

## **2.0 PROPOSED ACTION AND ALTERNATIVES**

This chapter describes the Proposed Action and alternatives to this action for each of the six Lease by Application (LBA<sup>1</sup>) tracts being evaluated in this EIS. The six LBA tracts are the North Hilight Field, South Hilight Field, West Hilight Field, and West Jacobs Ranch LBA Tracts as applied for by Ark Land Company (ALC), and the North Porcupine and South Porcupine LBA Tracts as applied for by BTU Western Resources, Inc. (BTU).

For each tract, the Proposed Action is to hold a separate competitive lease sale and issue a separate lease for the federal coal lands included in the tract as applied for by the applicant. Under each Proposed Action, the tract as applied for would be offered for lease at one competitive sealed bid lease sale, subject to standard and special lease stipulations developed for the Powder River Basin (PRB) and that tract. The boundaries of each tract would be consistent with the tract configuration proposed by each applicant. Figures 2-1 through 2-6 show the North Hilight Field, South Hilight Field, West Hilight Field, West Jacobs Ranch, North Porcupine, and South Porcupine LBA Tracts, respectively, under each Proposed Action. In each case, the Proposed Action assumes that the applicant would be the successful bidder on each tract, and that the tract would be mined as a maintenance lease for an existing mine.

The National Environmental Policy Act of 1969 (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” 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.

The No Action Alternative (Alternative 1) for each tract considered in this Environmental Impact Statement (EIS) is to reject the lease application. Under the No Action Alternative, a tract would not be offered for competitive sale, and the coal contained within the tract would not be mined as proposed. Rejection of an application would not affect currently permitted mining activities on existing leases at any of the applicant mines, and selection of the No Action Alternative would not preclude an application to lease any rejected tract in the future. Portions of the surface of each LBA tract would probably be disturbed due to overstripping to allow coal to be removed from the adjacent existing leases.

The Bureau of Land Management (BLM) Competitive Coal Leasing Manual (BLM Manual 3420-1) requires BLM to evaluate modifying the configuration of

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<sup>1</sup> Refer to page xxvii for a list of abbreviations and acronyms used in this document.

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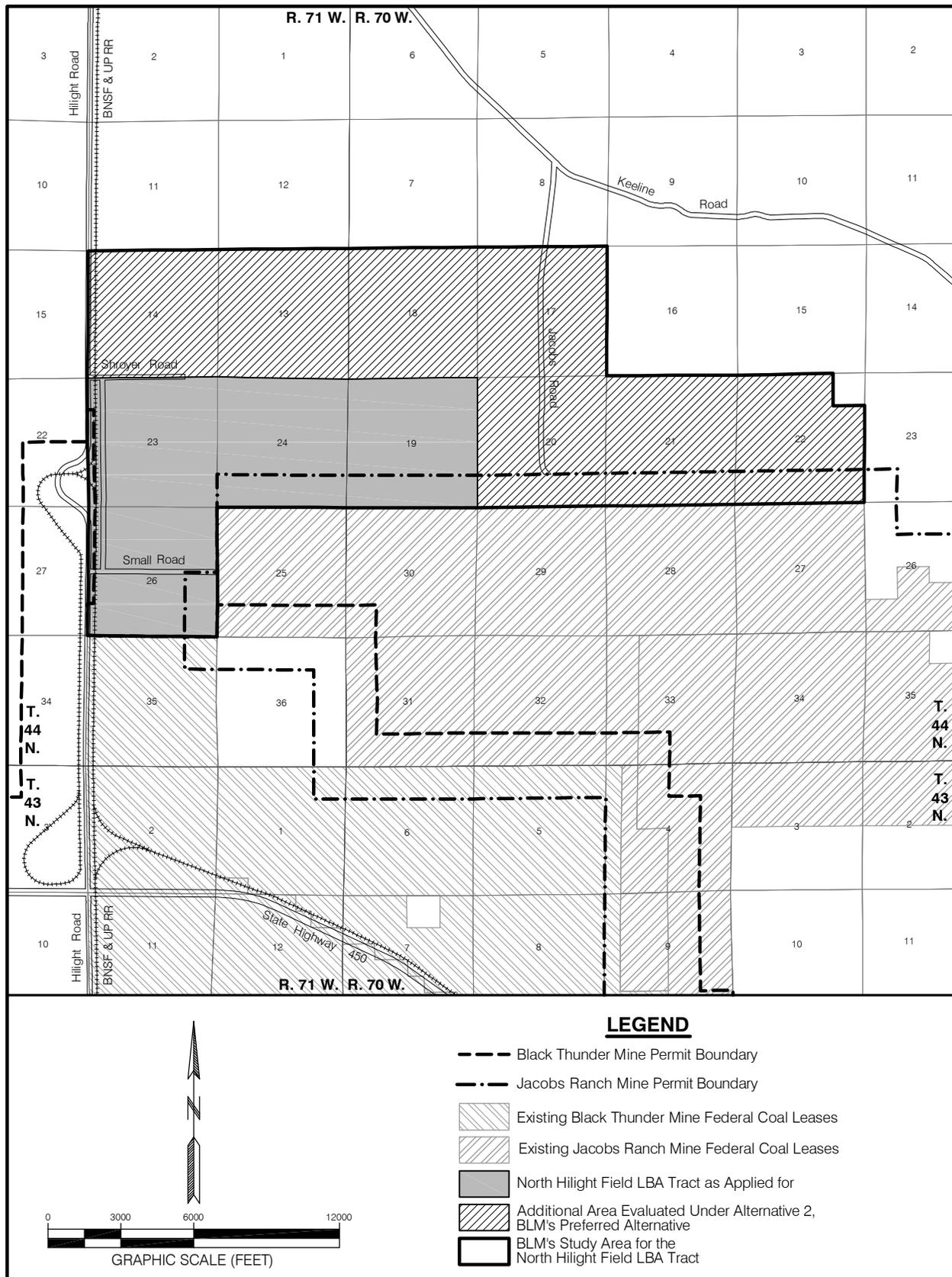


Figure 2-1. North Hilight Field LBA Tract Alternatives.

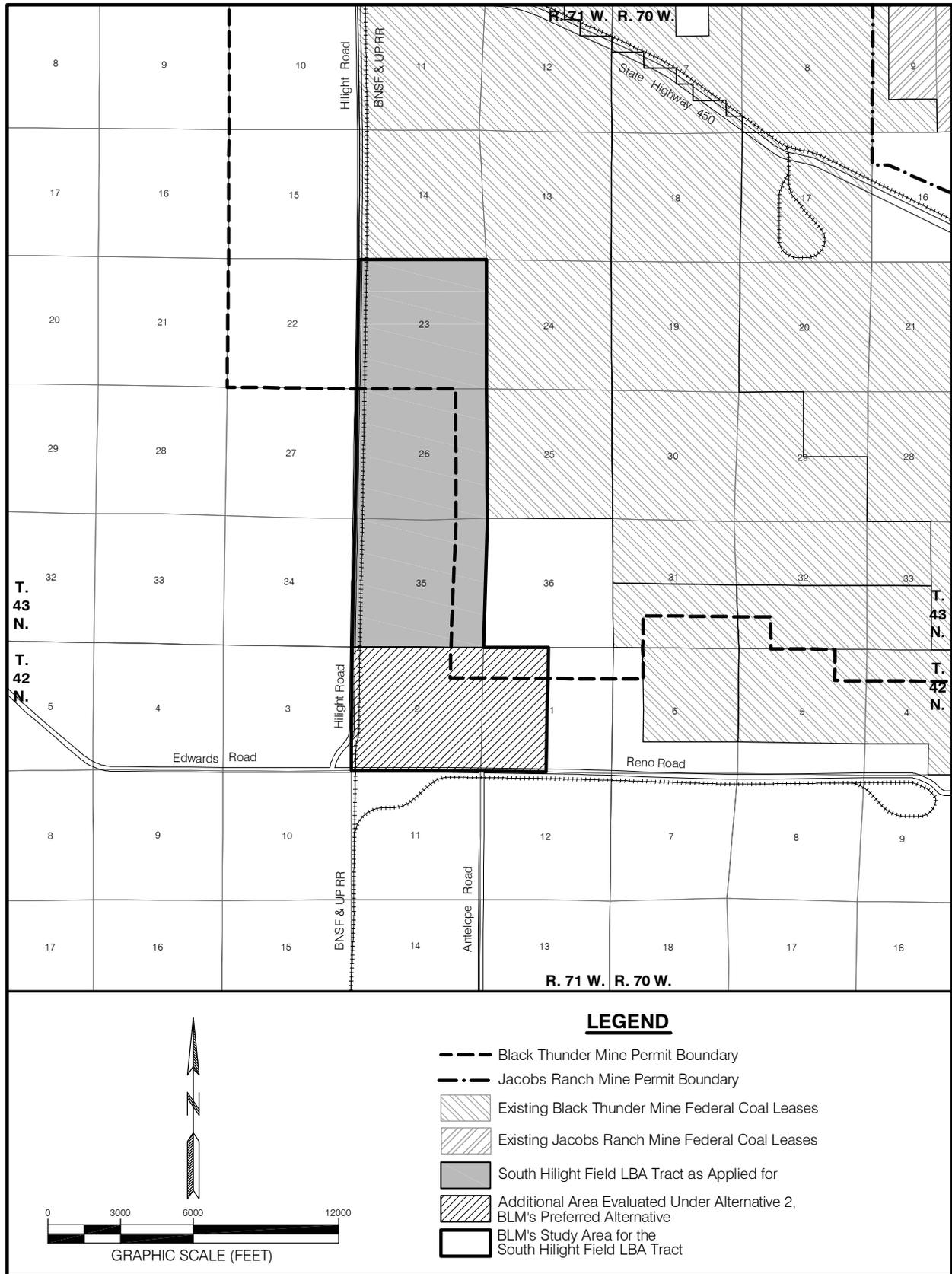


Figure 2-2. South Hilight Field LBA Tract Alternatives.

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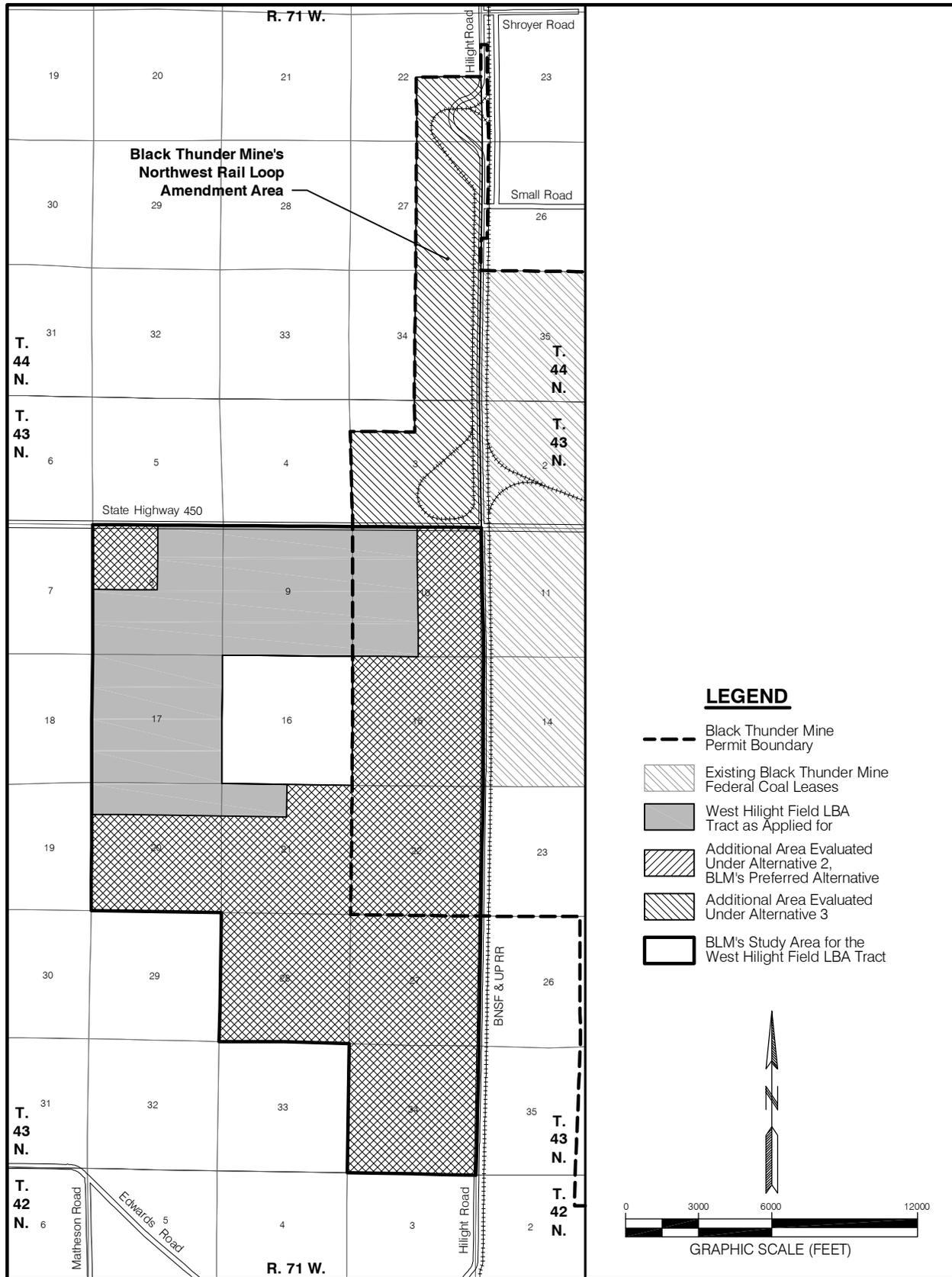


Figure 2-3. West Hilight Field LBA Tract Alternatives.

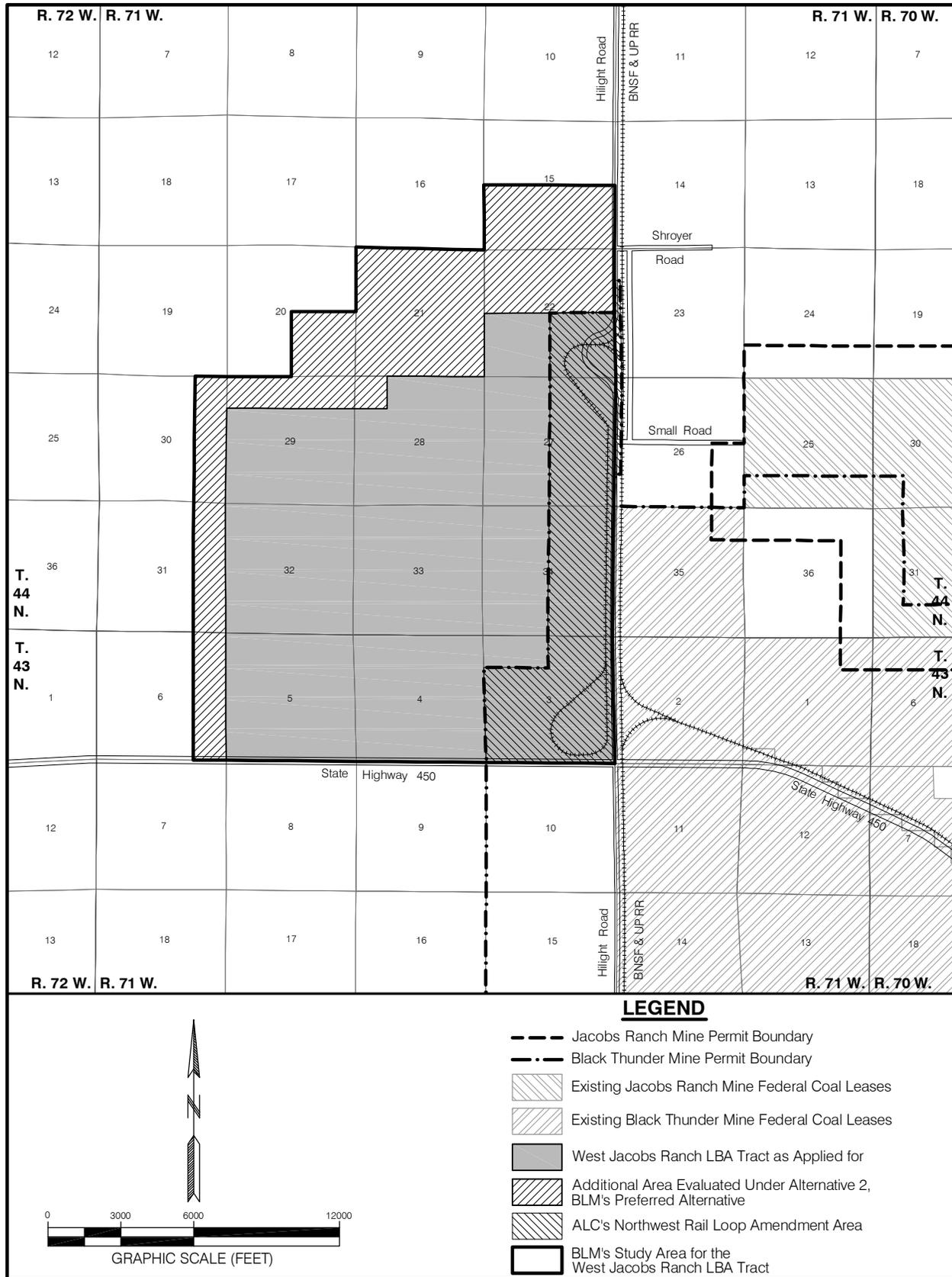


Figure 2-4. West Jacobs Ranch LBA Tract Alternatives.

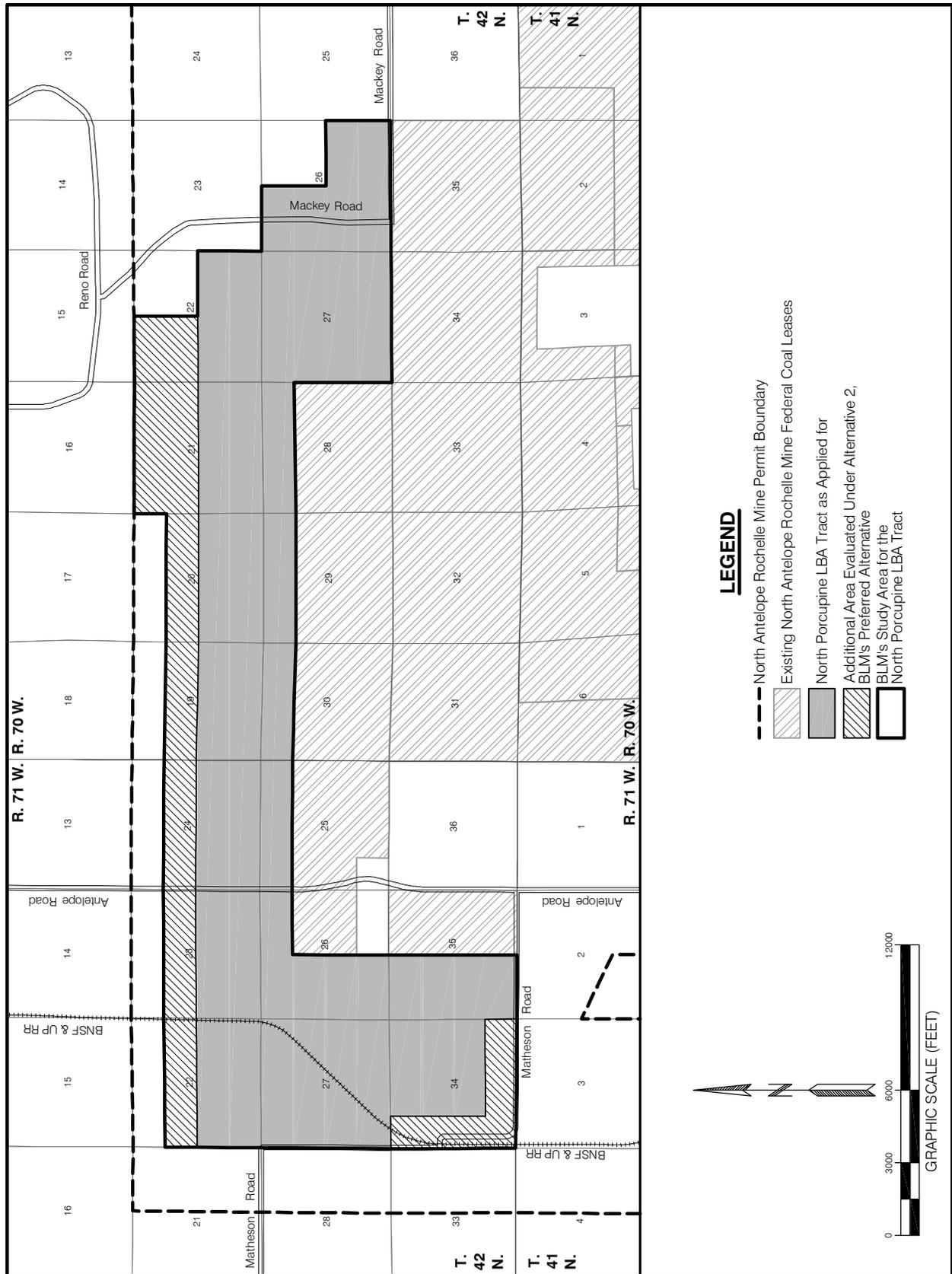


Figure 2-5. North Porcupine LBA Tract Alternatives.

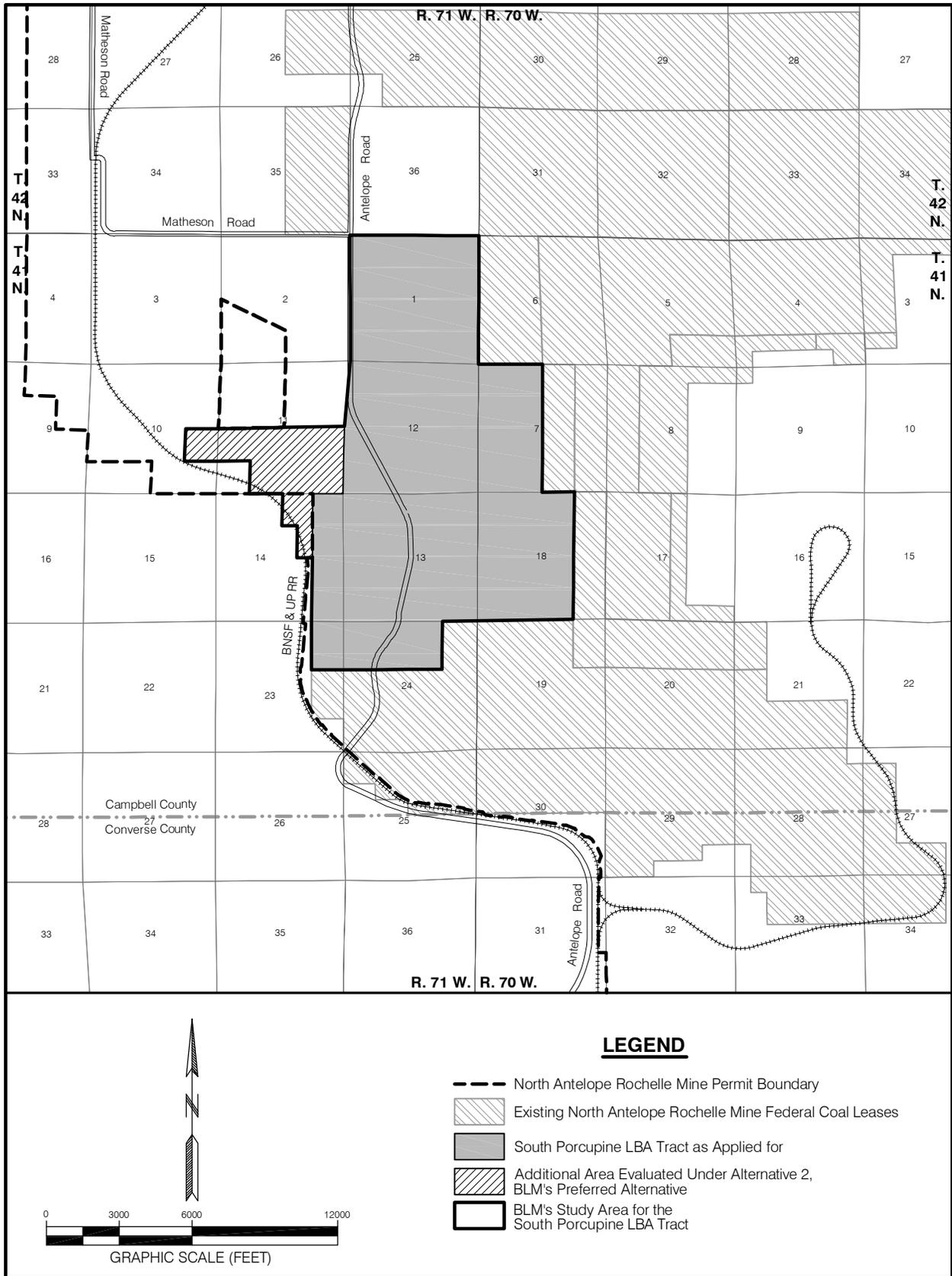


Figure 2-6. South Porcupine LBA Tract Alternatives.

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federal coal tracts 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. For NEPA purposes, BLM identifies alternate tract configurations and evaluates them as alternatives to the Proposed Action. BLM has identified a study area for each LBA tract that includes each tract as applied for and adjacent unleased federal coal. Figures 2-1 through 2-6 show these study areas for the North Hilight Field, South Hilight Field, West Hilight Field, West Jacobs Ranch, North Porcupine, and South Porcupine LBA Tracts, respectively. BLM is evaluating these study areas for the purpose of identifying potential alternate tract configurations to the Proposed Action that would be technically, economically, or environmentally preferable to the Proposed Action.

The Leasing on Application regulations at 43 CFR 3425.1-9 state that: “The authorized officer may add or delete lands from an area covered by an application for any reason he/she determines to be in the public interest.” Accordingly, in evaluating alternate tract configurations, BLM could either increase or decrease the size of each tract as applied for.

