

## CHAPTER 2: PROPOSED ACTION AND ALTERNATIVES

### INTRODUCTION

This chapter describes the Proposed Action and alternatives to this action. The Proposed Action is to hold a competitive coal lease sale and issue a lease for the federal coal lands in the West Hay Creek LBA tract as applied for by Triton. This alternative assumes that the tract would be developed as a maintenance tract for the Buckskin Mine.

NEPA requires the consideration and evaluation of other reasonable ways to meet proposal objectives while minimizing or avoiding environmental impacts. Thus, NEPA requires the evaluation of a No Action Alternative and a practical range of other "reasonable" action alternatives that may avoid or minimize project impacts. Reasonable alternatives are defined by NEPA as those that are technically, economically, and environmentally practical and feasible. Reasonable alternatives are formulated to address issues and concerns raised by the public and agencies during scoping. These alternatives should represent another means of satisfying the stated purpose and need for the federal action. BLM Manual 3420-1 requires the BLM to evaluate the configuration of the tract based on providing for maximum economic recovery of the coal resource, maintaining or increasing the potential for competition, and avoiding future bypass or captive tract situations. If BLM identifies alternate tract configurations that meet these criteria, they are considered as alternatives to the Proposed Action.

The No Action Alternative (Alternative 1) is to reject the West Hay Creek lease application. Under the No Action Alternative, the tract would not be offered for competitive sale; existing mining at the Buckskin Mine would continue as permitted. Selection of the No Action Alternative would not necessarily preclude mining in this area as the applicant or some other party could submit another application for a coal lease in the future.

Alternatives 2 and 3 evaluate alternate tract configurations considered by BLM. Under Alternatives 2 and 3, a competitive sale would be held and a lease issued for federal coal lands included in a tract modified by the BLM. The West Hay Creek LBA tract as applied for (Proposed Action) and as it might be modified by BLM (Alternatives 2 and 3) is shown in figure 2-1.

Other alternatives considered but not analyzed in detail include:

**Figure 2-1: West Hay Creek Tract Configurations**

- holding a competitive lease sale and issuing a lease for federal coal lands included in the West Hay Creek tract (as applied for or as modified by BLM), with the assumption that the tract would be developed as a stand-alone mine (Alternative 4); or
- delaying the sale of the West Hay Creek LBA tract to take advantage of higher coal prices and/or to allow recovery of the potential CBM resources in the tract before mining (Alternative 5). Under this alternative, it is assumed that the tract could be developed as a maintenance tract or a new start mine, depending on how long the sale is delayed.

LBA tracts are nominated for leasing by companies with an interest in acquiring them, but as discussed in chapter 1, the LBA process is, by law and regulation, an open, public, competitive sealed-bid process. If the decision reached after this EIS is completed is to hold a lease sale, the applicant (Triton) may or may not be the high bidder.

The Proposed Action and Alternatives 2 and 3 considered in this EIS assume that Triton would be the successful bidder if a competitive sale is held, and that the West Hay Creek LBA tract would be mined as a maintenance tract for the permitted Buckskin Mine.

If a decision is made to hold a competitive lease sale and there is a successful bidder, a detailed mining and reclamation plan must be developed by the successful bidder and approved before mining can begin. As part of the approval process, the mining and reclamation plan would undergo detailed review by state and federal agencies. This plan could potentially differ from the plan used to analyze the impacts of the Proposed Action and Alternatives 2 and 3 in this EIS, but the differences would not be expected to significantly change the impacts described here. These differences would typically be related to the details of mining and reclaiming the tract, but major factors (tons of coal mined, yards of overburden removed, and acres disturbed) would not be notably different from the plan used in this analysis.

The Proposed Action and alternatives assumed that an area larger than the tract would have to be disturbed in order to recover all of the coal in the tract. The disturbances outside the coal removal area would be due to activities like overstripping, matching undisturbed topography, and constructing flood control and sediment control structures.

## **THE PROPOSED ACTION**

Under the Proposed Action, the West Hay Creek LBA tract, as applied for by Triton, would be offered for lease at a competitive sale, subject to standard and special lease stipulations developed for the PRB (appendix D). The boundaries of the tract would be consistent with the tract configurations proposed in the West

Hay Creek LBA tract lease application (figure 2-1). The Proposed Action assumes that Triton will be the successful bidder on the West Hay Creek LBA tract if it is offered for sale.

The legal description of the proposed West Hay Creek LBA tract coal lease lands as applied for by Triton under the Proposed Action is as follows:

T. 52 N., R. 72 W., 6th P.M., Campbell County, Wyoming

Section 17:	Lot 5 (S2S2)	10.265 acres	
	6 (S2S2)	10.265	
	7 (S2S2)	10.3475	
	8 (S2S2)	10.3475	
	9	41.32	
	10	41.32	
	11	41.12	
	12	41.12	
	13	41.18	
	14	41.18	
	Section 18:	Lot 13 (E2)	21.035
		20 (E2)	20.75
	Section 19:	Lot 5 (E2)	20.71
		12 (E2)	20.84
13 (E2)		20.935	
20 (E2)		21.065	
Section 20:	Lot 2 (W2,W2E2)	31.1175	
	3	41.39	
	4	41.28	
	5	41.30	
	6	41.41	
	7 (W2,W2E2)	31.1325	
	10 (W2,W2E2)	31.1475	
	11	41.42	
	12	41.32	
	13	41.34	
	14	41.44	
Total Acres		838.0975 acres	

Land descriptions and acreage are based on the BLM Status of Public Domain Land and Mineral Title approved coal plat as of March 2, 2002.

