

2.0 PROPOSED ACTION AND ALTERNATIVES

This EIS addresses the Proposed Action of holding two separate competitive coal lease sales and issuing maintenance leases to the successful bidders (either the applicants or other qualified bidders) for the Powder River and Thundercloud LBA Tracts as applied for. Additional alternatives considered include:

- Alternative 1: No Action (not leasing either tract);
- Alternative 2: Configuring one or both tracts differently (adding or subtracting coal from one or both of the tracts, based on geologic, engineering, and/or economic considerations), holding two separate competitive coal lease sales, and issuing maintenance leases to the successful bidders (either the applicants or other qualified bidders) for each tract;
- Alternative 3: Holding a competitive coal lease sale and issuing a lease to the successful bidder (not the applicant or an adjacent existing mine) for development of one or both tracts as a new, stand-alone mine; and
- Alternative 4: Delaying the competitive coal lease sale for one or both tracts.

The Powder River and Thundercloud LBA Tract configurations as applied for (Proposed Action), and tract configurations as amended by BLM (Alternative 2), are shown on Figures 2-1 and 2-2, respectively.

Lease-by-application tracts are nominated for leasing by companies with an interest in acquiring them, but as discussed in Chapter

1.0, the LBA process is, by law and regulation, an open, public, competitive sealed-bid process. Thus, if the decisions reached as a result of this EIS are to hold separate lease sales, the applicants (PRCC and KMCC) may not be the high bidders. Nonetheless, the analysis presented in this EIS assumes the applicants would be the successful bidders if a competitive sale is held, and KMCC and PRCC would mine the lands as maintenance tracts with the permitted Jacobs Ranch Mine and North Antelope and Rochelle Mines, respectively.

The Thundercloud LBA Tract is also located adjacent to the Black Thunder Mine, operated by Thunder Basin Coal Company, LLC (TBCC), currently owned by Atlantic Richfield Company (ARCO). TBCC is also in a position to mine the tract as a maintenance lease. If TBCC acquires the tract, the rate of coal production, mining sequence, equipment, and facilities would be different than if KMCC acquired the tract. However, the impacts of TBCC mining the tract would be similar to the impacts of KMCC mining the tract, and company-specific mining and reclamation plans would not significantly alter the disturbed acreage and would not substantially alter the environmental analysis conducted in this EIS.

If a decision is made to hold competitive lease sales and there are successful bidders, mining and reclamation plans must be developed by the successful bidders and approved before mining can begin on the tracts. As part of the approval process, a mining and reclamation plan undergoes detailed review by state and federal agencies. This plan may differ from the plan summarized here, but changes to the mining plan used for this analysis would not be expected to significantly change the impacts described in this EIS. Those changes would typically be related to the details of mining

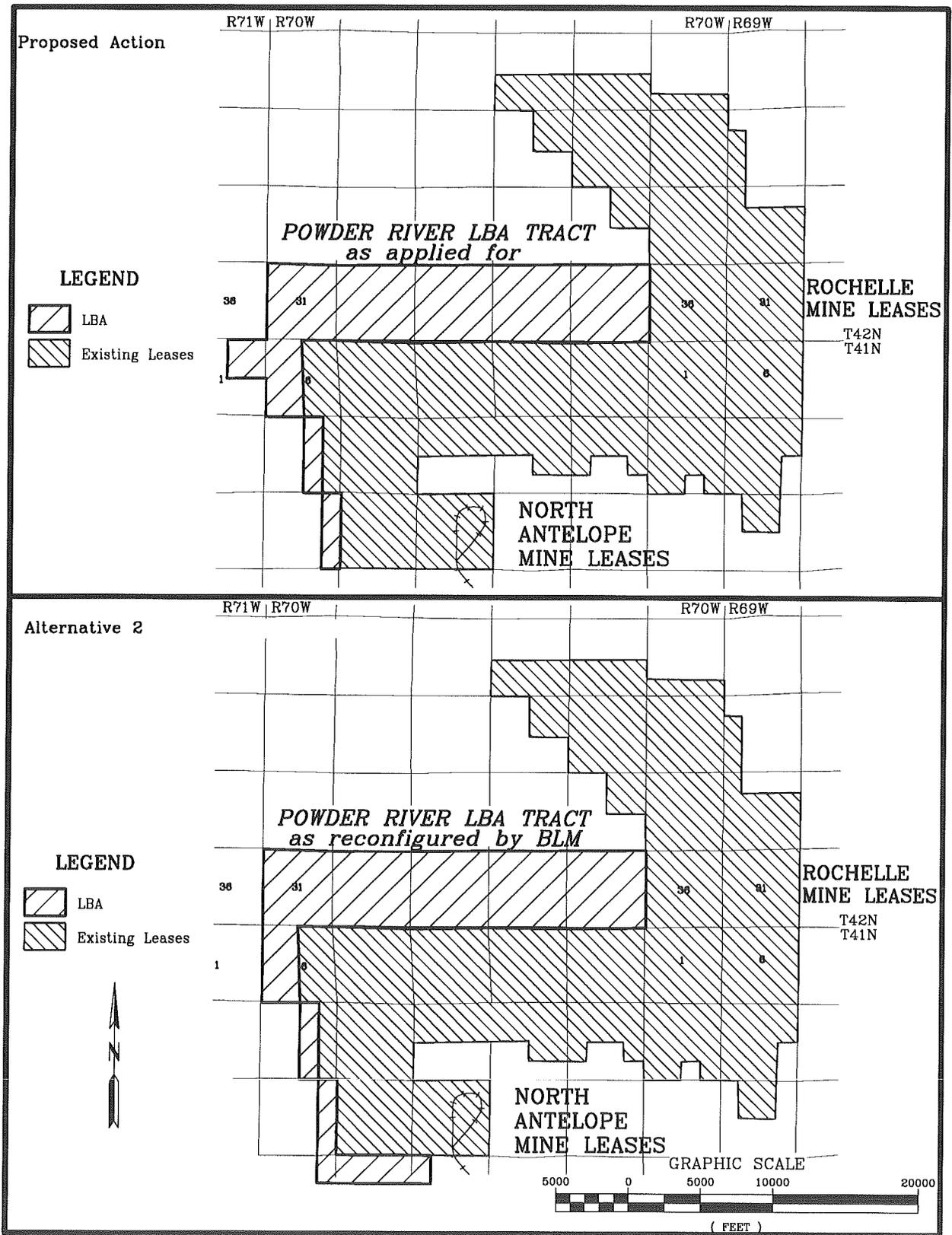


Figure 2-1. Powder River LBA Tract Configurations.