The potential tract configurations, and therefore the potential number of alternatives evaluated for NEPA purposes, can vary for each tract. In this EIS, one alternative, Alternative 2, is evaluated in addition to the Proposed Action and Alternative 1 (the No Action Alternative) for all of the tracts considered in this EIS. Under Alternative 2 for each tract, BLM is evaluating adding all or part of the BLM study area to the tract as applied for and/or reducing the size of the tract as applied for. For only the West Hilight Field LBA Tract, another alternative, Alternative 3, is evaluated in detail in this EIS in addition to the Proposed Action, Alternative 1, and Alternative 2. Under Alternative 3 for the West Hilight Field tract, BLM is evaluating adding all or part of the BLM study area and all or part of Thunder Basin Coal Company’s (TBCC’s) permitted Northwest Rail Loop Amendment Area (Figure 2-3). One competitive sealed bid sale would be held for each tract as configured by BLM.

Two alternatives were considered but not analyzed in detail. They are:

- holding a competitive lease sale and issuing a lease for federal coal lands included in one or more of the LBA tracts (as applied for or as modified by BLM), with the assumption that one or more of the tracts would be developed as a new mine (see Section 2.7.1), and
- delaying the sale of one or more of the LBA tracts as applied for in order to take advantage of higher coal prices and/or to allow recovery of the potential coal bed natural gas (CBNG) resources in the tract prior to mining. Under this alternative, it is assumed that one or more of the tracts could be developed later as a maintenance tract or a new mine start, depending on how long the sale was delayed (see Section 2.7.2).

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 a tract is offered for lease, the applicant for that tract may or may not be the high bidder when the lease sale is held. For each tract, the Proposed Action and Alternative 2 or Alternative 3 considered in this EIS assume that the applicant that applied for the tract would be the successful bidder if the federal coal included in the tract is offered for lease, and that each tract would be mined as a maintenance tract for an existing permitted mine.

If a decision is made to hold a competitive lease sale for a tract of federal coal and a lease is issued, the lessee must obtain a permit to conduct coal mining operations before mining can begin on the tract. As discussed in Chapter 1, Section 1.3, this permit application would undergo detailed review by state and federal agencies as part of the approval process. The detailed permit application for each tract could potentially differ from the more general mining plan used in this EIS to analyze the impacts of the Proposed Action and Alternative 2 or Alternative 3 for each tract, but the differences would not be expected to substantially change the impacts described here. These differences would typically be related to the details of mining and reclaiming each tract but major factors, like the approximate number of tons of coal to be mined and yards of overburden to be removed, the acres disturbed, etc., would not be substantially different from the plans used in this analysis.

If any of the tracts are leased under the Proposed Action or Alternative 2 or 3 for each tract, it is 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 construction of flood control and sediment control structures. This is referred to as the “general analysis area” for that tract. The Proposed Action and Alternative 2 or Alternative 3 for each LBA tract will be referred to collectively as the Action Alternatives.

For the Action Alternatives, future coal production rates are difficult to predict since mines must vary rates in response to the demand and competition for coal sales. BLM estimated future production rates for the purpose of estimating cumulative impacts. This was done as part of the Powder River Basin Coal Review - Task 2 Report - Past and Present and Reasonably Foreseeable Development Activities (BLM 2005a). The production estimates were based on forecasted coal demand for Wyoming PRB coal through the year 2020, and production rates were allocated to the three mine groups in the basin (Wright Area, South Gillette Area, and North Gillette Area) as constrained by production capacity. The Wright Area mines include the Antelope Mine as well as the three mines with the six LBA tracts addressed in this EIS (Figure 1-1). For this mine group, production was forecasted to reach somewhere between 291 million tons (lower range) to 307 million tons (upper range) per year by 2020. Mining company estimates from this EIS, as well as the West Antelope II EIS (BLM 2008d), total 306 million tons per year (mmtpy) by 2020.

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The sum of the company projections is near the upper range of the forecasted Wright Area production rate. In addition, a fifth mine has been proposed in the Wright Area mine group. The proposed School Creek Mine has not been permitted at this time; however, if School Creek Mine opens, it will compete for a portion of the coal expected to be produced from this mine group, in response to demand and competition with other mines.

### **2.1 North Hilight Field LBA Tract**

#### 2.1.1 North Hilight Field LBA Tract Proposed Action

Ark Land Company (ALC) has filed an application for two separate LBA tracts (North Hilight Field and South Hilight Field). Each tract will be evaluated separately and if a decision is made to lease both of these tracts, a separate competitive lease sale will be held for each tract.

Under the Proposed Action for the North Hilight Field LBA Tract, the tract as applied for by ALC would be offered for lease at a sealed-bid, competitive lease 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 configuration proposed in the North Hilight Field lease application (Figure 2-1). The Proposed Action assumes that ALC would be the successful bidder on the North Hilight Field LBA Tract, if it is offered for sale.

The legal description of the proposed North Hilight Field LBA Tract coal lease lands as applied for by ALC under the Proposed Action is as follows:

<u>T.44N., R.70W., 6<sup>th</sup> PM, Campbell County, Wyoming</u>	
Section 19: Lots 5 through 20;	656.88 acres
<u>T.44N., R.71W., 6<sup>th</sup> PM, Campbell County, Wyoming</u>	
Section 23: Lots 1 through 16;	653.11 acres
Section 24: Lots 1 through 16;	653.44 acres
Section 26: Lots 1 through 16;	650.07 acres
Total:	<u>2,613.50 acres</u>

Land descriptions and acreage are based on the BLM Status of Public Domain Land and Mineral Titles approved Master Title Plats as of August 30, 2005 and September 7, 2007 and Coal Plats as of September 7, 2007. The coal estate included in the tract described above is federally owned. The ownership of the surface and oil and gas estates is discussed in Section 3.11.

Some of the coal in the above-described lands in the North Hilight Field LBA Tract is not currently considered by TBCC, operator of the Black Thunder Mine, to be mineable due to the presence of the Burlington Northern Santa Fe & Union Pacific (BNSF & UP) rail line, which borders the western side of the tract (Figure 2-1). The coal underlying the BNSF & UP railroad right-of-way

(ROW) and an associated 100-foot buffer zone is not considered by TBCC to be mineable at this time because the cost that would be associated with moving the railroad tracks would make it economically unfeasible to recover the underlying coal. Although the federal coal underlying the railroad ROW and associated buffer zone would not be mined, it is included in the tract because it would allow maximum recovery of the mineable coal adjacent to but outside of the railroad ROW and its associated buffer zone and comply with the coal leasing regulations that do not allow leasing of less than 10-acre aliquot parts.

Also, some of the coal in the above-described lands in the North Hilight Field LBA Tract is overlain by the Shroyer Road (County Road 116), which borders the North Hilight Field LBA Tract (Figure 2-1). The Surface Mining Control and Reclamation Act of 1977 (SMCRA) prohibits surface mining operations on lands within 100 feet of the outside line of the ROW for a public road (SMCRA Section 522(e)(4) and 30 CFR 761.11(d)). Some of the coal in the above-described lands in the North Hilight Field LBA Tract is also within 100 feet of the Hilight Road (Campbell County Road 52) ROW. However, because the Hilight Road lies parallel and adjacent to the BNSF & UP rail line (Figure 2-1), the 100-foot buffer zone associated with the railroad ROW actually extends farther east and overlies more coal within the North Hilight Field LBA Tract than the 100-foot buffer zone associated with the Hilight Road ROW. The coal that is underlying the Shroyer Road, its ROW, and associated 100-foot buffer zone, and the coal that is within 100 feet of the Hilight Road ROW has been determined to be unsuitable for mining in accordance with SMCRA and as specified under Unsuitability Criterion 3 (43 CFR 3461).

There is an exception to this prohibition in the regulations at SMCRA Section 522(e)(4) and 30 CFR 761.11(d)(2), which can be applied if the appropriate road authority (Campbell County Board of Commissioners) allows the public roads to be relocated or closed after public notice, an opportunity for a public hearing, and a finding that the interests of the affected public and landowners will be protected. The Small Road (Campbell County Road 89) also overlies the North Hilight Field LBA Tract (Figure 2-1); however, it has been vacated by the Campbell County Commissioners. If TBCC obtains approval from the Campbell County Board of Commissioners to move the Shroyer Road, the exception to the prohibition on mining within the public road ROW and buffer zone could be applied and the unsuitability determination could be reconsidered. In that case, TBCC would be able to recover the coal underlying the county road ROW and its associated buffer zone. TBCC would not need to consider moving the Hilight Road for the reason explained above. If TBCC does not obtain approval to move or close the Shroyer Road, the coal underlying its ROW and associated buffer zone would remain unsuitable for mining and would not be recovered.

The federal coal underlying the Shroyer Road, its ROW and associated 100-foot buffer zone is included in the tract because it would allow maximum recovery of all the mineable coal adjacent to but outside of the road ROW and associated buffer zone if the road is not moved; it would also allow recovery of the coal under the road if it is moved or closed. If a lease is issued for this tract, a

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stipulation will be attached to the lease stating that no mining activity may be conducted in the portions of the lease within the ROW and buffer zone for the Shroyer Road and Hilight Road unless approval is obtained from the appropriate authority to move or close the road.

TBCC estimates that the North Hilight Field LBA Tract as applied for includes approximately 319.7 million tons of in-place coal. If the Shroyer Road is not moved or closed, and considering the coal underlying the BNSF & UP railroad ROW and buffer zone, TBCC estimates that the North Hilight Field LBA Tract as applied for contains approximately 286.3 million tons of mineable coal reserves. Based on historical recovery practices, TBCC assumes that about 92 percent of that coal, or approximately 263.4 million tons of coal, would be recovered from the North Hilight Field LBA Tract as applied for. If they acquire the tract and if the county road is not moved or closed, a total of 1,499.8 million tons of coal would be mined after January 1, 2008, with an estimated 263.4 million tons coming from the LBA tract. Based upon this estimate of recoverable reserves, about 17.6 percent of the in-place coal reserves included within the LBA tract would not be recovered under normal mining practices and due to the presence of the unmineable reserves within the railroad and public road ROWs and associated buffer zones. If the Shroyer Road is moved or closed, TBCC estimates that an additional 9.5 million tons of coal would be mineable in the North Hilight Field LBA Tract as applied for.

The North Hilight Field LBA Tract would be mined as an integral part of the Black Thunder Mine under the Proposed Action. Since the North Hilight Field LBA Tract would be an extension of the existing Black Thunder Mine, the facilities and infrastructure would be the same as those identified in the Wyoming Department of Environmental Quality/Land Quality Division (WDEQ/LQD) Mine Permit 233 Term T7, approved November 1, 2005 and the BLM Resource Recovery and Protection Plan (R2P2), which was approved December 12, 2006.

Black Thunder Mine's currently approved air quality permits (Permit Numbers MD-417A, MD-877, MD-1178, MD-1555, MD-6824, and MD-3851) from the Wyoming Department of Environmental Quality/Air Quality Division (WDEQ/AQD) allow up to 135 million tons of coal per year to be mined. The Black Thunder Mine produced:

- 62.6 million tons of coal in 2003,
- 66.8 million tons of coal in 2004,
- 62.7 million tons of coal in 2005,
- 67.3 million tons of coal in 2006,
- 65.3 million tons of coal in 2007, and
- 67.4 million tons of coal in 2008

(Wyoming Department of Employment 2003, Shamley 2008a and 2010).

As of December 31, 2008, a total of approximately 1,087.9 million tons of coal had been mined from within the current permitted area of the mine.

TBCC estimates an average annual coal production rate of 100 mmtpy after 2008 for the Black Thunder Mine, increasing to an average of 135 mmtpy by 2015. If ALC acquires the North Hilight Field LBA Tract as applied for, a total of approximately 1,432.8 million tons of coal would be recovered from the existing leases and the North Hilight Field LBA Tract after January 1, 2009, with an estimated 263.4 million tons coming from the LBA tract, as discussed above. With the North Hilight Field LBA Tract, coal production at the Black Thunder Mine would continue for approximately 11.3 years beyond 2008. The LBA tract accounts for approximately 2 years of the mine life extension.

BLM independently evaluates the volume and average quality of the coal resources included in proposed LBA tracts as part of the fair market value determination process. BLM's estimate of the mineable federal coal reserves and average quality of the coal included in the tract may not be in agreement with the mineable coal reserve and coal quality estimates provided by the applicant. BLM's estimate of the mineable federal coal 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.

Prior to disturbance and in advance of mining, mine support structures such as roads, power lines, substations, and flood and sediment control measures would be built as needed, and any public utility lines and oil and gas pipelines would be relocated as necessary.

The first step of the mining process is soil salvage with suitable heavy equipment, such as rubber-tired scrapers. During initial pit development, soil is placed in temporary stockpiles for later use in final pit closure and reclamation. Whenever possible, direct haulage of soil from salvage areas 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 again would be used to haul and redistribute the stockpiled topsoil on regraded areas.

The Black Thunder Mine is one of several mines currently operating in the PRB where the coal seams are notably thick and the overburden is relatively thin. Mining would be conducted in three separate pits identified as the North Pit, West Pit, and South Pit. After soil salvage operations are complete, blast holes are drilled down through the overburden to the top of the upper-most mineable coal seam. The drill holes are then loaded with explosives (a mixture of ammonium nitrate and fuel oil, or ANFO) and detonated to fragment the overburden to facilitate efficient excavation. Overburden removal has been and would continue to be conducted primarily with draglines, trucks and shovels, and/or direct cast blasting. Other equipment used during overburden removal and backfilling includes dozers, scrapers, excavators, front-end loaders, graders, and water trucks. Exposed coal seams have been and would continue to be cleaned with a dozer, drilled and blasted to facilitate efficient excavation, and then loaded into haul trucks for transport to the coal crushing and storage facilities.

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The design of the Black Thunder Mine seeks to confine disturbance to the active mine blocks. As overburden is removed, most would be directly placed into the previous empty pit where coal has been removed.

Chapter 4, Section 2(b)(i) of the WDEQ/LQD Coal Rules requires that rough backfilling and grading follow coal removal as closely as possible based on the mining conditions (WDEQ/LQD 2009). Replaced (backfilled) overburden is graded to approximate the original land surface contour, as required by WDEQ and the Office of Surface Mining Reclamation and Enforcement (OSM) rules. Elevations consistent with the approved post-mining topography (PMT) plan are established as quickly as possible to reconstruct a stable landscape and restore drainage. Under certain conditions, the PMT may not be immediately achievable. This occurs when there is an excess of material that 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. Backfilled and recontoured overburden is sampled and analyzed to verify suitability as subsoil. Should unsuitable backfill materials be encountered (i.e., material that is not suitable for use in reestablishing vegetation or that may affect groundwater quality due to high concentrations of certain constituents, such as selenium or adverse pH levels), mitigation by additional soil depth, excavation and burial, or other special handling to remove them from the root zone would occur. Prior to soil distribution, regraded backfill is scarified to relieve compaction. Soil is redistributed on recontoured backfill using rubber-tired scrapers or haul trucks, dozers and blades. Once a seedbed has been formed, the reclaimed areas are revegetated using native grasses, forbs, and shrubs that are consistent with the postmining land use. According to the most recent OSM evaluation of the Wyoming coal mining industry, the reclamation to disturbance ratio in 2008 was approximately 86 percent (4,703 acres reclaimed vs. 5,497 acres disturbed) (OSM 2009).

Coal would be produced from two mineable seams within the North Hilgert Field LBA Tract. TBCC refers to these seams as the Upper Wyodak (upper/rider seam) and the Middle Wyodak (main seam), which are separated by a shale parting that has an average thickness of approximately 1 foot. The Upper Wyodak seam averages 13 feet thick and the Middle Wyodak seam averages 48 feet thick. A third seam, the Lower Wyodak (basal seam), is not present over the entire tract. Coal would be mined at several working pit 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. Mining efficiency and air quality protection are and would continue to be facilitated by extensive use of near-pit crushers and overland conveyors.

Coal would be loaded with electric-powered shovels or hydraulic excavators into off-highway haul trucks for transport to crushing facilities. Coal haul roads would be temporary structures built within the mine areas. All coal transfer location points and crushing operations are controlled by baghouse-

type dust collectors, dry foggers, or passive enclosure control systems (PECs). The truck dumping operations use stilling sheds to control fugitive dust and the overland conveyor is covered by a dust hood.

There are currently four existing crushing facilities, four existing silos, and a slot storage facility within the permit area that provide capacity to produce at the permitted level. New coal processing facilities and a new train loadout have been constructed within TBCC's Northwest Rail Loop Amendment Area (refer to Section 2.3.4 for a description of this area), will improve operating efficiency and air quality protection. The new Thundercloud near-pit crusher/conveyor systems would be used if ALC acquires the North Hilight Field LBA Tract.

Full-time employment at the Black Thunder Mine is currently 1,080. If the mine increases production as estimated, employment would grow to 1,324 by 2013. If ALC acquires the North Hilight Field LBA Tract under the Proposed Action, they anticipate that Black Thunder Mine's employment would remain at 1,324 for the additional 2 years that it would take to mine the coal included in the tract.

As discussed in Chapter 1, the North Hilight Field LBA Tract is adjacent to existing leases at both the Black Thunder and Jacobs Ranch mines, but is not adjacent to any of the other mines in this area, (Figure 1-1). If a company other than ALC was to acquire the tract, the rate of coal production, mining sequence, equipment, and facilities could be different than if ALC acquired the tract as a maintenance lease, as described above. However, the area of disturbance and the impacts of removing the coal would not be substantially different from the area of disturbance and the impacts of ALC mining the tract.

### 2.1.2 North Hilight Field LBA Tract Alternative 1

Under the North Hilight Field LBA Tract Alternative 1, the No Action Alternative, ALC's application to lease the coal included in the North Hilight Field LBA Tract would be rejected. The tract would not be offered for competitive sale at this time, and the coal included in the tract would not be mined.

Rejection of the application would not affect permitted mining activities nor employment on the existing leases at the Black Thunder Mine. The Black Thunder Mine currently leases approximately 19,581.3 acres of federal coal, 41.9 acres of private coal, and 2,792.9 acres of state coal, all of which are within the existing Black Thunder Mine permit boundary. A total of approximately 26,490.2 acres will eventually be affected in mining the current leases. If the North Hilight Field LBA Tract is not leased, TBCC estimates that the average annual coal production at the Black Thunder Mine after 2008 would be 100 mmtpy, increasing to an average of 135 mmtpy by 2015, and the average full-time employment level by 2013 is expected to be 1,324 persons. Mining would continue at Black Thunder for approximately 9.3 years. Portions of the surface of the LBA tract would probably be disturbed by both the Black

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Thunder and Jacobs Ranch mines due to overstripping to allow coal to be removed from existing contiguous leases.

In order to compare the economic and environmental consequences of mining these lands versus not mining them, this EIS was prepared under the assumption that the North Hilight Field LBA Tract would not be mined in the foreseeable future if the No Action Alternative is selected. However, selection of the No Action Alternative would not preclude leasing and mining of this tract in the future. If the decision is made to reject the North Hilight Field lease application at this time, the tract could be leased as a maintenance lease in the future while the adjacent mine is in operation. If it is not leased while the existing adjacent mine is in operation, it may or may not be leased in the future. This tract does not include enough coal reserves to economically justify mining by a new operation; however, the coal reserves included in the tract could potentially be combined with unleased federal coal to the north, east and/or west to create a larger tract, which could be mined by a new operation in the future.

### 2.1.3 North Hilight Field LBA Tract Alternative 2--Preferred Alternative

Under Alternative 2 for the North Hilight Field LBA Tract, BLM would reconfigure the tract, hold one competitive coal sale for the lands included in the reconfigured tract, and issue a lease to the successful bidder. The modified tract would be subject to standard and special lease stipulations developed for the PRB and for this tract, if it is offered for sale (Appendix D). Alternative 2, holding a competitive coal sale for a modified tract, is BLM's Preferred Alternative.

Alternative 2 for the North Hilight Field LBA Tract assumes that ALC would be the successful bidder on the tract if a lease sale is held and that the federal coal would be mined as a maintenance lease for the existing Black Thunder Mine. Assumptions concerning mining methods, facilities, hazardous materials, mitigation and monitoring requirements, etc. are the same as described for the Proposed Action.

As applied for, the North Hilight Field LBA Tract consists of a single block of federal coal. In order to evaluate the potential that an alternate configuration of the tract would provide for more efficient recovery of the federal coal, increase competitive interest in the North Hilight Field LBA Tract, and/or reduce the potential that some of the remaining unleased federal coal in this area would be bypassed in the future, BLM identified a study area. The BLM study area includes the tract as applied for and unleased federal coal adjacent to the northern and eastern edges of the tract as applied for (Figure 2-1). The BLM study area includes lands (approximately 80.9 acres, or 1.1 percent of the study area) on the Thunder Basin National Grassland (TBNG), which is administered by the U.S. Department of Agriculture – Forest Service (USFS). Under Alternative 2, BLM could add all or part of the adjacent lands to the tract, or BLM could reduce the size of the tract, as discussed in Section 2.0.

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Under Alternative 2, the area BLM is evaluating adding to the tract as applied for includes the following lands:

T.44N., R.70W., 6<sup>th</sup> PM, Campbell County, Wyoming

Section 17: Lots 1 through 16;	654.17 acres
Section 18: Lots 5 through 20;	655.14 acres
Section 20: Lots 1 through 16;	651.07 acres
Section 21: Lots 1 through 16;	658.37 acres
Section 22: Lots 1 through 15;	606.85 acres

T.44N., R.71W., 6<sup>th</sup> PM, Campbell County, Wyoming

Section 13: Lots 1 through 16;	655.53 acres
Section 14: Lots 1 through 16;	644.74 acres

Total: 4,525.87 acres

The legal description of the Alternative 2 BLM reconfiguration (Figure 2-1) for the North Hilight Field LBA Tract is as follows:

T.44N., R.70W., 6<sup>th</sup> PM, Campbell County, Wyoming

Section 17: Lots 1 through 16;	654.17 acres
Section 18: Lots 5 through 20;	655.14 acres
Section 19: Lots 5 through 20;	656.88 acres
Section 20: Lots 1 through 16;	651.07 acres
Section 21: Lots 1 through 16;	658.37 acres
Section 22: Lots 1 through 15;	606.85 acres

T.44N., R.71W., 6<sup>th</sup> PM, Campbell County, Wyoming

Section 13: Lots 1 through 16;	655.53 acres
Section 14: Lots 1 through 16;	644.74 acres
Section 23: Lots 1 through 16;	653.11 acres
Section 24: Lots 1 through 16;	653.44 acres
Section 26: Lots 1 through 16;	650.07 acres

Total: 7,139.37 acres

Land descriptions and acreage are based on the BLM Status of Public Domain Land and Mineral Titles approved Master Title Plats as of August 30, 2005 and September 7, 2007 and Coal Plats as of September 7, 2007. The coal estate included in the tract described above is federally owned. The ownership of the surface and oil and gas estates is discussed in Section 3.11.

TBCC estimates that the LBA tract reconfigured under Alternative 2 (the BLM study area) includes approximately 756.9 million tons of in-place coal reserves. As discussed in Section 2.1.1, some of the coal included in the above-described alternative tract configuration is not currently considered by TBCC to be mineable due to the presence of the BNSF & UP rail line ROW and associated 100-foot buffer zone, which borders the entire western side of the BLM study

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area (Figure 2-1). TBCC estimates that approximately 29.4 million tons of coal would not be mineable because of the railroad ROW and associated buffer zone.

As discussed in Sections 1.5 and 2.1.1 and shown in Figure 2-1, some of the coal in the above-described alternative tract configuration is overlain by the Shroyer Road. Some of the coal in the above-described alternative tract configuration is also within 100 feet of the Hilight Road ROW. The coal that is underlying the public road ROWs and associated 100-foot buffer zones extending on either side of the ROWs has been determined to be unsuitable for mining in accordance with SMCRA and as specified in coal leasing Unsuitability Criterion Number 3 (43 CFR 3461) and would not be recoverable. The Hilight Road runs parallel and adjacent to the west side of the BNSF & UP railroad ROW (Figure 2-1); therefore, the 100-foot buffer zone associated with the railroad ROW actually extends farther east and overlies more coal within the BLM study area than the 100-foot buffer zone associated with the Hilight Road ROW.

As discussed in Section 2.1.1, there is an exception to this prohibition to mine the coal underlying the public road ROWs and associated buffer zones that can be applied if the appropriate public road authority allows the road to be relocated or closed (SMCRA Section 522(e)(4) and 30 CFR 761.11(d)(2)). The Jacobs Road (Campbell County Road 59) and Small Road are two other county roads that overlie the Alternative 2 reconfiguration of the North Hilight Field LBA Tract (Figure 2-1), although they have been vacated by the Campbell County Commissioners. If TBCC obtains approval from the Campbell County Board of Commissioners to move or close the Shroyer Road, the exception to the prohibition on mining within the public road ROW and its associated 100-foot buffer zone could be applied and the unsuitability determination could be reconsidered. In that case, TBCC would be able to recover the coal underlying the road ROW and associated buffer zone. TBCC would not need to consider moving the Hilight Road for the reason explained above. If TBCC does not obtain approval to move or close Shroyer Road, the coal underlying its ROWs and associated buffer zone would remain unsuitable for mining and would not be recovered.

If the Shroyer Road is not moved or closed, TBCC estimates that the BLM study area under Alternative 2 (Figure 2-1) includes approximately 709.6 million tons of mineable coal reserves. Using TBCC's projected recovery factor of 92 percent of the mineable coal reserves, about 652.8 million tons of the mineable coal would be recoverable. TBCC estimates that approximately 47.3 million tons of coal would not be mineable because of the railroad and public road ROWs and associated buffer zones. Although these lands would not be mined, they are included in the BLM study area tract configuration to allow maximum recovery of all the mineable coal that is adjacent to but outside of the ROWs and associated buffer zones and to comply with the coal leasing regulations that do not allow leasing of less than 10-acre aliquot parts. If a lease is issued for this tract, a stipulation will be attached to the lease stating that no mining activity

may be conducted in the portions of the leased tract within the Hilight and Shroyer county road ROWs and associated buffer zones unless approval is obtained from the appropriate public road authority to relocate or close the roads. If the Shroyer Road is moved or closed, TBCC estimates that an added 17.9 million tons of coal would be mineable in the BLM study area tract.

TBCC estimates an average annual coal production rate of 100 mmtpy after 2008 for the Black Thunder Mine, increasing to 135 mmtpy by 2015. With the BLM study area tract, coal production at the Black Thunder Mine would continue for approximately 14.1 years beyond 2008. The study area tract accounts for approximately 4.8 years of the mine life extension.

BLM independently evaluates the volume and average quality of the coal resources included in proposed LBA tracts as part of the fair market value determination process. BLM's estimate may not be in agreement with the estimate provided by the applicant. Under the Preferred Alternative (Alternative 2), BLM's estimate will be published in the sale notice for the tract, if it is offered for sale.