As mentioned in chapter 1, no lands in the West Hay Creek LBA tract were found to be unsuitable for mining. The tract as applied for includes approximately 838.0975 mineable acres. Triton estimates that it includes approximately 145 million tons of in-place coal, and that about 130 million tons of that coal would be recoverable. BLM will independently evaluate the volume and average quality of

the coal resources included in the tract as part of the fair market value determination process. BLM's estimate of the mineable reserves and average quality of the coal included in the tract will be published in the sale notice if the tract is offered for sale. Some coal quality information in the area of the West Hay Creek LBA tract is included in the "Geology" section in chapter 3.

The approved Buckskin mine permit (Triton 2002) includes monitoring and mitigation measures that are required by SMCRA and Wyoming state law. If Triton acquires the West Hay Creek LBA tract, these monitoring and mitigation measures would be extended to cover operations on the LBA tract when the coal mining permit is revised to include the tract. This permit would have to be approved before mining operations could take place. These monitoring and mitigation measures are considered to be a part of the Proposed Action and other action alternatives during the leasing process because they are regulatory requirements.

The West Hay Creek LBA tract would be mined as an integral part of the Buckskin Mine under the Proposed Action. The Buckskin Mine is already operating under both an approved state mining permit and an MLA mining plan. As shown on figure 2-1, the LBA tract as applied for is entirely within the current Buckskin Mine permit boundary, and all environmental baseline studies have been conducted. Both the existing approved state mining permit and the MLA mining plan would require revision to include mining the LBA tract as applied for. Since the West Hay Creek LBA tract would be an extension of the existing Buckskin Mine, the facilities and infrastructure would be the same as those identified in the WDEQ/LQD Mine Permit 500 for the Buckskin Mine and the BLM's resource recovery and protection plan (R2P2) for the Buckskin Mine.

Triton's currently approved air quality permit from the WDEQ/AQD allows up to 27.5 million tons of coal per year. In 2000, the Buckskin Mine produced 15.8 million tons. In 2001, the mine produced approximately 19.1 million tons. Under the No Action Alternative, the remaining 434 million tons of in-place leased federal coal reserves will be mined in approximately 17 years at an average annual production rate of 25 million tons per year. Under the Proposed Action, Triton currently estimates that average annual production would be 25 million tons per year, and the life of the existing mine would be extended by approximately 5 years.

If Triton acquires the West Hay Creek LBA tract as applied for, they estimate that a total of 564 million tons of federal coal would be mined after January 1, 2002, with an estimated 130 million tons coming from the LBA tract. This estimate of recoverable reserves assumes that about 10% of the coal would be lost under normal mining practices, based on historical recovery factors at the Buckskin Mine. As of December 31, 2001, about 190 million tons of coal had been mined from within the current permitted area of the mine.

Topsoil removal would be performed before the overburden is removed. Whenever possible, direct transport to a reclamation area would be done, but due to scheduling, some topsoil would be temporarily stockpiled. As required by the reclamation plan, heavy equipment would be used to haul and distribute the stockpiled topsoil.

The Buckskin Mine is one of several coal mines currently operating in the PRB where the coal seams are notably thick, and the overburden is relatively thin. The truck-shovel mining method and hydraulic excavator have to date been used for overburden stripping and coal mining at the mine. The overburden is excavated and loaded into trucks by electric-powered shovels. Overburden would be removed within the West Hay Creek LBA tract by truck-shovel operations. Most overburden and all coal would be drilled and blasted to facilitate efficient excavation. As overburden is removed, most would be directly placed into areas where coal has already been removed. Elevations consistent with an approved post-mining topography (PMT) plan would be established as quickly as possible. Under certain conditions, the PMT may not be immediately achievable. This would occur when there is an excess of material which may require temporary stockpiling; when there is insufficient material available from current overburden removal operations; or when future mining could redisturb an area already mined.

Coal would be produced from two coal seams, which Triton refers to as the Anderson and Canyon, at several working faces to enable blending of the coal to meet customer quality requirements, to comply with BLM lease requirements for maximum economic recovery of the coal resource, and to optimize coal removal efficiency with available equipment. There are two existing crushing facilities within the Buckskin Mine permit area that provide the capacity to produce the permitted level. The two facilities employ one-stage crushing to size the coal to a nominal 2-inch product. There are a total of 11 storage silos. While sufficient capacity exists, future facilities may be constructed to improve operating efficiency and air quality protection.

Current employment at the Buckskin Mine is 199. Production plans for the Buckskin Mine call for an increase to 25 million tons per year in 2004, with employment estimated at 225. If the LBA tract is acquired, Triton anticipates that production would be 25 million tons per year, and employment would be 225 persons.

