

## CHAPTER 4

### ANALYSIS OF ENVIRONMENTAL CONSEQUENCES

#### 4.0 INTRODUCTION

This chapter of the environmental assessment (EA) provides an analysis of the potential environmental consequences that would result from implementation of the proposed Little Monument natural gas project and/or alternatives. Certain measures that would avoid or reduce impacts under the Proposed Action have been included in Chapter 2. The following impact assessment takes these measures into consideration. Additional opportunities to mitigate impacts beyond the measures proposed in Chapter 2 are presented in this chapter for each resource discipline.

An environmental impact or consequence is defined as a modification or change in the existing environment brought about by the Proposed Action or alternatives to the Proposed Action. Impacts can be direct or indirect in nature, and can be permanent (long-term) or temporary (short-term). Impacts can vary in degree ranging from only a slight discernable change to a drastic change in the environment. Short-term impacts are impacts that occur during and immediately after pipeline construction and testing and last from two to five years. For purposes of this EA, short-term impacts are defined as lasting five years or less. Long-term impacts are impacts imposed by construction and operations that remain longer than five years and extend for the life-of-project (LOP) and beyond.

Discussions of the potential environmental consequences for each resource section include the following.

**Impacts** The level and duration of impacts that would occur as a result of the Proposed Action or the No Action Alternative. The impact evaluation assumes that the applicant-committed practices described in Chapter 2 would be implemented. Direct impacts are those which are caused by the action and occur at the same time and place. Indirect impacts are those impacts which are caused by the action but occur later in time or farther removed in distance.

**Mitigation** Any measures, in addition to those described in Chapter 2 that could be applied to avoid or further reduce adverse impacts.

**Residual Impacts** A summary of impacts that are unavoidable and cannot be reduced or eliminated through the application of available and reasonable mitigation and, therefore, would remain throughout the duration of the project and to some point beyond.

**Cumulative Impacts** A description of impacts likely to occur due to this project in combination with other on-going and recently approved activities, recently constructed projects and other past projects, and projects likely to be implemented in the near future (reasonably foreseeable future actions or RFFA's). Because the project area falls within the Lincoln Road Project area that was analyzed in the Fontenelle EIS and is well within the level of development approved in the associated ROD, the CIA for most land-based resources is limited to either the sections involved in the proposal or the Lincoln Road Project area. The CIA for air quality, livestock grazing, and socioeconomics consider larger areas.

## **CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES**

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### **4.1 GEOLOGY/MINERALS/PALEONTOLOGY/SOILS**

#### **4.1.1 Geology**

##### **4.1.1.1 Impacts**

###### **4.1.1.1.1 Proposed Action**

Impacts could occur to the geologic environment as a result of the Proposed Action if alteration of existing land surface steepens slopes or otherwise increases runoff or causes undercutting that could initiate slumping, landslides or other mass movements. If existing BLM construction restrictions on slopes and construction design described in Chapter 2 followed the possibility of the project initiating landslides or other mass movements, flooding is considered unlikely.

Impacts could occur to the geologic environment as well as project facilities as a result of inherent geologic hazards (e.g., landslides, mass movements, earthquakes), but this is considered unlikely. The relatively low relief over most of the area and the nearly horizontal geologic dip on the rocks at the surface lessens the chance for naturally occurring mass movements. In addition, no large landslides or mass movement deposits occur within the project area and no earthquake epicenters have been documented within 15 miles of the project area.

###### **4.1.1.1.2 Alternative A – No Action**

Under the No Action Alternative the lands surface would not be modified by the Proposed Action, and only affected by natural erosional processes and development as a result of APD's on federal lands considered on a case-by-case basis through individual project and site-specific environmental analysis.

###### **4.1.1.2 Mitigation**

No additional mitigation to the geologic environment is proposed.

###### **4.1.1.3 Cumulative Impacts**

No cumulative impacts to the geologic environment are identified.

###### **4.1.1.4 Residual Impacts**

No residual impacts to the geologic environment are identified.

#### **4.1.2 Minerals**

##### **4.1.2.1 Impacts**

###### **4.1.2.1.1 Proposed Action**

Natural gas is the only mineral resources that would be impacted with implementation of the Proposed Action. Production of natural gas would deplete reserves, but the proposed project allows for recovery of Federal natural gas resources per 43CFR 3162(a) and generation of

## **CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES**

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private and public revenues.

### **4.1.2.1.2 Alternative A – No Action**

Under the No Action Alternative natural gas reserves would not be developed and produced as discussed for the Proposed Action resulting in possible waste of federal mineral resource. Private and public revenue would not be generated, except to the extent allowed for on a case-by-case basis through individual project and site-specific environmental analysis.

### **4.1.2.2 Mitigation**

No mitigation to the mineral environment is identified.

### **4.1.2.3 Cumulative Impacts**

Depletion of natural gas reserves as a result of production is the natural consequence of the Proposed Action in combination with other on-going natural gas programs and recently approved activities throughout southern Wyoming.

### **4.1.2.4 Residual Impacts**

Depletion of natural gas reserves is an unavoidable impact associated with implementation of the Proposed Action. Drilling of wells however, may result in the identification of additional as yet unknown gas reserves, and allow the orderly development of gas reserves in the Little Monument Project Area.

## **4.1.3 Paleontology**

### **4.1.3.1 Impacts**

#### **4.1.3.1.1 Proposed Action**

Impacts could occur to the paleontology environment if surface disturbance associated with the Proposed Action results in the exposure and destruction of fossil resources, along with associated loss of geologic information. However, the Proposed Action could also result in new and important fossil resources being discovered and properly recovered and cataloged into the collection of a museum repository, so that they are available for study.

Early Tertiary (Eocene) aged sedimentary deposits represented by the Green River Formation (Laney Member) underlies the entirety of the project area. No fossil localities were identified by literature and records searches and by a field check of the area, however the Green River Formation, including the Laney Member is known to produce significant fossils elsewhere in Wyoming and is considered to be a Class 5 geological formation, or one that contains scientifically significant fossils and must be evaluated during environmental review.

#### **4.1.3.1.2 Alternative A – No Action**

Under the No Action Alternative, the Proposed Action would not be implemented and further drilling would be allowed on federal lands to the extent that it would be within the scope of

## **CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES**

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individual APD's that could be approved on a case-by-case basis. In terms of magnitude, such impacts would likely be substantially less than for the Proposed Action. The potential discovery of previously unknown fossils resources, however would not occur.

### **4.1.3.2 Mitigation**

The magnitude of impacts associated with the destruction of potential fossil resources can be reduced by the implementation of paleontologic resource mitigation measures described in Chapter 2 and below.

Should fossil resources be uncovered during surface disturbance associated with the Proposed Action, the project proponent or authorized personnel should immediately notify the BLM and work should cease immediately in the area of the discovery until the fossil remains can be evaluated for scientific significance by a qualified paleontologist. If fossil remains of significance are identified, additional mitigation may be proposed. Additional mitigation could include collection, identification, and curation of the fossil remains and potentially monitoring of on-going surface disturbance in the area of discovery.

### **4.1.3.3 Cumulative Impacts**

No cumulative impacts to fossil resources are identified.

### **4.1.3.4 Residual Impact**

No residual impacts to fossil resources are identified.

## **4.2 CLIMATE AND AIR QUALITY**

Air pollutant emissions would occur from the Proposed Action during well site construction activities and well production, and these emissions would impact air quality in the project area. The primary pollutants emitted would be particulate matter less than 10 microns in diameter (PM<sub>10</sub>), particulate matter less than 2.5 microns in diameter (PM<sub>2.5</sub>), nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), volatile organic compounds (VOC), sulfur dioxide (SO<sub>2</sub>), and hazardous air pollutants (HAP's). Construction emissions would be short-term and localized in nature. Air emissions would also result during gas production from small combustion equipment at each well site.

### **4.2.1 Impacts**

#### **4.2.1.1 Proposed Action**

Air pollutant emissions from the construction phase of the Proposed Action would result from construction of well pads and access roads, travel on unpaved roads to and from the pad sites, wind erosion of disturbed areas, diesel engine combustion from heavy construction equipment, well drilling, well completion, and pipeline construction. Construction of one well pad would be completed in 4 to 6 days. Rig-up, drilling, and rig-down at each well would be completed in approximately 16 days.

During construction, PM<sub>10</sub> and PM<sub>2.5</sub> emissions would result from well pad, access road, and pipeline construction and travel on unpaved roads and NO<sub>x</sub>, CO, VOC, SO<sub>2</sub>, and HAP emissions

## CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES

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would occur from drilling engine operation and from tailpipe emissions from heavy construction equipment. Air pollutant impacts from each well would be temporary (i.e., occurring during the 22-day well construction period or pipeline construction period) and would occur in isolation, without adversely interacting with adjacent well locations.

Pollutant emissions would also occur from the 31 wells during production operations over the 15 to 20-year LOP. Two small natural gas-fired heaters approximately 0.25 MMBTU/hr in size would operate at each well site, supporting the separator and dehydrator, which would be located at each well. Each heater would emit NO<sub>x</sub>, CO, VOC, and HAP emissions. NO<sub>x</sub> emissions from a typical 0.25 MMBTU/hr heater would be an estimated 0.11 tons per year (tpy) based on an AP-42 emission factor for natural gas combustion (EPA 1995). Two heaters at each of the 31 well sites would result in a total of 62 heaters and annual NO<sub>x</sub> emissions of 6.8 tpy. This calculation assumes year-round operation; these heaters would be operated primarily during the winter months.

WDEQ-AQD air quality requirements for short-term construction are limited to the minimization of fugitive dust during construction operations. Construction emissions would not be expected to cause exceedences in ambient air quality standards due to the emissions' temporary and localized nature. Prior to commencement of operations, WDEQ-AQD requires an emission source to undergo a permit review to ensure compliance with New Source Review permit requirements. An air quality permit application or equivalent would be required to be submitted to WDEQ-AQD for review, and would require approval prior to construction or operation. No exceedences of NAAQS, WAAQS, and Class II PSD Increments for any regulated air pollutant emitted would be allowed under WDEQ-AQD regulations.

Ambient pollutant data collected in the region would also serve as a demonstration of compliance with ambient standards. Regional ambient air quality background concentrations presented in Table 3-6 indicate that existing conditions in the region are below state and federal ambient standards.

### 4.2.1.2 Alternative A – No Action

The No Action Alternative would deny the proposal as submitted, but would allow consideration of individual APD's on federal lands on a case-by-case basis through individual project and site-specific environmental analysis. The No Action Alternative is expected to result in less impact than that described for the Proposed Action.

### 4.2.2 Mitigation

No additional mitigation procedures to reduce air quality impacts would be required.

