitat type characterized by being dominated by trees. Forests are densely covered by trees and have a continuous or nearly continuous canopy and little shade reaching the forest floor. In a woodland, trees are more widely scattered and sunlight reaches the floor, often supporting an understory of shrubs, grasses, and/or forbs.

Fugitive dust—Visible emissions released from sources other than stacks; for instance, dust blown from storage piles, road dust, emissions leaking from sides of buildings or open areas in buildings.

Functional impact—Impact that could preclude the use of or access to an area or an activity.

Gauss—A unit of magnetic induction.

General Land Office (GLO)—The GLO was created in 1812 as an independent agency to oversee the surveying and sale of public lands and was charged with maintaining land survey data for the entire United States and its territories. The agency was later placed under the authority of the Department of the Interior and eventually merged with the Grazing Service to form the BLM. The BLM facilitates public access to GLO data through its website in the form of digital images of federal land patent and survey maps produced between 1820 and 1908.

Geographic Information System (GIS)—A computer representation of data that is geographically distributed in three dimensions. These data can be generated and displayed to show their physical location. Each data set with a certain type of information constitutes a "layer" in the GIS. GIS layers can be superimposed to show the spatial relationships of different items.

Grasslands—Habitat types dominated by grasses (family Poaceae) with little woody vegetation or other forbs. In the Analysis Area, most grasslands are dominated by introduced grass species, though some native grasslands are present.

Greenfield—A piece of usually semi-rural property that is undeveloped except for agricultural use, especially one considered as a site for expanding urban development.

Habitat types—Communities of plants that typically occur together.

Hertz (Hz)—The unit of frequency in cycles per second; power systems in the U.S. operate with a frequency of 60 Hz.

High Potential Site/High Potential Route Segment—The term "high potential" in this context pertains to route segments or sites associated with National Historic Trails (NHT) with an increased likelihood of being historically significant. Federal land managers are required to identify such resources under the National Historic Trails System Act.

High voltage—Lines with 230 kV or above electrical capacity.

Histosols—Soils derived from organic matter often associated with wetland areas.

Historic property—Any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior.

Horizontal boring (HDD; or jack-and-bore)—An augering operation that simultaneously pushes a 36- to 42-inch steel casing through a crossing (e.g., water crossing) and removes the spoil inside the casing with a rotating auger.

"Hot" rebuild—Replacing an existing transmission line and its structures while maintaining power in the existing lines.

Hub and spoke—Refers to a transmission system in which each substation is a hub and receives or sends electricity along the spokes, with a backbone connecting the hubs.

Hydrology—The science dealing with the properties, distribution, and circulation of water.

Idaho Power—Idaho Power is a wholly owned subsidiary of IDA-CORP, a holding company. Idaho Power is responsible for providing electrical service to its service area, which includes most of southern Idaho and a portion of eastern Oregon, serving more than 480,000 general business customers. Idaho Power is a regulated public utility under the laws of the State of Idaho and is also a public utility under the jurisdiction of the Federal Energy Regulatory Commission (FERC).

Implosive fittings—A method of attaching the conductor to the insulator assembly at the dead-end structure. It uses explosives to compress the metal together. Implosive fittings do not require heavy equipment, but do create noise similar to a loud explosion when the primer is struck. The implosive type sleeve is faster to install than hydraulic compression fittings and results in a very secure connection between the conductor and the sleeve. Implosive sleeves are planned for the Project.

Indian tribe—An Indian tribe, band, nation, or other organized group or community, including a native village, regional corporation, or village corporation, as those terms are defined in section 3 of the Alaska Native Claims Settlement Act (43 U.S.C. 1602), which is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians. Government-to-government consultation is required for any project between the federal government and the government of any potentially impacted tribe.

Indirect effects—Those effects that are caused by the action and are later in time or farther removed in distance, such as sedimentation from soil disturbance, but are still reasonably foreseeable.

Insulators—A ceramic or other nonconducting material used to keep electrical circuits from jumping over to ground.

Integrated Resource Plan (IRP) (also known as the Energy Plan for the Future)—A comprehensive look at present and future demands for electricity, as well as a plan for meeting those demands.

Intermittent or seasonal stream—One which flows only at certain times of the year when it receives water from springs or from some surface source such as melting snow in mountainous areas.

Intermountain West—The region of North America lying west of the Rocky Mountains and east of the Cascade Mountains of Washington and Oregon and the Sierra Nevada Mountains of California

Invasive species—A species that is not native to the habitat under consideration and whose introduction causes, or is likely to cause, economic or environmental harm (Executive Order 13112). Invasive plants are typically adaptable, aggressive, and have a high reproductive capacity.

Invertebrates—Any animal without a backbone or spinal cord; any animal other than a fish, amphibian, reptile, bird, or mammal.

Isolated wetlands—Wetlands that have no connection with any tributary system that flows into traditional navigable waters or interstate waters (e.g., intrastate lakes, streams, prairie potholes, etc.)

K factor—A measure of soil susceptibility to erosion and rate of runoff.

Kcmil (1,000 cmils)—A quantity of measure for the size of a conductor; kcmil wire size is the equivalent cross-sectional area in thousands of circular mils. A circular mil (cmil) is the area of a circle with a diameter of one thousandth (0.001) of an inch.

Key Observation Point (KOP)—Viewing locations chosen to be generally representative of visually sensitive areas where it can be assumed that viewers may be affected by a change in the landscape setting from the Project. Views from KOPs are described by distance zones and are based on perception thresholds (changes in form, line, color, and texture).

Kilovolt —One thousand volts (see **volt**).

Landslide —Any mass-movement process characterized by downslide transport of soil and rock, under gravitational stress, by sliding over a discrete failure surface; or the resultant landform. Can also include other forms of mass wasting not involving sliding (rockfall, etc.).

Large woody debris (LWD)—Any piece of downed wood larger than 4 inches in diameter and 6 feet long.

Late successional (or late seral)—A forest in which the trees are even older and larger than a mature forest, the canopy is more open, some larger trees have died and become snags, and there is a well-developed understory of large trees; stands are typically between 120 and 190 years old.

Lattice tower—A freestanding steel framework tower that is often used to support electric transmission lines with voltages above 100 kilovolts.

Laydown yard—see **Staging Area**

Lead Agency—The agency or agencies preparing, or having taken primary responsibility for preparing, an environmental document as required by NEPA. For the Gateway West Transmission Line Project, the BLM is the lead agency.

Line losses—Energy consumed by the conductor generating heat during transport of power through each line; a function of load, circuit length, conductor size, and electrical “resistance.”

Lithic landscape—An area or region where aboriginal people habitually tested and procured tool stone and lithic materials.

Lithic scatter—Consists of stone material that has been left behind or dropped and can include stone tools such as projectile points, knives, or simply debris from stone tool manufacture or lithic procurement activities.

Load—The amount of electric power or energy delivered or required at any specified point or points on a system. Load originates primarily at the energy-consuming equipment of customers.

Load growth—An increase in demand for electricity typically driven by a variety of events, including population increases and new commercial and industrial projects that provide jobs to that population. (See **Load**.)

Low-gradient—With gentle slopes.

Management Areas—Units of federal land having different management emphasis or direction.

Management Indicator Species (MIS)—"plant and animal species, communities, or special habitats selected for emphasis in planning, and which are monitored during forest plan implementation in order to assess the effects of management activities on their populations and the populations of other species with similar habitat needs which they may represent" (Forest Service 1991).

Mass wasting—The slow downward slope of rock debris.

Megawatts (MW)—A megawatt is one million watts, or one thousand kilowatts; an electrical unit of power.

Mid-successional (or mid-seral)—A forest often characterized by a single-age class and closed canopies and most commonly harvested in commercial timber operations; stands are typically between 30 and 80 years old.

Migratory bird—A bird that moves seasonally to different ranges to maximize breeding and feeding opportunities.

Migratory Bird Treaty Act—A law enacted in 1918 that prohibits pursuing, hunting, taking, capturing, killing, possessing, selling, bartering, purchasing, delivering, transporting, and receiving any migratory birds, parts, nests, or eggs.

Milligauss (mG)—A unit used to measure magnetic field strength; one-thousandth of a gauss.

Minority community—A group of people who are considered a minority in the United States population and who experience common conditions of environmental effect. (See **Environmental justice**)

Mitigation—**Avoiding** an impact altogether by not taking a certain action or parts of an action; **Minimizing** impacts by limiting the degree or magnitude of the action and its implementation; **Rectifying** an impact by repairing, rehabilitating, or restoring the affected environment; **Reducing** or eliminating an impact over time by preservation and maintenance operations during the life of the action; and **Compensating** for an impact by replacing or providing substitute resources or environments. (40 CFR 1508.20)

National Environmental Policy Act (NEPA)—Federal statute, signed into law on January 1, 1970, that contains procedures to ensure that federal agency decision makers take environmental factors into account. The two major purposes of the NEPA process are citizen involvement and better informed decisions. The Act establishes national environmental policy and goals for the protection, maintenance, and

enhancement of the environment, and it provides a process for implementing these goals within the federal agencies. The Act also establishes the Council on Environmental Quality (CEQ) and requires an environmental impact statement on all major Federal actions significantly affecting the quality of the human environment. [42 U.S.C. 4332 2(2)(C).]

National Historic Landmark—A historic property that the Secretary of the Interior has designated a National Historic Landmark.

National Historic Preservation Act (NHPA)— The National Historic Preservation Act (Public Law 89-665 and amendments thereto; 16 U.S.C. 470 et seq.) was enacted in 1966. It has had major amendments, primarily additions to expand the effect of the law or to clarify its implementation, in 1980 and 1992. The law contains a strong policy statement supporting historic preservation activities and programs.

National Historic Trails (NHTs)—Extended trails which follow as closely as possible and practicable the original trails or routes of travel of national historic significance (16 U.S.C.1242 [a]).

National Historic Trails System Act—This Act (P.L. 90-543, as amended through P.L. 111-11, March 30, 2009) was passed in 1968 to establish a national trails system, including recreational, scenic, and historic trails. The Act specifies that the Secretary of the Interior and/or the Secretary of Agriculture is responsible for developing and administering the trails system.

National Register of Historic Places (NRHP)—Authorized by the NHPA of 1966 (P.L. 102-575), the NRHP is the National Park Service's (NPS) official list of the Nation's historic places that have been determined worthy of historic preservation.

National Vegetation Classification System (NVCS)—A hierarchical classification system that defines vegetation associations by species composition, uniform habitat conditions, and uniform physiognomy (i.e., the general characteristic of the landscape such as shrub-steppe or mixed conifer).

Native American Graves Protection and Repatriation Act (NAGPRA)—NAGPRA was established in 1990 to provide a means for museums and curation facilities to return certain collected items to Native American and Native Hawaiian groups. The Act pertains to the repatriation of human remains, funerary objects, sacred objects, and objects of cultural patrimony. Federal grants are awarded to indigenous groups and institutions holding collections under the act to assist in the repatriation process, which is overseen by the Native American Graves Protection and Repatriation Review Committee.

New Source Review—Federal pre-construction review for affected sources located in non-attainment areas for air quality.

Nitrogen oxides—A group of compounds consisting of various combinations of nitrogen and oxygen atoms.

No Action Alternative—The predicted result of the denial of the applications for Right-of-Way Grant and Special Use Permit. Under the No Action Alternative, the Gateway

West Project would not be constructed (no new substations, substation expansion, or transmission line).

NOAA Fisheries—The federal agency that oversees threatened and endangered anadromous fish species.

Nonattainment area—An area that does not meet air quality standards set by the Clean Air Act for specified localities and periods.

Northern Tier Transmission Group—A group of transmission providers and customers actively involved in the sale and purchase of transmission capacity that delivers electricity in the Pacific Northwest and mountain states.

Notice of Intent (NOI)—A public notice, published in the Federal Register, that an environmental impact statement will be prepared and considered in the decision making for a proposed action. It also provides background information on the proposed project in preparation for the scoping process.

Notice to Proceed (NTP)—Letter from a principal (client or owner) to a contractor stating the date the contractor can begin work subject to the conditions of the contract. The performance time of the contract starts from the NTP date.

Noxious weed—A legal term, meaning any plant officially designated by a federal, state, or local agency as injurious to public health, agriculture, recreation, wildlife, or property.

Off-highway vehicle—Land vehicles mostly used for recreation purposes on public or private trails, beaches or fields, or in the woods; usually not legal to operate on public highways, streets or roads. Examples are all terrain vehicles (ATVs), off road motorcycles or dirt bikes, snow mobiles and four wheel drive vehicles such as jeeps and trucks.

Old growth—A forest typically at least 200 years of age with moderate to low canopy closure; a multi-layered, multi-species canopy dominated by large overstory trees; numerous large snags; heavy accumulations of fallen wood; smaller trees in various age classes, as well as shrubs and herbaceous vegetation in the understory and on the forest floor.

Open camps or habitation sites—Defined minimally by the presence of one or more hearth features.

Open Access Transmission Tariff (OATT)—Electronic transmission tariff accepted by the U.S. Federal Energy Regulatory Commission requiring the Transmission Service Provider to furnish to all shippers with non-discriminating service comparable to that provided by Transmission Owners to themselves.

Opportunity—A resource or condition that can accommodate a transmission line route, including existing utility or transportation corridors.

Oregon-California Trails Association (OCTA)—OCTA is a non-profit (501 (C) (3) Association) headquartered in Independence, Missouri. Members are dedicated to preservation of overland emigrant trails and educating the public on the emigrant

experience through publication of their Overland Journal and News from the Plains newsletter in addition to other public outreach efforts.

Outage—Events caused by a disturbance on the electrical system that requires the provider to remove a piece of equipment or a portion or all of a line from service. The disturbances can be either natural or human-caused.

overload—Moving too much current flow over transmission facilities. Equipment has safeguards: in the event of system overload, switches will disconnect sensitive equipment from the flow of electricity**.**

Ozone—Associated with the corona discharge of high-voltage transmission lines. Rapidly recombines back to O_2.

PacifiCorp (Rocky Mountain Power)—Rocky Mountain Power is the trade name under which PacifiCorp delivers electricity to more than 955,000 customers in the Rocky Mountain Power service area, which includes portions of Utah, Wyoming, and Idaho. It transmits electricity via a grid of transmission lines throughout a six-state region. PacifiCorp serves 1.7 million retail customers through its distribution system. Rocky Mountain Power operates under oversight and regulatory controls of the public utility commissions of Wyoming, Utah, and Idaho. PacifiCorp is a public utility under the jurisdiction of the FERC.

Palustrine—Northwest Wetland Inventory system that includes wetlands dominated by trees, shrubs, and persistent emergent plants associated with water bodies that cover less than 20 acres or with water less than 6.6 feet deep.

Parturition areas—Areas where habitat is appropriate for female big game animals to seclude themselves while giving birth to young in late spring or early summer. Such areas are usually characterized by ample hiding cover and forage.

Perennial stream—One which flows continuously.

Petitioned species—A species for which a formal request is made to the U.S. Fish and Wildlife Service to give Endangered Species Act protection as either threatened or endangered. The Service reviews the information contained in the petition and other scientific information in their files to determine if further analysis is needed.

Physiographic—Pertaining to the features and phenomena of nature.

Power—The rate at which work is done. The basic unit of measure for power is the watt (w).

Prevention of Significant Deterioration (review)—Federal pre-construction review for affected sources located in attainment areas for air quality. It is intended to prevent a new source from causing air quality to deteriorate beyond acceptable levels.

Prime farmland—A land use classification used by the USDA (7 CFR §657.5) where a favorable growing season, adequate precipitation or irrigation source, and soil characteristics result provide good to excellent crop production.

Programmatic Agreement—A document that records the terms and conditions agreed upon to resolve the potential adverse effects of a federal agency program, complex undertaking, or other situations in accordance with 36 CFR § 800.14(b).

Proponents—Idaho Power Company and PacifiCorp, collectively.

Proposed Action—The Proposed Action for the federal agencies is to consider whether to issue right-of-way grants across various parcels of public lands to allow the construction and operation of portions of new 230-kV and 500-kV electric transmission system that would be located on federally managed lands between the Windstar Substation at Glenrock, Wyoming, and the Hemingway Substation approximately 30 miles southwest of Boise, Idaho.

Proposed Route—The route of the proposed Project as sited and proposed by the Proponents and presented to the federal agencies for their consideration in applications for right-of-way grants.

Protohistory—Refers to a period between prehistory and history, during which a culture or civilization has not yet developed writing, but other cultures have already noted its existence in their own writings.

Public Scoping Report—A report developed by the BLM that documents public outreach efforts and summarizes the comments received during the public scoping period.

Purpose and Need (NEPA)—Under the National Environmental Policy Act of 1969 (NEPA), the need to take an action may be something the agency identifies itself, or it may be a need to make a decision on a proposal brought to it by someone outside of the agency, for example, an applicant for a permit. Alternatives are measured against how well they meet the underlying need and best achieve the purposes to be attained.

Purpose and Need (project proponent)—As identified by an applicant or proponent of a project, the purpose and need describes the intended outcome of the project and the compelling reason why it is being proposed. Alternatives are measured against how well they meet the underlying need and best achieve the purposes to be attained.

Raptor—A bird of prey that feeds upon smaller animals.

Record of Decision (ROD) —The document that is prepared to substantiate a decision based on an EIS. The Record of Decision (ROD) is the final step for the BLM and USFS in the EIS process. The ROD states the final agency decisions, identifies the alternatives considered and discusses mitigation, enforcement and monitoring commitments.

Recreation Opportunity Spectrum (ROS)—Forest Service classification system uses a scale ranging from primitive to urban for the purpose of planning and managing recreational resources.

Regeneration station—A station amplifying the signals between substations or regeneration stations when the distance between exceeds 55 miles. Regeneration stations consist of a building 12 by 32 by 9 feet tall, a fenced yard, access road, and distribution power supply from the local distribution system. They are typically built very near the transmission line and have the fiber optic cable entry and exit runs to connect to the overhead ground fiber optic cables along the transmission line.

Reliability—Transmission systems must be built with sufficient levels of redundancy to enable the transmission system to reliably operate in the event of the loss of any single

element (i.e., transmission line segment or substation element). Following loss of any single element, the transmission operator has 20 minutes to readjust system flows, thereby bringing flows on lines and transformers to within normal ratings, in preparation for the next facility outage.

Remote sensing—"Remote sensing is the science and art of obtaining information about an object, area, or phenomenon through the analysis of data acquired by a device that is not in contact with the object, area, or phenomenon under investigation."[1] The term is most often applied to aerial or satellite-based imagery recording and interpretation.

Revegetate—Re-establishing vegetation on a disturbed site.

Right-of-way (ROW)—Refers to the area, generally centered on a specified centerline, requested by the Proponents of BLM and of other landowners and managers for the construction, operation, and maintenance of a linear feature such as a road, electric transmission line, or pipeline.

Right-of-way (ROW) grant—An authorization to use or occupy a specific piece of public land for a certain project, such as a road, pipeline, transmission line, or communication site. A ROW grant authorizes rights and privileges for a specific use of the land for a specific period of time. For a transmission line, this includes the construction, operation, maintenance, and termination of the Project. Generally, a ROW is granted for no longer than 30 years.

Riparian areas—Vegetation communities that occur adjacent to waterways such as streams, rivers, springs, ponds, lakes, or tidewater and that provide habitat for numerous plant and animal species. They generally occupy transitional areas between aquatic and upland habitats and may function as vegetative buffers for aquatic resources.

Riprap—Broken stones put in areas to prevent erosion, especially along river and stream banks.

Riverine system—Wetland inventory system that includes wetlands not dominated by trees, shrubs, or persistent emergents that are contained within a river channel.

Roadless area—An area of undeveloped public land typically exceeding 5,000 acres within which there are no improved roads maintained for travel by means of motorized vehicles intended for highway use.

Sage-grouse lek—A location used by male sage-grouse, generally every year, to assemble during the mating season and engage in competitive displays that attract females.

Scenery Management System—The Scenery Management System (SMS) replaces the Visual Management System (VMS) used in the most recent Medicine Bow National Forest Land and Resource Management Plan. The SMS provides an overall framework for the orderly inventory, analysis, and management of scenery. The new system

[1] Lillesand, Thomas M., and Ralph W. Kiefer. 1987. *Remote Sensing and Image Interpretation*. John Wiley & Sons. New York.

applies to all national forests and grasslands administered by the Forest Service and to all Forest Service management activities. The SMS process uses particular ecosystems as the environmental context for aesthetics.

Schedule Variation—The Schedule Variation proposes that the first single-circuit transmission line in Segments 2, 3, and 4 would be built as soon as the ROW Grant is issued, but that the second line would not begin construction until late 2016.

Scoping—Part of the federal environmental analysis process required under NEPA where significant issues are identified for detailed analysis. Scoping includes, but is not limited to, a formal scoping period early in the analysis process in which members of the public are invited to review the proposed project and identify possible issues or concerns with the project.

Section 106—Section 106 of the NHPA is a clause stating that heads of federal agencies must consider potential effects to any sites eligible for listing on the NRHP prior to the approval of licenses or the issuance of federal funds for undertakings on lands over which they hold jurisdiction.

Sedimentation—The deposition or accumulation of sediment.

Sensitive species—Those plants and animals identified by the Regional Forester for which population viability is a concern as evidenced by significant current or predicted downward trend in populations or density and significant or predicted downward trend in habitat capability.

Seral—Pertaining to the stages of ecological succession occurring in communities of plants and animals until the climax is reached.

Severe winter relief range—A documented survival range which may or may not be considered a crucial range area as defined above. It is used to a great extent, only in occasionally extremely severe winters (e.g., 2 years out of 10). It may lack habitat characteristics which would make it attractive or capable of supporting major portions of the population during normal years but is used by and allows at least a significant portion of the population to survive the occasional extremely severe winter. [Wyoming Chap. of Wildlife Society 1990]

Shrub wetlands—Wetlands dominated by woody perennial vegetation smaller than trees.

Shrubland—A habitat type characterized by woody vegetation smaller than trees (in general, having multiple main stems and being less than 20 feet in height and six inches diameter at breast height at maturity). In the Analysis Area, common shrubland plant species are big sage, mountain sagebrush, rabbitbrush, antelope bitterbrush, greastwood, and fourwing saltbush.

Single-circuit transmission line—A transmission line composed of three electrical phases and two lightning protection shield wires. One of the lighting protection shield wires is a steel OHGW, and the other is typically an OPGW.

Single-contingency—An analysis for reliability that takes into account a single event that could affect the grid. (See also **Double-Contingency**)

Siting study area—Initially defined as being 10 miles on either side of the centerlines of the Proposed Route and Route Alternatives considered in the initial siting process. The siting study area was designed to be large enough to include ancillary facilities, including roads, substations, structures, and areas needed for construction. As mapped, the siting study area includes 28 million acres. See also **Analysis Area.**

Soil erosion—The movement of soil particles, usually as a result of wind or water forces. Many factors affect soil erosion, including soil grain size, cohesion factor, soil moisture content, type and amount of vegetative cover, precipitation amount and intensity, steepness of slope, and wind speed.

Source Station—A power station that is the receiving point for energy from distant generation delivered over high voltage power lines.

Snag—A dead or dying tree.

Span length of a transmission circuit—the distance between two transmission support structures traveled by the conductors, measured either horizontally or along the conductors from the end of one insulator string to the end of the next insulator string.

Special Use Permit—A legal document that allows occupancy, use, rights, or privileges of National Forest System (NFS) land. The authorization is granted for a specific use of the land for a specific period of time.

Special Status Species—Species of plants or animals that have been designated by government agencies as needing special monitoring, conservation, or protection, usually due to declining populations. This group includes federally endangered and threatened species as well as other designations.

Species—A group of interbreeding individuals not interbreeding with another such group; similar, and related species are grouped into a genus.

Staging Area—A fenced, generally flat location where materials, equipment, and vehicles are stored prior to their use in construction of the transmission line or its ancillary facilities. Also known as a **Laydown Yard**.

Structures—Refers to a type of support used to hold up transmission or substation equipment.

State Historic Preservation Office (SHPO)—Created under Section 101 of the NHPA to survey and recognize historic properties, review nominations for properties to be included in the National Register of Historic Places, review undertakings for the impact on the properties as well as support federal organizations, state and local governments, and the private sector. States are responsible for setting up their own SHPO; therefore, each SHPO varies slightly on rules and regulations.

Stray voltage—Stray voltage is an extraneous voltage that appears on grounded surfaces in buildings, barns, and other structures, including utility distribution systems.

Stream Channel (Idaho)—By statute definition in Idaho, a natural water course of perceptible extent that has definite beds and banks, and which confines and conducts continuously flowing water. Only present channels are regulated under the stream alteration permit. Historic channels that no longer conduct continuously flowing water

are excluded from permit requirements. Continuously flowing water is defined as an amount of water capable of providing for the migration and movement of fish, but excludes those portions of streams that naturally go dry at the location of the alteration.

Stream channel alteration—Any activity that will obstruct, diminish, destroy, alter, modify, relocate or change the natural existing shape or direction of water flow of any stream channel.

Structure Variation—The proposed guyed structure variation would add four guy wires about 140 feet long from a point about 100 feet up in each tower to four guy anchors spaced in a square around the tower.

Substation—A fenced site containing switching and transformation equipment needed to transform one voltage to another and for protecting and controlling transmission and distribution lines. A substation is used to raise voltages for long distance transmission and to lower transmission voltages for distribution to the end users.

Sub-transmission Lines (69 kV; 138 kV; 161 kV)—Lines used for transmitting electrical energy between substations that are close to one another (up to approximately 100 miles). These lines will typically not carry as much energy as the extra-high voltage lines.

Summer or Spring-Summer-Fall range—A population or portion of a population of animals use the documented habitats within this range annually only (from the previous winter) to the onset of persistent winter conditions (variable, but commonly this period is between 5/1 and 11/30 or shorter in Wyoming). (5/1 – 11/14, adopted by WGFD in 2004) [Wyoming Chapter of Wildlife Society 1990]

Switches—Devices used to mechanically disconnect or isolate equipment; found on both sides of circuit breakers.

System reliability—The ability of a power system to provide uninterrupted service, even while that system is under stress.

Take—Harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, collecting, or attempting to engage in any such conduct toward a species listed under the ESA.

Talus—Rock debris that has accumulated at the base of a cliff or steep slope.

Tap—The point at which a transmission line is connected to a substation or other electrical device to provide service to a local load.

Temporary Use Permit—A permit given for temporary use of federally managed lands. A temporary use permit is typically issued for the construction of a project, followed by a special use permit or long-term right-of-way grant for the operation of the project.

Terrestrial—Occurring on land.

TES species—threatened and endangered species listed or candidates for listing under the federal Endangered Species Act (ESA) and those species listed by the BLM and the Forest Service as sensitive.

Threatened species—Those species officially listed by the U.S. Fish and Wildlife Service that are likely to become endangered within the foreseeable future throughout all or a significant portion of their range. [ESA §3(20)]

Total Maximum Daily Load (TMDL)—A quantitative assessment of water quality problems, contributing sources, and load reductions or control actions needed to restore and protect bodies of water.

Topsoil—The uppermost soil layer, generally ranging from a few inches to less than one foot in thickness. Topsoil is the site of greatest organic content, contains the most soil nutrients, and supports the greatest amount of plant life.

Track road—Unimproved dirt roads without surfacing or regular maintenance, generally 8 to 12 feet in width.

Traditional Cultural Property (TCP)—A property that is eligible for inclusion in the National Register of Historic Places because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community.

Transformers—Electrical equipment usually contained in a substation that is needed to change voltage on a transmission system.

Transmission line—A system of structures, wires, insulators, and associated hardware that carry electric energy from one point to another in an electric power system. Lines are operated at relatively high voltages varying from 69 kV up to 765 kV, and are capable of transmitting large quantities of electricity over long distances.

Trona—A monoclinic mineral, grayish or yellowish hydrous sodium carbonate and bicarbonate, $Na_2CO_3 \cdot NaHCO_3 \cdot 2H_2$, occurring in dried or partly evaporated lake basins.

Turbidity—The state or condition of opaqueness or reduced clarity of a fluid, due to the presence of suspended matter.

U.S. Department of Agriculture, Forest Service—A federal agency under the Department of Agriculture that manages 193 million acres of public land for multiple uses and benefits and for the sustained yield of renewable resources such as water, forage, wood, recreation, fish and wildlife habitat, wilderness areas, and archaeological, paleontological and historical sites.

USACE Jurisdictional Wetlands—Wetlands that are regulated by the USACE under Section 404 of the CWA. Areas must exhibit three characteristics of wetlands (hydrology, hydrophytes, and hydric soils) and must be navigable, or hydrologically connected to navigable waters, in order to be classified as jurisdictional wetlands (USACE 1987). It is important to understand that some areas that function as wetlands ecologically, but exhibit only one or two of the three wetland characteristics, do not currently qualify as USACE jurisdictional wetlands, and thus activities in these wetlands are not regulated under the Section 404 program. In addition, artificial water conveyance systems constructed within upland areas (such as agricultural drainage ditches or converted cropland) may develop some wetland characteristics overtime, however, these areas are not considered as jurisdictional wetlands, as long as they are

not located within historical wetland systems. Jurisdictional wetlands include **waters of the United States**.

Viewshed—As defined in the BLM Visual Resource Management Manual, viewshed refers to "the landscape that can be directly seen under favorable atmospheric conditions, from a viewpoint or along a transportation corridor."

Visual Contrast Rating (VCR)—A systematic process used by the Bureau of Land Management (BLM) to analyze potential visual impact of proposed projects and activities.

Visual Impact Assessment Point (VAP)—Specific locations where transmission facilities constructed along the alternative corridors would be visible.

Visual Quality Objective (VQO) (Forest Service)—Management standards that identify five degrees of alteration to the natural landscape based on the landscape's diversity of natural features and the public's concern for scenic quality.

Visual Resource Management (VRM) system (BLM)—The BLM system identifies four VRM Classes (I through IV) with specific management prescriptions for each class. The system is based on an inventory of the existing scenic quality, viewer sensitivity, and viewing distance zones. The management class for a given area is typically arrived at by comparing the scenic quality, visual sensitivity, and distance zone with the overall goals set forth for the area.

Volt—The international system unit of electric potential and electromotive force—a measure of electrical "pressure".

Voltage—The electrical potential difference between two points expressed in volts; the driving force that causes a current to flow in an electrical circuit.

Waters of the United States—Broadly defined by statute, regulation, and judicial interpretation to include all waters that were, are, or could be used in interstate commerce such as rivers, streams (including ephemeral streams), reservoirs, lakes, and adjacent wetlands. The USACE Wetlands Delineation Manual dated January 1987 (USACE 1987) and its current supplements must be used to determine if an area has sufficient wetland characteristics to be a water of the United States.

Watershed—The area that drains to a common waterway.

Weathering steel—A group of steel alloys developed to eliminate the need for painting (proposed for all H-frame structures).

West-wide Energy (WWE) Corridor—The designation of energy corridors, based on Section 368 of the Energy Policy Act of 2005, on federal lands in 11 western states, including Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

West-wide Energy Corridor Programmatic EIS—Considers 11 contiguous western states for the possible construction, operation, maintenance, and decommissioning and dismantling of energy infrastructure such as oil and gas pipelines and electric transmission lines. The states considered are Arizona, California, Colorado, Idaho,

Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming (www.corridoreis.anl.gov).

Wetlands—Defined for regulatory purposes as "Those areas that are inundated or saturated by surface or ground water (hydrology) at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation (hydrophytes) typically adapted for life in saturated soil conditions (hydric soils). Wetlands generally include swamps, marshes, bogs, and similar areas (33 CFR 328.3 and 40 CFR 232.2(r))."

Winter range—Areas that are used by animals, primarily big game, during winter months when forage is scarce and snow is often deep.

Winter/yearlong range—A population or a portion of a population of animals makes general use of the documented suitable habitat within this range on a year-round basis. But during the winter months (commonly between 12/1 and 4/30), there is a significant influx of additional animals into the area from other seasonal ranges. (11/15 – 4/30, adopted by WGFD in 2004).

Wire zone—A linear zone under the transmission wires, and extending 10 feet beyond them, maintained in vegetation cover less than 5 feet high.

Yearlong range— A population or portion of a population of animals makes general use of the suitable documented habitat within the range on a year round basis. Exception occasionally, under severe conditions (extremely severe winters, drought) animals may leave the area.

Zoning—Regulations used to guide growth and development; typically involve legally adopted restrictions on uses and building sites in specific geographic areas to regulate private land use.

INDEX

15 percent survey, 3.3-241
Area of Critical Environmental Concern (ACEC), 2-38, 2-97, 2-102, 2-105, 2-107, 3.2-177, 3.2-190, 3.3-276, 3.3-277, 3.17-38, 3.17-39, 3.17-126, 3.17-127, 3.17-128, 3.17-129, 3.17-133, 3.17-134, 3.17-135, 3.19-7, 3.19-29, 4-14, 4-15
Advisory Council on Historic Preservation (ACHP), 1-21, 1-22, 3.3-4, 3.3-6, 3.3-71, 5-6
Aeolus Substation, 2-2, 2-8, 2-13, 2-15, 2-22, 2-48, 2-49, 2-50, 2-51, 2-52, 2-53, 2-54, 2-55, 2-56, 2-57, 2-58, 2-116, 2-119, 2-120, 2-121, 2-122, 2-123, 3.2-22, 3.2-87, 3.2-96, 3.2-102, 3.3-88, 3.3-100, 3.4-47, 3.4-48, 3.4-49, 3.6-25, 3.6-28, 3.6-29, 3.7-32, 3.7-34, 3.7-36, 3.7-52, 3.8-15, 3.8-16, 3.8-17, 3.9-15, 3.9-17, 3.9-19, 3.10-51, 3.10-56, 3.10-60, 3.11-127, 3.11-130, 3.11-133, 3.12-16, 3.12-24, 3.12-25, 3.13-8, 3.13-13, 3.13-17, 3.14-15, 3.14-19, 3.14-20, 3.15-20, 3.15-21, 3.15-22, 3.17-24, 3.17-25, 3.17-58, 3.17-62, 3.17-66, 3.17-67, 3.17-71, 3.17-73, 3.18-25, 3.18-26, 3.18-28, 3.19-19, 3.19-20, 3.19-21, 4-40, 4-42
agriculture, 2-76, 2-77, 2-83, 2-86, 2-96, 2-97, 2-106, 2-107, 2-111, 2-143, 2-165, 2-177, 2-180, 2-183, 2-187, 2-189, 2-195, 2-196, 2-201, 2-204, 2-208, 2-211, 3.2-18, 3.2-41, 3.2-45, 3.2-47, 3.2-49, 3.2-50, 3.2-64, 3.2-66, 3.2-133, 3.2-160, 3.3-22, 3.3-55, 3.3-228, 3.4-38, 3.4-41, 3.4-42, 3.4-55, 3.6-1, 3.6-4, 3.6-20, 3.6-26, 3.6-27, 3.6-28, 3.6-29, 3.6-30, 3.6-31, 3.6-32, 3.6-33, 3.6-35, 3.6-36, 3.6-37, 3.6-38, 3.6-39, 3.6-40, 3.6-41, 3.6-42, 3.6-43, 3.6-44, 3.6-45, 3.6-47, 3.6-48, 3.6-49, 3.8-1, 3.8-7, 3.8-14, 3.8-19, 3.8-21, 3.10-2, 3.10-9, 3.10-14, 3.10-20, 3.10-23, 3.10-40, 3.10-44, 3.10-55, 3.10-64, 3.10-75, 3.10-83, 3.10-88, 3.10-94, 3.10-95, 3.10-96, 3.11-65, 3.11-145, 3.15-1, 3.15-7, 3.15-14, 3.17-4, 3.17-7, 3.17-17, 3.17-26, 3.17-58, 3.17-128, 3.17-137, 3.18-1, 3.18-2, 3.18-4, 3.18-5, 3.18-11, 3.18-12, 3.18-15, 3.18-23, 3.18-44, 3.21-21, 3.21-26, 4-13, 4-23, 4-53, 4-63, 4-66, 4-71, 4-92, 4-93
American Indian Religious Freedom Act (AIRFA), 1-21, 3.3-6, 3.3-7, 3.3-20
Aquatic Influence Zone (AIZ), 3.9-3, 3.9-22
alternative, 1-1, 1-4, 1-5, 1-6, 1-7, 1-18, 1-23, 1-31, 1-32, 1-41, 2-14, 2-17, 2-25, 2-26, 2-30, 2-39, 2-43, 2-49, 2-50, 2-51, 2-52, 2-53, 2-54, 2-55, 2-56, 2-57, 2-58, 2-59, 2-60, 2-61, 2-62, 2-65, 2-66, 2-67, 2-68, 2-69, 2-70, 2-71, 2-72, 2-73, 2-74, 2-75, 2-77, 2-78, 2-79, 2-80, 2-81, 2-82, 2-83, 2-84, 2-85, 2-86, 2-87, 2-88, 2-89, 2-90, 2-91, 2-92, 2-95, 2-96, 2-97, 2-98, 2-99, 2-100, 2-101, 2-102, 2-103, 2-104, 2-105, 2-106, 2-107, 2-108, 2-109, 2-110, 2-111, 2-118, 2-119, 2-123, 2-125, 2-128, 2-129, 2-139, 2-146, 2-147, 2-150, 2-164, 2-167, 2-168, 2-175, 2-178, 2-181, 2-184, 2-187, 2-190, 2-191, 2-197, 2-201, 2-205, 2-206, 2-207, 2-208, 2-209, 2-211, 3.1-4, 3.2-5, 3.2-21, 3.2-22, 3.2-27, 3.2-29, 3.2-43, 3.2-50, 3.2-56, 3.2-65, 3.2-66, 3.2-75, 3.2-79, 3.2-83, 3.2-84, 3.2-85, 3.2-87, 3.2-88, 3.2-94, 3.2-96, 3.2-102, 3.2-106, 3.2-115, 3.2-116, 3.2-117, 3.2-118, 3.2-119, 3.2-120, 3.2-122, 3.2-123, 3.2-124, 3.2-125, 3.2-126, 3.2-127, 3.2-131, 3.2-132, 3.2-133, 3.2-137, 3.2-138, 3.2-142, 3.2-143, 3.2-144, 3.2-145, 3.2-146, 3.2-149, 3.2-150, 3.2-151, 3.2-152, 3.2-154, 3.2-155, 3.2-157, 3.2-158, 3.2-160, 3.2-161, 3.2-162, 3.2-166, 3.2-167, 3.2-168, 3.2-169, 3.2-170, 3.2-174, 3.2-175, 3.2-179, 3.2-180, 3.2-183, 3.2-184, 3.2-185, 3.2-186, 3.2-187, 3.2-191, 3.2-193, 3.2-200, 3.2-201, 3.2-202, 3.3-18, 3.3-20, 3.3-27, 3.3-36, 3.3-47, 3.3-88, 3.3-100, 3.3-122, 3.3-154, 3.3-163, 3.3-239, 3.3-266, 3.3-270, 3.3-273, 3.3-275, 3.3-278, 3.4-64, 3.4-69, 3.4-71, 3.4-73, 3.5-7, 3.5-12, 3.6-15, 3.6-19, 3.6-25, 3.6-28, 3.6-30, 3.6-34, 3.6-35, 3.6-49, 3.7-32, 3.7-34, 3.7-36, 3.7-40, 3.7-43, 3.7-51, 3.8-10, 3.8-15, 3.8-16, 3.8-17, 3.8-19, 3.8-26, 3.9-2, 3.9-15, 3.9-17, 3.9-19, 3.9-23, 3.9-32, 3.10-7, 3.10-25, 3.10-38, 3.10-51, 3.10-57, 3.10-60, 3.10-64, 3.10-71, 3.10-72, 3.10-82, 3.10-83, 3.10-88, 3.10-89, 3.10-94, 3.11-18, 3.11-19, 3.11-51, 3.11-54, 3.11-61, 3.11-62, 3.11-68, 3.11-74, 3.11-75, 3.11-76, 3.11-77, 3.11-78, 3.11-79, 3.11-85, 3.11-87, 3.11-88, 3.11-89, 3.11-91, 3.11-94, 3.11-95, 3.11-96, 3.11-97, 3.11-98, 3.11-127, 3.11-130, 3.11-133, 3.11-134, 3.11-141, 3.11-145, 3.11-157, 3.11-159, 3.12-5, 3.12-16, 3.12-24, 3.12-25, 3.12-27, 3.12-29, 3.13-13, 3.13-16, 3.13-17, 3.13-18, 3.13-19, 3.13-22, 3.14-13, 3.14-15, 3.14-19, 3.14-20, 3.14-22, 3.14-26, 3.14-27, 3.15-14, 3.15-18, 3.15-20, 3.15-21, 3.15-22, 3.15-26, 3.15-27, 3.15-30, 3.15-32, 3.15-34, 3.17-47, 3.17-58, 3.17-59, 3.17-63, 3.17-65, 3.17-69, 3.17-70, 3.17-71, 3.17-74, 3.17-83, 3.17-89, 3.17-90, 3.17-91, 3.17-93, 3.17-96, 3.17-97, 3.17-101, 3.17-104, 3.17-111, 3.17-114, 3.17-117, 3.17-119, 3.17-128, 3.17-131, 3.17-133, 3.17-135, 3.17-136, 3.17-139, 3.18-23, 3.18-25, 3.18-27, 3.18-28, 3.18-32, 3.18-36, 3.18-42, 3.18-43, 3.19-3, 3.19-7, 3.19-20, 3.19-21, 3.19-22, 3.19-23, 3.19-24, 3.19-28, 3.19-29, 3.20-14, 3.20-16, 3.20-17, 3.21-4, 3.21-39, 3.21-46, 3.22-13, 3.23-19, 4-15, 4-19, 4-33, 4-39, 4-40, 4-41, 4-59, 4-60, 4-64, 4-66, 4-67, 4-76, 4-78, 4-81, 4-82, 4-88, 4-93, 4-95, 4-96, 5-1, 5-3, 5-4
amendment, 1-23, 2-26, 2-36, 2-38, 2-39, 2-49, 2-52, 2-53, 2-55, 2-58, 2-65, 2-73, 2-74, 2-75, 2-77, 2-78, 2-79, 2-82, 2-89, 2-90, 2-91, 2-92, 2-93, 2-94, 2-99, 2-100, 2-101, 2-102, 2-103, 2-106, 2-107, 2-108, 2-109, 2-110, 2-198, 2-201,