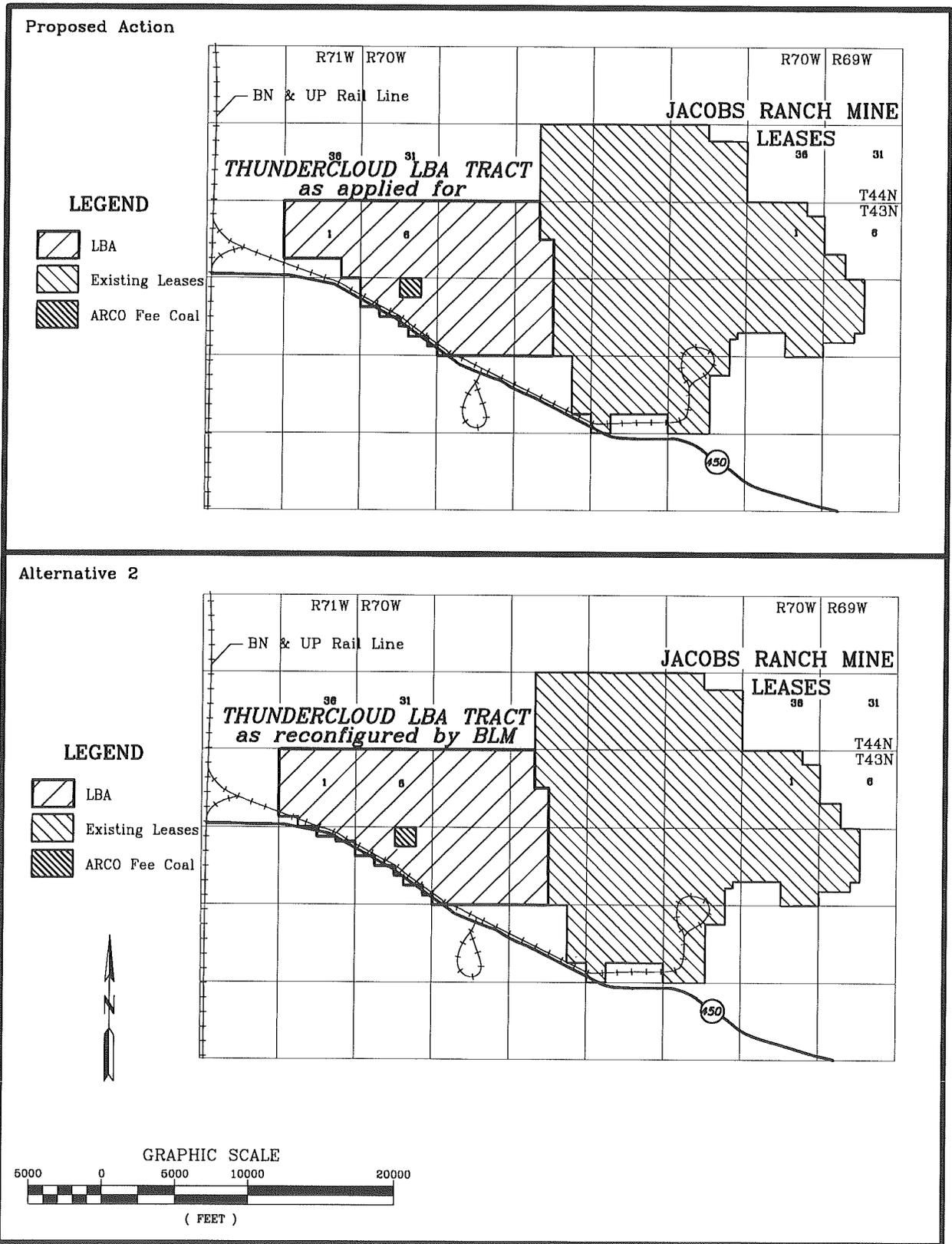


Figure 2-2. Thundercloud LBA Tract Configurations.

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and reclaiming the tracts, and major issues such as tons of coal mined, acres disturbed, and other environmental impacts would not be significantly different.

2.1 Proposed Action

Under the proposed action, the Powder River LBA Tract and the Thundercloud LBA Tract, as applied for by PRCC and KMCC, respectively, would be offered for lease at separate competitive sales, subject to standard and special lease stipulations developed for the PRB (Appendix D). The boundaries of the tracts would be consistent with the tract configurations proposed in the Powder River and Thundercloud LBA Tract lease applications (see Figures 2-1 and 2-2). The Thundercloud LBA Tract configuration contains 40 acres of privately owned surface and coal owned by ARCO. Although this coal is not federally owned, it would be logically mined with the federal coal in the Thundercloud Tract. Therefore, for the purposes of the environmental analysis in this EIS, it is assumed that this coal will be mined in conjunction with the federal coal in the Thundercloud Tract. The proposed action assumes that PRCC will be the successful bidder on the Powder River Tract, if it is offered for sale, and that KMCC will be the successful bidder on the Thundercloud LBA Tract if it is offered for sale.

Powder River LBA Tract

The legal description of the proposed Powder River LBA Tract coal lease lands as applied for by PRCC under the Proposed Action is as follows:

T41N, R71W, 6th P.M., Campbell County,
Wyoming

Section 1, Lots 5, 6, 11, 12
161.24 acres

T41N, R70W
Section 6, Lots 10-13 and 18-21
308.42 acres
Section 7, Lots 6, 11, 14, 19
160.42 acres
Section 18, Lots 5, 12, 13, 20
158.61 acres

T42N, R70W
Section 31, Lots 5-20 587.53 acres
Section 32, Lots 1-16 657.29 acres
Section 33, Lots 1-16 656.16 acres
Section 34, Lots 1-16 664.43 acres
Section 35, Lots 1-16 669.36 acres

Total surface area applied for:
4,023.46 acres

Land descriptions and acreage are based on the BLM Status of Public Domain Land and Mineral Title, approved Coal Plats as of January 12, 1995 and February 28, 1995.

The tract contains an estimated 515 million tons of coal. This estimate of coal resources is based on information provided by the applicant. BLM will independently evaluate the volume of the coal reserves included in the tract as part of the fair market value determination process. This reserve estimate will be included in the sale notice if the tract is offered for sale.

The Powder River LBA Tract will be mined as an integral part of the North Antelope Mine and the Rochelle Mine under the Proposed Action. The North Antelope Mine and Rochelle Mine are already operating under approved mining permits. The permits will require amendment to include the LBA tract. Since the Powder River LBA Tract would be an extension of the existing North Antelope/Rochelle Mines, the facilities and infrastructure will be the same as those identified in the WDEQ/LQD Mine Permit 532 Term T5 approved February 1, 1996 for

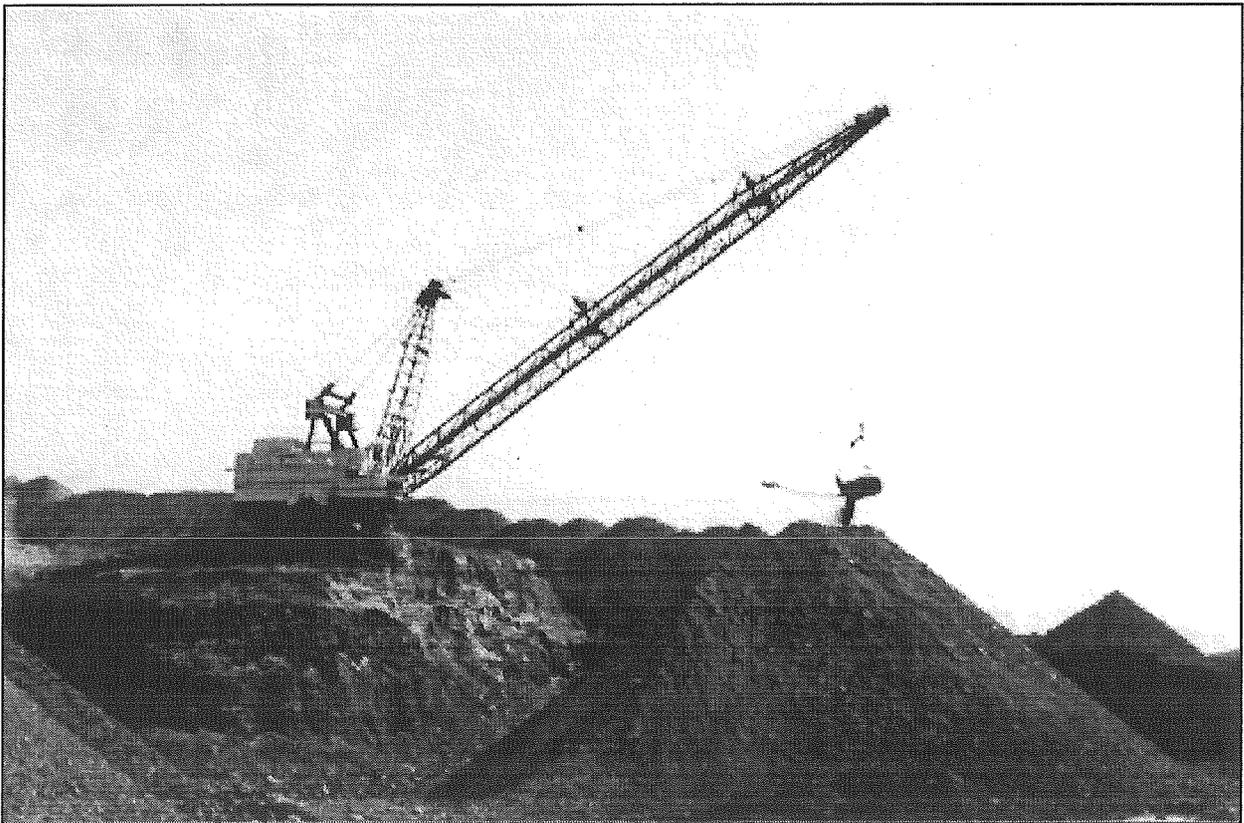
the North Antelope Mine, Permit 569 Term T4 approved August 31, 1994 for the Rochelle Mine; the BLM Resource Recovery and Protection Plans, approved February 1, 1986 and January 9, 1997 for the North Antelope and Rochelle Mines, respectively, and the BLM logical mining unit approved November 25, 1986 for the North Antelope Mine. The Rochelle Mine does not have a logical mining unit.