## **2.2 South Hilight Field LBA Tract**

### 2.2.1 South Hilight Field LBA Tract Proposed Action

ALC has filed an application for two separate LBA tracts (North Hilight Field and South Hilight Field). Each tract will be evaluated separately and if a decision is made to lease both of these tracts, a separate competitive lease sale will be held for each tract.

Under the Proposed Action for the South Hilight Field LBA Tract, the tract as applied for by ALC would be offered for lease at a sealed-bid, competitive lease 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 configuration proposed in the South Hilight Field lease application (Figure 2-2). The Proposed Action assumes that ALC would be the successful bidder on the South Hilight Field LBA Tract, if it is offered for sale.

The legal description of the proposed South Hilight Filed LBA Tract coal lease lands as applied for by ALC under the Proposed Action is as follows:

T.43N., R.71W., 6<sup>th</sup> PM, Campbell County, Wyoming

Section 23: Lots 1 through 16;	649.36 acres
Section 26: Lots 1 through 16;	667.69 acres
Section 35: Lots 1 through 16;	659.64 acres

Total: 1,976.69 acres

Land descriptions and acreage are based on the BLM Status of Public Domain Land and Mineral Titles approved Master Title Plat as of September 7, 2007

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and Coal Plat as of September 7, 2007. The coal estate included in the tract described above is federally owned. Much of the surface (approximately 82 percent, or 1,625.9 acres) of the tract as applied for includes lands on the TBNG, which is administered by the USFS. The ownership of the surface and oil and gas estates is discussed in Section 3.11.

As discussed in Section 1.5, some of the coal in the above-described lands in the South Hilight Field LBA Tract has been determined to be unsuitable for mining in accordance with SMCRA and as specified under Unsuitability Criterion 2 (43 CFR 3461) due to the presence of the BNSF & UP railroad line, which borders the western side of the LBA tract (Figure 2-2). The coal underlying the railroad ROW and an associated 100-foot buffer zone is also not considered by TBCC to be mineable at this time because the cost that would be associated with moving the railroad tracks would make it economically unsuitable to recover the underlying coal. Although the federal coal underlying the railroad ROW and its associated buffer zone would not be mined, the coal is included in the tract because it would allow maximum recovery of the mineable coal adjacent to but outside of the railroad ROW and its associated buffer zone and comply with the coal leasing regulations that do not allow leasing of less than 10-acre aliquot parts.

As indicated in Section 1.5, some of the coal in the above-described lands in the South Hilight Field LBA Tract is within 100 feet of the Hilight Road (Campbell County Road 52) ROW (Figure 2-2). SMCRA prohibits surface mining operations on lands within 100 feet of the outside line of the ROW for a public road (SMCRA Section 522(e)(4) and 30 CFR 761.11(d)). The coal that is within 100 feet of the Hilight Road ROW has been determined to be unsuitable for mining in accordance with SMCRA and as specified under Unsuitability Criterion 3 (43 CFR 3461). There is an exception to this prohibition in the regulations at SMCRA Section 522(e)(4) and 30 CFR 761.11(d)(2), which can be applied if the appropriate road authority (Campbell County Board of Commissioners) allows the public road to be relocated or closed. However, because the Hilight Road lies parallel and adjacent to the BNSF & UP rail line (Figure 2-2), the 100-foot buffer zone associated with the railroad ROW actually extends farther east and overlies more coal within the South Hilight Field LBA Tract than the 100-foot buffer zone associated with the Hilight Road ROW. TBCC would therefore not need to obtain approval from the Campbell County Board of Commissioners to close or move the Hilight Road in order to recover the coal underlying the 100-foot buffer zone along the east side of the Hilight Road ROW.

If a lease is issued for this alternative tract configuration, a stipulation will be attached to the lease stating that no mining activity may be conducted in the portions of the lease within 100 feet of either the BNSF & UP rail line or Hilight Road ROWs. The stipulation would allow recovery of the coal under Hilight Road if approval is obtained from the appropriate authority to move or close the road.

TBCC estimates that the South Hilight Field LBA Tract as applied for includes approximately 273.3 million tons of in-place coal, that approximately 232.2 million tons of those in-place coal reserves are mineable, and that about 213.6 million tons of coal would be recoverable. TBCC's estimate that approximately 78 percent of the estimated in-place reserves would be recoverable from the tract is based on assumptions about the currently unrecoverable reserves that lie within the railroad ROW and its associated buffer zone.

The South Hilight Field LBA Tract would be mined as an integral part of the Black Thunder Mine under the Proposed Action. Since the South Hilight Field LBA Tract would be an extension of the existing Black Thunder Mine, the facilities and infrastructure would be the same as those identified in the WDEQ/LQD Mine Permit 233 Term T7, approved November 1, 2005 and the BLM R2P2, which was approved December 12, 2006.

Black Thunder Mine's currently approved air quality permits from the WDEQ/AQD allow up to 135 million tons of coal per year to be mined. The Black Thunder Mine produced:

- 62.6 million tons of coal in 2003,
- 66.8 million tons of coal in 2004,
- 62.7 million tons of coal in 2005,
- 67.3 million tons of coal in 2006,
- 65.3 million tons of coal in 2007, and
- 67.4 million tons of coal in 2008

(Wyoming Department of Employment 2003, Shamley 2008a and 2010).

As of December 31, 2008, a total of approximately 1,087.9 million tons of coal had been mined from within the current permitted area of the mine.

TBCC estimates an average annual coal production rate of 100 mmtpy after 2008 for the Black Thunder Mine, increasing to an average of 135 mmtpy by 2015. If ALC acquires the South Hilight Field LBA Tract as applied for, a total of approximately 1,383.0 million tons of coal would be recovered from the existing leases and the South Hilight Field LBA Tract after January 1, 2009, with an estimated 213.6 million tons coming from the LBA tract, as discussed above. With the South Hilight Field LBA Tract, coal production at the Black Thunder Mine would continue for approximately 10.9 years beyond 2008. The LBA tract accounts for approximately 1.6 years of the mine life extension.

BLM independently evaluates the volume and average quality of the coal resources included in proposed LBA tracts as part of the fair market value determination process. BLM's estimate of the mineable federal coal reserves and average quality of the coal included in the tract may not be in agreement with the mineable coal reserve and coal quality estimates provided by the applicant. BLM's estimate of the mineable federal coal 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.

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Prior to disturbance and in advance of mining, mine support structures such as roads, power lines, substations, and flood and sediment control measures would be built as needed, and any public utility lines and oil and gas pipelines would be relocated as necessary.

A brief description of TBCC's mining operation at the Black Thunder Mine, emphasizing the methods and equipment that are used to remove, handle, and reclaim overburden and soil, is included in Section 2.1.1. The methods and equipment used to mine the coal, and the facilities used to process and store coal are also described in Section 2.1.1. Coal would be produced from two mineable seams within the South Hilight Field LBA Tract. TBCC refers to these seams as the Upper Wyodak (upper/rider seam) and the Middle Wyodak (lower/main seam), which are separated by a shale parting that has an average thickness of approximately 94 feet. The Upper Wyodak seam averages 5 feet thick and the Middle Wyodak seam averages 76 feet thick. The mining and reclamation methods, coal processing and storage facilities, and associated air quality protection measures would allow the Black Thunder Mine to produce at the currently permitted level. While sufficient capacity exists, future changes in facilities may be constructed to improve operating efficiency and air quality protection.

Full-time employment at the Black Thunder Mine is currently 1,080. If the mine increases production as estimated, employment would grow to 1,324 by 2013. If ALC acquires the South Hilight Field LBA Tract under the Proposed Action, they anticipate that the full-time employment level at the mine would remain at 1,324 for the additional 1.6 years that it would take to mine the coal included in the tract.

As discussed in Chapter 1, the South Hilight Field LBA Tract is adjacent to existing leases at the Black Thunder Mine, but is not adjacent to any of the other existing mines in this area (Figure 1-1). If a company other than ALC was to acquire the tract, the rate of coal production, mining sequence, equipment, and facilities would be different than if ALC acquired the tract as a maintenance lease, as described above. However, the area of disturbance and the impacts of removing the coal would not be substantially different from the area of disturbance and the impacts of ALC mining the tract.

### 2.2.2 South Hilight Field LBA Tract Alternative 1

Under the South Hilight Field LBA Tract Alternative 1, the No Action Alternative, ALC's application to lease the coal included in the South Hilight Field LBA Tract would be rejected. The tract would not be offered for competitive sale at this time, and the coal included in the tract would not be mined.

Rejection of the application would not affect permitted mining activities nor employment on the existing leases at the Black Thunder Mine. The Black Thunder Mine currently leases approximately 19,581.3 acres of federal coal,

41.9 acres of private coal, and 2,792.9 acres of state coal, all of which are within the existing Black Thunder Mine permit boundary. A total of approximately 26,490.2 acres will eventually be affected in mining the current leases. If the South Hilight Field LBA Tract is not leased, TBCC estimates that the average annual production at the Black Thunder Mine would be 100 mmtpy after 2008, increasing to an average of 135 mmtpy by 2015, and the average full-time employment level is expected to increase to 1,324 persons by 2013. Mining would continue at the Black Thunder Mine for approximately 9.3 years. Portions of the surface of the LBA tract would probably be disturbed by the Black Thunder Mine due to overstripping to allow coal to be removed from existing contiguous leases.

In order to compare the economic and environmental consequences of mining these lands versus not mining them, this EIS was prepared under the assumption that the South Hilight Field LBA Tract would not be mined in the foreseeable future if the No Action Alternative is selected. However, selection of the No Action Alternative would not preclude leasing and mining of this tract in the future. If the decision is made to reject the South Hilight Field lease application at this time, the tract could be leased as a maintenance lease in the future while the adjacent mine is in operation. If it is not leased while the existing adjacent mine is in operation, it may or may not be leased in the future. This tract does not include enough coal reserves to economically justify mining by a new operation; however, the coal reserves included in the tract could potentially be combined with unleased federal coal to the south and/or west to create a larger tract, which could be mined by a new operation in the future.

### 2.2.3 South Hilight Field LBA Tract Alternative 2--Preferred Alternative

Under Alternative 2 for the South Hilight Field LBA Tract, BLM would reconfigure the tract, hold one competitive coal sale for the lands included in the reconfigured tract, and issue a lease to the successful bidder. The modified tract would be subject to standard and special lease stipulations developed for the PRB and for this tract, if it is offered for sale (Appendix D). Alternative 2, holding a competitive coal sale for a modified tract, is BLM's preferred alternative.

Alternative 2 for the South Hilight Field LBA Tract assumes that ALC would be the successful bidder on the tract if a lease sale is held and that the federal coal would be mined as a maintenance lease for the existing Black Thunder Mine. Assumptions concerning mining methods, facilities, hazardous materials, mitigation and monitoring requirements, etc. are the same as described for the Proposed Action.

As applied for, the South Hilight Field LBA Tract consists of a single block of federal coal. In order to evaluate the potential that an alternate configuration of the tract would provide for more efficient recovery of the federal coal, increase competitive interest in the South Hilight Field LBA Tract, and/or

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reduce the potential that some of the remaining unleased federal coal in this area would be bypassed in the future, BLM identified a study area. The BLM study area includes the tract as applied for and unleased federal coal adjacent to the southern edge of the tract as applied for (Figure 2-2). Under Alternative 2, BLM could add all or part of the adjacent lands to the tract, or BLM could reduce the size of the tract, as discussed in Section 2.0.

Under Alternative 2, the area BLM is evaluating adding to the tract as applied for includes the following lands:

### T.42N., R.71W., 6<sup>th</sup> PM, Campbell County, Wyoming

Section 1:	Lots 7 through 10 and 15 through 18;	316.43 acres
Section 2:	Lots 5 through 20;	629.26 acres

Total: 945.69 acres

The legal description of the Alternative 2 BLM reconfiguration (Figure 2-2) for the South Hilight Field LBA Tract is as follows:

### T.42N., R.71W., 6<sup>th</sup> PM, Campbell County, Wyoming

Section 1:	Lots 7 through 10 and 15 through 18;	316.43 acres
Section 2:	Lots 5 through 20;	629.26 acres

### T.43N., R.71W., 6<sup>th</sup> PM, Campbell County, Wyoming

Section 23:	Lots 1 through 16;	649.36 acres
Section 26:	Lots 1 through 16;	667.69 acres
Section 35:	Lots 1 through 16;	659.64 acres

Total: 2,922.38 acres

Land descriptions and acreage are based on the BLM Status of Public Domain Land and Mineral Titles approved Master Title Plats as of September 7, 2007 and Coal Plats as of September 7, 2007. The coal estate included in the tract described above is federally owned. Much of the surface (approximately 88 percent, or 2,572.6 acres) of the BLM study area includes lands on the TBNG, which is administered by the USFS. The ownership of the surface and oil and gas estates is discussed in Section 3.11.

TBCC estimates that the LBA tract reconfigured under Alternative 2 (the BLM study area) includes approximately 406.5 million tons of in-place coal reserves. As discussed in Sections 1.5 and 2.2.1, some of the coal included in the above-described alternative tract configuration has been determined unsuitable for mining due to the presence of the BNSF & UP rail line, which borders the entire western side of the BLM study area (Figure 2-2). TBCC estimates that approximately 58.7 million tons of coal would not be mineable because of the railroad ROW and associated 100-foot buffer zone.

As shown in Figure 2-2, Reno Road (Campbell County Road 83) borders the southern edge of the BLM study area for the South Hilight Field LBA Tract. The coal that is underlying this public road ROW and associated 100-foot buffer zone has been determined to be unsuitable for mining in accordance with SMCRA and as specified under Unsuitability Criterion 3 (43 CFR 3461). Some of the coal in the above-described alternative tract configuration is also within 100 feet of the Hilight Road ROW; however, the 100-foot buffer zone associated with the railroad ROW extends farther east and overlies more coal within the BLM study area than the 100-foot buffer zone associated with the Hilight Road ROW.

As discussed in Section 2.2.1, there is an exception to this prohibition in the regulations at SMCRA Section 522(e)(4) and 30 CFR 761.11(d)(2), which can be applied if the appropriate road authority (Campbell County Board of Commissioners) allows the road to be relocated or closed. If TBCC obtains approval from the Campbell County Board of Commissioners to move or close Reno Road, the exception to the prohibition on mining within the public road ROW and its associated buffer zone could be applied and the unsuitability determination could be reconsidered. In that case, TBCC would be able to recover the coal underlying the county road ROW and buffer zone. TBCC would not need to consider closing or moving the Hilight Road for the reason explained above. If TBCC does not obtain approval to move or close Reno Road, the coal underlying its ROW and associated buffer zone would remain unsuitable for mining and would not be recovered.

If a lease is issued for this alternative tract configuration, a stipulation will be attached to the lease stating that no mining activity may be conducted in the portions of the lease within 100 feet of either the BNSF & UP railroad ROW, Hilight Road ROW, or Reno Road ROW. The stipulation would allow recovery of the coal under Reno or Hilight Road if approval is obtained from the appropriate authority to move or close the respective road.

If the Reno Road is not moved or closed, TBCC estimates that the BLM study area under Alternative 2 (Figure 2-2) includes approximately 330.8 million tons of mineable coal reserves. Using TBCC's projected recovery factor of 92 percent of the mineable coal reserves, about 304.3 million tons of the mineable coal would be recoverable. TBCC estimates that approximately 75.7 million tons of coal would not be mineable because of the railroad and public road ROWs and associated buffer zones. Although these lands would not be mined, they are included in the alternative tract configuration to allow maximum recovery of all the mineable coal that is adjacent to but outside of the ROWs and associated buffer zones and to comply with the coal leasing regulations that do not allow leasing of less than 10-acre aliquot parts. If a lease is issued for this tract, a stipulation will be attached to the lease stating that no mining activity may be conducted in the portions of the leased tract within the Reno Road ROW and associated buffer zone unless approval is obtained from the appropriate public road authority to relocate or close the road. If the Reno Road is moved or

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closed, TBCC estimates that an added 17.0 million tons of coal would be mineable in the BLM study area tract.

TBCC estimates an average annual coal production rate of 100 mmtpy after 2008 for the Black Thunder Mine, increasing to an average of 135 mmtpy by 2015. With the BLM study area tract, coal production at the Black Thunder Mine would continue for approximately 11.6 years beyond 2008. The study area tract accounts for approximately 2.3 years of the mine life extension.

BLM independently evaluates the volume and average quality of the coal resources included in proposed LBA tracts as part of the fair market value determination process. BLM's estimate may not be in agreement with the mineable coal reserve and coal quality estimates provided by the applicant. Under the Preferred Alternative (Alternative 2), BLM's estimate will be published in the sale notice for the tract, if it is offered for sale.

### **2.3 West Hilight Field LBA Tract**

#### 2.3.1 West Hilight Field LBA Tract Proposed Action

Under the Proposed Action for the West Hilight Field LBA Tract, the tract as applied for by ALC would be offered for lease at a sealed-bid, competitive lease 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 configuration proposed in the West Hilight Field lease application (Figure 2-3). The Proposed Action assumes that ALC would be the successful bidder on the West Hilight Field LBA Tract, if it is offered for sale.

The legal description of the proposed West Hilight Field LBA Tract coal lease lands as applied for by ALC under the Proposed Action is as follows:

#### T.43N., R.71W., 6<sup>th</sup> PM, Campbell County, Wyoming

Section 8:	Lots 1, 2, and 7 through 16;	493.00 acres
Section 9:	Lots 1 through 16;	655.31 acres
Section 10:	Lots 3 through 6, and 11 through 14;	327.85 acres
Section 17:	Lots 1 through 16;	650.17 acres
Section 20:	Lots 1 through 4;	162.54 acres
Section 21:	Lots 3 and 4	81.65 acres

Total: 2,370.52 acres

Land descriptions and acreage are based on the BLM Status of Public Domain Land and Mineral Titles approved Master Title Plat as of September 7, 2007 and Coal Plat as of September 7, 2007. The coal estate included in the tract described above is federally owned. A portion of the surface of the tract as applied for (approximately 29 percent, or 695.9 acres) includes lands on the TBNG, which is administered by the USFS. The ownership of the surface and oil and gas estates is discussed in Section 3.11.

As discussed in Section 1.5, Wyoming State Highway 450 borders the northern edge of the West Hilight LBA Tract (Figure 2-3). The Surface Mining Control and Reclamation Act of 1977 (SMCRA) prohibits mining within 100 feet on either side of the ROW of any public road unless the appropriate public road authority allows the road to be relocated or closed after public notice, an opportunity for a public hearing, and a finding that the interests of the affected public and landowners will be protected (30 CFR 761.11(d)). For State Highway 450 west of the BNSF & UP railroad ROW, an unsuitability decision (43 CFR 3461) is deferred subject to a finding by the Wyoming Department of Transportation (WYDOT) under this process (BLM 2001a). As a result, some of the coal in the above described lands is not currently considered to be recoverable. Although the federal coal underlying these lands may not be mined, it is included in the tract to allow maximum recovery of the mineable coal adjacent to but outside of the highway ROW and its associated buffer zone and to comply with the coal leasing regulations that do not allow leasing of less than 10-acre aliquot parts.

If a lease is issued for this tract configuration, a stipulation will be attached to the lease stating that no mining activity may be conducted in the portions of the lease within 100 feet of the State Highway 450 ROW. The stipulation would allow recovery of the coal under State Highway 450 if approval is obtained from the appropriate authority to move the road.

As applied for, the West Hilight Field LBA Tract includes an estimated 440.4 million tons of in-place coal reserves. TBCC estimates that 29.6 million tons of the in-place coal would not be mineable because of the Highway 450 ROW and associated buffer zone. Of the 410.8 million tons of mineable reserves, using TBCC's projected recovery factor of 92 percent of the mineable coal reserves, approximately 377.9 million tons would be recoverable from the West Hilight LBA Tract as applied for.

The West Hilight Field LBA Tract would be mined as an integral part of the Black Thunder Mine under the Proposed Action. Since the West Hilight Field LBA Tract would be an extension of the existing Black Thunder Mine, the facilities and infrastructure would be the same as those identified in the WDEQ/LQD Mine Permit 233 Term T7, approved November 1, 2005 and the BLM R2P2, which was approved December 12, 2006.

Black Thunder Mine's currently approved air quality permits from the WDEQ/AQD allow up to 135 million tons of coal per year to be mined. The Black Thunder Mine produced:

- 62.6 million tons of coal in 2003,
- 66.8 million tons of coal in 2004,
- 62.7 million tons of coal in 2005,
- 67.3 million tons of coal in 2006,
- 65.3 million tons of coal in 2007, and
- 67.4 million tons of coal in 2008

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(Wyoming Department of Employment 2003, Shamley 2008a and 2010).

As of December 31, 2008, a total of approximately 1,087.9 million tons of coal had been mined from within the current permitted area of the mine.

TBCC estimates an average annual coal production rate of 100 mmtpy after 2008 for the Black Thunder Mine, increasing to an average of 135 mmtpy by 2015. If ALC acquires the West Hilight Field LBA Tract as applied for, a total of approximately 1,547.3 million tons of coal would be recovered from the existing leases and the West Hilight Field LBA Tract after January 1, 2009, with an estimated 377.9 million tons coming from the LBA tract, as discussed above. About 14 percent of the in-place coal within the West Hilight Field LBA Tract would be lost under normal mining practices and would not be recovered due to the presence of the Highway 450 ROW and associated buffer zone. With the West Hilight Field LBA Tract, coal production at the Black Thunder Mine would continue for approximately 12.1 years beyond 2008. The LBA tract accounts for approximately 2.8 years of the mine life extension. If State Highway 450 is moved, TBCC estimates that an added 29.6 million tons of coal would be mineable in the West Hilight Field LBA Tract as applied for.

BLM independently evaluates the volume and average quality of the coal resources included in proposed LBA tracts as part of the fair market value determination process. BLM's estimate of the mineable federal coal reserves and average quality of the coal included in the tract may not be in agreement with the mineable coal reserves and coal quality estimates provided by the applicant. BLM's estimate of the mineable federal coal 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.

Prior to disturbance and in advance of mining, mine support structures such as roads, power lines, substations, and flood and sediment control measures would be built as needed, and any public utility lines and oil and gas pipelines would be relocated as necessary.

A brief description of TBCC's mining operation at the Black Thunder Mine, emphasizing the methods and equipment that are used to remove, handle, and reclaim overburden and soil, is included in Section 2.1.1. The methods and equipment used to mine the coal, and the facilities used to process and store coal are also described in Section 2.1.1. Coal would be produced from two mineable seams within the West Hilight Field LBA Tract. TBCC refers to these seams as the Upper Wyodak (upper/rider seam) and the Middle Wyodak (lower/main seam), which are separated by a shale parting that has an average thickness of approximately 32 feet. The Upper Wyodak seam averages 6 feet thick and the Middle Wyodak seam averages 87 feet thick. The mining and reclamation methods, coal processing and storage facilities, and associated air quality protection measures would allow the Black Thunder Mine to produce at the currently permitted level. While sufficient capacity exists, future changes

in facilities may be constructed to improve operating efficiency and air quality protection.

Full-time employment at the Black Thunder Mine is currently 1,080. If the mine increases production as estimated, employment would grow to 1,324 by 2013. If ALC acquires the West Hilight Field LBA Tract under the Proposed Action, they anticipate that the mine's full-time employment level would remain at 1,324 for the additional 2.8 years that it would take to mine the coal included in the tract.

As discussed in Chapter 1, the West Hilight Field LBA Tract is not adjacent to any existing leases at the Black Thunder Mine, although a portion of the tract lies within the mine's current mining permit boundary (Figure 2-3). The West Hilight Field LBA Tract is not adjacent to any of the other existing leases or mines in this area (Figure 1-1). If a company other than ALC was to acquire the tract, the rate of coal production, mining sequence, equipment, and facilities would be different than if ALC acquired the tract as a maintenance lease, as described above. However, the area of disturbance and the impacts of removing the coal would not be substantially different from the area of disturbance and the impacts of ALC mining the tract.

### 2.3.2 West Hilight Field LBA Tract Alternative 1

Under the West Hilight Field LBA Tract Alternative 1, the No Action Alternative, ALC's application to lease the coal included in the West Hilight Field LBA Tract would be rejected. The tract would not be offered for competitive sale at this time, and the coal included in the tract would not be mined.

Rejection of the application would not affect permitted mining activities nor employment on the existing leases at the Black Thunder Mine. The Black Thunder Mine currently leases approximately 19,581.3 acres of federal coal, 41.9 acres of private coal, and 2,792.9 acres of state coal, all of which are within the existing Black Thunder Mine permit boundary. A total of approximately 26,490.2 acres will eventually be affected in mining the current leases. If the West Hilight Field LBA Tract is not leased, TBCC estimates that the average annual coal production at the Black Thunder Mine would be 100 mmtpy after 2008, increasing to an average of 135 mmtpy by 2015, and the average full-time employment level is expected to increase to 1,324 persons by 2013. Mining would continue at the Black Thunder Mine for approximately 9.3 years. The surface of the LBA tract as applied for does not lie within any mine's current permit area and would therefore not likely be disturbed by mining activities.

In order to compare the economic and environmental consequences of mining these lands versus not mining them, this EIS was prepared under the assumption that the West Hilight Field LBA Tract would not be mined in the foreseeable future if the No Action Alternative is selected. However, selection of the No Action Alternative would not preclude leasing and mining of this tract in

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the future. If the decision is made to reject the West Hilight Field lease application at this time, the tract could be leased as a maintenance lease in the future while the adjacent mine is in operation. If it is not leased while the existing adjacent mine is in operation, it may or may not be leased in the future. This tract does not include enough coal reserves to economically justify mining by a new operation; however, the coal reserves included in the tract could potentially be combined with unleased federal coal that surrounds it to create a larger tract, which could be mined by a new operation in the future.

### 2.3.3 West Hilight Field LBA Tract Alternative 2--Preferred Alternative

Under Alternative 2 for the West Hilight Field LBA Tract, BLM would reconfigure the tract, hold one competitive coal sale for the lands included in the reconfigured tract, and issue a lease to the successful bidder. The modified tract would be subject to standard and special lease stipulations developed for the PRB and for this tract, if it is offered for sale (Appendix D). Alternative 2, holding a competitive coal sale for a modified tract, is BLM's preferred alternative.

Alternative 2 for the West Hilight Field LBA Tract assumes that ALC would be the successful bidder on the tract if a lease sale is held and that the federal coal would be mined as a maintenance lease for the existing Black Thunder Mine. Assumptions concerning mining methods, facilities, hazardous materials, mitigation and monitoring requirements, etc. are the same as described for the Proposed Action.