2-210, 3.2-86, 3.2-87, 3.2-95, 3.2-96, 3.2-100, 3.2-101, 3.2-103, 3.2-106, 3.2-107, 3.2-121, 3.2-122, 3.2-123, 3.2-131, 3.2-132, 3.2-155, 3.2-156, 3.2-157, 3.2-158, 3.2-159, 3.2-172, 3.2-173, 3.2-188, 3.2-189, 3.2-190, 3.3-264, 3.3-265, 3.3-266, 3.3-267, 3.3-268, 3.3-269, 3.3-270, 3.3-271, 3.3-272, 3.3-273, 3.3-274, 3.3-275, 3.3-276, 3.3-277, 3.4-27, 3.5-7, 3.7-19, 3.7-47, 3.7-51, 3.8-7, 3.9-7, 3.10-43, 3.10-48, 3.10-53, 3.10-58, 3.10-65, 3.10-68, 3.11-52, 3.11-53, 3.12-14, 3.13-10, 3.14-12, 3.15-12, 3.17-12, 3.17-60, 3.17-61, 3.17-68, 3.17-75, 3.17-80, 3.17-81, 3.17-90, 3.17-98, 3.17-99, 3.17-100, 3.17-102, 3.17-111, 3.17-112, 3.17-113, 3.17-116, 3.17-126, 3.17-127, 3.17-128, 3.18-11, 3.19-7, 3.19-21, 3.19-24, 3.19-26, 3.19-27, 3.19-28, 3.20-11, 3.21-13, 3.22-7, 3.23-6, 4-1, 4-8, 4-9, 4-10, 4-11, 4-12, 4-13, 4-14, 4-15, 4-16, 4-17, 4-18, 4-19, 4-37, 4-39, 4-91

Anticline Substation, 2-2, 2-9, 2-13, 2-15, 2-20, 2-22, 2-24, 2-58, 2-60, 2-61, 2-62, 2-63, 2-64, 2-116, 2-117, 2-119, 2-122, 2-123, 3.2-107, 3.2-108, 3.3-110, 3.3-112, 3.6-31, 3.6-32, 3.7-38, 3.7-39, 3.8-18, 3.9-20, 3.9-21, 3.10-65, 3.10-66, 3.11-136, 3.11-137, 3.12-25, 3.12-26, 3.13-18, 3.14-20, 3.14-21, 3.15-23, 3.15-24, 3.17-25, 3.17-77, 3.17-78, 3.17-79, 3.18-29, 3.18-30, 3.19-22, 3.19-23, 3.23-13, 3.23-16, 3.23-18, 4-27

Archaeological Resources Protection Act (ARPA), 1-21, 3.3-6, 3.3-7, 3.3-20

big game, 1-35, 1-40, 2-48, 2-49, 2-50, 2-51, 2-52, 2-54, 2-56, 2-57, 2-63, 2-64, 2-65, 2-70, 2-71, 2-72, 2-77, 2-81, 2-83, 2-84, 2-90, 2-108, 2-157, 2-175, 2-176, 2-178, 2-179, 2-181, 2-182, 2-184, 2-185, 2-186, 2-188, 2-190, 2-191, 2-193, 2-194, 2-199, 2-203, 3.10-2, 3.10-4, 3.10-6, 3.10-8, 3.10-10, 3.10-14, 3.10-19, 3.10-25, 3.10-26, 3.10-29, 3.10-41, 3.10-42, 3.10-44, 3.10-51, 3.10-54, 3.10-56, 3.10-57, 3.10-59, 3.10-60, 3.10-61, 3.10-63, 3.10-64, 3.10-65, 3.10-66, 3.10-67, 3.10-69, 3.10-70, 3.10-71, 3.10-72, 3.10-75, 3.10-77, 3.10-82, 3.10-83, 3.10-85, 3.10-87, 3.10-89, 3.10-90, 3.10-93, 3.10-94, 3.10-95, 3.10-96, 3.10-98, 3.10-99, 3.11-114, 3.17-15, 3.17-17, 3.21-26, 4-2, 4-67, 4-68

blasting, 1-36, 2-19, 2-141, 2-156, 2-167, 2-172, 2-174, 3.7-26, 3.9-7, 3.10-22, 3.10-31, 3.10-39, 3.10-99, 3.10-100, 3.12-15, 3.13-11, 3.14-3, 3.14-6, 3.14-7, 3.14-11, 3.14-12, 3.14-13, 3.14-14, 3.14-15, 3.14-19, 3.14-20, 3.14-21, 3.14-22, 3.14-23, 3.14-24, 3.14-25, 3.15-8, 3.15-14, 3.19-3, 3.22-11, 3.22-12, 3.23-3, 3.23-8, 3.23-9, 3.23-12

Boise District, 2-94, 2-198, 3.17-112, 3.17-127, 4-17, 4-18, 5-9, 5-10, 5-23

Borah Substation, 2-10, 2-13, 2-15, 2-22, 2-46, 2-66, 2-76, 2-78, 2-79, 2-80, 2-87, 2-123, 2-124, 2-208, 3.2-43, 3.2-44, 3.2-45, 3.2-124, 3.2-133, 3.3-163, 3.4-51, 3.6-35, 3.7-43, 3.8-19, 3.9-23, 3.10-72, 3.11-141, 3.12-26, 3.13-1, 3.13-19, 3.14-1, 3.14-22, 3.15-26, 3.17-5, 3.17-26, 3.17-88, 3.17-90, 3.17-92, 3.17-93, 3.18-31, 3.19-24

Bonneville Power Administration (BPA), 3.3-40, 3.4-57, 3.21-4

Bruneau FO, 3.2-70, 3.2-77, 3.3-276, 3.3-277, 3.17-19, 3.17-39

Bruneau MFP, 1-23, 2-41, 2-103, 3.2-188, 3.2-189, 3.2-190, 3.3-277, 3.10-90, 3.17-19, 3.17-38, 3.17-125, 3.17-133, 4-19, 4-91

Burley FO, 3.2-56, 3.2-61, 3.2-70, 3.3-272, 3.3-276, 3.3-277, 3.17-17, 3.17-27, 4-14

capacity, 1-1, 1-4, 1-8, 1-9, 1-10, 1-12, 1-13, 1-14, 1-16, 2-26, 2-53, 2-123, 3.4-21, 3.4-28, 3.4-39, 3.8-1, 3.10-21, 3.10-48, 3.15-8, 3.15-9, 3.17-10, 3.17-52, 3.19-14, 3.19-22, 4-30, 4-45, 4-47, 4-48, 4-50, 4-92

Caribou Forest Plan, 1-4, 2-34, 2-65, 3.3-270, 3.6-21, 3.6-22, 3.6-24, 3.6-34, 3.9-7, 3.10-9, 3.10-70, 3.11-7, 3.11-48, 3.11-52, 3.11-122, 3.11-123, 3.17-12, 3.17-13, 3.17-32, 3.17-80, 3.17-106, 3.19-6, 4-88

Caribou-Targhee NF, 1-4, 1-5, 2-63, 2-64, 2-70, 2-82, 2-89, 3.2-8, 3.2-29, 3.2-30, 3.2-33, 3.2-34, 3.2-41, 3.2-43, 3.2-112, 3.2-113, 3.2-114, 3.2-121, 3.3-267, 3.3-270, 3.4-44, 3.6-20, 3.6-21, 3.6-22, 3.6-33, 3.6-34, 3.6-41, 3.8-19, 3.9-3, 3.9-21, 3.9-22, 3.9-23, 3.10-9, 3.10-13, 3.10-66, 3.10-70, 3.10-77, 3.10-82, 3.11-11, 3.11-23, 3.11-48, 3.11-50, 3.11-59, 3.11-121, 3.11-122, 3.11-123, 3.11-138, 3.14-21, 3.15-6, 3.15-25, 3.17-12, 3.17-25, 3.17-27, 3.17-35, 3.17-56, 3.17-80, 3.19-5, 3.19-15, 3.19-23, 3.19-24, 4-12, 4-35, 4-36, 4-57, 4-91

Casper FO, 2-53, 3.2-19, 3.2-23, 3.2-95, 3.3-264, 3.3-265, 3.17-14, 3.17-43, 4-8

Casper RMP, 1-22, 2-48, 2-53, 3.2-95, 3.2-100, 3.3-264, 3.3-265, 3.6-23, 3.6-25, 3.17-14, 3.17-30, 3.17-61, 3.17-68, 4-8, 4-88

Cassia RMP, 1-22, 1-32, 2-36, 2-82, 2-90, 2-91, 3.2-156, 3.2-157, 3.2-158, 3.2-159, 3.3-272, 3.6-23, 3.6-24, 3.17-17, 3.17-34, 3.17-35, 3.17-38, 3.17-39, 3.17-90, 3.17-91, 3.17-94, 3.17-98, 3.17-99, 3.17-113, 3.17-138, 4-13, 4-89

Cedar Hill Substation, 1-14, 2-2, 2-10, 2-12, 2-13, 2-15, 2-22, 2-81, 2-85, 2-86, 2-91, 2-92, 2-93, 2-103, 2-110, 2-111, 2-115, 2-118, 2-119, 2-123, 2-124, 2-171, 2-191, 2-196, 2-208, 2-209, 3.2-47, 3.2-50, 3.2-56, 3.2-61, 3.2-134, 3.2-153, 3.2-162, 3.2-175, 3.2-192, 3.3-166, 3.3-216, 3.3-237, 3.3-247, 3.4-52, 3.4-53, 3.6-38, 3.6-40, 3.6-42, 3.6-46, 3.6-48, 3.7-44, 3.7-49, 3.7-51, 3.8-21, 3.8-24, 3.8-26, 3.9-25, 3.9-27, 3.9-29, 3.9-31, 3.10-76, 3.10-78, 3.10-79, 3.10-80, 3.10-81, 3.10-82, 3.10-89, 3.10-95, 3.11-70, 3.11-87, 3.11-123, 3.11-145, 3.11-147, 3.11-148, 3.11-149, 3.11-152, 3.11-156, 3.12-19, 3.12-22, 3.12-27, 3.12-28, 3.12-29, 3.13-16, 3.13-20, 3.13-21, 3.13-22, 3.14-18, 3.14-23, 3.14-25,

3.15-27, 3.15-30, 3.15-32, 3.17-6, 3.17-26, 3.17-96, 3.17-97, 3.17-103, 3.17-123, 3.17-137, 3.17-138, 3.18-2, 3.18-16, 3.18-34, 3.18-35, 3.18-36, 3.18-37, 3.18-40, 3.18-42, 3.18-46, 3.19-19, 3.19-25, 3.19-28, 3.19-29, 3.20-21, 3.23-15, 3.23-18

City of Rocks, 1-1, 2-92, 2-191, 3.2-3, 3.2-8, 3.2-9, 3.2-10, 3.2-11, 3.2-53, 3.2-56, 3.2-57, 3.2-58, 3.2-59, 3.2-60, 3.2-62, 3.2-160, 3.2-162, 3.3-57, 3.3-60, 3.3-67, 3.3-82, 3.3-184, 3.3-186, 3.3-187, 3.17-36, 4-58

compensatory mitigation, 2-210, 3.3-279, 3.7-33, 3.7-35, 3.7-37, 3.7-38, 3.7-39, 3.9-10, 3.9-11, 3.9-12, 3.9-13, 3.9-33, 3.11-17, 3.11-18, 3.11-68, 3.11-71, 3.11-72, 4-66

Core Area, 2-48, 2-53, 2-58, 2-65, 2-69, 2-72, 2-73, 2-74, 2-75, 2-178, 2-186, 2-206, 2-207, 3.11-19, 4-57

cost estimate, 3.4-40

county, 1-19, 1-20, 2-51, 2-55, 2-64, 2-81, 2-88, 2-92, 2-99, 2-119, 2-144, 2-149, 2-150, 2-151, 2-169, 2-171, 2-208, 3.2-9, 3.2-13, 3.3-63, 3.3-70, 3.3-73, 3.3-280, 3.4-2, 3.4-3, 3.4-4, 3.4-8, 3.4-9, 3.4-10, 3.4-12, 3.4-14, 3.4-16, 3.4-17, 3.4-19, 3.4-20, 3.4-21, 3.4-24, 3.4-25, 3.4-26, 3.4-32, 3.4-33, 3.4-47, 3.4-55, 3.4-59, 3.4-61, 3.4-62, 3.4-63, 3.4-64, 3.4-66, 3.4-68, 3.4-69, 3.4-70, 3.4-77, 3.4-78, 3.5-4, 3.5-6, 3.6-18, 3.6-51, 3.7-2, 3.7-5, 3.7-9, 3.8-1, 3.8-2, 3.8-3, 3.8-4, 3.8-5, 3.8-9, 3.15-4, 3.17-3, 3.17-4, 3.17-5, 3.17-6, 3.17-8, 3.17-11, 3.17-40, 3.17-43, 3.17-45, 3.17-46, 3.17-50, 3.17-54, 3.17-57, 3.17-86, 3.17-140, 3.18-4, 3.19-1, 3.19-5, 3.19-7, 3.19-12, 3.19-13, 3.19-14, 3.19-25, 3.23-1, 4-25, 4-54, 4-61, 4-65, 4-94

critical habitat, 1-21, 1-40, 3.7-8, 3.7-46, 3.11-2, 3.11-5, 3.11-6, 3.11-21, 3.11-22, 3.11-23, 3.11-24, 3.11-25, 3.11-33, 3.11-37, 3.11-39, 3.11-43, 3.11-77, 3.11-78, 3.11-85, 4-6, 4-74, 4-82

Conservation Reserve Program (CRP), 2-171, 2-177, 2-180, 2-183, 2-186, 2-189, 2-196, 2-200, 2-204, 3.17-24, 3.18-1, 3.18-4, 3.18-5, 3.18-10, 3.18-13, 3.18-14, 3.18-15, 3.18-17, 3.18-24, 3.18-25, 3.18-26, 3.18-27, 3.18-29, 3.18-31, 3.18-33, 3.18-34, 3.18-37, 3.18-38, 3.18-40, 3.18-42, 3.18-43, 3.18-46, 4-92

crucial range, 2-50

cumulative effects, 1-31, 1-32, 1-41, 2-26, 2-210, 3.1-1, 3.1-2, 3.1-5, 3.3-71, 3.4-46, 4-1, 4-2, 4-8, 4-9, 4-10, 4-11, 4-12, 4-14, 4-16, 4-19, 4-20, 4-24, 4-25, 4-27, 4-29, 4-30, 4-36, 4-37, 4-39, 4-44, 4-49, 4-51, 4-60, 4-61, 4-63, 4-64, 4-66, 4-67, 4-71, 4-72, 4-73, 4-74, 4-75, 4-76, 4-77, 4-78, 4-81, 4-82, 4-83, 4-84, 4-86, 4-87, 4-91, 4-92, 4-95

Clean Water Act (CWA), 1-3, 1-5, 1-6, 1-18, 1-19, 2-1, 2-144, 2-155, 2-175, 3.9-1, 3.9-2, 3.9-4, 3.9-11, 3.9-15, 3.9-33, 3.10-37, 3.10-39, 3.15-3, 3.15-35, 3.18-3, 4-66

Design Variation, 1-25, 2-2, 2-14, 2-15, 2-20, 2-24, 3.1-1, 3.1-3, 3.1-4, 3.2-81, 3.2-193, 3.2-194, 3.2-195, 3.2-196, 3.2-197, 3.2-198, 3.2-199, 3.3-69, 3.3-278, 3.4-27, 3.4-73, 3.5-7, 3.5-12, 3.5-13, 3.6-10, 3.6-49, 3.6-50, 3.7-19, 3.7-51, 3.7-52, 3.7-53, 3.7-54, 3.8-7, 3.8-26, 3.9-6, 3.9-15, 3.9-32, 3.10-18, 3.10-96, 3.11-157, 3.12-14, 3.12-23, 3.12-29, 3.12-30, 3.12-31, 3.13-10, 3.13-22, 3.13-23, 3.14-12, 3.14-25, 3.14-26, 3.15-12, 3.15-32, 3.15-33, 3.17-47, 3.17-139, 3.18-10, 3.18-43, 3.18-44, 3.19-6, 3.19-29, 3.20-11, 3.20-17, 3.20-22, 3.20-23, 3.21-13, 3.21-38, 3.21-39, 3.21-41, 3.21-42, 3.21-44, 3.21-46, 3.21-47, 3.22-6, 3.22-13, 3.23-6, 3.23-18, 3.23-19, 4-1

distribution line, 2-12, 2-126, 2-149, 3.2-40, 3.2-42, 3.2-47, 3.2-49, 3.2-63, 3.2-64, 3.2-66, 3.2-117, 3.2-118, 3.3-72, 3.3-238, 3.3-280, 3.10-36, 3.11-20, 3.11-69, 3.11-72, 3.11-87, 3.11-123, 3.21-8, 3.21-22, 3.22-11, 4-95

eagle, 2-51, 2-76, 2-79, 2-162, 2-181, 2-210, 3.10-5, 3.10-7, 3.10-9, 3.10-16, 3.10-17, 3.10-52, 3.10-56, 3.10-60, 3.10-61, 3.10-62, 3.10-65, 3.10-67, 3.10-68, 3.10-73, 3.10-79, 3.10-84, 3.10-91, 3.10-95, 3.11-7, 3.11-12, 3.11-40, 3.11-41, 3.11-57, 3.11-69, 3.11-85, 3.11-86, 3.11-87, 3.11-88, 3.11-111, 3.11-120, 3.11-127, 3.11-130, 3.11-131, 3.11-133, 3.11-134, 3.11-137, 3.11-141, 3.11-156, 3.11-157, 3.11-161, 4-3, 4-72

easement, 1-6, 1-24, 2-71, 2-149, 2-190, 3.3-73, 3.3-280, 3.4-19, 3.4-41, 3.4-43, 3.4-55, 3.4-56, 3.17-10, 3.17-53, 3.17-54, 3.18-11, 3.18-17, 4-24

ecoregion, 3.3-20, 3.3-21, 3.3-22, 3.3-23, 3.3-24, 3.3-25, 3.9-13

elk, 2-97, 2-159, 3.6-7, 3.10-6, 3.10-11, 3.10-14, 3.10-27, 3.10-28, 3.10-41, 3.10-51, 3.10-54, 3.10-59, 3.10-60, 3.10-61, 3.10-63, 3.10-64, 3.10-66, 3.10-69, 3.10-71, 3.10-72, 3.10-75, 3.10-77, 3.10-82, 3.10-83, 3.10-85, 3.10-87, 3.10-89, 3.21-26, 4-68, 4-69

electric and magnetic fields (EMF), 1-39, 3.4-56, 3.21-1, 3.21-7, 3.21-8, 3.21-12, 3.21-20, 3.21-23, 3.21-24, 3.21-25, 3.21-26, 3.21-27, 3.21-47, 3.22-1, 4-53

employment, 1-27, 3.4-4, 3.4-9, 3.4-10, 3.4-11, 3.4-12, 3.4-13, 3.4-14, 3.4-15, 3.4-27, 3.4-31, 3.4-33, 3.4-35, 3.4-36, 3.4-38, 3.4-43, 3.4-44, 3.4-45, 3.4-49, 3.4-50, 3.4-59, 3.4-62, 3.4-67, 3.4-77, 3.4-78, 3.4-79, 3.4-80, 3.5-8, 3.5-9, 3.18-11, 3.18-17, 4-60

environmental justice, 2-210, 3.5-1, 3.5-7, 4-3, 4-52

Executive Order (EO), 1-18, 2-60, 2-69, 2-71, 2-178, 2-181, 2-184, 2-206, 2-207, 2-208, 3.3-7, 3.3-20, 3.5-1, 3.8-2, 3.9-2, 3.10-5, 3.10-22, 3.11-19, 3.18-3, 4-45, 4-47, 4-48, 4-56, 4-57, 4-59, 4-78, 4-79, 4-93

EO 13007, 3.3-7

EO 13175, 3.3-7, 3.3-20
EO 2011-5, 2-60, 2-69, 2-71, 2-178, 2-181, 2-184, 2-206, 2-207, 3.11-19, 4-45, 4-47, 4-48, 4-56, 4-57, 4-59, 4-78, 4-79, 4-93
environmental protection measure (EPM), 2-143, 3.3-69, 3.7-21, 3.7-26, 3.7-40, 3.8-13, 3.10-22, 3.10-49, 3.11-58, 3.11-62, 3.11-77, 3.11-82, 3.11-86, 3.11-88, 3.11-89, 3.11-94, 3.11-96, 3.11-98, 3.11-101, 3.11-102, 3.11-103, 3.11-104, 3.11-106, 3.11-121, 3.11-126, 3.14-21, 3.14-22, 3.17-53, 3.19-14, 3.19-16, 3.19-17, 3.20-13
erosion, 1-36, 2-150, 2-151, 2-155, 2-156, 2-167, 2-168, 2-169, 2-172, 2-213, 3.2-1, 3.2-18, 3.3-103, 3.3-117, 3.3-130, 3.3-144, 3.3-145, 3.3-165, 3.3-179, 3.3-186, 3.3-201, 3.3-226, 3.4-40, 3.4-41, 3.4-43, 3.6-12, 3.6-14, 3.6-18, 3.6-51, 3.6-52, 3.7-20, 3.8-7, 3.8-10, 3.9-1, 3.9-3, 3.9-9, 3.9-10, 3.9-12, 3.9-15, 3.9-16, 3.9-22, 3.9-25, 3.10-13, 3.10-38, 3.10-43, 3.10-49, 3.10-99, 3.11-61, 3.11-76, 3.11-78, 3.11-80, 3.11-81, 3.11-95, 3.11-112, 3.11-115, 3.11-120, 3.14-13, 3.15-1, 3.15-3, 3.15-4, 3.15-6, 3.15-8, 3.15-10, 3.15-13, 3.15-14, 3.15-15, 3.15-17, 3.15-18, 3.15-19, 3.15-20, 3.15-23, 3.15-24, 3.15-25, 3.15-26, 3.15-27, 3.15-28, 3.15-29, 3.15-30, 3.15-31, 3.15-32, 3.15-35, 3.17-15, 3.18-11, 3.18-14, 3.19-13, 3.19-30, 4-65, 4-72, 4-86
Endangered Species Act (ESA), 1-21, 2-144, 2-161, 2-175, 3.7-1, 3.7-2, 3.7-3, 3.7-5, 3.7-8, 3.7-9, 3.7-18, 3.7-20, 3.7-21, 3.7-22, 3.7-23, 3.7-24, 3.7-25, 3.7-27, 3.7-32, 3.7-34, 3.7-36, 3.7-38, 3.7-39, 3.7-43, 3.7-44, 3.7-45, 3.7-46, 3.7-49, 3.7-51, 3.10-1, 3.10-4, 3.10-6, 3.11-1, 3.11-4, 3.11-5, 3.11-6, 3.11-7, 3.11-12, 3.11-15, 3.11-17, 3.11-18, 3.11-20, 3.11-21, 3.11-22, 3.11-23, 3.11-24, 3.11-25, 3.11-26, 3.11-29, 3.11-31, 3.11-32, 3.11-34, 3.11-35, 3.11-36, 3.11-37, 3.11-39, 3.11-40, 3.11-43, 3.11-44, 3.11-45, 3.11-46, 3.11-48, 3.11-51, 3.11-54, 3.11-55, 3.11-64, 3.11-70, 3.11-71, 3.11-72, 3.11-74, 3.11-76, 3.11-77, 3.11-79, 3.11-80, 3.11-81, 3.11-82, 3.11-83, 3.11-85, 3.11-92, 3.11-100, 3.11-116, 3.11-117, 3.11-157, 3.11-160, 3.12-4, 4-78
ethnographic, 3.3-8, 3.3-11, 3.3-16, 3.3-20, 3.3-25, 3.3-26, 3.3-31, 5-7, 5-8
fiber optic, 1-26, 2-1, 2-4, 2-11, 2-34, 2-54, 2-140, 2-142, 3.3-27, 3.23-6
fly yard, 1-25, 1-26, 2-140, 2-141, 2-150, 2-151, 2-168, 2-169, 2-177, 3.1-5, 3.2-193, 3.2-199, 3.3-5, 3.3-19, 3.3-278, 3.4-73, 3.4-74, 3.5-12, 3.5-13, 3.6-1, 3.6-18, 3.6-20, 3.6-22, 3.6-26, 3.6-27, 3.6-28, 3.6-29, 3.6-30, 3.6-31, 3.6-32, 3.6-33, 3.6-35, 3.6-36, 3.6-37, 3.6-38, 3.6-40, 3.6-42, 3.6-44, 3.6-45, 3.6-47, 3.6-49, 3.6-50, 3.6-52, 3.7-1, 3.7-51, 3.7-52, 3.8-10, 3.8-26, 3.8-27, 3.9-1, 3.9-4, 3.9-9, 3.9-32, 3.10-2, 3.10-19, 3.10-22, 3.10-42, 3.10-96, 3.10-97, 3.11-2, 3.11-54, 3.11-65, 3.11-94, 3.11-105, 3.11-157, 3.11-158, 3.12-5, 3.12-19, 3.12-24, 3.12-29, 3.12-31, 3.13-22, 3.13-23, 3.14-3, 3.14-26, 3.15-15, 3.15-17, 3.15-20, 3.15-32, 3.15-33, 3.17-1, 3.17-22, 3.17-50, 3.17-51, 3.17-139, 3.17-140, 3.18-1, 3.18-43, 3.18-44, 3.19-7, 3.19-29, 3.19-30, 3.20-17, 3.20-22, 3.21-46, 3.21-47, 3.22-13, 3.22-14, 3.23-7, 3.23-10, 3.23-19, 4-2, 4-43
Field Office (FO), 2-20, 2-41, 2-66, 2-67, 2-71, 2-99, 2-147, 3.2-3, 3.2-29, 3.2-46, 3.2-56, 3.2-61, 3.2-63, 3.2-65, 3.2-67, 3.2-70, 3.2-75, 3.2-155, 3.2-158, 3.2-202, 3.3-9, 3.3-17, 3.3-29, 3.3-34, 3.3-38, 3.3-240, 3.3-247, 3.3-267, 3.3-268, 3.3-272, 3.3-274, 3.3-275, 3.3-276, 3.6-22, 3.7-3, 3.7-19, 3.8-2, 3.10-37, 3.10-68, 3.15-4, 3.17-14, 3.17-15, 3.17-16, 3.17-17, 3.17-18, 3.17-19, 3.17-20, 3.17-27, 3.17-35, 3.17-36, 3.17-39, 3.17-42, 3.17-43, 3.17-79, 3.17-80, 3.18-6, 4-8, 4-11, 4-12, 4-14, 4-16, 4-17, 4-18, 4-19, 4-37, 4-38, 4-74
Forest Plan, 1-4, 1-5, 1-4, 1-22, 1-32, 1-41, 2-27, 2-34, 2-35, 2-63, 2-91, 2-92, 2-93, 2-146, 2-155, 2-156, 2-169, 3.2-3, 3.2-8, 3.2-87, 3.2-94, 3.2-95, 3.2-101, 3.2-121, 3.2-159, 3.2-160, 3.2-161, 3.3-265, 3.3-266, 3.3-272, 3.3-273, 3.6-2, 3.6-21, 3.6-24, 3.6-34, 3.8-2, 3.9-11, 3.9-33, 3.10-6, 3.10-32, 3.10-39, 3.10-43, 3.10-48, 3.10-100, 3.11-7, 3.11-48, 3.11-76, 3.11-122, 3.12-4, 3.15-6, 3.15-13, 3.17-12, 3.17-13, 3.17-22, 3.17-27, 3.17-29, 3.17-32, 3.17-35, 3.17-49, 3.17-60, 3.17-68, 3.17-80, 3.17-101, 3.17-102, 3.17-106, 3.18-3, 3.19-3, 3.19-7, 3.19-12, 3.19-21, 3.19-24, 3.19-26, 4-1, 4-9, 4-12, 4-14, 4-87, 4-88, 4-89, 4-91
Forest Service, 1-1, 1-4, 1-5, 1-16, 1-17, 1-18, 1-19, 1-20, 1-22, 1-23, 1-32, 1-36, 1-41, 2-1, 2-25, 2-26, 2-55, 2-63, 2-64, 2-70, 2-82, 2-147, 2-151, 2-154, 2-168, 2-169, 2-176, 2-177, 2-178, 2-179, 2-182, 2-185, 2-186, 2-188, 2-189, 2-193, 2-194, 2-195, 2-196, 2-199, 2-200, 2-203, 2-204, 3.2-1, 3.2-2, 3.2-3, 3.2-5, 3.2-7, 3.2-8, 3.2-12, 3.2-14, 3.2-17, 3.2-33, 3.2-34, 3.2-61, 3.2-85, 3.2-86, 3.2-87, 3.2-94, 3.2-100, 3.2-101, 3.2-109, 3.2-112, 3.2-114, 3.2-120, 3.2-131, 3.2-141, 3.2-142, 3.2-144, 3.2-145, 3.2-147, 3.2-148, 3.2-149, 3.2-152, 3.2-153, 3.2-155, 3.2-159, 3.2-171, 3.2-187, 3.2-192, 3.2-201, 3.3-5, 3.3-16, 3.3-71, 3.3-280, 3.4-18, 3.4-43, 3.4-44, 3.6-2, 3.6-15, 3.6-16, 3.6-18, 3.6-20, 3.6-21, 3.6-23, 3.6-24, 3.6-33, 3.6-34, 3.6-41, 3.6-50, 3.6-52, 3.7-1, 3.7-2, 3.7-3, 3.7-4, 3.7-5, 3.7-9, 3.7-10, 3.7-11, 3.7-12, 3.7-18, 3.7-20, 3.7-26, 3.7-27, 3.8-2, 3.8-3, 3.8-4, 3.8-11, 3.8-12, 3.8-27, 3.8-28, 3.9-3, 3.10-1, 3.10-4, 3.10-5, 3.10-6, 3.10-7, 3.10-8, 3.10-17, 3.10-25, 3.10-35, 3.10-36, 3.10-48, 3.10-51, 3.10-53, 3.10-58, 3.10-70, 3.11-1, 3.11-2, 3.11-4, 3.11-5, 3.11-6, 3.11-7, 3.11-11, 3.11-20, 3.11-22, 3.11-23, 3.11-24, 3.11-26, 3.11-29, 3.11-31, 3.11-32, 3.11-34, 3.11-39, 3.11-40, 3.11-41, 3.11-42, 3.11-43, 3.11-44, 3.11-45, 3.11-46, 3.11-47, 3.11-48, 3.11-49, 3.11-50, 3.11-51,

3.11-53, 3.11-54, 3.11-58, 3.11-59, 3.11-60, 3.11-61, 3.11-63, 3.11-73, 3.11-74, 3.11-76, 3.11-78, 3.11-82, 3.11-85, 3.11-88, 3.11-89, 3.11-91, 3.11-95, 3.11-96, 3.11-97, 3.11-99, 3.11-101, 3.11-102, 3.11-103, 3.11-104, 3.11-105, 3.11-106, 3.11-109, 3.11-110, 3.11-111, 3.11-113, 3.11-114, 3.11-115, 3.11-116, 3.11-117, 3.11-118, 3.11-120, 3.11-122, 3.11-125, 3.11-126, 3.11-138, 3.11-157, 3.12-3, 3.12-4, 3.13-2, 3.14-3, 3.15-3, 3.15-4, 3.15-6, 3.15-7, 3.15-17, 3.15-25, 3.15-34, 3.17-12, 3.17-13, 3.17-14, 3.17-17, 3.17-22, 3.17-27, 3.17-28, 3.17-40, 3.17-41, 3.17-42, 3.17-48, 3.17-49, 3.17-52, 3.17-54, 3.17-56, 3.17-80, 3.17-101, 3.17-102, 3.18-6, 3.18-7, 3.18-8, 3.18-17, 3.19-3, 3.19-7, 3.19-15, 3.19-16, 3.19-21, 3.19-24, 3.19-26, 3.22-9, 4-2, 4-3, 4-6, 4-7, 4-8, 4-35, 4-39, 4-45, 4-52, 4-72, 4-73, 4-75, 4-76, 4-77, 4-81, 4-82, 4-83, 4-84, 4-87, 5-1, 5-3, 5-13, 5-17, 5-23

forested wetlands, 3.6-9, 3.9-3, 3.9-8, 3.9-16, 3.9-18, 3.9-19, 3.9-21, 3.9-22, 3.9-23, 3.9-24, 3.9-28, 3.9-31, 3.9-32, 3.10-24, 3.10-44, 3.11-16

Fort Hall Indian Reservation, 1-17, 2-76, 2-79, 2-187, 2-208, 3.2-43, 3.2-44, 3.2-87, 3.2-125, 3.2-128, 3.2-129, 3.2-132, 3.2-133, 3.3-163, 3.3-270, 3.3-272, 3.5-4, 3.5-10, 3.5-11, 3.6-35, 3.7-43, 3.8-19, 3.9-23, 3.10-72, 3.11-141, 3.12-27, 3.13-19, 3.14-22, 3.15-26, 3.17-21, 3.17-28, 3.17-88, 3.17-89, 3.17-91, 3.18-31, 3.19-24, 4-58

grazing, 1-37, 1-38, 1-40, 2-40, 2-150, 3.2-18, 3.2-60, 3.3-21, 3.3-22, 3.3-23, 3.3-108, 3.4-38, 3.4-39, 3.6-4, 3.6-11, 3.7-19, 3.8-7, 3.8-9, 3.10-16, 3.10-23, 3.11-9, 3.11-32, 3.11-34, 3.11-49, 3.11-72, 3.17-1, 3.17-7, 3.17-8, 3.17-12, 3.17-13, 3.17-15, 3.17-17, 3.17-18, 3.17-19, 3.17-20, 3.18-1, 3.18-3, 3.18-6, 3.18-12, 3.18-17, 3.18-25, 3.19-2, 3.21-26, 4-55, 4-63, 4-65, 4-67, 4-71, 4-73, 4-78, 4-86, 4-92, 4-93

Green River RMP, 1-22, 2-28, 2-65, 3.2-121, 3.3-267, 3.6-24, 3.10-48, 3.10-65, 3.10-68, 3.11-52, 3.11-67, 3.11-90, 3.11-106, 3.11-107, 3.17-15, 3.17-32, 3.17-77, 3.17-78, 3.17-81, 4-10

Hemingway Substation, 1-1, 1-15, 2-1, 2-2, 2-11, 2-12, 2-13, 2-15, 2-22, 2-23, 2-93, 2-94, 2-95, 2-100, 2-102, 2-103, 2-105, 2-118, 2-124, 3.1-3, 3.2-2, 3.2-162, 3.2-175, 3.3-187, 3.3-216, 3.4-2, 3.4-52, 3.4-53, 3.4-71, 3.6-43, 3.6-46, 3.7-45, 3.7-49, 3.8-23, 3.8-24, 3.9-28, 3.9-29, 3.10-84, 3.10-89, 3.11-150, 3.11-152, 3.12-28, 3.13-21, 3.14-24, 3.15-29, 3.15-30, 3.17-7, 3.17-26, 3.17-109, 3.17-115, 3.17-123, 3.17-131, 3.18-2, 3.18-38, 3.18-40, 3.19-27, 3.19-28, 3.23-11, 4-18, 4-40

Heward Substation, 1-14, 2-8, 2-13, 2-15, 2-22, 2-122, 3.2-96, 3.6-28, 3.7-34, 3.8-16, 3.9-17, 3.10-57, 3.12-24, 3.14-19, 3.15-21, 3.17-4, 3.18-27, 3.19-20

H-frame, 2-4, 2-5, 2-6, 2-48, 2-53, 2-54, 2-55, 2-118, 2-125, 2-126, 2-128, 2-129, 2-130, 2-131, 2-140, 2-141, 2-146, 2-147, 2-161, 3.2-83, 3.2-105, 3.2-106, 3.2-107, 3.2-155, 3.2-202, 3.3-73, 3.3-98, 3.3-103, 3.3-104, 3.3-105, 3.3-107, 3.3-109, 3.3-110, 3.3-111, 3.3-112, 3.3-130, 3.3-133, 3.3-143, 3.3-144, 3.3-145, 3.3-146, 3.3-151, 3.3-158, 3.3-160, 3.3-164, 3.3-173, 3.3-182, 3.3-188, 3.3-189, 3.3-190, 3.3-191, 3.3-195, 3.3-196, 3.3-200, 3.3-201, 3.3-202, 3.3-204, 3.3-205, 3.3-207, 3.3-208, 3.3-209, 3.3-210, 3.3-217, 3.3-219, 3.3-220, 3.3-231, 3.3-232, 3.3-233, 3.3-237, 3.3-238, 3.4-42, 3.4-43, 3.10-36, 3.10-97, 3.11-58, 3.11-157, 3.11-158, 3.17-66, 3.17-67, 3.21-5, 3.21-14, 3.21-15, 3.21-18, 3.21-28, 3.21-33, 3.22-11, 4-8, 4-43, 4-57

Idaho Falls District, 3.3-10, 5-10, 5-23

Idaho State Office, 2-201, 3.13-6, 5-10, 5-11, 5-11, 5-23

Idaho Army National Guard (IDANG), 1-3, 2-94, 2-99, 2-101, 2-170, 2-197, 2-209, 3.7-8, 3.17-19, 3.17-106, 3.17-116, 3.17-119, 3.17-133, 3.17-141

Idaho Department of Fish and Game (IDFG), 3.2-40, 3.2-50, 3.2-65, 3.2-137, 3.2-174, 3.10-6, 3.10-8, 3.10-14, 3.11-3, 3.11-8, 3.11-11, 3.11-14, 3.11-16, 3.11-17, 3.11-27, 3.11-43, 3.11-47, 3.17-22, 3.17-28, 4-5, 5-3, 5-9

Impact Value, 3.3-241, 3.3-243, 3.3-244, 3.3-247

invasive species, 2-150, 2-156, 3.6-24, 3.7-20, 3.8-1, 3.8-2, 3.8-5, 3.8-8, 3.8-9, 3.8-10, 3.8-13, 3.8-14, 3.10-16, 3.10-22, 3.10-24, 3.10-39, 3.10-40, 3.10-100, 3.11-9, 3.11-61, 3.11-100, 4-63, 4-64, 4-66, 4-72, 4-73, 4-86

Jarbidge FO, 3.2-65, 3.2-70, 3.2-74, 3.2-77, 3.3-274, 3.3-276, 3.17-18, 4-16

Jarbidge RMP, 1-22, 2-37, 2-38, 2-99, 2-107, 3.2-171, 3.2-172, 3.2-188, 3.2-189, 3.2-190, 3.3-274, 3.3-276, 3.6-23, 3.6-24, 3.17-18, 3.17-19, 3.17-36, 3.17-111, 3.17-127, 3.17-128, 3.19-7, 3.19-28, 4-15, 4-16, 4-89, 4-90