### **Hazardous and Solid Waste**

Solid waste, which is produced at the existing Buckskin Mine, consists of floor sweepings, shop rags, lubricant containers, welding rod ends, metal shavings, worn tires, packing material, used filters, and office and food wastes. The mine disposes of its solid wastes within its permit boundary in accordance with the WDEQ-approved solid waste disposal plan. Sewage is handled by WDEQ-permitted sewage systems at the existing mine facilities. Maintenance and

lubrication of most of the equipment takes place at shop facilities at the mine.

Major lubrication and oil changes of most equipment are performed inside the service building lube bays, where used oil is currently contained and deposited in storage tanks. Used oil is disposed of in accordance with WDEQ/SHWD regulations.

Triton has reviewed the EPA's *Consolidated List of Chemicals Subject to Reporting Under Title III of the Superfund Amendments and Re-authorization Act (SARA) of 1986* (as amended) and EPA's *List of Extremely Hazardous Substances* as defined in 40 CFR 355 (as amended) for hazardous substances used at the Buckskin Mine. Triton maintains files containing material safety data sheets for all chemicals, compounds, and/or substances which are or would be used during the course of mining.

Triton is responsible for ensuring that all production, use, storage, transport, and disposal of hazardous and extremely hazardous materials as a result of mining are in accordance with all applicable existing or hereafter promulgated federal, state, and local government rules, regulations, and guidelines. All mining activities involving the production, use, and/or disposal of hazardous or extremely hazardous materials are and would continue to be conducted so as to minimize potential environmental impacts.

Any release of hazardous or extremely hazardous substances in excess of the reportable quantity, as established in 40 CFR 117, is reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended. The materials for which such notification must be given are the extremely hazardous substances listed in section 302 of the Emergency Planning and Community Right to Know Act and the hazardous substances designated under section 102 of CERCLA, as amended. If a reportable quantity of a hazardous or extremely hazardous substance is released, immediate notice must be given to the WDEQ Solid and Hazardous Waste Division and all other appropriate federal and state agencies.

Each mining company is expected to prepare and implement several plans and/or policies to ensure environmental protection from hazardous and extremely hazardous materials. These plans/policies include:

- spill prevention control and countermeasure plans;
- spill response plans;
- inventories of hazardous chemical categories pursuant to section 312 of SARA, as amended; and
- emergency response plans.

All mining operations are also required to be in compliance with regulations promulgated under the Resource Conservation and Recovery Act, Federal Water Pollution Control Act (Clean Water Act), Safe Drinking Water Act, Toxic Substances Control Act, Mine Safety and Health Act, and the Federal Clean Air Act (CAA). In addition, mining operations must comply with all attendant state rules and regulations relating to hazardous material reporting, transportation, management, and disposal.

Compliance with these rules is the current practice at Buckskin Mine. Acquisition of the West Hay Creek LBA tract by Triton would not change these current practices nor the amount or type of any wastes generated or disposed at the mine, although quantities of some wastes would increase in proportion to anticipated increases in coal production (fuel, lubricants, and shop and office wastes).

### **ALTERNATIVE 1: NO ACTION ALTERNATIVE**

Under the No Action Alternative, Triton's coal lease application would be rejected, the West Hay Creek LBA tract would not be offered for competitive sale, and the coal contained within the tract would not be mined. Rejection of the application would not affect permitted mining activities on existing leases at the adjacent Buckskin Mine. The mine currently leases approximately 4,949 acres of federal coal leases, about 160 acres of private leases, and about 640 acres of state lease (of which only 372 acres are within the permit boundary). Approximately 5,099 acres will eventually be affected. Under the No-Action Alternative, Triton estimates that average annual production at the Buckskin Mine after 2002 will be 25 mmtpy, and average employment will be 225 persons. Portions of the surface of the LBA tract will be disturbed due to overstripping to allow coal to be removed from existing, contiguous leases at mine.

In order to compare the economic and environmental consequences of mining these lands versus not mining them, this EIS analysis was prepared under the assumption that the West Hay Creek tract would not be mined in the near future if the No Action Alternative were selected. However, selection of this alternative would not preclude leasing and mining of this tract in the future, either as a maintenance tract for an existing operation or as a new start mine.

### **ALTERNATIVE 2**

Under Alternative 2, BLM would hold a competitive lease sale and issue a maintenance lease for a tract that is larger than the applied for configuration. BLM has identified lands to the north and a small area in the southeast corner to the tract as applied for that could be added to the tract in order to maximize economic recovery and avoid bypassing potentially recoverable federal coal (figure 2-1). BLM is evaluating adding some or all of these lands to the tract. The

lands BLM is considering adding are described as follows:

T. 52 N., R. 72 W., 6th P.M., Campbell County, Wyoming

- Section 17: Lot 5-14, inclusive;
- Section 18: Lot 12 (E2)  
Lot 13 (E2)  
Lot 20 (E2)
- Section 19: Lot 5 (E2)  
Lot 12 (E2)  
Lot 13 (E2)  
Lot 20 (E2)
- Section 20: Lot 2 (W2, W2E2)  
Lot 7 (W2, W2E2)  
Lot 10 (W2, W2E2)  
Lot 15 (W2, W2E2)  
Lots 3-6, 11-14, inclusive.