PRCC has an air quality permit approved by the Air Quality Division of the Wyoming Department of Environmental Quality (WDEQ/AQD) to mine up to 35 million tons of coal per year at the North Antelope Mine and 30 million tons per year at the Rochelle Mine. In 1996, the North Antelope and Rochelle Mines produced 28.6 million tons and 26.2 million tons respectively (Wyoming Coal Information Committee 1997). The Powder River LBA Tract will extend the life

of these existing mines, allowing them to maintain the combined permitted coal production level of 65 million tons per year.

A total of 1,129 million tons would be mined from the proposed combined permit areas after 1997, with an estimated 489 million tons from the Powder River LBA Tract. The 489 million tons of coal is based on a recovery of 95% of the in-place reserve as determined by operational experience to date. A total estimated 3,045 million bank cubic yards of overburden will be excavated. Prior to the end of 1997, 291 million tons of coal and 459 million bank cubic yards of overburden will have already been excavated from within the current permitted area of the two mines.

Topsoil removal with scrapers, using a combination of company-owned and contractor equipment, will proceed ahead of



Typical dragline operation showing overburden removal (left) and backfill placement (right).

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overburden removal. Whenever possible direct haulage to a reclamation area will be done, but due to scheduling, some topsoil will be temporarily stockpiled. As the reclamation plan requires, scrapers again will be used to haul and distribute the stockpiled topsoil. Mining will be accomplished in three separate pits identified as West Pit, Middle Pit, and East Pit. Trucks and shovels will be used for overburden removal at the West and Middle Pits; a 64-yard dragline will remove overburden at the East Pit. Most overburden and all coal will be drilled and blasted to facilitate efficient excavation. As overburden is removed, most will be directly placed into areas where coal has already been removed. Elevations consistent with an approved post-mining topography (PMT) plan will be established as quickly as possible. Under certain conditions, the PMT may not be immediately achievable. This will 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 will be loaded with electric shovels (45 cubic yard to 80 cubic yard capacity) and rubber tired loaders into 240-ton off-highway trucks for transport to crushing facilities. Coal haul roads will be temporary structures built within the mining areas. There are three existing crushing facilities within the permit area that together provide capacity to produce at the permitted level. The three facilities all employ one-stage crushing to size coal to a nominal 2-inch product. There is a total of five storage silos, each with a batch-weigh loadout and a covered storage slot. All facilities have either bag houses or stilling sheds to control coal dust emissions. While sufficient capacity exists, future changes in facilities may be constructed to improve operating efficiencies.

Current full-time employment at the two mines is 640. Projected future employment will increase to 860 if the LBA tract is acquired. Existing shop, office and change facilities will be utilized. As employment and equipment increase, minor additions to these facilities may be required.

Thundercloud LBA Tract

The legal description of the proposed Thundercloud LBA Tract coal lease lands as applied for by KMCC under the proposed action is as follows:

T43N, R70W, 6th P.M., Campbell County, Wyoming	
Section 4, Lots 8, 9, 15-18	235.80 acres
Section 5, Lots 5-20	663.71 acres
Section 6, Lots 8-23	645.99 acres
Section 7, Lots 5-7, N1/2 Lot 8, Lots 9-12, N1/2 and SE1/4 Lot 13, and NE1/4 Lot 19	347.50 ¹ acres
Section 8, Lots 1-16	660.84 acres
Section 9, Lots 3-6 and 11-14	325.06 acres
T43N, R71W, 6th P.M., Campbell County, Wyoming	
Section 1, Lots 5-15, 19 and SE1/4 NE1/4	<u>517.01 acres</u>

Total surface area applied for:
3,395.91 acres

¹The NW1/4 NE1/4 Section 7 surface and coal are owned by ARCO and are not included as part of the area or volume of coal being considered for leasing in the Thundercloud LBA Tract.

Land descriptions and acreage are based on the BLM Status of Public Domain Land and Mineral Title, approved Coal Plats as of January 12, 1995 and February 28, 1995.

Approximately 89 acres containing 11 million tons of coal within the Thundercloud LBA Tract are unsuitable for mining due to the presence of the BN/C&NW railroad right-of-way. Although these lands would not be mined, they are included in the tract to allow recovery of all the mineable coal outside of the right-of-way and to comply with the coal leasing regulations which do not allow leasing of less than 10 acre aliquot parts.

The Thundercloud LBA Tract contains approximately 427 million tons of coal, after the area beneath the railroad right-of-way is eliminated. This estimate of coal resources is based on information provided by the applicant. BLM will independently evaluate the volume of the coal reserves included in the tract as part of the fair market value determination process. This reserve estimate will be included in the sale notice if the tract is offered for sale. If KMCC acquires the federal coal lease for these lands, the coal would be mined, processed, and distributed as part of KMCC's permitted Jacobs Ranch Mine, which comprises 9,198 acres and originally contained 538 million tons of coal.

The proposed addition of the Thundercloud LBA Tract reserves would allow KMCC to maintain and expand existing contracts. The additional reserve base will also extend the life of the current mining operations and preserve the long-term job stability of mine employees.