As applied for, the West Hilight Field LBA Tract consists of a single block of federal coal. In order to evaluate the potential that an alternate configuration of the tract would provide for more efficient recovery of the federal coal, increase competitive interest in the West Hilight Field LBA Tract, and/or reduce the potential that some of the remaining unleased federal coal in this area would be bypassed in the future, BLM identified a study area. The BLM study area includes the tract as applied for and unleased federal coal adjacent to the eastern, southern, northeastern, and northwestern edges of the tract as applied for (Figure 2-3). Under Alternative 2, BLM could add all or part of the adjacent lands to the tract, or BLM could reduce the size of the tract, as discussed in Section 2.0.

Under Alternative 2, the area BLM is evaluating adding to the tract as applied for includes the following lands:

#### T.43N., R.71W., 6<sup>th</sup> PM, Campbell County, Wyoming

Section 8:	Lots 3 through 6;	164.33 acres
Section 10:	Lots 1, 2, 7 through 10, 15, and 16;	326.18 acres
Section 15:	Lots 1 through 16;	659.26 acres
Section 20:	Lots 5 through 16;	488.50 acres
Section 21:	Lots 1, 2, and 5 through 16;	569.73 acres
Section 22:	Lots 1 through 16;	657.89 acres

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Section 27: Lots 1 through 16;	656.87 acres
Section 28: Lots 1 through 16;	648.02 acres
Section 34: Lots 1 through 16;	649.98 acres
Total:	<u>4,820.76 acres</u>

The legal description of the Alternative 2 BLM reconfiguration (Figure 2-3) for the West Hilight Field LBA Tract is as follows:

T.43N., R.71W., 6<sup>th</sup> PM, Campbell County, Wyoming

Section 8: Lots 1 through 16;	654.33 acres
Section 9: Lots 1 through 16;	655.31 acres
Section 10: Lots 1 through 16;	654.03 acres
Section 15: Lots 1 through 16;	659.26 acres
Section 17: Lots 1 through 16;	650.17 acres
Section 20: Lots 1 through 16;	651.04 acres
Section 21: Lots 1 through 16;	651.38 acres
Section 22: Lots 1 through 16;	657.89 acres
Section 27: Lots 1 through 16;	656.87 acres
Section 28: Lots 1 through 16;	648.02 acres
Section 34: Lots 1 through 16;	649.98 acres
Total:	<u>7,191.28 acres</u>

Land descriptions and acreage are based on the BLM Status of Public Domain Land and Mineral Titles approved Master Title Plat as of September 7, 2007 and Coal Plat as of September 7, 2007. The coal estate included in the tract described above is federally owned. Approximately 40 percent (or about 2,900 acres) of the West Hilight Field LBA Tract under Alternative 2 includes lands on the TBNG, which is administered by the USFS. The ownership of the surface and oil and gas estates is discussed in Section 3.11.

TBCC estimates that the West Hilight Field LBA Tract reconfigured under Alternative 2 (the BLM study area) includes approximately 1,147.9 million tons of in-place coal reserves. As discussed in Section 2.3.1 and shown in Figure 2-3, a portion of Wyoming State Highway 450 borders the entire northern edge of the above-described alternate tract configuration. Therefore, some of the coal included in the West Hilight Field LBA Tract under this alternative is overlain by Highway 450 and SMCRA prohibits surface mining operations on lands within 100 feet of the outside line of the ROW for a public road (SMCRA Section 522(e)(4) and 30 CFR 761.11(d)). If TBCC obtains approval from the WYDOT to move State Highway 450, the exception to the prohibition on mining within the road ROW and buffer zone could be applied and the unsuitability determination could be reconsidered. In that case, TBCC would be able to recover the coal underlying Wyoming State Highway 450, its ROW, and associated buffer zone.

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As discussed in Section 1.5, some of the coal included in the above-described alternative tract configuration has been determined unsuitable for mining due to the presence of the BNSF & UP rail line, which borders the entire eastern side of the BLM study area (Figure 2-3).

As shown in Figure 2-3, a portion of Hilight Road (Campbell County Road 52) lies west of and adjacent to the BNSF & UP rail line ROW, and also borders the entire eastern edge of the above described BLM study area. Therefore, some of the coal included in the West Hilight Field LBA Tract under this alternative is overlain by the Hilight Road and SMCRA prohibits surface mining operations on lands within 100 feet of the outside line of the ROW for a public road. The coal underlying this county road, its ROW, and associated 100-foot buffer zone has been determined to be unsuitable for mining in accordance with SMCRA and as specified under Unsuitability Criterion 3. There is an exception to this prohibition in the regulations at 30 CFR 761.11(d)(2), which can be applied if the appropriate road authority (Campbell County Board of Commissioners) allows the road to be relocated or closed. If TBCC obtains approval from the Campbell County Board of Commissioners to move this county road, the exception to the prohibition on mining within the road ROW and buffer zone could be applied and the unsuitability determination could be reconsidered. In that case, TBCC would be able to recover the coal underlying Hilight Road, its ROW, and associated buffer zone. If TBCC does not obtain approval to move or close the county road, the coal underlying the road, its ROW, and associated buffer zone would remain unsuitable for mining and would not be recovered.

If Wyoming State Highway 450 and the Hilight Road are not moved or closed, TBCC estimates that the West Hilight Field LBA Tract under Alternative 2 (Figure 2-3) includes approximately 1,049.1 million tons of mineable coal reserves. Using TBCC's projected recovery factor of 92 percent of the mineable coal reserves, about 965.2 million tons of the mineable coal would be recoverable. TBCC estimates that approximately 98.8 million tons of coal would not be mineable because of the public road ROWs and associated buffer zones. Although these lands would not be mined, they are included in the alternative tract configuration to allow maximum recovery of all the mineable coal that is adjacent to but outside of the ROWs and associated buffer zones and to comply with the coal leasing regulations that do not allow leasing of less than 10-acre aliquot parts. If a lease is issued for this tract, a stipulation will be attached to the lease stating that no mining activity may be conducted in the portions of the leased tract within the Wyoming State Highway 450 and Hilight Road ROWs and associated buffer zones unless approval is obtained from the appropriate public road authority to relocate or close the roads.

TBCC estimates an average annual coal production rate of 100 mmtpy after 2008 for the Black Thunder Mine, increasing to an average of 135 mmtpy by 2015. With the BLM study area tract, coal production at the Black Thunder Mine would continue for approximately 16.4 years beyond 2008. The study area tract accounts for approximately 7.1 years of the mine life extension.

If Hilight Road is moved or closed, TBCC estimates that an added 52.6 million tons of coal would be mineable in the BLM study area tract. If relocation of Wyoming State Highway 450 were approved, TBCC estimates that an additional 46.2 million tons of coal would be mineable in the BLM study area tract.

Full-time employment at the Black Thunder Mine is currently 1,080. If the mine increases production as estimated, employment would grow to 1,324 by 2013. If ALC acquires the BLM study area tract, they anticipate that the mine's full-time employment level would remain at 1,324 for the additional 7.1 years that it would take to mine the coal included in the tract.

BLM independently evaluates the volume and average quality of the coal resources included in proposed LBA tracts as part of the fair market value determination process. BLM's estimate may not be in agreement with the mineable coal reserve and coal quality estimates provided by the applicant. Under the Preferred Alternative (Alternative 2), BLM's estimate will be published in the sale notice for the tract, if it is offered for sale.

#### 2.3.4 West Hilight Field LBA Tract Alternative 3

Under Alternative 3 for the West Hilight Field LBA Tract, BLM is considering adding some or all of the BLM study area, as discussed under Alternative 2 (Section 2.3.3), and some or all of TBCC's Northwest Rail Loop Amendment Area (Figure 2-3). Under Alternative 3, BLM would reconfigure the tract, hold one competitive coal sale for the lands included in the reconfigured tract, and issue a lease to the successful bidder. The modified tract would be subject to standard and special lease stipulations developed for the PRB and for this tract, if it is offered for sale (Appendix D).

Alternative 3 for the West Hilight Field LBA Tract assumes that ALC would be the successful bidder on the tract if a lease sale is held and that the federal coal would be mined as a maintenance lease for the existing Black Thunder Mine. Assumptions concerning mining methods, facilities, hazardous materials, mitigation and monitoring requirements, etc. are the same as described for the Proposed Action.

As applied for, the West Hilight Field LBA Tract consists of a single block of federal coal. As discussed under Alternative 2, BLM identified a study area in order to evaluate the potential that an alternate configuration of the tract would provide for more efficient recovery of the federal coal, increase competitive interest in the West Hilight Field LBA Tract, and/or reduce the potential that some of the remaining unleased federal coal in this area would be bypassed in the future. The BLM study area, shown in Figure 2-3, includes the tract as applied for and unleased federal coal adjacent to the eastern, southern, and northwestern edges of the tract as applied for, and additionally under Alternative 3, BLM is considering adding some or all of Black Thunder Mine's Northwest Rail Loop Amendment Area.

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TBCC's Northwest Rail Loop Amendment Area, which lies north of Wyoming State Highway 450 and west of the Hilight Road, is entirely within Black Thunder Mine's current permit area (Figure 2-3). In 2008, Black Thunder Mine completed the construction of a new train loadout facility, including a railroad spur and two storage silos within their Northwest Rail Loop Amendment Area. This area is also entirely within the West Jacobs Ranch LBA Tract; therefore, BLM has not included it within the study area for the West Hilight Field LBA Tract. However, this alternative tract configuration will preserve the option of delineating some or all of TBCC's Northwest Rail Loop Amendment Area into the West Hilight Field, the West Jacobs Ranch, or both LBA tracts.

It may not be economically feasible to move the railroad spur, train loadout and silos to recover all the coal at this time. However, BLM is considering including this area in the tract because it may be possible to recover portions of the coal reserves in this area when the rest of the tract is mined, if it is leased at this time. It may also be economically feasible at some point in the future to move the train loadout facilities and recover the coal if it is leased.

Under Alternative 3, the lands within TBCC's Northwest Rail Loop Amendment Area that BLM is evaluating adding to the Alternative 2 reconfiguration of the West Hilight Field LBA Tract are as follows:

<u>T.43N., R.71W., 6<sup>th</sup> PM, Campbell County, Wyoming</u>	
Section 3: Lots 2, 5, and 8 through 19;	557.99 acres
<u>T.44N., R.71W., 6<sup>th</sup> PM, Campbell County, Wyoming</u>	
Section 22: Lots 9, 10, 15, and 16;	164.25 acres
Section 27: Lots 1, 2, 7 through 10, 15, and 16;	327.88 acres
Section 34: Lots 1, 2, 7 through 10, 15, and 16;	328.73 acres
Total:	<u>1,378.85 acres</u>

The legal description of the Alternative 3 reconfiguration of the West Hilight Field LBA Tract is as follows:

<u>T.43N., R.71W., 6<sup>th</sup> PM, Campbell County, Wyoming</u>	
Section 3: Lots 2, 5, and 8 through 19;	557.99 acres
Section 8: Lots 1 through 16;	654.33 acres
Section 9: Lots 1 through 16;	655.31 acres
Section 10: Lots 1 through 16;	654.03 acres
Section 15: Lots 1 through 16;	659.26 acres
Section 17: Lots 1 through 16;	650.17 acres
Section 20: Lots 1 through 16;	651.04 acres
Section 21: Lots 1 through 16;	651.38 acres
Section 22: Lots 1 through 16;	657.89 acres
Section 27: Lots 1 through 16;	656.87 acres
Section 28: Lots 1 through 16;	648.02 acres
Section 34: Lots 1 through 16;	649.98 acres

T.44N., R.71W., 6<sup>th</sup> PM, Campbell County, Wyoming

Section 22: Lots 9, 10, 15, and 16;	164.25 acres
Section 27: Lots 1, 2, 7 through 10, 15, and 16;	327.88 acres
Section 34: Lots 1, 2, 7 through 10, 15, and 16;	328.73 acres

Total: 8,570.13 acres

Land descriptions and acreage are based on the BLM Status of Public Domain Land and Mineral Titles approved Master Title Plats as of August 30, 2005 and September 7, 2007 and Coal Plats as of September 7, 2007. The coal estate included in the tract described above is federally owned. Approximately 35 percent (roughly 2,900 acres) of the West Hilight Field LBA Tract under Alternative 3 includes lands on the TBNG, which is administered by the USFS. The ownership of the surface and oil and gas estates is discussed in Section 3.11.

TBCC estimates that the West Hilight Field LBA Tract under this alternative includes approximately 1,373.4 million tons of in-place coal reserves. As discussed in Sections 2.3.1 and 2.3.2, and shown in Figure 2-3, a portion of Wyoming State Highway 450 borders the northern edge and lies across a portion of the above-described alternate tract configuration. Therefore, some of the coal included in the West Hilight Field LBA Tract under this alternative is overlain by State Highway 450 and SMCRA prohibits surface mining operations on lands within 100 feet of the outside line of the ROW for a public road (SMCRA Section 522(e)(4) and 30 CFR 761.11(d)). If TBCC obtains approval from the WYDOT to relocate State Highway 450, the exception to the prohibition on mining within the road ROW and buffer zone could be applied and the unsuitability determination could be reconsidered. In that case, TBCC would be able to recover the coal underlying Wyoming State Highway 450, its ROW, and associated buffer zone.

As discussed in Section 1.5, some of the coal included in the above-described alternative tract configuration has been determined unsuitable for mining due to the presence of the BNSF & UP rail line, which borders the entire eastern side of the Alternative 3 reconfiguration of the West Hilight Field LBA Tract (Figure 2-3).

As shown in Figure 2-3, a portion of Hilight Road (Campbell County Road 52) lies west of and adjacent to the BNSF & UP rail line ROW, and also borders the entire eastern edge of the above described Alternative 3 tract reconfiguration. Therefore, some of the coal included in the West Hilight Field LBA Tract under this alternative is overlain by the Hilight Road and SMCRA prohibits surface mining operations on lands within 100 feet of the outside line of the ROW for a public road. The coal underlying this county road, its ROW, and associated 100-foot buffer zone has been determined to be unsuitable for mining in accordance with SMCRA and as specified under Unsuitability Criterion 3. There is an exception to this prohibition in the regulations at 30 CFR 761.11(d)(2), which can be applied if the appropriate road authority (Campbell

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County Board of Commissioners) allows the road to be relocated or closed. If TBCC obtains approval from the Campbell County Board of Commissioners to move this county road, the exception to the prohibition on mining within the road ROW and buffer zone could be applied and the unsuitability determination could be reconsidered. In that case, TBCC would be able to recover the coal underlying Hilight Road, its ROW, and associated buffer zone. If TBCC does not obtain approval to move or close the county road, the coal underlying the road, its ROW, and associated buffer zone would remain unsuitable for mining and would not be recovered.

If a lease is issued for this tract, a stipulation will be attached to the lease stating that no mining activity may be conducted in the portions of the leased tract within the Wyoming State Highway 450 and Hilight Road ROWs and associated buffer zones unless approval is obtained from the appropriate public road authority to relocate or close the roads.

If Wyoming State Highway 450 and the Hilight Road are not moved or closed, TBCC estimates that the West Hilight Field LBA Tract under Alternative 3 (Figure 2-3) includes approximately 1,049.1 million tons of mineable coal reserves. Using TBCC's projected recovery factor of 92 percent of the mineable coal reserves, about 965.2 million tons of the mineable coal would be recoverable. TBCC estimates that approximately 324.3 million tons of coal would not be mineable because of the presence of the mine's new railroad spur, train loadout and two storage silos, plus the public road ROWs and associated buffer zones. Although these lands would not be mined, they are included in the alternative tract configuration to allow maximum recovery of all the mineable coal that is adjacent to but outside of the Northwest Rail Loop facilities, road ROWs and associated buffer zones, and to comply with the coal leasing regulations that do not allow leasing of less than 10-acre aliquot parts. If a lease is issued for this tract, a stipulation will be attached to the lease stating that no mining activity may be conducted in the portions of the leased tract within the Wyoming State Highway 450 and Hilight Road ROWs and associated buffer zones unless approval is obtained from the appropriate public road authority to relocate or close the roads.

TBCC estimates an average annual coal production rate of 100 mmtpy after 2008 for the Black Thunder Mine, increasing to an average of 135 mmtpy by 2015. With the West Hilight Field LBA Tract under Alternative 3, coal production at the Black Thunder Mine would continue for approximately 16.4 years beyond 2008. The Alternative 3 Tract configuration accounts for approximately 7.1 years of the mine life extension.

If Hilight Road is moved or closed, and if relocation of Wyoming State Highway 450 were approved, TBCC estimates that an added 98.8 million tons of coal would be mineable in the Alternative 3 tract. TBCC estimates that about 207.5 million tons could be recovered assuming coal under the Northwest Rail Loop Amendment Area were mineable at some time in the future.

Full-time employment at the Black Thunder Mine is currently 1,080. If the mine increases production as estimated, employment would grow to 1,324 by 2013. If ALC acquires the West Hilight Field LBA as configured under Alternative 3, they anticipate that the mine's full-time employment level would remain at 1,324 for the additional 7.1 years that it would take to mine the coal included in the tract.

BLM independently evaluates the volume and average quality of the coal resources included in proposed LBA tracts as part of the fair market value determination process. BLM's estimate may not be in agreement with the mineable coal reserve and coal quality estimates provided by the applicant. Under Alternative 3, BLM's estimate will be published in the sale notice for the tract, if it is offered for sale.

## 2.4 West Jacobs Ranch LBA Tract

### 2.4.1 West Jacobs Ranch LBA Tract Proposed Action

Under the Proposed Action for the West Jacobs Ranch LBA Tract, the tract as applied for by ALC would be offered for lease at a sealed-bid, competitive lease 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 configuration proposed in the West Jacobs Ranch lease application (Figure 2-4). The Proposed Action assumes that ALC would be the successful bidder on the West Jacobs Ranch LBA Tract, if it is offered for sale.

The legal description of the proposed West Jacobs Ranch LBA Tract coal lease lands as applied for by ALC under the Proposed Action is as follows:

#### T.43N., R.71W., 6<sup>th</sup> PM, Campbell County, Wyoming

Section 3:	Lots 2 and 5 through 19;	638.38 acres
Section 4:	Lots 5 through 20;	639.50 acres
Section 5:	Lots 5 through 20;	636.67 acres

#### T.44N., R.71W., 6<sup>th</sup> PM, Campbell County, Wyoming

Section 22:	Lots 9 through 16;	326.99 acres
Section 27:	Lots 1 through 16;	658.21 acres
Section 28:	Lots 1 through 3 and 5 through 16;	608.43 acres
Section 29:	Lots 5 through 15 and SE $\frac{1}{4}$ SE $\frac{1}{4}$ ;	478.10 acres
Section 32:	Lots 1 through 15 and SW $\frac{1}{4}$ SE $\frac{1}{4}$ ;	643.83 acres
Section 33:	Lots 1 through 15 and NE $\frac{1}{4}$ SE $\frac{1}{4}$ ;	653.02 acres
Section 34:	Lots 1 through 16;	661.24 acres

Total: 5,944.37 acres

Land descriptions and acreage are based on the BLM Status of Public Domain Land and Mineral Titles approved Master Title Plats as of August 30, 2005 and September 7, 2007 and Coal Plats as of September 7, 2007. The coal estate

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included in the tract described above is federally owned. The ownership of the surface and oil and gas estates is discussed in Section 3.11.

As discussed in Section 1.5, Wyoming State Highway 450 borders the entire southern edge of the West Jacobs Ranch LBA Tract (Figure 2-4). SMCRA prohibits mining within 100 feet on either side of the ROW of any public road unless the appropriate public road authority allows the road to be relocated or closed after public notice, an opportunity for a public hearing, and a finding that the interests of the affected public and landowners will be protected (30 CFR 761.11(d)). For State Highway 450 west of the BNSF & UP railroad ROW, an unsuitability decision (43 CFR 3461) is deferred subject to a finding by WYDOT under this process (BLM 2001a). As a result, some of the coal in the above described lands is not currently considered to be recoverable.

TBCC's Northwest Rail Loop Amendment Area, which lies north of Wyoming State Highway 450 and west of the Hilight Road, is entirely within Black Thunder Mine's current permit area (Figure 2-3). Black Thunder Mine completed the construction of a new train loadout facility, including a railroad spur and two storage silos, within their Northwest Rail Loop Amendment Area in 2008. TBCC's new railroad spur, train loadout facility, and two storage silos are located entirely within the West Jacobs Ranch LBA Tract. It may not be economically feasible to move the railroad spur and the coal processing and storage facilities to recover all the coal at this time, but may be economically feasible at some point in the future, if the coal is leased.

As discussed in Section 1.5, some of the coal included in the above-described alternative tract configuration has been determined unsuitable for mining due to the presence of the BNSF & UP rail line ROW, which borders the entire eastern side of the LBA tract. As shown in Figure 2-4, a portion of Hilight Road (Campbell County Road 52) lies west of and adjacent to the BNSF & UP rail line ROW, and also borders the entire eastern edge of the above described lands. Therefore, some of the coal included in the West Jacobs Ranch LBA Tract as applied for is overlain by the Hilight Road and SMCRA prohibits surface mining operations on lands within 100 feet of the outside line of the ROW for a public road. The coal that is underlying this county road, its ROW, and associated 100-foot buffer zone has been determined to be unsuitable for mining in accordance with SMCRA and as specified under Unsuitability Criterion 3. There is an exception to this prohibition in the regulations at SMCRA Section 522(e)(4) and 30 CFR 761.11(d)(2), which can be applied if the appropriate road authority (Campbell County Board of Commissioners) allows the road to be relocated or closed. If ALC obtains approval from the Campbell County Board of Commissioners to move this county road, the exception to the prohibition on mining within the road ROW and buffer zone could be applied and the unsuitability determination could be reconsidered. In that case, ALC would be able to recover the coal underlying Hilight Road, its ROW, and associated buffer zone.

ALC estimates that the West Jacobs Ranch LBA Tract as applied for includes approximately 957.0 million tons of in-place coal reserves. If Wyoming State Highway 450 and the Hilight Road are not closed or relocated, ALC estimates that the West Jacobs Ranch LBA Tract as applied for (Figure 2-4) includes approximately 744.0 million tons of mineable coal reserves. Using ALC's projected recovery factor of 90 percent of the mineable coal reserves, about 669.6 million tons of the mineable coal would be recoverable. ALC estimates that approximately 213.0 million tons of coal would not be mineable because of the public road ROWs and associated buffer zones. Although these lands would not be mined, they are included in the as applied for tract configuration to allow maximum recovery of all the mineable coal that is adjacent to but outside of the public road ROWs and associated buffer zones, and to comply with the coal leasing regulations that do not allow leasing of less than 10-acre aliquot parts. If a lease is issued for this tract, a stipulation will be attached to the lease stating that no mining activity may be conducted in the portions of the leased tract within the State Highway 450 and Hilight Road ROWs and associated buffer zones unless approval is obtained from the appropriate public road authority to relocate or close the roads.

The West Jacobs Ranch LBA Tract would be mined as an integral part of the Jacobs Ranch Mine under the Proposed Action. Since the West Jacobs Ranch LBA Tract would be an extension of the existing Jacobs Ranch Mine, the facilities and infrastructure would be the same as those identified in the WDEQ/LQD Mine Permit 271 Term T5, approved November 23, 2004 and the BLM R2P2, which was approved October 19, 2005.

Jacobs Ranch Mine's currently approved air quality permit (Permit Number MD-1005A2) from the WDEQ/AQD allows up to 55 million tons of coal per year to be mined. The Jacobs Ranch Mine produced:

- 36.0 million tons of coal in 2003,
- 38.6 million tons of coal in 2004,
- 37.3 million tons of coal in 2005,
- 40.0 million tons of coal in 2006,
- 38.1 million tons of coal in 2007, and
- 42.1 million tons of coal in 2008

(Wyoming Department of Employment 2003, Shamley 2008a and 2010).

As of December 31, 2008, a total of approximately 671.1 million tons of coal had been mined from within the current permitted area of the mine.

ALC estimates an average annual coal production rate of 40 mmtpy for the Jacobs Ranch Mine for the years beyond 2008. If ALC acquires the West Jacobs Ranch LBA Tract as applied for, a total of approximately 1,049.0 million tons of coal would be recovered from the existing leases and the West Jacobs Ranch LBA Tract after January 1, 2009, with an estimated 669.6 million tons coming from the LBA tract, as discussed above. About 30 percent of the in-place coal within the West Jacobs Ranch LBA Tract would be lost under

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normal mining practices and would not be recovered due to the presence of the Highway 450 and Hilight Road ROWs and associated buffer zones. With the West Jacobs Ranch LBA Tract as applied for, coal production at the Jacobs Ranch Mine would continue for approximately 26.3 years beyond 2008. The LBA tract accounts for approximately 16.7 years of the mine life extension.

If the Hilight Road is moved or closed, and if relocation of Wyoming State Highway 450 were approved, ALC estimates that an added 213.0 million tons of coal would be mineable in the West Jacobs Ranch LBA Tract as applied for.

BLM independently evaluates the volume and average quality of the coal resources included in proposed LBA tracts as part of the fair market value determination process. BLM's estimate of the mineable federal coal reserves and average quality of the coal included in the tract may not be in agreement with the mineable coal reserve and coal quality estimates provided by the applicant. BLM's estimate of the mineable federal coal 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.

Prior to disturbance and in advance of mining, mine support structures such as roads, power lines, substations, and flood and sediment control measures would be built as needed, and any public utility lines and oil and gas pipelines would be relocated as necessary.

The first step of the mining process is soil salvage with suitable heavy equipment, such as rubber-tired scrapers. During initial pit development, soil is placed in temporary stockpiles for later use in final pit closure and reclamation. Whenever possible, direct haulage of soil from salvage areas 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 again would be used to haul and redistribute the stockpiled topsoil on regraded areas.

The Jacobs Ranch Mine is one of several mines currently operating in the PRB where the coal seams are notably thick and the overburden is relatively thin. Mining has historically been conducted in two pits in order to facilitate blending of the coal to meet customers' coal quality requirements. Mining may be conducted in three separate pits; two located within the current permit area and one located within the proposed lease area. The locations of the specific pits may change as a result of further geologic and mining evaluations. After soil salvage operations are complete, blast holes are drilled down through the overburden to the top of the upper-most mineable coal seam. The drill holes are then loaded with explosives (ANFO) and detonated to fragment the overburden to facilitate efficient excavation. Overburden removal has been and would continue to be conducted primarily with a dragline and/or trucks and shovels. Cast blasting is employed to supplement dragline productivity. Other equipment used during overburden removal and backfilling includes dozers, scrapers, excavators, front-end loaders, graders, and water trucks. Exposed

coal seams have been and would continue to be cleaned with a dozer, drilled and blasted to facilitate efficient excavation, and then loaded into haul trucks for transport to the coal crushing and storage facilities. Coal is also transported by overland conveyor to the final preparation plant and storage facilities.