### 4.2.3 Cumulative Impacts

The Pinedale Anticline EIS (PAC EIS) (USDI-BLM 2000), completed in May 2000, analyzed cumulative air quality impacts at Class I and Class II areas from emissions sources in southwest Wyoming. The analysis used an approach that included the modeling of existing and proposed regional sources at permitted and planned emission rates, respectively. Industrial development after 1995 was explicitly modeled in the analysis for sources in southwest Wyoming, northwest Colorado, and northeast Utah. 631 tons of PM<sub>10</sub>, 2,663 tons of NO<sub>x</sub>, 1,070 tons of SO<sub>2</sub>, and 7,272 tons of VOC were inventoried in southwest Wyoming as part of the PAC EIS cumulative

## **CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES**

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analysis. Industrial development before 1995 was accounted for in regional ambient background concentrations for each pollutant.

The PAC EIS air quality analysis predicted the impacts on ambient concentrations in PSD Class I areas and the impacts on AQRV's such as acid deposition at sensitive lakes and regional visibility at Class I areas. The study found no potential exceedences of PSD Class I Increments in federal Class I areas. Potential cumulative impacts to sensitive lakes were found to be below applicable significance thresholds. The cumulative visibility study, including the worst-case development alternative of those proposed in the PAC EIS, found a maximum of 15 days which exceeded the 0.5 deciview or 5% change in extinction visibility management threshold. Cumulative visibility impacts for all analyzed alternatives were found to be below the visibility threshold of 1.0 deciview or 10% change in extinction.

The PAC EIS cumulative analysis examined long-term emissions related to the operation of emissions sources. No construction emissions were included in the cumulative analysis. The operation phase of the Proposed Action, for which NO<sub>x</sub> emissions are estimated at 6.8 tpy, would constitute an increase in NO<sub>x</sub> emissions of 0.3% over levels analyzed in the PAC EIS.

### **4.2.4 Residual Impacts**

Air emissions would be generated during construction activities occurring over the 6-day construction period. In addition, air emissions would be generated through operation of the well site heaters during production. These impacts would occur beyond the mitigation measures outlined in Chapter 2. Short-term impacts would be within state-mandated air quality levels, would be localized and temporary, and would be quickly dispersed by the wind. Long-term impacts of pollutant emissions from year-round heater operation would be within permit limits established by WDEQ-AQD and would be less than NAAQS, WAAQS, and PSD Class II Increments. Because no air emissions would occur after the LOP, no residual impacts would be expected beyond the LOP.

## **4.3 SOILS**

### **4.3.1 Impacts**

#### **4.3.1.1 Proposed Action**

Impacts could occur to the soil environment as a result of the Proposed Action if during surface alteration land surfaces and gradients are steepened, which could increase runoff and erosion or if soil cover is removed and the area is subject to accelerated erosion, undercutting, collapse or subsidence.

#### **4.3.1.2 Alternative A – No Action**

Under the No Action Alternative the soil surface would not be modified by the Proposed Action and only affected by natural erosional processes and development that could be authorized on a case-by-case basis. The soils in the area are well-drained and the natural slope of the lands is low, lessening the chance of flooding, erosion, or collapse or subsidence.

## **CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES**

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### **4.3.2 Mitigation**

No mitigation to the soil environment is proposed.

### **4.3.3 Cumulative Impacts**

No cumulative impacts to soils are identified.

### **4.3.4 Residual Impacts**

No residual impacts to soils are identified.

## **4.4 WATER RESOURCES**

### **4.4.1 Impacts**

#### **4.4.1.1 Proposed Action**

Impacts described herein are based on implementation of the Proposed Action, and in terms of water resources, represent the maximum impact.

##### **4.4.1.1.1 Surface Water**

Potential impacts that could occur to the surface water system due to the Proposed Action include increased surface water runoff and off-site sedimentation due to soil disturbance (Soils Section 4.3), water quality impairment of surface waters, and stream channel morphology changes due to road and pipeline crossings. The magnitude of the impacts to surface water resources would depend on the proximity of the disturbance to a drainage channel, slope aspect and gradient, degree and area of soil disturbance, soil character, duration of construction activities, and the timely implementation and success/failure of mitigation measures. Impacts would likely be greatest shortly after the start of construction activities and would decrease in time due to

stabilization, reclamation, and revegetation efforts. Construction activities would occur over a relatively short period of time; therefore, the majority of the disturbance would be intense but short-lived. Petroleum products and other chemicals could be accidentally spilled resulting in surface water contamination. Similarly, reserve and evaporative pits could leak if liners were punctured or no liners were installed, resulting in surface water degradation.

The primary impact of the Proposed Action on surface water resources is the potential for increasing surface runoff, erosion, and off-site sedimentation that could cause channel instability and degradation of surface water quality. As described in Chapter 2, total new short-term surface disturbance resulting from the Proposed Action would cover 91.4 acres (approximately 2.4 percent of the total LMPA which encompasses about 3,857 acres). The construction disturbance would not be uniformly distributed across the project area because project facilities would be located where the efficiency and feasibility of extracting the natural gas would be the highest, as discussed in Chapter 2. Locating project facilities on slopes in excess of 25 percent would constitute a adverse impact relating to excessive surface runoff and such areas will be avoided.

## CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES

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Access to the LMPA would be via U.S. Highway 189 and numerous existing improved roads. The existing road network was developed to access prior and ongoing drilling and production activities, as well as other land use activities on Federal surface. All new access roads would be constructed specifically for natural gas well field development. Roads will be designed to minimize disturbance, and all surface disturbance will be contained within the road ROW. In the event drilling is non-productive, all disturbed areas, including the well site and new access road, would be reclaimed to the approximate landform that existed prior to construction. If drilling is productive, all access roads to the well site would remain in place for well servicing activities. Partial reclamation would be completed on segments of the well pad and access road ROW no longer needed. Each new well within the LMPA would require an average of 500 feet of new roads or upgrades of existing roads, and an average of 500 feet of new gas and water collection lines would be installed in a 50-foot wide facilities corridor. Where possible, flow pipelines would be routed adjacent to the new roadway ROW to minimize surface disturbance.

The majority of soil disturbance would be well away from stream channels, as required by RMP management directives (USDI-BLM 1997) (“within 500 feet of or on 100-year floodplains, wetlands, or perennial streams and within 100 feet of the edge of the inner gorge of intermittent and large ephemeral drainages”). Authorization of the Proposed Action would require full compliance with the RMP management directives that relate to surface water protection, Executive Order 11990 (floodplains protection), and the CWA in regard to protection of water quality and compliance with Section 404 permits. These directives require avoidance of stream channels to the maximum extent possible. Where total avoidance is not possible, the minimization of impacts to streams and associated floodplains/floodways must be implemented and the operator would be required to show the BLM AO why such resources cannot be avoided and how impacts would be minimized. These regulations also require that certain permits/authorizations be obtained for project implementation including a NPDES permit (needed for surface discharge); development of a surface runoff, erosion, and sedimentation control plan; oil spill containment and contingency plan; as well as CWA Section 404 permits. Given these conditions, adverse sedimentation is not expected to occur as a result of the implementation of the Proposed Action.

Most of the ephemeral drainage channels identified on Figure 3-2 are classified as waters of the U.S. Crossings of these channels and any associated wetlands would require authorization from the COE through the CWA Section 404 permitting process. However, these channel crossings would likely receive expedited authorization from the COE through Nationwide Permits No. 12 (buried utility lines) and/or No. 14 (minor road crossing fills) and No. 18 (minor discharges) as well as Programmatic General Permit 98-08. Other project facilities could not be located in waters of the U.S.; therefore, Section 404 permitting would not be necessary for such facilities. Each individual channel crossing would be reviewed during the APD/ROW permitting process for specific permit requirements under Section 404 and the CWA. Given these conditions, wetland damage is not expected to occur as a result of the implementation of the Proposed Action.

There is a remote chance that road and pipeline construction across established channels could adversely modify flow hydraulics. However, with correct design of channel crossings, including design for 25- to 50-year runoff events, no adverse impacts are expected. As discussed in Chapter 3, drainage channels in the project area are predominantly ephemeral. Therefore, it is unlikely that project activities would lead to an increase in sedimentation enough to adversely affect the quality of surface waters.

Reserve pits would be constructed to all contain drilling fluids, cuttings, and water produced during drilling. The operator proposes to use lined reserve pits at all drill site locations. The reserve pit

## CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES

---

would be lined with an impermeable poly liner or drilling mud gel (bentonite) to prevent seepage. Bentonite or synthetic lining would be used where appropriate as defined during the APD review. The synthetic poly liner would be at least 12 mils thick, reinforced with a bursting strength of 174 x 175 pounds per inch (ASTMD 75719), resistant to decay from sunlight and hydrocarbons, and compatible with the drilling fluids to be retained. Leakage of the pit fluids would be minimal from lined reserve pits unless the liners were installed incorrectly or the liners were damaged during drilling operations. Thus, adverse impacts from leaks in reserve pits would likely not occur.

Water for drilling purposes would be obtained from three existing water source wells located within the LMPA. Assuming no re-use of drilling water, each well would require approximately 189,000 gallons of water for well completion, well stimulation, and dust control. This water demand is relatively small and would not adversely affect existing surface or groundwater sources or rights.

Handling and management of hydrostatic test water, if used by the operator, would be accomplished in a manner that does not adversely affect soils, stream channels, and surface water and groundwater quality. After testing operations are completed, the water would be pumped into water hauling trucks and transported to drilling locations within the project area and used in conjunction with the drilling operations. However, if such water is not re-used it would be disposed of in a manner where soil scouring and water quality impairment would not result. Hydrostatic test water would be evaluated for compliance with State water quality standards. No test water would be discharged unless such water meets these standards. Test water not needed for drilling operations that meets water quality standards would be disposed of onto undisturbed land having vegetative cover or into an established drainage channel in a manner as not to cause accelerated erosion.

If a well is productive, site erosion and off-site sedimentation would be controlled by promptly revegetating sites in the first appropriate season (fall or spring) after drilling, and providing surface water drainage controls, such as berms, sediment collection traps, diversion ditches and erosion stops as needed. These measures would be described in the individual APD/ROW. If a well is not productive, all facilities constructed for its drilling and completion would be reclaimed according to APD conditions of approval.

Methods used for the disposal of produced water (water produced in association with the natural gas which is separated out at the well location) would vary but would generally be accomplished by surface evaporation in lined ponds.

### 4.4.1.1.2 Groundwater

The producing geologic formation in the LMPA is the Frontier Formation and the drilling depths would vary between approximately 9,000 feet and 11,000 feet. Compliance with "On-Shore Oil and Gas Order No. 2" will assure that the project will not adversely affect groundwater quality. Due to the state-of-the-art drilling and well completion techniques, the possibility of adverse degradation of groundwater quality by the Proposed Action would be negligible.

Well completion must be accomplished in compliance with "On-Shore Oil and Gas Order No 2". These guidelines specify the following:

*"...proposed casing and cementing programs shall be conducted as approved to protect and/or isolate all usable water zones, potentially productive zones, lost circulation zones, abnormally pressured zones, and any prospectively valuable deposits of minerals. Any isolating medium other than cement shall*

## CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES

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*receive approval prior to use”.*

Usable water is defined as groundwater with a TDS of 10,000 ppm or less encountered at any depth. To comply with the order, wells must be completed such that either usable water is isolated from “unusable” water, or that unusable water is isolated from usable water through the use of cementing and other proven technologies. Assuming compliance with this order, no contamination of usable groundwater would likely occur. Well drilling and completion as proposed in Chapter 2 appears to comply with the onshore order.