176.2 acres

Triton estimates that this 176.2 acres contains approximately 20 million tons of recoverable coal. If all of these lands are added to the tract, Alternative 2 results in a tract that includes approximately 1,014.2975 acres containing approximately 150 million tons of recoverable coal, according to information provided by the applicant.

As shown on figure 2-1, the entire Alternative 2 tract is within the Buckskin Mine permit boundary. However, this boundary would need to be expanded to include overburden layback areas along the northern portion of the tract to allow mining of all proposed coal within the tract configuration, if all of the lands under consideration in this alternative are added to the tract. Environmental baseline studies have not been conducted for this area or the associated WDEQ adjacent area. Both the existing approved state mining permit and the MLA mining plan would require revision to include the Alternative 2 tract. A mining permit amendment would be needed to add the new lands and associated environmental baseline studies to the permit boundary. Alternative 2 assumes that the tract would be developed as a maintenance tract for an the Buckskin Mine. Other assumptions would also be the same as for the Proposed Action. Since the West Hay Creek LBA tract would be an extension of the existing Buckskin Mine, the facilities and infrastructure would be the same as those identified in the WDEQ/LQD Mine Permit 500 for the mine and the BLM's R2P2 for the Buckskin Mine.

### ALTERNATIVE 3

BLM is considering an alternate tract configuration for the West Hay Creek LBA tract in order to minimize the risk of bypassing federal coal that would potentially become economically unrecoverable if it is not included in this tract. As part of the preliminary geologic analysis of the federal coal resources in and around the West Hay Creek LBA tract, the BLM identified unleased federal coal southeast of the tract as applied for that would be isolated and might be bypassed if it is not included in the tract.

Specifically, this alternative adds approximately 31.1625 acres of unleased federal coal in the W½ W½E½ of lot 5 in section 20.

The Alternative 3 tract is described as follows:

T. 52 N., R. 72 W., 6th P.M., Campbell County, Wyoming

Section 17:	Lot	5 (S2S2)	10.265 acres		
		6 (S2S2)	10.265		
		7 (S2S2)	10.3475		
		8 (S2S2)	10.3475		
		9	41.32		
		10	41.32		
		11	41.12		
		12	41.12		
		13	41.18		
		14	41.18		
		Section 18:	Lot	13 (E2)	21.035
				20 (E2)	20.75
		Section 19:	Lot	5 (E2)	20.71
				12 (E2)	20.84
13 (E2)	20.935				
20 (E2)	21.065				
Section 20:	Lot	2 (W2,W2E2)	31.1175		
		3	41.39		
		4	41.28		
		5	41.30		
		6	41.41		
		7 (W2,W2E2)	31.1325		
		10 (W2,W2E2)	31.1475		
		11	41.42		
		12	41.32		
		13	41.34		
		14	41.44		
	15 (W2, W2E2)	31.1625			
Total surface area applied for:			869.26 acres		

Reconfiguration of the tract under Alternative 3 contains approximately 130 million tons of recoverable coal.

Before the Buckskin Mine applied for this LBA, this area was considered for inclusion in their application. The mine did not incorporate this area in their application because their current geologic model did not indicate that any mineable coal was present. As described in chapter 3, (Geology), this modeling indicates the presence of a geologic anomaly along the southern portion of the tract. However, as the model becomes further defined by additional drilling information, there may be portions of the area that include mineable coal.

As shown on figure 2-1, the tract in this alternative is entirely within the current Buckskin Mine permit boundary, and all environmental baseline studies have been conducted. Both the existing approved state mining permit and the MLA mining plan would require revision to include mining the Alternative 3 tract. This alternative assumes that the tract would be developed as a maintenance tract for the Buckskin Mine. Other assumptions would also be the same as for the Proposed Action. Since the West Hay Creek LBA tract would be an extension of the existing Buckskin Mine, the facilities and infrastructure would be the same as those identified in the WDEQ/LQD Mine Permit 500 for the Buckskin Mine and the BLM Resource Recovery and Protection Plan for the Buckskin Mine.

## **ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL**

### **Alternative 4**

Under this alternative, as under the Proposed Action and Alternatives 2 and 3, the BLM would hold a separate, competitive, sealed-bid sale for the lands included in the West Hay Creek LBA tract. Alternative 4 assumes, however, that the successful qualified bidder would be someone other than the applicant and that this bidder would acquire the tract in order to open a new mine to develop the coal resources in the tract.

A company acquiring this coal for a new stand-alone mine would require considerable initial capital expenses, including the construction of new surface facilities (offices, shops, warehouses, coal processing facilities, coal loadout facilities, and rail spur), extensive baseline data collection, and development of new mining and reclamation plans. In addition, a company or companies acquiring this coal for a new start mine would have to compete for customers with established mines in a competitive market.