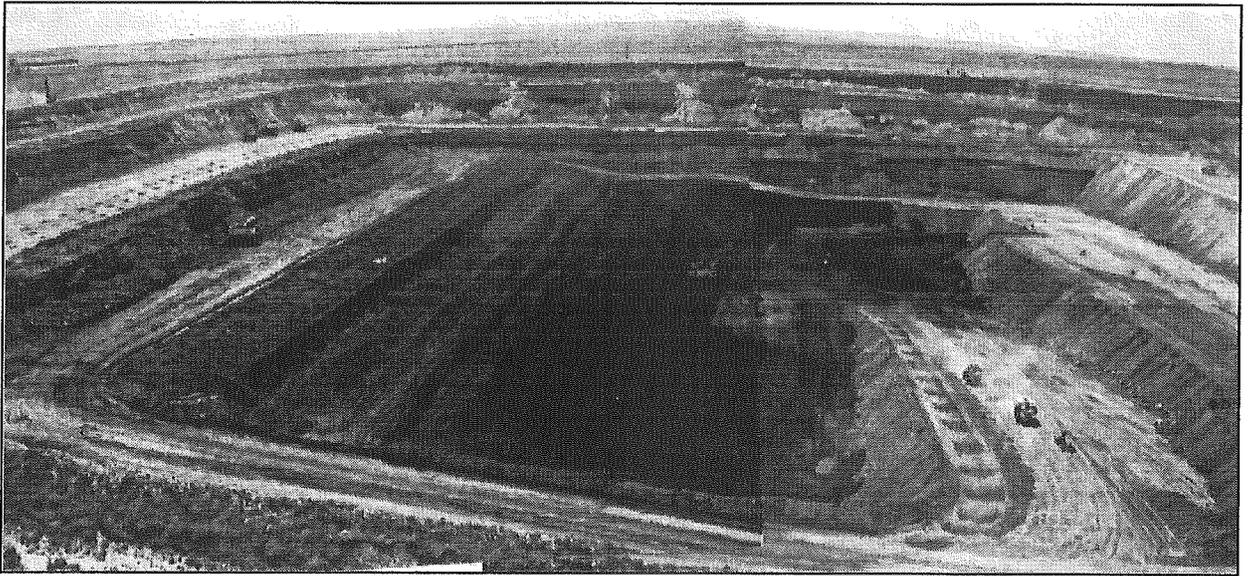
Due to its location and configuration, the Thundercloud LBA Tract is a logical extension of the operations at the Jacobs Ranch Mine and would be mined as an

integral part of the permitted mining operation using the same mining methods. The mining method to be used is a truck and shovel surface mining operation. The mine has an air quality permit approved by WDEQ/AQD to mine up to 35 million tons of coal per year. The mine produced 24.5 million tons in 1996 and plans to increase production to the permitted maximum by 2002. The intended use of the coal is primarily for electrical power generation, the same use as for the coal currently being mined at the Jacobs Ranch Mine.

The Jacobs Ranch 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 is the sole means of overburden stripping and coal mining at Jacobs Ranch Mine. Based on experience to date, KMCC projects a 90% recovery factor for the coal in the Thundercloud Tract.

The truck-shovel mining method is used to remove overburden from above the coal seam(s) and place it into the backfill. The overburden is excavated and loaded into trucks by electric power shovels with dipper capacities ranging from 27 to 54 cubic yards. Most of the overburden is drilled and blasted prior to removal. Other equipment used during overburden removal and backfilling includes water trucks, motor graders, track and wheel dozers, scrapers, hydraulic excavators, front-end loaders, and belt loaders.

To maintain a safe bench height in overburden which is up to 180 ft thick, a multiple bench system is used. These benches, which are 20-60 ft high and normally more than 200 ft wide, extend along the advancing face of the operating pit.



Typical truck-shovel operation showing overburden removal (left) and backfill (right).

The floor of each bench is used as a roadway by the haulage equipment, and some of these haulroads extend outside the immediate pit area.

Pits are developed by opening an initial rectangular box cut and hauling the overburden to out-of-pit overburden piles. The volumes of the resulting voids created by overburden and coal removal are sufficient to enable a direct haulback system of the overburden from the advancing face to an in-pit backfill and can be used for virtually the life of the mine. No box cut would be required under the Proposed Action, in which the Thundercloud LBA Tract would be mined as an extension of the Jacobs Ranch Mine.

The exposed coal is drilled and blasted prior to removal. After blasting, the coal is removed by either electrically powered shovels with bucket capacities from 25 to 50 cubic yards or large front-end loaders with bucket capacities up to 27 cubic yards. A belt loader may also be employed for use in mining coal. The 240-ton end-dump haul trucks are used with the shovels while 170-

ton end-dump trucks are used with the other loading equipment or the shovels. The shovels are operated on benches 10-60 ft high by 200 ft wide, similar to the overburden benches.

In cases where the bottom few feet of the seam are extremely wet and soft, due to water in the coal seeping to the bottom of the seam, dozers are used to push the wet coal into piles so that the water can drain. After the coal has dried sufficiently, it is loaded into the haulage trucks and taken to the preparation plant. There are three existing crushing facilities within the permit area that provide the capacity to produce at the permitted level. The three facilities employ one-stage crushing to size coal to a nominal 2-inch product. There are a total of 7 storage silos. While sufficient capacity exists, future facilities may be constructed to improve operating efficiencies. KMCC recently applied to WDEQ/AQD for a modification to the Jacobs Ranch Mine Air Quality Permit to open an additional production facility by the end of 1997 in order to increase its capacity to over 39 million tons per year (Wyoming State Geological Survey, June 1997, p. 27).

Since the Thundercloud LBA Tract would be an extension of the existing Jacobs Ranch Mine operations under the Proposed Action, the facilities and infrastructure will be the same as those identified in the WDEQ/LQD Mine Permit 271 for Term T3 approved August 30, 1994; the BLM R2P2 approved February 1995; and the BLM logical mining unit approved in April 1995. Mining facilities and transportation systems, including maintenance and office buildings, the railroad loop, and the coal crushing, storage, and loading facilities, are located off of coal. Access corridors for roads, utilities, and the railroad are combined as much as possible to restrict surface disturbance and coal losses. Currently there are 375 full-time employees at the Jacobs Ranch Mine. Projected future employment will increase to 420 if the LBA tract is acquired and production is increased to the maximum permitted level.

2.2 Alternative 1

Alternative 1 is the No-Action Alternative. Under the No-Action Alternative, both PRCC's and KMCC's coal lease applications would be rejected, the Powder River and Thundercloud LBA Tracts would not be offered for competitive sale, and the coal contained within the tracts would not be mined. Rejection of the applications would not affect permitted mining activities on existing leases at the Jacobs Ranch, North Antelope, and Rochelle Mines. Approximately 6,955 acres are currently leased at Jacobs Ranch, and about 8,122 acres will eventually be affected. At North Antelope and Rochelle, the total current lease holdings are 11,434 acres and about 11,948 acres will eventually be affected. Portions of the surface of both LBA tracts would probably be disturbed due to overstripping to allow coal to be removed from existing, contiguous leases.

For purposes of this analysis, it is assumed that if the No-Action Alternative is selected neither LBA tract would be mined in the foreseeable future. Selection of this alternative would not preclude leasing of these tracts in the future; however, this assumption allows a comparison of the economic and environmental consequences of mining these lands versus not mining them. If this alternative is chosen, this assumption would become more likely if leasing does not occur in time for these tracts to be mined as extensions of existing operations.

2.3 Alternative 2

Under Alternative 2, the BLM would reconfigure the Powder River and Thundercloud LBA Tracts. Reconfiguration of the tracts 1) makes both tracts more attractive to potential bidders, 2) minimizes the risk of bypassing federal coal that would then become economically unrecoverable, and/or 3) enhances the fair market value of remaining unleased federal coal in the area.

Alternative 2 is the preferred alternative of the BLM.