Jim Bridger 230-kV Substation, 2-9, 2-13, 2-15

Jim Bridger 345-kV Substation, 2-9, 2-13, 2-15, 3.2-108, 3.3-110, 3.6-32, 3.7-38, 3.8-18, 3.9-20, 3.10-65, 3.11-136, 3.12-26, 3.13-18, 3.14-20, 3.15-23, 3.17-4, 3.17-77, 3.18-29, 3.19-22

Kemmerer FO, 2-67, 2-71, 2-73, 2-151, 2-168, 3.2-36, 3.2-37, 3.2-38, 3.2-108, 3.2-121, 3.2-122, 3.2-123, 3.3-3, 3.3-17, 3.3-44, 3.3-67, 3.3-112, 3.3-240, 3.3-267, 3.3-268, 3.3-269, 3.6-19, 3.6-22, 3.6-33, 3.6-52, 3.7-9, 3.7-19, 3.7-20, 3.7-23, 3.7-39, 3.7-40, 3.7-43, 3.8-19, 3.9-21, 3.10-66, 3.11-25, 3.11-30, 3.11-67, 3.11-69, 3.11-73, 3.11-137, 3.12-26, 3.13-18, 3.14-21, 3.15-18, 3.15-24, 3.15-34, 3.17-16, 3.17-79, 3.17-80, 3.18-3, 3.18-6, 3.18-30, 3.19-23, 4-11, 4-37, 4-38, 4-74

Kemmerer RMP, 1-22, 2-30, 2-67, 2-68, 2-69, 2-73, 2-74, 2-75, 2-165, 2-166, 3.2-121, 3.3-268, 3.3-269, 3.4-39, 3.6-23, 3.6-24, 3.7-43, 3.10-70,

3.10-97, 3.11-67, 3.11-107, 3.11-160, 3.17-16, 3.17-33, 3.17-46, 3.17-81, 3.17-86, 3.19-7, 3.19-23, 4-10, 4-11, 4-88

Key Habitat, 2-186, 2-188, 2-193, 2-194, 2-199, 2-204, 3.11-18, 4-78, 4-79, 4-80, 4-81

Key Observation Point (KOP), 2-147, 3.2-1, 3.2-12, 3.2-13, 3.2-17, 3.2-18, 3.2-19, 3.2-20, 3.2-21, 3.2-22, 3.2-23, 3.2-24, 3.2-25, 3.2-26, 3.2-27, 3.2-28, 3.2-29, 3.2-30, 3.2-31, 3.2-32, 3.2-33, 3.2-34, 3.2-35, 3.2-36, 3.2-37, 3.2-38, 3.2-39, 3.2-40, 3.2-41, 3.2-42, 3.2-43, 3.2-44, 3.2-45, 3.2-46, 3.2-47, 3.2-48, 3.2-49, 3.2-50, 3.2-51, 3.2-52, 3.2-53, 3.2-54, 3.2-55, 3.2-56, 3.2-57, 3.2-58, 3.2-59, 3.2-60, 3.2-61, 3.2-62, 3.2-63, 3.2-64, 3.2-65, 3.2-66, 3.2-67, 3.2-68, 3.2-69, 3.2-70, 3.2-71, 3.2-72, 3.2-73, 3.2-74, 3.2-75, 3.2-76, 3.2-77, 3.2-78, 3.2-79, 3.2-80, 3.2-81, 3.2-86, 3.2-87, 3.2-88, 3.2-89, 3.2-90, 3.2-91, 3.2-92, 3.2-93, 3.2-96, 3.2-97, 3.2-98, 3.2-99, 3.2-100, 3.2-101, 3.2-102, 3.2-103, 3.2-104, 3.2-105, 3.2-106, 3.2-107, 3.2-108, 3.2-109, 3.2-110, 3.2-111, 3.2-112, 3.2-113, 3.2-114, 3.2-115, 3.2-116, 3.2-117, 3.2-118, 3.2-119, 3.2-120, 3.2-121, 3.2-122, 3.2-125, 3.2-126, 3.2-127, 3.2-128, 3.2-129, 3.2-130, 3.2-131, 3.2-134, 3.2-135, 3.2-136, 3.2-137, 3.2-138, 3.2-139, 3.2-140, 3.2-141, 3.2-142, 3.2-143, 3.2-144, 3.2-145, 3.2-146, 3.2-147, 3.2-148, 3.2-149, 3.2-150, 3.2-151, 3.2-152, 3.2-153, 3.2-154, 3.2-155, 3.2-156, 3.2-157, 3.2-158, 3.2-163, 3.2-164, 3.2-165, 3.2-166, 3.2-167, 3.2-168, 3.2-169, 3.2-170, 3.2-171, 3.2-172, 3.2-173, 3.2-175, 3.2-176, 3.2-177, 3.2-178, 3.2-179, 3.2-180, 3.2-181, 3.2-182, 3.2-183, 3.2-184, 3.2-185, 3.2-186, 3.2-187, 3.2-188, 3.2-189, 3.2-190, 3.2-192, 3.2-194, 3.2-195, 3.2-196, 3.2-197, 3.2-198, 3.2-202, 3.3-17, 3.3-18, 3.3-19, 3.3-73, 3.3-74, 3.3-75, 3.3-88, 3.3-89, 3.3-90, 3.3-91, 3.3-92, 3.3-93, 3.3-94, 3.3-95, 3.3-96, 3.3-97, 3.3-98, 3.3-99, 3.3-100, 3.3-101, 3.3-102, 3.3-103, 3.3-104, 3.3-105, 3.3-106, 3.3-107, 3.3-108, 3.3-109, 3.3-110, 3.3-111, 3.3-112, 3.3-113, 3.3-114, 3.3-115, 3.3-116, 3.3-117, 3.3-118, 3.3-119, 3.3-120, 3.3-121, 3.3-122, 3.3-123, 3.3-124, 3.3-125, 3.3-126, 3.3-127, 3.3-128, 3.3-129, 3.3-130, 3.3-131, 3.3-132, 3.3-133, 3.3-134, 3.3-135, 3.3-136, 3.3-137, 3.3-138, 3.3-139, 3.3-140, 3.3-141, 3.3-142, 3.3-143, 3.3-144, 3.3-145, 3.3-146, 3.3-147, 3.3-148, 3.3-149, 3.3-150, 3.3-151, 3.3-152, 3.3-153, 3.3-154, 3.3-155, 3.3-156, 3.3-157, 3.3-158, 3.3-159, 3.3-160, 3.3-161, 3.3-162, 3.3-163, 3.3-164, 3.3-165, 3.3-166, 3.3-167, 3.3-168, 3.3-169, 3.3-170, 3.3-171, 3.3-172, 3.3-173, 3.3-174, 3.3-175, 3.3-176, 3.3-177, 3.3-178, 3.3-179, 3.3-180, 3.3-181, 3.3-182, 3.3-183, 3.3-184, 3.3-185, 3.3-186, 3.3-187, 3.3-188, 3.3-189, 3.3-190, 3.3-191, 3.3-192, 3.3-193, 3.3-194, 3.3-195, 3.3-196, 3.3-197, 3.3-198, 3.3-199, 3.3-200, 3.3-201, 3.3-202, 3.3-203, 3.3-204, 3.3-205, 3.3-206, 3.3-207, 3.3-208, 3.3-209, 3.3-210, 3.3-211, 3.3-212, 3.3-213, 3.3-214, 3.3-215, 3.3-216, 3.3-217, 3.3-218, 3.3-219, 3.3-220, 3.3-221, 3.3-222, 3.3-223, 3.3-224, 3.3-225, 3.3-226, 3.3-227, 3.3-228, 3.3-229, 3.3-230, 3.3-231, 3.3-232, 3.3-233, 3.3-234, 3.3-235, 3.3-236, 3.3-237, 3.3-238, 3.3-239, 3.3-264, 3.3-265, 3.3-266, 3.3-267, 3.3-268, 3.3-269, 3.3-272, 3.3-273, 3.3-275, 3.3-277, 3.3-279

Kuna, 1-3, 1-20, 1-22, 2-42, 2-94, 2-95, 2-98, 2-100, 2-101, 2-102, 2-147, 2-197, 3.2-11, 3.2-67, 3.2-68, 3.2-85, 3.2-162, 3.2-168, 3.2-169, 3.2-173, 3.2-174, 3.2-201, 3.3-84, 3.3-187, 3.3-214, 3.3-274, 3.4-6, 3.4-71, 3.4-72, 3.4-73, 3.6-43, 3.7-45, 3.8-23, 3.9-28, 3.10-84, 3.11-150, 3.12-28, 3.13-21, 3.14-24, 3.15-29, 3.17-7, 3.17-8, 3.17-14, 3.17-18, 3.17-19, 3.17-36, 3.17-38, 3.17-109, 3.17-110, 3.17-111, 3.17-113, 3.17-115, 3.17-116, 3.17-117, 3.17-118, 3.17-120, 3.18-38, 3.19-27, 3.23-4, 4-19, 4-32, 4-52, 4-62, 5-4, 5-17, 5-22

Kuna MFP, 1-22, 2-42, 2-94, 2-100, 2-101, 2-102, 3.2-173, 3.3-274, 3.17-18, 3.17-19, 3.17-36, 3.17-111, 3.17-113, 3.17-120, 4-19

land ownership, 2-113, 2-114, 2-115, 2-116, 2-143, 3.2-26, 3.2-27, 3.2-28, 3.2-29, 3.2-105, 3.2-106, 3.4-70, 3.11-55, 3.11-79, 3.11-84, 3.11-160, 3.11-161, 3.12-16, 3.17-1, 3.17-16, 3.17-22, 3.17-27, 3.17-31, 3.17-42, 3.17-58, 3.17-71, 3.17-79, 3.17-89, 3.17-90, 3.17-96, 3.17-110, 3.17-123, 3.18-6, 4-88

Laramie Mountains, 2-44, 2-48, 2-49, 2-50, 2-51, 2-178, 3.3-21, 3.6-9, 3.7-2, 3.11-1, 3.13-1, 3.14-1, 3.15-1

lattice tower, 2-14, 2-19, 2-20, 2-57, 2-60, 2-62, 2-93, 2-118, 2-125, 2-126, 2-128, 2-129, 2-130, 2-131, 2-211, 3.2-83, 3.2-199, 3.3-73, 3.3-278, 3.5-12, 3.6-50, 3.7-52, 3.8-26, 3.9-32, 3.10-97, 3.11-157, 3.14-26, 3.15-33, 3.17-140, 3.18-44, 3.19-30, 3.20-17, 3.21-5, 3.21-47, 3.22-10, 3.22-13, 3.23-19, 4-43

laydown yard, 2-141, 3.6-1, 3.9-1, 3.10-2, 3.10-19, 3.10-22, 3.13-11, 3.15-13

lek, 1-32, 2-49, 2-51, 2-56, 2-59, 2-71, 2-72, 2-82, 2-84, 2-90, 2-91, 2-97, 2-163, 2-164, 2-165, 3.3-267, 3.11-3, 3.11-10, 3.11-11, 3.11-20, 3.11-27, 3.11-29, 3.11-43, 3.11-64, 3.11-65, 3.11-66, 3.11-67, 3.11-71, 3.11-91, 3.11-92, 3.11-93, 3.11-94, 3.11-106, 3.11-121, 3.17-72, 4-5, 4-78

literature review, 2-148, 2-152, 3.2-86, 3.3-2, 3.3-11, 3.3-15, 3.3-16, 3.3-20, 3.3-27, 3.3-32, 3.3-70, 3.7-25, 3.18-4, 5-7

maintenance, 1-4, 1-5, 1-13, 1-17, 1-25, 1-34, 1-37, 1-41, 2-3, 2-14, 2-17, 2-18, 2-19, 2-29, 2-91, 2-126, 2-128, 2-129, 2-130, 2-131, 2-133, 2-135, 2-136, 2-140, 2-141, 2-142, 2-143, 2-145, 2-147, 2-151, 2-154, 2-156, 2-157, 2-161, 2-163, 2-164, 2-169, 2-172, 2-174, 2-191, 2-212, 3.1-1, 3.2-82,

3.2-85, 3.2-202, 3.3-68, 3.3-226, 3.4-33, 3.4-38, 3.4-41, 3.4-43, 3.4-58, 3.4-64, 3.4-80, 3.6-2, 3.6-4, 3.6-5, 3.6-14, 3.6-16, 3.6-17, 3.6-18, 3.6-25, 3.6-27, 3.6-37, 3.6-41, 3.6-43, 3.6-45, 3.6-48, 3.6-49, 3.6-51, 3.7-19, 3.7-20, 3.7-24, 3.7-26, 3.7-43, 3.7-47, 3.7-51, 3.8-11, 3.8-12, 3.8-13, 3.8-27, 3.9-2, 3.9-9, 3.9-11, 3.9-12, 3.9-14, 3.9-16, 3.9-18, 3.9-19, 3.9-21, 3.9-23, 3.9-24, 3.9-26, 3.9-29, 3.9-31, 3.9-32, 3.10-36, 3.10-40, 3.10-41, 3.10-42, 3.10-43, 3.10-44, 3.10-45, 3.10-47, 3.10-48, 3.10-49, 3.10-99, 3.11-52, 3.11-56, 3.11-58, 3.11-65, 3.11-81, 3.11-82, 3.11-83, 3.11-94, 3.11-98, 3.11-100, 3.11-104, 3.11-105, 3.11-108, 3.11-109, 3.11-110, 3.11-112, 3.11-114, 3.11-118, 3.11-119, 3.11-122, 3.11-124, 3.11-125, 3.11-126, 3.11-158, 3.11-160, 3.15-18, 3.17-3, 3.17-41, 3.17-54, 3.17-55, 3.17-57, 3.17-140, 3.18-17, 3.18-25, 3.19-13, 3.19-15, 3.19-16, 3.19-21, 3.19-24, 3.19-26, 3.19-31, 3.20-1, 3.20-5, 3.20-6, 3.20-8, 3.20-13, 3.20-16, 3.20-24, 3.22-5, 3.22-8, 3.22-10, 3.22-11, 3.22-12, 3.23-7, 4-24, 4-30, 4-36, 4-52, 4-61, 4-62, 4-64, 4-65, 4-66, 4-76, 4-86, 4-92, 4-95

Malad MFP, 1-22, 2-35, 2-77, 2-78, 2-79, 2-82, 2-89, 3.2-131, 3.2-132, 3.2-155, 3.2-156, 3.3-270, 3.3-271, 3.3-272, 3.6-23, 3.6-24, 3.17-16, 3.17-34, 3.17-90, 3.17-94, 3.17-100, 4-12

Migratory Bird Treaty Act (MBTA), 3.10-4, 3.10-5, 3.10-16, 3.10-32, 3.10-34, 3.10-100, 3.11-7, 3.11-40, 4-70

Medicine Bow Forest Plan, 1-4, 2-28, 2-49, 2-53, 2-55, 3.2-5, 3.2-19, 3.2-94, 3.2-100, 3.3-265, 3.3-266, 3.6-21, 3.6-24, 3.10-9, 3.10-43, 3.10-48, 3.10-53, 3.10-57, 3.11-7, 3.11-48, 3.11-49, 3.11-50, 3.11-51, 3.11-52, 3.11-76, 3.11-106, 3.11-118, 3.11-119, 3.11-120, 3.11-122, 3.11-124, 3.11-125, 3.11-126, 3.17-12, 3.17-29, 3.17-60, 3.17-68, 3.19-6, 4-9, 4-88

Medicine Bow-Routt NFs, 1-5, 1-4, 2-48, 2-49, 2-50, 3.2-5, 3.2-19, 3.2-20, 3.2-23, 3.2-89, 3.2-95, 3.2-99, 3.2-101, 3.3-264, 3.3-265, 3.3-266, 3.4-48, 3.6-18, 3.6-20, 3.6-21, 3.6-26, 3.6-29, 3.8-16, 3.8-17, 3.9-3, 3.9-16, 3.9-17, 3.9-18, 3.10-9, 3.10-32, 3.10-51, 3.10-53, 3.10-57, 3.10-68, 3.11-11, 3.11-50, 3.11-54, 3.11-76, 3.11-106, 3.11-121, 3.11-122, 3.11-128, 3.11-131, 3.15-21, 3.15-22, 3.17-12, 3.17-24, 3.17-27, 3.17-30, 3.17-31, 3.17-58, 3.17-60, 3.17-66, 3.17-68, 3.19-21, 4-8, 4-35, 4-36, 4-91

Management Framework Plan (MFP), 1-22, 2-36, 2-42, 2-94, 3.2-4, 3.2-131, 3.2-132, 3.2-155, 3.2-158, 3.2-172, 3.2-188, 3.3-271, 3.3-272, 3.3-273, 3.3-274, 3.3-275, 3.3-277, 3.6-24, 3.10-88, 3.17-12, 3.17-16, 3.17-17, 3.17-18, 3.17-19, 3.17-22, 3.17-34, 3.17-35, 3.17-37, 3.17-38, 3.17-39, 3.17-49, 3.17-90, 3.17-94, 3.17-100, 3.17-106, 3.17-113, 3.17-125, 3.17-126, 3.17-138, 4-1, 4-12, 4-15, 4-18, 4-19, 4-89, 4-90, 4-91

Midpoint Substation, 1-14, 2-2, 2-10, 2-11, 2-13, 2-15, 2-22, 2-80, 2-87, 2-93, 2-97, 2-98, 2-99, 2-110, 2-111, 2-118, 2-124, 3.2-65, 3.2-66, 3.2-81, 3.2-134, 3.2-162, 3.2-166, 3.2-192, 3.2-193, 3.3-166, 3.3-187, 3.3-237, 3.3-271, 3.4-1, 3.4-51, 3.4-52, 3.4-53, 3.6-38, 3.6-43, 3.6-48, 3.7-43, 3.7-45, 3.7-51, 3.8-20, 3.8-23, 3.8-26, 3.9-25, 3.9-28, 3.9-31, 3.10-76, 3.10-84, 3.10-95, 3.11-144, 3.11-150, 3.11-156, 3.12-27, 3.12-28, 3.12-29, 3.13-9, 3.13-19, 3.13-21, 3.13-22, 3.14-23, 3.14-24, 3.14-25, 3.15-27, 3.15-29, 3.15-32, 3.17-8, 3.17-26, 3.17-109, 3.17-137, 3.18-2, 3.18-18, 3.18-34, 3.18-38, 3.18-42, 3.19-25, 3.19-27, 3.19-29, 4-41

minerals, 2-210, 2-212, 2-213, 3.4-25, 3.12-1, 3.12-3, 3.12-4, 3.12-6, 3.12-13, 3.12-14, 3.12-15, 3.12-19, 3.12-22, 3.12-24, 3.12-25, 3.12-26, 3.12-27, 3.12-28, 3.12-29, 3.12-31, 3.14-1, 3.17-13, 3.17-14, 3.17-15, 3.17-16, 3.17-17, 3.17-18, 3.17-19, 4-53, 4-67

Minidoka National Historic Site, 2-111, 3.3-65, 3.3-87

mining, 1-36, 2-57, 2-61, 2-62, 2-63, 2-65, 2-166, 2-181, 3.3-21, 3.3-22, 3.3-26, 3.3-33, 3.3-36, 3.3-39, 3.3-40, 3.3-48, 3.3-62, 3.3-63, 3.4-8, 3.4-9, 3.4-10, 3.4-26, 3.4-46, 3.6-1, 3.6-10, 3.12-1, 3.12-3, 3.12-4, 3.12-5, 3.12-12, 3.12-13, 3.12-14, 3.12-15, 3.12-16, 3.12-24, 3.12-28, 3.12-31, 3.14-3, 3.14-14, 3.14-21, 3.14-22, 3.14-23, 3.17-4, 3.17-16, 3.17-23, 3.17-25, 3.17-48, 3.17-54, 3.17-69, 3.17-74, 3.17-77, 3.17-78, 3.17-83, 3.17-106, 3.17-132, 3.17-133, 3.19-23, 3.22-5, 4-7, 4-11, 4-34, 4-52, 4-55, 4-57, 4-63, 4-65, 4-67, 4-70, 4-71, 4-73, 4-81, 4-82, 4-85, 4-86

Management Indicator Species (MIS), 3.10-1, 3.11-1, 3.11-4, 3.11-7, 3.11-20, 3.11-26, 3.11-42, 3.11-48, 3.11-49, 3.11-50, 3.11-51, 3.11-63, 3.11-91, 3.11-110, 3.11-117, 3.11-118, 3.11-119, 3.11-120, 3.11-124, 3.11-125, 3.11-126, 4-6, 4-75, 4-77, 4-84

mitigation, 1-7, 1-17, 1-21, 1-23, 1-29, 1-39, 1-40, 2-20, 2-27, 2-28, 2-29, 2-30, 2-32, 2-33, 2-34, 2-35, 2-40, 2-68, 2-122, 2-127, 2-129, 2-140, 2-142, 2-143, 2-144, 2-146, 2-148, 2-149, 2-153, 2-155, 2-167, 2-175, 2-207, 2-210, 3.1-3, 3.1-5, 3.2-83, 3.2-87, 3.2-89, 3.2-105, 3.2-106, 3.2-112, 3.2-123, 3.2-154, 3.2-157, 3.2-165, 3.2-167, 3.2-199, 3.2-200, 3.3-1, 3.3-2, 3.3-3, 3.3-6, 3.3-7, 3.3-69, 3.3-70, 3.3-71, 3.3-72, 3.3-265, 3.3-266, 3.3-269, 3.3-270, 3.3-273, 3.3-276, 3.3-279, 3.3-280, 3.4-27, 3.4-38, 3.4-48, 3.4-49, 3.4-51, 3.4-52, 3.4-53, 3.4-54, 3.4-68, 3.4-69, 3.4-83, 3.4-84, 3.5-13, 3.6-10, 3.6-15, 3.6-16, 3.6-18, 3.6-25, 3.6-50, 3.7-19, 3.7-20, 3.7-21, 3.7-22, 3.7-23, 3.7-24, 3.7-25, 3.7-26, 3.7-32, 3.7-40, 3.7-43, 3.7-44, 3.7-46, 3.7-47, 3.7-51, 3.7-55, 3.8-7, 3.8-11, 3.8-12, 3.8-13, 3.8-14, 3.8-27, 3.9-3, 3.9-6, 3.9-10, 3.9-11, 3.9-12, 3.9-13, 3.9-14, 3.9-15, 3.9-33, 3.10-6, 3.10-7, 3.10-19, 3.10-22, 3.10-25, 3.10-30, 3.10-34, 3.10-35, 3.10-36,

3.10-37, 3.10-38, 3.10-39, 3.10-40, 3.10-44, 3.10-46, 3.10-49, 3.10-50, 3.10-51, 3.10-65, 3.10-97, 3.10-98, 3.10-99, 3.10-100, 3.11-9, 3.11-12, 3.11-17, 3.11-18, 3.11-19, 3.11-51, 3.11-52, 3.11-53, 3.11-55, 3.11-58, 3.11-61, 3.11-62, 3.11-64, 3.11-65, 3.11-66, 3.11-67, 3.11-68, 3.11-69, 3.11-71, 3.11-72, 3.11-73, 3.11-74, 3.11-75, 3.11-76, 3.11-77, 3.11-78, 3.11-80, 3.11-81, 3.11-83, 3.11-84, 3.11-86, 3.11-87, 3.11-88, 3.11-89, 3.11-90, 3.11-91, 3.11-93, 3.11-94, 3.11-95, 3.11-96, 3.11-97, 3.11-100, 3.11-101, 3.11-102, 3.11-103, 3.11-104, 3.11-105, 3.11-106, 3.11-107, 3.11-108, 3.11-109, 3.11-110, 3.11-111, 3.11-112, 3.11-113, 3.11-114, 3.11-115, 3.11-116, 3.11-118, 3.11-119, 3.11-120, 3.11-121, 3.11-122, 3.11-123, 3.11-124, 3.11-125, 3.11-126, 3.11-157, 3.11-158, 3.11-160, 3.11-161, 3.11-162, 3.12-14, 3.12-15, 3.12-31, 3.13-1, 3.13-10, 3.13-12, 3.13-23, 3.13-24, 3.14-12, 3.14-13, 3.14-15, 3.14-19, 3.14-20, 3.14-21, 3.14-26, 3.14-27, 3.15-9, 3.15-12, 3.15-13, 3.15-16, 3.15-19, 3.15-33, 3.15-34, 3.17-47, 3.17-52, 3.17-57, 3.17-74, 3.17-78, 3.17-140, 3.18-11, 3.18-15, 3.18-25, 3.18-36, 3.19-6, 3.19-12, 3.19-13, 3.19-15, 3.19-17, 3.19-30, 3.20-11, 3.20-13, 3.20-24, 3.21-13, 3.21-23, 3.21-32, 3.21-36, 3.21-38, 3.21-47, 3.22-7, 3.22-14, 3.23-6, 3.23-19, 3.23-20, 4-37, 4-55, 4-59, 4-61, 4-63, 4-64, 4-65, 4-66, 4-72, 4-73, 4-74, 4-76, 4-78, 4-82, 4-83, 4-84, 4-86, 5-5

mitigation bank, 3.9-10, 3.9-12

Morley Nelson Snake River Birds of Prey National Conservation Area (SRBOP), 2-39, 2-42, 2-94, 2-99, 2-100, 2-101, 2-102, 2-103, 2-106, 2-107, 2-108, 2-109, 2-110, 2-197, 2-202, 2-209, 3.2-2, 3.2-69, 3.2-70, 3.2-71, 3.2-75, 3.2-77, 3.2-162, 3.2-172, 3.2-173, 3.2-174, 3.2-175, 3.2-184, 3.2-188, 3.2-189, 3.2-190, 3.2-191, 3.3-33, 3.3-86, 3.3-187, 3.3-216, 3.3-223, 3.3-225, 3.3-226, 3.3-228, 3.3-230, 3.3-232, 3.3-274, 3.3-275, 3.3-276, 3.6-2, 3.6-23, 3.6-24, 3.6-43, 3.6-46, 3.7-19, 3.7-45, 3.7-47, 3.7-49, 3.7-51, 3.8-23, 3.8-25, 3.9-28, 3.9-30, 3.10-17, 3.10-84, 3.10-90, 3.11-150, 3.11-152, 3.12-28, 3.13-21, 3.13-22, 3.14-24, 3.14-25, 3.15-29, 3.15-31, 3.17-13, 3.17-14, 3.17-19, 3.17-36, 3.17-37, 3.17-38, 3.17-42, 3.17-109, 3.17-110, 3.17-111, 3.17-112, 3.17-117, 3.17-119, 3.17-120, 3.17-121, 3.17-123, 3.17-124, 3.17-125, 3.17-126, 3.17-127, 3.17-131, 3.17-133, 3.17-134, 3.17-135, 3.18-38, 3.18-40, 3.19-7, 3.19-27, 3.19-28, 4-17, 4-18, 4-89, 4-90

Native American Graves Protection and Repatriation Act (NAGPRA), 1-21, 2-148, 3.3-6, 3.3-7, 3.3-70

National Trails System Act, 2-30, 3.3-18

Nationwide Permit, 3.9-2, 3.9-3

National Environmental Policy Act (NEPA), 1-1, 1-3, 1-4, 1-6, 1-21, 1-41, 2-1, 2-144, 2-148, 2-175, 2-212, 3.3-1, 3.3-2, 3.3-3, 3.3-4, 3.3-6, 3.3-7, 3.3-15, 3.3-20, 3.3-70, 3.6-2, 3.7-20, 3.8-3, 3.10-5, 3.10-97, 3.11-107, 3.12-4, 3.13-6, 3.17-13, 3.17-42, 4-1, 4-14, 4-39, 5-1, 5-2, 5-3, 5-4, 5-10, 5-14, 5-15

National Historic Preservation Act (NHPA), 1-16, 1-19, 1-20, 1-21, 2-175, 3.3-1, 3.3-2, 3.3-3, 3.3-4, 3.3-5, 3.3-6, 3.3-7, 3.3-20, 3.3-71, 5-6

National Historic Trail (NHT), 2-30, 2-31, 2-32, 2-82, 2-90, 2-92, 2-147, 2-190, 2-191, 3.2-3, 3.2-8, 3.2-9, 3.2-10, 3.2-21, 3.2-25, 3.2-30, 3.2-32, 3.2-33, 3.2-35, 3.2-37, 3.2-39, 3.2-40, 3.2-46, 3.2-53, 3.2-57, 3.2-59, 3.2-63, 3.2-64, 3.2-66, 3.2-74, 3.2-76, 3.2-85, 3.2-87, 3.2-91, 3.2-98, 3.2-109, 3.2-110, 3.2-114, 3.2-115, 3.2-118, 3.2-119, 3.2-120, 3.2-123, 3.2-125, 3.2-135, 3.2-161, 3.2-163, 3.2-166, 3.2-172, 3.2-180, 3.2-191, 3.2-201, 3.3-2, 3.3-36, 3.3-39, 3.3-41, 3.3-42, 3.3-43, 3.3-44, 3.3-45, 3.3-56, 3.3-57, 3.3-58, 3.3-59, 3.3-60, 3.3-61, 3.3-62, 3.3-67, 3.3-74, 3.3-77, 3.3-78, 3.3-79, 3.3-80, 3.3-81, 3.3-82, 3.3-83, 3.3-84, 3.3-85, 3.3-86, 3.3-90, 3.3-92, 3.3-94, 3.3-95, 3.3-120, 3.3-122, 3.3-124, 3.3-125, 3.3-126, 3.3-127, 3.3-128, 3.3-129, 3.3-132, 3.3-133, 3.3-134, 3.3-136, 3.3-137, 3.3-138, 3.3-139, 3.3-141, 3.3-143, 3.3-145, 3.3-146, 3.3-148, 3.3-151, 3.3-152, 3.3-154, 3.3-155, 3.3-157, 3.3-163, 3.3-164, 3.3-165, 3.3-167, 3.3-168, 3.3-169, 3.3-170, 3.3-171, 3.3-172, 3.3-173, 3.3-174, 3.3-175, 3.3-176, 3.3-177, 3.3-178, 3.3-179, 3.3-180, 3.3-181, 3.3-182, 3.3-183, 3.3-184, 3.3-186, 3.3-188, 3.3-192, 3.3-193, 3.3-197, 3.3-198, 3.3-199, 3.3-200, 3.3-201, 3.3-202, 3.3-204, 3.3-205, 3.3-207, 3.3-208, 3.3-209, 3.3-210, 3.3-211, 3.3-212, 3.3-219, 3.3-220, 3.3-221, 3.3-222, 3.3-223, 3.3-224, 3.3-225, 3.3-226, 3.3-227, 3.3-228, 3.3-229, 3.3-230, 3.3-231, 3.3-232, 3.3-233, 3.3-234, 3.3-264, 3.3-265, 3.3-266, 3.3-267, 3.3-268, 3.3-269, 3.3-270, 3.3-272, 3.3-274, 3.3-275, 3.3-276, 3.3-277, 3.6-15, 3.15-14, 3.17-16, 3.17-30, 3.17-33, 3.17-34, 3.17-35, 3.17-37, 3.17-38, 3.17-39, 3.17-56, 3.17-65, 3.17-84, 3.17-85, 3.17-87, 3.17-94, 3.17-107, 3.17-111, 3.17-112, 3.17-120, 3.17-121, 3.17-122, 3.17-127, 3.17-134, 3.17-135, 3.17-139, 3.19-7, 3.19-23, 4-16, 4-18, 4-89

No Action Alternative, 1-25, 2-26, 2-211, 3.1-1, 3.1-5, 3.2-82, 3.3-69, 3.4-28, 3.5-7, 3.6-10, 3.7-20, 3.8-7, 3.9-7, 3.10-19, 3.11-53, 3.12-14, 3.13-10, 3.14-12, 3.15-13, 3.17-47, 3.18-11, 3.19-7, 3.20-11, 3.21-14, 3.22-7, 3.23-6, 4-54

non-motorized area, 2-39, 2-94, 2-108, 2-197, 2-202, 3.2-69, 3.7-49, 3.8-25, 3.13-22, 3.14-25, 3.15-31, 3.17-112, 3.17-127, 4-18, 4-90

National Park Service (NPS), 1-1, 3.2-3, 3.2-8, 3.2-9, 3.2-12, 3.2-30, 3.2-57, 3.2-86, 3.2-87, 3.2-116, 3.2-117, 3.2-147, 3.2-153, 3.3-1, 3.3-8, 3.3-16, 3.3-17, 3.3-31, 3.3-32, 3.3-39, 3.3-40,

3.3-41, 3.3-42, 3.3-44, 3.3-45, 3.3-53, 3.3-56, 3.3-57, 3.3-58, 3.3-59, 3.3-60, 3.3-61, 3.3-65, 3.3-67, 3.3-71, 3.3-103, 3.3-128, 3.3-165, 3.3-193, 3.3-205, 3.3-225, 3.3-279, 3.11-13, 3.17-14, 3.17-15, 3.17-28, 3.17-42, 3.17-138, 5-3

National Register of Historic Places (NRHP), 1-16, 1-21, 2-50, 2-101, 2-122, 2-148, 2-149, 3.3-3, 3.3-4, 3.3-5, 3.3-6, 3.3-7, 3.3-15, 3.3-27, 3.3-32, 3.3-34, 3.3-42, 3.3-44, 3.3-46, 3.3-47, 3.3-48, 3.3-49, 3.3-50, 3.3-51, 3.3-52, 3.3-53, 3.3-54, 3.3-55, 3.3-57, 3.3-58, 3.3-60, 3.3-61, 3.3-62, 3.3-63, 3.3-64, 3.3-66, 3.3-69, 3.3-73, 3.3-100, 3.3-109, 3.3-124, 3.3-240, 3.3-269, 3.3-273, 3.3-275, 3.3-278, 3.3-280, 3.17-37, 3.17-81, 4-59

National Wetland Inventory (NWI), 2-70, 3.9-3, 3.9-5, 3.11-24, 3.17-22

Oregon-California Trails Association (OCTA), 3.3-18, 3.3-43, 3.3-61, 3.3-92, 3.3-145, 3.3-193, 3.3-279, 5-4

off-highway vehicle (OHV), 2-33, 2-169, 3.2-39, 3.2-65, 3.2-73, 3.2-76, 3.2-80, 3.17-1, 3.17-14, 3.17-15, 3.17-16, 3.17-19, 3.17-20, 3.17-28, 3.17-29, 3.17-31, 3.17-32, 3.17-34, 3.17-35, 3.17-36, 3.17-38, 3.17-40, 3.17-41, 3.17-53, 3.17-57, 3.17-58, 3.17-65, 3.17-66, 3.17-71, 3.17-75, 3.17-76, 3.17-77, 3.17-78, 3.17-87, 3.17-88, 3.17-94, 3.17-95, 3.17-107, 3.17-108, 3.17-109, 3.17-122, 3.17-123, 3.17-136, 3.17-137, 3.17-139, 3.17-140, 3.19-1, 3.19-7, 3.22-13, 4-20, 4-63, 4-65, 4-74, 4-78, 4-86, 4-92

old growth, 3.6-26, 3.6-34, 3.10-13

Orchard Training Area, 2-39, 2-94, 2-99, 2-101, 2-170, 2-197, 2-209, 3.7-8, 3.17-19, 3.17-116, 3.17-119, 3.17-120, 3.17-133, 3.17-141, 3.19-27

Overall Visual Impact, 3.3-239, 3.3-240, 3.3-241, 3.3-243, 3.3-244, 3.3-247

Overall Visual Impact (OVI), 3.3-241

Owyhee FO, 3.2-70, 3.2-77, 3.3-276, 3.17-20, 3.17-42

Programmatic Agreement (PA), 1-21, 1-22, 2-149, 3.3-2, 3.3-3, 3.3-6, 3.3-10, 3.3-11, 3.3-12, 3.3-14, 3.3-71, 3.3-72, 3.3-279, 3.3-280, 4-60, 5-7

photographic simulation, 3.2-17, 3.3-18, 3.3-73, 3.3-145, 3.3-157, 3.3-232

pictograph, 3.3-8

plan amendment, 1-23, 1-37, 2-26, 2-52, 2-56, 2-59, 2-60, 2-61, 2-79, 2-80, 2-81, 2-90, 2-91, 2-94, 2-111, 2-210, 2-211, 3.1-1, 3.2-86, 3.2-87, 3.2-95, 3.2-121, 3.2-159, 3.2-160, 3.2-161, 3.2-172, 3.2-189, 3.3-264, 3.3-265, 3.3-267, 3.3-268, 3.3-273, 3.3-274, 3.3-276, 3.3-277, 3.6-23, 3.7-3, 3.7-19, 3.7-20, 3.7-43, 3.10-6, 3.10-43, 3.10-53, 3.10-58, 3.11-7, 3.11-51, 3.11-52, 3.11-53, 3.11-67, 3.11-123, 3.17-3, 3.17-12, 3.17-49, 3.17-58, 3.17-59, 3.17-61, 3.17-68, 3.17-73, 3.17-77, 3.17-81, 3.17-91, 3.17-98, 3.17-102, 3.17-111, 3.17-113, 3.17-125, 3.17-128, 3.17-138, 3.19-6, 3.19-21, 4-8, 4-9, 4-10, 4-12, 4-13, 4-14, 4-15, 4-16, 4-17, 4-18, 4-19, 4-37, 4-39, 4-43, 4-88, 4-91

Pocatello FO, 2-88, 3.2-40, 3.2-41, 3.2-42, 3.2-46, 3.2-56, 3.2-61, 3.2-131, 3.3-10, 3.3-267, 3.3-270, 3.3-271, 3.3-272, 3.6-22, 3.17-16, 3.17-27, 3.17-35, 3.17-36, 3.17-80, 4-12, 4-38, 4-52

Populus Substation, 1-14, 2-10, 2-13, 2-15, 2-20, 2-22, 2-62, 2-63, 2-64, 2-65, 2-66, 2-76, 2-78, 2-81, 2-82, 2-86, 2-92, 2-93, 2-117, 2-118, 2-123, 2-124, 3.2-61, 3.2-108, 3.3-112, 3.4-2, 3.4-43, 3.4-50, 3.4-51, 3.4-52, 3.6-32, 3.6-38, 3.7-39, 3.7-52, 3.8-18, 3.9-21, 3.10-66, 3.11-137, 3.12-26, 3.13-18, 3.14-21, 3.15-24, 3.17-5, 3.17-79, 3.17-82, 3.18-30, 3.19-22, 4-58

Proposed Action, 1-4, 1-5, 1-13, 1-25, 1-26, 1-41, 2-1, 2-2, 2-3, 2-4, 2-5, 2-6, 2-7, 2-8, 2-9, 2-10, 2-11, 2-12, 2-13, 2-20, 2-43, 2-68, 2-81, 2-105, 2-116, 2-118, 2-125, 2-143, 2-212, 3.1-1, 3.1-3, 3.1-5, 3.2-46, 3.2-193, 3.2-194, 3.2-195, 3.2-199, 3.3-1, 3.3-278, 3.4-1, 3.4-2, 3.4-3, 3.4-18, 3.4-27, 3.4-28, 3.4-33, 3.4-35, 3.4-36, 3.4-38, 3.4-46, 3.4-51, 3.4-53, 3.4-54, 3.4-59, 3.4-60, 3.4-61, 3.4-63, 3.4-64, 3.4-67, 3.4-68, 3.4-69, 3.4-70, 3.4-73, 3.4-74, 3.4-77, 3.4-78, 3.4-79, 3.4-80, 3.4-82, 3.4-83, 3.4-84, 3.5-12, 3.5-13, 3.6-11, 3.6-12, 3.6-14, 3.6-16, 3.6-19, 3.6-20, 3.6-49, 3.7-52, 3.8-26, 3.9-32, 3.10-96, 3.11-157, 3.12-1, 3.12-29, 3.12-31, 3.13-1, 3.13-22, 3.14-12, 3.14-15, 3.14-26, 3.15-1, 3.15-13, 3.15-32, 3.15-33, 3.17-139, 3.18-43, 3.19-29, 3.19-30, 3.20-1, 3.20-6, 3.20-11, 3.20-12, 3.20-15, 3.20-16, 3.20-17, 3.20-22, 3.20-23, 3.21-39, 3.21-42, 3.21-46, 3.22-13, 3.23-1, 3.23-10, 3.23-17, 3.23-18, 3.23-19, 4-1, 4-21, 4-36