BLM currently estimates that a tract would potentially need to include as much as 500 to 600 million tons of coal in order to attract a buyer interested in opening a new mine in the Wyoming PRB. This is based on the assumptions that an operator would construct facilities capable of producing 30 mmtpy to take advantage of the economies of scale offered by the coal deposits in the PRB, and

20 to 30 years of coal reserves would be needed to justify the expense of building the facilities described above. Given these assumptions, the tract does not include sufficient coal resources to consider opening a new mine under the Proposed Action or Alternatives 2 or 3. Therefore, development of a new mine on the West Hay Creek LBA tract is unlikely, and this alternative is not analyzed in detail in this EIS.

The environmental impacts of developing a new mine to recover the coal resources in the West Hay Creek LBA tract would be greater than under the Proposed Action, the No Action Alternative, or Alternatives 2 or 3 because of the need for new facilities, new rail lines, new employment, and the creation of additional sources of particulates (dust). In the event that a lease sale is held and the applicant is not the successful bidder, the successful bidder would be required to submit a detailed mining and reclamation plan for approval before any the tract could be mined. This NEPA analysis would be reviewed and supplemented as necessary before that mining and reclamation plan is approved.

### **Alternative 5**

Under Alternative 5, the BLM would delay the sale of the West Hay Creek LBA tract as applied for to increase the benefit to the public afforded by higher coal prices and/or to allow more complete recovery of the potential CBM resources in the tract prior to mining.

There are two major sources of revenue to state and federal governments from the leasing and mining of federal coal: 1) the competitive bonus bid paid at the time the coal is leased, and 2) a 12.5% royalty collected when the coal is sold. This alternative could potentially increase the fair market value of the coal resources in the LBA tract, thus increasing the bonus bid when the coal is leased. The price paid for coal from northeastern Wyoming decreased by more than \$1.00 per ton from 1992 to 2000, while production of low sulfur PRB coal increased annually since 1992. Coal prices have increased in 2001 and are projected to remain stable or increase slightly from 2002 through 2006 (WGS 2002). There is no assurance that delaying the sale would result in a higher coal price.

The fair market value of the tract and the resulting bonus payment to the government could increase if the lease sale is postponed and if higher PRB coal prices continue, but the postponement would not necessarily lead to higher royalty income to the state or federal governments. Royalty payments are the larger of the two revenue sources. They increase automatically when coal prices increase because they are collected at the time the coal is sold, but they cannot be collected until the coal is leased and permitted and that takes several years. If leasing is delayed, then by the time the coal is mined, the current higher coal prices may or may not persist. If the higher coal prices do persist, they may enable the coal lessee to negotiate longer term contracts at higher prices, which

would result in longer term, higher royalty payments. On the other hand, if the existing mining operation runs out of coal reserves before prices rise, they may have to shut down their operations before additional coal can be leased and permitted for mining. In that case, the fair market value of the coal may actually drop because the added expense of reopening a mine or starting a new mine would have to be factored into the fair market value.

Other considerations include the value of leaving the mineable coal for future development versus the value of making low-sulfur coal available now, in anticipation of cleaner fuel sources being developed in the future. Continued leasing of PRB coal enables coal-fired power plants to meet Clean Air Act requirements without constructing new plants, revamping existing plants, or switching to existing alternative fuels, which may significantly increase power costs for individuals and businesses. If cleaner fuel sources are developed in the future, they could be phased in with less economic impact to the public.

A range of the potential future economic benefits of delaying leasing until coal prices rise could be quantified in an economic analysis, but the benefits would have to be discounted to the present, which would make them similar to the Proposed Action and Alternatives 2 and 3.

BLM and the state of Wyoming have approved applications to drill CBM wells on oil and gas leases inside the West Hay Creek LBA tract. If the tract is leased, mining would not occur until the lessee has an approved mining and reclamation permit and MLA mining plan, which would take several years. This would allow time for a large portion of the CBM resources to be recovered from the tract.

The environmental impacts of mining the coal later as part of an existing mine would be expected to be similar and about equal to the Proposed Action and Alternatives 2 and 3. If a new mine start is required to mine the coal, the environmental impacts would be expected to be greater than if it were mined as an extension of an existing mine.

## **COMPARISON OF ALTERNATIVES**

Figure 2-1 shows the locations of the Proposed Action and Alternatives 2 and 3 for the West Hay Creek LBA tract. Table 2-1 is a summary comparison of coal production, surface disturbance, mine life, and projected federal and state revenues for the Proposed Action and Alternatives 2 and 3 for the West Hay Creek LBA tract.

Table 2-2 presents a comparative summary of the direct and indirect environmental impacts of implementing each alternative as compared to the No-Action Alternative. The No-Action Alternative assumes completion of currently permitted mining at the Buckskin Mine for comparison to the West Hay Creek LBA tract. Table 2-3 presents a comparative summary of cumulative

environmental impacts of implementing each alternative. The environmental consequences of the Proposed Action and alternatives are analyzed in chapter 4.

These summary impact tables are derived from the following explanation of impacts and magnitude. As required by NEPA, all agencies of the federal government are required to provide a detailed statement by the responsible official on:

- § the environmental impact of the Proposed Action,
- § any adverse environmental effects which cannot be avoided should the proposal be implemented,
- § Alternatives to the Proposed Action,
- § the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and
- § any irreversible and irretrievable commitments of resources which would be involved in the Proposed Action should it be implemented (42 USC ' 4332[C]).