The BLM determined that the Powder River LBA Tract could be reconfigured to prevent bypass of currently unleased federal coal and enhance the value of remaining unleased federal coal. The original configuration of the Powder River LBA Tract as applied for would be partially reconfigured by removing the following acreage from the tract:

T41N, R71W

Section 1, Lots 5, 6, 11, and 12

Total: 161.24 acres

The Powder River LBA Tract would be further reconfigured by adding the following acreage:

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T41N, R70W

Section 19, Lot 5, N1/2 Lot 12

Section 20, Lots 1-4 and N1/2 Lots 5-8

Section 21, Lot 4 and N1/2 Lot 5

Total: 362.01 acres

The net increase to the Powder River LBA Tract would be 200.77 acres containing about 19 million tons of coal. The reconfiguration results in a lease comprising 4,224.2 acres containing approximately 532 million tons of coal, or 505 million tons of recoverable coal at 95% according to the information provided by the applicant.

Subsequent to conducting a geologic review of the Thundercloud LBA Tract as applied for, the BLM identified an area northeast of the railroad in T43N, R71W, Sections 1 and 12 that contains approximately 5 million tons of mineable coal that would be bypassed if not added to the Thundercloud LBA Tract. This does not include about 11 million tons of coal within the area added under Alternative 2 that are within the railroad right of way and buffer area that are unsuitable for mining. The reconfiguration results in a lease comprising 3,545.5 acres containing approximately 432 million tons of coal according to the information provided by the applicant. Using KMCC's projected recovery factor of 90%, the reconfigured tract would contain about 389 million tons of recoverable coal. Under Alternative 2, the following area would be added to the Thundercloud LBA Tract as applied for and described in Section 2.1:

T43N, R71W

Section 1, N1/2 Lot 16, Lots 17 and 18

Section 12, Lot 1 and NE1/4 Lot 2

Total: 149.59 acres

Under Alternative 2, the federal coal tracts, with amended boundaries, would be offered for competitive sale subject to the standard coal lease stipulations and to special coal lease stipulations developed for the Wyoming PRB (Appendix D). Alternative 2 also assumes KMCC and PRCC are the successful bidders on the tracts and the coal would be mined as previously described. As with the Proposed Action, if another mine acquires the amended tracts as maintenance tracts, the mining rate and/or sequence may differ from the mining plan used in this analysis. However, the impacts of mining the coal would not be expected to be significantly different.

2.4 Alternatives Considered but Not Analyzed in Detail

2.4.1 Alternative 3

Under Alternative 3, BLM would hold separate competitive coal lease sales and issue separate leases to the successful bidders, one or both of whom is not the applicant and who propose(s) to develop a new stand-alone mine on one or both LBA tracts.

Both the Powder River and Thundercloud LBA tracts potentially contain sufficient coal resources that a new mine could be opened on either tract. If one or both competitive coal sales are held, the successful bidder on either tract could potentially be a party other than the applicant who proposes to start a new coal mine.

A new stand alone mine would require considerable initial capital expenses, including the construction of new surface facilities (i.e., offices, shops, warehouses, coal processing facilities, coal loadout facilities, and rail spur), extensive baseline data collection, and development of a mining

and reclamation plan. A company acquiring this coal would have to compete for customers with established mines in a competitive market that is currently characterized by low prices. At this time it is unlikely that these tracts would attract bidders interested in starting new mines. Therefore, Alternative 3 is not being considered by BLM and is not analyzed in detail in this EIS. The environmental impacts of developing a new mine to recover the coal resources in one or both of the LBA tracts would be greater than under the Proposed Action, the No Action Alternative, or Alternative 2 because of the need for new facilities, a new rail line, new employment, and the creation of additional sources of dust and blasting.

2.4.2 Alternative 4

Under Alternative 4, sale of both the Powder River and Thundercloud LBA tracts would be postponed or the sale of one of the tracts would be postponed until PRB coal prices increase. A price increase could potentially increase the fair market value of the coal resources in the LBA tracts, which could increase the bonus bid when the coal is leased.

The Clean Air Act of 1990 includes provisions that encourage the use of low sulfur coal. As a result, PRB coal production has increased by more than 10% annually since 1992. However, an increase in coal prices has not accompanied this increased demand. With the expiration of older contracts with guaranteed prices, and the market shift to spot sales of coal, the average price paid for coal from northeastern Wyoming has decreased by more than \$1.00 per ton since 1992.

There are two major sources of revenue to state and federal governments from the

leasing and mining of federal coal: 1) a bonus bid paid at the time the coal is leased, and 2) a 12.5% royalty collected when the coal is sold. The royalty payment is the larger of the two income sources. Since the royalty payment is collected when the coal is sold, government revenues increase if prices rise. Although postponement of the lease sale until prices rise could conceivably result in higher bonus payments for the tracts, it would not necessarily result in higher royalty payments. It takes several years to lease and permit a coal tract, and coal prices would not necessarily remain high until the coal is actually mined if a sale is postponed until the price increases. If the coal is already leased when prices increase, the company might be able to negotiate longer term contracts at the higher prices. If leasing is delayed too long, adjacent mining operations may be completed. If that occurs, the LBA tracts may only be mineable as new mines. Because of the high cost of starting a new mine, the value of the tracts as new mines may be less than their value as production maintenance tracts.

This alternative was not analyzed in detail because the potential impacts to economic benefits are not predictable and the environmental impacts of mining coal at a later time would be expected to be similar and about equal to the Proposed Action or Alternative 2.

2.5 Comparison of Alternatives

The locations of the Proposed Action and Alternative 2 for the Powder River and Thundercloud LBA Tracts are shown on Figures 2-1 and 2-2. A summary comparison of coal production, surface disturbance, mine life, and projected federal and state revenues for the Proposed Action and Alternatives 1 and 2 for the Powder River LBA Tract and

the Thundercloud LBA Tract are presented in Tables 2-1 and 2-2, respectively.

Table 2-3 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 Jacobs Ranch Mine for comparison to the Thundercloud LBA Tract and completion of mining at the North Antelope and Rochelle Mines for comparison to the Powder River Tract. Table 2-4 presents a comparative summary of cumulative environmental impacts of implementing each alternative. The environmental consequences of the Proposed Action and both alternatives are analyzed in Chapter 4.0.

These summary impact tables are derived from the following explanation of impacts and magnitude. NEPA requires all agencies of the federal government to include, in every recommendation or report on proposals for legislation and other major federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on:

- (i) the environmental impact of the proposed action,
- (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,
- (iii) alternatives to the proposed action,
- (iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and
- (v) 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 judgement 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. Summary Comparison of Coal Production, Surface Disturbance, and Mine Life for Powder River LBA Tract, North Antelope and Rochelle Mines

Item	No Action Alternative (Existing North Antelope/Rochelle Mines)	Added by Proposed Action	Added by Alternative 2
Leased Coal (In place)	1.01 billion tons ¹	515 million tons	532 million tons
Recoverable Coal ^{2, 3}	971 million tons	489 million tons	505 million tons
Lease Acres ³	11,434 acres	4,023.5 acres	4,224.2 acres
Total Area To Be Disturbed	11,948 acres	4,626 acres	4,669 acres
Permit Area ⁴	16,217 acres	6,530 acres	6,530 acres
Average Annual Coal Production	65 million tons	none added (65 million tons)	none added (65 million tons)
Life Of Mine	33 years	7.5 years	7.8 years
Average No. Of Employees	640	220	220
Total Projected State Revenues ⁵	\$1.07 billion	\$538 million	\$555 million
Total Projected Federal Revenues ⁶	\$334 million	\$168 million	\$174 million

¹ Does not include 165 million tons of coal in original lease that were never included in the mine permit due to economic factors.

² Assumes 95% recovery of in-place coal reserves, based on operational experience at the North Antelope and Rochelle Mines.

³ Tons and acres provided for life of mine beginning in 1983 for North Antelope Mine and 1985 for Rochelle Mine.