Purpose and Need, 1-1, 1-3, 1-4, 1-7, 1-30, 2-1, 2-26, 2-66, 3.1-1

raptor, 2-29, 2-49, 2-50, 2-51, 2-52, 2-54, 2-58, 2-63, 2-64, 2-83, 2-84, 2-90, 2-91, 2-92, 2-102, 2-157, 2-161, 2-163, 2-174, 2-175, 2-178, 2-187, 2-192, 3.3-268, 3.6-24, 3.10-2, 3.10-6, 3.10-8, 3.10-10, 3.10-16, 3.10-17, 3.10-19, 3.10-35, 3.10-36, 3.10-48, 3.10-53, 3.10-56, 3.10-61, 3.10-64, 3.10-65, 3.10-67, 3.10-68, 3.10-71, 3.10-76, 3.10-84, 3.10-89, 3.10-91, 3.10-95, 3.10-96, 3.10-98, 3.10-99, 3.11-10, 3.11-11, 3.11-52, 3.11-56, 3.11-57, 3.11-58, 3.11-71, 3.11-86, 3.11-88, 3.11-89, 3.11-90, 3.11-91, 3.11-106, 3.11-107, 3.11-123, 3.11-124, 3.11-157, 3.11-158, 3.11-162, 3.17-13, 3.17-19, 3.17-66, 4-10, 4-70, 4-71, 4-73, 4-74, 4-76, 4-82, 4-83, 4-84

rare plant, 2-152, 2-153, 3.7-23, 3.7-32, 3.7-55, 4-63, 4-64

Rawlins FO, 2-61, 3.2-19, 3.2-29, 3.2-95, 3.3-264, 3.3-266, 3.7-19, 3.10-9, 3.10-17, 3.11-22, 3.15-6, 3.17-15, 3.17-43, 3.18-6

Rawlins RMP, 1-22, 2-28, 2-49, 2-52, 2-53, 2-55, 2-58, 3.2-94, 3.2-95, 3.2-103, 3.2-106, 3.3-264, 3.3-266, 3.6-23, 3.6-24, 3.17-15, 3.17-29, 3.17-30, 3.17-31, 3.17-32, 3.17-60, 3.17-61, 3.17-68, 3.17-72, 3.17-75, 3.17-76, 4-10, 4-88

recreation, 1-33, 1-37, 2-41, 2-64, 2-146, 2-147, 2-187, 3.2-2, 3.2-3, 3.2-6, 3.2-7, 3.2-8, 3.2-13, 3.2-21, 3.2-30, 3.2-41, 3.2-45, 3.2-84, 3.2-87, 3.2-93, 3.2-94, 3.2-115, 3.2-117, 3.2-129, 3.2-130, 3.2-131, 3.2-133, 3.2-160, 3.2-161, 3.2-190, 3.2-200, 3.2-201, 3.3-18, 3.3-22, 3.3-23, 3.3-54, 3.3-63, 3.3-139, 3.3-177, 3.3-212, 3.3-230, 3.3-233, 3.4-3, 3.4-8, 3.4-10, 3.6-4, 3.6-8, 3.8-1, 3.8-7, 3.17-1, 3.17-3, 3.17-12, 3.17-13, 3.17-15, 3.17-16, 3.17-17, 3.17-18, 3.17-19, 3.17-28, 3.17-29, 3.17-30, 3.17-31, 3.17-32, 3.17-33, 3.17-34, 3.17-35, 3.17-36, 3.17-37, 3.17-38, 3.17-39, 3.17-40, 3.17-41, 3.17-42, 3.17-44, 3.17-46, 3.17-47, 3.17-49, 3.17-52, 3.17-53, 3.17-56, 3.17-57, 3.17-59, 3.17-64, 3.17-65, 3.17-68, 3.17-70, 3.17-75, 3.17-78, 3.17-80, 3.17-85, 3.17-86, 3.17-91, 3.17-107, 3.17-111, 3.17-125, 3.17-126, 3.17-128, 3.17-140, 4-12, 4-18, 4-36, 4-58

regeneration station, 1-26, 2-3, 2-54, 2-57, 2-62, 2-81, 2-102, 2-141, 2-143, 2-177, 3.1-5, 3.3-5, 3.4-63, 3.6-16, 3.6-19, 3.9-1, 3.10-19, 3.18-17, 3.18-18, 3.22-11, 4-43

reliability, 1-1, 1-8, 1-9, 1-10, 1-11, 1-12, 1-13, 1-14, 1-15, 1-16, 2-2, 2-25, 2-53, 2-54, 2-69, 2-70, 2-78, 2-85, 2-88, 2-94, 2-101, 2-120, 2-132, 2-133, 2-134, 2-135, 2-139, 2-142, 3.4-28, 3.4-49, 3.17-49, 3.17-50, 3.17-54, 3.17-66, 3.17-80, 3.17-119, 4-48

riparian areas, 1-34, 1-35, 1-40, 2-146, 2-155, 2-161, 3.2-84, 3.2-200, 3.6-2, 3.6-4, 3.6-9, 3.6-10, 3.6-29, 3.6-50, 3.7-2, 3.7-8, 3.9-1, 3.9-2, 3.9-3, 3.9-4, 3.9-5, 3.9-6, 3.9-7, 3.9-8, 3.9-9, 3.9-10, 3.9-11, 3.9-12, 3.9-15, 3.9-16, 3.9-17, 3.9-18, 3.9-19, 3.9-20, 3.9-21, 3.9-22, 3.9-23, 3.9-24, 3.9-25, 3.9-26, 3.9-28, 3.9-29, 3.9-30, 3.9-31, 3.9-32, 3.9-33, 3.10-2, 3.10-3, 3.10-13, 3.10-15, 3.10-17, 3.10-18, 3.10-19, 3.10-37, 3.10-40, 3.10-49, 3.10-50, 3.10-68, 3.11-1, 3.11-2, 3.11-14, 3.11-16, 3.11-26, 3.11-42, 3.11-43, 3.11-44, 3.11-48, 3.11-49, 3.11-51, 3.11-61, 3.11-62, 3.11-79, 3.11-112, 3.11-114, 3.11-115, 3.11-120, 3.11-128, 3.11-131, 3.11-159, 3.15-25, 4-3, 4-64, 4-65, 4-66, 4-83, 4-92

Resource Management Plan (RMP), 1-9, 1-13, 1-14, 1-22, 1-23, 2-25, 2-26, 2-27, 2-33, 2-39, 2-41, 2-43, 2-69, 2-94, 2-107, 2-119, 2-156, 2-166, 2-198, 3.2-4, 3.2-10, 3.2-95, 3.2-100, 3.2-120, 3.2-121, 3.2-122, 3.2-123, 3.2-131, 3.2-155, 3.2-156, 3.2-157, 3.2-158, 3.2-172, 3.2-188, 3.2-189, 3.2-193, 3.3-15, 3.3-264, 3.3-265, 3.3-267, 3.3-268, 3.3-269, 3.3-271, 3.3-272, 3.3-273, 3.3-274, 3.3-275, 3.3-276, 3.4-2, 3.6-24, 3.7-47, 3.7-51, 3.10-17, 3.10-39, 3.10-48, 3.10-100, 3.11-52, 3.11-64, 3.11-67, 3.11-90, 3.11-91, 3.11-106, 3.11-107, 3.11-160, 3.15-4, 3.15-6, 3.15-13, 3.17-12, 3.17-14, 3.17-15, 3.17-16, 3.17-17, 3.17-18, 3.17-19, 3.17-20, 3.17-22, 3.17-27, 3.17-30, 3.17-31, 3.17-32, 3.17-33, 3.17-34, 3.17-35, 3.17-36, 3.17-37, 3.17-38, 3.17-42, 3.17-46, 3.17-49, 3.17-61, 3.17-68, 3.17-72, 3.17-75, 3.17-76, 3.17-81, 3.17-86, 3.17-90, 3.17-91, 3.17-98, 3.17-99, 3.17-100, 3.17-111, 3.17-112, 3.17-113, 3.17-120, 3.17-126, 3.17-127, 3.17-128, 3.17-135, 4-1, 4-8, 4-9, 4-10, 4-11, 4-12, 4-13, 4-15, 4-16, 4-17, 4-18, 4-19, 4-38, 4-78, 4-88, 4-89, 4-90, 4-91

roadless area, 1-37, 2-92, 3.2-157, 3.17-3, 3.17-97, 3.17-98, 4-14

Rock Springs FO, 2-61, 3.2-29, 3.2-121, 3.3-9, 3.3-267, 3.10-65, 3.10-68, 3.17-15, 3.17-79

Rogerson Substation, 2-46, 2-81, 2-119, 2-191, 3.2-162

Recreation Opportunity Spectrum (ROS), 2-34, 2-35, 3.2-8, 3.2-51, 3.2-144, 3.2-145, 3.2-149, 3.2-152, 3.2-158, 3.2-159, 3.10-43, 3.17-29, 3.17-41, 3.17-42, 3.17-60, 3.17-61, 3.17-68, 3.17-80, 3.17-81, 3.17-101, 3.17-102, 3.17-112, 3.17-127, 3.19-6, 3.19-24, 3.19-26, 4-9, 4-12, 4-88

right-of-way (ROW), 1-1, 1-3, 1-4, 1-7, 1-12, 1-13, 1-16, 1-17, 1-18, 1-19, 1-20, 1-21, 1-23, 1-25, 1-26, 1-34, 1-41, 2-1, 2-2, 2-3, 2-4, 2-5, 2-6, 2-7, 2-12, 2-14, 2-16, 2-17, 2-18, 2-19, 2-20, 2-25, 2-26, 2-32, 2-33, 2-35, 2-36, 2-38, 2-39, 2-40, 2-41, 2-48, 2-51, 2-53, 2-55, 2-57, 2-58, 2-59, 2-60, 2-62, 2-64, 2-65, 2-70, 2-71, 2-72, 2-126, 2-127, 2-129, 2-130, 2-136, 2-137, 2-140, 2-141, 2-145, 2-146, 2-147, 2-151, 2-152, 2-154, 2-155, 2-157, 2-160, 2-162, 2-163, 2-164, 2-167, 2-169, 2-170, 2-172, 2-173, 2-177, 2-178, 2-181, 2-184, 2-211, 2-213, 3.1-4, 3.2-82, 3.2-83, 3.2-85, 3.2-94, 3.2-95, 3.2-112, 3.2-113, 3.2-114, 3.2-121, 3.2-122, 3.2-123, 3.2-131, 3.2-132, 3.2-155, 3.2-156, 3.2-157, 3.2-158, 3.2-159, 3.2-172, 3.2-173, 3.2-189, 3.2-193, 3.2-199, 3.2-201, 3.2-202, 3.3-2, 3.3-10, 3.3-11, 3.3-12, 3.3-68, 3.3-73, 3.3-271, 3.3-275, 3.3-278, 3.4-13, 3.4-18, 3.4-40, 3.4-41, 3.4-43, 3.4-44, 3.4-55, 3.4-60, 3.4-63, 3.4-64, 3.4-70, 3.4-73, 3.4-74, 3.5-9, 3.5-12, 3.5-13, 3.6-4, 3.6-5, 3.6-8, 3.6-12, 3.6-14, 3.6-15, 3.6-16, 3.6-17, 3.6-18, 3.6-19, 3.6-20, 3.6-21, 3.6-22, 3.6-23, 3.6-24, 3.6-25, 3.6-26, 3.6-27, 3.6-28, 3.6-29, 3.6-30, 3.6-31, 3.6-32, 3.6-33, 3.6-34, 3.6-35, 3.6-36, 3.6-37, 3.6-38, 3.6-39, 3.6-40, 3.6-41, 3.6-42, 3.6-43, 3.6-44, 3.6-45, 3.6-46, 3.6-47, 3.6-48, 3.6-49, 3.6-50, 3.6-51, 3.6-52, 3.7-1, 3.7-20, 3.7-25, 3.7-27, 3.7-51, 3.7-52, 3.8-2, 3.8-3, 3.8-11, 3.8-14, 3.8-18, 3.8-23, 3.8-26, 3.9-8, 3.9-10, 3.9-11, 3.9-12, 3.9-16, 3.9-17, 3.9-18, 3.9-19, 3.9-20, 3.9-21, 3.9-22, 3.9-23, 3.9-24, 3.9-26, 3.9-27, 3.9-28, 3.9-29, 3.9-30, 3.9-31, 3.9-32, 3.10-3, 3.10-13, 3.10-20, 3.10-24, 3.10-25, 3.10-29, 3.10-34, 3.10-35, 3.10-36, 3.10-38, 3.10-40, 3.10-44,

3.10-45, 3.10-47, 3.10-49, 3.10-50, 3.10-62, 3.10-73, 3.10-96, 3.10-97, 3.10-98, 3.10-101, 3.11-2, 3.11-19, 3.11-59, 3.11-60, 3.11-68, 3.11-74, 3.11-76, 3.11-80, 3.11-82, 3.11-83, 3.11-96, 3.11-100, 3.11-101, 3.11-105, 3.11-109, 3.11-110, 3.11-121, 3.11-122, 3.11-124, 3.11-125, 3.11-146, 3.11-157, 3.11-158, 3.12-5, 3.12-16, 3.12-29, 3.12-31, 3.13-8, 3.13-13, 3.13-22, 3.13-23, 3.14-3, 3.14-13, 3.14-25, 3.14-26, 3.14-27, 3.15-13, 3.15-15, 3.15-32, 3.15-33, 3.17-1, 3.17-22, 3.17-23, 3.17-24, 3.17-33, 3.17-37, 3.17-47, 3.17-48, 3.17-49, 3.17-50, 3.17-51, 3.17-52, 3.17-53, 3.17-54, 3.17-55, 3.17-56, 3.17-57, 3.17-59, 3.17-62, 3.17-67, 3.17-69, 3.17-72, 3.17-73, 3.17-77, 3.17-79, 3.17-80, 3.17-81, 3.17-82, 3.17-89, 3.17-90, 3.17-92, 3.17-93, 3.17-97, 3.17-99, 3.17-100, 3.17-102, 3.17-103, 3.17-104, 3.17-105, 3.17-110, 3.17-112, 3.17-114, 3.17-115, 3.17-118, 3.17-119, 3.17-120, 3.17-121, 3.17-124, 3.17-127, 3.17-128, 3.17-130, 3.17-131, 3.17-132, 3.17-134, 3.17-135, 3.17-138, 3.17-139, 3.17-140, 3.18-11, 3.18-13, 3.18-15, 3.18-22, 3.18-24, 3.18-43, 3.18-44, 3.18-45, 3.19-1, 3.19-3, 3.19-4, 3.19-20, 3.19-22, 3.19-23, 3.19-24, 3.19-28, 3.19-29, 3.19-30, 3.20-1, 3.20-12, 3.20-17, 3.20-22, 3.21-1, 3.21-2, 3.21-3, 3.21-4, 3.21-9, 3.21-13, 3.21-17, 3.21-18, 3.21-20, 3.21-21, 3.21-22, 3.21-26, 3.21-27, 3.21-30, 3.21-31, 3.21-32, 3.21-35, 3.21-36, 3.21-37, 3.21-38, 3.21-39, 3.21-41, 3.21-42, 3.21-44, 3.21-46, 3.21-47, 3.22-8, 3.22-9, 3.22-13, 3.22-14, 3.23-1, 3.23-11, 3.23-15, 3.23-16, 3.23-17, 3.23-18, 3.23-19, 4-2, 4-7, 4-8, 4-9, 4-10, 4-12, 4-13, 4-18, 4-19, 4-24, 4-25, 4-38, 4-43, 4-54, 4-59, 4-63, 4-86, 4-90, 4-91, 4-92, 4-96, 5-1, 5-7, 5-8

sage-grouse, 1-18, 1-32, 1-35, 1-36, 1-41, 2-20, 2-48, 2-49, 2-50, 2-51, 2-52, 2-54, 2-56, 2-57, 2-58, 2-59, 2-60, 2-63, 2-64, 2-65, 2-70, 2-71, 2-72, 2-73, 2-74, 2-75, 2-81, 2-82, 2-84, 2-87, 2-90, 2-91, 2-97, 2-108, 2-164, 2-165, 2-166, 2-175, 2-178, 2-181, 2-184, 2-190, 2-191, 2-192, 2-206, 2-207, 2-210, 3.2-88, 3.2-102, 3.3-88, 3.3-100, 3.3-267, 3.3-268, 3.6-24, 3.6-25, 3.6-30, 3.7-32, 3.7-36, 3.8-15, 3.8-17, 3.9-15, 3.9-19, 3.10-11, 3.10-12, 3.10-16, 3.10-21, 3.10-41, 3.10-51, 3.10-60, 3.11-3, 3.11-4, 3.11-5, 3.11-7, 3.11-8, 3.11-9, 3.11-10, 3.11-11, 3.11-12, 3.11-16, 3.11-17, 3.11-18, 3.11-19, 3.11-23, 3.11-26, 3.11-27, 3.11-29, 3.11-39, 3.11-48, 3.11-52, 3.11-63, 3.11-65, 3.11-66, 3.11-67, 3.11-68, 3.11-69, 3.11-70, 3.11-71, 3.11-72, 3.11-75, 3.11-79, 3.11-87, 3.11-93, 3.11-94, 3.11-104, 3.11-105, 3.11-108, 3.11-117, 3.11-127, 3.11-128, 3.11-130, 3.11-131, 3.11-133, 3.11-134, 3.11-136, 3.11-137, 3.11-141, 3.11-142, 3.11-144, 3.11-145, 3.11-146, 3.11-150, 3.11-153, 3.11-156, 3.11-157, 3.11-159, 3.11-160, 3.11-162, 3.12-16, 3.12-25, 3.13-13, 3.13-18, 3.14-15, 3.14-20, 3.15-20, 3.15-22, 3.17-58, 3.17-71, 3.17-72, 3.17-98, 3.18-25, 3.18-28, 3.19-20, 3.19-22, 4-5, 4-10, 4-45, 4-47, 4-48, 4-56, 4-74, 4-77, 4-78, 4-81, 4-93

Salt Lake Alternate, 3.3-60, 3.3-62, 3.3-182, 3.3-183, 3.3-184, 3.3-185, 3.3-186, 3.3-187, 3.17-36, 3.17-107

Schedule Variation, 2-2, 2-3, 2-4, 2-5, 2-6, 2-7, 2-8, 2-9, 2-10, 2-11, 2-12, 2-20, 2-22, 2-24, 3.1-1, 3.1-3, 3.1-4, 3.2-82, 3.2-199, 3.3-69, 3.3-278, 3.4-27, 3.4-28, 3.4-74, 3.4-75, 3.4-76, 3.4-77, 3.4-78, 3.4-79, 3.4-80, 3.4-81, 3.4-82, 3.4-83, 3.4-84, 3.5-7, 3.5-12, 3.5-13, 3.6-10, 3.6-50, 3.7-19, 3.7-52, 3.8-7, 3.8-26, 3.9-6, 3.9-32, 3.10-18, 3.10-97, 3.10-98, 3.11-158, 3.12-14, 3.12-31, 3.13-10, 3.13-23, 3.14-12, 3.14-26, 3.15-12, 3.15-33, 3.17-47, 3.17-140, 3.18-10, 3.18-44, 3.19-6, 3.19-30, 3.20-11, 3.20-17, 3.20-22, 3.20-23, 3.21-13, 3.21-47, 3.22-7, 3.22-14, 3.23-6, 3.23-19, 4-1

Section 404, 1-5, 1-6, 1-17, 1-18, 2-1, 2-155, 2-175, 3.7-33, 3.7-35, 3.7-37, 3.7-38, 3.7-39, 3.9-1, 3.9-2, 3.9-4, 3.9-10, 3.9-11, 3.9-15, 3.9-33

sensitive species, 2-161, 2-163, 3.6-9, 3.7-3, 3.7-26, 3.7-27, 3.10-25, 3.10-32, 3.10-47, 3.11-7, 3.11-12, 3.11-20, 3.11-34, 3.11-39, 3.11-51, 3.11-54, 3.11-55, 3.11-58, 3.11-85, 3.11-87, 3.11-88, 3.11-90, 3.11-97, 3.11-104, 3.11-106, 3.11-107, 3.11-110, 3.11-112, 3.11-113, 3.11-114, 3.11-123, 3.11-158, 3.11-162, 4-6, 4-84

Shirley Basin, 1-14, 2-43, 2-44, 2-55, 3.2-23, 3.2-24, 3.2-25, 3.2-93, 3.3-21, 3.3-98, 3.11-9, 3.11-22, 3.11-54, 3.11-58, 3.17-31, 3.17-44

Shoshone FO, 3.2-63, 3.2-65, 3.3-272, 3.3-274, 3.3-275, 3.3-277, 3.10-88, 3.17-17, 3.17-18, 4-18

State Historic Preservation Office (SHPO), 1-21, 2-207, 3.3-6, 3.3-16, 3.3-17, 3.3-19, 3.3-26, 3.3-27, 3.3-30, 3.3-42, 3.3-44, 3.3-45, 3.3-47, 3.3-49, 3.3-50, 3.3-51, 3.3-52, 3.3-56, 3.3-63, 3.3-92, 3.3-108, 3.3-193, 3.3-242, 5-4, 5-9

Scenic Integrity Objective (SIO), 1-32, 2-26, 2-27, 2-176, 3.2-6, 3.2-19, 3.2-23, 3.2-56, 3.2-89, 3.2-94, 3.2-95, 3.2-101, 3.17-61, 3.17-68, 4-9

Scenery Management System (SMS), 2-27, 3.2-2, 3.2-5, 3.2-6, 3.2-7, 3.2-12, 3.2-13, 3.2-14, 3.2-17, 3.2-86, 3.2-94, 3.17-60

Snake River, 1-5, 1-17, 1-22, 2-39, 2-40, 2-41, 2-76, 2-78, 2-79, 2-80, 2-85, 2-94, 2-95, 2-99, 2-100, 2-101, 2-103, 2-105, 2-106, 2-108, 2-109, 2-110, 2-111, 2-147, 2-170, 2-187, 2-208, 2-209, 3.2-2, 3.2-3, 3.2-11, 3.2-17, 3.2-18, 3.2-41, 3.2-44, 3.2-45, 3.2-64, 3.2-65, 3.2-66, 3.2-67, 3.2-68, 3.2-69, 3.2-70, 3.2-71, 3.2-73, 3.2-74, 3.2-75, 3.2-76, 3.2-77, 3.2-79, 3.2-80, 3.2-81, 3.2-84, 3.2-126, 3.2-130, 3.2-132, 3.2-162, 3.2-165, 3.2-167, 3.2-169, 3.2-171, 3.2-174, 3.2-175, 3.2-176, 3.2-181, 3.2-191, 3.2-192, 3.2-193, 3.2-201, 3.3-23, 3.3-24, 3.3-25, 3.3-32, 3.3-33, 3.3-34, 3.3-47, 3.3-56, 3.3-57, 3.3-58, 3.3-59, 3.3-61, 3.3-62, 3.3-63, 3.3-64, 3.3-65, 3.3-187,

3.3-188, 3.3-189, 3.3-197, 3.3-201, 3.3-212, 3.3-213, 3.3-219, 3.3-220, 3.3-226, 3.3-228, 3.3-230, 3.3-270, 3.3-273, 3.3-275, 3.6-1, 3.6-3, 3.6-43, 3.7-8, 3.7-15, 3.7-19, 3.7-45, 3.7-47, 3.7-48, 3.7-51, 3.8-1, 3.8-23, 3.9-28, 3.10-18, 3.10-21, 3.10-33, 3.10-47, 3.10-83, 3.10-84, 3.11-31, 3.11-34, 3.11-35, 3.11-36, 3.11-37, 3.11-47, 3.11-48, 3.11-80, 3.11-82, 3.11-83, 3.11-99, 3.11-101, 3.11-103, 3.11-113, 3.11-150, 3.12-1, 3.12-28, 3.13-1, 3.13-7, 3.13-9, 3.13-21, 3.14-1, 3.14-24, 3.15-1, 3.15-29, 3.17-1, 3.17-17, 3.17-19, 3.17-26, 3.17-35, 3.17-37, 3.17-38, 3.17-93, 3.17-109, 3.17-112, 3.17-114, 3.17-118, 3.17-120, 3.17-121, 3.17-122, 3.17-126, 3.17-127, 3.17-134, 3.17-135, 3.17-141, 3.18-1, 3.18-38, 3.19-27, 3.19-28, 3.20-7, 3.20-8, 4-12, 4-16, 4-17, 4-18, 4-23, 4-32, 4-33, 4-55, 4-59, 4-77, 4-89, 4-90, 4-91, 5-10

soils, 1-36, 2-64, 2-82, 2-83, 2-147, 2-150, 2-151, 2-152, 2-154, 2-167, 2-168, 2-170, 2-171, 2-177, 2-180, 2-183, 2-186, 2-189, 2-195, 2-196, 2-200, 2-204, 2-210, 3.2-85, 3.2-201, 3.3-24, 3.3-25, 3.4-45, 3.6-14, 3.6-15, 3.6-51, 3.7-8, 3.7-9, 3.7-12, 3.7-16, 3.7-17, 3.7-23, 3.7-32, 3.7-55, 3.8-7, 3.8-10, 3.9-2, 3.9-4, 3.9-11, 3.9-12, 3.10-49, 3.11-31, 3.11-32, 3.11-41, 3.11-42, 3.11-44, 3.11-46, 3.11-82, 3.11-101, 3.14-1, 3.15-1, 3.15-3, 3.15-4, 3.15-5, 3.15-6, 3.15-7, 3.15-8, 3.15-9, 3.15-10, 3.15-11, 3.15-12, 3.15-13, 3.15-14, 3.15-15, 3.15-16, 3.15-17, 3.15-18, 3.15-19, 3.15-20, 3.15-21, 3.15-22, 3.15-23, 3.15-24, 3.15-25, 3.15-26, 3.15-27, 3.15-28, 3.15-29, 3.15-30, 3.15-31, 3.15-32, 3.15-33, 3.15-34, 3.17-30, 3.17-57, 3.17-70, 3.18-3, 3.18-5, 3.18-11, 3.18-16, 3.18-17, 3.18-45, 3.18-46, 3.19-1, 3.19-7, 3.19-23, 3.20-13, 3.22-2, 4-53, 4-65, 4-66, 4-86

South Alternate, 3.3-59, 3.3-86, 3.3-223, 3.3-224, 3.3-225, 3.3-226, 3.3-227, 3.3-228, 3.3-229, 3.3-230, 3.3-231, 3.3-232, 3.3-233, 3.3-234, 3.17-37, 3.17-38, 3.17-39, 3.17-122, 3.17-136

Special Status Species, 3.7-19, 3.7-33, 3.7-35, 3.7-37, 3.7-38, 3.7-40, 3.7-43, 3.7-44, 3.7-45, 3.7-47, 3.7-49, 3.7-51, 3.10-6

Special Use Permit, 1-4, 1-5, 1-16, 1-17, 2-1, 2-26, 2-172, 3.17-6, 3.17-7, 3.17-48, 3.19-13, 3.19-31

SRBOP RMP, 2-42, 2-94, 2-100, 2-101, 2-102, 2-103, 2-107, 2-108, 2-109, 2-110, 3.2-172, 3.2-173, 3.2-188, 3.2-189, 3.2-190, 3.3-275, 3.3-276, 3.6-23, 3.17-19, 3.17-36, 3.17-37, 3.17-42, 3.17-111, 3.17-112, 3.17-120, 3.17-126, 3.17-127, 3.17-135, 3.19-7, 3.19-27, 3.19-28, 4-17, 4-89, 4-90

stream crossing, 2-121, 2-145, 2-156, 2-169, 2-171, 2-177, 2-180, 2-183, 2-186, 2-189, 2-196, 2-200, 2-204, 3.10-37, 3.10-38, 3.10-49, 3.10-50, 3.10-53, 3.10-56, 3.10-58, 3.10-62, 3.10-65, 3.10-68, 3.10-72, 3.10-73, 3.10-76, 3.10-80, 3.10-84, 3.10-86, 3.10-89, 3.10-91, 3.10-95, 3.10-99, 3.11-21, 3.11-99, 3.11-101, 3.11-102, 3.11-103, 3.11-104, 3.19-8, 3.19-12, 4-73

Structure Variation, 1-41, 2-2, 2-17, 3.1-1, 3.1-4, 3.2-199, 3.3-2, 3.3-69, 3.3-278, 3.4-74, 3.5-7, 3.5-12, 3.6-10, 3.6-50, 3.7-19, 3.7-52, 3.8-7, 3.8-26, 3.9-6, 3.9-32, 3.10-18, 3.10-97, 3.11-157, 3.12-14, 3.12-31, 3.13-10, 3.13-23, 3.14-12, 3.14-26, 3.15-12, 3.15-33, 3.17-47, 3.17-140, 3.18-10, 3.18-44, 3.19-6, 3.19-30, 3.20-17, 3.21-47, 3.22-6, 3.22-13, 3.23-19

substation, 1-10, 1-11, 1-12, 1-13, 1-14, 1-15, 1-26, 1-41, 2-1, 2-3, 2-6, 2-8, 2-9, 2-10, 2-11, 2-12, 2-20, 2-25, 2-26, 2-54, 2-57, 2-58, 2-64, 2-68, 2-80, 2-81, 2-85, 2-88, 2-105, 2-115, 2-116, 2-117, 2-118, 2-119, 2-120, 2-121, 2-122, 2-123, 2-124, 2-125, 2-131, 2-133, 2-141, 2-142, 3.1-3, 3.1-5, 3.2-27, 3.2-41, 3.2-45, 3.2-81, 3.2-82, 3.2-103, 3.2-134, 3.2-135, 3.2-192, 3.3-166, 3.3-167, 3.3-271, 3.4-1, 3.4-19, 3.4-28, 3.4-36, 3.4-47, 3.4-51, 3.4-55, 3.4-60, 3.4-63, 3.4-74, 3.6-38, 3.6-39, 3.7-24, 3.7-43, 3.7-44, 3.8-20, 3.8-21, 3.9-4, 3.9-25, 3.10-76, 3.10-77, 3.11-59, 3.11-61, 3.11-76, 3.11-83, 3.11-84, 3.11-95, 3.11-115, 3.11-144, 3.11-145, 3.12-27, 3.13-19, 3.13-20, 3.14-23, 3.15-27, 3.17-7, 3.17-26, 3.17-53, 3.17-54, 3.17-67, 3.17-69, 3.17-77, 3.17-83, 3.17-93, 3.17-96, 3.18-11, 3.18-34, 3.19-7, 3.19-25, 3.20-2, 3.20-4, 3.20-6, 3.20-22, 3.22-4, 3.22-12, 3.23-5, 3.23-7, 3.23-12, 3.23-18, 4-30, 4-41

traditional cultural property (TCP), 1-21, 1-33, 3.3-1, 3.3-2, 3.3-5, 3.3-6, 3.3-7, 3.3-8, 3.3-9, 3.3-15, 3.5-10, 4-2, 5-6, 5-8

threatened, endangered, and sensitive (TES), 1-34, 2-27, 2-28, 2-143, 2-152, 2-156, 2-161, 2-164, 2-174, 2-213, 3.6-9, 3.7-1, 3.7-2, 3.7-3, 3.7-4, 3.7-5, 3.7-19, 3.7-20, 3.7-26, 3.7-27, 3.7-32, 3.7-43, 3.7-47, 3.7-51, 3.7-52, 3.7-55, 3.9-7, 3.11-1, 3.11-2, 3.11-5, 3.11-7, 3.11-10, 3.11-11, 3.11-12, 3.11-13, 3.11-14, 3.11-15, 3.11-20, 3.11-51, 3.11-52, 3.11-53, 3.11-56, 3.11-100, 3.11-108, 3.11-126, 3.11-127, 3.11-130, 3.11-133, 3.11-136, 3.11-137, 3.11-141, 3.11-142, 3.11-144, 3.11-145, 3.11-150, 3.11-153, 3.11-156, 3.11-158, 3.11-160

timber, 1-37, 2-151, 3.3-9, 3.3-22, 3.3-23, 3.4-13, 3.4-26, 3.4-43, 3.4-44, 3.4-45, 3.4-82, 3.6-1, 3.6-2, 3.6-18, 3.6-22, 3.6-23, 3.6-52, 3.7-23, 3.7-40, 3.11-30, 3.11-73, 3.17-1, 3.17-3, 3.17-12, 3.17-13, 3.17-14, 3.17-16, 3.17-18, 3.17-24, 3.17-27, 3.17-41, 3.17-51, 3.17-55, 4-20, 4-36, 4-37, 4-38, 4-52, 4-70, 4-74, 4-92

traffic, 1-36, 1-38, 2-137, 2-140, 2-142, 2-171, 3.2-82, 3.3-36, 3.3-48, 3.3-50, 3.3-57, 3.3-61, 3.3-62, 3.3-107, 3.3-113, 3.3-118, 3.3-148, 3.3-158, 3.3-161, 3.3-186, 3.3-193, 3.3-210, 3.3-225, 3.3-277, 3.4-59, 3.5-8, 3.8-14, 3.9-12, 3.10-42, 3.10-43, 3.10-50, 3.11-54, 3.14-15, 3.15-3, 3.15-24, 3.17-20, 3.17-42, 3.17-50, 3.17-51, 3.17-52, 3.17-118, 3.19-1, 3.19-2, 3.19-3,

3.19-4, 3.19-12, 3.19-13, 3.19-14, 3.19-15, 3.19-16, 3.19-17, 3.19-22, 3.19-24, 3.19-30, 3.21-9, 4-70, 4-86, 4-94, 4-96

transportation, 1-13, 1-17, 2-20, 2-141, 2-143, 2-149, 2-167, 2-173, 2-174, 2-210, 3.3-2, 3.3-7, 3.3-21, 3.3-22, 3.3-23, 3.3-24, 3.3-25, 3.3-26, 3.3-36, 3.3-45, 3.3-49, 3.3-51, 3.3-54, 3.3-59, 3.3-63, 3.4-48, 3.4-49, 3.4-51, 3.4-52, 3.4-53, 3.4-54, 3.4-60, 3.4-85, 3.8-7, 3.8-8, 3.9-9, 3.14-14, 3.14-15, 3.17-5, 3.17-7, 3.17-14, 3.17-15, 3.17-16, 3.17-17, 3.17-18, 3.17-50, 3.17-51, 3.17-58, 3.17-69, 3.17-116, 3.19-1, 3.19-2, 3.19-3, 3.19-4, 3.19-6, 3.19-8, 3.19-12, 3.19-14, 3.19-15, 3.19-17, 3.19-21, 3.19-22, 3.19-25, 3.19-27, 3.19-29, 3.19-30, 3.22-2, 3.22-3, 3.22-9, 3.22-11, 3.22-12, 3.22-14, 3.23-5, 3.23-10, 4-53, 4-94, 4-96

Twin Falls MFP, 1-22, 2-36, 2-37, 2-92, 2-93, 2-106, 3.2-158, 3.2-159, 3.2-188, 3.3-272, 3.3-273, 3.3-277, 3.6-23, 3.6-24, 3.17-17, 3.17-35, 3.17-39, 3.17-98, 3.17-100, 3.17-106, 3.17-126, 3.17-138, 3.19-7, 3.19-28, 4-14, 4-89

visual contrast rating (VCR), 3.3-17, 3.3-19, 3.3-88, 3.3-90, 3.3-92, 3.3-94, 3.3-98, 3.3-100, 3.3-102, 3.3-103, 3.3-107, 3.3-108, 3.3-109, 3.3-110, 3.3-111, 3.3-113, 3.3-114, 3.3-116, 3.3-117, 3.3-118, 3.3-120, 3.3-122, 3.3-124, 3.3-125, 3.3-126, 3.3-127, 3.3-128, 3.3-129, 3.3-130, 3.3-132, 3.3-133, 3.3-134, 3.3-136, 3.3-137, 3.3-138, 3.3-139, 3.3-141, 3.3-143, 3.3-145, 3.3-146, 3.3-148, 3.3-151, 3.3-152, 3.3-154, 3.3-155, 3.3-157, 3.3-158, 3.3-160, 3.3-161, 3.3-164, 3.3-165, 3.3-166, 3.3-168, 3.3-169, 3.3-170, 3.3-171, 3.3-172, 3.3-173, 3.3-175, 3.3-177, 3.3-178, 3.3-179, 3.3-180, 3.3-182, 3.3-183, 3.3-184, 3.3-186, 3.3-187, 3.3-188, 3.3-189, 3.3-191, 3.3-193, 3.3-195, 3.3-196, 3.3-197, 3.3-200, 3.3-202, 3.3-204, 3.3-205, 3.3-207, 3.3-208, 3.3-209, 3.3-210, 3.3-212, 3.3-214, 3.3-215, 3.3-217, 3.3-219, 3.3-220, 3.3-222, 3.3-223, 3.3-225, 3.3-226, 3.3-228, 3.3-230, 3.3-232, 3.3-233, 3.3-234, 3.3-235, 3.3-236, 3.3-238, 3.3-241

viewshed, 2-32, 2-33, 2-67, 2-92, 3.2-9, 3.2-17, 3.2-165, 3.3-5, 3.3-17, 3.3-18, 3.3-19, 3.3-88, 3.3-100, 3.3-103, 3.3-107, 3.3-108, 3.3-110, 3.3-111, 3.3-117, 3.3-125, 3.3-133, 3.3-154, 3.3-155, 3.3-175, 3.3-182, 3.3-225, 3.3-233, 3.10-25, 3.17-15, 3.17-81

Visual Impact Study, 3.3-5

VMS, 2-35, 3.2-2, 3.2-5, 3.2-7, 3.2-12, 3.2-14, 3.2-17, 3.2-86

Visual Quality Objective (VQO), 2-26, 2-34, 2-35, 2-193, 2-194, 3.2-7, 3.2-8, 3.2-13, 3.2-29, 3.2-56, 3.2-62, 3.2-109, 3.2-114, 3.2-141, 3.2-142, 3.2-147, 3.2-153, 3.2-157, 3.2-158, 3.2-159, 3.17-80, 3.17-81, 3.17-101, 3.17-102, 4-12

Visual Resource Management (VRM), 1-23, 1-32, 2-26, 2-27, 2-28, 2-29, 2-31, 2-32, 2-35, 2-36, 2-37, 2-38, 2-39, 2-41, 2-52, 2-63, 2-64, 2-65, 2-72, 2-73, 2-74, 2-75, 2-76, 2-77, 2-78, 2-82, 2-83, 2-87, 2-89, 2-94, 2-96, 2-97, 2-98, 2-99, 2-104, 2-105, 2-119, 2-147, 2-176, 2-178, 2-179, 2-182, 2-184, 2-185, 2-188, 2-193, 2-194, 2-197, 2-199, 2-201, 2-202, 2-203, 3.2-2, 3.2-4, 3.2-5, 3.2-12, 3.2-13, 3.2-14, 3.2-19, 3.2-21, 3.2-23, 3.2-25, 3.2-26, 3.2-27, 3.2-28, 3.2-29, 3.2-30, 3.2-32, 3.2-33, 3.2-34, 3.2-35, 3.2-36, 3.2-37, 3.2-38, 3.2-40, 3.2-41, 3.2-42, 3.2-46, 3.2-47, 3.2-48, 3.2-49, 3.2-50, 3.2-55, 3.2-56, 3.2-61, 3.2-63, 3.2-65, 3.2-67, 3.2-68, 3.2-69, 3.2-70, 3.2-71, 3.2-72, 3.2-73, 3.2-74, 3.2-75, 3.2-77, 3.2-79, 3.2-80, 3.2-81, 3.2-85, 3.2-86, 3.2-87, 3.2-88, 3.2-91, 3.2-93, 3.2-94, 3.2-95, 3.2-96, 3.2-97, 3.2-100, 3.2-101, 3.2-102, 3.2-105, 3.2-106, 3.2-107, 3.2-108, 3.2-109, 3.2-114, 3.2-116, 3.2-118, 3.2-119, 3.2-120, 3.2-121, 3.2-122, 3.2-123, 3.2-124, 3.2-125, 3.2-126, 3.2-127, 3.2-130, 3.2-131, 3.2-132, 3.2-133, 3.2-135, 3.2-137, 3.2-140, 3.2-141, 3.2-147, 3.2-152, 3.2-153, 3.2-155, 3.2-156, 3.2-157, 3.2-158, 3.2-159, 3.2-161, 3.2-162, 3.2-163, 3.2-165, 3.2-166, 3.2-170, 3.2-171, 3.2-172, 3.2-173, 3.2-174, 3.2-175, 3.2-176, 3.2-178, 3.2-179, 3.2-180, 3.2-182, 3.2-184, 3.2-187, 3.2-188, 3.2-189, 3.2-190, 3.2-191, 3.2-192, 3.2-201, 3.3-15, 3.3-264, 3.3-265, 3.3-266, 3.3-267, 3.3-269, 3.3-270, 3.3-272, 3.3-273, 3.3-274, 3.3-275, 3.3-276, 3.3-277, 3.6-15, 3.6-23, 3.6-24, 3.10-6, 3.17-49, 3.17-61, 3.17-68, 3.17-72, 3.17-81, 3.17-90, 3.17-91, 3.17-99, 3.17-100, 3.17-102, 3.17-111, 3.17-113, 3.17-125, 3.17-126, 3.17-127, 3.17-128, 3.19-7, 3.19-23, 4-8, 4-10, 4-11, 4-12, 4-13, 4-15, 4-16, 4-17, 4-18, 4-19, 4-88, 4-89, 4-90, 4-91

water quality, 1-36, 1-40, 3.9-1, 3.9-3, 3.9-16, 3.9-22, 3.9-25, 3.10-7, 3.10-31, 3.10-37, 3.11-102, 3.17-16, 4-32, 4-72, 4-73

waters of the U.S., 1-40, 2-156, 3.10-40, 3.10-100

waters of the United States, 1-3, 1-5, 1-6, 1-17, 2-155, 3.9-1, 3.9-2, 3.9-4, 3.9-11, 3.9-15, 3.9-33, 3.10-40, 3.10-100

weed, 1-34, 2-40, 2-149, 2-150, 2-151, 2-152, 2-153, 2-154, 3.4-40, 3.4-41, 3.4-43, 3.6-14, 3.6-17, 3.6-18, 3.6-19, 3.6-25, 3.6-50, 3.6-51, 3.6-52, 3.7-13, 3.7-23, 3.7-27, 3.7-38, 3.7-44, 3.7-47, 3.7-51, 3.7-55, 3.8-1, 3.8-2, 3.8-3, 3.8-4, 3.8-5, 3.8-6, 3.8-7, 3.8-8, 3.8-9, 3.8-10, 3.8-11, 3.8-12, 3.8-13, 3.8-14, 3.8-16, 3.8-27, 3.9-8, 3.9-12, 3.10-24, 3.10-43, 3.11-9, 3.11-68, 3.11-82, 3.11-100, 3.14-15, 3.17-56, 3.18-24, 4-3, 4-36, 4-63, 4-64, 4-65