The design of the Jacobs Ranch Mine seeks to confine disturbance to the active mine blocks. As overburden is removed, most would be directly placed into the previous empty pit where coal has been removed.

Chapter 4, Section 2(b)(i) of the WDEQ/LQD Coal Rules requires that rough backfilling and grading follow coal removal as closely as possible based on the mining conditions (WDEQ/LQD 2009). Replaced (backfilled) overburden is graded to approximate the original land surface contour, as required by WDEQ and OSM rules. Elevations consistent with the approved PMT plan are established as quickly as possible to reconstruct a stable landscape and restore drainage. Under certain conditions, the PMT may not be immediately achievable. This occurs when there is an excess of material that 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. Backfilled and recontoured overburden is sampled and analyzed to verify suitability as subsoil. Should unsuitable backfill materials be encountered (i.e., material that is not suitable for use in reestablishing vegetation or that may affect groundwater quality due to high concentrations of certain constituents, such as selenium or adverse pH levels), mitigation by additional soil depth, excavation and burial, or other special handling to remove them from the root zone would occur. Prior to soil distribution, regraded backfill is scarified to relieve compaction. Soil is redistributed on recontoured backfill using rubber-tired scrapers. Once a seedbed has been formed the reclaimed areas are revegetation using native grasses, forbs, and shrubs that are consistent with the postmining land use. According to the most recent OSM evaluation of the Wyoming coal mining industry, the reclamation to disturbance ratio in 2008 was approximately 86 percent (4,703 acres reclaimed vs. 5,497 acres disturbed) (OSM 2009).

The Jacobs Ranch Mine mines up to three coal seams that the operator (TBCC) refers to as the Upper, Middle, and Lower Wyodak seams. Coal would be produced from one mineable seam within the West Jacobs Ranch LBA Tract. TBCC refers to this single coal seam as the Wyodak and it has an average thickness of about 102 feet in the LBA tract area. Coal would be mined at several working pit 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. Mining efficiency and air quality protection are and would continue to be facilitated by the use of a near-pit crusher and overland conveyor. Coal would be loaded with electric-powered shovels or hydraulic excavators into off-highway haul trucks for transport to the near-pit crusher or the coal preparation plant. Coal haul roads would be temporary structures

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built within the mine areas. All coal transfer location points and crushing operations are controlled by baghouse-type dust collectors, dry fog systems, or PECs. The truck dumping operations use stilling sheds to control fugitive dust and the overland conveyor system is entirely enclosed. There are two existing crushing facilities, the near-pit primary crusher and the coal preparation plant, and seven coal storage silos within the permit area that provide capacity to produce at the permitted level. While sufficient capacity exists, future changes in facilities may be constructed to improve operating efficiency and air quality protection. Future possibilities for processing and loadout of coal include overland conveying to existing facilities. Alternately, if ALC acquires the West Jacobs Ranch LBA Tract, TBCC's new coal processing and train loadout facilities that are located within Black Thunder Mine's Northwest Rail Loop Amendment Area (Figures 2-3 and 2-4) may be utilized once the Jacobs Ranch and Black Thunder Mine permits are consolidated.

Full-time employment at the Jacobs Ranch Mine is currently 630. If ALC acquires the West Jacobs Ranch LBA Tract under the Proposed Action, they anticipate that, at the expected average annual post-2008 coal production of 40 million tons, the average employment level would increase to from 630 to 785 for the additional 16.7 years that it would take to mine the coal included in the tract.

As discussed in Chapter 1, the West Jacobs Ranch LBA Tract is adjacent to existing leases at the Black Thunder Mine and a portion of the tract is within the mine's current permit area. The West Jacobs Ranch LBA Tract is not adjacent to any of the other existing leases or mines in this area (Figure 1-1). If a company other than ALC was to acquire the tract, the rate of coal production, mining sequence, equipment, and facilities would be different than if ALC acquired the tract as a maintenance lease, as described above. However, the area of disturbance and the impacts of removing the coal would not be substantially different from the area of disturbance and the impacts of TBCC mining the tract.

### 2.4.2 West Jacobs Ranch LBA Tract Alternative 1

Under the West Jacobs Ranch LBA Tract Alternative 1, the No Action Alternative, ALC's application to lease the coal included in the West Jacobs Ranch LBA Tract would be rejected. The tract would not be offered for competitive sale at this time, and the coal included in the tract would not be mined.

Rejection of the application would not affect permitted mining activities nor employment on the existing leases at the Jacobs Ranch Mine. The Jacobs Ranch Mine currently leases approximately 7,381.0 acres of federal coal, 720 acres of private coal, and 503.8 acres of state coal, all of which are within the existing Jacobs Ranch Mine permit boundary. A total of approximately 15,261.5 acres will eventually be affected in mining the current leases. If the West Jacobs Ranch LBA Tract is not leased, TBCC estimates that the annual

production at the Jacobs Ranch Mine after 2008 would average 40 million tons, and the average full-time employment level is expected to be 630 persons. Mining would continue at the Jacobs Ranch Mine for approximately 9.6 years. No portion of the West Jacobs Ranch LBA Tract will be disturbed under the Jacobs Ranch and Black Thunder mines' existing mining plans in order to recover the coal in the existing contiguous coal leases. However, the construction of a new train loadout facility for the Black Thunder Mine within TBCC's permitted Northwest Rail Loop Amendment Area, which is located within the eastern portion of the LBA tract (Figures 2-3 and 2-4), was completed in 2008.

In order to compare the economic and environmental consequences of mining these lands versus not mining them, this EIS was prepared under the assumption that the West Jacobs Ranch LBA Tract would not be mined in the foreseeable future if the No Action Alternative is selected. However, selection of the No Action Alternative would not preclude leasing and mining of this tract in the future. If the decision is made to reject the West Jacobs Ranch lease application at this time, the tract could be leased as a maintenance lease in the future while the adjacent mine is in operation. If it is not leased while the existing adjacent mine is in operation, it may or may not be leased in the future. This tract includes enough coal reserves to economically justify mining by a new operation, and the coal reserves included in the tract could potentially be combined with unleased federal coal to the north, east and/or west to create a larger tract that could be mined by a new operation in the future.

#### 2.4.3 West Jacobs Ranch LBA Tract Alternative 2--Preferred Alternative

Under Alternative 2 for the West Jacobs Ranch LBA Tract, BLM would reconfigure the tract, hold one competitive coal sale for the lands included in the reconfigured tract, and issue a lease to the successful bidder. The modified tract would be subject to standard and special lease stipulations developed for the PRB and for this tract, if it is offered for sale (Appendix D). Alternative 2, holding a competitive coal sale for a modified tract, is BLM's preferred alternative.

Alternative 2 for the West Jacobs Ranch LBA Tract assumes that ALC would be the successful bidder on the tract if a lease sale is held and that the federal coal would be mined as a maintenance lease for the existing Jacobs Ranch Mine. Assumptions concerning mining methods, facilities, hazardous materials, mitigation and monitoring requirements, etc. are the same as described for the Proposed Action.

As applied for, the West Jacobs Ranch LBA Tract consists of a single block of federal coal. In order to evaluate the potential that an alternate configuration of the tract would provide for more efficient recovery of the federal coal, increase competitive interest in the West Jacobs Ranch LBA Tract, and/or reduce the potential that some of the remaining unleased federal coal in this

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area would be bypassed in the future, BLM identified a study area. The BLM study area includes the tract as applied for and unleased federal coal adjacent to the northern and western edges of the tract as applied for (Figure 2-4). Under Alternative 2, BLM could add all or part of the adjacent lands to the tract, or BLM could reduce the size of the tract, as discussed in Section 2.0.

Under Alternative 2, the area BLM is evaluating adding to the tract as applied for includes the following lands:

### T.43N., R.71W., 6<sup>th</sup> PM, Campbell County, Wyoming

Section 6: Lots 8, 15, 16, and 23; 163.05 acres

### T.44N., R.71W., 6<sup>th</sup> PM, Campbell County, Wyoming

Section 15: Lots 9 through 16; 326.83 acres

Section 20: Lots 9, 10, 14, and 15; 161.38 acres

Section 21: Lots 1 through 16; 639.69 acres

Section 22: Lots 1 through 8; 320.85 acres

Section 28: Lot 4; 41.00 acres

Section 29: Lots 1 through 4; 159.36 acres

Section 30: Lots 5, 12, 13, and 20; 157.29 acres

Section 31: Lots 5, 12, 13, and 20; 162.40 acres

Total: 2,131.85 acres

The legal description of the Alternative 2 BLM reconfiguration (Figure 2-4) for the West Jacobs Ranch LBA Tract is as follows:

### T.43N., R.71W., 6<sup>th</sup> PM, Campbell County, Wyoming

Section 3: Lots 2 and 5 through 19; 638.38 acres

Section 4: Lots 5 through 20; 639.50 acres

Section 5: Lots 5 through 20; 636.67 acres

Section 6: Lots 8, 15, 16, and 23; 163.05 acres

### T.44N., R.71W., 6<sup>th</sup> PM, Campbell County, Wyoming

Section 15: Lots 9 through 16; 326.83 acres

Section 20: Lots 9, 10, 14, and 15; 161.38 acres

Section 21: Lots 1 through 16; 639.69 acres

Section 22: Lots 1 through 16; 647.84 acres

Section 27: Lots 1 through 16; 658.21 acres

Section 28: Lots 1 through 16; 649.43 acres

Section 29: Lots 1 through 15 and SE $\frac{1}{4}$ SE $\frac{1}{4}$ ; 637.46 acres

Section 30: Lots 5, 12, 13, and 20; 157.29 acres

Section 31: Lots 5, 12, 13, and 20; 162.40 acres

Section 32: Lots 1 through 15 and SW $\frac{1}{4}$ SE $\frac{1}{4}$ ; 643.83 acres

Section 33: Lots 1 through 15 and NE $\frac{1}{4}$ SE $\frac{1}{4}$ ; 653.02 acres

Section 34: Lots 1 through 16; 661.24 acres

Total: 8,076.22 acres

Land descriptions and acreage are based on the BLM Status of Public Domain Land and Mineral Titles approved Master Title Plats as of August 30, 2005 and September 7, 2007 and Coal Plats as of September 7, 2007. The coal estate included in the tract described above is federally owned. The ownership of the surface and oil and gas estates is discussed in Section 3.11.

ALC estimates that the LBA tract reconfigured under Alternative 2 (the BLM study area) includes approximately 1,269.0 million tons of in-place coal reserves. As discussed in Sections 1.1, 1.5, and 2.4.1 and shown in Figure 2-4, a portion of Wyoming State Highway 450 borders the entire southern edge of the above-described alternate tract configuration. Therefore, some of the coal included in the West Jacobs Ranch LBA Tract under this alternative is overlain by Highway 450 and SMCRA prohibits surface mining operations on lands within 100 feet of the outside line of the ROW for a public road (SMCRA Section 522(e)(4) and 30 CFR 761.11(d)). If ALC obtains approval from the WYDOT to move this state highway, the exception to the prohibition on mining within the road ROW and buffer zone could be applied and the unsuitability determination could be reconsidered. In that case, ALC would be able to recover the coal underlying Wyoming State Highway 450, its ROW and associated buffer zone. If ALC does not obtain approval to relocate the highway, the coal underlying the road, its ROW, and associated buffer zone would remain unsuitable for mining and would not be recovered.

TBCC's Northwest Rail Loop Amendment Area, which lies north of Wyoming State Highway 450 and west of the Hilight Road, is entirely within Black Thunder Mine's current permit area (Figures 2-3 and 2-4). Black Thunder Mine completed the construction of a new train loadout facility, including a railroad spur and two storage silos, within their Northwest Rail Loop Amendment Area in 2008. TBCC's new railroad spur, train loadout facility, and two storage silos are located entirely within the West Jacobs Ranch LBA Tract. It may not be economically feasible to move the railroad spur and the coal processing and storage facilities to recover all the coal at this time, but may be economically feasible at some point in the future, if the coal is leased.

As discussed in Section 1.5, some of the coal included in the above-described alternative tract configuration has been determined unsuitable for mining due to the presence of the BNSF & UP rail line, which borders the entire eastern side of the LBA study area (Figure 2-4).

As shown in Figure 2-4, a portion of Hilight Road (Campbell County Road 52) lies west of and adjacent to the BNSF & UP rail line ROW, and also borders the entire eastern edge of the above described lands. Therefore, some of the coal included in the West Jacobs Ranch LBA Tract under this alternative is overlain by the Hilight Road and SMCRA prohibits surface mining operations on lands within 100 feet of the outside line of the ROW for a public road. The coal underlying this county road, its ROW, and associated 100-foot buffer zone has been determined to be unsuitable for mining in accordance with SMCRA and as specified under Unsuitability Criterion 3. There is an exception to this

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prohibition in the regulations at 30 CFR 761.11(d)(2), which can be applied if the appropriate road authority (Campbell County Board of Commissioners) allows the road to be relocated or closed. If ALC obtains approval from the Campbell County Board of Commissioners to close or move this county road, the exception to the prohibition on mining within the road ROW and buffer zone could be applied and the unsuitability determination could be reconsidered. In that case, ALC would be able to recover the coal underlying Hilight Road, its ROW, and associated buffer zone. If ALC does not obtain approval to move or close the county road, the coal underlying the road, its ROW, and associated buffer zone would remain unsuitable for mining and would not be recovered.

If State Highway 450 and Hilight Road are not moved or closed, ALC estimates that the BLM study area tract (Figure 2-4) includes approximately 1,014.0 million tons of mineable coal reserves. Using ALC's projected recovery factor of 90 percent of the mineable coal reserves, about 912.6 million tons of the mineable coal would be recoverable. Although these lands would not be mined, they are included in the alternative tract configuration to allow maximum recovery of all the mineable coal that is adjacent to but outside of the public road ROWs and associated buffer zones and to comply with the coal leasing regulations that do not allow leasing of less than 10-acre aliquot parts. If a lease is issued for this tract, a stipulation will be attached to the lease stating that no mining activity may be conducted in the portions of the leased tract within the Wyoming State Highway 450 and Hilight Road ROWs and associated buffer zones unless approval is obtained from the appropriate public road authority to relocate or close the roads.

ALC estimates an average annual coal production rate of 40 mmtpy for the Jacobs Ranch Mine after 2008. With the West Jacobs Ranch LBA Tract reconfigured under Alternative 2, coal production at the Jacobs Ranch Mine would continue for approximately 32.4 years beyond 2008. The study area tract accounts for approximately 22.8 years of the mine life extension.

If the Hilight Road is moved or closed, and if relocation of Wyoming State Highway 450 were approved, ALC estimates that an added 255.0 million tons of coal would be mineable in the BLM study area tract.

BLM independently evaluates the volume and average quality of the coal resources included in proposed LBA tracts as part of the fair market value determination process. BLM's estimate may not be in agreement with the mineable coal reserve and coal quality estimates provided by the applicant. Under the Preferred Alternative (Alternative 2), BLM's estimate will be published in the sale notice for the tract, if it is offered for sale.

## 2.5 North Porcupine LBA Tract

### 2.5.1 North Porcupine LBA Tract Proposed Action

Under the Proposed Action for the North Porcupine LBA Tract, the tract as applied for by BTU Western Resources, Inc. (BTU) would be offered for lease at a sealed-bid, competitive lease 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 configuration proposed in the North Porcupine lease application (Figure 2-5). The Proposed Action assumes that BTU would be the successful bidder on the North Porcupine LBA Tract, if it is offered for sale.

The legal description of the proposed North Porcupine LBA Tract coal lease lands as applied for by BTU under the Proposed Action is as follows:

#### T.42N., R.70W., 6<sup>th</sup> PM, Campbell County, Wyoming

Section 19: Lots 13 through 20;	296.94 acres
Section 20: Lots 9 through 16;	328.00 acres
Section 21: Lots 9 through 16;	329.54 acres
Section 22: Lots 9 through 16;	327.74 acres
Section 26: Lots 3 through 6 and 9 through 16;	496.64 acres
Section 27: Lots 1 through 16;	664.48 acres
Section 28: Lots 1 through 4;	165.98 acres
Section 29: Lots 1 through 4;	164.30 acres
Section 30: Lots 5 through 8;	147.79 acres

#### T.42N., R.71W., 6<sup>th</sup> PM, Campbell County, Wyoming

Section 22: Lots 10 through 15 and 21 through 24;	323.49 acres
Section 23: Lots 9 through 16;	324.94 acres
Section 24: Lots 9 through 16;	325.82 acres
Section 25: Lots 1 through 4;	162.96 acres
Section 26: Lots 1 through 6 and 11 through 14;	404.09 acres
Section 27: Lots 2 through 6, 9, 12, and 15 through 30;	649.42 acres
Section 34: Lots 1 through 3 and 6 through 11;	360.46 acres
Section 35: Lots 3 through 6 and 11 through 14;	323.19 acres

Total: 5,795.78 acres

Land descriptions and acreage are based on the BLM Status of Public Domain Land and Mineral Titles approved Master Title Plats as of September 7, 2007 and September 20, 2007 and Coal Plats as of September 7, 2007 and September 20, 2007. The coal estate included in the tract described above is federally owned. Much of the surface (approximately 72 percent, or 4,186 acres) of the tract as applied for includes lands on the TBNG, which is administered by the USFS. The ownership of the surface and oil and gas estates is discussed in Section 3.11.

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As discussed in Section 1.5, and as shown in Figure 2-5, some of the coal included in the above-described lands in the North Porcupine LBA Tract has been determined to be unsuitable for mining in accordance with SMCRA and as specified under Unsuitability Criterion 2 (43 CFR 3461) due to the presence of the BNSF & UP railroad line, which crosses the western side of the LBA tract. The coal underlying the railroad ROW and an associated 100-foot buffer zone is also not considered by Powder River Coal (PRC), operator of the North Antelope Rochelle Mine, to be mineable at this time because the cost that would be associated with moving the railroad tracks would make it economically unfeasible to recover the underlying coal. Although the federal coal underlying the railroad ROW and associated buffer zone would not be mined, it is included in the tract to allow maximum recovery of all of the mineable coal that is adjacent to but outside of the railroad ROW and its associated buffer zone and to comply with the coal leasing regulations that do not allow leasing of less than 10-acre aliquot parts. PRC estimates that approximately 65.8 million tons of mineable coal included in the North Porcupine LBA Tract as applied for is located within a layback buffer zone that PRC has determined extends 1,000 feet on either side of the railroad centerline.

Some of the coal included in the above-described lands is not currently considered by PRC to be mineable due to the presence of the Teckla Electric Power Substation, which is located adjacent to the North Porcupine tract in the NE $\frac{1}{4}$ NE $\frac{1}{4}$  of Section 3, T.41N., R.71W. Due to the requirement that no blasting operations be conducted within 500 feet of the substation, the coal underlying the southwestern diagonal half of Lot 13, Section 35, T.42N., R.71W., is not considered mineable at this time by PRC because the cost that would be associated with moving the substation would make it economically unfeasible to recover. PRC estimates that approximately 2.7 million tons of mineable coal included in the North Porcupine LBA Tract is located within the Teckla Substation layback buffer zone. Although the federal coal underlying the substation buffer zone would not be mined, it is included in the tract to allow maximum recovery of all of the mineable coal that is adjacent to but outside of the substation buffer zone and to comply with the coal leasing regulations that do not allow leasing of less than 10-acre aliquot parts.

As indicated in Section 1.5 and as shown in Figure 2-5, some of the coal included in the above-described lands in the North Porcupine LBA Tract is overlain by the Antelope Road (Campbell County Road 4), which crosses a portion of the LBA tract, the Matheson Road (Campbell County Road 70), which borders a portion of the LBA tract, and the Mackey Road (Campbell County Road 69), which borders and crosses a portion of the LBA tract. SMCRA prohibits surface mining operations on lands within 100 feet of the outside line of the ROW for a public road (SMCRA Section 522(e)(4) and 30 CFR 761.11(d)). The coal that is underlying these public road ROWs and associated 100-foot buffer zones has been determined to be unsuitable for mining in accordance with SMCRA and as specified under Unsuitability Criterion 3 (43 CFR 3461). There is an exception to this prohibition in the regulations at SMCRA Section 522(e)(4) and 30 CFR 761.11(d)(2), which can be applied if the

appropriate road authority (Campbell County Board of Commissioners) allows the roads to be relocated or closed.

As discussed in Section 1.1, PRC has obtained approval from the Campbell County Board of Commissioners to close and relocate the portions of Antelope and Matheson roads that cross and border the North Porcupine LBA Tract as applied for. The exception to Unsuitability Criterion 3 is therefore applicable and the coal underlying those two county road ROWs and associated buffer zones would be recoverable if a lease is issued for the North Porcupine LBA Tract. If PRC obtains approval from the Campbell County Board of Commissioners to close and relocate the Mackey Road, which crosses and borders the North Porcupine tract, the exception to the prohibition on mining within that road's ROW and buffer zone could be applied and the unsuitability determination could be reconsidered. In that case, PRC would be able to recover the coal underlying the Mackey Road ROW and associated buffer zone. If PRC does not obtain approval to close and relocate the Mackey Road, the coal underlying its ROW and buffer zone would remain unsuitable for mining and would not be recovered. If the Mackey Road is moved or closed, PRC estimates that an added 34.9 million tons of coal would be mineable in the North Porcupine LBA Tract.

The federal coal underlying the Mackey Road, its ROW, and adjacent 100-foot buffer zone is included in the as applied for tract configuration because it would allow maximum recovery of all the mineable coal adjacent to but outside of the road ROW and associated buffer zone, and to comply with the coal leasing regulations that do not allow leasing of less than 10-acre aliquot parts if the road is not moved; it would also allow recovery of the coal under the road if it is closed or relocated. If a lease is issued for this tract, a stipulation will be attached to the lease stating that no mining activity may be conducted in the portions of the lease within 100 feet of either the BNSF & UP rail line ROW or Mackey Road ROW. The stipulation would allow recovery of the coal under Mackey Road if approval is obtained from the appropriate authority to move or close the road.

PRC estimates that the North Porcupine LBA Tract as applied for includes approximately 756.9 million tons of in-place coal reserves. If the Mackey Road is not closed or relocated, PRC estimates that the North Porcupine LBA Tract as applied for contains approximately 653.5 million tons of mineable coal reserves. Based on historical recovery practices, PRC assumes that about 92 percent of that coal, or approximately 601.2 million tons of coal, would be recovered from the North Porcupine LBA Tract as applied for. PRC estimates that approximately 103.4 million tons of coal (which is about 14 percent of the in-place coal within the North Porcupine LBA Tract as applied for) would not be mineable because of the public road ROW and the layback buffers for the substation and rail line.

The North Porcupine LBA Tract would be mined as an integral part of the North Antelope Rochelle Mine under the Proposed Action. Since the North Porcupine

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LBA Tract would be an extension of the existing North Antelope Rochelle Mine, the facilities and infrastructure would be the same as those identified in the WDEQ/LQD Mine Permit 569 Term T7, approved July 28, 2009 and the BLM R2P2, which was approved February 28, 2007.

North Antelope Rochelle Mine's currently approved air quality permits (Permit Numbers MD-1172, MD-1309, MD-1331, and MD-6375) from the WDEQ/AQD allow up to 140 million tons of coal per year to be mined. The North Antelope Rochelle Mine produced:

- 80.1 million tons of coal in 2003,
- 82.5 million tons of coal in 2004,
- 82.7 million tons of coal in 2005,
- 88.5 million tons of coal in 2006,
- 91.5 million tons of coal in 2007, and
- 97.6 million tons of coal in 2008

(Wyoming Department of Employment 2003, Shamley 2008a and 2010).

As of December 31, 2008, a total of approximately 1,230.8 million tons of coal had been mined from within the current permitted area of the mine.

PRC estimates an average annual coal production rate of 95 mmtpy for the North Antelope Rochelle Mine for the years beyond 2008. If BTU acquires the North Porcupine LBA Tract as applied for, a total of approximately 1,535.0 million tons of coal would be recovered from the existing leases and the North Porcupine LBA Tract after January 1, 2009, with an estimated 601.2 million tons coming from the LBA tract, as discussed above. With the North Porcupine LBA Tract as applied for, coal production at the North Antelope Rochelle Mine would continue for approximately 16.2 years beyond 2008, and PRC anticipates that the current work force of 1,150 persons would remain the same. The LBA tract accounts for approximately 6.3 years of the mine life extension.

BLM independently evaluates the volume and average quality of the coal resources included in proposed LBA tracts as part of the fair market value determination process. BLM's estimate of the mineable federal coal reserves and average quality of the coal included in the tract may not be in agreement with the mineable coal reserve and coal quality estimates provided by the applicant. BLM's estimate of the mineable federal coal 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.

Prior to disturbance and in advance of mining, mine support structures such as roads, power lines, substations, and flood and sediment control measures would be built as needed, and any public utility lines and oil and gas pipelines would be relocated as necessary.

The first step of the mining process is soil salvage with suitable heavy equipment, such as rubber-tired scrapers. During initial pit development, soil is placed in temporary stockpiles for later use in final pit closure and reclamation. Whenever possible, direct haulage of soil from salvage areas 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 again be used to haul and redistribute the stockpiled topsoil on regraded areas.

The North Antelope Rochelle Mine is one of several mines currently operating in the PRB where the coal seams are notably thick and the overburden is relatively thin. Mining has been and would continue to be conducted in three semi-independent pits (West, North, and East Pits). The design of the North Antelope Rochelle Mine seeks to confine disturbance to the active mine blocks. After soil salvage operations are complete, blast holes are drilled down through the overburden to the top of the upper-most mineable coal seam. The drill holes are then loaded with explosives (ANFO) and detonated to fragment the overburden to facilitate efficient excavation. As overburden is removed, most would be directly placed into the previous empty pit where coal has been removed. The mine's current method of overburden removal employs a truck and shovel pre-benching operation in advance of a dragline. Cast blasting is also employed to supplement dragline productivity. Other equipment used during overburden removal and backfilling includes dozers, scrapers, excavators, front-end loaders, graders, and water trucks. While increasing overburden depths in the North Porcupine tract would require an increasing percentage of overburden material to be moved by the truck and shovel pre-benching operation, overburden removal methods would remain essentially the same as the current operation. However, once operations have moved west of the BNSF & UP rail line, the mine may utilize an alternative method of overburden removal and handling for the box cut and pre-benching operations. In combination with the conventional truck/shovel and dragline system, in-pit overburden crushing and overland conveying methods may be employed to move and emplace overburden materials to open pits areas east of the rail line and/or stockpile locations off of the coal lease area.