Impacts can be beneficial or adverse, and they can be a primary result of an action (direct) or a secondary result (indirect). They can be permanent, long-term (persisting beyond the end of mine life and reclamation) or short-term (persisting during mining and reclamation and through the time the reclamation bond is released). Impacts also vary in terms of significance. The basis for conclusions regarding significance are the criteria set forth by the Council on Environmental Quality (40 CFR 1508.27) and the professional judgment of the specialists doing the analyses. Impact significance may range from negligible to substantial; impacts can be significant during mining but be reduced to insignificance following completion of reclamation.

**TABLE 2-1  
COMPARISON OF COAL PRODUCTION, SURFACE DISTURBANCE,  
AND MINE LIFE**

Item	No Action Alternative (existing Buckskin Mine)	Added by Proposed Action	Added by Alternative 2	Added by Alternative 3
In-place <sup>1</sup> federal coal (as of 1/1/02)	512 mmt	145 mmt	170 mmt	150 mmt
Recoverable coal <sup>2</sup> (as of 1/1/02)	434 mmt	130 mmt	150 mmt	130 mmt
Coal mined <sup>3</sup> , 12/31/01	189.9 mmt	---	—	---
Lease acres <sup>4</sup>	4,949 ac	838.13 ac	1,014.30 ac	869.26 ac
Total area to be disturbed <sup>4</sup>	5,099 ac	830 ac	990 ac	830 ac
Permit area <sup>4</sup>	7,602 ac	7,602 ac	7,842 ac	7,602 ac
Average annual post-2001 coal production	25 mmt	25 mmt	25 mmt	25 mmt
Remaining life of mine (post- 2001)	12.4 yrs	17.6 yrs	18.4 yrs	17.6 yrs
Average no. of employees	225	0	0	0
Total projected state revenues (post-2001) <sup>5</sup>	\$477 million	\$143 million	\$165 million	\$143 million
Total projected federal revenues (post-2001) <sup>6</sup>	\$165 million	\$49 million	\$57 million	\$49 million

<sup>1</sup>In-place coal includes all Canyon and Anderson coal within the lease area.

<sup>2</sup>Buckskin Mine defines recoverable coal as an estimate of the extractable coal that can be recovered. Excludes all mining losses that occur during normal mining operations, including wedge losses, coal left in pillars and fenders, and top and bottom coal cleaning.

<sup>3</sup>Assumes 90% to 92% recovery of extractable coal.

<sup>4</sup>Lease area includes Federal coal leases only and does not include state and private coal within the permit boundary. The permit area is larger than leased or disturbed areas to assure that all disturbed lands are within the permit boundary and to allow an easily defined legal land description. For the Proposed Action and Alternative 3, the permit area would not need to be changed. For Alternative 2, approximately 240 acres along the northern perimeter would need to be added.

<sup>5</sup>Projected revenue to the state of Wyoming is \$1.10 per ton of coal sold and includes income from severance tax, property and production taxes, sales and use taxes, and Wyoming's share of federal royalty payments (University of Wyoming 1994).

<sup>6</sup>Federal revenues based on \$4.00 per ton price x federal royalty of 12.5% x amount of recoverable coal plus bonus payment on LBA coal of \$0.26 per ton based on average of last 11 LBAs (table 1-1) x amount of recoverable coal less state's 50% share.

**TABLE 2-2**  
**SUMMARY COMPARISON OF DIRECT AND INDIRECT IMPACTS**

(Impacts are assumed to be adverse unless otherwise indicated.)  
(See chapter 4 for a complete description of the impacts)

RESOURCE	MAGNITUDE TYPE AND DURATION OF IMPACT	
	NO ACTION ALTERNATIVE	PROPOSED ACTION AND ALTERNATIVES
<b>TOPOGRAPHY &amp; PHYSIOGRAPHY</b>		
Permanent topographic alternation would result in a reduction of microhabitat, habitat diversity, and wildlife carrying capacity. Precipitation infiltration would occur. There would be a reduction in water runoff and peak flows. Erosion would be reduced, vegetative productivity would be enhanced, and groundwater recharge would be accelerated.	Impacts would be moderate but long term on the existing mine area. Some impacts would be beneficial.	Same as the No Action Alternative on expanded area of coal removal.
<b>GEOLOGY AND MINERALS</b>		
Subsurface changes would result in removal of coal and removal and replacement of topsoil and overburden. The physical characteristics of the geology would be altered. Coal bed methane would be lost.	Coal removal and loss of the coal bed methane would be a permanent impact. Other activities would be moderate but long-term.	Same as the No Action Alternative on expanded area of coal removal.
<b>SOILS</b>		
Changes to physical properties would include increased near-surface bulk density, more uniformity in soil type, thickness, and texture, and an increased uniformity in mixed soils (texture). Soil loss would be decreased due to topographic modification.	Impacts would be moderate but long-term on the existing mine area. Some changes to the physical properties would be beneficial.	Same as the No Action Alternative on expanded area of coal removal.
Changes in chemical properties would include uniform soil nutrient distribution.	Changes to the chemical properties would have a beneficial, long-term effect.	Same as the No Action Alternative on expanded area of coal removal.
Changes in biological properties would include a reduction in organic matter and microorganism populations. The existing plant habitat in stockpiled soils would be reduced.	Changes in biological properties would be moderate and long-term on the existing mine area.	Same as the No Action Alternative on expanded area of coal removal.
<b>AIR QUALITY</b>		
Concentrations of total suspended particulates (TSP) and gaseous emissions would be elevated.	Impacts would be moderate and short term on the existing mine area.	Same as the No Action Alternative on expanded area of coal removal.
<b>ALLUVIAL VALLEY FLOORS</b>		
There are no AVF's significant to agriculture on the proposed lease tract.	No impact on existing mine area.	Same as the No Action Alternative on expanded area of coal removal.
<b>WETLANDS</b>		
All existing wetlands would be removed.	Impacts would be long term, but wetlands on mined areas would be reclaimed.	Same as the No Action Alternative on expanded area of coal removal.