No springs or seeps have been identified within the project area. If any should be discovered during the life of the project, the exact locations and associated water-bearing strata of such surface expressions of groundwater would be evaluated during the site-specific analysis conducted for all components at the APD stage. Further, all construction activities and storage of petroleum products would be kept away from any seeps and springs (a minimum distance of 200 to 600 feet depending on the type of spring); therefore, contamination would be unlikely.

As discussed in Chapter 3, SEO records identify one active permitted groundwater right in the project area. The well is designated for livestock use. Due to the high improbability of groundwater quality degradation, the potential of impacts to holders of existing groundwater rights in the LMPA is remote.

### **4.4.1.2 Alternative A – No Action**

The No Action Alternative would deny the proposal as submitted, but would allow consideration of individual APD’s on federal lands on a case-by-case basis through individual project and site-specific environmental analysis. The No Action Alternative is expected to result in less impact than that described for the Proposed Action.

### **4.4.2 Mitigation**

No mitigation measures or procedures would be required to minimize impacts to water resources.

### **4.4.3 Cumulative Impacts**

Aside from limited oil and gas exploration and production, no other resource developments currently occur within or near the proposed project area. No mitigation measures or procedures other than those proposed by Burlington and the management direction contained in the Green River RMP (USDI-BLM 1997) would be required to minimize cumulative impacts to water resources.

### **4.4.4 Residual Impacts**

No adverse residual impacts would result from project implementation of the RMP management directives and specific mitigation measures discussed above, and with adherence to the CWA and EO 11990.

## CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES

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### 4.5 VEGETATION, WETLANDS AND NOXIOUS WEEDS

#### 4.5.1 Impacts

##### 4.5.1.1 Proposed Action

###### 4.5.1.1.1 Vegetation

Potential impacts to existing native shrub/grassland communities resulting from project implementation may include direct impacts such as disturbance, reduction, and/or removal of vegetation. Potential indirect impacts to the vegetation resource could occur as a result of soil compaction, mixing of soil horizons, loss of topsoil productivity, increased soil surface exposure, soil loss due to wind and water erosion, and damage to biological soil crusts (Belnap et al. 2001).

The Proposed Action assumes construction of 31 wells and associated roads and pipelines. Construction and installation of well sites, access roads, and ancillary facilities (including pipelines) would directly reduce the extent of vegetation cover types. Over the estimated three-year development phase (depending on drilling success), the Proposed Action would involve surface disturbance of about 91.4 acres (Table 2-1) which represents about 2.4% of the LMPA land surface area. This disturbance would be distributed among the primary and secondary vegetation types on the LMPA identified by Merrill et al. (1996). For purposes of this analysis it was assumed that disturbance associated with roads and pipelines would be located in the same vegetation cover type as the proposed well location.

Analysis of initial construction disturbance upon vegetation types is based on the approximate location of proposed wells prior to construction. As stated in the LMPA Scoping Statement, actual placement and number of wells may change as development proceeds. All 31 proposed new wells would be located in the Wyoming big sagebrush primary cover type, which represents about 2.4% of this cover type.

Twenty-six wells would be located in the mixed grass prairie secondary cover type with a total disturbance of 78.8 acres or about 2.4% of this cover type. Five wells would be located in the desert shrub secondary cover type with a total disturbance of 12.6 acres or about 2.4% of this cover type.

During the production phase of the project, pipelines and about 1.0 acres of each initial 1.8-acre well pad will be reclaimed along with both the back slopes and fore slopes of all roads with the exception of 30 feet of useable road surface. Therefore, total vegetation disturbance would be reduced from about 91.4 acres to about 40.0 acres (1.0% of the LMPA) after successful reclamation during the LOP. This total assumes all 31 well are productive; the LOP total could be decreased further if non-productive wells are encountered and affected well pad area(s) and associated road(s) are reclaimed earlier than currently anticipated.

In general, the extent of these impacts will be influenced by success of mitigation and reclamation efforts and the time period required for disturbed areas to return to pre-existing conditions. Reclamation success, in part, depends on the amount of surface area disturbed and quality of topsoil salvaged and stockpile/redistribution methods in disturbed areas. Re-vegetation efforts would be implemented in accordance with APD and BLM mitigation guidelines

## **CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES**

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after cessation of surface-disturbing activities and original contour and grade are achieved as explained in Section 2.2.2.9

### **4.5.1.1.2 Wetlands**

Due to a paucity of wetland/riparian sites on the LMPA, the probability of well pads, roads, or pipelines impacting these resources is low. The RMP specifies that a 500-foot (minimum) buffer around riparian and other water resources will be maintained. Permits under Section 404 of the CWA would be required for any activities in wetlands. Burlington would be required to demonstrate to the COE that there are no “practical alternatives” to placement of a well location in a wetland. The probability of impacting wetlands and other waters of the U.S. under the Proposed Action is low given the xeric nature of the LMPA and identified mitigation procedures stated in Chapter 2, Burlington’s APD’s, the RMP, COE and BLM surface-disturbing guidelines.

### **4.5.1.1.3 Noxious Plant Species**

Surface-disturbing activities could increase the potential for establishment and spread of invasive (includes noxious) plant species. Invasive species, especially weeds, usually thrive on newly disturbed surfaces such as road and pipeline ROW’s and readily out-compete more desirable and indigenous plant species. Burlington would be responsible for the management and control of all invasive weed infestations on project-related surface disturbances during the projected LOP and will consult with the BLM AO and/or local Sweetwater County Weed and Pest Control District authority for acceptable weed control methods.

Appendix 9-2 of the RMP provides guidelines for herbicide utilization within the RSFO management area. In addition, Appendix 5-1 of the RMP specifies that herbicide loading sites will be located at least 500 feet from live water, floodplains, riparian areas, and all special status species plant locations. In addition, aerial spraying of chemicals would be prohibited within ¼ mile of special status plant locations, and hand-application would be prohibited within 500 feet. Control measures would adhere to those allowed in the *FEIS, Vegetation treatment of BLM lands in the thirteen western states* (USDI-BLM 1991).

### **4.5.1.2. Alternative A - No Action**

The No Action Alternative would deny the proposal as submitted but would allow consideration of individual APD’s on federal lands on a case-by-case basis through individual project and site-specific environmental analysis. Transport of natural gas products would be allowed from those wells within the LMPA that are currently productive. Additional gas development could occur on State and private lands within the project area under APD’s approved by the WOGCC.

Direct and indirect impacts to vegetation and wetland/riparian areas could continue as additional exploratory and development activities beyond this project are permitted. Given the current unknown extent of these activities it is not possible to reasonably predict what future impacts may occur under the No Action Alternative.

## **4.5.2 Mitigation**

No mitigation measures for soil resources are recommended.

## **CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES**

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### **4.5.3 Cumulative Impacts**

The Proposed Action would temporarily add to the cumulative removal of vegetation within the area. Any non-permitted impacts to riparian/wetland areas would add to the cumulative loss in Wyoming and the Continental U.S. Planned or incidental use of existing field infrastructure and facilities (e.g., well pads, roads, pipeline corridors) by Burlington would reduce the potential long-term cumulative impacts to both of these resources. Because of the widespread distribution and abundance of Wyoming big sagebrush/mixed grass prairie cover type in this portion of Wyoming, minor reductions in these upland cover types would not be a adverse cumulative impact.

### **4.5.4 Residual Impacts**

No residual impacts to vegetation resources would occur with implementation of and compliance with mitigation measures and stipulations stated in Chapter 2, Burlington's APD's, the RMP, and BLM surface-disturbing mitigation guidelines, recognizing that complete revegetation to pre-existing conditions (especially the shrub component) may require several decades in the arid (<10 " precipitation) environment of the project area, depending in great part, on future climatic conditions and land-use patterns.

## **4.6 RANGE RESOURCES**

### **4.6.1 Impacts**

#### **4.6.1.1 Proposed Action**

Sheep and cattle grazing would continue on the LMPA and Eighteen Mile grazing allotment during the drilling, field development and operations phases of the project. The primary impact to grazing resources would be short-term loss of available forage as a result of construction and production-related disturbance sites. These sites, except for roads, production equipment and ancillary facilities would be reclaimed as soon as practicable

Assuming all 31 wells are successful, the Proposed Action would result in an estimated initial 91.4 acres of short-term disturbance (about 2.4% of the total project area) or about 0.04% of the 245,659 acres encompassed within the Eighteen Mile grazing allotment (D'Ewart 2003). During the anticipated LOP, this total is estimated to decrease to about 40.0 acres (1.0% of the total project area) or about 0.02% of the total land area of the grazing allotment.

The average stocking rate for the Eighteen Mile grazing allotment is about 13 acres per AUM (D'Ewart 2003). Consequently, the Proposed Action would result in a short-term loss of about 7 AUM's, and long-term loss of about 3 AUM's. These losses would amount to substantially less than one percent of the 18,925 permitted AUM's for the Eighteen Mile allotment (D'Ewart 2003). Depending upon the success of drilling productive wells, long-term reduction of AUM's could be less than currently calculated. For example, in the Lincoln Road Unit, approximately 10% of wells drilled were non-producing wells and have been subsequently plugged, abandoned, and reclaimed. If a minimum of 10% of the proposed new 31 wells are non-producing, an additional 3 well pads and their associated facilities and access roads would be reclaimed earlier than currently projected.

## **CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES**

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Under the Proposed Action, the estimated initial and LOP disturbed acres and associated AUM reductions represent less than 1.0% of the total land area and permitted AUM's, respectively, and would not be considered adverse. In addition, Burlington would reclaim unneeded and illegal roads, which would offset loss of forage from new construction.

Reclamation of disturbed sites with grasses and forbs could cause a localized increase in the availability of livestock forage and depending upon the intensity of use (grazing by wildlife, wild horses, and livestock) could interfere with revegetation success of reclaimed areas and fencing may be required to avoid overuse and to assure successful reclamation of the site.

Prevention and control of invasive weed species would be a positive impact to livestock by reducing competition with indigenous plants, thereby maximizing forage production.

The Proposed Action increases the potential for livestock/vehicle collisions. However, if Burlington advises project personnel regarding appropriate speed limits on designated access roads and these instructions are complied with, the likelihood of livestock/vehicle collisions will be minimized.

### **4.6.1.2 Alternative A - No Action**

Under the No Action Alternative, disturbances to the rangeland resource located in proximity to roads and existing facilities would continue due to vehicular use and continued gas field-related activities. Consideration of individual APD's by the BLM on federal lands could continue on a case-by-case basis through individual project and site-specific environmental analysis. Additional gas development could occur on State lands within the LMPA under APD's approved by the WOGCC. Given these conditions, it may be assumed that further impacts will occur in the project area; however, the duration and extent of these impacts are not known at this time.