Wells RMP, 1-23, 2-41, 2-92, 2-93, 3.2-158, 3.3-273, 3.17-18, 3.17-35, 3.17-98, 3.17-99, 3.17-106, 4-19

Western Area Power Administration, 3.3-40, 4-40, 4-42, 4-48, 5-17

wetland, 1-5, 1-6, 1-19, 2-66, 2-117, 2-155, 2-161, 3.6-4, 3.6-7, 3.6-9, 3.6-11, 3.6-17, 3.6-24, 3.6-25,

3.6-26, 3.6-27, 3.6-28, 3.6-29, 3.6-31, 3.6-32, 3.6-34, 3.6-35, 3.6-36, 3.6-38, 3.6-40, 3.6-41, 3.6-43, 3.6-44, 3.6-45, 3.6-46, 3.6-47, 3.6-48, 3.6-50, 3.7-2, 3.7-9, 3.7-17, 3.7-26, 3.7-32, 3.7-34, 3.7-36, 3.7-38, 3.7-39, 3.7-51, 3.9-1, 3.9-2, 3.9-3, 3.9-4, 3.9-5, 3.9-6, 3.9-7, 3.9-8, 3.9-9, 3.9-10, 3.9-11, 3.9-12, 3.9-15, 3.9-16, 3.9-17, 3.9-18, 3.9-19, 3.9-20, 3.9-21, 3.9-22, 3.9-23, 3.9-24, 3.9-25, 3.9-26, 3.9-28, 3.9-30, 3.9-31, 3.9-32, 3.9-33, 3.10-13, 3.10-17, 3.10-24, 3.10-32, 3.10-40, 3.10-44, 3.10-55, 3.10-64, 3.10-71, 3.10-75, 3.10-88, 3.11-1, 3.11-2, 3.11-15, 3.11-24, 3.11-43, 3.11-44, 3.11-49, 3.11-51, 3.11-61, 3.11-62, 3.11-76, 3.11-77, 3.11-78, 3.11-79, 3.11-80, 3.11-81, 3.11-82, 3.11-83, 3.11-95, 3.11-96, 3.11-111, 3.11-112, 3.11-113, 3.11-114, 3.11-115, 3.11-116, 3.11-120, 3.11-128, 3.11-131, 3.11-138, 3.11-142, 3.11-146, 3.11-159, 3.15-9, 3.15-12, 3.15-13, 3.15-16, 3.15-25, 3.17-18, 3.17-22, 4-3, 4-4, 4-64, 4-66, 4-67, 4-76, 4-83, 4-84

Wyoming Game and Fish Department (WGFD), 2-58, 2-59, 2-71, 2-73, 3.10-8, 3.10-14, 3.11-3, 3.11-8, 3.11-11, 3.11-14, 3.11-15, 3.11-16, 3.11-17, 3.11-21, 3.11-27, 3.11-32, 3.11-42, 3.11-43, 3.11-44, 3.11-45, 3.17-22, 3.17-28, 4-5, 5-3, 5-9

wilderness characteristics, 3.17-42, 3.17-43, 3.17-44, 3.17-64, 3.17-65, 3.17-70, 3.17-85, 3.17-86, 3.17-107

Windstar Substation, 1-1, 2-1, 2-2, 2-8, 2-13, 2-15, 2-22, 2-48, 2-49, 2-50, 2-52, 2-53, 2-54, 2-56, 2-122, 3.1-3, 3.2-96, 3.3-88, 3.4-48, 3.4-49, 3.6-28, 3.7-34, 3.8-16, 3.9-17, 3.10-56, 3.11-130, 3.12-24, 3.13-17, 3.14-19, 3.15-21, 3.17-24, 3.17-61, 3.17-66, 3.18-26, 3.19-20, 4-27, 4-40, 4-41, 4-42

Wild and Scenic River (WSR), 2-36, 2-38, 2-42, 2-102, 2-103, 2-201, 3.2-70, 3.2-75, 3.2-188, 3.3-276, 3.17-49, 3.17-126, 3.17-128, 3.17-130, 3.19-7, 3.19-29, 4-15

WWE corridor, 1-23, 2-2, 2-25, 2-43, 2-48, 2-51, 2-52, 2-54, 2-55, 2-57, 2-58, 2-59, 2-60, 2-61, 2-62, 2-63, 2-65, 2-66, 2-76, 2-81, 2-92, 2-93, 2-94, 2-95, 2-96, 2-97, 2-98, 2-99, 2-100, 2-102, 2-103, 2-104, 2-105, 2-106, 2-107, 2-108, 2-109, 2-110, 2-111, 2-115, 2-116, 2-181, 2-197, 2-201, 3.2-56, 3.2-61, 3.2-71, 3.2-74, 3.2-79, 3.2-80, 3.2-101, 3.2-102, 3.2-162, 3.2-172, 3.2-174, 3.2-175, 3.2-192, 3.3-100, 3.3-187, 3.3-216, 3.3-237, 3.6-30, 3.6-43, 3.6-46, 3.6-48, 3.7-36, 3.7-45, 3.7-49, 3.7-51, 3.8-3, 3.8-17, 3.8-23, 3.8-24, 3.8-26, 3.9-19, 3.9-28, 3.9-29, 3.9-31, 3.10-60, 3.10-84, 3.10-89, 3.10-95, 3.11-133, 3.11-150, 3.11-152, 3.11-156, 3.12-25, 3.12-28, 3.12-29, 3.13-17, 3.13-21, 3.13-22, 3.14-20, 3.14-24, 3.14-25, 3.15-22, 3.15-29, 3.15-30, 3.15-32, 3.17-27, 3.17-49, 3.17-59, 3.17-60, 3.17-67, 3.17-71, 3.17-72, 3.17-77, 3.17-79, 3.17-80, 3.17-90, 3.17-97, 3.17-98, 3.17-109, 3.17-110, 3.17-111, 3.17-114, 3.17-123, 3.17-124, 3.17-125, 3.17-128, 3.17-131, 3.17-137, 3.17-138, 3.18-28, 3.18-38, 3.18-40, 3.18-42, 3.19-21, 3.19-27, 3.19-29, 4-15, 4-16, 4-19, 4-39, 4-57, 4-59, 4-79, 4-87, 5-7

Wyoming State Office, 3.6-9, 5-9, 5-13, 5-23

zoning, 3.2-9, 3.4-73, 3.17-4, 3.17-6, 3.17-8, 3.17-11, 3.17-48, 3.17-116, 3.17-119

7.0 REFERENCES

Aase, Arvid. 2008. Personal communication with Arvid Aase, Fossil Butte National Monument Archaeologist concerning local landslides. January 22.

AASHTO (American Association of State Highway and Transport Officials). current edition. Guidelines for Geometric Design of Very Low-Volume Local Roads (ADT ≤400).

Adams, T. 2010. E-mail from T. Adams, Idaho Power, to P. Eckert and J. Nickerson, Tetra Tech, re: access road water crossings. February 8.

AESO (Alberta Electric System Operator). 2010. 500 kV AC Underground Transmission Technical Feasibility Study. Available online at: http://www.aeso.ca/downloads/UndergroundStudybackgrounderFeb24.pdf

Algers, B.; and K. Hennichs. 1985. The effect of exposure to 400-kV transmission lines on the fertility of cows: a retrospective cohort study. *Preventive Veterinary Medicine* 3:351-361.

Algers, B.; and J. Hultgren. 1987. Effects of long-term exposure to a 400-kV, 50-Hz transmission line on estrous and fertility in cows. *Preventive Veterinary Medicine* 5:21-36.

Anderson, J.R., E.E. Hardy, J.T. Roach, and R.E. Witmet. 1976. A Land Use and Land Cover Classification System for Use with Remote Sensor Data. Geological Survey Professional Paper 964. 28 pp.

Angell, R.F.; Schott, M.R.; Raleigh, R.J.; Bracken, T.D. 1990. Effects of a high-voltage direct-current transmission line on beef cattle production. *Bioelectromagnetics* 11(4):273-282.

APLIC (Avian Power Line Interaction Committee) and USFWS (U.S. Fish and Wildlife Service). 2005. Avian Protection Plan Guidelines. A joint document prepared by: The Edison Electric Institute's Avian Power Line Interaction Committee (APLIC) and U.S. Fish and Wildlife Service (USFWS) (April 2005).

APLIC. 2006. Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006. Edison Electric Institute, APLIC, and the California Energy Commission. Washington, D.C. and Sacramento, CA. http://www.aplic.org/

Arkush, Brooke S. 1990. The Protohistoric Period in the Western Great Basin. *Journal of California and Great Basin Anthropology* 14(1):28-36.

Armitage, C.L., J.C. Newberry, J.C. Mackay, C.M. Love, D. Heffington, K. Harvey, J.E. Sall, K. Dueholm, and S.D. Creasman. 1982. *The Deadman Wash Site.* Cultural Resource Management Report No. 6, Archaeological Services of Western Wyoming College, Rock Springs.

Arrington, L.J. 1994. *History of Idaho*. University of Idaho Press, Boise.

AWEA (American Wind Energy Association). 2010a. AWEA projects listing. Available online at: http://www.awea.org/projects/Projects.aspx?s=Wyoming

AWEA. 2010b. AWEA 2nd Quarter 2010 Market Report. Available online at: http://www.awea.org/publications/reports/2Q10.pdf

AWEA. [no date]. Web site home page. Available online at: http://www.awea.org (accessed October 2010)

Bacon, W. 1974. The Visual Management System. In: National Forest Landscape Management, Agricultural Handbook No. 462 (Vol.2). Washington, D.C. U.S. Government Printing Office.

Baishiki, R.S.; Johnson, G.B.; Zaffanella, L.E.; Bracken, T.D.; Sussman, S.S.; Rauch, G.B.; and Silva, J.M. 1990. Studies of Power System Magnetic Fields: Characterization of Sources in Residential Environments, Measurement of Exposure, Influence On Computer Screens. (36-104) CIGRE, Paris, France. 10 pages.

Baker, Steven G. 2007. Protohistoric and Historic Native Americans: The Ute. In *Colorado History: A Context for Historical Archaeology*, pp. 36-88, by Minette C. Church, Steven G. Baker, Bonnie J. Clark, Richard F. Carrillo, Jonathon C. Horn, Carl D. Späth, David R. Guilfoyle, and E. Steve Cassells. Colorado Council of Professional Archaeologists, Denver, Colorado.

Balmori, A., and O. Hallberg. 2007. The urban decline of the house sparrow (Passer domesticus), a possible link to electromagnetic radiation. *Electromagnetic Biology and Medicine* 26:141-151.

Banfai, B., G.G. Karady, C.J. Kim, and K.B. Maracas. 2000. Magnetic field effects on CRT computer monitors. IEEE Trans. on Power Delivery 15, 307-312.

Barold, S.S., M.D. Falkoff, L.S. Ong, and R.A. Heinle. 1991. Interference in cardiac pacemakers: exogenous sources. In: *Cardiac Pacing and Electrophysiology*, 3rd Ed. El-Sherif, N; Samet, P (eds). Philadelphia, PA: WB Saunders Co, pp. 608-633.

Baydack, R., and D. Hein. 1987. Tolerance of Sharp-Tailed Grouse to Lek Disturbance. Wildlife Society Bulletin 15(4) 535-539

Beaulaurier, D.L. 1981. Mitigation of Bird Collisions with Transmission Lines. Bonneville Power Administration. Portland, Oregon.

Beaulaurier, D.L., B.W. James, P.A. Jackson, J.R. Meyer, J.M. Lee Jr. 1982. Mitigating the Incidence of Bird Collisions with Transmission Lines. Pages 539-550 in: Third Annual International Symposium on Environmental Concerns in Rights–Of-Way Management, San Diego, California.

Beck, W. 2010. Personal communication with W. Beck, Caribou-Targhee NF. April 15.

Beck, J.L., K.P. Reese, J. W. Connelly, and M. B. Lucia. 2006. Movement and Survival of Juvenile Greater Sage-grouse in Southwestern Idaho. *Wildlife Society Bulletin* 34:1070–1078.

Belliston, N., R. Whitesides, S. Dewey, J. Merritt, and S. Burningham. 2009. *Noxious Weed Field Guide for Utah.* Utah State University Cooperative Extension.

Bennett, J., and D. Keinath. 2001. Distribution and Status of the Yellow-billed Cuckoo (*Coccyzus americanus*) in Wyoming. Wyoming Natural Diversity Database. University of Wyoming. Laramie, Wyoming.

Berrigan, D. 1992. 48LN2444/48SW10055 Wyoming Cultural Properties site form. Independent Archaeological Consultants. On file at the Wyoming Cultural Records Office, Laramie, Wyoming.

Bevill, R., E. Nilsson, J. Reid, and M.S. Kelly. 2008. *Class III Sample Cultural Resource Inventory for the Gateway West Transmission Line Project, Idaho Portion*. URS Corporation, Portland, Oregon.

Bissonette, J.A., and I. Storch. 2003. *Landscape Ecology and Resource Management.* Island Press, Washington, D.C.

Blakeslee, D.J. 1988. Indian Trails in the Central Plains. *Plains Anthropologist* 33-119: 17-26.

BLM (U.S. Department of the Interior, Bureau of Land Management). 1980. Bennett Hills/Timmerman Hills Management Framework Plan. BLM Shoshone Field Office, U.S. Department of Interior.

BLM. 1981. Malad Management Framework Plan. Burley District, Idaho.

BLM. 1982. Twin Falls Management Framework Plan. BLM Burley Field Office, U.S. Department of Interior.

BLM. 1983a. Kuna Management Framework Plan. BLM Four Rivers Field Office, U.S. Department of Interior.

BLM. 1983b. Bruneau Management Framework Plan. BLM Bruneau Field Office, U.S. Department of Interior.

BLM. 1984. BLM Manual 8400-Visual Resource Management.

BLM. 1985a. Cassia Resource Management Plan. BLM Burley District Office, U.S. Department of Interior.

BLM. 1985b. Wells Resource Management Plan. BLM Wells Area, U.S. Department of Interior.

BLM. 1985c. 9100 – Facilities Planning, Design, Construction and Maintenance (Public) Bureau of Land Management. Section 9113. Available online at http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/blm_manual.Par.80761.File.dat/9100.pdf

BLM. 1986a. Oregon/Mormon Pioneer Historic Trails Management Plan. U.S. Department of Interior.

BLM. 1986b. Visual Resource Management Inventory and Contrast Rating System. U.S. Department of Interior.

BLM. 1986c. Monument Resource Management Plan. BLM Shoshone District, U.S. Department of Interior.

BLM. 1987. Jarbidge Resource Management Plan. BLM Jarbidge Field Office, U.S. Department of Interior.

BLM. 1994. Birds of Southeastern Wyoming, Rawlins District. Jamestown, North Dakota. Northern Prairie Wildlife Research Center Online. Available online at: http://www.npwrc.usgs.gov/resource/birds/chekbird/r6/rawlins.htm

BLM. 1997. Record of Decision and Green River Resource Management Plan. Green River Resource Area. Rock Springs District Office. October.

BLM. 1999. Owyhee Resource Management Plan. BLM Owyhee Field Office, U.S. Department of Interior.

BLM. 2000a. National Scenic and Historic Trails Strategy and Work Plan. Washington, D.C.

BLM. 2000b. Field Guide to the Special Status Plants of the Bureau of Land Management Lower Snake River District. Available online at: http://www.blm.gov/id/st/en/info/publications/field_guide_to_the.html

BLM. 2003a. Idaho BLM Special Status Plant Species by District and Field Office. May 20.

BLM. 2003b. Statewide programmatic bald eagle Biological Assessment. Wyoming State Office, Cheyenne, Wyoming. Available online at http://www.blm.gov/wy/st/en/programs/Wildlife/baldeagle.html

BLM. 2004a. *BLM Manual 8100: The Foundations for Managing Cultural Resources.* Available online at: http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/blm_manual.Par.71969.File.dat/8100.pdf (accessed June 16, 2010).

BLM. 2004b. *BLM Manual Section 8110: Identifying and Evaluating Cultural Resources*. Available online at: http://www.blm.gov/heritage/docum/manual/Binder2-2.pdf (accessed March 9, 2009).

BLM. 2004c. *Cultural Class I Regional Overview: Casper Field Office Planning Area*. Casper Field Office, Casper Wyoming.

BLM. 2005a. Land Use Planning Handbook. BLM Handbook H-1601-1. U.S. Department of Interior. March 11.

BLM. 2005b. Southwest Idaho Fire Planning Unit Fire Management Plan. U.S. Bureau of Land Management, Boise District, Idaho.

BLM. 2006. *Programmatic Agreement Among the Bureau of Land Management, Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers Regarding the Manner in Which BLM Will Meet Its Responsibilities Under the National Historic Preservation Act. State Protocol Between the Wyoming Bureau of Land Management State Director and the Wyoming State Historic Preservation Officer*. Cheyenne, Wyoming. Available online at http://wyoshpo.state.wy.us/Section106/Protocol.aspx (accessed July 21, 2010).

BLM. 2007a. Record of Decision and Approved Casper Resource Management Plan. Wyoming State Office – Casper Field Office. December.

BLM. 2007b. Overland Pass Pipeline Project ROD MOA. Memorandum of Agreement for the treatment and protection of cultural resources. September 26, 2007.

BLM. 2007c. Statewide Programmatic Biological Assessment: Ute Ladies'-tresses orchid (*Spiranthes diluvialis*). October 2005, Final Edits March 2007

BLM. 2007d. Migratory Bird Treaty Act – Interim Management Guidance. Instruction Memorandum No. 2008-050. U.S. Department of the Interior, Washington, D.C.

BLM. 2008a. Proposed Resource Management Plan and Final Environmental Impact Statement for Public Land Administered by the Bureau of Land Management Rawlins Field Office. U.S. Department of Interior, Bureau of Land Management, Rawlins Field Office, Idaho. Available online at: http://www.blm.gov/wy/st/en/programs/Planning/rmps/rawlins/feis_prmp.html

BLM. 2008b. Morley Nelson Snake River Birds of Prey NCA Resource Management Plan and Record of Decision. Boise District Office. September. Available online at: http://www.blm.gov/pgdata/content/id/en/fo/four_rivers/Planning/snake_river_birds.html

BLM. 2008c. Proposed Kemmerer RMP/Final EIS. Bureau of Land Management, Kemmerer Field Office, Kemmerer Wyoming.

BLM. 2008d. BLM Wyoming State Director's Sensitive Species List (Animals and Plants). November 11.

BLM. 2008e. BLM Threatened and Endangered Species Reports. Available online at: http://www.blm.gov/wy/st/en/programs/Botany.status.html

BLM. 2008f. Potential Fossil Yield Classification (PFYC) System for paleontological resources on pubic lands. Instructional Memorandum No. 2008-009.

BLM. 2008g. Record of Decision and Resource Management Plan Amendments for Geothermal Leasing in the Western United States December 2008. BLM-WO-GI-09-003-1800 FES – 08-44.

BLM. 2008h. Bureau of Land Management National Environmental Policy Act Handbook, H 1790-1. January. Available online at: http://www.blm.gov/wo/st/en/info/nepa.2.html

BLM. 2009a. Approved Resource Management Plan Amendments/Record of Decision (ROD) for Designation of Energy Corridors on Bureau of Land Management-Administered Lands in the 11 Western States. BLM/WO-GI-09-005-1800. Washington Office. Signed by Foster L. Wade, Deputy Assistant Secretary, Lands and Minerals Management. Department of the Interior. January 14, 2009.

BLM. 2009b. Wilson Butte Cave: A National Register Archaeological Site. Available online at: http://www.blm.gov/id/st/en/fo/shoshone/wilson_butte_cave.html (accessed December 12, 2009).

BLM. 2009c. Greater Sage-Grouse Habitat Management Policy on Wyoming Bureau of Land Management Administered Public Lands including the Federal Mineral Estate. Instruction Memorandum No. WY-2010-012.

BLM. 2010a. Environmental Assessment for the Gateway West Geotechnical Drilling Project (WYW174598-01). EA No. WY-060-EA09-88. July.

BLM. 2010b. Record of Decision and Approved Kemmerer Resource Management Plan. Wyoming High Desert District, Kemmerer Field Office. BLM/WY/PL-10/014+1610. Available online at: http://www.blm.gov/wy/st/en/programs/Planning/rmps/kemmerer/rod_armp.html

BLM. 2010c. Proposed Resource Management Plan and Final Environmental Impact Statement. Pocatello Field Office. FES 10-12. BLM\ID\PT-06\010+1610 April. Available online at: http://www.blm.gov/id/st/en/fo/pocatello/planning/pocatello_resource.html

BLM. 2011a. Framework for Sage-Grouse Impacts Analysis for Interstate Transmission Lines. April 13.

BLM. 2011b. Black Mountain HMA. Available online at: http://www.blm.gov/id/st/en/prog/wild_horses_/hmas/black_mountain_hma.html

BLM. 2011c. Saylor Creek HMA. Available online at: http://www.blm.gov/id/st/en/fo/jarbidge/wild_horses.html

BLM and Forest Service. [no date]. GeoCommunicator. Publication site for National Integrated Land System. Available online at: http://www.geocommunicator.gov/GeoComm/index.shtm

BLM and Office of the Solicitor (editors). 2001. The Federal Land Policy and Management Act, as amended. U.S. Department of the Interior, Bureau of Land Management Office of Public Affairs, Washington, D.C. 69 pp.

BLM and USFWS (U.S. Fish and Wildlife Service). 2010. Memorandum of Understanding between the U.S. Department of the Interior Bureau of Land Management and the U.S. Fish and Wildlife Service to Promote the Conservation of Migratory Birds. April 12.

Boarman, W., and B. Heinrich. 1999. Comon raven (*Corvus corax*). Pages 1-31 in: A. Poole and F. Gill. *The Birds of North America*, No. 476.

Bonnichsen, B., and M.M. Godchaux. 2006a. Geologic map compilation of the Murphy 30 x 60 minute quadrangle, Ada, Canyon, Elmore, and Owyhee counties, Idaho. Idaho Geological Survey Digital Web Map 80.

Bonnichsen, B., and M.M. Godchaux. 2006b. Geologic map of the Melba Quadrangle, Canyon and Ada Counties, Idaho. Idaho Geological Survey Digital Web Map 79.

Borell, A.E. 1939. Telephone Wires Fatal to Sage-grouse. *Condor* 41:85-86.

Bottemiller, S.C., J.M. Cahill, and J.R. Cowger. 2000. Impacts on Residential Property Values along Transmission Lines. An Update of Three Pacific Northwest Metropolitan Areas Right of Way. July/August.

Boyd, W.H. 1946. *The Holladay-Villard Transportation Empire in the Pacific Northwest.* The Pacific Historical Review.

BPA (U.S. Department of Energy, Bonneville Power Administration). [no date]. "Corona and Field Effects" Computer Program (Public Domain Software). Bonneville Power Administration, P.O. Box 491-ELE, Vancouver, WA 98666.

Bradfield, T.D. 1974. On the behavior and ecology of the pygmy rabbit *Sylvilagus idahoensis*. M.S. Thesis. Idaho State University, Pocatello, ID, 43 pp

Bradley, G.D. 2003. *The Story of the Pony Express.* IndyPublish.com

Braun, C. E. 2002. A review of Greater sage grouse Habitat Needs and Greater sage grouse Management Issues for the Revision of the BLM's Pinedale District Resource Management Plan. Prepared for the Wilderness Society. October 2002

Brown, Randy. 2010. Personal communication with Randy Brown, Director of Planning and Zoning, Elko County, Nevada. February 22.

Bowers, A.W., and C.N. Savage. 1962. Primitive Man on Brown's Bench. Idaho Bureau of Mines and Geology, Information Circular No. 14, Moscow.

Bull, E. L. 2005. Ecology of the Columbia spotted frog in northeastern Oregon. Gen. Tech. Rep. PNW-GTR-640. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 46 p.

Burchard, J.F., D.H. Nguyen, and E. Block. 1998. Effects of electric and magnetic fields on nocturnal melatonin concentrations in dairy cows. *Journal of Dairy Science* 81(3):722-727.

Burchard, J.F., D.H. Nguyen, H.G. Monardes, and D. Petitclerc. 2004. Lack of effect of 10 kV/m 60 Hz electric field exposure on pregnant dairy heifer hormones. *Bioelectromagnetics* 25(4):308-312.

Bureau of Reclamation. 2009a. The North Platte Project. Available online at: http://www.usbr.gov/projects/Project.jsp?proj_Name=North%20Platte%20Project (accessed June 28, 2010).

Bureau of Reclamation. 2009b. The Seedskadee Project. Available online at: http://www.usbr.gov/projects/Project.jsp?proj_Name=Seedskadee%20Project (accessed June 28, 2010).

Bureau of Reclamation. 2011. Bureau of Reclamation Hydroelectric Powerplants Listed by Name.. Available online at http://www.usbr.gov/power/data/faclname.html

Burton, T.A., S.J. Smith, and E.R. Cowley. 2008. Monitoring Stream Channels and Riparian Vegetation – Multiple Indicators. Interagency Technical Bulletin Version 5.0. BLM/ID/GI-08/001+1150. April. Available online at http://www.blm.gov/id/st/en/info/publications/technical_bulletins/tb_07-01.html

Butler, B.R. 1968. *A Guide to Understanding Idaho Archaeology, Second (Revised) Edition*. Idaho State College Museum, Pocatello, Idaho.

Butler, B.R. 1978. *A Guide to Understanding Idaho Archaeology (Third Edition)*: *The Upper Snake and Salmon River Country.* Idaho State Historic Preservation Office, Boise.

Butler, B.R. 1986. Prehistory of the Snake and Salmon River Area. In *Handbook of North American Indians,* Volume 11: Great Basin, edited by Warren d'Azevedo, pp. 127-134. Smithsonian Institution, Washington, D.C.

Caldwell, M.M., and J.H. Richards. 1989. Hydraulic Lift: Water Efflux from Upper Roots Improves Effectiveness of Water Uptake by Deep Roots. *Oecologia* 79:1-5. As cited in Montana Fish Wildlife and Parks (MFWP). 2010. Sagebrush Bulletin. Available online at: http://fwp.mt.gov/habitat/wildlife/sagebrushBulletin/

California Climate Action Registry. 2009a. General Reporting Protocol. Reporting Entity-Wide Greenhouse Gas Emissions. Version 3.1. January.

California Climate Action Registry. 2009b. Power Generation/Electric Utility Reporting Protocol. Reporting Entity-Wide Greenhouse Gas Emissions Produced by Electric Power Generators and Electric Utilities. Version 1.1. May.

California ISO Corporation. 2005. Report on Pacific Intertie Loss with Subsequent Load Shedding Event. November.

Callaway, D., J. Janetski, and O.C. Stewart. 1986. Ute. In *Great Basin*, edited by Warren L. D'Azevedo, pp. 336-367. Handbook of North America Indians, Vol. 11, William C. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

Canyon County Parks, Recreation and Waterways. 2008. *Celebration Park.* Available online at: http://canyonco.org/parks.aspx. Accessed September 22, 2008.

Capitol Impact. 2008. Capitol Impact Government Gateway. Available online at: http://wwww.capitolimpact.com/

Colwell, P.F. 1990. Power Lines and Land Value. Journal of Real Estate Research. Volume 5(1), 117-127.

Carr, W.J., and D.E. Trimble 1976. Geologic map and section of the Rockland and Arbon quadrangles, Power County, Idaho. United States Department of the Interior Geological Survey. Bulliten 1399 Plate, scale 1:1:48,000.

Cassia County. 2009. Letter from Commissioner Clay Handy to Walt George, BLM, proposing county entrance and exit points. August 25.

CCOHS (Canadian Centre for Occupational Health and Safety). 1988. Possible heath hazards for cardiac pacemaker wearer from exposure to electromagnetic fields. CCOHS Number: P88-5E; DSS catalogue number: CC273-2/88-5E; Hamilton, Ontario.

CCS (Center for Climate Strategies). 2007. Wyoming Greenhouse Gas Inventory and Reference Case Projections 1990-2020. Prepared for the Wyoming Department of Environmental Quality. Spring. Available online at: http://www.climatestrategies.us/ewebeditpro/items/O25F18230.pdf

CCS. 2008. Idaho Greenhouse Gas Inventory and Reference Case Projections 1990-2020. Prepared for the Idaho Department of Environmental Quality. Spring. Available online at: http://www.deq.idaho.gov/air/prog_issues/ghg/pdfs/ghg_inventory_idaho_sp08.pdf

CDC (Centers for Disease Control and Prevention). 2003. Landslide (Mudslide) Safety Fact Sheet. Available online at http://www.bt.cdc.gov/disasters/pdf/landslides.pdf

CDOW (Colorado Division of Wildlife. 2007. Recommended Survey Protocol and Recommended Actions to Protect Burrowing Owls when Conducting Prairie Dog Control. Revised March 2007

CEC (California Energy Commission). 1995. Avian collision and electrocution: An annotated bibliography. Publication Number: P700-95-001

CEC. 2005. Assessment of Avian Mortality from Collisions and Electrocutions. CEC-700-2005-015. Available online at: http://www.altamontsrc.org/alt_doc/cec_june_2005_assessment_of_avian_mortality_from_collisions_and_electrocutions.pdf

Cemeteries of Bannock County Idaho. 2009. Photographs of tombstones, electronic files. Available online at: http://www.rootsweb.ancestry.com/~idbancem/downey_area_cemeteries/red_rock_pass_cemetery/redrock_pass_cemetery.htm (accessed November 17, 2009).

CEQ (Council on Environmental Quality). 1986. Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act. 40 CFR Part 1500-1508, promulgated 1978.

CEQ. 1997a. Environmental Justice Guidance under the National Environmental Policy Act. Executive Office of the President. Washington, D.C. December 10. Available online at: http://www.epa.gov/compliance/resources/policies/ej/index.html

CEQ. 1997b. Considering Cumulative Effects under the National Environmental Policy Act, January.

Chapman, D. 2005. Transmission Lines and Industrial Property Value. Right of Way. November/December 2005. 20-27

Chapman, S. 2004. *Promise: Bozeman's Trail to Destiny.* Pavey Western Publishing, Missoula, Montana.

Chapman, S.S., S.A. Bryce, J.M. Omernik, D.G. Despain, J. ZumBerge, and M. Conrad. 2004. Ecoregions of Wyoming (color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey (map scale 1:1,400,000).

Chartier, V., R. Sheridan, J. DiPlacido, and M. Loftness. 1986. Electromagnetic Interference Measurements at 900 MHz on 230-kV and 500-kV Transmission Lines, IEEE Transactions on Power Systems, PWRD-1: 140-149.

City of Kuna. 2009a. Letter from Steven Hasson, Director of Planning Services (Kuna), to Walt George, BLM, concerning the Administrative Draft EIS. June 17.

City of Kuna. 2009b. 2009 Comprehensive Plan. Kuna, Idaho. Available online at: http://www.cityofkuna.com/

City of Rocks (City of Rocks Back Country Byway Advisory Committee). 1998. City of Rocks Back Country Byway Rural Heritage Stewardship Handbook and Byway Management Plan. June.

Coates, P.S., and D.J. Delehanty. 2010. Nest Predation of Greater Sage-grouse in Relation to Microhabitat Factors and Predators. Journal of Wildlife Management 74:240–248.

Colwell, P.F. 1990. Power Lines and Land Value. *Journal of Real Estate Research* 5(1): 117-127.

Connelly, J. W.; Knick, S. T.; Schroeder, M. A.; Stiver, S. J.; and Western Association of Fish and Wildlife Agencies. 2004. Conservation Assessment of Greater Sage-grouse and Sagebrush Habitats. U.S. Government Documents (Utah Regional Depository). Paper 73. http://digitalcommons.usu.edu/govdocs/73

Connelly. J.W., M.A. Schroeder, A.R. Sands, and C.E. Braun. 2000. Guidelines for management of greater sage grouse populations and habitats. *Wildlife Society Bulletin* 28(4):967-985.

Conroy, M., L. Gysel, and G. Dudderar. 1979. Habitat Components of Clear-Cut Areas for Snowshoe Hares in Michigan. *The Journal of Wildlife Management* 43:680-690.

Coutant, Charles G. 1899. *History of Wyoming Vol. 1.* Chaplin, Spafford and Matheson, Printers, Laramie, Wyoming.

Covington, H.R. and J. N. Weaver. 1990. Geologic map and profile of the north wall of the Snake River Canyon, Eden, Murtaugh, Milner Butte, and Milner quadrangles, Idaho. U.S. Geological Survey. Map I-1947-E, scale 1:24,000.

Cowardin, L. M., V. Carter. F. C. Golet, and E. T. LaRue. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Department of the Interior, Fish and Wildlife Service. FWS/OBS-79/31.

Cowger, J.R., S.C. Bottemiller, and J.M. Cahill. 1996. Transmission Line Impact on Residential Property Values. A Study of Three Pacific Northwest Metropolitan Areas. Right of Way. September/October.

Crockett, J. 2010. Personal Communication between John Crockett (Office of Energy Resources; Idaho) and John Crookston (Tetra Tech). September 13.

Currit, Richard. 2009. Personal communication from Richard Currit, Senior Archaeologist, Review and Federal Consultation NEPA Coordinator for WY SHPO, to Ken Bedingfield, URS Senior Staff Archaeologist. November.

Curtis, Jan, and Kate Grimes. 2008. Wyoming Climate Atlas. Available online at: http://www.wrds.uwyo.edu/sco/climateatlas/temperature.html

CWS (Canadian Wildlife Service) and USFWS (United States Fish and Wildlife Service). 2005. International recovery plan for the whooping crane. Recovery of Nationally Endangered Wildlife, Ottawa, Canada, and U.S. Fish and Wildlife Service, Albuquerque, New Mexico, USA. 162 pp.

D'Eon, R. 2007. Harvest block spatial configuration as a function of logging road density: Do larger more aggregated blocks create less road? *BC Journal of Ecosystems and Management* 8(1):50–60. Available online at http://www.forrex.org/jem/Article.asp?Article=149

Dabkowski, J.; and A. Taflove. 1979. Prediction Method for Buried Pipeline Voltages Due to 60 Hz AC Inductive Coupling. Part II: Field Test Verification. IEEE Transactions on Power Apparatus and Systems, PAS-98(3, May/June):788-794.

Dalmer, D. 1999a. *Site Form for GAL 177*. Intermountain Antiquities Computer System (IMACS). Form on file at Idaho State Historic Preservation Office, Boise, Idaho.

Dalmer, D. 1999b. *Site Form for GAL 175*. Intermountain Antiquities Computer System (IMACS). Form on file at Idaho State Historic Preservation Office, Boise, Idaho.

Dalziel, C.F., and T H. Mansfield. 1950. Effects of Frequency on Perception Currents. *AIEE Trans*. 69: 1162-1168.

Danehy, Robert J., C.G. Colson, K. Parrett, and S.D. Duke. 2005. Patterns and sources of thermal heterogeneity in small mountain streams within a forested setting. Forest Ecology and Management. Issue 208.

Darlington. 2006. 48SW3868 Wyoming Cultural Properties Site Form. Office of the Wyoming State Archaeologist. On file at the Wyoming Cultural Records Office, Laramie, Wyoming.

Dary, D. 2005. *The Oregon Trail.* Alfred A. Knopf, New York.

Daubenmire, R. 1970. Steppe Vegetation of Washington. Washington Agricultural Experiment Station. Technical Bulletin No. 62. As cited in Montana Fish Wildlife and Parks (MFWP). 2010. Sagebrush Bulletin. Available online at: http://fwp.mt.gov/habitat/wildlife/sagebrushBulletin/

Deanne, L.F., Nearly, D.G., Follett, P.F. 1998. *Fire's Effects on Ecosystems.* John Wiley and Sons; 333 p.

Delaney, C.J., and D. Timmons. 1992. High Voltage Power Lines: Do They Affect Residential Property Value? *Journal of Real Estate Research* 7(3):315–329.

DeLorme. 2000. DeLorme Gazetteer for Wyoming and Idaho.

DeLorme. 2003. DeLorme Gazetteer for Wyoming and Idaho.

DeMallie, R.J. 2001. *Handbook of North American Indians, Volume 13.* Washington, DC: Smithsonian Institution Press.

Des Rosiers, F. 2002. Power Lines, Visual Encumbrance and House Values: A Microspatial Approach to Impact Measurement. *Journal of Real Estate Research* 23(3): 275-301.

DeVecchio, D. E., S. S, Oriel, and P. K. Link. 2003. Geologic map of the Downey East Quadrangle and regions of the Swan Lake, Oxford, and Cottonwood Peak Quadrangles, Bannock County, Idaho. Idaho Geological Survey Technical Reports 03-2.

DOE (U.S. Department of Energy). 2003a. Map prepared by Patrick Laney and Julie Brizzee at the Idaho National Engineering and Environmental Laboratory for the U.S. Department of Energy Office of Energy Efficiency and Renewable Energy Geothermal Technologies Program. Idaho Geothermal Resources Publication No. - INEEL/MIS-2002-1618 Rev. 2. November.

DOE. 2003b. Soil Erosion Factor. Available online at: http://mepas.pnl.gov/mepas/formulations/source_term/5_0/5_32/5_32.html

DOE. 2006. National Electric Transmission Congestion Study. Available online at: http://nietc.anl.gov/documents/docs/Congestion_Study_2006-9MB.pdf

DOE. 2009. 2008 Renewable Energy Data Book. July 2009. DOE/GO-102009-2827. http://www1.eere.energy.gov/geothermal/pdfs/data_book.pdf

DOE and BLM (lead agencies). 2008. Programmatic Environmental Impact Statement for the Designation of Energy Corridors on Federal Land in the 11 Western States (DOE/EIS-0386). November. Available online at http://corridoreis.anl.gov/index.cfm.

Dorsey, G.A. and A.L. Kroeber. 1903. *Traditions of the Arapaho*. Pub. Field Col., Museum of Anthropology Series, Vol. 5. Chicago, Illinois.

Driggs, Howard R. 1942. *Westward America*. G.P. Putnam's Sons, New York.

Dunford, R., T. Ginn, and W. Desvousges. 2004. The use of Habitat Equivalency Analysis in Natural Resource Damage Assessments. *Ecological Economics* 48(2004):49–70.