⁴ Includes combined North Antelope and Rochelle Mine Permit Areas, which overlap. Separately, the two permit areas comprise 18,063 acres.

⁵ Projected revenue to the State of Wyoming assumes the State will receive \$1.10 per ton of coal sold (University of Wyoming 1994). Projection includes estimated income to the State from severance tax, property and production taxes, sales and use taxes, and Wyoming's share of federal royalty payments.

⁶ Federal Revenues based on a \$4.00/ton price x federal royalty of 12.5% x amount of recoverable coal plus bonus payment of 17.8¢/ton based on an average of last 7 LBA's (see Table 1-1) x amount of leased coal less state's 50% share.

Table 2-2. Summary Comparison of Coal Production, Surface Disturbance, and Mine Life for Thundercloud LBA Tract and Jacobs Ranch Mine

Item	No Action Alternative (Existing Jacobs Ranch Mine)	Added by Proposed Action	Added by Alternative 2
Leased Coal (in place)	538 million tons	427 million tons ¹	432 million tons ²
Recoverable Coal ³	484 million tons	384 million tons	389 million tons
Lease Acres	6,955 acres	3,395.9 acres ⁴	3,545.5 acres ⁴
Total Area To Be Disturbed	8,122 acres	3,749 acres ⁵	3,834 acres ⁵
Permit Area	9,198 acres	3,851 acres ⁵	3,851 acres ⁵
Average Annual Coal Production (1997 forward)	27 million tons	8 million tons (to 35 million tons)	8 million tons (to 35 million tons)
Life Of Mine	30 years	11 years	11.1 years
Average No. Of Employees	350	100	100
Total Projected State Revenues ⁶	\$532 million	\$422 million	\$428 million
Total Projected Federal Revenues ⁷	\$169 million	\$134 million	\$136 million

¹ Excludes the 40-acre coal tract in the NW/4 NE/4 of Section 7 owned by ARCO. Includes 11 million tons beneath the railroad right of way and buffer area.

² Excludes the 40-acre coal tract in the NW/4 NE/4 of Section 7 owned by ARCO. Includes 20 million tons beneath the railroad right of way and buffer area.

³ Assumes 90% recovery of in-place coal reserves.

⁴ Excludes the 40-acre coal tract in the NW/4 NE/4 of Section owned by ARCO.

⁵ Includes the 40-acre coal tract in the NW/4 NE/4 of Section 7 owned by ARCO.

⁶ Projected revenue to the State of Wyoming assumes the state will receive \$1.10 per ton of coal sold (University of Wyoming 1994). Projection includes estimated income to the State from severance tax, property and production taxes, sales and use taxes, and Wyoming's share of federal royalty payments.

⁷ Federal revenues based on a \$4.00/ton price x federal royalty of 12.5% x amount of recoverable coal plus bonus payment of 17.8¢/ton based on an average of last 7 LBA's (see Table 1-1) x amount of leased coal less state's 50% share.

Table 2-3. Summary Comparison of Magnitude¹ and Duration of Direct and Indirect Impacts for the Proposed Action, Alternative 2, and the No-Action Alternative for the Powder River and Thundercloud LBA Tracts²

¹ Refer to Section 4.0 and 4.1 for a discussion on magnitude of impacts.
² All impacts are assumed to be adverse unless noted otherwise.

DESCRIPTION OF POTENTIAL IMPACT BY RESOURCE	MAGNITUDE AND DURATION OF IMPACT	NO ACTION ALTERNATIVE	PROPOSED ACTION & ALTERNATIVE 2
RESOURCE NAME			
TOPOGRAPHY & PHYSIOGRAPHY PERMANENT TOPOGRAPHIC MODERATION could result in: Microhabitat reduction Habitat diversity reduction Reduction in water runoff and peak flows Increased precipitation infiltration Wildlife carrying capacity reduction Reduction in erosion Enhanced vegetative productivity Potential acceleration of groundwater recharge	Moderate, long term on existing mine areas Moderate, possibly short term on existing mine areas Moderate, long term on existing mine areas Moderate, beneficial, long term on existing mine areas Moderate, long term on existing mine areas	Same as No Action on expanded mine areas Same as No Action on expanded mine areas	
GEOLOGY AND MINERALS SUBSURFACE changes would result in: Removal of coal Removal and replacement of topsoil and overburden Physical characteristic alterations in geology Loss of coal bed methane	Moderate, short term on existing mine areas Moderate, long term on existing mine areas Moderate, long term on existing mine areas Moderate, permanent on existing mine areas	Same as No Action on expanded mine areas Same as No Action on expanded mine areas Same as No Action on expanded mine areas Same as No Action on expanded mine areas	
SOILS CHANGES IN PHYSICAL PROPERTIES would include: Increased near-surface bulk density More uniformity in soil type, thickness, and texture Increased uniformity in mixed soils (e.g., texture) Decreased soil loss due to topographic modification	Moderate, long term on existing mine areas Moderate, beneficial, long term on existing mine areas Moderate, beneficial, long term on existing mine areas Moderate, beneficial, long term on existing mine areas	Same as No Action on expanded mine areas Same as No Action on expanded mine areas Same as No Action on expanded mine areas Same as No Action on expanded mine areas	
CHANGES IN CHEMICAL PROPERTIES would include: Uniform soil nutrient distribution	Moderate, beneficial, long term on existing mine areas	Same as No Action on expanded mine areas	
CHANGES IN BIOLOGICAL PROPERTIES would include: Organic matter reduction Microorganism population reduction Existing plant habitat reduction in soils stockpiled before placement	Moderate, long term on existing mine areas Moderate, long term on existing mine areas Moderate, long term on existing mine areas	Same as No Action on expanded mine areas Same as No Action on expanded mine areas Same as No Action on expanded mine areas	
AIR QUALITY IMPACTS ASSOCIATED WITH MINING OPERATIONS would include: Elevated concentration levels of TSP Elevated concentrations of gaseous emissions	Negligible, short term on existing mine areas Negligible, short term on existing mine areas	Same as No Action on expanded mine areas Moderate short term on expanded mine areas	

Table 2-3. (cont'd)

DESCRIPTION OF POTENTIAL IMPACT BY RESOURCE	MAGNITUDE AND DURATION OF IMPACT	NO ACTION ALTERNATIVE	PROPOSED ACTION & ALTERNATIVE 2
<p>WATER RESOURCES SURFACE WATER CHANGES IN RUNOFF CHARACTERISTICS AND SEDIMENT DISCHARGE include the following: Disruption of surface drainage systems Increased runoff and erosion rates Increased infiltration Reduction in peak flows</p>	<p>Moderate, short term on existing mine areas Moderate, short term on existing mine areas Moderate, long term on existing mine areas Moderate, long term on existing mine areas</p>	<p>Same as No Action on expanded mine areas Same as No Action on expanded mine areas Same as No Action on expanded mine areas Same as No Action on expanded mine areas</p>	
<p>GROUNDWATER GROUNDWATER RESOURCE IMPACT would include the following: Removal of coal and overburden aquifers Replacement of existing coal and overburden with spoil aquifers Depressed water levels in aquifers adjacent to mines Change in hydraulic properties Change in groundwater quality in backfilled areas</p>	<p>Negligible, short term on existing mine areas Negligible, long term on existing mine areas Moderate, short term on existing mine areas Negligible, long term on existing mine areas Moderate, long term on existing mine areas</p>	<p>Same as No Action on expanded mine areas Same as No Action on expanded mine areas</p>	
<p>ALLUVIAL VALLEY FLOORS While a final determination has not been made by WDEQ/LQD, it is believed that there are no AVF's significant to agriculture on the proposed lease tracts</p>	<p>No impact on existing mine areas</p>	<p>No impact within the expanded mine areas</p>	
<p>WETLANDS Removal of all existing wetlands</p>	<p>Wetlands on existing mine areas would be mined and reclaimed</p>	<p>Same as No Action on expanded mine areas</p>	
<p>VEGETATION PROGRESSIVE REDUCTION IN NATIVE VEGETATION would result in: Increased erosion Wildlife and livestock habitat loss Wildlife habitat carrying capacity loss</p>	<p>Moderate, short term on existing mine areas Moderate, short term on existing mine areas Moderate, long term on existing mine areas</p>	<p>Same as No Action on expanded mine areas Same as No Action on expanded mine areas Same as No Action on expanded mine areas</p>	
<p>AFTER RECLAMATION the following could result: Changes in surface water networks Reduction in vegetation diversity Reduction in shrub density</p>	<p>Negligible, long term on existing mine areas Negligible, long term on existing mine areas Negligible, long term on existing mine areas</p>	<p>Same as No Action on expanded mine areas Same as No Action on expanded mine areas Same as No Action on expanded mine areas</p>	