### **4.6.2 Mitigation**

Burlington should coordinate with affected livestock operators to minimize disruption during livestock operations, including calving and lambing. In addition, as noted in Chapter 2, once the new roads are constructed, Burlington would reclaim existing illegal shortcut roads in the LMPA and sign them for no commercial use. No additional measures would be required other than those specified in Chapter 2, Burlington's APD's and by existing RMP and BLM standard mitigation practices for surface-disturbing and disruptive activities.

### **4.6.3 Cumulative Impacts**

Existing land management and use activities that have impacted the general project area in various degrees include livestock grazing, and road construction. Use would continue during the LOP, estimated to be 15-20 years. The long-term impacts would be the loss of forage associated with roads and infrastructures that are not reclaimed within 5 to 20 years.

Successful revegetation of disturbed sites with grasses and forbs would cause a localized increase in the availability of livestock forage over time. Depending upon the intensity of use, grazing could interfere with revegetation of reclaimed areas. The loss of forage from disturbance would be temporary and lasting until areas are revegetated, approximately 3 to 5 years after reseeding.

## **CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES**

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Long-term production-related disturbances such as portions of well pads and road surfaces would convert rangeland to an industrial use for the life of the facility. Because the project area overlies an existing gas field, the surrounding rangeland landscape has already been altered to an industrial landscape and additional disturbance would continue to encroach on to natural rangeland and their historic uses. The long term production related disturbances would make a larger industrial landscape footprint with additional infrastructure.

The Proposed Action increases the potential for livestock/vehicle collisions. However, if Burlington advises project personnel regarding appropriate speed limits on designated access roads and these instructions are complied with, the likelihood of livestock/vehicle collisions will be minimized.

### **4.6.4 Residual Impacts**

No adverse residual impacts would occur with project implementation, assuming successful implementation of the proposed measures to avoid or reduce adverse impacts to minimum levels.

## **4.7 WILDLIFE**

### **4.7.1 Impacts**

#### **4.7.1.1 Proposed Action**

Over the three-year proposed drilling period, approximately 31 wells will be drilled, disturbing approximately 91.4 acres (2.4% of the project area) of general wildlife habitat. During the production phase, the unused portion of well sites and roads, as well as pipelines (a total of 51.4 acres) would be reclaimed. Following completion of production operations (life of the project is estimated at 15-20 years), the well field and ancillary facilities would be reclaimed and abandoned. Well pads would be removed and the areas revegetated with seed mixes approved by the BLM, some of which are specifically designed to enhance wildlife use. The duration of impacts to vegetation would depend, in part, on the success of mitigation and reclamation efforts and the time needed for natural succession to return revegetated areas to predisturbance conditions. Grasses and forbs are expected to become established within the first several years following reclamation, however, much more time would be required to achieve reestablishment of shrub communities. Consequently, disturbance of shrub communities, particularly mixed shrub communities that big game utilize during winter, would result in a long-term loss of those habitats.

In addition to the direct loss of habitat due to construction of well pads and associated roads and pipelines, disturbances from human activity and traffic would lower the utilization of habitat immediately adjacent to these areas. Species that are sensitive to indirect human disturbance (noise and visual disturbance) would be impacted most. Habitat effectiveness of these areas would be lowest during the construction phase when human activities are more ubiquitous and intensive. Disturbance would be reduced during the production phase of operations and many animals may become accustomed to equipment and facilities in the gas field and may once again use habitats adjacent to disturbance areas.

## CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES

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### 4.7.1.1.1 General Wildlife

The direct disturbance of approximately 91.4 acres of wildlife habitat under the Proposed Action would reduce habitat availability and effectiveness for a variety of common small mammals, birds and their predators. The initial phases of surface disturbance would result in some direct mortality and displacement of songbirds and small mammals from construction sites. In addition, some increase in mortality from increased vehicle use of roads in the project area is expected. Quantification of these losses is not possible; however, the impact is likely to range from low to moderate over the short-term. Due to the relatively high production potential of these species and the relatively small amount of habitat disturbed, small mammal and songbird populations would quickly rebound to pre-disturbance levels following reclamation of pipelines, unused portions of roads, well pads, and wells that are no longer productive. No long-term adverse impacts to populations of small mammals and songbirds are expected.

### 4.7.1.1.2 Big Game

In general, impacts to big game species would include direct loss of habitat and forage, and increased disturbance from drilling, construction, and maintenance operations. Disturbance of big game species during the parturition period and on winter range can increase stress and may influence species distribution (Hayden-Wing 1980, Morgantini and Hudson 1980). There may also be a potential for an increase in poaching and harassment of big game, particularly during winter. The potential for vehicle collisions with big game would likely increase as a result of increased vehicular traffic and speeds associated with the presence of construction crews and would continue (although at a reduced rate) throughout all phases of the operations.

**Pronghorn.** All of the project area is classified as spring/summer/fall pronghorn range and sustains some use by pronghorn throughout the year. All proposed wells would be located in spring/summer/fall pronghorn range; total disturbance associated with these wells would be approximately 91.4 acres (2.4%) of spring/summer/fall range in the project area. Following reclamation, approximately 40.0 acres of spring/summer/fall pronghorn range would remain disturbed for the remaining LOP.

Activities associated with the construction phase of the project would likely temporarily displace some pronghorn, however, once construction is complete pronghorn will likely habituate and return to pre-disturbance activity patterns. Reeve (1984) found that pronghorn acclimated to increased traffic volumes and machinery as long as the traffic and machines moved in a predictable manner. The displacement of pronghorn and disturbance of habitats is considered a short-term impact because of the temporary nature of the displacement and the availability of comparable habitats in adjacent areas.

### 4.7.1.1.3 Wild Horses

An estimated 91.4 acres will initially be affected by the Proposed Action, which represents about 0.02% of the total land surface of the Little Colorado HMA. The 91.4 acres will decrease to approximately 40.0 acres during the LOP or about 0.008% of the HMA. Any impacts of vegetation disturbance/removal on wild horses due to project activities are anticipated to be minor because of the small land area affected.

By their nature, free-roaming wild horses have shown the capacity to disperse over wild areas in search of food and water, seek shelter, or to escape insect pests and human activity. Movement of wild horses in the Little Colorado HMA has been documented to include seasonal

## CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES

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elevational movements in response to snow and winter conditions as well as shorter

movements to higher elevation habitats in summer to escape heat and insect pests. Therefore, displacement of wild horses resulting from the Proposed Action is expected to be minimal.

Primary public access to view wild horses in and near the project area is via U.S. Hwy 189 and numerous existing improved roads and the Proposed Action would not affect the opportunity for the public to view wild horses.

### 4.7.1.1.4 Upland Game Birds

**Greater Sage-grouse.** According to the RSFO, there are no known greater sage-grouse leks on or within two miles of the project area. If all avoidance and mitigation measures identified in this document and the RMP are implemented, impacts to greater sage-grouse are expected to be minimal if they are found to occur.

**Mourning Dove.** Mourning doves are found in the project area; therefore it is possible that some breeding activity and nesting occurs on the project area during the spring and summer. The project area is located in UGMA #7, in which only 1.9% of the state's total harvest of mourning doves occurred in 2001 (WGFD 2002b). If all avoidance and mitigation measures identified in this document and the RMP are implemented, impacts to mourning doves are expected to be minimal.

### 4.7.1.1.5 Waterfowl and Shorebirds

Although habitat for waterfowl and shorebirds is minimal on the project area, there is a possibility of incidental use by a number of different species because of suitable habitat within the region. Given mitigation measures for water resources identified in this document and in the RMP, it is expected that the Proposed Action would not have adverse impacts upon waterfowl or shorebirds.

### 4.7.1.1.6 Raptors

Impacts to raptor species are not expected because the project area does not contain good raptor nesting media (trees, broken topography cliffs) and the records of the RSFO indicate that there are no raptor nests on or within two miles of the project area. However, it is likely that raptors hunt in the general area since WOS records (WGFD 2002d) show that 12 species have been observed on or within six miles of the project area. When, or if, active raptor nests are located on or within one mile of the project area during the development period, appropriate avoidance and mitigation measures would be taken to avoid adverse impacts to breeding raptors.

### 4.7.1.2 Alternative A - No Action

Under the No Action Alternative, disturbances to the wildlife species and their habitats would be expected to be similar to those described for the Proposed Action, but of a lesser magnitude. Consideration of individual APD's by the BLM could continue on a case-by-case basis through individual project and site-specific environmental analysis. Given these conditions, it may be assumed that further impacts will occur in the project area; however, the duration and extent of these impacts are not known at this time.

## CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES

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### 4.7.2 Mitigation

No additional mitigation for the wildlife resource is proposed.

### 4.7.3 Cumulative Impacts

The cumulative impacts of this proposed project upon wildlife populations and habitats are expected to be minimal, provided the guidelines and mitigation measures contained in this document and the RMP are implemented.

### 4.7.4 Residual Impacts

Although the potential impacts associated with the Proposed Action would be non-adverse, the effects of some would persist until they were off-set over time. Construction of new roads may also cause long-term impacts such as increased human disturbance of wildlife near those roads and an increased potential for wildlife/vehicle collisions, poaching, and harassment.

## 4.8 SPECIAL STATUS WILDLIFE, FISH AND PLANT SPECIES

### 4.8.1 Impacts

#### 4.8.1.1 Proposed Action

##### 4.8.1.1.1 Threatened, Endangered or Proposed for Listing Species of Wildlife, Fish, and Plant

Because the following fish species occur within the general region (USDI-FWS 2002a), of which the project area is a part, potential impacts to these species caused by the Proposed Action are considered.

**Fish.** Formal consultation with the FWS for endangered fish species found in the Upper Colorado River System has been completed. Consultation concluded that since water depletions would average 6.00 acre-feet per year, or 18.00 acre-feet for the project, is below the threshold of 100 acre-feet criteria set for the recovery program, the depletion fee has been waived (May 2, 2003). No further direct, indirect, or cumulative impacts to endangered fish are anticipated.

##### 4.8.1.1.2 Sensitive Wildlife, Fish, and Plant Species

Although these species have no legal protection under the ESA, the BLM and FWS still maintain an active interest in their numbers and status. All of these species may have the potential to occur on or near the project area (USDI-BLM 2002) and, therefore, potential impacts to them, which may be caused by the Proposed Action, are considered.

The following wildlife species have the highest potential to occur on the LMPA: swift fox, Wyoming pocket gopher, pygmy rabbit, sage thrasher, loggerhead shrike, Brewer's sparrow, sage sparrow, mountain plover, white-faced ibis, midget-faded rattlesnake, and Great Basin spadefoot toad. Since suitable habitats for the remaining sensitive wildlife and plant species (Table 3-11) do not occur on the project area, the likelihood of impacts associated with the Proposed Action is expected to be non-adverse.

## CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES

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**Swift Fox.** Some portions of the project area may provide limited foraging opportunities, however, swift foxes are very adaptable, and the limited amount of disturbance would not be a adverse impact if they are present on the LMPA.

**Wyoming Pocket Gopher.** It is possible that the Wyoming pocket gopher is present in portions of the LMPA. This species utilizes dry ridge tops with dry gravelly soils and greasewood. This species may be abundant within its distribution, but no population studies have been conducted (Clark and Stromberg 1987). No adverse impacts to this species are expected with development of the Proposed Action.