**TABLE 2-2**  
(continued)

RESOURCE	MAGNITUDE TYPE AND DURATION OF IMPACT	
	NO ACTION ALTERNATIVE	PROPOSED ACTION AND ALTERNATIVES
<b>WATER RESOURCES</b>		
<b>Surface water:</b> Changes in runoff characteristics and sediment discharge include disruption of surface drainage systems, increased runoff and erosion rates, increased infiltration, and a reduction in peak flows.	Impacts would be moderate and short term on existing mine area.	Same as the No Action Alternative on expanded area of coal removal.
<b>Groundwater:</b> Coal and overburden aquifers would be removed; the existing coal and overburden would be replaced with spoil aquifers; water levels in aquifers adjacent to the mine would be depressed; hydraulic properties. Groundwater quality in backfilled areas would be changed.	Impacts would be minor to moderate and long term on the existing mine area.	Same as the No Action Alternative on expanded area of coal removal.
<b>VEGETATION</b>		
Progressive reduction in native vegetation would result in increased erosion, loss of wildlife and livestock habitat, and loss of wildlife habitat carrying capacity.	Impacts would be moderate and both short- and long-term.	Same as the No Action Alternative on expanded area of coal removal.
After reclamation, changes in vegetation patterns, reduction in vegetation diversity, as well as reduction in shrub density could result.	Impacts would be minor but long term.	Same as the No Action Alternative on expanded area of coal removal.
<b>WILDLIFE</b>		
During mining wildlife would be displaced and habitat would be lost. Passage through the area by wildlife would decrease. Small mammals would be displaced, and their mortality rate would increase. Foraging and nesting habitat for raptors and songbirds would be removed. Raptor nests would be abandoned. Waterfowl resting and feeding habitat would be reduced. Road kills by mine-related traffic would continue.	Impacts would be moderate and short term.	Same as the No Action Alternative on expanded area of coal removal.
<b>THREATENED, ENDANGERED AND PROPOSED SPECIES</b>		
Loss of black-footed ferret colonies.	No effect due to lack of suitable habitat and lack of occurrence in area.	Same as the No Action Alternative on expanded area of coal removal.
Loss of bald eagle habitat.	Disturbance of potential bald eagle habitat, not likely to adversely affect.	Same as the No Action Alternative on expanded area of coal removal
Loss of Ute ladies'-tresses habitat.	No effect due to lack of suitable habitat and lack of occurrence in area.	Same as the No Action Alternative on expanded area of coal removal
Loss of mountain plover habitat.	Little to no suitable habitat present, not likely to adversely affect.	Same as the No Action Alternative on expanded area of coal removal
Loss of black-tailed prairie dog colonies or habitat.	No effect due to absence of colonies on the tract.	Same as the No Action Alternative on expanded area of coal removal

**TABLE 2-2**  
(continued)

RESOURCE	MAGNITUDE TYPE AND DURATION OF IMPACT	
	NO ACTION ALTERNATIVE	PROPOSED ACTION AND ALTERNATIVES
<b>NATIVE AMERICAN CONCERNS</b>	No impact identified on existing mine area.	Same as the No Action Alternative on expanded area of coal removal.
<b>PALEONTOLOGICAL RESOURCES</b>		
Overburden removal could expose fossils for scientific examination.	No impact identified on existing mine area.	Same as the No Action Alternative on expanded area of coal removal.
<b>VISUAL RESOURCES</b>		
During mining, the landscape would be altered. Following reclamation, slopes would be smoother and sagebrush would be less dense.	Impacts would be negligible and short term.	Same as the No Action Alternative on expanded area of coal removal.
<b>NOISE</b>		
The increased noise levels during mining could affect occupied dwellings within 1 mile and wildlife in immediate vicinity.	Impacts would be moderate and short term.	Same as the No Action Alternative on expanded area of coal removal.
<b>SOCIOECONOMICS</b>		
During mining there would be no potential for increased employment. The state and federal governments would receive revenues from royalties and taxes. Campbell and Converse counties would benefit from increased economic development and population.	Impacts would be moderate and short term.	Impacts would be moderate, beneficial, and short term on expanded area of coal removal.