Table 2-3. (cont'd)

DESCRIPTION OF POTENTIAL IMPACT BY RESOURCE	MAGNITUDE AND DURATION OF IMPACT	NO ACTION ALTERNATIVE	PROPOSED ACTION & ALTERNATIVE 2
RESOURCE NAME			
WILDLIFE			
DURING MINING the following could occur:			
Wildlife displacement	Moderate, short term on existing mine areas	Same as No Action on expanded mine areas	Same as No Action on expanded mine areas
Pronghorn passage reduction	Moderate, short term on existing mine areas	Same as No Action on expanded mine areas	Same as No Action on expanded mine areas
Increased mortality rate to small mammals	Moderate, short term on existing mine areas	Same as No Action on expanded mine areas	Same as No Action on expanded mine areas
Temporary displacement of small mammals	Moderate, short term on existing mine areas	Same as No Action on expanded mine areas	Same as No Action on expanded mine areas
Sage grouse habitat removal	Negligible, short term on existing mine areas	Same as No Action on expanded mine areas	Same as No Action on expanded mine areas
Abandonment of raptor nests	Negligible, short term on existing mine areas	Same as No Action on expanded mine areas	Same as No Action on expanded mine areas
Foraging habitat reduction for raptors	Negligible, short term on existing mine areas	Same as No Action on expanded mine areas	Same as No Action on expanded mine areas
Loss of nesting and foraging habitat for MBHFI	Negligible, short term on existing mine areas	Same as No Action on expanded mine areas	Same as No Action on expanded mine areas
Reduction in waterfowl resting and feeding habitat	Negligible, short term on existing mine areas	Same as No Action on expanded mine areas	Same as No Action on expanded mine areas
Loss of songbird foraging habitat	Moderate, short term on existing mine areas	Same as No Action on expanded mine areas	Same as No Action on expanded mine areas
Temporary wildlife habitat loss	Negligible, short term on existing mine areas	Same as No Action on expanded mine areas	Same as No Action on expanded mine areas
Continued road kills by mine-related traffic	Negligible, short term on existing mine areas	Same as No Action on expanded mine areas	Same as No Action on expanded mine areas
THREATENED, ENDANGERED AND CANDIDATE SPECIES			
MINING IMPACTS could result in the following:			
Loss of black-footed ferret colonies	No impacts on existing mine areas	Same as No Action on expanded mine areas	Same as No Action on expanded mine areas
Loss of bald eagle nesting and foraging habitat	Negligible, short term on existing mine areas	Same as No Action on expanded mine areas	Same as No Action on expanded mine areas
Loss of peregrine falcon nesting and foraging habitat	No impact on existing mine areas	Same as No Action on expanded mine areas	Same as No Action on expanded mine areas
Loss of Ute ladies' tresses orchid habitat	Negligible on existing mine areas	Same as No Action on expanded mine areas	Same as No Action on expanded mine areas
Loss of mountain plover habitat	Negligible on existing mine areas	Same as No Action on expanded mine areas	Same as No Action on expanded mine areas
Loss of swift fox habitat	Negligible on existing mine areas	Same as No Action on expanded mine areas	Same as No Action on expanded mine areas
LAND USE AND RECREATION			
ENVIRONMENTAL CONSEQUENCES ON LAND USE would be:			
Reduction of livestock grazing	Moderate, long term on existing mine areas	Same as No Action on expanded mine areas	Same as No Action on expanded mine areas
Loss of wildlife habitat	Moderate, long term on existing mine areas	Same as No Action on expanded mine areas	Same as No Action on expanded mine areas
Curtailement of oil and gas development	Moderate, long term on existing mine areas	Same as No Action on expanded mine areas	Same as No Action on expanded mine areas
Loss of public land available for recreation activities	Moderate, short term on existing mine areas	Same as No Action on expanded mine areas	Same as No Action on expanded mine areas
Loss of coal bed methane reserves	Moderate, permanent on existing mine areas	Same as No Action on expanded mine areas	Same as No Action on expanded mine areas
CULTURAL RESOURCES			
78 sites not eligible or recommended not eligible for NRHP	Impacts to eligible or unevaluated sites are not permitted; any site eligible for the NRHP would be avoided or mitigated through data recovery	Impacts to eligible or unevaluated sites are not permitted; any site eligible for the NRHP would be avoided or mitigated through data recovery	Impacts to eligible or unevaluated sites are not permitted; any site eligible for the NRHP would be avoided or mitigated through data recovery
1 not eligible for NRHP/recommended for avoidance	any site eligible for the NRHP would be avoided or mitigated through data recovery	Negligible on expanded mine areas	Negligible on expanded mine areas
2 unevaluated	No impacts on existing mine areas	Negligible on expanded mine areas	Negligible on expanded mine areas
6 eligible for NRHP/4 mitigated, 2 pending mitigation	No impacts on existing mine areas	Same as No Action on expanded mine areas	Same as No Action on expanded mine areas
Possible increase in vandalism	No impacts on existing mine areas	Same as No Action on expanded mine areas	Same as No Action on expanded mine areas
Possible increase in unauthorized collecting	No impacts on existing mine areas	Same as No Action on expanded mine areas	Same as No Action on expanded mine areas
NATIVE AMERICAN CONCERNS			
No impact identified on existing mine areas	No impact identified on existing mine areas	Same as No Action on expanded mine areas	Same as No Action on expanded mine areas

Table 2-3. (cont'd)