**Pygmy Rabbit.** Pygmy rabbits are limited to areas of dense and tall big sagebrush (Campbell et al. 1982, Clark and Stromberg 1987, Heady et al. 2002). Although the project area is dominated primarily by Wyoming big sagebrush, no pygmy rabbit occurrence has been reported within six miles (WGFD 2002d, WYNDD 2002). The possibility exists that pygmy rabbits could occur there; however, it is unlikely the population would be adversely impacted because only 2.4% of the Wyoming big sagebrush habitat would be disturbed. If pygmy rabbits are found to occur on the project area, potential impacts could be reduced by avoiding well, road, and pipeline placement within areas of tall dense sagebrush.

**Sage Thrasher.** The sage thrasher is considered a sagebrush obligate and is generally dependent on large patches and expanses of sagebrush steppe for successful breeding. Sage thrashers have been observed throughout Wyoming, although there are no records of them occurring within six miles of LMPA (WGFD 2002d). Development of the Proposed Action could displace some sage thrashers, however, suitable habitat is very abundant throughout the project area, and no adverse impacts to this species are expected.

**Loggerhead Shrike.** No records of loggerhead shrikes are documented within six miles of the LMPA; however, it is possible that they utilize portions of the project area during the nesting season. Construction within shrub habitats may possibly disturb nesting shrikes if they are found to occur on the project area. However, facilities associated with well development may provide increased perching sites, which shrikes use for hunting. Implementation of the Proposed Action is not likely to adversely affect the loggerhead shrike.

**Brewer's Sparrow.** The Brewer's sparrow breeds in landscapes dominated by big sagebrush (*Artemisia tridentata*) throughout the Great Basin and intermountain West (Rotenberry et al. 1999). Brewer's sparrows are likely present throughout the project area where suitable habitat occurs. Development of the Proposed Action could displace some Brewer's sparrows, however, suitable habitat is very abundant throughout the project area, and therefore, no adverse impacts to this species are expected.

**Sage Sparrow.** Sage sparrows typically utilize stands of big sagebrush or mixed big sagebrush and greasewood for nesting. It is possible that the sage sparrow, a sagebrush-obligate species, may be present within the LMPA. Because of the small amount of disturbance associated with the project, their inherent mobility, and the availability of suitable habitats on undisturbed land, the effects on these species should be minimal.

**Mountain Plover.** According to the RSFO, habitats suitable for mountain plover are unlikely to occur on the project area, and impacts to this species are not expected.

**White-faced Ibis.** Suitable habitat for the white-faced ibis does not exist on the project area;

## CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES

---

therefore no adverse impacts to the ibis from the Proposed Action would be expected to occur.

**Midget-faded Rattlesnake.** In Wyoming, the midget-faded rattlesnake inhabits the lower Green River valley from the cities of Green River and Rock Springs south to the Utah-Wyoming state line. In southwestern Sweetwater County the midget faded rattlesnake is commonly found among rock outcroppings (Baxter and Stone 1992). The project area is outside the known distribution range of the midget-faded rattlesnake and potentially suitable habitats do not occur there. The species is not likely to inhabit the project area and implementation of the Proposed Action is not expected to cause impacts.

**Great Basin Spadefoot Toad.** Limited habitat exists in the area; however, it is possible that Great Basin spadefoots utilize the intermittent and temporary water sources for breeding during years with adequate moisture. If measures are taken to avoid disturbance of water sources, no adverse impacts to this species are expected from implementation of the Proposed Action.

**Fish.** The drainages in the project area are ephemeral or intermittent. Five fish species of special concern occur downstream of the LMPA: roundtail chub, bluehead sucker, flannelmouth sucker, Colorado River cutthroat trout, and the leatherside chub (USDI-BLM 2002). Produced water would be stored temporarily in lined reserve pits at all drill site locations and later backfilled (see Section 2.2.2.2), and project activities are not expected to affect these fish species of concern found downstream from the LMPA.

**Plants.** The probability of occurrence of habitats for plant species of concern on the proposed project area is low (Glennon 2003), therefore, no adverse cumulative impacts to these habitats are anticipated due to project implementation.

### 4.8.1.2 Alternative A - No Action

Under the No Action Alternative, disturbances to the special status wildlife, fish, and plant species and their habitats would be expected to be similar to those described for the Proposed Action, but of a lesser magnitude. Consideration of individual APD's by the BLM could continue on a case-by-case basis through individual project and site-specific environmental analysis. Given these conditions, it may be assumed that further impacts will occur in the project area; however, the duration and extent of these impacts are not known at this time.

### 4.8.2 Mitigation

No additional mitigation for sensitive species is proposed.

### 4.8.3 Cumulative Impacts

The cumulative impacts of the proposed project upon special status wildlife, fish, and plant species and their habitats are expected to be minimal, provided the guidelines and mitigation measures contained in this document and the RMP are implemented.

### 4.8.4 Residual Impacts

No residual impacts are expected to occur with project implementation, assuming successful implementation of the proposed measures.

## **CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES**

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### **4.9 RECREATION**

#### **4.9.1 Impacts**

##### **4.9.1.1 Proposed Action**

The LMPA is located in an existing oilfield, the Little Monument II Unit. Recreation use in the LMPA and immediately adjacent areas is believed to be minimal, at least in part because of the level of oil and gas development in the area and the availability of more desirable recreation resources such as Fontenelle Reservoir and Seedsakdee NWR. Relatively few recreation visitors access the east side of Fontenelle Reservoir (Butterfield 2003). Conflicts between natural gas activities and recreation use of Fontenelle Reservoir are unlikely.

Consequently, few, if any, recreation users would be displaced by drilling and field development activities. Impacts to the recreation resource would not be adverse due to the short-term nature of drilling and construction activities and small number of recreation users affected.

##### **4.9.1.2 Alternative A - No Action**

Under the No Action Alternative, natural gas development could occur on federal lands, on a case-by-case basis. Therefore, implementation of the No Action Alternative could result in recreation effects similar in nature to those described for the Proposed Action, but likely at reduced levels. These impacts would not be adverse.

#### **4.9.2 Mitigation**

Given the minimal level of recreation impacts anticipated, no additional recreation mitigation measures are proposed.

#### **4.9.3 Cumulative Impacts**

The pace of drilling and field development in southwest Wyoming and in the Fontenelle area has been accelerating in recent years. Because the Proposed Action would be located within an area of existing oil and gas development, it would only minimally add to the level of cumulative impact to regional recreation resources.

#### **4.9.4 Residual Impacts**

No residual recreation impacts are anticipated.

### **4.10 VISUAL RESOURCES**

#### **4.10.1 Impacts**

##### **4.10.1.1 Proposed Action**

The LMPA is located in an existing oil and gas field, and the region containing the LMPA has been classified as VRM Class IV by the BLM, which allows for major modification of the character of the landscape, with appropriate mitigation measures to reduce visual impacts.

## **CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES**

---

Impacts to visual resources associated with Proposed Action-related construction and drilling in the LMPA would include contrasts in line, form, color, and texture. In the short term, these contrasts would be associated with surface disturbance, drilling rigs, construction equipment, service trailers and the general industrial character of drilling activities. Additional impacts could occur from fugitive dust produced by construction activities. In the longer term, contrasts would be associated with well facilities, access roads and ancillary facilities.

Potential reviewers of these contrasts would be primarily oil and gas field workers, grazing operators and recreation users passing through the area. Activity in the LMPA would not be visible from the surface or shoreline of Fontenelle Reservoir.

The Proposed Action would result in an intensification of the existing visual character within the LMPA, but would be within the guidelines for VRM Class IV areas. No adverse long-term impacts are anticipated given proposed mitigation measures.

### **4.10.1.2 Alternative A – No Action**

Under the No Action Alternative, natural gas development could occur on federal lands, on a case-by-case basis. Therefore, implementation of the No Action Alternative could result in visual effects similar in nature to those described for the Proposed Action, but at reduced levels. These impacts would not be adverse.

### **4.10.2 Mitigation**

No mitigation would be required.

### **4.10.3 Cumulative Impacts**

The LMPA is located in a portion of southwest Wyoming that has been highly modified due to historic and ongoing oil and gas development. The Proposed Action and perhaps, to a substantially lesser degree, the No Action Alternative would intensify the regional visual modification, but would not substantially expand the modified area. Consequently neither alternative would more than minimally add to the cumulative visual impact in the region, particularly after drilling, field development and reclamation of disturbed areas is completed.

### **4.10.4 Residual Impacts**

Even after application of mitigation measure, wellhead facilities, ancillary facilities and access roads would be visible for the life of the project, but these facilities fall within the guidelines for VRM Class IV areas; consequently, residual impacts would not be considered adverse.

## **4.11 CULTURAL RESOURCES**

### **4.11.1 Impacts**

Cultural resources on public lands, including archaeological sites and historic properties, are protected by various laws and regulations; for example the National Historic Preservation Act (NHPA) of 1966, as amended, and 36 CFR Part 800, the acts implementing regulations. The specific guidance can be found in "Archaeology and Historic Preservation: Secretary of the

## CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES

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Interior's Standards and Guidelines" (48FR44716). Laws and regulations concerning cultural resources stipulate the proposed undertaking take into consideration the effects of the action to significant cultural resources. This requires that cultural resources within the proposed area of potential effect (APE) must be identified and evaluated. Measures will be taken to mitigate or minimize adverse effects to historic properties included in, or eligible for, the NRHP.

The Little Monument project area data base contains seven sites in a 3,857-acre area. Sites include six prehistoric open camps (48SW5134, 48SW5135, 48SW5136, 48SW6924, and 48SW12064) and the Yellow Point Lithic Landscape (48SW10923). No historic sites have been recorded in the project area. None of the sites are eligible for the NRHP.

Potential impacts to specific eligible or unevaluated properties are unknown at this time. Only 18 projects have been conducted in the Little Monument project area. The LMPA encompasses approximately six square miles or 3,857 acres. Approximately 240 acres (block) or ca. 6.2% of the project area have been inventoried for cultural resources. There are no acreage calculations for the linear projects. The overall site density within the project area cannot be accurately calculated due to the paucity of projects conducted within the project area. Based upon the area surveyed and the number of sites identified, there might be as many as 105 unknown resources in the LMPA. Four sites have been recorded in Section 28 (48SW5135, 48SW5136, 48SW10919, and 48SW12064), one site (48SW6924) has been recorded in Section 21, and one site (48SW5134) has been recorded in Section 27. The Yellow Point Landscape (48SW10923) has been identified in all sections within the project area. Certain topographic settings have a higher archaeological sensitivity such as eolian deposits (sand dunes, sand shadows, and sand sheets), alluvial deposits along major drainages, and colluvial deposits along lower slopes of ridges. As development increases it is certain that the number of prehistoric sites will also increase.