ECS (Environmental Conservation Services, Inc.). 2009. Re: Proposed Alternative to the Midpoint-Hemingway Route Identified in the Gateway West Transmission Line (Treasure Valley Subsegment corridor (8g, 8h, 8j, 8k, 8l, 8m, 8n, 8p, 11). July 10.

Edison Electric Institute. 2006. Memorandum of Understanding Among the Edison Electric Institute and the U.S. Department of Agriculture Forest Service and the U.S. Department of the Interior Bureau of Land Management Fish and Wildlife Service National Park Service and the U.S. Environmental Protection Agency. Available online at: http://www.ivmpartners.org/eei_mou.pdf

EIA (Energy Information Administration). 2010. Annual Energy Outlook 2010 With Projections to 2035. DOE/EIA-0383(2010). April 2010. Available online at http://www.eia.doe.gov/oiaf/aeo/

EIA. 1999. Natural Gas 1998 Issues and Trends. April. http://www.eia.doe.gov/oil_gas/natural_gas/analysis_publications/natural_gas_1998_issues_and_trends/it98.html

Eichhorst, Jerry. 2010a. Pieces of the Puzzle: Rediscovering Idaho's North Alternate Oregon Trail. Manuscript on file, Oregon California Trails Association, Independence, Missouri.

Eichhorst, Gerald. 2010b. Personal communication from Gerald Eichhorst, Vice-President and Webmaster of the Idaho chapter of OCTA, to Ken Bedingfield, URS Senior Staff Archaeologist. August 16.

Elliot, Norma L. 1955. *A Biographical Sketch of Jefferson Hunt.* Manuscript digitized online. Available online at: http://freepages.genealogy.rootsweb.ancestry.com/~jeffhunt/bios.htm. Accessed November 17, 2009.

Elliott-Smith, E., and S. M. Haig. 2004. Piping plover (*Charadrius melodus*). The Birds of North America Online, Cornell Lab of Ornithology, Ithaca, New York. Available online at: http://bna.birds.cornell.edu/bna/species/002.

Ellis, K. L. 1984. Behavior of Lekking Sage Grouse in Response to a Perched Golden Eagle. *Western Birds* 15:37-38.

Ellis, K.L. 1985. Effects of a New Transmission Line on Distribution and Aerial Predation of Breeding Male Sage Grouse. Final report, Deseret Generation and Transmission Cooperative, Sandy, UT. 28 pp.

Ellsworth, E., and T.D. Reynolds. 2006. Snowshoe Hare (*Lepus americanus*): a technical conservation assessment. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/snowshoehare.pdf

End of the Oregon Trail Interpretive Center. 2008. *The Oregon Trail Generation: 1841-1866.* Available online at: http://www.endof_theoregontrail.org/road2oregon/sa09chrono.html. Accessed November 2009.

Engel, K.A., L.S. Young, K. Steenhof, J.A. Roppe and M.N. Kochert. 1992. Communal roosting of common ravens in southwestern Idaho. *Wilson Bulletin* 104: 105-121.

Engel, K.A., L.S. Young, K. Steenhof, J.A. Roppe and M.N. Kochert. 1992. Communal roosting of common ravens in southwestern Idaho. *Wilson Bulletin* 104:105-121.

EPRI (Electric Power Research Institute). 1982. Field Effects of Overhead Transmission Lines and Stations.: Transmission Line Reference Book: 345 KV and Above. Second ed. Electric Power Research Institute, Palo Alto.

Erickson, R. 2010. Personal communication between Rebecca Erickson, Elko County Treasurer, and Matt Dadswell, Tetra Tech EC. March 5.

Erickson, Wallace P., Gregory D. Johnson, and David P. Young Jr. 2005. A Summary and Comparison of Bird Mortality from Anthropogenic Causes with an Emphasis on Collisions. Bird Conservation Implementation in the Americas: Proceedings 3rd International Partners in Flight Conference 2002, C.J. Ralph and T. D. Rich, Editors. USDA Forest Service Gen. Tech. Rep. PSW-GTR-191.

Faanes, C.A. 1987. Bird Behavior and Mortality in Relation to Power Lines in Prairie Habitats. U.S. Fish and Wildlife Service. Fish and Wildlife Technical Report 7.

Fanselow. 2001. *Falcon Guide to Traveling the Oregon Trail*. Falcon Press Publishing Company, Guilford, CT.

FBI (Federal Bureau of Investigation). 2007. Offenses Known to Law Enforcement by State by Metropolitan and Nonmetropolitan Counties, 2007. Available online at: http://www.fbi.gov/ucr/cius2006/data/table_10.html

FCC (Federal Communications Commission). 1988. Federal Communications Commission Rules and Regulations. 10-1-88 ed. Vol. II part 15, 47 CFR, Ch. 1.

FEMA (Federal Emergency Management Agency) & USDOT OPS (U.S. Department of Transportion, Office of Pipeline Safety). 1996. National Disaster Study National Pipeline Risk Index Technical Report.

FEMA. 2009. Federal Disaster Declarations – Wyoming.. Available online at http://www.fema.gov

Fenneman, N.M. 1931. *Physiography of Western United States.* London: McGraw Hill.

FERC (Federal Energy Regulatory Commission). 2008. Order-890. Pro Forma Open Access Transmission Tariff, Appendix C.

Fernie, K.J., and S.J. Reynolds. 2005. Effects of Electromagnetic Fields from Power Lines on Avian Reproductive Biology and Physiology: A Review. *Journal of Toxicology and Environmental Health Part B. Critical Reviews* 8: 127–140.

FHWA (Federal Highway Administration). 2003. *Manual on Uniform Traffic Control Devices for Streets and Highways.* 2003 Edition. U.S. Department of Transportation.

Fisher, C., D. Pattie, and T. Hartson. 2000. *Mammals of the Rocky Mountains*. Lone Pine Publishing. 295 pp.

Fletcher, Patricia K. A., Jack E. Fletcher, and Lee Whiteley. 1999. Cherokee Trail Diaries New Routes to the California Gold Rush Vol. 1 1849, Vol. II 1850. Fletcher Family Trust, Sequim, Washington.

Forest Service (U.S. Department of Agriculture Forest Service). 1974. National Forest Landscape Management, Vol. 2, Chapter 1: The Visual Management System. "THE BIG EYE BOOK." USDA Agriculture Handbook No. 462.

Forest Service. 1988. FSH 2509.22 – Soil and Water Conservation Practices Handbook. Effective May. Available online at: http://www.fs.fed.us/cgi-bin/Directives/get_dirs/fsh?2509.22!r4_ALL

Forest Service. 1990a. Silvics of North America. Volume 1 Conifers. Agriculture Handbook 654.

Forest Service. 1990b. Soil Survey of the Caribou National Forest, Idaho, Parts of Bannock, Bear Lake, Bonneville, Caribou, Franklin, Oneida, and Power Counties. Caribou-Targhee National Forest, 1405 Hollipark Drive, Idaho Falls, ID 83401. 424 p.

Forest Service. 1991a. Forest Service Manual Amendment 2600-91-5. July 19.

Forest Service. 1991b. FSH 2509.18 – Soil Management Handbook. Effective September 3.. Available online at http://www.fs.fed.us/im/directives/fsh/2509.18/2509.18,0_code.txt

Forest Service. 1992. Forest Service Handbook 7709.57 - Road Construction Handbook. Available online at: http://www.fs.fed.us/im/directives/fsh/7709.57/

Forest Service. 1993. Payette National Forest Region 4 Sensitive Species Broadcast Vocalization Compact Disk.

Forest Service. 1995. Landscape Aesthetics: A Handbook for Scenery Management. Agriculture Handbook Number 701. December.

Forest Service. 1997. Final Environmental Impact Statement 1997 Revised Forest Plan Targhee National Forest.

Forest Service. 2000. National Forest System Road Management Strategy Environmental Assessment and Civil Rights Impact Analysis. Available online at: http://www.fs.fed.us/eng/road_mgt/DOCSfinaldraftEA.shtml

Forest Service. 2003a. Revised Forest Plan for the Caribou National Forest. February. Caribou-Targhee National Forest. Available online at: http://www.fs.fed.us/r4/caribou-targhee/projects/caribou_plan/index.shtml

Forest Service. 2003b. Medicine Bow National Forest Final Environmental Impact Statement and Revised Land and Resource Management Plan. Available online at http://www.fs.fed.us/r2/mbr/projects/forestplans/mb/index.shtml

Forest Service. 2003c. Record of Decision for the Final Environmental Impact Statement and Revised Land and Resource Management Plan (Revised Plan). Sawtooth National Forest. Available online at http://www.fs.fed.us/r4/sawtooth/arevision/sawtoothplan.htm

Forest Service. 2003d. Record of Decision. Final Environmental Impact Statement and Revised Forest Plan. Caribou National Forest. Caribou-Targhee National Forest.

Forest Service. 2003e. Final Environmental Impact Statement for the Caribou National Forest Revised Forest Plan. Volume 1. Caribou-Targhee National Forest. February. Available online at: http://www.fs.fed.us/r4/caribou-targhee/projects/caribou_plan/index.shtml

Forest Service. 2003f. Guidance for Aquatic Species Passage Design. Forest Service Northern Region & Intermountain Region. Missoula, Montana and Ogden, Utah. Available online at: http://fsweb.r1.fs.fed.us/wildlife/wwfrp/fisheries/Fish_Passage_Web_Page.htm

Forest Service. 2005. Roads Analysis for the Revised Caribou NF Travel Plan. Caribou-Targhee National Forest. Available online at: http://www.fs.fed.us/r4/caribou-targhee/projects/caribou_travel_analysis/roads_analysis_cnf_document.pdf

Forest Service. 2006. FSH 2509.25 – Watershed Conservation Practices Handbook. Effective May 5. Available online at: http://www.fs.fed.us/cgi-bin/Directives/get_dirs/fsh?2509.25

Forest Service. 2007a. Species of Local Concern for the Medicine-Bow Routt National Forests and Thunder Basin National Grassland. Prepared by Kathy Roche. July 13, 2007.

Forest Service. 2007b. Region 2 Regional Forester's Sensitive Species. http://www.fs.fed.us/r2/project/scp/sensitivespecies/index.shtml. Accessed September 6, 2008.

Forest Service. 2007c. Northern Rockies Lynx Management Direction Volume 1. Final Environmental Impact Statement.

Forest Service. 2008a. Rocky Mountain Region, Species Conservation Program: Species Conservation Assessments. http://www.fs.fed.us/r2porjgects/scp/assessments/index.html.

Forest Service. 2008b. March 4 email from Ann Keysor, Caribou-Targhee National Forest, Montpelier Idaho, to Amanda O'Conner, URS Corporation. Subject Re: Gateway West – draft survey protocol.

Forest Service. 2009a. Designation of Section 368 Energy Corridors on National Forest System Land in 10 Western States. Decision by Secretary of Agriculture to Amend Land Management Plans Described as the Environmentally Preferred Alternative. January 14.

Forest Service. 2009b. Forest Service Handbook 7709.58 - Transportation System Maintenance Handbook. Amendment No: 7709.58-2009-1. Effective date February 5. Available online at: http://www.fs.fed.us/im/directives/fsh/7709.58/

Forest Service. 2009c. FSH 7709.55 – Travel Planning Handbook. Amendment number 7709.55-2009-4. Effective date January 8. Available online at: http://www.fs.fed.us/im/directives/fsh/7709.55/

Forest Service. 2010. FSH 7709.56 -– Road Preconstruction Handbook. Amendment No.: 7709.56-2010-1. Effective Date: March 24, 2010. Available online at: http://www.fs.fed.us/im/directives/fsh/7709.56/

Forest Service and USFWS. 2008. Memorandum of Understanding between the U.S. Department of Agriculture Forest Service and the U.S. Fish and Wildlife Service to Promote the Conservation of Migratory Birds. Available online at: http://www.fs.fed.us/biology/resources/pubs/mou_moa.html

Forman, R. T. T., B. Reineking, and A. M. Hersperger. 2002. Road traffic and nearby grassland bird patterns in a suburbanizing landscape. *Environmental Management* 29:782–800.

Fort Bridger Treaty. 1868. Fort Bridger Treaty of 1868 (Shoshone Bannock Treaty). Government of the United States.

Fosberg, L. 2010. Personal communication between Lynn Fosberg, Elko County Public Works Department and John Crookston, Tetra Tech EC. March 1.

Fowler, C.S. and Liljeblad, S. 1986. Northern Paiute. In *Handbook of North American Indians*, Vol. 11. Edited by William C. Sturtvent, Smithsonian Institution, Washington, D.C.

Fowler, Loretta. 2001. Arapaho. In Plains, edited by Raymond J. DeMallie, pp. 840-862. Handbook of North American Indians, Vol. 13, William C. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

Francis, J. 2004. 48CO2850 Wyoming Cultural Properties site form. Wyoming Department of Transportation. On file at the Wyoming Cultural Records Office, Laramie, Wyoming.

Franzen, J.G. 1981. Southeastern Idaho Cultural Resources Overview, Burley and Idaho Falls Districts: Final Report R-2196. Commonwealth Associates, Jackson, Michigan. Submitted to U.S. Bureau of Land Management.

Frizell, John P. 1998. 48CR3648 Wyoming Cultural Properties Site Form. Western Archaeological Services. On file at the Wyoming Cultural Records Office, Laramie, Wyoming.

Fry, Matthew. 2010. E-mail communication from Matthew Fry, WGFD, to Walt Vering, Tetra Tech. January 19.

Gardner, A.D. 1985. 48LN300 Wyoming Cultural Properties Site Form. Archaeological Services Western Wyoming College. On file at the Wyoming Cultural Records Office, Laramie, Wyoming.

Gardner, A.D. 1991. Reliance Coal Tipple National Register Nomination Form. On file at the Wyoming Cultural Records Office, Laramie, Wyoming.

Gardner, A.D. 1982. 48CR2181 Wyoming Cultural Properties site form. Western Wyoming College, Archaeological Services. On file at the Wyoming Cultural Records Office, Laramie, Wyoming.

Gardner, A.D., and S. Creasman. 1986. *Natural Corrals Site 48SW336 National Register of Historic Places Inventory-Nomination Form*. Unpublished report on file in the Office of the Wyoming SHPO, Cheyenne.

Gardner, A.D., and V.R. Flores. 1989. *Forgotten Frontier: A History of Wyoming Coal Mining.* Westview Press, Boulder, San Francisco, & London.

Gardner, A.D., and D.E. Johnson. 1987. Historical Investigations at Holden Hill, Lincoln County, Wyoming. Archaeological Services Western Wyoming College, Rock Springs, Wyoming.

Gardner, A.D., D. Allen, and D.E. Johnson. 2006. *Historical Assessment of the Cherokee Trail and Brian to Browns Park Road in Sweetwater County*. Western Archaeological Services, Rock Springs, Wyoming.

GEA (Geothermal Energy Association). 2009. U.S. Geothermal Power Production and Development Update March 2009. http://www.geo-energy.org/publications/reports/Industry_Update_March_Final.pdf

Gerrard, Darrell T. 2010. Affidavit. Testimony before the Utah Facility Review Board. Rocky Mountain Power v. Tooele County. August 4. Available online at: http://psc.utah.gov/utilities/electric/elecindx/2010/1003539indx.html

Gibblings, Peter, et al. 2001. Assessing the Accuracy and Integrity of RTK GPS Beneath High Voltage Power Lines. University of Southern Queensland, 42nd Australian Surveyors Congress.

Giesen, K. M., and J. W. Connelly. 1993. Guidelines for Management of Columbian sharp-tailed grouse Habitats. *Wildlife Society Bulletin* 21(3): 325–333.

Gillerman, V. S., and J. D. Kauffman. 2005. Geologic map the Hagerman Quadrangle, Gooding and Twin Falls Counties, Idaho. Idaho Geological Survey Digital Web Map 50.

Gillis, Michael J., and Michael F. Magliari. 2004. *John Bidwell and California: The Life and Writings of a Pioneer 1841-1900*. The Arthur H. Clark Company, Spokane, Washington.

Goldsmith, W., M. Silva, and C. Fischenich. 2001. Determining Optimal Degree of Soil Compaction for Balancing Mechanical Stability and Plant Growth Capacity. ERDC TN-EMRRP-SR-26. US Army Engineer Research and Development Center, Vicksburg, Mississippi.

Goodwin Jr., J.G. 1975. Big game movement near a 500-kV transmission line in northern Idaho. Bonneville Power Administration, Engineering and Construction Division, Portland, OR. June 27.

Grande, L. 1984. Paleontology of the Green River Formation with a review of the fish fauna. Geological Survey of Wyoming Bulletin 63.

Grasslands Renewable Energy LLC. [no date]. An Innovative Solution to Renewable Energy Development. Web site for Wind Spirit Project. Available online at: http://www.gre-llc.com/wind-spirit-project/project-overview/ (accessed September 7, 2010)

Gray, D. 2003. Rabbit Creek Bridge. Idaho Historic Sites inventory form. On file at the Idaho State Historic Preservation Office, Boise.

Gray, D. 2005. *Toano Freight Wagon Road Historic District*, *National Register Nomination Form*. Frontier Historical Consultants, Grandview, Idaho.

Great Basin Transmission LLC. [no date]. Overland Transmission Line. Website for Southwest Intertie Project. Available online at: http://www.swipos.com/overland_intertie.htm (accessed September 7, 2010)

Great Basin Transmission LLC. [no date]. Website for Southwest Intertie Project. Available online at: http://www.swipos.com/ (accessed September 7, 2010)

Green, G. A., and R. G. Anthony. 1989. Nesting Success and Habitat Relationships of Burrowing Owls in the Columbia Basin, Oregon. *The Condor* 91(2):347-354.

Green, Thomas L., and Glenda L. Torgeson. 1977. Black Butte-Guffey Butte Archaeological District National Register Nomination Form. On file at the Idaho State Historic Preservation Office.

Greenberg, B.; Bindokas, V.P.; Frazier, M.J.; Gauger, J.R. 1981. Response of honey bees, *apis mellifera L*., to high-voltage transmission lines. *Environmental Entomology* 10:600-610.

Gresswell, R.E. 2009. Yellowstone Cutthroat Trout (*Oncorhynchus clarkia bouvieri*): A Technical Conservation Assessment. USDA Forest Service, Rocky Mountain Region. Available online at: http://www.fs.fed.us/r2/projects/scp/assessments/yellowstonecutthroattrout.pdf (accessed May 27, 2010).

Griffin, J.C. 1986. Cardiac pacemakers: effects of power frequency electric and magnetic fields. Presented at the International Utility Symposium, Health Effects of Electric and Magnetic Fields: Research, Communications, Regulation. September 16-19; Toronto, Canada.

Griscom, H., D. Keinath, and M. Anderson. 2010. Pocket Gopher Surveys in Southwestern Wyoming. Wyoming Natural Diversity Database.

Grossman, D. H., D. Faber-Langendoen, A. S. Weakley, M. Anderson, P. Bourgeron, R. Crawford, K. Goodin, S. Landaal, K. Metzler, K. D. Patterson, M. Pyne, M. Reid, and L. Sneddon. 1998. International classification of ecological communities: terrestrial vegetation of the United States. Volume I. The National Vegetation Classification System: development, status, and applications. The Nature Conservancy, Arlington, Virginia.

Groves, C., B. Butterfield, A. Lippincott, B. Csuti, and J. Scott. 1997. Atlas of Idaho's Wildlife. Idaho Department of Fish and Game, Nongame and Endangered Wildlife Program. Boise, Idaho.

Gruhn, Ruth. 1961. *The Archaeology of Wilson Butte Cave South-Central Idaho*. Occasional Papers of the Idaho State College Museum, No. 6. Pocatello, Idaho.

Guisto, Bret. 2010. Personal communication from Bret Guisto, Heritage Program Manager, Sawtooth National Forest, to Kimberly Henderson, URS Senior Staff Archaeologist. July 6.

Guyon, J. 2009. Biological Evaluation of Commissary Ridge area. Memo to D. Oles, BLM Forester, Kemmerer, WY. U.S. Forest Service, August 24, 2009. File code 3420.

Hamilton, Ronald C. 1993. Characteristics of Old-Growth Forests in the Intermountain Region. USDA Forest Service Intermountain Region.

Hamilton, S.W., and G.M. Schwann. 1995. Do High Voltage Electric Transmission Lines Affect Property Value? *Land Economics* 71(4):436-44.

Hamilton, W. 1905. *My Sixty Years on the Plains, Trapping, Trading, and Indian Fighting*. Forest and Stream, New York, New York (Reprinted in 1960: University of Oklahoma Press, Norman, OK).

Hann, W. J., J. L. Jones, M. G. Karl, P. F. Hessburg, R. E. Kean, D. G. Long, J. P. Menakis, C. H. McNicoll, S. G. Leonard, R. A. Gravenmier, and B. G. Smith. 1997. An assessment of ecosystem components in the Interior Columbia Basin and portions of the Klamath and Great Basins, Vol. II. Landscape dynamics of the basin. General Technical Report PNW-GTR-405. Portland, OR: Forest Service, U.S. Department of Agriculture.

Harrell, L. 1996. 48LN3203/48UT1885 Wyoming Cultural Properties site form. Bureau of Land Management, Kemmerer Field Office. Form on file at the Wyoming Cultural Records Office, Laramie, Wyoming.

Hasson, Steven. 2010. E-mail from Steven Hasson, Director of Planning Services, City of Kuna to Walt George, BLM. April 14.

HCN (Health Council of the Netherlands). 2001. ELF Electromagnetic Fields Committee. Electromagnetic fields: Annual Update 2001. No. 2001/14.

HCN. 2004. ELF Electromagnetic Fields Committee. Electromagnetic fields: Annual Update 2003. The Hague: Health Council of the Netherlands. Publication No. 2004/1.

Hebdon, Lance. 2009. E-mail communication from Lance Hebdon, IDFG. to Walt Vering, Tetra Tech. December 4.

Henderson, K.H., M. Meier, B. Shaw, G.C. Tucker, J. McNutt, K. Bedingfield, T. Spivey, E. Rogers, and E. Dawson. 2009. Gateway West Transmission Line Project Cultural Resource Literature Review Wyoming. URS Corporation. Prepared for Tetratech. On file at Wyoming BLM.

Henderson, K., M. Meier, B. Shaw, G.C. Tucker Jr., J. McNutt, K. Bedingfield, J. Fariello, E. Roberts, C. Tucker, and K. Zielinski. 2010. Trails of the West: A Review and Evaluation of Historic Trails in Wyoming and Idaho Along the Proposed Gateway West Transmission Line Project. Draft. Prepared for Idaho Power and Rocky Mountain Power. URS Corporation/Tetra Tech, Inc.

Herkert, J.R., D L. Reinking, D.A. Wiedenfelt, M. Winter, J.L. Zimmerman, W.E. Jensen, E.J. Finck, R.R. Koford, D.H. Wolfe, S.K. Sherrod, M.A. Jenkins, J. Faaborg, and S.K. Robinson.

2001. Effects of prairie fragmentation on the nest success of breeding birds in the midcontinental United States. *Conservation Biology* 17:587–594.

Hodgson, Rich. 2008. E-mail from Rich Hodgson, Solvay Minerals, regarding subsidence potential at FMC Granger Mine. June 24.

Hoefer, T. 1999. 48CR2181-3 Wyoming Cultural Properties site form. Foothill Engineering Consultants, Inc. On file at the Wyoming Cultural Records Office, Laramie, Wyoming.

Holmer, R.N. 1986. Common Projectile Points of the Intermountain West. In *Anthropology of the Desert West: Essays in Honor of Jesse D. Jennings,* edited by Carol J. Condie and Don D. Fowler, 99, 89-115. University of Utah Anthropological Papers No. 110. Salt Lake City.

Homer, C., T. Edwards, and R. Ramsey. 1993. Use of Remote Sensing Methods in Modeling Sage Grouse Winter Habitat. *Journal of Wildlife Management* 57(1) 78-84

Hoobles, M. 2010. Personal communication (phone conversation) with Mathew Hoobles, State Coordinator for the Wyoming State Engineers Office, and John Crookston, Tetra Tech. June 9.

Houston, S. 1998. *Wyoming's Railroad History*. Available online at: http://wyoarchives.state.wy.us/articles/railroad.html. Accessed September 16, 2008.

HRA (Historical Research Associations, Inc.). 1996. *Historic Resources Study City of Rocks National Reserve South-central Idaho*. National Park Service, Pacific West Field Area. Columbia-Cascade System Support Office, Seattle, Washington. Located at http://www.nps.gov/history/ history/online_books/ciro/hrs.htm. Accessed January 6, 2010.

Huffman, M. 2010. Personal communication between Morris Huffman (Biomass Coordinator for the Woody Biomass Utilization Partnership) and John Crookston (Tetra Tech). September 9, 2010.

Hughes, R.E., and R.L. Smith. 1993. Archaeology, Geology, and Geochemistry in Obsidian Provenance Studies. Geological Society of America Special Paper 283.

Hultkrantz, A. 1987. Ghost Dance. In *The Encyclopedia of Religion,* ed. Mircea Eliade. MacMillan Publishing Company, New York.

Hutchison, D.J., and L.R. Jones (eds). 1993. *Emigrant Trails of Southern Idaho.* Adventures in the Past – Idaho Cultural Resource Series, Number 1. Joint publication of USDI Bureau of Land Management and Idaho State Historical Society.

HydroSolutions, Inc., and Fehringer Agricultural Consulting, Inc. 2007. Farming Cost Review (Final) Montana-Alberta Tie Ltd. Submitted to Environmental Management Bureau. Montana Department of Environmental Quality.

IARC (International Agency for Research on Cancer). 2002. IARC Monographs on the evaluation of carcinogenic risks to humans. Volume 80: Static and Extremely Low-Frequency (ELF) Electric and Magnetic Fields. IARC Press. Lyon, France.

ICES (International Committee on Electromagnetic Safety). 2002. IEEE Standard for Safety Levels with Respect to Human Exposure to Electromagnetic Fields 0 to 3 kHz C95. 6-2002. Piscataway, NJ: IEEE.

ICF International. 2010a. Final Report, Wyoming Collector and Transmission System Conceptual Design, prepared for the Wyoming Infrastructure Authority, Cheyenne, WY 82001. February 2, 2010. Available online at: http://wyia.org/wp-content/uploads/2010/02/wcts_final_report_2010_0202.pdf

ICF International. 2010b. Wyoming Wind Collector System and Integration Study: Phase 2: Analysis of Energy Corridor Constraints and Opportunities, Commercial Financing Options, and Renewable Energy Backup. Final Report December 2010 (revised). Available online at http://wyia.org/wp-content/uploads/2011/02/icf-final-report-wyoming-wind-december-2010-revised1.pdf

ICF International. 2010c. Western Area Power Administration Environmental Opportunity/Constraint Map. Available online at http://wyia.org/wp-content/uploads/2011/02/western-area-power-administration-environmetal-opportunity-constraint-map1.pdf

ICNIRP (International Commission on Non-Ionizing Radiation Protection). 1998. Guidelines for limiting exposure to time-varying electric, magnetic, and electromagnetic fields (up to 300 GHz). Health Phys, 74:494-522.

Idaho CDC (Conservation Data Center). 2010. Idaho's Special Status Plants. Available online at: http://fishandgame.idaho.gov/cdc/plants/

Idaho Department of Labor. 2010. Monthly Labor Force Data, Seasonally Adjusted. September 2010 (Preliminary, October 22, 2010). Research & Analysis and Public Affairs. Available online at: http://lmi.idaho.gov

Idaho Legislature. 2009. Title 36, Fish and Game, Chapter 11, Protection of Birds. Idaho Statutes

Idaho Office of Energy Resources. 2009. Geothermal Web page. http://www.energy.idaho.gov/renewableenergy/geothermal.htm (accessed March 5, 2010).

Idaho Sage-grouse Advisory Committee. 2006. Conservation Plan for the Greater Sage-grouse in Idaho. Available online at: http://fishandgame.idaho.gov/cms/hunt/grouse/conserve_plan/Sage-grousePlan.pdf

Idaho SHPO (State Historic Preservation Officer). 1977. Site Form for Walter's Ferry (10CN52). Idaho State Historical Society, State Historic Preservation Office. Boise, Idaho.

Idaho State Board of Land Commissioners. 2007. State Trust Lands Asset Management Plan. December. Available online at: http://www.idl.idaho.gov/am/upd073008/Final_AM_Plan_wEFIB.pdf

Idaho State Tax Commission. 2003. An Educational Guide to Operating Property in the State of Idaho. Available online at: http://tax.idaho.gov/propertytax/pt_brochures.htm (accessed on September 25, 2008).

Idaho State Tax Commission. 2010a. 2010 Annual Report. Available online at http://tax.idaho.gov/annual_reports.htm

Idaho State Tax Commission. 2010b. Sales, Use, and Travel and Convention Tax Revenues for Fiscal Year ending June 2010. Unpublished data provided by Saul Cohen, Tax Policy Specialist. November 5.

Idaho State Tax Commission. 2011. County Value and Property Tax Data for 2010. Data provided by Gary Houde, Senior Research Analyst. June 23.

IDEQ (Idaho Department of Environmental Quality). 2005. Catalog of Stormwater Best Management Practices for Idaho Cities and Counties. IDEQ Water Quality Division. Volume 2.

IDFG (Idaho Department of Fish and Game). 2005. Idaho comprehensive wildlife conservation strategy. Idaho Conservation Data Center, Idaho Department of Fish and Game, Boise, Idaho.

IDFG. 2006. Conservation Plan for the Greater Sage-grouse in Idaho. Final, July 2006.

IDFG. 2007. Management Plan for Conservation of Yellowstone Cutthroat Trout in Idaho. Boise, Idaho. Available online at: http://fishandgame.idaho.gov/cms/fish/programs/yellowstone.pdf (accessed May 27, 2010).

IDFG. 2010. Hunting: current seasons and rules. Available online at: http://fishandgame.idaho.gov/hunt/rules/

IDWR (Idaho Department of Water Resources). 2009. Idaho's Geothermal Resources. Web page. Available online at http://www.idwr.idaho.gov/waterinformation/GeothermalResources/geo_default.htm

IEEE (Institute of Electrical and Electronics Engineers). 1986. IEEE Standard Procedures for Measurement of Radio Noise from Overhead Power Lines and Substations. ANSI/IEEE Std. 430-1986, New York, NY. (see also)
IEEE Committee Report. March/April 1971. Radio Noise Design Guide for High Voltage Transmission Lines. IEEE Transactions on Power Apparatus and Systems, PAS-90 (No. 2, March/April):833-842.

IEEE. 1994. IEEE Standard Procedures for Measurement of Power Frequency Electric and Magnetic Fields from AC Power Lines. ANSI/IEEE Std. 644-1994, New York, NY.

IEEE. 2007. National Electrical Safety Code 2007 Edition. New York, NY. August 1, 2006. Available online at: http://standards.ieee.org/nesc/nesc.html

IGS (Idaho Geological Survey). 2010. 2009 Idaho Mining Review-Staff Report. Available online at: http://www.idahogeology.org/PDF/Staff_Reports_(S)/2010/Mining_and_Exploration_S-10-5.pdf

Ingelfinger, F., and S. Anderson. 2004. Passerine response to roads associated with natural gas extraction in a sagebrush steppe habitat. *Western North American Naturalist* 64: 385–395.

IOER (Idaho Office of Energy Resources). 2009. Wood Bioenergy; Homegrown Baseload Energy for Idaho. Report of the Forestry Task Force Idaho Strategic Energy Alliance. June.

IPC (Idaho Power Company). 2008. Transmission Line Clearing Specifications. 12-100-01. September.

IPC. 2009. 2009 Integrated Resource Plan. Boise, Idaho. December. Available online at http://www.idahopower.com/pdfs/AboutUs/PlanningForFuture/irp/2009/2009IntegratedResourcePlan.pdf

IPC. 2010a. Response to Data Request 13 from Paul Ortmann, IPC, on May 8 regarding GPS interference.

IPC. 2010b. Data Request 13, question 11 in project record. E-mail from Todd Adams, Idaho Power, received July 22.

IPC. 2011. Hydroelectric. Available on IPC Web site at: http://www.idahopower.com/AboutUs/OurPowerPlants/Hydroelectric/hydroelectric.cfm

IPC and RMP (Rocky Mountain Power). 2008. Draft Gateway West Transmission Line Project Siting Study. August. Available online at: http://www.wy.blm.gov/nepa/cfodocs/gateway_west/documents.php

IPC and RMP. 2009. Memorandum Concerning Analysis of Revised Gateway West Project Routing from T. Adams, IPC, and P. Anderson, RMP, to W. George, BLM. December 30. Available online at: http://www.wy.blm.gov/nepa/cfodocs/gateway_west/documents.php

IPC and RMP. 2010. BLM Data Request #18 – Question 1 Response. E-mail from D. Raugutt, PacifiCorp, and P. Anderson, RMP to Cameo Flood, Tetra Tech. July 19.

IPUC (Idaho Public Utilities Commission). 2007. The Commission's 2007 Annual Report. Section VII: Utilities by City. Available online at: http://www.puc.idaho.gov

ISDA (Idaho State Department of Agriculture). 2008. Idaho's Official Noxious Weeds. Idaho Department of Agriculture in partnership with Idaho Weed Superintendents Association, Idaho Weed Coordinating Committee, Idaho Weed Awareness Campaign, and Idaho Weed Control Association. 115 pp. Available online at: http://www.idahoag.us/Categories/PlantsInsects/NoxiousWeeds/watchlist.php

ISHS (Idaho State Historical Society). 1964. *Hudspeth's Cutoff*. Idaho State Historical Society Reference Series Number 290, Boise, Idaho.

ISHS. 1971. *Stage Lines – Owyhee*. Idaho State Historical Society Reference Series Number 145, Boise, Idaho. Electronic document, www.idahohistory.net/reference_series.html, accessed February 2008.

ISHS. 1984. *Rattlesnake Station.* Reference Series: Number 187.

ISHS. 1993. *Boise, Nampa and Owyhee Railroad.* Reference Series: 218.

ISHS. 1995. Pioneer Emigrant Traffic to City of Rocks. Reference Series: Number 632.

ISHS. 2001. Oregon Trail in Idaho: Indian Creek, Mayfield, Bonneville Point. Available online at: http://www.history.idaho.gov/OTindiancrk.html (accessed July 2010).

ITD (Idaho Transportation Department). 2008. Guide for Utility Management. Available online at: http://itd.idaho.gov/manuals/Downloads/GUM.htm

ITD. 2010. Traffic Statistics, Highway Data, Bridge Conditions, and More. Statistics and Information. Available online at: http://itd.idaho.gov/highways/

Jackson, W. Turrentine. 1952. *Wagon Roads West: A Study of Federal Road Surveys and Construction in the Tran-Mississippi West, 1846-1869*. University of California Press, Berkeley and Los Angeles.

Jackson, R., J. Spidell, D. Kennelly-Spidell, and A. Kovak. 2009. A Historic Context for Native American Procurement of Obsidian in the State of Utah. Pacific Legacy, Inc., Cameron Park, CA.

James, B.W. and B.A. Haak. 1979. Factors Affecting Avian Flight Behavior and Collision Mortality at Transmission Lines. Final Report. Bonneville Power Administration, Portland, Oregon.

Janetski, J.J. 1983. *The Indians of Yellowstone Park*. University of Utah Press, Salt Lake City, Utah.

Jankovsky-Jones, Mabel. 2001. Wetland Conservation Strategy for the Middle and Western Snake River and Lower Reaches of its Major Tributaries including the Boise River and Payette River. Idaho Department of Fish and Game, Boise, Idaho.

Janssen, W. 2010. Letter from W. Janssen, NPS, on the Gateway West Project Administrative Draft EIS version 2. April 12.

Jenks, M. D., B. Bonnichsen, and M. M. Godchaux. 1998. Geologic map of the Grandview-Bruneau Area, Owyhee County, Idaho. Idaho Geological Survey Technical Report 98-1.

Jensen, R.L. 1975. *The Greenwood-Sublette Cutoff of the Oregon Trail.* M.A. thesis, Department of History, University of Utah, Salt Lake City.

Jimenez, M.D., D.W. Smith, D.R. Stahler, D.S. Guernsey, S.P. Woodruff, and R.F. Krischke, 2008. Wyoming Wolf Recovery 2007 Annual Report. Pages WY-1 to WY-28 in U.S. Fish and Wildlife Service Rocky Mountain Wolf Recovery 2007 Annual Report. USFWS, Ecological Services, 585 Shepard Way, Helena, Montana, 59601.

Johnson, D.E. 1998. Reconnaissance of the Bryan to South Pass Road: Stagecoach Draw Field. Archaeological Services of Western Wyoming College, Rock Springs, Wyoming.

Johnson, Tom. 2010. Personal communication with Tom Johnson, USACE representative, Cheyenne Regulatory Office, on January 27, 2010.

Johnson, A.S., and S.H. Anderson. 2003. Wilson's Warbler (*Wilsonia pusilla pileolata*): a Technical Conservation Assessment. USDA Forest Service, Rocky Mountain Region. December 9. Available: http://www.fs.fed.us/r2/projects/scp/assessments/wilsonswarbler.pdf

Johnson, B.R., and G.L. Raines. 1996. Digital Representation of the Idaho State Geologic Map: A Contribution to the Interior Columbia Basin Ecosystem Management Project. U.S. Geological Survey Open-File Report 95-690.

Johnson, D.E., R.G. Rosenberg, and A.D. Gardner. 2005. A Historical Assessment of Overland Trail Segments from the Washakie Stage Station to Point of Rocks, Carbon And Sweetwater Counties, Wyoming (03-WAS-546) Revised. A report prepared for Andarko Petroleum and on file at the Wyoming State Historic Preservation Office.

Johnson, D.J., M.J. Holloran, J.W. Connelly, S.E. Hanser, C.L. Amundson, and S.T. Knick. 2010. Influences of Environmental and Anthropogenic Features on Greater Sage-grouse Populations, 1997-2007. Chapter 17 in Studies in Avian Biology. No. 38.

Jones, G.T., C. Beck, E.E. Jones, and R. Hughes. 2003. Lithic Source Use and Paleoarchaic Foraging Territories in the Great Basin. *American Antiquity* 68:5-38.

Jones, L. 1972. Kelton Road. Idaho State Historical Society Reference Series Number 74, Boise, Idaho.

Jones, L. 1982a. *Dorsey's Ferry and Granview Ferry.* Idaho State Historical Society Reference Series Number 753, Boise, Idaho.

Jones, L. 1982b. *Walter's Ferry.* Idaho State Historical Society Reference Series Number 755, Boise, Idaho. Available online at: www.idahohistory.net/reference_series.html (accessed February 2008).

Jorgensen, J. 1972. *Sundance Religion: Power for the Powerless*. University of Chicago Press, Chicago, Illinois.

Joyner, James. 2010. Personal communication with James Joyner, USACE representative, Idaho Falls Regulatory Office, on January 27, 2010.

Kantola, A. 2010. Personal communication (phone conversation) between Angela Kantola, the Upper Colorado Endangered Fish Recovery Program, and John Crookston, Tetra Tech. June 8.

Kauffman, J. D., and K.L. Orthberg. 2004. Geol0ogic map of the Gooding Quadrangle, Gooding County, Idaho. Idaho Geological Survey Digital Web Maps 20.

Kauffman, J. D., and K.L. Orthberg. 2005. Geologic map of the Shoshone SW Quadrangle, Jerome and Lincoln Counties, Idaho. Idaho Geological Survey Digital Web Map 45.

Kauffman, J.D, K.L. Orthberg, V.S. Gillerman, and D.L. Garwood. 2005. Geologic map of the Twin Falls 30 x 60 minute quadrangle, Idaho. Idaho Geological Survey Digital Web Map 43.

Keinath, D. 2001. Habitat Associations of Preble's Meadow Jumping Mice in Wyoming: A GIS Model and Descriptive Analysis. Wyoming Natural Diversity Database University of Wyoming.

Keinath, D.A. and G.P. Beauvais. 2006. Wyoming Pocket Gopher (*Thomomys clusius*): a technical conservation assessment, August 31, 2006. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/Projects/scp/assessments/wyomingpocketgopher.pdf [

Kelly, B. 2011. Idaho National Guard Input for Gateway West Project. Personal communication between Colonel Bernard Kelly, Joint Installation Director and Cecil Werven, Realty Specialist, BLM. April 8.

Kendall, C. 2010. Limber Pine Communities. Available online at: http://www.nrmsc.usgs.gov/research/limber.htm

Kennedy, P.L. 2003. Northern Goshawk (*Accipiter gentiles atricapillus*): a technical conservation assessment. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/northerngoshawk.pdf

Kimball. 1991. *Historic Resource Study: Mormon Pioneer National Historic Trail.* National Park Service, Washington, D.C.