Exposed coal seams have been and would continue to be cleaned with a dozer, drilled and blasted to facilitate efficient excavation. Coal removal is currently accomplished with the conventional truck and shovel method and then transported to one of four truck dump/crusher locations. Two of these truck dumps are remotely located from the final coal preparation plant and unit train loadout facilities. Coal haul roads would be temporary structures built within the mine areas. Coal is also transported from the near-pit crushers by overland conveyor to the final preparation plant and storage facilities. Some changes to the coal handling system infrastructure may be implemented in the future. For example, an additional remote coal truck dump/near-pit crusher and overland conveyor may be constructed west of the BNSF & UP railroad line.

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Chapter 4, Section 2(b)(i) of the WDEQ/LQD Coal Rules requires that rough backfilling and grading follow coal removal as closely as possible based on the mining conditions (WDEQ/LQD 2009). Replaced (backfilled) overburden is graded to approximate the original land surface contour, as required by WDEQ and OSM rules. Elevations consistent with the approved PMT plan are established as quickly as possible to reconstruct a stable landscape and restore drainage. Under certain conditions, the PMT may not be immediately achievable. This occurs when there is an excess of material that 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. Backfilled and recontoured overburden is sampled and analyzed to verify suitability as subsoil. Should unsuitable backfill materials be encountered (i.e., material that is not suitable for use in reestablishing vegetation or that may affect groundwater quality due to high concentrations of certain constituents, such as selenium or adverse pH levels), mitigation by additional soil depth, excavation and burial, or other special handling to remove them from the root zone would occur. Prior to soil distribution, regraded backfill is scarified to relieve compaction. Soil is redistributed on recontoured backfill using rubber-tired scrapers. Once a seedbed has been formed the reclaimed areas are revegetated using native grasses, forbs, and shrubs that are consistent with the postmining land use. According to the most recent OSM evaluation of the Wyoming coal mining industry, the reclamation to disturbance ratio in 2008 was approximately 86 percent (4,703 acres reclaimed vs. 5,497 acres disturbed) (OSM 2009).

Coal would be produced from two mineable seams within the North Porcupine LBA Tract. PRC refers to these seams as the Wyodak-Anderson 1 and the Wyodak-Anderson 2. These two coal seams are separated by a shale parting that averages approximately 17 feet thick within North Antelope Rochelle Mine's existing lease areas. However, there is no shale parting in the LBA tract as applied for, and the combined Wyodak-Anderson 1 and 2 seam averages approximately 75 thick. Coal would be mined at several working pit 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. Mining efficiency and air quality protection are and would continue to be facilitated by extensive use of near-pit crushers and overland conveyors. There are four existing crushing facilities within the existing permit area. The overland conveyors are covered by dust hoods and all coal transfer points on conveyor belts and the truck dump hoppers are controlled by PECs, fogger/spray systems, or stilling sheds. There are five existing storage silos and one covered storage slot. While sufficient capacity exists to produce at the permitted level, future changes in coal handling and processing facilities may be constructed to improve operating efficiency and air quality protection.

The North Antelope Rochelle Mine has a current full-time work force of 1,150 persons. If BTU acquires the North Porcupine LBA Tract under the Proposed

Action, they anticipate that employment levels would remain the same for the additional 6.3 years that it would take to mine the coal included in the tract.

As discussed in Chapter 1, the North Porcupine LBA Tract is adjacent to existing leases at the North Antelope Rochelle Mine, but is not adjacent to any of the other existing mines in this area (Figure 1-1). If a company other than BTU was to acquire the tract, the rate of coal production, mining sequence, equipment, and facilities would be different than if BTU acquired the tract as a maintenance lease, as described above. However, the area of disturbance and the impacts of removing the coal would not be substantially different from the area of disturbance and the impacts of PRC mining the tract.

### 2.5.2 North Porcupine LBA Tract Alternative 1

Under the North Porcupine LBA Tract Alternative 1, the No Action Alternative, BTU's application to lease the coal included in the North Porcupine LBA Tract would be rejected. The tract would not be offered for competitive sale at this time, and the coal included in the tract would not be mined.

Rejection of the application would not affect permitted mining activities nor employment on the existing leases at the North Antelope Rochelle Mine. The North Antelope Rochelle Mine currently leases approximately 16,666 acres of federal coal and 1,400 acres of state coal, all of which are within the existing North Antelope Rochelle Mine permit boundary. A total of approximately 27,443 acres will eventually be affected in mining the current leases. If the North Porcupine LBA Tract is not leased, PRC estimates that the annual production at the North Antelope Rochelle Mine after 2008 would average 95 million tons, and the average full-time employment level is expected to remain at 1,150 persons. Mining would continue at the North Antelope Rochelle Mine for approximately 9.9 years. Portions of the surface of the LBA tract will be disturbed by the North Antelope Rochelle Mine due to overstripping to allow coal to be removed from existing contiguous leases.

In order to compare the economic and environmental consequences of mining these lands versus not mining them, this EIS was prepared under the assumption that the North Porcupine LBA Tract would not be mined in the foreseeable future if the No Action Alternative is selected. However, selection of the No Action Alternative would not preclude leasing and mining of this tract in the future. If the decision is made to reject the North Porcupine lease application at this time, the tract could be leased as a maintenance lease in the future while the adjacent mine is in operation. If it is not leased while the existing adjacent mine is in operation, it may or may not be leased in the future. This tract includes enough coal reserves to economically justify mining by a new operation, and the coal reserves included in the tract could potentially be combined with unleased federal coal to the north, south and/or west to create a larger tract that could be mined by a new operation in the future.

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### 2.5.3 North Porcupine LBA Tract Alternative 2--Preferred Alternative

Under Alternative 2 for the North Porcupine LBA Tract, BLM would reconfigure the tract, hold one competitive coal sale for the lands included in the reconfigured tract, and issue a lease to the successful bidder. The modified tract would be subject to standard and special lease stipulations developed for the PRB and for this tract, if it is offered for sale (Appendix D). Alternative 2, holding a competitive coal sale for a modified tract, is BLM's preferred alternative.

Alternative 2 for the North Porcupine LBA Tract assumes that BTU would be the successful bidder on the tract if a lease sale is held and that the federal coal would be mined as a maintenance lease for the existing North Antelope Rochelle Mine. Assumptions concerning mining methods, facilities, hazardous materials, mitigation and monitoring requirements, etc. are the same as described for the Proposed Action.

As applied for, the North Porcupine LBA Tract consists of a single block of federal coal. In order to evaluate the potential that an alternate configuration of the tract would provide for more efficient recovery of the federal coal, increase competitive interest in the North Porcupine LBA Tract, and/or reduce the potential that some of the remaining unleased federal coal in this area would be bypassed in the future, BLM identified a study area. The BLM study area includes the tract as applied for and unleased federal coal adjacent to the northern and southwestern edges of the tract as applied for (Figure 2-5). Under Alternative 2, BLM could add all or part of the adjacent lands to the tract, or BLM could reduce the size of the tract, as discussed in Section 2.0.

Under Alternative 2, the area BLM is evaluating adding to the tract as applied for includes the following lands:

#### T.42N., R.70W., 6<sup>th</sup> PM, Campbell County, Wyoming

Section 19: Lots 9 through 12;	149.02 acres
Section 20: Lots 5 through 8;	162.93 acres
Section 21: Lots 1 through 8;	330.71 acres
Section 22: Lots 3 through 6;	163.80 acres

#### T.42N., R.71W., 6<sup>th</sup> PM, Campbell County, Wyoming

Section 22: Lots 5 through 7, 19, and 20;	162.70 acres
Section 23: Lots 5 through 8;	162.51 acres
Section 24: Lots 5 through 8;	163.30 acres
Section 34: Lots 4, 5, and 12 through 16;	276.04 acres

Total: 1,572.01 acres

The legal description of the Alternative 2 BLM reconfiguration (Figure 2-5) for the North Porcupine LBA Tract is as follows:

T.42N., R.70W., 6<sup>th</sup> PM, Campbell County, Wyoming

Section 19:	Lots 9 through 20;	445.96 acres
Section 20:	Lots 5 through 16;	490.93 acres
Section 21:	Lots 1 through 16;	660.25 acres
Section 22:	Lots 3 through 6 and 9 through 16;	491.54 acres
Section 26:	Lots 3 through 6 and 9 through 16;	496.64 acres
Section 27:	Lots 1 through 16;	664.48 acres
Section 28:	Lots 1 through 4;	165.98 acres
Section 29:	Lots 1 through 4;	164.30 acres
Section 30:	Lots 5 through 8;	147.79 acres

T.42N., R.71W., 6<sup>th</sup> PM, Campbell County, Wyoming

Section 22:	Lots 5 through 7, 10 through 15, and 19 through 24;	486.19 acres
Section 23:	Lots 5 through 16;	487.45 acres
Section 24:	Lots 5 through 16;	489.12 acres
Section 25:	Lots 1 through 4;	162.96 acres
Section 26:	Lots 1 through 6 and 11 through 14;	404.09 acres
Section 27:	Lots 2 through 6, 9, 12, and 15 through 30;	649.42 acres
Section 34:	Lots 1 through 16;	636.50 acres
Section 35:	Lots 3 through 6 and 11 through 14;	323.19 acres

Total: 7,366.79 acres

Land descriptions and acreage are based on the BLM Status of Public Domain Land and Mineral Titles approved Master Title Plats as of September 7, 2007 and September 20, 2007 and Coal Plats as of September 7, 2007 and September 20, 2007. The coal estate included in the tract described above is federally owned. Much of the surface (approximately 72 percent, or 5,289.6 acres) of the BLM study area includes lands on the TBNG, which is administered by the USFS. The ownership of the surface and oil and gas estates is discussed in Section 3.11.

PRC estimates that the LBA tract reconfigured under Alternative 2 (the BLM study area) includes approximately 955.8 million tons of in-place coal reserves. As discussed in Sections 1.5, and 2.5.1, some of the coal included in the above-described alternative tract configuration is not currently considered by PRC to be mineable due to the presence of the BNSF & UP rail line ROW and associated 100-foot buffer zone, which crosses the BLM study area (Figure 2-5). The coal that is located within the BNSF & UP railroad ROW and associated buffer zone has been determined to be unsuitable for mining under Coal Unsuitability Criterion Number 2 and would not be recoverable. Within the BLM study area, PRC estimates that approximately 95.2 million tons of mineable coal is located within a layback buffer zone that extends 1,000 feet on either side of the railroad centerline.

As discussed in Section 2.5.1, some of the coal included in the above-described lands is not currently considered by PRC to be mineable due to the

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requirement that no blasting operations be conducted within 500 feet of the Teckla Electric Power Substation, which is located in the NE $\frac{1}{4}$ NE $\frac{1}{4}$  of Section 3, T.41N., R.71W. Therefore, the coal underlying the substation buffer zone is not considered mineable at this time by PRC because the cost that would be associated with moving the substation would make it economically unfeasible to recover.

As discussed in Sections 1.5 and 2.5.1 and shown in Figure 2-5, some of the coal in the above-described alternative tract configuration is overlain by the Antelope, Matheson, and Mackey roads (Campbell County roads 4, 70, and 69, respectively). The coal that is underlying these public road ROWs and associated 100-foot buffer zones extending on either side of the ROWs has been determined to be unsuitable for mining in accordance with SMCRA and as specified in coal leasing Unsuitability Criterion Number 3 (43 CFR 3461) and would not be recoverable. There is an exception to this prohibition to mine the coal underlying the public road ROWs and associated buffer zones that can be applied if the appropriate public road authority allows the road to be relocated or closed (SMCRA Section 522(e)(4) and 30 CFR 761.11(d)(2)). PRC has currently obtained approval from the Campbell County Board of Commissioners to close and relocate the portion of Antelope Road that crosses the BLM study area and Matheson Road that crosses and borders the North Porcupine LBA Tract as applied for. However, PRC has not obtained approval from the County Commissioners to close and relocate the portion of Matheson Road that borders lands added by the BLM study area and would not seek approval because this portion of the road lies within the BNSF & UP railroad buffer zone, and because it provides access to the Teckla Electric Power Substation. PRC has not yet obtained approval from the County Commissioners to close and relocate the portion of Mackey Road that crosses the BLM study area. If PRC obtains approval from the Campbell County Board of Commissioners to close and relocate Mackey Road, which crosses and borders the BLM study area, the exception to the prohibition on mining within the road's ROW and buffer zone could be applied and the unsuitability determination could be reconsidered. In that case, PRC would be able to recover the coal underlying the Mackey Road ROW and associated buffer zone. If PRC does not obtain approval to close and relocate the Mackey Road, the coal underlying its ROW and buffer zone would remain unsuitable for mining and would not be recovered.

If the above-described portions of the Matheson and Mackey roads are not closed or relocated, PRC estimates that the BLM study area tract (Figure 2-5) includes approximately 810.2 million tons of mineable coal reserves. Using PRC's projected recovery factor of 92 percent of the mineable coal reserves, about 745.4 million tons of the mineable coal would be recoverable. At the average annual production rate of 95 mmpy, mining this coal would extend the life of the mine by about 7.8 additional years. PRC estimates that approximately 145.6 million tons of coal would not be mineable within the BLM study area due to the presence of the railroad and public road ROWs and associated buffer zones and the Teckla Substation buffer zone. Although these

lands would not be mined, they are included in BLM's study area (the preferred alternative tract configuration) to allow maximum recovery of all the mineable coal that is adjacent to but outside of the railroad and public road ROWs and associated buffer zones and the electric substation buffer zone and to comply with the coal leasing regulations that do not allow leasing of less than 10-acre aliquot parts. If a lease is issued for this tract, stipulations will be attached to the lease stating that no mining activity may be conducted in the portions of the leased tract within the BNSF & UP railroad and public road ROWs and associated buffer zones. The stipulations would also state that mining within the public road ROWs and buffer zones may be conducted if approval is obtained from the appropriate public road authority to relocate or close the roads.

If the Mackey Road is moved or closed, PRC estimates that an added 47.7 million tons of coal would be mineable in the BLM study area tract under Alternative 2.

BLM independently evaluates the volume and average quality of the coal resources included in proposed LBA tracts as part of the fair market value determination process. BLM's estimate may not be in agreement with the mineable coal reserve and coal quality estimates provided by the applicant. Under the Preferred Alternative (Alternative 2), BLM's estimate will be published in the sale notice for the tract, if it is offered for sale.

## 2.6 South Porcupine LBA Tract

### 2.6.1 South Porcupine LBA Tract Proposed Action

Under the Proposed Action for the South Porcupine LBA Tract, the tract as applied for by BTU would be offered for lease at a sealed-bid, competitive lease 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 configuration proposed in the South Porcupine lease application (Figure 2-6). The Proposed Action assumes that BTU would be the successful bidder on the South Porcupine LBA Tract, if it is offered for sale.

The legal description of the proposed South Porcupine LBA Tract coal lease lands as applied for by BTU under the Proposed Action is as follows:

#### T.41N., R.70W., 6<sup>th</sup> PM, Campbell County, Wyoming

Section 7: Lots 7 through 10 and 15 through 18;	320.94 acres
Section 18: Lots 6 through 11 and 14 through 19;	479.71 acres

#### T.41N., R.71W., 6<sup>th</sup> PM, Campbell County, Wyoming

Section 1: Lots 5 through 20;	638.15 acres
Section 12: Lots 1 through 16;	678.52 acres
Section 13: Lots 1 through 16;	668.93 acres
Section 14: Lots 1, 8, 9, and 16;	154.62 acres

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Section 23: Lot 1 and N½ of Lot 8;	59.81 acres
Section 24: Lots 2 through 4 and N½ of Lots 5, 6 and 7;	185.28 acres
Total:	<u>3,185.96 acres</u>

Land descriptions and acreage are based on the BLM Status of Public Domain Land and Mineral Titles approved Master Title Plats as of September 6, 2007 and Coal Plats as of September 6, 2007. The coal estate included in the tract described above is federally owned. Roughly half of the surface (approximately 51 percent or 1,637.2 acres) of the tract as applied for includes lands on the TBNG, which is administered by the USFS. The ownership of the surface and oil and gas estates is discussed in Section 3.11.

As discussed in Section 1.5 and as shown in Figure 2-6, some of the coal in the above-described lands in the South Porcupine LBA Tract is not mineable due to the presence of the BNSF & UP railroad ROW and associated 100-foot no-disturbance buffer zone. The rail line lies west of and adjacent to the South Porcupine tract, and like the North Porcupine tract, the coal underlying portions of the railroad ROW and associated 100-foot buffer zone in this area has been determined by the BLM to be unsuitable for mining according to the coal leasing Unsuitability Criterion 2 (43 CFR 3461). Although the federal coal underlying the railroad ROW and associated buffer zone has been determined to be unsuitable for mining and would therefore not be recovered, it is included in the LBA tract to allow maximum recovery of all of the mineable coal that is adjacent to but outside of the railroad ROW and its associated buffer zone and to comply with the coal leasing regulations that do not allow leasing of less than 10-acre aliquot parts. PRC estimates that approximately 13.8 million tons of mineable coal included in the South Porcupine LBA Tract as applied for is located within a layback buffer zone that extends 1,000 feet east of the railroad centerline. If a lease is issued for this tract, a stipulation will be attached to the lease stating that no mining activity may be conducted within the BNSF & UP railroad ROW.

As indicated in Section 1.5 and as shown in Figure 2-6, some of the coal included in the above-described lands in the South Porcupine LBA Tract is overlain by the Antelope Road (Campbell County Road 4), which crosses the LBA tract. SMCRA prohibits surface mining operations on lands within 100 feet of the outside line of the ROW for a public road (SMCRA Section 522(e)(4) and 30 CFR 761.11(d)). The coal that is underlying this public road ROW and associated 100-foot buffer zone on both sides of the ROW has been determined to be unsuitable for mining in accordance with SMCRA and as specified under Unsuitability Criterion 3 (43 CFR 3461). There is an exception to this prohibition in the regulations at SMCRA Section 522(e)(4) and 30 CFR 761.11(d)(2), which can be applied if the appropriate road authority (Campbell County Board of Commissioners) allows the road to be relocated or closed. As discussed in Section 1.1, PRC has obtained approval from the Campbell County Board of Commissioners to close and relocate a portion (approximately 1.25 miles) of the Antelope Road that crosses the South Porcupine LBA Tract.

PRC plans to apply for the approval of the County Commissioners to close or relocate the remaining length (approximately 2.25 miles) of Antelope Road that crosses the South Porcupine tract. If PRC obtains approval from the County Commissioners to close or relocate this section of the county road, the exception to the prohibition on mining within the road ROW and associated buffer zone could be applied and the unsuitability determination could be reconsidered. In that case, PRC would be able to recover the coal underlying the county road ROW and buffer zone. If PRC does not obtain approval to move or close the 2.25-mile section of Antelope Road, the coal underlying its ROW and buffer zone would remain unsuitable for mining and would not be recovered.

The federal coal underlying the above-described 2.25-mile section of Antelope Road, its ROW, and adjacent buffer zone is included in the tract because it would allow maximum recovery of all the mineable coal adjacent to but outside of the road ROW and associated buffer zone if this length of road is not moved; it would also allow recovery of the coal under the road if it is moved or closed. If a lease is issued for this tract, a stipulation will be attached to the lease stating that no mining activity may be conducted within the Antelope Road ROW and 100-foot buffer zone for this 2.25-mile section unless approval is obtained from the appropriate authority to close or relocate the road.

PRC estimates that the South Porcupine LBA Tract as applied for includes approximately 422.2 million tons of in-place coal. If the remaining 2.25-mile section of Antelope Road is not closed or relocated, PRC estimates that the South Porcupine LBA Tract as applied for contains approximately 336.6 million tons of mineable coal reserves. Based on historical recovery practices, PRC assumes that about 92 percent of that coal, or approximately 309.7 million tons of coal, would be recovered from the South Porcupine LBA Tract as applied for.

The South Porcupine LBA Tract would be mined as an integral part of the North Antelope Rochelle Mine under the Proposed Action. Since the South Porcupine LBA Tract would be an extension of the existing North Antelope Rochelle Mine, the facilities and infrastructure would be the same as those identified in the WDEQ/LQD Mine Permit 569 Term T7, approved July 28, 2009 and the BLM R2P2, which was approved February 28, 2007.

North Antelope Rochelle Mine's currently approved air quality permits from the WDEQ/AQD allow up to 140 million tons of coal per year to be mined. The North Antelope Rochelle Mine produced:

- 80.1 million tons of coal in 2003,
- 82.5 million tons of coal in 2004,
- 82.7 million tons of coal in 2005,
- 88.5 million tons of coal in 2006,
- 91.5 million tons of coal in 2007, and

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- 97.6 million tons of coal in 2008  
(Wyoming Department of Employment 2003, Shamley 2008a).

As of December 31, 2008, a total of approximately 1,230.8 million tons of coal had been mined from within the current permitted area of the mine.

PRC estimates an average annual coal production rate of 95 mmtpy for the North Antelope Rochelle Mine for the years beyond 2008. If BTU acquires the South Porcupine LBA Tract as applied for, a total of approximately 1,243.5 million tons of coal would be recovered from the existing leases and the South Porcupine LBA Tract after January 1, 2009, with an estimated 309.7 million tons coming from the LBA tract, as discussed above. Based upon this estimate of recoverable reserves, about 27 percent of the in-place coal reserves included within the LBA tract would not be recovered under normal mining practices and due to the presence of the unmineable reserves within the railroad ROW and associated buffer zone and the 2.25-mile section of the Antelope Road ROW and associated buffer zone. With the South Porcupine LBA Tract, coal production at the North Antelope Rochelle Mine would continue for approximately 13.2 years beyond 2008. The LBA tract accounts for approximately 3.3 years of the mine life extension.

If the remaining 2.25-mile section of Antelope Road is closed or relocated, PRC estimates that that an added 71.8 million tons of coal would be mineable in the South Porcupine LBA Tract. Based upon this estimate of recoverable reserves, about 11 percent of the in-place coal reserves included within the LBA tract would not be recovered under normal mining practices and due to the presence of the unmineable reserves within the railroad ROW and associated buffer zone.

BLM independently evaluates the volume and average quality of the coal resources included in proposed LBA tracts as part of the fair market value determination process. BLM's estimate of the mineable federal coal reserves and average quality of the coal included in the tract may not be in agreement with the mineable coal reserve and coal quality estimates provided by the applicant. BLM's estimate of the mineable federal coal 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.

Prior to disturbance and in advance of mining, mine support structures such as roads, power lines, substations, and flood and sediment control measures would be built as needed, and any public utility lines and oil and gas pipelines would be relocated as necessary.

A brief description of PRC's mining operation at the North Antelope Rochelle Mine, emphasizing the methods and equipment that are used to remove, handle, and reclaim overburden and soil, is included in Section 2.5.1. The methods and equipment used to mine the coal, and the facilities used to process and store coal are also described in Section 2.5.1. Coal would be

produced from two mineable seams within the South Porcupine LBA Tract. PRC refers to these seams as the Wyodak-Anderson 1 and the Wyodak-Anderson 2, which have a combined average thickness of approximately 76 feet in the LBA tract. These two coal seams are separated by a shale parting that averages approximately 17 feet thick within the mine's existing leases and approximately 10 feet thick within the South Porcupine LBA Tract. The mining and reclamation methods, coal handling, processing and storage facilities, and associated air quality protection measures would allow the North Antelope Rochelle Mine to produce at the currently permitted level. While sufficient capacity exists, future changes in facilities may be constructed to improve operating efficiency and air quality protection.

The North Antelope Rochelle Mine has a current full-time work force of 1,150 persons. If BTU acquires the South Porcupine LBA Tract under the Proposed Action, they anticipate that employment levels would remain the same for the additional 3.3 years that it would take to mine the coal included in the tract.

As discussed in Chapter 1, BTU applied for the South Porcupine LBA Tract, but the tract is also adjacent to the Antelope Mine, operated by Antelope Coal Company (Figure 1-1). As a result, Antelope Coal Company is potentially in a position to mine the South Porcupine LBA Tract. If a company other than BTU was to acquire the tract, the rate of coal production, mining sequence, equipment, and facilities would be different than if BTU acquired the tract as a maintenance lease, as described above. However, the area of disturbance and the impacts of removing the coal would not be substantially different from the area of disturbance and the impacts of PRC mining the tract.

### 2.6.2 South Porcupine LBA Tract Alternative 1

Under the South Porcupine LBA Tract Alternative 1, the No Action Alternative, BTU's application to lease the coal included in the South Porcupine LBA Tract would be rejected. The tract would not be offered for competitive sale at this time, and the coal included in the tract would not be mined.

Rejection of the application would not affect permitted mining activities nor employment on the existing leases at the North Antelope Rochelle Mine. The North Antelope Rochelle Mine currently leases approximately 16,666 acres of federal coal and 1,400 acres of state coal, all of which are within the existing North Antelope Rochelle Mine permit boundary. A total of approximately 27,443 acres will eventually be affected in mining the current leases. If the South Porcupine LBA Tract is not leased, PRC estimates that the annual production at the North Antelope Rochelle Mine after 2008 would average 95 million tons, and the average full-time employment level is expected to remain at 1,150 persons. Mining would continue at the North Antelope Rochelle Mine for approximately 9.9 years. Portions of the surface of the LBA tract would probably be disturbed by the North Antelope Rochelle Mine due to overstripping to allow coal to be removed from existing contiguous leases.

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In order to compare the economic and environmental consequences of mining these lands versus not mining them, this EIS was prepared under the assumption that the South Porcupine LBA Tract would not be mined in the foreseeable future if the No Action Alternative is selected. However, selection of the No Action Alternative would not preclude leasing and mining of this tract in the future. If the decision is made to reject the South Porcupine lease application at this time, the tract could be leased as a maintenance lease in the future while the adjacent mine is in operation. If it is not leased while the existing adjacent mine is in operation, it may or may not be leased in the future. This tract does not include enough coal reserves to economically justify mining by a new operation; however, the coal reserves included in the tract could potentially be combined with unleased federal coal to the west to create a larger tract that could be mined by a new operation in the future.

### 2.6.3 South Porcupine LBA Tract Alternative 2--Preferred Alternative

Under Alternative 2 for the South Porcupine LBA Tract, BLM would reconfigure the tract, hold one competitive coal sale for the lands included in the reconfigured tract, and issue a lease to the successful bidder. The modified tract would be subject to standard and special lease stipulations developed for the PRB and for this tract, if it is offered for sale (Appendix D). Alternative 2, holding a competitive coal sale for a modified tract, is BLM's preferred alternative.