### 4.11.1.1 The Proposed Action

Direct impacts would primarily result from construction related activities and would be considered adverse if lost information impeded efforts to reconstruct the prehistory or history of the region. Activities considered to have the greatest effect on cultural resources include blading of well pads and associated facilities, and the construction of roads and pipelines. Sites located outside the APE will not be directly affected by the construction activities. If the area of the site crossed by earth disturbing activities does not possess the qualities that contribute to the eligibility of the site, the project is judged to have no effect. Alteration of the environmental setting of eligible historic properties may be considered an adverse effect in the form of a direct impact. Indirect impacts would not immediately result in the physical alteration of the property. Indirect impacts to prehistoric sites primarily would result from unauthorized surface collecting of artifacts, which could physically alter the sites. At historic sites this could include bottle collecting and the introduction of visual impacts. In addition, unauthorized excavation in the project area would represent an adverse impact.

Gauging the effect of any impact depends on the level of information available for that particular property provided by inventory and/or testing data. If cultural resources on or eligible to the National Register are to be adversely impacted by the proposed undertaking, then the applicant, in consultation with the surface managing agency and the SHPO, shall develop a mitigation plan. Construction would not proceed until terms of the mitigation plan are satisfied.

## **CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES**

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### **4.11.1.2 Alternative A - No Action**

Under the No Action Alternative, development would be approved on a case-by-case basis by the BLM, as described in Chapter 2. Impacts to cultural resources would be similar to those described above. In terms of magnitude, such impacts would likely be less than for the Proposed Action.

### **4.11.2 Mitigation**

Mitigation procedures will be implemented if a site considered eligible or listed on the National Register is impacted. Avoidance is preferred and is achieved through redesign of a project, elimination of the project, or minimizing impacts. However, these means are not always possible. Mitigation of adverse effects to properties would be accomplished by the documentation of physical remains. Mitigation would include data recovery of prehistoric and historic sites and could include documentation through detailed drawings and photographs of standing structures. Data recovery plans are subject to review and approval by the BLM and SHPO, pursuant to BLM State Protocol agreement.

Mitigation could also include interpretation of significant resources, stabilization of resources, and research vital to understanding resources (e.g. paleoenvironmental studies). Such measures are routinely developed through consultation with SHPO and negotiations with the applicant.

### **4.11.3 Cumulative Impacts**

Disturbance and/or loss of other unidentified sites or artifacts could add to the cumulative loss of information about our heritage in the project area and in the region if these sites or resources are not identified and inventoried prior to disturbance. Any loss or damage to unidentified cultural or historical sites or resources associated with the proposed project, combined with similar losses or damage due to mineral development could be substantial. Such losses are not expected because application of mitigation actions would be implemented.

### **4.11.4 Residual impacts**

Avoidance of known significant cultural resources during the construction projects and implementation of Class III cultural resource inventories for the Proposed Action minimizes the potential for adverse impacts to cultural resources. Implementation of protective measures on all lands would result in the avoidance of impacts to cultural resources in the LMPA.

## **4.12 SOCIOECONOMICS**

### **4.12.1 Impacts**

#### **4.12.1.1 Proposed Action**

The socioeconomic assessment is based on the drilling of 31 natural gas wells over a three-year period. If fewer wells are drilled, or if wells are drilled over a longer period, the resultant socioeconomic effects would be less than those described in this assessment.

## CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES

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Socioeconomic impacts of the Proposed Action would be largely positive. The project would enhance regional economic conditions and generate local, state and federal government tax and royalty revenues. The relatively small, short-term drilling and field development workforce would not generate significant demand for temporary housing or local government services. Consequently no adverse socioeconomic impacts would be anticipated.

### Economic and Employment Effects

Development and operation of the Proposed Action would require goods and services from a variety of local and regional contractors and vendors, from the oil and gas service industry and from other industries. Expenditures by the proponent for these goods and services, coupled with employee and contractor spending, would generate both direct and indirect economic effects in southwest Wyoming, elsewhere in the State of Wyoming and in the nation as a whole.

For the Proposed Action, direct drilling and field development employment was estimated by assuming a three-year drilling and field development schedule, and assuming that wildlife and seasonal stipulations would reduce the drilling period to 212 days in any given year. Based on these assumptions, drilling and field development employment associated with the Proposed Action would require an estimated 3,000 to 3,400 worker days annually over the three-year period, or about 13 full-time annual job equivalents.

Drilling and field development employment would average about 16 workers per day during the 212-day annual drilling period, with peak days of as much as 33 workers.

Most drilling and field development work would be performed by contractors who would be on site for the duration of their task. In some cases, such as drilling contractors, these workers would work in the LMPA for several months at a time; in other cases, workers would be on site for a matter of days or hours.

During project operations, many tasks would be performed by existing Burlington employees. It is also assumed that an average of 2 additional fulltime employees would be required. Each well would require workover operations every two years, during which time a crew of 4 or 5 workers would work at the well for a variable number of days, depending on the workover activities required at each well.

The Proposed Action as described in Chapter 2 of this assessment would involve a substantial capital investment in natural gas wells and ancillary facilities. A recent study prepared by the University of Wyoming Agricultural Economics Department (USDI-BLM 2003), estimated employment, earnings and total economic impact associated with natural gas drilling and completion in the Jack Morrow Hills area, which is also located in southwestern Wyoming. The study estimated that a gas well drilled and completed to an average 9,000 feet would result in \$620,784 in direct expenditures and would generate \$847,000 in total economic impact, including \$131,000 in earnings and 2.12 full time equivalent jobs (all estimates are in inflation-adjusted 2001 dollars).

The 31 wells associated with the Proposed Action are anticipated to range between 9,000 and 11,000 feet in depth. Based on the estimates contained in the UW study, the drilling phase of the Proposed Action would generate an estimated \$19 million in direct expenditures, \$26.2 million in total economic impact, \$4 million in total earnings and 66 full-time equivalent jobs (direct and indirect).

## **CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES**

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The UW study also estimated the economic effects associated with 1,000 MCF of natural gas produced in southwest Wyoming at an average sales price of \$2.81/MCF (2001\$). These estimates included \$2,793 in total economic impact in southwest Wyoming, \$188 in earnings and .005387 jobs.

Based on Burlington's production forecasts, the 31 wells associated with the Proposed Action would produce an estimated 39,079 MMcf over 30 years. Based on the UW estimates, the 31 wells associated with the Proposed Action would generate an estimated total of \$ 109 million in total economic impact in southwest Wyoming over 30 years, or an average annual economic impact of \$3.6 million. This would include estimated total earnings of \$7.3 million (an annual average of \$243,000), associated with an annual average of 7 full-time equivalent direct and indirect jobs.

The foregoing assessment assumes that all wells will be successful. If some wells were dry, if production were less than anticipated, or if gas prices were lower than the U.S. Department of Energy, Energy Information Administration (EIA) forecasts, the economic effects of the project would be lower than those presented above. Conversely, higher rates of production and/or gas sales prices would produce higher economic effects.

### **Sweetwater County Oil and Gas Activity**

Successful completion of the Proposed Action would increase natural gas production in Sweetwater County. Based on operator production forecasts, peak year Little Monument production (5,000 MMcf) would be about 2 percent of total 2001 Sweetwater County natural gas production.

Assuming that the 31 wells associated with the Proposed Action were drilled in three years, the annual increment in drilling would be about 3 percent of all Sweetwater County APD's approved in 2001.

### **Population Effects**

Direct and indirect population effects of the Proposed Action would be minimal. Drilling and field development activities associated with the Proposed Action would be performed by contractors, who may come from Rock Springs, Green River, the Kemmerer/Diamondville area, the Farson/Eden area, La Barge, or the Big Piney/Marbleton area. Some contractors may also come from elsewhere in Wyoming or from out of state. Non-local contractors and their employees would be likely to locate in communities near the LMPA temporarily, for the duration of their contract. Given the short-term nature of the drilling and field development phase of the project, non-local workers are likely to relocate single status, and return to their place of residence on their days-off and during periods when drilling ceases. The relatively few direct jobs associated with project operations would not generate measurable population effects.

The economic activity associated with the Proposed Action would result in increased employment opportunities in other sectors of the economy; however, these indirect jobs are likely to be dispersed across southwestern Wyoming and filled by existing residents rather than non-local workers. Consequently, little if any net population gain would occur as a result of the Proposed Action.

## CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES

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### Housing Demand

Non-local drilling and field development workers associated with the Proposed Action would be likely to seek temporary housing resources in one of the several communities near the LMPA. Existing temporary housing resources in these communities could accommodate the relatively small Proposed Action-related demand for temporary housing. The operations phase of the Proposed Action would not generate appreciable housing demand.

### Community Facilities, Law Enforcement and Emergency Response Demand

The relatively small temporary population increases associated with the Proposed Action would be accommodated with existing county and municipal facilities. Emergency services demand associated with field development and operations activities would also be accommodated by existing Sweetwater or Lincoln County law enforcement and emergency management resources (Valentine 2003).

### Fiscal Effects

The Proposed Action would generate certain state and local tax revenues including:

- local ad valorem property taxes on production and certain field facilities;
- sales and uses taxes to the State of Wyoming, Sweetwater County and its incorporated municipalities;
- mineral royalties to the federal government, a portion of which are returned to the State and local governments; and,
- state severance taxes.

### Ad Valorem Taxes

The Proposed Action would generate ad valorem property tax revenue to Sweetwater County, the Wyoming School Foundation Fund, Sweetwater County schools and various taxing districts within the county. Ad valorem taxes would be generated from two sources: 1) the fair market value of methane produced and sold; and 2) the value of certain capital facilities within the well fields (all underground facilities associated with wells are exempt by state statute).

Constant 2003 Sweetwater County mill levies were used to prepare the following estimates. In reality some mill levies are set each year by the Sweetwater County Commissioners, officials of the various special and school districts and the state; some change each year. Mill levies reflect the revenue needs of the taxing entity and estimates of assessed valuation within the entity.

Based on Burlington's production estimates, US DOE Energy Information Administration price forecasts for natural gas (USDOE EIA 2003), and FY 2003 mill levies, the estimated Proposed Action-related gas production would generate a total of \$7.7 million (2001\$) in total ad valorem property tax revenues to Sweetwater County over the 30-year life of the project. Based on current distributions, about 70 percent of the total property tax revenues would be distributed to State and local schools, and about 17 percent would be distributed to Sweetwater County government.

## **CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES**

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### Federal Mineral Royalties

All of the 31 wells associated with the Proposed Action are anticipated to be on federal lands. The federal government collects a 12.5 percent royalty on the fair market value of gas produced from federal leases, less production and transportation costs. Half of mineral royalty revenues are returned to the state where the minerals were produced. In Wyoming, a portion of the state's share is distributed to local governments and to the Wyoming School Foundation Fund.

Based on Burlington's production estimates and US DOE EIA price forecasts for natural gas, an estimated total \$11.7 million (2001\$) in Federal Mineral Royalties would be generated by the Proposed Action; and approximately \$5.8 million of that amount would be returned to the State of Wyoming. Actual Mineral Royalty revenues collected would vary based on actual production levels, gas sales prices, and production and transportation costs.