King, D. 1997. Comparing Ecosystem Services and Values, with Illustrations for Performing Habitat Equivalency Analysis. Prepared by King and Associated, Inc. Washington, D.C., for the U.S. Department of Commerce, Silvery Spring, Maryland.

Kirby, D.R., R.G. Lym, J. John, and C.H. Sieg. 2003. Observation: Leafy spruge control in western prairie fringed orchid habitat. *Journal of Range Management* 56(5):446-473.

Knight, D. H. 1994. *Mountains and Plains: The Ecology of Wyoming Landscapes*. Yale University Press, New Haven, Connecticut.

Koch, E.D,. and C.R. Peterson. 1995. *Amphibians and Reptiles of Yellowstone and Grand Teton National Parks.* Salt Lake City: University of Utah Press.

Koehler, G. 1990. Population and habitat characteristics of lynx and snowshoe hares in north-central Washington. *Canadian Journal Zoology* 68: 845–851.

Kohler, K., and R. Dodge. 2006. Visual HEA: Habitat Equivalency Analysis Software to Calculate Compensatory Restoration Following Natural Resource Injury. Proceedings of the 10th International Coral Reef Symposium.

Kornfeld, M., G.C. Frison, and M.L. Larson. 2010. *Prehistoric Hunter-Gatherers of the High Plains and Rockies.* Academic Press, Inc.

Kramer, G. 2009. *Corridors of Power. The Bonneville Power Administration Transmission Network. Historic Context Statement.* Report for the Bonneville Power Administration by Kramer & Company, Ashland, Oregon.

Kramer, Terry. 2009. Personal communication between Terry Kramer, Twin Falls County Commissioner, and Jim Nickerson, Tetra Tech. December.

Kreutzer, L. 2008. *The Tangle of Trails Through Idaho: National Historic Trails Auto Tour Route Interpretive Guide.* Prepared by the National Park Service National Trails System – Intermountain Region, Salt Lake City, Utah.

Kroll, C., and T. Priestley. 1992. The Effects of Overhead Transmission Lines on Property Values. Edison Electric Institute Siting and Environmental Planning Task Force. Washington DC. 101 pages.

Larsen, T.K. 2003. 48LN228, Emigrant Spring, Wyoming Cultural Properties site form. LTA, Inc. On file at the Wyoming Cultural Records Office, Laramie, Wyoming.

Larson, T.A. 1978. *History of Wyoming*. University of Nebraska Press, Lincoln.

Larson, T.K., D.M. Penny, M. Williams, C. Summers, and J. Melanson. 2004. A Landscape-Scale Overview and Class III Inventory of a Portion of the Sublette Trail, Lincoln County, Wyoming. LTA, Inc. Submitted to Bureau of Land Management, Kemmerer Field Office.

Leary, S. 2003. 10TF1280 Archaeological Survey of Idaho site inventory form. Shapiro and Associates, Inc. On file at the Idaho State Historic Preservation Office, Boise.

Lee, J.M., Stormshak, F., Thompson, J., Hess, D.L., Foster, D.L. 1995. Melatonin and puberty in female lambs exposed to EMF: a replicate study. *Bioelectromagnetics* 16(2):119-123.

Lee, J.M., Stormshak, F., Thompson, J., Thinesen, P., Painter, L., Olenchek, B., Hess, D., Forbes, R. 1993. Melatonin secretion and puberty in female lambs exposed to environmental electric and magnetic fields. *Biology of Reproduction* 49(4):857-864.

Lee, J.M.; Pierce, K.S.; Spiering, C.A.; Stearns, R.D.; Van Ginhoven, G. 1996. Electrical and biological effects of transmission lines: a review. Bonneville Power Administration, Portland, Oregon. December.

Lefcourt, A.M. 1991. Effects of Electrical Voltage/Current on Farm Animals: How to Detect and Remedy Problems. U.S. Department of Agriculture, Agricultural Handbook No. 696, 142 pp.

Leonard, K.M., K.P. Reese, and J.W. Connelly. 2000. Distribution, movements and habitat of sage grouse *Centrocersus urophasianus* on the Upper Snake River Plain of Idaho: changes from the 1950s to the 1990s. *Wildlife Biology* 6:4 265-270

Levine, M.J., M. Vila, C.M. D'Antonio, J. Dukes, K. Grigulis, and S. Lavorel. 2003. Mechanisms Underlying the Impacts of Exotic Plant Invasions. *Proceedings of the Royal Society of London* 270:775-781.

Limerick, Patricia. 1987. *The Legacy of Conquest: The Unbroken Past of the American West.* W.W. Norton and Company, New York.

Lindmeir, Tom. 2002. *Drybone: A History of Fort Fetterman. High Plains Press.* Glendo, Wyoming.

Link, P.K., and L.R. Stanford. 1999. Geologic map compilation of the Pocatello 30 x 60 minute quadrangle, Idaho. Idaho Geological Survey Technical Report 99-2.

Little, E.L., Jr. 1971. Atlas of United States Trees. Volume 1, Conifers and Important Hardwoods: U.S. Department of Agriculture Miscellaneous Publication 1146, 9 p., 200 maps.

Lloyd, D. S., J. P. Koenings, and J. D. LaPerriere. 1987. Effects of turbidity in fresh water of Alaska. *North American Journal of Fisheries Management* 7:18-33.

Long, S.P., and P.K. Link. 2007. Geologic map compilation of the Malad City 30 x 60 minute quadrangle, Idaho, Idaho Geological Survey Technical Report 07-1.

Longfellow, R. 2008. Back in Time: The Lincoln Highway. Available online at: http://www.fhwa.dot.gov/infrastructure/back1102.cfm (accessed on September 1, 2009).

Love, J.D., and A.C. Christiansen. 1985. Geologic Map of Wyoming. U.S. Geological Survey.

Lowie, R. 1909. *The Northern Shoshone*. Anthropological Papers of the American Museum of Natural History, Vol. 2, Pt. 2. American Museum Press, New York, New York.

Lowie, R. 1915. *Dances and Societies of the Plains Shoshone*. Anthropological Papers of the American Museum of Natural History, Vol. 2. Pt. 2. American Museum Press, New York, New York.

Lowie, R. 1924. *Notes on Shoshonean Ethnography*. Anthropological Papers of the American Museum of Natural History, Vol. 20, Pt. 3. American Museum Press, New York, New York.

LS Power. [no date]. About the WCI. Website for the Wyoming-Colorado Intertie Transmission Project. Available online at: http://www.wcintertie.com/about.htm (accessed September 7, 2010)

Lyon, L. J. 1983. Road density models describing habitat effectiveness for elk. *Journal of Forestry* 81:592–595.

Magic Valley Times-News. 2010. Energy company proposes Jerome Co. solar farm. Available online at http://www.magicvalley.com/news/local/article_6682332a-6505-11df-a140-001cc4c002e0.html (accessed September 7, 2010).

Malouf, Carling I., and John M. Findlay. 1986. Euro-American Impact Before 1870. In Great Basin, edited Warren L. D'Azevedo, pp.499-516. Handbook of North America Indians, Vol. 11, William C. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

Malde, H.E. 1982. The Yahoo Clay, a Lacustrine Unit Impounded by the McKinney Basalt in the Snake River Canyon Near Bliss, Idaho, *in* Bonnichsen, B. and R.M Breckenridge, editors, Cenozoic Geology of Idaho: Idaho Bureau of Mines and Geology Bulletin 26, p. 617-628.

Malde, Harold E., and Howard A. Powers. 1972 Geologic Map of the Glenns Ferry-Hagerman Area, West Central Snake River Plain, Idaho. Department of the Interior. United States Geological Survey. Map I-696 (Sheet 1 and 2), scale 1:48,000.

Manville, A. M., II. 2004. Prairie grouse leks and wind turbines: U.S. Fish and Wildlife Service justification for a 5-mile buffer from leks; additional grassland songbird recommendations. Division of Migratory Bird Management, USFWS, Arlington, VA, peer-reviewed briefing paper. 17 pp.

Manville, A.M., II. 2010. Steps to Avoid or Minimize Take and Disturbances of Raptors at Power Lines and Commercial Wind Turbines. Presented at 2010 Raptor Research Foundation Conference at Fort Collins, Colorado. September 22-26.

Manville, Albert M. II. 2005. Bird Strikes and Electrocutions at Power Lines, Communication Towers, and Wind Turbines: State of The Art and State Of The Science – next steps toward mitigation. Bird Conservation Implementation in the Americas: Proceedings 3rd International Partners in Flight Conference 2002, C.J. Ralph and T. D. Rich, Editors. U.S.D.A. Forest Service General Technical Report PSW-GTR-191, Pacific Southwest Research Station, Albany, CA: 1051-1064.

Manzer, D.L., and S.J. Hannon. 2005. Relating Grouse Nest Success and Corvid Density to Habitat: A Multi-Scale Approach. *Journal of Wildlife Management* 69:110-123.

Marks, J. S, and V. S. Marks. 1988. Winter Habitat Use by Columbian sharp-tailed grouse in Western Idaho. The Journal of Wildlife Management, 52(4), pp. 743-746.

Marne, D. 2007. National Electrical Safety Code 2007 Handbook. McGraw-Hill Professional, New York.

Martin, D. 1980. *Pilgrim Stage Station: Site 10-EL-566*. Surveyed as part of the National Trails Project. Form on file at Idaho State Historic Preservation Office, Boise, Idaho.

Massey, R. 1992a. *Transportation: Trails Context.* Wyoming State Historic Preservation Office. Cheyenne, Wyoming.

Massey, R. 1992b. *Ranching Context.* Wyoming State Historic Preservation Office. Cheyenne, Wyoming.

Massey, R. 1992c. *Homesteading Context.* Wyoming State Historic Preservation Office. Cheyenne, Wyoming.

Matthews, S.H., J.W. Shervais, J.D. Kauffman, and K.L. Othberg. 2006. Geologic map of the Shoshone SE Quadrangle, Jerome and Lincoln Counties, Idaho. Idaho Geological Survey Digital Web Map 62.

Mauser, L. 2005. Canyon Creek Stage Station. Idaho Historic Sites inventory form. On file at the Idaho State Historic Preservation Office.

McBride, S.A., K.S. Myers, R.F. Jeffers, M.M. Plum, R.J. Turk, and L.R. Zirker. 2008. The Cost of Not Building Transmission: Economic Impact of Proposed Transmission Line Projects for the Pacific NorthWest Economic Region. Idaho National Laboratory. Prepared for the Pacific Northwest Economic Region under DOE Idaho Operations Office Contract DE-AC07-05ID14517. Available online at: http://pnwersenergyhorizon.com/files/PNWERReport_Rev2c_Final_16Jul08_ntwtm3.pdf

McGrath C.L., A.J. Woods, J.M. Omernik, S.A. Bryce, M. Edmondson, J.A. Nesser, J. Shelden, R.C. Crawford, J.A. Comstock, and M.D. Plocher. 2002. Ecoregions of Idaho (color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey (map scale 1:1,350,000).

McKee, J. 2010. Personal communication (phone conversation) with J. McKee, U.S. Fish and Wildlife Service, and John Crookston, Tetra Tech. June 9.

McKelvey, K.S., Y.K. Ortega, G.M. Koehler, K.B. Aubry, and J.D. Brittell. 2000. Canada Lynx Habitat and Topographic Use Patterns in North Central Washington: a Reanalysis. Pages 307-336 in Ruggiero, L.F., K. B. Aubry, S. W. Buskirk, G. M. Koehler, C. J. Krebs, K. S. McKelvey, and J. R. Squires (Tech. Eds.). *Ecology and Conservation of Lynx in the United States.* University Press of Colorado. Boulder, Colorado. 480 pp.

McNees, L., and B. McClelland. 1991a. 48LN2322 Intermountain Antiquities Computer System Site Form. Mariah Associates, Inc. On file at the Wyoming Cultural Records Office, Laramie, Wyoming.

McNees, L., and B. McClelland. 1991b. 48LN2321 Intermountain Antiquities Computer System Site Form. Mariah Associates, Inc. On file at the Wyoming Cultural Records Office, Laramie, Wyoming.

McNees, L. 1993. 48LN2739 Wyoming Cultural Properties site form. Mariah Associates, Inc. On file at the Wyoming Cultural Records Office, Laramie, Wyoming.

Meatte, L. 1990. Prehistory of the Western Snake River Basin. *Occasional Papers of the Idaho Museum of Natural History,* Number 35, Pocatello, Idaho.

Means, B. 2010a. Email from B. Means, BLM, to J. Crookston, Tetra Tech. September 13.

Means, B. 2010b. Wyoming white bark pine summary. Unpublished information summary. Provided via email to John Crookston, Tetra Tech. September.

Medtronic. 2006. Technical memo regarding electromagnetic compatibility (EMC) and electromagnetic interference (EMI). p. 2.

Meints, D.R. 1991. Seasonal Movements, Habitat Use, and Productivity of Columbian Sharp-tailed Grouse in Southeastern Idaho. M.S. Thesis, University of Idaho, Moscow. 74 pp.

Meyer, J.R. 1978. Effects of Transmission Lines on Bird Flight Behavior and Collision Mortality. Prepared for Bonneville Power Administration Engineering and Construction Division, Portland, Oregon.

Michno, Gregory and Susan Michno. 2009. *Circle the Wagons!: Attacks on Wagon Trains in History and Hollywood.* McFarland and Company, Jefferson, North Carolina.

Miller, D.M., R.l. Armstrong, D.R. Bedford, and M. Davis. 2008. U.S Department of the Interior U.S. Geological Survey. Open file report 2008-1103, scale 1:24,000.

Miller, Jay. 1983. Basin Religion and Theology: A Comparative Study of Power (Puha). *Journal of California and Great Basin Anthropology* 5(2). Available online at: http://www.escholarship.org/uc/item/9f75b16w (accessed on March 9, 2010).

Miller, M., G. Gill, and R. Shepard. 1994. 48CR5718 Wyoming Cultural Properties site form. University of Wyoming/OWSA. On file at the Wyoming Cultural Records Office, Laramie, Wyoming.

Minnesota IMPLAN Group. 2008. IMPLAN Professional Version 2.0. Social Accounting and Impact Analysis Software. Data for Idaho, Nevada, and Wyoming Counties for 2007.

Moll, J.E. 1996. *A Guide for Road Closure and Obliteration in the Forest Service.* San Dimas Technology and Development Center. 49 pp.

Mooney, J. 1907. Arapaho. In *Handbook of Americans North of Mexico*. Edited by F. Hodge. American Bureau of Ethnology, Bulletin 30. Government Printing Office, Washington, D.C. (Reprinted by Rowman and Littlefield, New York, 1971.

Moore, G., B. Noisant, and J. Campbell. 1987. Archeological and Historical Investigations on the Amoco Bairoil CO2 Project, Vol. 1, Class I Overview, Research Paper No. 20, Overland Associates Inc., Boulder, Colorado.

Morgan, T.A., T. P. Spoelma, C. E. Keegan III, A. L. Chase, and M.T. Thompson. 2005. Wyoming's Forest Products Industry and Timber Harvest, 2000. United States Department of Agriculture, Forest Service, Rocky Mountain Research Station, Resource Bulletin, RMRS-RB-5. March. Available online at: http://www.bber.umt.edu/

Mowat, G., K.G. Poole, and M. O'Donoghue. 2000. Ecology of Lynx in Northern Canada and Alaska. Chapter 9 in Ruggiero, L.F., K. B. Aubry, S. W. Buskirk, G. M. Koehler, C. J. Krebs, K. S. McKelvey, and J. R. Squires (Tech. Eds.). *Ecology and Conservation of Lynx in the United States.* University Press of Colorado. Boulder, Colorado. 480 pp.

Murcia, C. 1995. Edge effects in fragmented forests: implications for conservation. *Trends in Ecology and Evolution* 10(2): 58-62.

Murphy, R., and Y. Murphy. 1960. *Shoshone-Bannock Subsistence and Society*. UC-AR, Vol. 16, No. 7, pp. 293-338. Berkeley, California.

Murphy, R., and Y. Murphy. 1986. Northern Shoshone and Bannock. In Great Basin, Volume 11 of the *Handbook of North American Indians*, edited by Warren L. D'Azevedo. Smithsonian Institution, Washington, D.C.

Murray, S. 2002. *Opal Wagon Road: Wyoming Cultural Properties Form*. Western Archaeological Services. On file at the Wyoming Cultural Records Office, Laramie, Wyoming.

Myler C., G. Mladenka, and G. Minshall. 2007. Trend Analysis Shows Decline of an Endangered Thermophilic Springsnail (*Pyrgulopsis bruneauensis*) in Southwestern Idaho. *Western North American Naturalist* 67(2) 199-205.

Mytton, J.W., P.L. Williams, and W.A. Morgan. 1990. Geologic map of the Stricker 4 quadrangle, Cassia County, Idaho. Department of the Interior United States Geological Survey. Map I-2052, scale 1:48,000.

NACE International. 2003. Grounding Systems. Houston, TX. Available online at http://www.nace.org/content.cfm?parentid=1001&currentID=1001

Nadeau, M.S., C. Mack, J. Holyan, J. Husseman, M. Lucid, B. Thomas, and D. Spicer. 2008. Wolf conservation and management in Idaho; progress report 2007. Idaho Department of Fish and Game, 600 South Walnut, Boise, Idaho; Nez Perce Tribe, P.O. Box 365, Lapwai, Idaho. 73pp.

Nagorsen, D.W., and R.M. Brigham. 1993. *Bats of British Columbia.* UBC Press, Vancouver, British Columbia, Canada.

Naiman, R.J., and R.E. Bilby, eds. 1998. *River Ecology and Management: Lessons from the Pacific Coastal Ecoregion.* New York: Springer-Verlag.

Naiman, R.J., H. Decamps, and M.E. McClain. 2005. *Riparia: Ecology, Conservation, and Management of Streamside Communities.* Elsevier Academic Press. Massachusetts.

NAS (National Academy of Sciences). 1999. Research on POWER-FREQUENCY FIELDS, Completed Under the Energy Policy Act of 1992, Committee to Review the Research Activities Completed Under the Energy Policy Act of 1992, Commission on Life Sciences, National Research Council, National Academy Press, Washington, D.C.

National Audubon Society. 2011. Raft River/Curlew Valley Important Bird Area. Available online at: http://iba.audubon.org/iba/viewSiteProfile.do?siteId=657&navSite=state

National Grid. 2009. Undergrounding High Voltage Electricity Transmission: The Technical Issues. August. Available online at: http://www.nationalgrid.com/uk/LandandDevelopment/SC/Undergrounding/

National Invasive Species Information Center. 2008. Invasive Species. Available online at http://alic.arid.arizona.edu/invasive/sub2/index.shtml

NatureServe. 2008. NatureServe Explorer results for various species. Available online at: http://www.natureserve.org/explorer/

NatureServe. 2009. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available online at: http://www.natureserve.org/explorer. Accessed May 19, 2009.

Naugle, D.E., K.E. Doherty, B.L. Walker, J. Holloran, and H.E. Copeland. 2010. Energy Development and Greater Sage-Grouse. Chapter 21. Studies in Avian Biology. No. 38.

NAU (Northern Arizona University). 2009. Nevada Comprehensive Wildlife Conservation Strategy: From Planning to Implementation. Available online at: http://www.biogeog.ucsb.edu/SWAP/Docs/States/NV_summary.pdf.

NDA (Nevada Department of Agriculture Plant Industry Division). 2009. Noxious Weeds. Available online at: http://agri.nv.gov/plant_noxweeds_index.htm

NDEP (State of Nevada Department of Conservation and Environmental Resources, Division of Environmental Protection). 2002. Surface Area Disturbance Permit, Dust Control Plan Preparation Guidelines October.

NDEP. 2007. Operating Permit Application Package for Stand-Alone Surface Area Disturbance. March.

NDW (Nevada Department of Wildlife). 2009. Nevada Hunt Book. Reno, Nevada.

NERC (North American Electricity Reliability Corporation). 2010. About NERC and Reliability Standards. Pamphlet. Available online at: http://www.nerc.com/files/About-NERC.pdf

NESC (National Electric Safety Code). 2007. National Electrical Safety Code. 2007 ed. Institute of Electrical and Electronics Engineers, Inc., New York, NY. 287 pages.

Nevada Department of Conservation and Natural Resources. 2009. GIS at the Nevada Natural Heritage Program. Available online at: http://heritage.nv.gov/

Nevada Department of Employment, Training, and Rehabilitation. 2010. Local Area Unemployment Statistics (LAUS). Available online at: http://www.nevadaworkforce.com/ (accessed on October 31, 2010).

Nevada Department of Taxation. 2010. Annual Report Fiscal 2008-2009. January 15. Available online at: http://tax.state.nv.us/documents/AnnualReport_FY09_final.pdf

Nevada State Demographer's Office. 2008. Nevada County Population Projections 2008 to 2028. August. Available online at: http://www.nsbdc.org/what/data_statistics/demographer/ (accessed October 29, 2009).

Newcombe, C.P., and J.O.T. Jensen. 1996. Channel suspended sediment and fisheries: A synthesis for quantitative assessment of risk and impact. *North American Journal of Fisheries Management* 16:693–727.

NIEHS (National Institute of Environmental Health Sciences). 1998. Assessment of health effects from exposure to power-line frequency electric and magnetic fields: Working Group Report. NIH Publication No. 98-3981. Research Triangle Park, NC: National Institute of Environmental Health Sciences of the U.S. National Institutes of Health.

NIEHS (National Institute of Environmental Health Sciences). 1999. Health effects from exposure to power line frequency electric and magnetic fields. NIH; National Institute of Health; NIH No. 99-4493; Research Triangle Park, NC.

Nilsson, E., R. Bevill, and M.S. Kelly. 2009. *Class I Existing Information Inventory, Gateway West Transmission Line Project, Idaho Portion*. Unpublished report submitted to Idaho Power Company and BLM Idaho State Office by URS Corporation, Portland, Oregon.

NOAA (National Oceanic and Atmospheric Administration). 2006. Habitat Equivalency Analysis: An Overview. Available online at www.darrp.noaa.gov/library/pdf/heaoverv.pdf.

NOAA. 2009. Restoration Economics Habitat Equivalency Analysis. Available online at: heetp:://www.csc.noaa.gov

Northwestern Energy. [no date]. About the Project. Website for Mountain States Transmission Intertie (MSTI) Project. Available online at: http://www.msti500kv.com/About_the_Project (accessed September 7, 2010)

NPS (U.S. Department of the Interior, National Park Service). 1978. Indian Land Areas Judicially Established 1978. Available online at: http://www.nps.gov/nagpra/DOCUMENTS/ClaimsMAP.htm (accessed on October 1, 2010).

NPS. 1995. Final Comprehensive Management Plan/Development Concept Plan/Environmental Impact Statement: City of Rocks National Reserve. Denver, Colorado.

NPS. 1998. *Oregon and Mormon Pioneer National Historic Trails: Management and Use Plan Update.* USDI National Park Service, Washington, D.C.

NPS. 2000. *Guidelines for Evaluating and Registering Archeological Properties Bulletin.* National Park Service, National Register of Historic Places, Washington, D. C.

NPS. 2003. *Minidoka Internment National Monument*. Available online at: http://www.nps.gov/archive/miin/home.html. Accessed September 22, 2008.

NPS. 2004. *Lincoln Highway; Special Resource Study Environmental Assessment.* U.S. Department of Interior.

NPS. 2006. City of Rocks National Reserve: Management. Available online at: http://www.nps.gov/ciro/parkmgmt/index.htm (accessed June 18, 2010).

NPS. 2010a. National Register of Historic Places. Available online at: http://nrhp.focus.nps.gov/natregsearchresult.do?fullresult=true&recordid=0. (accessed September 1, 2010).

NPS. 2010b. Nabesna Off-Road Vehicle Management Plan Draft Environmental Impact Statement. Wrangell-St. Elias National Park and Preserve. July. Available online at: http://parkplanning.nps.gov/documentsList.cfm?projectID=20698

NPS. No date. Birds of the Fossil Butte Area. National Park Service. 1 page. Jamestown, North Dakota. Northern Prairie Wildlife Research Center Online. Available online at: http://www.npwrc.usgs.gov/resource/birds/chekbird/r6/fossil.htm

NRC (National Research Council). 1997. An evaluation of the U.S. Navy's Extremely Low Frequency Communications System Ecological Monitoring Program. National Academy Press, Washington, D.C. Available online at: http://www.nap.edu/catalog.php?record id=5155#toc

NRCS (National Resources Conservation Service). 1993. Soil Survey Manual. Soil Survey Division Staff. U.S. Department of Agriculture Handbook 18. Available online at: http://soils.usda.gov/technical/manual/

NRCS. 1995. State Soil Geographic (STATSGO) Data Base. Misc. Publication no. 1492. Available online at http://www.nrcs.usda.gov/technical/techtools/statsgo_db.pdf

NRCS. 2009. The PLANTS Database (http://plants.usda.gov, 7 December 2009). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

NRPB (National Radiological Protection Board). 2001. Response statement of the NRPB: ELF electromagnetic fields and the risk of cancer. National Radiological Protection Board, Chilton, Dicot, Oxon, Volume 12, No.1, ISNB 0-859951-456-0.

NRPB. 2004. Review of the Scientific Evidence for Limiting Exposure to Electromagnetic Fields (0-300 GHz) National Radiological Protection Board, Volume 15, No 3.

NTSB (National Transportation Safety Board). 2008. Accident Database & Synopses. Available online at http://www.ntsb.gov/ntsb/query.asp. Bottom of Form. Accessed on December 19, 2008.

O'Dell, Kevin C. 2000. 48CO187 Wyoming Cultural Properties Site Form. Abraska Cultural Resource Consultants, Inc. On file at the Wyoming Cultural Records Office, Laramie, Wyoming.

Office of Geothermal Technologies, US Department of Energy. 1998. Energy Conversion. DOE/GO-10098-537. http://www1.eere.energy.gov/geothermal/pdfs/conversion.pdf

OGW (Office of the Governor of Wyoming). 2009a. Letter to W. George, BLM, from A. Clark, Special Advisor to the Governor, concerning request for inclusion of an additional alternative in the Draft EIS. February 10.

OGW. 2009b. Letter to W. George, BLM, from A. Clark, Special Advisor to the Governor, concerning Gateway West Segment 4 NEPA alternatives. July 14.

Olendorff, R.R., A.D. Miller, and R.N. Lehman. 1981. Suggested Practices for Raptor Protection on Power Lines. The State of the Art in 1981. Raptor Research Foundation, St. Paul, Minnesota. Prepared for Edison Electric Institute, Washington, D.C

Oles, D. 2010. Personal communication with D. Oles, BLM. October 14.

Omernik, J.M. 1987. Ecoregions of the conterminous United States. Map (scale 1:7,5000,000). *Annals of the Association of American Geographers* 77(1):118-125.

Orr, Patrick. 2008. Who is liable in Boise fire? *Idaho Statesman*. August 29, 2008: Local 1.

Orthberg, K.L., and J.D. Kauffman. 2005. Geologic map of the Bliss Quadrangle, Gooding and Twin Falls Counties, Idaho. Idaho Geological Survey Digital Web Map 53.

Orthberg, K.L., and R.M. Breckenridge. 2004a. Geologic map of the Kimberly Quadrangle, Jerome and Twin Falls Counties, Idaho Geological Survey Digital Web Map 21, scale 1:24,000.

Orthberg, K.L., and R.M. Breckenridge. 2004b. Geologic map of the Eden Quadrangle, Jerome and Twin Falls Counties, Idaho. Idaho Geological Survey Digital Web Map 22.

Orthberg, K.L., and R.M. Breckenridge. 2004c. Geologic map of the Wendell Quadrangle, Gooding County, Idaho. Idaho Geological Survey Digital Web Map 23.

Owyhee County. 2009. Letter from Commissioners Jerry Hoagland, George Hyer, and Richard Freund to Walt George, BLM, proposing alternative routes. September 1.

PacifiCorp Energy. 2007a. Seven Mile Hill Wind Energy Project. Wyoming Industrial Development Information and Siting Act Section 109 Permit Application. Prepared by CH2M HILL. November. Available online at: http://deq.state.wy.us/isd/

PacifiCorp Energy. 2007b. Glenrock Wind Energy Project and Rolling Hills Wind Energy Project. Wyoming Industrial Development Information and Siting Act Section 109 Permit Application. Prepared by CH2M HILL. November. Available online at: http://deq.state.wy.us/isd/

PacifiCorp. 2007c. Transmission & Distribution Vegetation Management Program Specification Manual. June 1.

PacificCorp. 2009. 2008 Integrated Resource Plan. Portland, Oregon. May. Available online at http://www.pacificorp.com/es/irp.html

PacifiCorp. 2011. 2011 Integrated Resources Plan. Volumes I and II. Filed March 31, 2011, with Idaho, Oregon, Utah, Washington and Wyoming public utilities commissions. Portland, OR. Available online at http://www.rockymountainpower.net/about/irp.html

PacifiCorp. [no date]. Transmission Projects. Website. Available online at: http://www.pacificorp.com/tran/tp.html (accessed September 7, 2010)

Pagel, J.E., D.M. Whittington, and G.T. Allen. 2010. Interim Golden Eagle Inventory and Monitoring Protocols; and Other Recommendations. Division of Migratory Bird Management, U.S. Fish and Wildlife Service.

Parker, Patricia L., and Thomas F. King. 1992. *Guidelines for Evaluating and Documenting Traditional Cultural Properties*. National Register Bulletin 38. Washington, D.C.

Parfitt, Todd. 2010. E-mail from Todd Parfitt, AML Administrator, Wyoming Department of Environmental Quality, Abandoned Mines Division, to Paul Spillers, Tetra Tech. May 10.

Pastor, Jana V. 1980. 48SW2472 Wyoming Cultural Properties Site Form. On file at the Wyoming Cultural Records Office, Laramie, Wyoming.

Patla, D.A. and D. Keinath. 2005. Columbia Spotted Frog (*Rana luteiventris* formerly *R. pretiosa*): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available online at: http://www.fs.fed.us/r2/Projects/scp/assessments/columbiaspottedfrog.pdf [Accessed Nov. 17, 2008].

Pauli, J.N., R.M. Stephens, and S.H. Anderson. 2006. White-tailed Prairie Dog (*Cynomys leucurus*): A Technical Conservation Assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/Projects/scp/assessments/whitetailedprairiedog.pdf [Nov. 21, 2008].

Picton, H.D., Canfield, J.E., and G.P. Nelson. 1985. The impact of a 500-kV transmission line upon the North Boulder Winter Elk Range. U.S. Forest Service Contract 53-0398-30E-3.

PIF (Partners in Flight). 2004. North American Landbird Conservation Plan. Cornell Lab of Ornithology, Ithaca, New York.

Pierce, K.L., H.R. Covington, P. L. Williams, and D.H. McIntyre. 1983. Geologic map of the Cotterel Mountains and the Northern Raft Valley, Cassia County, Idaho. Department of the Interior United States Geological Survey. Map I-1450, scale 1:48,000.

Pitman, J.C., C.A. Hagen, R.J. Robel, T.M. Loughin, and R.D. Applegate. 2005. Location and Success of Lesser Prairie-Chicken Nests in Relation to Vegetation and Human Disturbance. Journal of Wildlife Management 69(3):1259-1269

Planmakers and J-U-B Engineers, Inc. 2004. Western Heritage Historic Byway Corridor Management Plan. September. Available online at: http://itd.idaho.gov/planning/byways/scenic/Western_Heritage_CMP.pdf

Planmakers and J-U-B Engineers. 2007. Thousand Springs Scenic Byway Corridor Management Plan. Prepared for Thousand Springs Scenic Byway Advisory Committee. Boise, Idaho.

Planmakers and J-U-B ENGINEERS, Inc. 2008. Pioneer Historic Byway Corridor Management Plan. Boise, Idaho.

Planmakers Planning & Urban Design and Taylor Planning. 2008. Oregon Trail Bear Lake Scenic Byway Corridor Management Plan. Boise, Idaho. Taylor Planning.

Planmakers. 1992. *Oregon Trail Sesquicentennial 1993 and Beyond*. The Governor's Oregon Trail Executive Committee and Idaho/Oregon Trail Working Committee, Boise, Idaho.

Planmakers. 2001. Rock Creek Station and Stricker Homestead: Idaho Historic Site Master Plan. Idaho State Historical Society, Boise, Idaho.

Platts. 2009. Vector Digital Data, obtained and used under license from Platts, a Division of The McGraw-Hill Companies, Inc. http://www.gisdata.platts.com

Plew, M.G. 2000. *The Archaeology of the Snake River Plain.* Boise State University, Boise, Idaho.

Pocatello Cession Agreement. 1900. Pocatello Cession Agreement of 1900. Government of the United States.

Pope, A. D., J. J. Blair, and P. K. Link. 2001. Geologic map of the Wakley Peak Quadrangle, Bannock and Oneida Counties, Idaho. Idaho Geological Survey Technical Reports 01-4, scale 1:24,000.

Pope, A. D., J. J. Blair, and P. K. Link. 2001. Geologic map of the Wakley Peak Quadrangle, Bannock and Oneida Counties, Idaho. Idaho Geological Survey Technical Reports 01-4.

Postema, Angela. 2010. E-mail to S. Flinders, Tetra Tech, from A. Postema, U.S. Air Force. January 29.

Power County Task Force. 2009a. E-mail to W. George, BLM, from D. Balfour, Power County Planning and Zoning Attorney. October 19.

Power County Task Force. 2009b. Letter to S. Flinders, Tetra Tech, from D. Balfour, Power County Plannning and Zoning Attorney re: Segment 5. October 19.

Power County Task Force. 2009c. Letter to Walt George, BLM from Douglas Balfour,. Attorney, Power County Planning and Zoning Gateway West Task Force. December 21.

Power County Task Force. 2009d. Estimated Losses/Damages Worksheet. Cattle/Pasture/Range.

Power County Task Force. 2009e. Estimated Losses/Damages Worksheet. Breakdown of Figures. Re: Gateway Utility Easement.

Power County Task Force. 2009f. Estimated Losses/Damages Worksheet. City of Rockland.

Power County Task Force. 2010. ADEIS Comments from Power County Task Force. Email to Walt George, BLM from Douglas Balfour,. Attorney, Power County Planning and Zoning Gateway West Task Force. April 26.

Preston, C.R., and R.D. Beane. 2009. Red-tailed hawk (*Buteo jamaicensis*). The Birds of North America Online. Cornell Lab or Ornithology, Ithaca, New York. http://bna.birds.cornell.edu/bna/species/052 (accessed May 28, 2010).

Pritchard, D. 1998. A User's Guide to Assessment of Proper Functioning Condition. and the Supporting Science for Lotic Areas. Technical Reference 1737-15. U.S. Department of the Interior, Bureau of Land Management.

Pruett, C.L., M.A. Patten, and D.H. Wolfe. 2008. Avoidance behavior by prairie grouse: implication for wind energy development. *Conservation Biology* 23 (5) 1253-1259.

Rachlow, J., and L. Svancara. 2006. Prioritizing Habitat for Surveys of an Uncommon Mammal: A Modeling Approach Applied to Pygmy Rabbits. *Journal of Mammalogy* 87(5): 827-833

Raugutt, D. 2010. E-mail from D. Raugutt, Director, Transmission Tech Support & Construction Management for PacifiCorp, to P. Eckert, Tetra Tech, re: water crossings. February 4.

Reiss, D. (editor). 2000. *Cultural Context of Prehistoric and Historic Sites on Wyoming Army National Guard Lands, Platte County, Wyoming*. Project WY-16-99 prepared for Wyoming Army National Guard by the Office of the Wyoming State Archaeologist, Laramie, Wyoming.

Reynolds, T.D., and C.I. Hinckley. 2005. A Survey for Yellow-billed Cuckoo in recorded historical and other likely locations in Idaho. TREC, Inc. August.

Rich, T. 1986. Habitat and Nest-site Selection by Burrowing Owls in the Sagebrush Steppe of Idaho. *Journal of Wildlife Management* 50(4), pp. 548-555.

Rich, T.D., M.J. Wisdom, and V.A. Saab. 2005. Conservation of priority birds in sagebrush ecosystems. General Technical Report PSW-GTR-191. U.S. Forest Service.

Roberts, H.B. 2003. Status of the Pygmy Rabbit (*Brachylagus idahoensis*) in Idaho. Technical Bulletin No. 03-6. Idaho Bureau of Land Management, Boise, Idaho. April 2003.

Roe, A.N., K.G. Poole, and D.L. May. 1999. A Review of Lynx Behavior and Ecology and Its Relation to Ski Area Planning and Management. Unpublished Report, IRIS Environmental Systems. Calgary, Alberta, Canada. 67 pp.

Root, Matthew J., Daryl E. Furgeson, Sarah M. Moore, and David Albaugh. 2006. Site Form for 10OE2840. Intermountain Antiquities Computer System (IMACS). Form on file at Idaho State Historic Preservation Office, Boise, Idaho.

Rosenberg, R.G. 1981. *The Dempsey-Hockaday Trail Historic District; A Determination of Eligibility for the National Register of Historic Places.* Archaeological Services, Laramie, Wyoming. Document on File at the Wyoming Cultural Records Office, Laramie, Wyoming.

Rosenberg, R.G. 1982. *Sheepherder Camps in Wyoming.* Historic Context. Wyoming State Historic Preservation Office, Cheyenne, Wyoming.

Rosenberg, R.G. 1984. Historic Overview and Trail Evaluation for the Exxon-Labarge Project, Lincoln and Sublette Counties, Wyoming. Cultural Research and Management, Inc., Cheyenne, Wyoming.

Rosenberg, R.G. 1990. 48CO775 Intermountain Antiquities Computer System Site Form. Rosenberg Historical Consultants. On file at the Wyoming Cultural Records Office, Laramie, Wyoming.

Rosenberg, R.G. 1996. 48CR2181 Seg 2 Wyoming Cultural Properties Site Form. Rosenberg H.C. (RD). On file at the Wyoming Cultural Records Office, Laramie, Wyoming.

Rosenberg, R.G. 1999. Woodrock Tie Hack District, Bighorn National Forest Cultural Resource Management Plan. Available online at: http://wyoshpo.state.wy.us/pdf/TieHackCampsBighorns.pdf (accessed June 28, 2010).

Rosenberg, R.G. 2003. Historical Context for the National Park-to-Park Highway/Yellowstone Highway (48FR4539). Submitted to the Lander Field Office BLM by Rosenberg Historical Consultants, Cheyenne, WY.

Rosenberg, R.G., and E. Rosenberg. 1998. Wyoming Cultural Properties Form for the Rock Creek and Fort Fetterman Stage Road (48AB356/48CO776). Document on file at the Wyoming Cultural Records Office, Laramie, Wyoming.

Rosenberg, R.G., and E. Rosenberg. 2006. 48LN950 Wyoming Cultural Resources Properties Site Form. Western Archaeological Services. On file at the Wyoming Cultural Records Office, Laramie, Wyoming.

Rost, G.R., and J.A. Bailey. 1979. Distribution of mule deer and elk in relation to roads. *Journal of Wildlife Management* 43:634–641.

Ruediger, B., J. Claar, S. Gniadek, B. Holt, L. Lewis, S. Mighton, B. Naney, G. Patton, T. Rinaldi, J. Trick, A. Vandehey, F. Wahl, N. Warren, D. Wenger, and A. Williamson. 2000. Canada Lynx Conservation Assessment and Strategy. USDA Forest Service, USDI Fish and Wildlife Service, USDI Bureau of Land Management, and USDI National Park Service. Missoula, Montana.

Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, G.M. Koehler, C.J. Krebs, K.S. McKelvey, and J.R. Squires. 2000. Ecology and Conservation of Lynx in the United States. General Technical Report RMRS-GTR-30WWW. Fort Collins, Colorado. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

Salzmann, Z. 1983. *Dictionary of Contemporary Arapaho Usage*. Arapaho Language and Culture, Instructional Materials Series 4. Wind River Reservation, Wyoming.

Sanders, D.A., and R.J. Hobbs (editors). 1991. *Nature Conservation 2: The Role of Corridors.* Surrey Beatty and Sons, Chipping Norton.

Sanders, P.H. 2007. 48CR2181 Wyoming Cultural Properties site form. Office of the Wyoming State Archaeologist. On file at the Wyoming Cultural Records Office, Laramie, Wyoming.