**TABLE 2-3  
SUMMARY COMPARISON OF CUMULATIVE IMPACTS**

(see chapter 4 for a complete description of the impacts)

RESOURCE	MAGNITUDE TYPE AND DURATION OF IMPACT	
	NO ACTION ALTERNATIVE	PROPOSED ACTION AND ALTERNATIVES
<b>TOPOGRAPHY &amp; PHYSIOGRAPHY</b>		
Reduced relief and subdued topography could result in a reduction in topographic diversity, biodiversity, and big game carrying capacity. Precipitation infiltration could increase.	Impacts would be negligible and long term.	Same as the No Action Alternative on expanded area of coal removal.
<b>GEOLOGY AND MINERALS</b>		
Continued recovery of the coal would result in a stabilization of municipal, county, and state economies.	Impacts would be significant, beneficial, and short term.	Same as the No Action Alternative on expanded area of coal removal.
<b>SOILS</b>		
Reclaiming soils could result in Increased soil productivity and reduced erosion.	Impacts would be negligible and long term.	Same as the No Action Alternative on expanded area of coal removal.
<b>AIR QUALITY</b>		
Impacts associated with mining operations would include elevated concentrations of TSP and gaseous emissions.	Impacts would be short term and may overlap with impacts caused by other development on adjacent lands.	Same as the No Action Alternative on expanded area of coal removal.
<b>WATER QUALITY</b>		
<b>Surface water:</b> Impacts to surface water could result in a temporary reduction in soil infiltration rates and increased runoff. Quality of surface water discharges would be monitored.	Impacts would be negligible and short term.	Same as the No Action Alternative on expanded area of coal removal.
<b>Groundwater:</b> Impacts to groundwater could result in replacement of the coal and overburden aquifers with spoil aquifers; drawdown in the coal and shallower aquifers in surrounding areas; and decline in the water level in the subcoal Fort Union Formation. Quality of groundwater could change.	Replacement of the coal and overburden aquifers as well as the change in groundwater quality would be negligible but long term. Drawdown in the coal and shallow aquifers and the decline in the water level of the subcoal in the Fort Union Formation would be negligible and short term.	Same as the No Action Alternative on expanded area of coal removal.
<b>ALLUVIAL VALLEY FLOORS</b>		
	No cumulative impacts anticipated on existing mine areas.	Same as the No Action Alternative on expanded area of coal removal.
<b>WILDLIFE</b>		
The diversity and carrying capacity of some wildlife (for example, pronghorn) habitat would be lost forever. There would be a reduction in mule deer population, raptor nesting and foraging habitat, sage grouse habitat, and waterfowl habitat.	Most impacts would be moderate and short- term. However, the reduction of waterfowl habitat, wildlife habitat diversity and carrying capacity would be permanent.	Same as the No Action Alternative on expanded area of coal removal.

**TABLE 2-3**  
(continued)

RESOURCE	MAGNITUDE TYPE AND DURATION OF IMPACT	
	NO ACTION ALTERNATIVE	PROPOSED ACTION AND ALTERNATIVES
<b>WETLANDS</b>		
Wetlands within mined areas would be removed.	Impacts would be long term, but wetlands would be reclaimed.	Same as the No Action Alternative on expanded area of coal removal.
<b>THREATENED, ENDANGERED AND PROPOSED SPECIES</b>		
	Individuals of some species will potentially be directly affected by mining operations on the existing leases for mines in this area, impacts may overlap with other developments on adjacent lands.	Additional impacts to individuals not likely on expanded area of coal removal.
<b>LAND USE AND RECREATION</b>		
Agricultural production would be lost. Oil and gas development and production would be disrupted while mining is occurring. Wildlife habitat would be reduced. Access to public lands users, particularly hunters, would be lost.	Impacts would be moderate and short term.	Same as the No Action Alternative on expanded area of coal removal.
<b>CULTURAL RESOURCES</b>		
	Impacts to sites eligible for NRHP would be mitigated on existing mine areas, ineligible sites would be destroyed.	Same as No Action on expanded mine area.
<b>NATIVE AMERICAN CONCERNS</b>		
	No impact identified on existing mine areas.	Same as the No Action Alternative on expanded area of coal removal.
<b>PALEONTOLOGICAL RESOURCES</b>		
	No impact identified on existing mine areas.	Same as the No Action Alternative on expanded area of coal removal.
<b>VISUAL RESOURCES</b>		
For the most part, mining would not be visible from major travel routes. Following reclamation, the appearance of the landscape would appear smoother, but not notably.	Impacts would be moderate and short term.	Same as the No Action Alternative on expanded area of coal removal.
<b>NOISE</b>		
	Minor to moderate, short term.	Same as the No Action Alternative on expanded area of coal removal.
<b>TRANSPORTATION FACILITIES</b>		
Use of existing transportation facilities at current levels would be extended. Oil and gas pipelines would be removed from all areas to be mined.	Impacts would be moderate and short term.	Same as the No Action Alternative on expanded area of coal removal.
<b>SOCIOECONOMICS</b>		
Cumulative mineral and energy related development could increase, which could result in new employment and housing needs. Income to the state and counties from revenues and royalties could be expected.	Although short term, benefits would be significant, some benefits would be beneficial.	Same as the No Action Alternative on expanded area of coal removal.