Alternative 2 for the South Porcupine LBA Tract assumes that BTU would be the successful bidder on the tract if a lease sale is held and that the federal coal would be mined as a maintenance lease for the existing North Antelope Rochelle Mine. Assumptions concerning mining methods, facilities, hazardous materials, mitigation and monitoring requirements, etc. are the same as described for the Proposed Action.

As applied for, the South Porcupine LBA Tract consists of a single block of federal coal. In order to evaluate the potential that an alternate configuration of the tract would provide for more efficient recovery of the federal coal, increase competitive interest in the South Porcupine LBA Tract, and/or reduce the potential that some of the remaining unleased federal coal in this area would be bypassed in the future, BLM identified a study area. The BLM study area includes the tract as applied for and unleased federal coal adjacent to the western edge of the tract as applied for (Figure 2-6). Under Alternative 2, BLM could add all or part of the adjacent lands to the tract, or BLM could reduce the size of the tract, as discussed in Section 2.0.

Under Alternative 2, the area BLM is evaluating adding to the tract as applied for includes the following lands:

#### T.41N., R.71W., 6<sup>th</sup> PM, Campbell County, Wyoming

Section 10: Lot 9;	41.20 acres
Section 11: Lots 9 through 12 and 14 through 16;	283.80 acres

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Section 14: Lot 2 and E½ of Lot 7;	57.07 acres
Total:	<u>382.07 acres</u>

The legal description of the Alternative 2 BLM reconfiguration (Figure 2-6) for the South Porcupine LBA Tract is as follows:

T.41N., R.70W., 6<sup>th</sup> PM, Campbell County, Wyoming

Section 7: Lots 7 through 10 and 15 through 18;	320.94 acres
Section 18: Lots 6 through 11 and 14 through 19;	479.71 acres

T.41N., R.71W., 6<sup>th</sup> PM, Campbell County, Wyoming

Section 1: Lots 5 through 20;	638.15 acres
Section 10: Lot 9;	41.20 acres
Section 11: Lots 9 through 12 and 14 through 16;	283.80 acres
Section 12: Lots 1 through 16;	678.52 acres
Section 13: Lots 1 through 16;	668.93 acres
Section 14: Lots 1, 2, E½ of 7, 8, 9, and 16;	211.69 acres
Section 23: Lot 1 and N½ of Lot 8;	59.81 acres
Section 24: Lots 2 through 4 and N½ of Lots 5, 6 and 7;	185.28 acres

Total:	<u>3,568.03 acres</u>
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Land descriptions and acreage are based on the BLM Status of Public Domain Land and Mineral Titles approved Master Title Plats as of September 6, 2007 and Coal Plats as of September 6, 2007. The coal estate included in the tract described above is federally owned. A portion of the surface (approximately 46 percent, or 1,637.6 acres) of the BLM study area includes lands on the TBNG, which is administered by the USFS. The ownership of the surface and oil and gas estates is discussed in Section 3.11.

PRC estimates that the LBA tract reconfigured under Alternative 2 (the BLM study area) includes approximately 470.9 million tons of in-place coal reserves. As discussed in Sections 1.5, and 2.6.1, some of the coal included in the above-described alternative tract configuration is not currently considered by PRC to be mineable due to the presence of the BNSF & UP rail line ROW and associated 100-foot buffer zone, which crosses the BLM study area (Figure 2-6). The coal that is located within the BNSF & UP railroad ROW and associated buffer zone has been determined to be unsuitable for mining under Coal Unsuitability Criterion Number 2 and would not be recoverable. Within the BLM study area, PRC estimates that approximately 30.3 million tons of mineable coal included in the South Porcupine LBA Tract configured under Alternative 2 is located within a layback buffer zone that extends 1,000 feet on either side of the railroad centerline.

As discussed in Sections 1.5 and 2.6.1 and shown in Figure 2-6, some of the coal included in the above-described alternative tract configuration is overlain by the Antelope Road. The coal that is underlying this public road ROW and

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associated 100-foot buffer zone extending on either side of the ROW has been determined to be unsuitable for mining in accordance with SMCRA and as specified in coal leasing Unsuitability Criterion Number 3 (43 CFR 3461) and would therefore not be recoverable.

As discussed in Section 2.6.1, there is an exception to this prohibition to mine the coal underlying the public road ROW and associated buffer zone that can be applied if the appropriate public road authority allows the road to be relocated or closed (SMCRA Section 522(e)(4) and 30 CFR 761.11(d)(2)). As discussed in Section 1.1, PRC has obtained approval from the Campbell County Board of Commissioners to close and relocate a portion (approximately 1.25 miles) of the Antelope Road that crosses the South Porcupine LBA Tract under the alternative tract configuration. PRC plans to apply for the approval of the County Commissioners to close or relocate the remaining length (approximately 2.25 miles) of the Antelope Road that crosses the BLM study area for the South Porcupine tract. If PRC obtains approval from the County Commissioners to close or relocate this section of the county road, the exception to the prohibition on mining within the road ROW and associated buffer zone could be applied and the unsuitability determination could be reconsidered. In that case, PRC would be able to recover the coal underlying the county road ROW and buffer zone. If PRC does not obtain approval to move or close the 2.25-mile section of Antelope Road, the coal underlying its ROW and buffer zone would remain unsuitable for mining and would not be recovered.

Although these lands would not be mined, they are included in the alternative tract configuration to allow maximum recovery of all the mineable coal that is adjacent to but outside of the railroad and public road ROWs and associated buffer zones and to comply with the coal leasing regulations that do not allow leasing of less than 10-acre aliquot parts. If a lease is issued for this tract, stipulations will be attached to the lease stating that no mining activity may be conducted in the portions of the leased tract within the BNSF & UP railroad and public road ROWs and associated buffer zones. The stipulations would also state that mining within the public road ROW and buffer zone may be conducted if approval is obtained from the appropriate public road authority to relocate or close the remaining 2.25-mile portion of the Antelope Road.

If the remaining 2.25-mile section of Antelope Road is not closed or relocated, PRC estimates that the South Porcupine LBA Tract configured under Alternative 2 (BLM's study area) includes approximately 368.8 million tons of mineable coal reserves. Using PRC's projected recovery factor of 92 percent of the mineable coal reserves, about 339.3 million tons of the mineable coal would be recoverable. At the average annual production rate of 95 mmtpy, mining this coal would extend the life of the mine by about 3.6 additional years. PRC estimates that approximately 102.1 million tons of coal would not be mineable because of the railroad and public road ROWs and associated buffer zones.

If the remaining 2.25-mile section of Antelope Road is closed or relocated, PRC estimates that an added 71.8 million tons of coal would be mineable in the BLM study area tract (BLM's preferred tract configuration).

BLM independently evaluates the volume and average quality of the coal resources included in proposed LBA tracts as part of the fair market value determination process. BLM's estimate may not be in agreement with the mineable coal reserve and coal quality estimates provided by the applicant. Under the Preferred Alternative (Alternative 2), BLM's estimate will be published in the sale notice for the tract, if it is offered for sale.

## **2.7 Alternatives Considered but not Analyzed in Detail**

### 2.7.1 Alternative 4: New Mine Start

Under this alternative, as under the Proposed Actions and Alternatives 2 and 3, BLM would hold a separate, competitive, sealed-bid sale for the lands included in each LBA tract. Under this alternative, it is assumed, however, that the successful qualified bidder for a tract would be someone other than the applicant and that this bidder would plan to open a new mine to develop the coal resources in one or more of the LBA tracts (North Hilight Field, South Hilight Field, West Hilight Field, West Jacobs Ranch, North Porcupine, and South Porcupine).

BLM currently estimates that a tract would potentially need to include as much as 500 to 600 million tons of in-place coal in order to attract a buyer interested in opening a new mine in the Wyoming PRB. This is based on several assumptions. First, it is assumed that an operator would need to construct facilities capable of producing 30 mmtpy in order to take advantage of the economies of scale offered by the coal deposits in the PRB. Secondly, it is assumed that 20 to 30 years of coal reserves would be needed to justify the expense of building the facilities described above. Given these assumptions, the West Jacobs Ranch and North Porcupine LBA Tracts as applied for include sufficient coal reserves to consider opening a new mine, while the three Hilight Field LBA Tracts as applied for and the South Porcupine LBA Tract as applied for do not. The North Hilight Field, West Hilight Field, West Jacobs Ranch, and North Porcupine LBA Tracts reconfigured under Alternative 2 (and Alternative 3 for the West Hilight Field tract), each include sufficient coal reserves to support a new mine, while the South Hilight Field and South Porcupine tracts do not. Therefore, it is unlikely that a company or companies would lease the South Hilight Field or South Porcupine tracts in order to open a new mine. However, the other four LBA Tracts that are included in this EIS analysis do include sufficient coal reserves to support a new mine.

A company or companies acquiring this coal for one or more new stand-alone mines 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 spurs), mining equipment,

## *2.0 Proposed Action and Alternatives*

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extensive baseline data collection, and development of new mining and reclamation plans. A new start mine would also require a large number of new employees, which may not be available from the mining sector workforce (which includes the oil and gas industry), considering the current strong demand for labor and low unemployment in Campbell County and surrounding counties in the PRB.

In addition, a company or companies acquiring this coal for one or more new start mines would have to compete for customers with established mines in a competitive market. Based on demand forecasting for the Wyoming PRB mines, there is sufficient existing mine capacity to provide for expected coal demand through the year 2020 (BLM 2005a). While this does not mean that no new operations would open, it becomes difficult for a new operation with the capital costs of new facilities and mine start up costs to produce coal at a price competitive with the existing operations. The potential difficulty in obtaining an air quality permit is another issue that could discourage new mine starts in the PRB. A new mine would create a new source of air quality impacts. As discussed in Chapter 3, the WDEQ/AQD administers a permitting program to assist the agency in managing the state's air resources. Under this program, anyone planning to construct, modify, or use a facility capable of emitting designated pollutants into the atmosphere must obtain an air quality permit to construct. Coal mines fall into this category.

In order to obtain a construction permit, an operator may be required to demonstrate that the proposed activities will not increase air pollutant levels above annual standards established by the Wyoming Air Quality Standards and Regulations, which can be found on the WDEQ/AQD website at <http://deq.state.wy.us/aqd/standards.asp>. There were no exceedances of the 24-hour PM<sub>10</sub> standard anywhere in the PRB through year 2000. From 2001 through 2006, there were 29 monitored exceedances of the 24-hour PM<sub>10</sub> standard at seven operating mines in the Wyoming PRB. Nineteen of these exceedances occurred in 2001 and 2002, while two, three, five, and zero exceedances occurred in 2003, 2004, 2005, and 2006 respectively. In 2007, there were a total of 11 exceedances of the 24-hour PM<sub>10</sub> standard reported at six PRB surface coal mines. Seven of those 11 exceedances in 2007 occurred at the mines that are located in the general Wright analysis area (one at the Black Thunder Mine, two at the North Antelope Rochelle Mine, and four at the North Rochelle Mine, which was acquired by Arch Coal, Inc. in 2004 and is located between and adjacent to the Black Thunder and North Antelope Rochelle mines). A total of two exceedances of the 24-hour PM<sub>10</sub> standard were reported at the PRB mines in 2008, one each at the Black Thunder and North Rochelle mines. WDEQ/AQD subsequently issued notices of violation for the two exceedances that occurred in 2008 (Shamley 2010). Although many of these exceedances have been attributed to high winds, concerns about future potential exceedances of the federal and state ambient air quality standards may make it more difficult for an operator planning on opening a new mine to demonstrate that new operations would not result in air pollution levels that are above the standards.

In view of the issues discussed above, development of a new mine on one or more of the six LBA tracts that are included in this EIS is considered unlikely and this alternative is not analyzed in detail in this EIS.

The environmental impacts of developing one or more new mines to recover the coal resources in one or more of these six LBA tracts 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 one or more lease sales are held and the applicants are not the successful bidder(s), the successful bidder(s) would be required to submit detailed mining and reclamation plans for approval before any of the tract(s) could be mined, and this NEPA analysis would be reviewed and supplemented as necessary prior to approval of those mining and reclamation plans.

### 2.7.2 Alternative 5: Delaying the Sale

Under this alternative, BLM would delay the sale of one or more of the LBA tracts as applied for. This alternative assumes that a tract could be developed later as either a maintenance tract or a new start mine, depending on how long the sale was delayed.

Coal bed natural gas (CBNG) resources are currently being recovered from oil and gas leases on all six LBA tracts. Delaying the sale of one or more of the tracts would allow CBNG resources to be more completely recovered prior to mining. There are several mechanisms in place that would allow continuing recovery of the CBNG resources prior to mining if the federal coal reserves in the tracts are leased now. These include:

- BLM can attach a Multiple Mineral Development stipulation to each lease, which states that BLM has the authority to withhold approval of coal mining operations that would interfere with the development of mineral leases issued prior to the coal lease.
- BLM has a policy in place on CBNG-coal conflicts (BLM Instruction Memorandum No. 2006-153) that directs BLM decision makers to optimize the recovery of both resources and ensure that the public receives a reasonable return (BLM 2006a).
- Mining of each LBA tract cannot occur until the coal lessee has a permit to mine the tract approved by the WDEQ/LQD and a Mineral Leasing Act (MLA) mining plan approved by the Secretary of the Interior. Before the MLA mining plan can be approved, BLM must approve the R2P2 for mining the tract. Prior to approving the R2P2, BLM can review the status of CBNG development on the tract and the mining sequence proposed by the coal lessee.

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- The mine permit approval process generally takes the coal lessee several years to complete. This would allow time for the CBNG resources to be recovered from each tract.

However, delaying the sale of one or more of the tracts would not necessarily result in the recovery of more CBNG because the recovery is likely to continue post-sale, and most (or all) of the CBNG has either been, or will be by the time coal mining operations commence, produced from the oil and gas leases on the tract.

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) federal and state royalties and taxes collected when the coal is sold. Delaying the sale of one or more of the tracts may result in a higher coal price and/or higher bonus bid. If coal prices do increase, the fair market value of the coal resources in the LBA tracts could potentially increase, which could result in an increased bonus bid if the coal is leased at a later date. However, postponing a lease sale would not necessarily lead to higher royalty or tax income to the state and federal governments. Royalty and tax payments are the larger of the two revenue sources and they increase automatically when coal prices increase because they are collected at the time the coal is sold. They cannot be collected until the coal is leased and permitted, which takes several years. If leasing is delayed, then by the time the coal is mined, the 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, and tax revenues. On the other hand, if a existing mine runs out of coal reserves before prices rise, it would potentially have to shut down before additional coal could be leased and permitted for mining. Under this scenario, the fair market value of the coal could actually decrease because the added expense of reopening a mine or starting a new mine would have to be factored into the fair market value.

The average price received for PRB coal in 2000 was just under \$5.00 per ton. Prices increased to between \$6.00 and \$7.00 per ton from 2001 to 2004, and in 2005 the average price peaked at more than \$20.00 per ton. During much of 2005, coal shipments from the PRB were limited due to damage to railroad lines in Wyoming and other states. These shipping constraints combined with increasing world energy demands and natural disasters in other parts of the country led to anomalously large increases in coal prices in 2005. Rail capacity increased in 2006, which effectively helped to moderate coal prices throughout 2006. Average prices received for PRB coal remained fairly stable at around \$10.00 per ton in 2007, increased to around \$14.50 in 2008, and then decreased to under \$10.00 per ton throughout most of 2009.

The recent history of price volatility and the lengthy lease and permitting process underscores the difficulty in predicting the price of coal, and therefore, the bonus and royalty payments to the government. However, the global

demand for coal has increased largely due to the rise of developing foreign markets like China and India. Fueled by recent overseas demand, Appalachian coal prices have increased dramatically. PRB coal may help to fill the gap left by the Appalachian coal exports, which could lead to greater demand and prices for PRB coal. If so, the bonus and royalty payments to the government might be higher if one or more of the tracts is offered for sale at a later date. There is no assurance however at this time that delaying the sale of one or more of the LBA tracts would result in a higher coal price or a higher bonus bid.

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 continue meeting the nation's energy needs while also meeting the existing 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.

This alternative was not analyzed in detail because it would not produce substantially different impacts from other alternatives analyzed in detail. Rental and royalty provisions in each proposed lease provide for the U.S. to benefit if coal prices increase by the time of mining. Moreover, recovery of a large portion of the economically-recoverable CBNG resources on the tracts would be anticipated after lease issuance because of the mechanisms discussed above. 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 for each LBA tract. If a new mine is required to mine the coal, the environmental impacts would be expected to be greater than if each tract were mined as an extension of an existing mine.

## **2.8 Regulatory Compliance, Mitigation and Monitoring**

SMCRA and Wyoming state law require surface coal mines to collect extensive baseline information and implement extensive monitoring programs and mitigation measures. The currently approved permits to conduct mining operations for the Black Thunder, Jacobs Ranch, and North Antelope Rochelle mines include these requirements. Monitoring programs and mitigation measures that are required by regulation are considered to be part of the Proposed Action and the Action Alternatives considered in this EIS for the North Hilight Field, South Hilight Field, West Hilight Field, West Jacobs Ranch, North Porcupine, and South Porcupine LBA Tracts. These data collection

## *2.0 Proposed Action and Alternatives*

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requirements, mitigation plans, and monitoring plans are in place for the No Action Alternative as part of the current approved permit to conduct mining operations for the existing Black Thunder, Jacobs Ranch, and North Antelope Rochelle mines. These data collection requirements, mitigation plans, and monitoring commitments would be extended to include mining operations on the North Hilight Field, South Hilight Field, West Hilight Field, West Jacobs Ranch, North Porcupine, and South Porcupine LBA Tracts if they are leased and permitted for mining. A mining and reclamation plan would have to be approved for each tract before any mining operations could be conducted, regardless of who acquires the tract. The major mitigation and monitoring measures that are required by state or federal regulation are summarized in Table 2-1. More specific information about some of these mitigation and monitoring measures and their results at the Black Thunder, Jacobs Ranch, and North Antelope Rochelle mines are described in Chapter 3.

If impacts are identified during the leasing process that are not mitigated by existing required mitigation measures, BLM can require additional mitigation measures in the form of stipulations on the new lease, within the limits of its regulatory authority. In general, the levels of mitigation and monitoring required for surface coal mining by SMCRA and Wyoming state law are more extensive than those required for other surface disturbing activities; however, concerns are periodically identified that are not monitored or mitigated under existing procedures.

### **2.9 Hazardous and Solid Waste**

Wastes produced by current mining activities at the Black Thunder, Jacobs Ranch, and North Antelope Rochelle mines are handled according to the procedures described in the approved mine permits (TBCC 2005, JRCC 2009, and PRC 2009, respectively). Under the Proposed Action and Action Alternatives for each of the six LBA tracts, the procedures and requirements for handling of hazardous and solid wastes would be the same as the procedures and requirements for the existing mining operations and in accordance with the mines' approved waste disposal plans.

Solid waste that is produced at the existing Black Thunder, Jacobs Ranch, and North Antelope Rochelle mines consists of floor sweepings, shop rags, empty lubricant containers, welding rod ends, metal shavings, worn tires, packing material, used filters, and office and food wastes. A portion of the solid wastes produced at the Black Thunder, Jacobs Ranch, and North Antelope Rochelle mines is disposed of within the mines' permit boundaries in accordance with WDEQ-approved solid waste disposal plans. Non-hazardous solid waste from the mines is also disposed of at the regulated Campbell County landfill near Gillette. Sewage is handled by WDEQ-permitted sewage systems present on the existing mine facilities. Maintenance and lubrication of most of the equipment takes place at existing shop facilities at each of the three mines. Major lubrication, oil changes, etc. of most equipment are performed inside the service building lubrication bays at the Black Thunder, Jacobs Ranch, and

Table 2-1. Regulatory Compliance, Mitigation and Monitoring Measures for Surface Coal Mining Operations Required by SMCRA and State Law for all Alternatives.

Resource	Regulatory Compliance or Mitigation Required by Stipulations, State or Federal Law <sup>1</sup>	Monitoring <sup>1</sup>
Topography & Physiography	<ul style="list-style-type: none"> <li>▪ Restoring to approximate original contour or other approved topographic configuration.</li> </ul>	<ul style="list-style-type: none"> <li>▪ WDEQ/LQD checks as-built vs. approved topography with each annual report.</li> </ul>
Geology & Minerals	<ul style="list-style-type: none"> <li>▪ Identifying &amp; selectively placing or mixing chemically or physically unsuitable overburden materials to minimize adverse effects to vegetation or groundwater.</li> </ul>	<ul style="list-style-type: none"> <li>▪ WDEQ/LQD requires monitoring in advance of mining to detect unsuitable overburden.</li> </ul>
Soil	<ul style="list-style-type: none"> <li>▪ Salvaging soil suitable to support plant growth for use in reclamation;</li> <li>▪ Protecting soil stockpiles from disturbance and erosional influences;</li> <li>▪ Selectively placing at least 4 feet of suitable overburden on the graded backfill surface below replaced topsoil to meet guidelines for vegetation root zones.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Monitoring vegetation growth on reclaimed areas to determine need for soil amendments;</li> <li>▪ Sampling regraded overburden for compliance with root zone criteria.</li> </ul>
Air Quality	<ul style="list-style-type: none"> <li>▪ Dispersion modeling of mining plans for annual average particulate pollution impacts on ambient air;</li> <li>▪ Using particulate pollution control technologies;</li> <li>▪ Using work practices designed to minimize fugitive particulate emissions;</li> <li>▪ Using EPA- or state-mandated BACT, including:               <ul style="list-style-type: none"> <li>-Fabric filtration or wet scrubbing of coal storage silo and conveyor vents,</li> <li>-Watering or using chemical dust suppression on haul roads and exposed soils,</li> <li>-Containment of truck dumps and primary crushers,</li> <li>-Covering of conveyors,</li> <li>-Prompt revegetation of exposed soils,</li> <li>-High efficiency baghouse dust collection systems or PECs, or atomizers/foggers on the crusher, conveyor transfer, storage bin and train loadout, meeting a standard of 0.01 grains per dry standard cubic foot (dscf) of exit volume,</li> <li>-Watering of active work areas,</li> <li>-Reclamation plan to minimize surface disturbances subject to wind erosion,</li> <li>-Paving of access roads,</li> <li>-Haul truck speed limits,</li> <li>-Limited material drop heights for shovels and draglines.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ On-site air quality monitoring for PM<sub>10</sub> and/or TSP;</li> <li>▪ Off-site ambient monitoring for PM<sub>10</sub> and/or TSP;</li> <li>▪ On-site compliance inspections.</li> </ul>

<sup>1</sup> These requirements, mitigation plans, and monitoring plans are required by SMCRA and Wyoming state law, and are already in place for the existing Black Thunder, Jacobs Ranch, and North Antelope Rochelle mines in their current approved WDEQ/LQD mining and reclamation plans (the No Action Alternatives). If the North Hilight Field, South Hilight Field, West Hilight Field, West Jacobs Ranch, North Porcupine, and South Porcupine LBA Tracts were leased, these requirements, mitigation plans, and monitoring plans would be part of the mining plan revisions covering each of the LBA tracts that must be approved before mining can occur on the tracts under the Proposed Actions or Action Alternatives.

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Table 2-1. Regulatory Compliance, Mitigation and Monitoring Measures for Surface Coal Mining Operations Required by SMCRA and State Law for all Alternatives (Continued).

Resource	Regulatory Compliance or Mitigation Required by Stipulations, State or Federal Law <sup>1</sup>	Monitoring <sup>1</sup>
Air Quality (continued)	<ul style="list-style-type: none"> <li>▪ Following voluntary and required measures to avoid exposing the public to NO<sub>2</sub> from blasting clouds, including:               <ul style="list-style-type: none"> <li>-Phone notification of neighbors and workers prior to blasting,</li> <li>-Monitoring weather and atmospheric conditions prior to decisions to blast,</li> <li>-Timing blasts to avoid temperature inversions and to minimize inconvenience to neighbors,</li> <li>-Closing public roads when appropriate to protect the public,</li> <li>-Minimizing blast sizes,</li> <li>-Posting signs on major public roads.</li> </ul> </li> </ul>	
Surface Water	<ul style="list-style-type: none"> <li>▪ Building and maintaining sediment control ponds or other devices during mining;</li> <li>▪ Restoring approximate original drainage patterns during reclamation;</li> <li>▪ Restoring stock ponds and playas during reclamation.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Monitoring storage capacity in sediment ponds;</li> <li>▪ Monitoring quality of discharges;</li> <li>▪ Monitoring streamflow and water quality.</li> </ul>
Groundwater Quantity	<ul style="list-style-type: none"> <li>▪ Evaluating cumulative impacts to water quantity associated with proposed mining;</li> <li>▪ Replacing existing water rights that are interrupted, discontinued, or diminished by mining with water of equivalent quantity.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Monitoring wells track water levels in overburden, coal, interburden, underburden, and backfill.</li> </ul>
Groundwater Quality	<ul style="list-style-type: none"> <li>▪ Evaluating cumulative impacts to water quality associated with proposed mining;</li> <li>▪ Replacing existing water rights that are interrupted, discontinued, or diminished by mining with water of equivalent quality.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Monitoring wells track water quality in overburden, coal, interburden, underburden, and backfill.</li> </ul>
Alluvial Valley Floors	<ul style="list-style-type: none"> <li>▪ Identifying all AVFs that would be affected by mining;</li> <li>▪ WDEQ/LQD determination of significance to agriculture of all identified AVFs affected by mining;</li> <li>▪ Protecting downstream AVFs during mining;</li> <li>▪ Restoring essential hydrologic function of all AVFs affected by mining.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Monitoring to determine restoration of essential hydrologic functions of any declared AVF.</li> </ul>
Wetlands	<ul style="list-style-type: none"> <li>▪ Identifying all wetlands that would be affected by mining;</li> <li>▪ COE identification of jurisdictional wetlands;</li> <li>▪ Replacing all jurisdictional wetlands that would be disturbed by mining;</li> <li>▪ Replacing functional wetlands as required by surface managing agency, surface landowner, or WDEQ/LQD.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Monitoring of reclaimed wetlands using same procedures used to identify pre-mining jurisdictional wetlands.</li> </ul>

<sup>1</sup> These requirements, mitigation plans, and monitoring plans are required by SMCRA and Wyoming state law, and are already in place for the existing Black Thunder, Jacobs Ranch, and North Antelope Rochelle mines in their current approved WDEQ/LQD mining and reclamation plans (the No Action Alternatives). If the North Hilight Field, South Hilight Field, West Hilight Field, West Jacobs Ranch, North Porcupine, and South Porcupine LBA Tracts were leased, these requirements, mitigation plans, and monitoring plans would be part of the mining plan revisions covering each of the LBA tracts that must be approved before mining can occur on the tracts under the Proposed Actions or Action Alternatives.