Sauer, J.R., J.E. Hines, and J. Fallon. 2008. The North American Breeding Bird Survey, Results and Analysis 1966 - 2007. Version 5.15.2008. *USGS Patuxent Wildlife Research Center*, Laurel, MD. Available online at: http://www.mbr-pwrc.usgs.gov/bbs/bbs.html

Schroeder, T. 2010. Personal communication between T. Schroeder, Wyoming Department of Environmental Quality, Industrial Siting Division and J. McLain, Tetra Tech. February 3.

Schweigert, K.P. 1998. *Historical Evaluation Western Area Power Administration Facilities, Colorado, Wyoming, Nebraska, Utah.* Western Area Power Administration Rocky Mountain Region, Loveland, Colorado.

Scott, W.E. 1982. Surficial Geology of the Eastern Snake River Plain and Adjacent Areas, 111º to 115ºW., Idaho and Nevada. Department of the Interior United States Geological Survey. Map I-1372 (Sheets 1 and 2), scale 1:250,000.

Seglund, A.E., A.E. Ernst, M. Grenier, B. Luce, A. Puchniak and P. Schnurr. 2004. White-tailed Prairie Dog Conservation Assessment.

Sheley, R., and J. Petroff. 1999. *Biology and Management of Noxious Rangeland Weeds.* Oregon State University Press, Corvallis, Oregon.

Shimkin, D.B. 1942. *Dynamics of Recent Wind River Shoshone History*. *American Anthropologist,* Vol. 42, No. 2: pp. 223-245.

Shimkin, D.B. 1986. Eastern Shoshone. In *Great Basin*, edited by Warren d'Azevedo, pp. 308-335. Handbook of North American Indians, Vol. 11, William C. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

Shoshone-Bannock (Shoshone-Bannock Tribes). 2009. The Shoshone – Bannock Tribes. Available online at: http://www.shoshonebannocktribes.com

Shoshone-Bannock. 2010a. Draft Environmental Assessment for the Shoshone-Bannock Tribes Integrated Resource Management Plan. January 26, 2010. Available online at: http://www.scribd.com/doc/27118754/Draft-Environmental-Assessment

Shoshone-Bannock. 2010b. Shoshone-Bannock Tribal Integrated Resource Management Planning. Available online at: http://tribalirmpplanning.blogspot.com/

Sibley, D.A. 2003. *The Sibley Field Guide to Birds of Western North America*. National Audubon Society.

SIEDO (Southern Idaho Economic Development Organization). 2010. Creating Quality Cities. The Official Newsletter of the Association of Idaho Cities. No. 2010-08. September 29. Page 10. Available online at: http://www.idahocities.org/vertical/Sites/%7B1441454F-0900-48FF-9202-CD2E787A2350%7D/uploads/%7B15DA3346-0464-4867-B925-D64D2D1EE438%7D.PDF#page=10

Silva, M., and R. Olsen. 2002. Use of Global Positioning System (GPS) Receivers Under Power-Line Conductors. *IEEE Transactions on Power Delivery* 17 (4): 938-944.

Simms, S.R. 2008. *Ancient Peoples of the Great Basin and Colorado Plateau.* Left Coast Press, Walnut Creek, California.

SJRB (San Juan River Basin Recovery Implementation Program). 2010. The Colorado Pikminnow and the Razorback Sucker. Available online at: http://www.fws.gov/southwest/sjrip/GB_FS.cfm

Smith Travel Research. 2008. Hotel and Motel Data for Idaho and Wyoming. September.

Smith, B.E., and D. Keinath. 2004. Species Assessment for the Northern Leopard Frog (*Rana pipiens*) in Wyoming. Cheyenne, Wyoming. Prepared for the Bureau of Land Management, Wyoming State Office.

Smith, J.F., Jr. 1982. Geologic map of the Strevell 15-minute quadrangle, Cassia County, Idaho. Department of the Interior United States Geological Survey. Map I-1403, scale 1:62,500.

Smith, S. 2008. Lentic Riparian-Wetland Area Prioritization Guide: A Process for Evaluating Management & Restoration Priorities for Non-Riverine Systems. BLM, Idaho State Office. Idaho Technical Bulletin 2007-2 Rev 2008. BLM/ID/GI-07/003+1150. Available online at: http://www.blm.gov/id/st/en/info/publications/technical_bulletins/TB_07-2.html

Smith, J.P. 2010. Fall 2009 Raptor Migration Studies at Commissary Ridge in Southwestern Wyoming. HawkWatch International, Inc., Salt Lake City, Utah. Available online at http://www.hawkwatch.org/images/stories/Conservation_Science/Publications_and_Reports/Technical_Reports_-_Current_Projects/CommissaryRidge2009report.pdf

Stahlecker, D. W. 1978. Effects of a new transmission line on wintering prairie raptors. Condor 80:444–446.

Stainbrook, J. 1994. 48SW10055 Wyoming Cultural Properties site form. Archaeological Services Western Wyoming College, Rock Springs.

Staples, W. R. 1995. Lynx and Coyote Diet and Habitat Relationships during a Low Hare Population on the Kenai Peninsula, Alaska. M.S. Thesis, University of Alaska, Fairbanks.

State of Wyoming. 2008. Title 23 – Game and Fish, Chapter 1 – Administration, Article 1 – General Provisions, 23-1-101 Definitions of wildlife.

State of Wyoming. 2009. Wyoming 8-Hour Ozone Designation Recommendation-Upper Green River Basin Area, Governor Dave Freudenthal, State of Wyoming. March 12.

States and Capitols. 2008. State Fire and Police Directory. Available online at: http://www.50states.com/

Stearns, H.T. 1938. Geologic map of the Snake River Plain east of King Hill, Idaho. United States Department of the Interior. Water-Supply Paper 774, Plate 4, scale 1:500,000.

Stebbins, R.C. 2003. *Western Reptiles and Amphibians*. Houghton Mifflin.

Steenhof, K., M.N. Kochert, and J.A. Roppe. 1993. Nesting by raptors and common ravens on electrical transmission line towers. Journal of Wildlife Management 57:271-281.

Stephens, R.M. and S.H. Anderson. 2003. Lincoln's Sparrow (Melospiza lincolnii): a technical conservation assessment. USDA Forest Service, Rocky Mountain Region. Available online at: http://www.fs.fed.us/r2/projects/scp/assessments/lincolnssparrow.pdf

Steward, J. H. 1938. *Basin-Plateau Aboriginal Sociopolitical Groups*. Bulletin of the American Bureau of Ethnology, Washington, D.C.

Steward, J.H. 1942. *Cultural Element Distributions XVIII: Ute – Southern Paiute*. Univeristy of California Anthropological Records Vol. 6, No. 4, pp. 231-256. Berkely, California.

Stewart, K. M., T. E. Fulbright, and D. L. Drawe. 2000. White-tailed deer use of clearings relative to forage availability. *Journal of Wildlife Management* 64:733–741.

Stewart, O.C. 1939. *The Northern Paiute Bands*. University of California Anthropological Records Vol. 2, No. 3, pp. 127-49. Berkeley, California.

Storm, R.M., and W.P. Leonard. 1995. *Reptiles of Washington and Oregon.* Seattle Audubon Society, Seattle, Washington.

Stormshak, F.; Bracken, T.D.; Carey, M.; Chartier, V.; Dickson, L.; Forbes, R.; Hall, A.; Havens, P.; Hess, D.; Krippaehne, S.; Lee, J.; Ogden, B.; Olenchek, B.; Painter, L.; Rowe, K.; Stearns, R.; Thinesen, P.; Thompson, J. 1992. Joint HVAC transmission EMF environmental study: final report on experiment 1. Bonneville Power Administration, Contract # DE-B179-90BPO4293, Portland, OR, May.

Stubbs, D., G. Clingerman, D. Etheridge, and J. Strout. 2004. 48LN2739 Wyoming Cultural Properties Site Form. ACR Consultants, Inc. On file at the Wyoming Cultural Records Office, Laramie, Wyoming.

Stumpf, K. 2007. Wrangell-St. Elias National Park and Preserve Landcover Mapping Project. Natural Resource Technical Report NPS/WRST/NRTR

Swagerty, W.R. 1986. Indian Trade in the Trans-Mississippi West to 1870. In *Handbook of North American Indians*, Vol. 4, History of Indian-White Relations. Smithsonian Institute, Washington, D.C.

Swan, C. 2010. Personal communication between C. Swan, Zone Forester, BLM Pocatello Field Office, and B. Woeck, Tetra Tech, regarding Pocatello Field Office commercial forest management activities. October 24.

Swanson, E. 1972. National Register of Historic Places Inventory Form, Wilson Butte Cave (10JE6). On file at the Idaho State Historical Society, Boise.

Swanson, E.H., Jr. 1974. The Snake River Plain. *Idaho Yesterdays* 18 (2):2-12.

Taflove, A., and J. Dabkowski. 1979. Prediction Method for Buried Pipeline Voltages Due to 60 Hz AC Inductive Coupling. Part I: Analysis. IEEE Transactions on Power Apparatus and Systems, PAS-98(3, May/June):780-787.

Tate, M.J., B.P. O'Neil, R.J. Mutaw, and G.C. Tucker Jr. 1989. *Archaeological Studies at the New Denver International Airport, Phase I. Denver County, Colorado*. Unpublished report prepared for Dames & Moore by Powers Elevation Co., Aurora, Colorado.

Tetra Tech. 2008. Greater Sage-grouse and Columbian Sharp-tailed Grouse Aerial Surveys and Raptor Nest Aerial and Ground Surveys. 3987RPT.DOC. December 15.

Tetra Tech. 2009a. Scoping Report. Gateway West Transmission Line Project. Prepared for Bureau of Land Management, Cheyenne, Wyoming by Tetra Tech, Boise Idaho. Tetra Tech Project No. 106-3594. December 22. Available online at: http://www.wy.blm.gov/nepa/cfodocs/gateway_west/documents.php

Tetra Tech. 2009b. Vegetation and Habitat Mapping Baseline Technical Report. Gateway West Transmission Line Project. Prepared for Bureau of Land Management, Cheyenne, Wyoming by Tetra Tech, Boise, Idaho. Tetra Tech Report No. 4040.

Tetra Tech. 2010a. 2010 Old Growth Survey: Caribou-Targhee National Forest..

Tetra Tech. 2010b. Ute Ladies'-tresses Orchid Surveys. Gateway West Transmission Line. Prepared for the BLM. March 25.

Tetra Tech. 2010c. Medicine Bow National Forest Northern Goshawk Surveys. Prepared for United States Forest Service, Medicine Bow National Forest. Laramie, Wyoming. August 24.

Tetra Tech. 2010d. Cache National Forest Northern Goshawk and Flammulated Owl Surveys. Prepared for Bureau of Land Management, Wyoming State Office. Cheyenne, Wyoming. April 6.

Thibodeau, T. 1994. 48LN2872 Wyoming Cultural Properties site form. Wyoming State Historic Preservation Office. On file at the Wyoming Cultural Records Office, Laramie, Wyoming.

Thomas, David H., Pendleton, Lorann S.H., and Stephen C. Cappannari. 1986. Western Shoshone. In Great Basin, edited Warren L. D'Azevedo, pp.262-283. Handbook of North America Indians, Vol. 11, William C. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

Thompson, J.M., F. Stormshak, J.M. Lee, D. Hess, and L. Painter. 1995. Cortisol secretion and growth in ewe lambs chronically exposed to electric and magnetic fields of a 60-Hertz 500-kilovolt AC transmission line. *Journal of Animal Science* 73(11):3274-3280.

Thompson, K.W., and J.V. Pastor. 1995. *People of the Sage: 10,000 Years of Occupation in Southwest Wyoming*. Cultural Resource Management Report No. 67, Archaeological Services, Western Wyoming College, Rock Springs, Wyoming.

TransWest Express LLC. [no date]. Schedule and timeline. Web site for the TransWest Express Transmission Project. Available online at: http://www.transwestexpress.net/about/timeline.shtml (accessed September 7, 2010)

Tu, M., C. Hurd, and J.M. Randall. 2001. Weed Control Methods Handbook: Tools and Techniques for Use in Natural Areas. The Nature Conservancy. Davis, California.

Twin Falls County. 2010a. Letter from Twin Falls County Commissioners, signed by George Urie and Terry Ray Kramer, to Walt George, BLM Project Manager, Gateway West Transmission Line Project Manager. Twin Falls, ID, June 23, 2010.

Twin Falls County. 2010b. Letter and attachments from George Urie, Terry Ray Kramer, and Tom Mikesell, Twin Falls County Board of Commissioners, to Walt George, BLM, requesting consideration of Rogerson Route. June 23.

U.S. BLS (Bureau of Labor Statistics). 2009. Quarterly Census of Employment and Wages. Available online at: http://www.bls.gov/lau (accessed on November 15, 2009).

U.S. BLS. 2010. News Release: Regional and State Employment and Unemployment: September 2010. Available online at: http://www.bls.gov/lau

U.S. Bureau of Economic Analysis. 2008a. CA25N SIC (1990 and 2000) - Total full-time and part-time employment by industry. Available online at www.bea.gov (accessed on August 27, 2008).

U.S. Bureau of Economic Analysis. 2008b. Table SA1-3,SA51-52 - Summary personal income and disposable personal income. Available online at: http://www.bea.gov/regional/spi/SA1-3fn.cfm (accessed on December 29, 2008).

U.S. Bureau of Economic Analysis. 2008c. National Income and Product Accounts: Table 7.1. Selected Per Capita Product and Income Series in Current and Chained Dollars. Available online at: http://www.bea.gov/bea/dn/nipaweb/ (Accessed on December 29, 2008).

U.S. Bureau of Economic Analysis. 2010. CA25N NAICS (2001-2008) - Total full-time and part-time employment by industry. Available online at www.bea.gov (accessed on October 30, 2010).

U.S. Census Bureau. 2000a. P1. Total Population. Census 2000 Summary File 1 (SF 1) 100-Percent Data. Available online at www.census.gov. Accessed on November 1, 2010.

U.S. Census Bureau. 2000b. H1. Housing Units, H3. Occupancy Status, H4. Tenure, H5. Vacancy Status. Census 2000 Summary File 1 (SF 1) 100-Percent Data. Available online at www.census.gov (accessed on August 30, 2008).

U.S. Census Bureau. 2000c. P8. Hispanic or Latino By Race. Census 2000 Summary File 1 (SF 1) 100-Percent Data. Available online at: http://www.census.gov (downloaded on August 27, 2008).

U.S. Census Bureau. 2000d. P82 Per Capita Income in 1999 and P87 Poverty Status in 1999 by Age. Census 2000 Summary File 3 (SF 3) Sample Data. Available online at http://www.census.gov (downloaded on August 27, 2008).

U.S. Census Bureau. 2000e. Detailed Tables: Fort Hall Reservation and Off-Reservation Trust Land, ID. Available online at: http://factfinder.census.gov

U.S. Census Bureau. 2008a. Table 1. Projections of the Population and Components of Change for the United States: 2010 to 2050 (NP2008-T1). Release Date: August 14, 2008. Available online at: http://www.census.gov (accessed March 2009).

U.S. Census Bureau. 2008b. Poverty Definitions. Available online at: http://www.census.gov/hhes/www/poverty/definitions.html

U.S. Census Bureau. 2010a. Table 4: Annual Estimates of the Population for Incorporated Places in Idaho, Listed Alphabetically: April 1, 2000 to July 1, 2009 (SUB-EST2009-04-16). Available online at www.census.gov. Accessed on October 30, 2010.

U.S. Census Bureau. 2010b. Table 4: Annual Estimates of the Population for Incorporated Places in Wyoming, Listed Alphabetically: April 1, 2000 to July 1, 2009 (SUB-EST2009-04-56). Available online at www.census.gov. Accessed on October 30, 2010.

U.S. Census Bureau. 2010c. Table 3. Estimates of Resident Population Change for the United States, Regions, States, and Puerto Rico and Region and State Rankings: July 1, 2008 to July 1, 2009 (NST-EST2009-03). Available online at www.census.gov. Accessed on October 30, 2010.

U.S. Census Bureau. 2010d. Table 1: Annual Estimates of the Resident Population for Counties of Idaho: April 1, 2000 to July 1, 2009 (CO-EST2009-01-16). Available online at www.census.gov. Accessed on October 30, 2010.

U.S. Census Bureau. 2010e. Table 1: Annual Estimates of the Resident Population for Counties of Wyoming: April 1, 2000 to July 1, 2009 (CO-EST2009-01-56). Available online at www.census.gov. Accessed on October 30, 2010.

U.S. Census Bureau. 2010f. Table 1: Annual Estimates of the Resident Population for Counties of Nevada: April 1, 2000 to July 1, 2009 (CO-EST2009-01-32). Available online at www.census.gov. Accessed on October 30, 2010.

U.S. Census Bureau. 2010g. Table 4: Cumulative Estimates of the Components of Population Change for Counties of Wyoming: April 1, 2000 to July 1, 2009 (CO-EST2009-04-56). Available online at www.census.gov. Accessed on October 30, 2010.

U.S. Census Bureau. 2010h. Table 4: Cumulative Estimates of the Components of Population Change for Counties of Idaho: April 1, 2000 to July 1, 2009 (CO-EST2008-04-16). Available online at www.census.gov. Accessed on October 30, 2010.

U.S. Census Bureau. 2010i. Table 4: Cumulative Estimates of the Components of Population Change for Counties of Nevada: April 1, 2000 to July 1, 2009 (CO-EST2009-04-32). Available online at www.census.gov. Accessed on October 30, 2010.

U.S. Census Bureau. 2010j. Table 1: Annual Estimates of the Resident Population for the United States, Regions, States, and Puerto Rico: April 1, 2000 to July 1, 2009 (NST-EST2008-01). Available online at www.census.gov. Accessed on October 30, 2010.

U.S. Census Bureau. 2010k. Table 3. Rental Vacancy Rates, by State: 1986 to 2008. Housing Vacancies and Homeownership Annual Statistics: 2007. Housing and Household Economic Statistics Division. Available online at www.census.gov. Accessed on November 1, 2010.

U.S. Census Bureau. 2010l. Table 4: Annual Estimates of Housing Units for Counties in Idaho, Nevada, and Wyoming: April 1, 2000 to July 1, 2009. Population Division. Released September 2010. Available online at www.census.gov. Accessed on November 1, 2010.

U.S. Census Bureau. 2010m. Table 1: 2008 Poverty and Median Income Estimates – Counties. Small Area Estimates Branch. December. Available online at: http://www.census.gov/cgi-bin/saipe/saipe.cgi

U.S. Census Bureau. 2011a. Table QT-PL: Race, Hispanic or Latino, Age, and Housing Occupancy: 2010. Available online at: www.factfinder2.census.gov

U.S. Census Bureau. 2011b. Table P2. Hispanic or Latino, and Not Hispanic or Latino by Race. 2010 Census Redistricting Data (Public Law 94-171) Summary File. Available online at: www.factfinder2.census.gov

U.S. Department of Education. 2008. National Center for Educational Statistics, Common Core of Data (CCD). Available online at: http://nces.ed.gov/

U.S. Department of Labor. 2005. Findings from the National Agricultural Workers Survey (NAWS) 2001 - 2002._A Demographic and Employment Profile of United States Farm Workers. Office of the Assistant Secretary for Policy, Office of Programmatic Policy, Research Report No. 9. March 2005. Available online at: http://www.doleta.gov/agworker/report9/toc.cfm Downloaded on October 2, 2008.

U.S. Geothermal. 2007 Raft River Project Web page. Available online at http://www.usgeothermal.com/RaftRiverProject.aspx.

UDNR (Utah Department of Natural Resources). 2010. Contemporary Knowledge and Research Needs Regarding the Potential Effects of Tall Structures on Sage-Grouse (*Centrocercus urophasianus* and *C. minimus*). September.

Ulmschneider, H. 2004. Surveying for Pygmy Rabbits (*Brachylagus idahoensis*). Fourth Draft 25 pp.

University of Montana, Bureau of Business and Economic Analysis. 2009a. Forest Products Regional Reports, Reports in Progress, Wyoming 2005 Tables. Available online at: http://www.bber.umt.edu/

University of Montana, Bureau of Business and Economic Analysis. 2009b. Forest Products Regional Reports, Reports in Progress, Idaho 2006 Data. Provided by email from Jon Songster, University of Montana to M. Dadswell, Tetra Tech EC, March 26.

University of Montana–Missoula. 2009. Invaders Database System. Available online at: http://invader/dbs.umt.edu

University of Reno, Nevada. 1996. What is Richter magnitude? Web page of J. Louie. Available online at: http://www.seismo.unr.edu/ftp/pub/louie/class/100/magnitude.html (accessed on March 9, 2010).

University of Wyoming. 2009. Weather Services Center. College of Engineering – Department of Atmospheric Science.

University of Wyoming. 2009. Wyoming's State of the Space A Comprehensive Review of Land Use Trends in Wyoming. William D. Ruckelshaus Institute of Environment and Natural Resources, Department of Agricultural and Applied Economics, Wyoming Natural Diversity Database, and Wyoming Geographic Information Science Center. May.

Unruh, J.D., Jr. 1979. *The Plains Across: The Overland Emigrants and the Trans-Mississippi West*, *1840-1860*. University of Illinois Press, Urbana.

Urbanek, Mae B. 1988. *Wyoming Place Names*. Mountain Press Publishing, Missoula, Montana.

URS (URS Corporation). 2009a. Gateway West Transmission Line Project: Wyoming Cultural Resource Literature Review. Report on file at the State BLM office, and Casper, Rawlins, Rock Springs, and Kemmerer Field Offices.

URS. 2009b. Gateway West Transmission Line Project, Selected Segments: Results of a Class III Cultural Resources Inventory, Albany, Carbon, Natrona, and Sweetwater Counties, Wyoming. Report on file at the State BLM office, and Casper, Rawlins, Rock Springs, and Kemmerer Field Offices.

USACE (U.S. Army Corps of Engineers). 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. Prepared by Environmental Laboratory, Department of the Army. January. Available online at: http://www.wetlands.com/regs/tlpge02e.htm

USDA (U.S. Department of Agriculture). 2007. Table 1. County Summary Highlights: 2007. Census of Agriculture – County Data. National Agricultural Statistics Service. Available online at: http://www.agcensus.usda.gov/

USDA. 2008. FSA Handbook for the Agricultural Resource Conservation Program for State and County Offices. Available online at: http://www.fsa.usda.gov/Internet/FSA_File/2-crp.pdf

USDA. 2010a. Range Review. Issue 2010-02. National Agricultural Statistics Service. Available online at: http://www.nass.usda.gov/Statistics_by_State/Wyoming/Publications/Monthly_Range_Review/

USDA. 2010b. Land Values and Cash Rents 2010 Summary. National Agricultural Statistics Service. August. Available online at: http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1446

USDA Economic Research Service. 2004. Measuring Rurality: 2004 County Typology Codes. Available online at: htp://www.ers.usda.gov/Briefing/rurality/Typology/

USDOT (U.S. Department of Transportation), Federal Transit Administration. 2006. Transit Noise and Vibration Impact Assessment. 2006.

USDOT Federal Aviation Administration, Advisory Circular AC 70/7460-1k Obstruction Marking and Lighting, August 1, 2000.

USEPA (U.S. Environmental Protection Agency). 1974. Information on Levels of Environmental Noise Requisite to Protect the Public Health and Welfare with an Adequate Margin of Safety, Publication EPA-550/9-74-004. March.

USEPA. 1998. Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses. April. Available online at: http://www.epa.gov/compliance/resources/policies/ej/index.html

USEPA. 1999. Consideration of Cumulative Impacts in EPA Review of NEPA Documents, EPA 315-R-99-002. May.

USEPA. 2007. Ecoregion Maps and GIS Resources. Electronic document, http://www.epa.gov/wed/pages/ecoregions.htm, accessed February 21, 2010.

USEPA. 2008. National Menu of Stormwater Best Management Practices. Available online at http://cfpub.epa.gov/npdes/stormwater/menuofbmps/

USEPA. 2009. Procedures for Implementing the Requirements of the Council on Environmental Quality on the National Environmental Policy Act (40 CFR Part 6).

USFWS (U.S. Fish and Wildlife Service). 1979. Birds of Seedskadee National Wildlife Refuge. Jamestown, North Dakota. Northern Prairie Wildlife Research Center Online. Available online at http://www.npwrc.usgs.govseedskad.htm (Version 22MAY98).

USFWS. 1985. Birds of Minidoka National Wildlife Refuge, Idaho. U.S. Fish and Wildlife Service. Unpaginated. Jamestown, ND: Northern Prairie Wildlife Research Center Online. Available online at: http://www.npwrc.usgs.gov/resource/birds/chekbird/r1/mini.htm

USFWS. 1989. Black-footed ferret survey guidelines for compliance with the Endangered Species Act. Denver, Colorado and Albuquerque, New Mexico. April.

USFWS. 1993. Birds of Bear Lake National Wildlife Refuge, Idaho. U.S. Fish and Wildlife Service. Unpaginated. Jamestown, ND: Northern Prairie Wildlife Research Center Online. Available online at: http://www.npwrc.usgs.gov/resource/birds/chekbird/r1/bearlake.htm

USFWS. 1995. Snake River Aquatic Species Recovery Plan December 1995.

USFWS. 2001. USFWS Pallid Sturgeon Fact Sheet. Platte River Recovery Implementation Program. Available online at: http://www.platteriverprogram.org/News/Documents/USFWS Pallid Sturgeon Fact Sheet.pdf

USFWS. 2002a. A Guide to the Laws and Treaties of the United States for Protecting Migratory Birds. Available online at: http://www.fws.gov/migratorybirds/RegulationsPolicies/treatlaw.htmll

USFWS. 2002b. Birds of Conservation Concern 2002. Division of Migratory Bird Management, Arlington, VA. 99 p.

USFWS. 2003. Recovery Plan for the Northern Idaho Ground Squirrel (*Spermophilus brunneus brunneus*). Portland, Oregon. 68 pp.

USFWS. 2004a. Programmatic Biological Opinion for the Wyoming Bureau of Land Management Resource Management Plans and Their Effects to the Bald Eagle (*Haliaeetus leucocephalus*). Wyoming Ecological Services Office, Cheyenne, Wyoming. Available online at: http://www.blm.gov/wy/st/en/programs/Wildlife/baldeagle.html

USFWS. 2004b. Letter concerning need for black-footed ferret surveys in prairie dog colonies. ES-61411/BFF/WY7746. Dated February 2.

USFWS. 2006a. Final Biological Opinion on the Platte River Recovery Implementation Program. Ecological Services, Nebraska Field Office, Grand Island, Nebraska.

USFWS. 2006b. Estimating the effects of auditory and visual disturbance to northern spotted owls and marbled murrelets in northwestern California. Memorandum. Arcata Fish and Wildlife Office, Arcata, California.

USFWS. 2007a. Final Conservation Strategy for the Grizzly Bear in the Greater Yellowstone Area. March.

USFWS. 2007b. Species Assessment Form for the Yellow-billed Cuckoo, Western U.S. Distinct Population Segment. Online. US Fish and Wildlife Service. Available online at: http://ecos.fws.gov/speciesProfile/SpeciesReport.do?spcode=B06R (accessed November 17, 2008).

USFWS. 2008a. Endangered, Threatened and Candidate Species and Designated Critical Habitat for Wyoming Counties. Ecological Services, Wyoming Field Office, Cheyenne, Wyoming. February.

USFWS. 2008b. Idaho Species, County Species Information. Snake River Fish and Wildlife Office. Available online at: http://www.USFWS.gov/idaho/agencies/Countybycounty:htm

USFWS. 2008c. Questions and Answers Regarding the Revised Endangered Species Listing for the Preble's Meadow Jumping Mouse. July 10, 2008.

USFWS. 2010a. Eagle Take Permitting under the Bald and Golden Eagle Protection Act, Region 8: Interim guidance for external partners. May.

USFWS. 2010b. Endangered Colorado River Basin Fish: Humpback Chub. Available online at: http://www.fws.gov/coloradoriverrecovery/Crhbc.htm

USFWS. 2010c. Species Profile: Bonytail Chub (*Gila elegans*). U.S. Fish and Wildlife Service Environmental Conservation Online System. Available online at: http://www.fws.gov/ecos/ajax/docs/life_histories/E020.html

USFWS. 2010d. News Release: Endangered Species Act Protection for the Wyoming Pocket Gopher is not Warranted. April 14, 2010.

USFWS. 2010e. 12-Month Findings for Petitions to List the Greater Sage-Grouse as Threatened or Endangered.

USFWS. 2011. Cokeville Meadows National Wildlife Refuge. Available online at: http://www.fws.gov/seedskadee/cokevillemeadows.htm

USFWS, Nez Perce Tribe, National Park Service, Montana Fish, Wildlife & Parks, Blackfeet Nation, Confederated Salish and Kootenai Tribes, Idaho Fish and Game, and USDA Wildlife

Services. 2008. Rocky Mountain Wolf Recovery 2007 Annual Report. C.A. Sime and E. E. Bangs, eds. USFWS, Ecological Services, 585 Shepard Way, Helena, Montana 59601. 275pp.

USGS (U.S. Geologic Survey). 1994. Bedrock Geology of Wyoming. U.S. Geological Survey.

USGS. 2006. The National Map LANDFIRE: LANDFIRE National Existing Vegetation Type layer. September. Available online at: http://gisdata.usgs.net/website/landfire (February 8, 2007).

USGS. 2009. Nonindigenous aquatic species. U.S. Department of the Interior, Gainesville, Florida. Version 19AUG2009. Available online at: http://nas.er.usgs.gov/default.aspx (accessed October 25, 2010).

USGS National Gap Analysis Program. 2004. Provisional Digital Land Cover Map for the Southwestern United States. Version 1.0. RS/GIS Laboratory, College of Natural Resources, Utah State University. Available online at: http://USFWS-case-12.nmsu.edu/SWGAPWorkshops/land_cover.htm

USGS National Gap Analysis Program. 2005. Provisional Digital Animal-Habitat Models for the Southwestern United States. Version 1.0. Center for Applied Spatial Ecology, New Mexico Cooperative Fish and Wildlife Research Unit, New Mexico State University. Available online at http://USFWS-case-12.nmsu.edu/SWGAPWorkshops/HabitatModeling.htm

UTNR (Utah Department of Natural Resources). 2010. Contemporary Knowledge and Research Needs Regarding the Potential Effects of Tall Structures on Sage-Grouse (*Centrocercus urophasianus* and *C. minimus*). September.

Valley County Economic Development Council. 2008. Population Projections. Available online at: http://www.valleycountyeconomicdevelopment.com/ Accessed on April 14, 2008.

Vander Haegen, W.M., and B. Walker. 1998. Parasitism by Brown-headed Cowbirds in the Shrubsteppe of Eastern Washington. Washington Department of Fish and Wildlife, Wildlife Research Division, Olympia.

Vasquez, M., and L. Spicer. 2005. American Marten (*Martes Americana*) Species Assessment. Prepared for the Grand Mesa Uncompahgre and Gunnison National Forest.

Ventyx. 2010. Proprietary GIS data. Published August. See www.ventyx.com

Visit Idaho. 2008. Places to Stay. Available online at: http://www.visitidaho.org/placestostay/

Vlcek, D.T. 2008. The New Fork Wagon Road: a Nineteenth Century Southwestern Wyoming Lifeline to the Union Pacific Railspur. Pinedale Field Office, BLM. Available online at: http://www.blm.gov/wy/st/en/field_offices/Pinedale/arch/wagon_road.html, accessed January 11, 2009.

Von Ahlefeldt, J., T. Byer, and P. McLaughlin. 1992. Thunder Basin National Grassland checklist of birds. Medicine Bow National Forest. Jamestown, North Dakota. Northern Prairie Wildlife Research Center Online. Available online at: http://www.npwrc.usgs.gov/resource/birds/chekbird/r6/thunder.htm

Walker, D.E. 1973. American Indians of Idaho. Vol. 1: Aboriginal Cultures. Anthropological Monographs of the University of Idaho 2. Moscow.

Walker, D.E. 1978. *Indians of Idaho*. University of Idaho Press, Moscow, Idaho.

Walker, D.E. 1991. Protection of American Indian Sacred Geography. In *Handbook of American Indian Religious Freedom*. Edited by Christopher Vecsey. New York, The Crossroad Publishing Company.

Walker, D.E. 1993. The Shoshone-Bannock: An Anthropological Reassessment. *Northwest Anthropological Research Notes* (27) 2:139-160.

Walker, D.E. 2005. Sacred Geography in Native North America. In *Encyclopedia of Religion and Culture* (B. Taylor, ed.). London and New York: Continuum.

Walker, D.E. 2009. *Draft Report for the Gateway Transmission Line Right-of-Way Literature Review.* Walker Research Group, Ltd., Boulder Colorado.

WDEQ. [no date]. Industrial Siting News. Available online at: http://deq.state.wy.us/isd/isdnews.htm (accessed September 7, 2010).

WECC (Western Electricity Coordinating Council). 2008. TPL – (001 thru 004) – WECC – 1 – CR ─ System Performance Criteria. Available online at http://www.wecc.biz/Standards/WECC%20Criteria/Forms/AllItems.aspx

WECC. 2010. About WECC. Web page. Available online at: http://www.wecc.biz/About/Pages/ default.aspx

Western Great Basin Coordination Center. 2011. Western Great Basin Dispatch Zones. Available online at: http://gacc.nifc.gov/wgbc/about/about.htm

Western Interstate Energy Board. 2009. 2009. Wyoming Transmission Siting Information.

WGA (Western Governor's Association). 2010. Woody Biomass Utilization Database. Available online at: http://www.nationalbiomassutilization.org/

WGFD (Wyoming Game and Fish Department). 2005. The Comprehensive Wildlife Conservation Strategy. Approved by the Wyoming Game and Fish Commission on July 12, 2005. http://gf.state.wy.us/wildlife/CompConvStrategy/index.asp

WGFD. [no date]. Grassland Ecosystems and Species. Available online at http://gf.state.wy.us/wildlife/nongame/LIP/Grasslands/index.asp

WGS (Wyoming State Geological Survey). 2010a. WSGS Uranium. Available online at http://www.wsgs.uwyo.edu/WSGSgroups/Uranium/Default.aspx

WGS. 2010b. WSGS Construction Aggregate. Available online at http://www.wsgs.uwyo.edu/Topics/IndustrialMinerals/aggregate.aspx

WHDP (Wyoming Housing Database Partnership). 2010. The 2010 Wyoming Profile of Demographics, Economics and Housing. Semiannual Report, ending June 30, 2010. Available online at: www.wyomingcda.com/ (accessed on November 1, 2010).

Wiggins, D. 2004. American Three-toed Woodpecker (*Picoides dorsalis*): a technical conservation assessment. USDA Forest Service, Rocky Mountain Region. Available online at: http://www.fs.fed.us/r2/projects/scp/assessments/americanthreetoedwoodpecker.pdf

WildEarth (WildEarth Guardians). 2010. Petition to List Ten Great Basin Butterflies Under the U.S. Endangered Species Act.

Wildlife Action Plan Team. 2006. Nevada Wildlife Action Plan. Nevada Department of Wildlife, Reno, Nevada.

Williams, Paul L., James W. Mytton, and Harry R. Covington. 1990a. Geologic map of the Stricker 1 quadrangle, Cassia, Twin Falls and Jerome Counties, Idaho. Department of the Interior U.S. Geological Survey. Map I-2078, scale 1:48,000.

Williams, Paul L., James W. Mytton, and William A. Morgan. 1990b. Geologic map of the Stricker 3 quadrangle, Twin Falls and Cassia County, Idaho. Department of the Interior . Map I-2633, scale 1:48,000.

Wisdom, M.J., R.S. Holthausen, B.C. Wales, C.D. Hargis, V.A. Saab, D.C. Lee, W.J. Hann, T.D. Rich, M.M. Rowland, W.J. Murphy, and M.R. Eames. 2000. Source Habitats for Terrestrial Vertebrates of Focus in the Interior Columbia Basin: Broadscale Trends and Management Implications—Volume 1, Overview. General Technical Report PNW-GTR-485. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 3 vol. (Quigley, Thomas M., tech. ed.; Interior Columbia Basin Ecosystem Management Project: scientific assessment).

Wright, P. 1972. *Rock Creek Station and Stricker Ranch*. Idaho State Historical Society Reference Series, Number 972, Boise, Idaho.

WSFD (Office of State Lands and Investments, Wyoming State Forestry Division). 2007. Wyoming Biomass Inventory: Animal Waste, Crop Residue, Wood Residue, and Municipal Solid Waste. March. Available online at: http://slf-web.state.wy.us/forestry/adobe/biomass.pdf

WYNDD (Wyoming Natural Diversity Database). 2007. Plant Species of Concern. http://uwadmnweb.uwyo.edu/WYNDD/Plants/plant_soc_home.htm (accessed September 6, 2008).

WYNDD. 2008. Data compilation for M. Garner and W. Vering, completed January 15, 2008. Unpublished report. Wyoming Natural Diversity Database, University of Wyoming, Laramie, Wyoming.

Wyoming Department of Employment. 2009. Wyoming Job Losses Continue in September. Available online at: http://doe.state.wy.us/lmi/news.htm (accessed on November 2, 2009).

Wyoming Department of Employment. 2010. Modest Job Growth Continues in September 2010. Available online at: http://doe.state.wy.us/lmi/news.htm (accessed on October 31, 2010).

Wyoming Department of Homeland Security. 2008. Multi-Hazard Mitigation Plan.

Wyoming Department of Revenue. 2010. Department of Revenue 2010 Annual Report. Available online at: http://revenue.state.wy.us/ (accessed on June 23, 2011).

WYDOT (Wyoming Department of Transportation). 1990. Utility Accommodation Regulation. April (updated October 1, 2006). Available online at: http://www.dot.state.wy.us/webdav/site/wydot/shared/Highway_Development/Utilities/WYDOT%20Utility%20Accommodation%20Regulations.pdf

WYDOT. 2008. Traffic Data: Traffic Volume and Vehicle Miles. Wyoming State Government. Available online at: http://www.dot.state.wy.us/wydot/planning_projects/Traffic_Data

Wyoming Economic Analysis Division. 2006. Population for Wyoming, Counties, Cities, and Towns: 2000 to 2020. Prepared by Wyoming Department of A & I, Economic Analysis

Division (http://eadiv.state.wy.us), December. Available online at: www.eadiv.state.wy.us/pop/ (accessed on August 5, 2008).

Wyoming Economic Analysis Division. 2010. Wyoming Sales, Use, and Lodging Tax Revenue 2010. Available online at: http://eadiv.state.wy.us (accessed on June 24, 2011).

Wyoming Infrastructure Authority. High Plains Express Project (HPX). [no date]. Available online at: http://wyia.org/projects/transmission-projects/high-plains-express-project-hpx/

Wyoming Oil and Gas Conservation Commission. 2009. 2008 Approved Drilling Permits by County. Available online at http://wogcc.state.wy.us/cfdocs/2008_stats.htm

Wyoming Oil and Gas Conservation Commission. 2010. Web site. Updated 9/2010. Available online at: http://wogcc.state.wy.us/

Wyoming Public Service Commission. 2007. Wyoming Gas Utilities Certified Areas, September 2007. Available online at: http://psc.state.wy.us/

Wyoming SHPO (State Historic Preservation Office). 2008. *Emigrant Trails Throughout Wyoming.* Available online at: http://wyoshpo.state.wy.us/trailsdemo/index.html (accessed September 17, 2008).

Wyoming SHPO. 2009. Oregon, California, Mormon, Pioneer and Pony Express Virtual Trails Tour. Available online at: http://wyoshpo.state.wy.us/trailsdemo/alvah_unthank.htm (accessed November 19, 2009).

Wyoming Tourism. 2008. Places to Stay. Available online at: http://www.wyomingtourism.org/placestostay?view=List

Wyoming Water Development Commission. 2007. State of Wyoming 2007 Water System Survey Report. Available online at: http://wwdc.state.wy.us

Wyoming Weed and Pest Council. 2008a. Wyoming Weed and Pest Control Designated List. Available online at http://www.wyoweed.org/Documents/DocumentPage/WYOMINGWEEDList.pdf

Wyoming Weed and Pest Council. 2008b. Declared List of Weeds and Pests: Wyoming Weed and Pest Control Act of 1973.

Yates, Kirt, and Janet Yates. 2010. Letter to W. George, BLM, from Kirt and Janet Yates regarding Alternative 7H. March 3.

Zaffanella, L.E. 1993. Survey of Residential Magnetic Field Sources. Vol. 1: Goals, Results, and Conclusions. (EPRI TR-102759-V1, Project 3335-02) Electric Power Research Institute, Palo Alto, CA.