### Wyoming Severance Taxes

The State of Wyoming collects a six percent severance tax on the fair market value of natural gas produced within the state. Federal mineral royalty payments and production and transportation costs are exempt from this tax. The state uses revenues from this fund for a variety of purposes (e.g., General Fund, Water Development Fund, Mineral Trust Fund, and Budget Reserve) and returns a portion to counties and municipalities.

An estimated total \$4.9 million (2001\$) in severance taxes would be generated by the Proposed Action. Actual severance tax revenues would vary based on actual production levels, gas sales prices, and production and transportation costs.

### Sales and Use Tax

Wyoming levies a four percent sales and use tax on the gross receipts of tangible goods and certain services (drilling services are exempted). The state returns 28 percent of the revenue (less administrative costs) to the county and municipalities where the taxes were collected. Sweetwater County also levies a one percent local option sales and use tax, which is distributed to the county and its municipalities and a 0.5 percent facilities tax. Proceeds from the facilities tax will be used to fund construction of a new county jail.

In drilling the 31 wells associated with the Proposed Action, an estimated \$11.5 million would be spent for goods and services subject to state and local sales and use taxes, based on UW estimates for wells of this depth. This amount would generate about \$635,000 in total sales and use tax revenues, including \$332,500 for the State of Wyoming and about \$243,000 for Sweetwater County and its municipalities. The local option facilities tax would raise an estimated \$58,000 from Proposed Action-related expenditures.

#### **4.12.1.2 Alternative A - No Action**

Under the No Action Alternative, natural gas development could occur on federal lands on a case-by-case basis. Therefore, implementation of the No Action Alternative could result in socioeconomic effects similar in nature to those described for the Proposed Action. Drilling and field development under the No Action Alternative is likely to be at a substantially reduced level as compared to the Proposed Action. Therefore socioeconomic effects of the No Action

## **CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES**

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Alternative (i.e., economic and fiscal effects, demand for temporary housing and community services) would be less than those described under the Proposed Action.

### **4.12.2 Mitigation**

No adverse or substantial negative socioeconomic impacts are anticipated to be associated with the Proposed Action. The mitigation measures outlined in Chapter 2 would enhance the positive socioeconomic effects of the project. Burlington should coordinate emergency response planning with the Sweetwater County Emergency Management Agency. The anticipated revenues associated with the Proposed Action would provide revenues to local governments in Sweetwater County to compensate for the anticipated minimal Proposed Action-related demand for law enforcement and emergency response services. However, there would be a lag between the time development begins and the time substantial tax revenues flow to the county.

### **4.12.3 Cumulative Impacts**

In recent years, southwest Wyoming has experienced an increase in the pace and level of natural gas development. While this increase in development will result in increased employment, income and tax revenues in the region, it will also result in increased housing demand and increased demand for local government facilities and services.

As described in Section 3.12, most communities near the LMPA are still below peak population levels of the 1980's and have infrastructure and housing to accommodate some population growth. Therefore the recent increase in natural gas drilling and field development has been largely positive for most southwestern Wyoming communities, helping slow population loss.

The pace of natural gas development in southwest Wyoming would have to increase dramatically to generate population growth at a level that would strain existing housing resources and community facilities. It is conceivable that world events may result in such a dramatic increase in demand, however, the substantial lead time that would be necessary to increase drilling and field development capabilities to accommodate a dramatic increase in demand should also allow these communities time to plan for growth.

### **4.12.4 Residual Impacts**

No residual socioeconomic impacts are anticipated.

## **4.13 TRANSPORTATION**

### **4.13.1 Impacts**

#### **4.13.1.1 Proposed Action**

The relatively small level of increases in traffic associated with the Proposed Action could accelerate road maintenance requirements and increase the risk of accidents on state highways and county roads, but with successful implementation of mitigation measures these impacts would not be adverse.

## **CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES**

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Transportation effects of the Proposed Action would occur primarily on WYO 372, US 189, LCR 311, SCR 8, SCR 52 and BLM Road 4202. These highways and roads provide access to Rock Springs, Green River and the Kemmerer/Diamondville area, and the bulk of heavy equipment, delivery and employee commuting trips are anticipated to occur along this access route.

Some contractors or workers could be hired from or seek temporary residence in Farson, Eden, La Barge, Big Piney or Marbleton. Contractors and workers from these areas could use the primary access routes identified above. But, secondary transportation effects could also occur on SCR 49, which provides access to the LMPA from the Farson/Eden area, and LCR 313 and 316, which provide access from US 189 for workers coming from the La Barge and the Big Piney/Marbleton area. A few workers coming from La Barge and Big Piney/Marbleton may also access the LMPA using LCR 318 and BLM Road 4210. Use of any of these routes is anticipated to be minimal. Transportation impacts would also occur on operator-maintained roads within the LMPA.

The Proposed Action would primarily generate increases in traffic volumes on WYO 372, US 189, LCR 311, SCR 8, SCR 52 and BLM Road 4202. These increases would result from the movement of project-related workers, equipment and materials to and from the project area to perform drilling, field development, well service, field operations and reclamation activities.

The largest increase in project-related traffic would occur during drilling and field development. Drilling and construction activities associated with each well would generate an estimated 366 one-way trips over the 30 day drilling and completion cycle.

The Proposed Action anticipates drilling 31 wells in three years. It is assumed that wildlife and seasonal stipulations would reduce the drilling period to 212 days in any given year. Based on these assumptions the peak year would involve drilling 11 wells, using one drilling rig, which would generate an estimated annual 3,190 one-way trips (1,595 round trips). This would be an average daily traffic (ADT) of 15 one-way trips per day over the 212-day drilling cycle, or an average annual daily traffic (AADT) increase of 9 trips on affected highways and roads. On peak days, traffic could reach 32 one-way trips. It is estimated that about 40 percent of all trips would involve trucks larger than 2½ tons. Development of central compression facilities would involve 10 to 15 trips /per day for a 45 day period.

During project operations, trips to service wells and ancillary facilities would be combined with trips to serve existing wells and facilities. It is assumed that incremental one-way trips would average less than 10 per day, except during well workovers, which might average 10 to 20 one-way trips/day for several days depending on the operations that would be performed.

### **State Highways**

Figure 4-1 contrasts estimated Proposed Action-related traffic estimates with recent Wyoming Department of Transportation AADT counts on WYO 372, at the Sweetwater/Lincoln County line. ADT during the 212-day drilling period would be about 6 percent of 2001 AADT. Truck traffic during that period would be about 10 percent of average annual daily truck traffic in 2001. Peak day traffic associated with the Proposed Action would be about 12 percent of 2001 AADT. Truck traffic on the peak day would be about 32.5 percent of 2001 average annual daily truck traffic. This relatively small, short-term increase in traffic on WYO 372 should not result in a deterioration of the service level for that highway.

## **CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES**

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The estimated Proposed Action-related AADT would be about 3 percent of 2001 AADT on US 189, and therefore would not result in a deterioration of the service level on that highway.

### **County Roads**

The Proposed Action would result in relatively small increases in traffic on the county roads that provide primary access to the LMPA (LCR 311, SCR 8, SCR 52 and BLM Road 4202) during the drilling and field development period. Excessive speed or use of the roads when they are muddy could damage road surfaces. Deteriorated roads would result in accelerated road maintenance requirements for the Lincoln and Sweetwater County Road and Bridge departments.

The Proposed Action-related increase in traffic would also increase the risk of damage to the Sweetwater County bridge over the Green River on SCR 8 (Gibbons 2003). The relatively minimal amount of light vehicle traffic that is anticipated to use LCR 318 would be less likely to damage the bridge on that road. The cost associated with accelerated road maintenance requirements and dust control on Sweetwater County roads may be offset by the Proposed

Action-related ad valorem and sales and use tax revenues generated to Sweetwater County government. However, the availability of substantial project-related revenues would lag county road maintenance requirements. Lincoln County would not receive tax revenues from the Project. Burlington and other area operators would continue to be responsible for maintaining BLM Road 4202.

### **Internal Roads**

Section 2.2.2.1 (Road Construction) describes the measure proposed by the proponent to develop the transportation network necessary to access wells and ancillary facilities within the LMPA. According to the proponent, existing resource roads within the LMPA would be used to the extent feasible. Burlington anticipates constructing or reconstructing an estimated three miles of resource roads to access new well locations. Burlington would also be responsible for maintaining existing and new roads within the project area. New resource road locations would be identified in consultation with the AO and be designed, constructed and maintained in compliance with the standards contained in BLM Manual 9113.

#### **4.13.1.2 Alternative A – No Action**

Implementation of the No Action Alternative may result in increased traffic on State, county and resource roads, if gas leases are approved on a case-by-case basis. Transportation impacts similar to those described under the Proposed Action could occur, but at a reduced level, depending on the level of development that is ultimately approved.

#### **4.13.2 Mitigation**

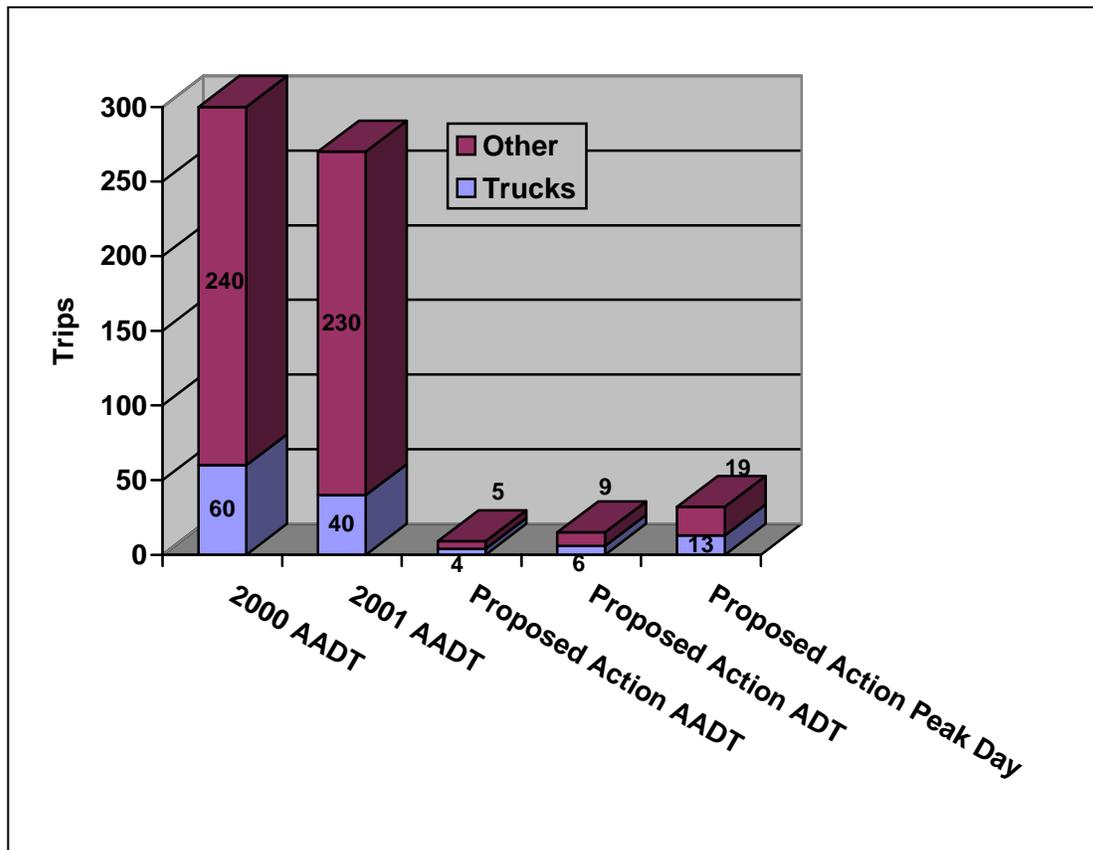
Mitigation for impacts on State highways would include rigorous adherence to WYDOT regulations regarding oversize and overweight loads. Mitigation for County Roads would include Burlington and contractor policies to reinforce speed limits and other traffic safety laws and to reinforce weight and width limits on one-lane bridges on SCR 8 and LCR 318.

## CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES

### 4.13.3 Cumulative Impacts

Cumulative transportation impacts on County and operator maintained roads would generally be limited to ongoing oil and gas development and operations traffic and that associated with the Proposed Action. Some cumulative traffic impacts could be associated with construction of the Monell pipeline but these impacts would be relatively minimal and short-term. No adverse cumulative impacts from other RFFA's are anticipated.

Figure 4-1. Proposed Action-Related Traffic on WYO 372 compared to 2001 and 2002 AADT.



Sources: 2000 and 2001 AADT, WYDOT Vehicle Miles Book. Proposed Action AADT, ADT and Peak Day Traffic, Blankenship Consulting LLC.

### 4.13.4 Residual Impacts

Minor increases in traffic associated with production, well and pipeline service and reclamation activities would continue throughout the LOP.

## CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES

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### 4.14 HEALTH AND SAFETY

#### 4.14.1 Impacts

##### 4.14.1.1 Proposed Action

Potential health and safety effects associated with the Proposed Action would be similar in nature to those associated with existing conditions in the LMPA, but would occur at increased levels, especially during the drilling and field development phase of the project. Potential health and safety effects include occupational hazards associated with natural gas development and operations; risk associated with vehicular travel on county, BLM and operator-maintained roads; firearms accidents during hunting season and by casual firearms use such as plinking and target shooting; and natural events such as range fires.

##### Occupational Hazards

The BLM, OSHA, USDOT and WOGCC each regulate certain safety aspects of oil and gas development. Adherence to relevant safety regulations on the part of the operator and enforcement by the respective agencies would reduce the probability of accidents. Additionally, given the remote nature of the project area, and the relatively low use of these lands by others (primarily grazing permittees), occupational hazards associated with the Proposed Action would mainly be limited to employees and contractors rather than the public at large.

##### Pipeline Hazards

Increasing the miles of gathering and transmission pipelines within the LMPA would increase the chance of a pipeline failure. However, the relatively small amount of new pipeline associated with the Proposed Action, coupled with the low probability of failure and the remoteness of the project area would result in minimal risk to public health and safety. Signing of pipeline ROW's could reduce the likelihood of pipeline ruptures caused by excavation equipment, particularly in the vicinity of road crossings or areas likely to be disturbed by road maintenance activities.

##### **Hazardous Materials**

Drilling, field development and production activities require use of a variety of chemicals and other materials, some of which would be classified as hazardous. Potential impacts associated with hazardous materials include human contact, inhalation or ingestion and the effects of exposure, spills or accidental fires on soils, surface and ground water resources and wildlife.

The risk of human contact would be limited predominately to LMPA operator and contractor employees. The Hazard Communication Program, Spill Prevention Control and Countermeasure (SPCC) Plans, and other mitigation measures described in Section 2.2.2.9.6 would reduce the risk of human contact, spills and accidental fires, and provide protocols and employee training to deal with these events should they occur. Based on successful implementation of the above-listed plans and procedures, no adverse impacts associated with hazardous materials would be anticipated.

## **CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES**

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### Other Risks and Hazards

Highway and road safety impacts are discussed in Section 4.13 (Transportation). Sanitation and hazardous material impacts would be avoided or reduced by the implementation of the mitigation measures outlined in Section 2.2.2.9.6.

The potential for firearms-related accidents would occur primarily during hunting season. The LMPA is believed to receive minimal hunting use and the increased activity during drilling and field development would be likely to further discourage hunting in the LMPA. Consequently the risk of fire arms-related accidents should be minimal. During project operations, the relatively few personnel on site would also result in minimal risk of firearms-related accidents.

The risk of fire in the project area would increase under the Proposed Action. This is an unavoidable impact associated with construction activities, industrial development and the presence of fuels, storage tanks, natural gas pipelines and gas production equipment. However, this risk would be reduced by the placement of facilities on pads and locations that are graded and devoid of vegetation, which could lead, to wildfires. In the event of a fire, property damage most likely would be limited to construction or production-related equipment and range resources. Fire suppression equipment, a no smoking policy, shutdown devices and other safety measures typically incorporated into gas drilling and production activities would help to minimize the risk of fire. There would be a heightened risk of wildfire where construction activities place welding and other equipment in close proximity to native vegetation. Given the limited public use and presence in the project area, the risk to the public would be minimal. There would be a small increase in risk to area fire suppression personnel associated with the Proposed Action.

Based on the foregoing assessment, risks to public health and safety should not adversely increase as a result of the Proposed Action.

#### **4.14.1.2 Alternative A - No Action**

The health and safety risks identified under the Proposed Action could also occur under the No Action Alternative, if leases are approved by the BLM on a case-by-case basis. The magnitude of risk would be dependent on the level of development that would occur, but is likely to be less than that associated with the Proposed Action. Operators would be subject to the same health and safety standards and regulations as under the Proposed Action, therefore, significant risks to public health and safety would not be anticipated under the No Action Alternative.

#### **4.14.2 Mitigation**

Burlington should coordinate emergency response planning with the Sweetwater County Emergency Management Agency and provide documentation regarding compliance with Federal Hazardous Material Regulations and the Uniform Fire Code.

#### **4.14.3 Cumulative Impacts**

Cumulative health and safety impacts within the LMPA would include those associated with existing oil and gas operations, proposed natural gas development and existing grazing and recreation activities. These combined activities would not pose significant risks to public health and safety.

## **CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES**

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### **4.14.4 Residual Impacts**

Risk to health and safety of workers, contractors and other users of the project area associated with industrial accidents, transportation accidents, shooting accidents and natural disasters would remain for the LOP. However, these risks would be small, given the remoteness of the area, the few employees and visitors anticipated and the proposed mitigation measures.

### **4.15 NOISE**

#### **4.15.1 Impacts**

##### **4.15.1.1 Proposed Action**

Noise levels associated with drilling, field development and operations activities may temporarily exceed 55 dBA, but the lack of human residences and the low level of non project-related human occupation of the project area would result in non-adverse noise impacts under the criteria used for this assessment. Although noise impacts associated with compression facilities would be long term in duration, these same factors, lack of human residences and low human densities, would render compression noise impacts of small importance.

Implementation of the Proposed Action has the potential to create noise-generated impacts that emanate from machinery used during drilling and during construction of drill sites, pipelines, access roads and ancillary facilities, and from the operation of heavy trucks and related equipment. During field operations, noise would be generated by compression facilities, pumper trucks, road maintenance equipment and by well workover operations.

Noise associated with natural gas drilling, field development and field operations can affect human safety (at extreme levels) and comfort. Noise impacts can also modify animal behavior. The magnitude of noise impacts are contingent on a number of factors including the intensity and pitch of the source, air density, humidity, wind direction, screening/focusing by topography or vegetation, and distance to the observer. A variety of heavy equipment and machinery commonly used during drilling, field development and production operations generate noise levels in excess of the 55 dBA maximum standard. Noise impacts created by these activities are short term, lasting as long as drilling, construction or field maintenance activities are performed at well sites, access roads, pipelines, and ancillary facilities. Under typical conditions, noise levels decline below the 55 dBA maximum standard at a relatively short distance (less than one mile from the source) depending on the factors outlined above.

Drilling, field development and field operations workers would be the only groups directly affected by Proposed Action related noise disturbances for more than a brief period of time. These groups are subject to OSHA regulations regarding industrial noise protection. Grazing operators and recreation users of the area are few in number and would typically be affected by noise impacts only for the brief period required to pass by sites where drilling, field development and field operations occur.

Based on the foregoing and the noise mitigation measures contained in Section 2.2.2.9.3, noise impacts associated with the Proposed Action would not be adverse.

## **CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES**

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### **4.15.1.2 Alternative A - No Action**

Implementation of the No Action Alternative could result in noise impacts similar to those associated with the Proposed Action, but noise generating activities would likely occur at fewer locations on public land. Consequently noise impacts associated with the No Action Alternative would not be adverse.

### **4.15.2 Mitigation**

No additional measures are proposed.

### **4.15.3 Cumulative Impacts**

The Proposed Action, operations of the existing oil and gas facilities and occasional vehicular traffic associated with grazing operations and recreation visitors are the only noise-generating RFFA's anticipated for the LMPA. For the most part these noise-generating activities would be temporary and dispersed and therefore not anticipated to create adverse cumulative noise impacts.

### **4.15.4 Residual Impacts**

Although both intermittent (field maintenance and workover activities) and long-term (compression facilities) exceedences of 55dBA noise levels would occur for the LOP, the lack of human residences and the low human occupation of the project area would render these impacts unimportant.

## **4.16 UNAVOIDABLE ADVERSE IMPACTS**

### **4.16.1 Proposed Action**

The Proposed Action would disturb approximately 91.4 acres, thus increasing the potential for wind and water erosion before the land is revegetated. Other unavoidable adverse impacts are a short-term loss of vegetation and forage production, the temporary loss of livestock forage, short-term impacts to air quality /noise levels due to construction activities, and possible temporary disruption of wildlife activities during construction.

### **4.16.2 Alternative A – No Action**

Under the No Action Alternative, there would be no project-related beneficial economic impacts to local economies.

## **4.17 RELATIONSHIP BETWEEN SHORT-TERM USE OF THE ENVIRONMENT VS. LONG-TERM PRODUCTIVITY**

### **4.17.1 Proposed Action**

Short-term use of the environment would facilitate and enhance natural gas transportation and stimulate local economies. Environmental impacts would be short-term and not adverse. The proposed project would not adversely affect long-term use and would enhance long-term productivity related to natural gas supplies.

## **CHAPTER 4: ANALYSIS OF ENVIRONMENTAL CONSEQUENCES**

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### **4.17.2 Alternative A – No Action**

There would be no changes in short-term use under the No Action Alternative. Long-term productivity in terms of natural gas production would be less than under the Proposed Action.

## **4.18 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES**

### **4.18.1 Proposed Action**

Irreversible or irretrievable commitments of resources would include the depletion of energy, materials, and manpower necessary to implement the Proposed Action.

### **4.18.2 Alternative A – No Action**

There would be no project-related resource commitments under the No Action Alternative.