DESCRIPTION OF POTENTIAL IMPACT BY RESOURCE	MAGNITUDE AND DURATION OF IMPACT	
RESOURCE NAME	NO ACTION ALTERNATIVE	PROPOSED ACTION & ALTERNATIVE 2
PALEONTOLOGICAL RESOURCES Overburden removal could expose fossils for scientific examination	No impact identified on existing mine areas	Same as No Action on expanded mine areas
VISUAL RESOURCES EVIDENT IMPACTS DURING MINING include the following: Alteration of landscape classified by the USFS as "common"	Negligible, short term on existing mine areas	Same as No Action on expanded mine areas
IMPACTS FOLLOWING RECLAMATION could be: Smoother sloped terrain Reduction in sagebrush density	Negligible, long term on existing mine areas Negligible, short term on existing mine areas	Same as No Action on expanded mine areas Same as No Action on expanded mine areas
NOISE INCREASED NOISE LEVELS could effect: Nearby occupied dwellings Wildlife in immediate vicinity	Negligible, short term on existing mine areas Negligible, short term on existing mine areas	Same as No Action on expanded mine areas Same as No Action on expanded mine areas
TRANSPORTATION FACILITIES Increase in duration that coal is shipped on railroads and employees travel on highways by 8-9 years Relocation of pipelines Relocation of utility lines	No impact on existing mine areas No impact on existing mine areas No impact on existing mine areas	Negligible, short term on expanded mine areas Negligible, short term on expanded mine areas Same as No Action on expanded mine areas
SOCIOECONOMICS INCREASE IN SOCIOECONOMICS could increase the following: Employment (Increase of up to 320 jobs in expanded mine areas is expected) Revenues from royalties and taxes to the state government Revenues from royalties and taxes to the federal government Economic development Population in Campbell and Converse counties	No impact on existing mine areas No impact on existing mine areas	Moderate, beneficial, short term on expanded mine areas Moderate, beneficial, short term on expanded mine areas Moderate, beneficial, short term on expanded mine areas Moderate, beneficial, long term on expanded mine areas Moderate, beneficial, short term on expanded mine areas

Table 2-4. Summary Comparison of Magnitude and Duration of Cumulative Impacts¹

¹ Refer to Section 4.5 for a discussion of cumulative impacts.

<i>DESCRIPTION OF POTENTIAL IMPACT BY RESOURCE</i>	<i>MAGNITUDE TYPE AND DURATION OF IMPACT</i>	<i>PROPOSED ACTION & ALTERNATIVE 2</i>
<i>RESOURCE NAME</i>	<i>NO ACTION ALTERNATIVE</i>	
TOPOGRAPHY & PHYSIOGRAPHY REDUCED RELIEF AND SUBDUED TOPOGRAPHY could result in: Reduction in topographic diversity Increased precipitation infiltration Biodiversity reduction Big game carrying capacity reduction	Negligible, long term on existing mine areas Negligible, long term on existing mine areas Negligible, long term on existing mine areas Negligible, long term on existing mine areas	Same as No Action on expanded mine areas Same as No Action on expanded mine areas Same as No Action on expanded mine areas Same as No Action on expanded mine areas
GEOLOGY AND MINERALS RECOVERY OF COAL would result in: Stabilization of municipal, county and state economies	Significant, beneficial, short term on existing mine areas	Same as No Action on expanded mine areas
SOILS RECLAIMED SOILS could result in: Increased soil productivity Reduced erosion	Negligible, long term on existing mine areas Negligible, long term on existing mine areas	Same as No Action on expanded mine areas Same as No Action on expanded mine areas
AIR QUALITY IMPACTS ASSOCIATED WITH MINING OPERATIONS would include: Elevated concentration levels of TSP Elevated concentrations of gaseous emissions	Negligible, short term on existing mine areas Negligible, short term on existing mine areas	Same as No Action on expanded mine areas Same as No Action on expanded mine areas
WATER RESOURCES SURFACE WATER IMPACTS TO SURFACE WATER could result in: Temporary reduction in soil infiltration rates and increased runoff	Negligible, short term on existing mine areas	Same as No Action on expanded mine areas
GROUNDWATER IMPACTS ON GROUNDWATER could result in: Replacing coal and overburden aquifers with spoil aquifers Drawdown in the coal and shallower aquifers in surrounding areas Water-level decline in the sub-coal Fort Union Formation Change in groundwater quality as a result of mining	Negligible, long term on existing mine areas Negligible, short term on existing mine areas Negligible to moderate, short term on existing mine areas Negligible, long term on existing mine areas	Same as No Action on expanded mine areas Same as No Action on expanded mine areas Same as No Action on expanded mine areas Same as No Action on expanded mine areas
ALLUVIAL VALLEY FLOORS	No cumulative impacts anticipated on existing mine areas	No cumulative impacts anticipated on expanded mine areas
WETLANDS Removal of existing wetlands	Wetlands on existing mine areas would be mined and reclaimed	Same as No Action on expanded mine areas
VEGETATION SURFACE DISTURBANCE would result in: Loss of common native vegetation types for wildlife Regional loss of vegetative diversity	Negligible, short term on existing mine areas Negligible, long term on existing mine areas	Negligible, short term on expanded mine areas Negligible, long term on expanded mine areas

Table 2-4. (cont'd)

DESCRIPTION OF POTENTIAL IMPACT BY RESOURCE	MAGNITUDE TYPE AND DURATION OF IMPACT	PROPOSED ACTION & ALTERNATIVE 2
RESOURCE NAME	NO ACTION ALTERNATIVE	
<p>WILDLIFE IMPACTS ON WILDLIFE FROM SURFACE MINING could result in: Loss of pronghorn habitat Mule deer and white tail deer population reduction Reduction in raptor nesting sites and foraging habitat Reduction in sage grouse leks Loss of nesting and foraging habitat for MBHFI Reduction in waterfowl habitat Permanent reduction in wildlife habitat diversity Permanent reduction in some wildlife carrying capacity</p>	<p>Moderate, short term on existing mine areas Negligible, short term on existing mine areas Minor, short term on existing mine areas Major, long term on existing mine areas Major, long term on existing mine areas</p>	<p>Same as No Action on expanded mine areas Same as No Action on expanded mine areas</p>
<p>THREATENED, ENDANGERED AND CANDIDATE SPECIES No significant cumulative impacts to T & E species are projected</p>	<p>Negligible, short term on existing mine areas</p>	<p>Same as No Action on expanded mine areas</p>
<p>LAND USE AND RECREATION IMPACTS ON LAND USE could result in: Loss of agricultural production Disruption of oil and gas development/production Reduction of wildlife habitat</p>	<p>Moderate, short term on existing mine areas Moderate to significant, short term on existing mine areas Moderate, short term on existing mine areas</p>	<p>Same as No Action on expanded mine areas Same as No Action on expanded mine areas Same as No Action on expanded mine areas</p>
<p>IMPACTS ON RECREATION could result in: Loss of access to public lands used by recreationists, particularly hunting</p>	<p>Moderate, short term on existing mine areas</p>	<p>Same as No Action on expanded mine areas</p>
<p>CULTURAL RESOURCES</p>	<p>Sites eligible for NRHP would be mitigated on existing mine areas</p>	<p>Same as No Action on expanded mine areas</p>
<p>NATIVE AMERICAN CONCERNS</p>	<p>No impact identified on existing mine areas</p>	<p>Same as No Action on expanded mine areas</p>
<p>PALEONTOLOGICAL RESOURCES</p>	<p>No impact identified on existing mine areas</p>	<p>Same as No Action on expanded mine areas</p>
<p>VISUAL RESOURCES Impacts on visual resources by mining activities</p>	<p>Moderate, short term on existing mine areas</p>	<p>Same as No Action on expanded mine areas</p>
<p>NOISE</p>	<p>No impact anticipated outside of existing mine areas</p>	<p>Same as No Action outside expanded mine areas</p>
<p>TRANSPORTATION FACILITIES Continued use of existing transportation facilities</p>	<p>No additional transportation impacts anticipated</p>	<p>Negligible, short term on expanded mine areas</p>
<p>SOCIOECONOMICS IMPACTS ON SOCIOECONOMICS could include: Mineral and energy related development Employment Housing market Economic development Revenues and royalties</p>	<p>Moderate, beneficial, short term on existing mine areas Significant, beneficial, short term on existing mine areas Significant, short term due to existing mines Significant, beneficial, short term due to existing mine areas Significant, beneficial, short term due to existing mine areas</p>	<p>Same as No Action on expanded mine areas Same as No Action on expanded mine areas</p>