Table 2-1. Regulatory Compliance, Mitigation and Monitoring Measures for Surface Coal Mining Operations Required by SMCRA and State Law for all Alternatives (Continued).

Resource	Regulatory Compliance or Mitigation Required by Stipulations, State or Federal Law <sup>1</sup>	Monitoring <sup>1</sup>
Vegetation	<ul style="list-style-type: none"> <li>▪ Permanently revegetating reclaimed areas according to a comprehensive revegetation plan using approved permanent reclamation seed mixtures consisting predominantly of species native to the area;</li> <li>▪ Reclaiming 20 percent of reclaimed area with native shrubs at a density of one per square meter;</li> <li>▪ Controlling erosion on reclaimed lands prior to seeding with final seed mixture using mulching, cover crops, or other approved measures;</li> <li>▪ Chemically and mechanically controlling weed infestation;</li> <li>▪ Direct hauling of topsoil;</li> <li>▪ Selectively planting shrubs in riparian areas;</li> <li>▪ Planting sagebrush;</li> <li>▪ Creating depressions and rock piles;</li> <li>▪ Using special planting procedures around rock piles;</li> <li>▪ Posting reclamation bond covering the cost of reclamation.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Monitoring of revegetation growth &amp; diversity until release of final reclamation bond (minimum 10 years);</li> <li>▪ Monitoring of erosion to determine need for corrective action during establishment of vegetation;</li> <li>▪ Use of controlled grazing during revegetation evaluation to determine suitability for post-mining land uses.</li> </ul>
Wildlife and Sensitive Species	<ul style="list-style-type: none"> <li>▪ Restoring pre-mining topography to the maximum extent possible;</li> <li>▪ Planting a diverse mixture of grasses, forbs, and shrubs in configurations beneficial to wildlife;</li> <li>▪ Designing fences to permit wildlife passage;</li> <li>▪ Raptor-proofing power transmission poles;</li> <li>▪ Using raptor safe power lines;</li> <li>▪ Creating artificial raptor nest sites;</li> <li>▪ Increasing habitat diversity by creating rock clusters and shallow depressions on reclaimed land;</li> <li>▪ Cottonwood plantings along reclaimed drainages;</li> <li>▪ Replacing drainages, wetlands, and AVFs disturbed by mining;</li> <li>▪ Reducing vehicle speed limits to minimize mortality;</li> <li>▪ Instructing employees not to harass or disturb wildlife;</li> <li>▪ Following USFWS-approved raptor mitigation plans;</li> <li>▪ Avoiding bald eagle disturbance;</li> <li>▪ Restoring bald eagle perching and foraging areas disturbed by mining;</li> <li>▪ Creating raptor nesting habitat through enhancement efforts;</li> <li>▪ Development of a Migratory Bird Species of Management Concern (including the Greater sage-grouse) Monitoring and Mitigation Plan;</li> <li>▪ Restoring sage-grouse and mountain plover habitat disturbed by mining;</li> <li>▪ Surveying for sage-grouse, mountain plover and black-tailed prairie dogs.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Baseline and annual wildlife monitoring surveys;</li> <li>▪ Monitoring for raptors and other migratory bird species of management concern.</li> </ul>

<sup>1</sup> These requirements, mitigation plans, and monitoring plans are required by SMCRA and Wyoming state law, and are already in place for the existing Black Thunder, Jacobs Ranch, and North Antelope Rochelle mines in their current approved WDEQ/LQD mining and reclamation plans (the No Action Alternatives). If the North Hilight Field, South Hilight Field, West Hilight Field, West Jacobs Ranch, North Porcupine, and South Porcupine LBA Tracts were leased, these requirements, mitigation plans, and monitoring plans would be part of the mining plan revisions covering each of the LBA tracts that must be approved before mining can occur on the tracts under the Proposed Actions or Action Alternatives.

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Table 2-1. Regulatory Compliance, Mitigation and Monitoring Measures for Surface Coal Mining Operations Required by SMCRA and State Law for all Alternatives (Continued).

Resource	Regulatory Compliance or Mitigation Required by Stipulations, State or Federal Law <sup>1</sup>	Monitoring <sup>1</sup>
Threatened, Endangered, Proposed, and Candidate Species (Vegetation and Animals)	<ul style="list-style-type: none"> <li>▪ Surveying for Ute ladies'-tresses and blowout penstemon;</li> <li>▪ USFWS block clearance from black-footed ferret surveys in project area;</li> <li>▪ Same as Wildlife and Sensitive Species above.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Baseline and annual wildlife monitoring surveys.</li> </ul>
Land Use	<ul style="list-style-type: none"> <li>▪ Suitably restoring reclaimed area for historic uses (grazing and wildlife);</li> </ul>	<ul style="list-style-type: none"> <li>▪ Monitoring of controlled grazing prior to bond release evaluation.</li> </ul>
Cultural Resources	<ul style="list-style-type: none"> <li>▪ Conducting Class I &amp; III surveys to identify cultural properties on all state and federal lands and on private lands affected by federal undertakings;</li> <li>▪ Consulting with SHPO to evaluate eligibility of cultural properties for the NRHP;</li> <li>▪ Avoiding or recovering data from significant cultural properties identified by surveys, according to an approved plan;</li> <li>▪ Notifying appropriate federal personnel if historic or prehistoric materials are uncovered during mining operations;</li> <li>▪ Instructing employees of the importance of and regulatory obligations to protect cultural resources.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Monitoring of mining activities during topsoil stripping;</li> <li>▪ Cessation of activities and notification of authorities if unidentified sites are encountered during topsoil removal.</li> </ul>
Native American Concerns	<ul style="list-style-type: none"> <li>▪ Notifying Native American tribes with known interest in this area of leasing action and request for help in identifying potentially significant religious or cultural sites.</li> </ul>	<ul style="list-style-type: none"> <li>▪ No specific monitoring program.</li> </ul>
Paleontological Resources	<ul style="list-style-type: none"> <li>▪ Notifying appropriate federal personnel if potentially significant paleontological sites are discovered during mining.</li> </ul>	<ul style="list-style-type: none"> <li>▪ No specific monitoring program.</li> </ul>
Visual Resources	<ul style="list-style-type: none"> <li>▪ Restoring landscape character during reclamation through return to approximate original contour and revegetation with native species.</li> </ul>	<ul style="list-style-type: none"> <li>▪ No specific monitoring program.</li> </ul>
Noise	<ul style="list-style-type: none"> <li>▪ Protecting employees from hearing loss.</li> </ul>	<ul style="list-style-type: none"> <li>▪ MSHA inspections.</li> </ul>
Transportation Facilities	<ul style="list-style-type: none"> <li>▪ Relocating existing pipelines, if necessary, in accordance with specific agreement between pipeline owner and coal lessee.</li> </ul>	<ul style="list-style-type: none"> <li>▪ No specific monitoring program.</li> </ul>
Socioeconomics	<ul style="list-style-type: none"> <li>▪ Paying royalty and taxes as required by federal, state, and local regulations.</li> <li>▪ No mitigation measures are proposed.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Surveying and reporting to document volume of coal removed.</li> </ul>

<sup>1</sup> These requirements, mitigation plans, and monitoring plans are required by SMCRA and Wyoming state law, and are already in place for the existing Black Thunder, Jacobs Ranch, and North Antelope Rochelle mines in their current approved WDEQ/LQD mining and reclamation plans (the No Action Alternatives). If the North Hilight Field, South Hilight Field, West Hilight Field, West Jacobs Ranch, North Porcupine, and South Porcupine LBA Tracts were leased, these requirements, mitigation plans, and monitoring plans would be part of the mining plan revisions covering each of the LBA tracts that must be approved before mining can occur on the tracts under the Proposed Actions or Action Alternatives.

Table 2-1. Regulatory Compliance, Mitigation and Monitoring Measures for Surface Coal Mining Operations Required by SMCRA and State Law for all Alternatives (Continued).

Resource	Regulatory Compliance or Mitigation Required by Stipulations, State or Federal Law <sup>1</sup>	Monitoring <sup>1</sup>
Hazardous & Solid Waste	<ul style="list-style-type: none"> <li>▪ Disposing of solid waste and sewage within permit boundaries according to approved plans;</li> <li>▪ Storing and recycling waste oil;</li> <li>▪ Maintaining of files containing Material Safety Data Sheets for all chemicals, compounds, and/or substances used during course of mining;</li> <li>▪ Ensuring that all production, use, storage, transport, and disposal of hazardous materials is in accordance with applicable existing or hereafter promulgated federal, state, and government requirements;</li> <li>▪ Complying with emergency reporting requirements for releases of hazardous materials as established in CERCLA, as amended;</li> <li>▪ Preparing and implementing spill prevention control and countermeasure plans, spill response plans, inventories of hazardous chemical categories pursuant to Section 312 of SARA, as amended;</li> <li>▪ Preparing emergency response plans.</li> </ul>	<ul style="list-style-type: none"> <li>▪ No specific monitoring other than required by these other regulations and response plans.</li> </ul>

<sup>1</sup> These requirements, mitigation plans, and monitoring plans are required by SMCRA and Wyoming state law, and are already in place for the existing Black Thunder, Jacobs Ranch, and North Antelope Rochelle mines in their current approved WDEQ/LQD mining and reclamation plans (the No Action Alternatives). If the North Hilight Field, South Hilight Field, West Hilight Field, West Jacobs Ranch, North Porcupine, and South Porcupine LBA Tracts were leased, these requirements, mitigation plans, and monitoring plans would be part of the mining plan revisions covering each of the LBA tracts that must be approved before mining can occur on the tracts under the Proposed Actions or Action Alternatives.

## *2.0 Proposed Action and Alternatives*

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North Antelope Rochelle mines, where used oil and grease are currently contained and deposited in storage tanks. All of the collected used oils and grease are then beneficially recycled off site or used for energy recovery, including, at some of the PRB mines, blending with diesel fuel oil for use as equipment fuel. These practices would not change if the applicants acquire these LBA tracts.

TBCC and PRC have reviewed 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.

TBCC and PRC maintain files containing Material Safety Data Sheets (MSDS) for all chemicals, compounds, and/or substances that are or would be used during the course of mining.

TBCC and PRC are 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.

TBCC and PRC must comply with emergency reporting requirements for release of hazardous materials. 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 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, WDEQ Water Quality 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;
- Stormwater Pollution Prevention Plans;
- Inventories of Hazardous Chemical Categories Pursuant to Section 313 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, Department of Transportation, and the Federal Clean Air Act. 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 the Black Thunder, Jacobs Ranch, and North Antelope Rochelle mines. Acquisition of the LBA tracts by the applicants would not change these current practices nor the type of any wastes generated and disposed of by the mines; however, the quantities of some wastes (e.g., lubricants and solid wastes produced in the shops and offices) would likely increase in proportion to increases in coal production.

## **2.10 Summary of Alternatives and Environmental Consequences**

### 2.10.1 Background

The decision-making process for public lands in Wyoming is conducted in compliance with NEPA, which requires all federal agencies to involve interested publics in their decision-making, consider reasonable alternatives to the proposed actions, develop measures to mitigate environmental impacts, and prepare environmental documents that disclose the impacts of proposed actions and alternatives.

This final EIS analyzes in detail different alternatives for the North Hilight Field, South Hilight Field, West Hilight Field, West Jacobs Ranch, North Porcupine, and South Porcupine LBA Tracts described in the discussion above.

### 2.10.2 Summary of Alternatives

The North Hilight Field, South Hilight Field, West Hilight Field, West Jacobs Ranch, North Porcupine, and South Porcupine LBA Tracts under the Action Alternatives are shown on Figures 2-1 through 2-6, respectively. A summary comparison of projected coal production, surface disturbance, mine life, and federal and state revenues for the Proposed Action and Alternatives 1, 2, and 3 (if applicable) for the North Hilight Field, South Hilight Field, West Hilight Field, West Jacobs Ranch, North Porcupine, and South Porcupine LBA Tracts LBA Tracts are presented in Tables 2-2 through 2-13, respectively.

Table 2-2 presents the comparisons assuming that Shroyer Road is not moved and the underlying coal is not recovered from the North Hilight Field tract. Table 2-3 presents the comparisons assuming that Shroyer Road is moved and the underlying coal is recovered from the North Hilight Field tract.

Table 2-4 presents the comparisons assuming that Reno Road is not moved and the underlying coal is not recovered from the South Hilight Field tract.

## 2.0 Proposed Action and Alternatives

Table 2-2. Summary Comparison of Coal Production, Surface Disturbance, Mine Life, and Revenues for North Hilight Field LBA Tract and Black Thunder Mine – Shroyer Road is Not Moved and the Underlying Coal is Not Recovered.

<b>Item</b>	<b>Alternative 1 - No Action Alternative (Existing Black Thunder Mine)</b>	<b>Added by Proposed Action</b>	<b>Added by Alternative 2</b>
In-Place Coal (as of 1/1/09)	1,271.1 mmt	319.7 mmt	756.9 mmt
Mineable Coal (as of 1/1/09) <sup>1</sup>	1,271.1 mmt	286.3 mmt	709.6 mmt
Recoverable Coal (as of 1/1/09) <sup>2</sup>	1,169.4 mmt	263.4 mmt	652.8 mmt
Coal Mined Through 2008	1,087.9 mmt	--	--
Lease Area <sup>3</sup>	19,581.3 ac	2,613.5 ac	7,139.4 ac
Total Area To Be Disturbed <sup>3</sup>	26,490.2 ac	5,053.0 ac	12,908.8 ac
Permit Area <sup>3</sup>	29,212.0 ac	5,053.0 ac	12,908.8 ac
Average Annual Coal Production (by 2015) <sup>4</sup>	135 mmt	0 mmt	0 mmt
Remaining Life of Mine (post-2008)	9.3 yrs	2.0 yrs	4.8 yrs
Projected Number of Employees (by 2013) <sup>4</sup>	1,324	0	0
Total Projected State Revenues (post-2008) <sup>5</sup>	\$1,977.9 mm	\$488.5 – \$584.4 mm	\$1,210.5 – \$1,448.3 mm
Total Projected Federal Revenues (post-2008) <sup>6</sup>	\$1,541.1 mm	\$390.1 – \$486.0 mm	\$966.8 – \$1,204.5 mm

<sup>1</sup> Under the Proposed Action and Alternative 2, the mineable coal figure excludes all coal that would not be mined beneath the BNSF & UP railroad ROW and associated buffer zone and Shroyer Road ROW and associated buffer zone.

<sup>2</sup> Assumes 92 percent recovery of mineable coal that occurs during normal mining operation.

<sup>3</sup> The lease area figure includes federal coal leases only and does not include state and private coal within the permit boundary. The disturbed area typically exceeds the leased area (total federal and state) because of the need for highwall reduction, topsoil removal, and other mine support activities outside the lease boundaries. The permit area is larger than the leased or disturbed area to assure that all disturbed lands are within the permit boundary and to allow an easily defined legal land description.

<sup>4</sup> The mine projects to increase production rate from 100 mmtpy after 2008 to 135 mmtpy by 2015. The mine projects to increase employment from 1,080 to 1,324 as projected production increases.

<sup>5</sup> Revenues to the State of Wyoming include severance taxes, property and production taxes (ad valorem), sales and use taxes, and Wyoming's share of federal royalty payments, AML fees and bonus bid payments. State revenues are based on \$0.4312 per ton estimate for severance taxes × amount of recoverable coal, plus \$0.372 per ton estimate for ad valorem taxes × amount of recoverable coal, plus \$0.0569 per ton estimate for sales and use taxes × amount of recoverable coal, plus a projected coal price of \$11.06 per ton × amount of recoverable coal × federal royalty of 12.5 percent minus federal's 50 percent share, plus \$0.28 per ton for AML fees × amount of recoverable coal minus federal's 50 percent share, plus bonus bid payment on LBA leased coal of \$0.30 to \$0.97 per ton (based on the range of bonus bid payments for the last 9 LBAs sold from 2004 through early 2009) × amount of mineable coal minus federal's 50 percent share. These figures could change based on the outcome of recent legislation that changed the percent of distribution to states.

<sup>6</sup> Federal revenues include black lung taxes and the federal government's share of federal royalty payments, AML fees, and bonus bid payments. Federal revenues are based on a projected coal price of \$11.06 per ton × amount of recoverable coal × black lung tax of 4.4 percent, plus \$11.06 per ton price × amount of recoverable coal × federal royalty of 12.5 percent minus state's 50 percent share, plus \$0.28 per ton for AML fees × amount of recoverable coal minus state's 50 percent share, plus bonus bid payments on LBA leased coal of \$0.30 to \$0.97 per ton (based on the range of bonus payments for the last 9 LBAs sold from 2004 through early 2009) × amount of mineable coal minus state's 50 percent share. These figures could change based on the outcome of recent legislation that changed the percent of distribution to states.

Table 2-3. Summary Comparison of Coal Production, Surface Disturbance, Mine Life, and Revenues for North Hilight Field LBA Tract and Black Thunder Mine – Shroyer Road is Moved and the Underlying Coal is Recovered.

<b>Item</b>	<b>Alternative 1 - No Action Alternative (Existing Black Thunder Mine)</b>	<b>Added by Proposed Action</b>	<b>Added by Alternative 2</b>
In-Place Coal (as of 1/1/09)	1,271.1 mmt	319.7 mmt	756.9 mmt
Mineable Coal (as of 1/1/09) <sup>1</sup>	1,271.1 mmt	295.8 mmt	727.5 mmt
Recoverable Coal (as of 1/1/09) <sup>2</sup>	1,169.4 mmt	272.1 mmt	669.3 mmt
Coal Mined Through 2008	1,087.9 mmt	--	--
Lease Area <sup>3</sup>	19,581.3 ac	2,613.5 ac	7,139.4 ac
Total Area To Be Disturbed <sup>3</sup>	26,490.2 ac	5,053.0 ac	12,908.8 ac
Permit Area <sup>3</sup>	29,212.0 ac	5,053.0 ac	12,908.8 ac
Average Annual Coal Production (by 2015) <sup>4</sup>	135 mmt	0 mmt	0 mmt
Remaining Life of Mine (post-2008)	9.3 yrs	2.0 yrs	5.0 yrs
Projected Number of Employees (by 2013) <sup>4</sup>	1,324	0	0
Total Projected State Revenues (post-2008) <sup>5</sup>	\$1,977.9 mm	\$504.6 – \$603.7 mm	\$1,241.1 – \$1,484.9 mm
Total Projected Federal Revenues (post-2008) <sup>6</sup>	\$1,541.1 mm	\$403.0 – \$502.1 mm	\$991.2 – \$1,234.9 mm

<sup>1</sup> Under the Proposed Action and Alternative 2, the mineable coal figure excludes all coal that would not be mined beneath BNSF & UP railroad ROW and associated buffer zone.

<sup>2</sup> Assumes 92 percent recovery of mineable coal that occurs during normal mining operation.

<sup>3</sup> The lease area figure includes federal coal leases only and does not include state and private coal within the permit boundary. The disturbed area typically exceeds the leased area (total federal and state) because of the need for highwall reduction, topsoil removal, and other mine support activities outside the lease boundaries. The permit area is larger than the leased or disturbed area to assure that all disturbed lands are within the permit boundary and to allow an easily defined legal land description.

<sup>4</sup> The mine projects to increase production rate from 100 mmtpy after 2008 to 135 mmtpy by 2015. The mine projects to increase employment from 1,080 to 1,324 as projected production increases.

<sup>5</sup> Revenues to the State of Wyoming include severance taxes, property and production taxes (ad valorem), sales and use taxes, and Wyoming's share of federal royalty payments, AML fees and bonus bid payments. State revenues are based on \$0.4312 per ton estimate for severance taxes × amount of recoverable coal, plus \$0.372 per ton estimate for ad valorem taxes × amount of recoverable coal, plus \$0.0569 per ton estimate for sales and use taxes × amount of recoverable coal, plus a projected coal price of \$11.06 per ton × amount of recoverable coal × federal royalty of 12.5 percent minus federal's 50 percent share, plus \$0.28 per ton for AML fees × amount of recoverable coal minus federal's 50 percent share, plus bonus bid payment on LBA leased coal of \$0.30 to \$0.97 per ton (based on the range of bonus bid payments for the last 9 LBAs sold from 2004 through early 2009) × amount of mineable coal minus federal's 50 percent share. These figures could change based on the outcome of recent legislation that changed the percent of distribution to states.

<sup>6</sup> Federal revenues include black lung taxes and the federal government's share of federal royalty payments, AML fees, and bonus bid payments. Federal revenues are based on a projected coal price of \$11.06 per ton × amount of recoverable coal × black lung tax of 4.4 percent, plus \$11.06 per ton price × amount of recoverable coal × federal royalty of 12.5 percent minus state's 50 percent share, plus \$0.28 per ton for AML fees × amount of recoverable coal minus state's 50 percent share, plus bonus bid payments on LBA leased coal of \$0.30 to \$0.97 per ton (based on the range of bonus payments for the last 9 LBAs sold from 2004 through early 2009) × amount of mineable coal minus state's 50 percent share. These figures could change based on the outcome of recent legislation that changed the percent of distribution to states.

## 2.0 Proposed Action and Alternatives

Table 2-4. Summary Comparison of Coal Production, Surface Disturbance, Mine Life, and Revenues for South Hilight Field LBA Tract and Black Thunder Mine – Reno Road is Not Moved and the Underlying Coal is Not Recovered.

<b>Item</b>	<b>Alternative 1 - No Action Alternative (Existing Black Thunder Mine)</b>	<b>Added by Proposed Action</b>	<b>Added by Alternative 2</b>
In-Place Coal (as of 1/1/09)	1,271.1 mmt	273.3 mmt	406.5 mmt
Mineable Coal (as of 1/1/09) <sup>1</sup>	1,271.1 mmt	232.2 mmt	330.8 mmt
Recoverable Coal (as of 1/1/09) <sup>2</sup>	1,169.4 mmt	213.6 mmt	304.3 mmt
Coal Mined Through 2008	1,087.9 mmt	--	--
Lease Area <sup>3</sup>	19,581.3 ac	1,976.7 ac	2,922.4 ac
Total Area To Be Disturbed <sup>3</sup>	26,490.2 ac	1,126.0 ac	2,731.4 ac
Permit Area <sup>3</sup>	29,212.0 ac	1,126.0 ac	2,731.4 ac
Average Annual Coal Production (by 2015) <sup>4</sup>	135 mmt	0 mmt	0 mmt
Remaining Life of Mine (post-2008)	9.3 yrs	1.6 yrs	2.3 yrs
Projected Number of Employees (by 2013) <sup>4</sup>	1,324	0	0
Total Projected State Revenues (post-2008) <sup>5</sup>	\$1,977.9 mm	\$396.1 – \$473.9 mm	\$564.3 – \$675.1 mm
Total Projected Federal Revenues (post-2008) <sup>6</sup>	\$1,541.1 mm	\$316.3 – \$394.1 mm	\$450.7 – \$561.5 mm

<sup>1</sup> Under the Proposed Action and Alternative 2, the mineable coal figure excludes all coal that would not be mined beneath BNSF & UP railroad ROW and associated buffer zone. Under Alternative 2, the mineable coal figure excludes all coal that would not be mined beneath Reno Road ROW and associated buffer zone.

<sup>2</sup> Assumes 92 percent recovery of mineable coal that occurs during normal mining operation.

<sup>3</sup> The lease area figure includes federal coal leases only and does not include state and private coal within the permit boundary. The disturbed area typically exceeds the leased area (total federal and state) because of the need for highwall reduction, topsoil removal, and other mine support activities outside the lease boundaries. The permit area is larger than the leased or disturbed area to assure that all disturbed lands are within the permit boundary and to allow an easily defined legal land description.

<sup>4</sup> The mine projects to increase production rate from 100 mmtpy after 2008 to 135 mmtpy by 2015. The mine projects to increase employment from 1,080 to 1,324 as projected production increases.

<sup>5</sup> Revenues to the State of Wyoming include severance taxes, property and production taxes (ad valorem), sales and use taxes, and Wyoming's share of federal royalty payments, AML fees and bonus bid payments. State revenues are based on \$0.4312 per ton estimate for severance taxes × amount of recoverable coal, plus \$0.372 per ton estimate for ad valorem taxes × amount of recoverable coal, plus \$0.0569 per ton estimate for sales and use taxes × amount of recoverable coal, plus a projected coal price of \$11.06 per ton × amount of recoverable coal × federal royalty of 12.5 percent minus federal's 50 percent share, plus \$0.28 per ton for AML fees × amount of recoverable coal minus federal's 50 percent share, plus bonus bid payment on LBA leased coal of \$0.30 to \$0.97 per ton (based on the range of bonus bid payments for the last 9 LBAs sold from 2004 through early 2009) × amount of mineable coal minus federal's 50 percent share. These figures could change based on the outcome of recent legislation that changed the percent of distribution to states.

<sup>6</sup> Federal revenues include black lung taxes and the federal government's share of federal royalty payments, AML fees, and bonus bid payments. Federal revenues are based on a projected coal price of \$11.06 per ton × amount of recoverable coal × black lung tax of 4.4 percent, plus \$11.06 per ton price × amount of recoverable coal × federal royalty of 12.5 percent minus state's 50 percent share, plus \$0.28 per ton for AML fees × amount of recoverable coal minus state's 50 percent share, plus bonus bid payments on LBA leased coal of \$0.30 to \$0.97 per ton (based on the range of bonus payments for the last 9 LBAs sold from 2004 through early 2009) × amount of mineable coal minus state's 50 percent share. These figures could change based on the outcome of recent legislation that changed the percent of distribution to states.

Table 2-5. Summary Comparison of Coal Production, Surface Disturbance, Mine Life, and Revenues for South Hilight Field LBA Tract and Black Thunder Mine – Reno Road is Moved and the Underlying Coal is Recovered.

<b>Item</b>	<b>Alternative 1 - No Action Alternative (Existing Black Thunder Mine)</b>	<b>Added by Proposed Action</b>	<b>Added by Alternative 2</b>
In-Place Coal (as of 1/1/09)	1,271.1 mmt	273.3 mmt	406.5 mmt
Mineable Coal (as of 1/1/09) <sup>1</sup>	1,271.1 mmt	232.2 mmt	347.8 mmt
Recoverable Coal (as of 1/1/09) <sup>2</sup>	1,169.4 mmt	213.6 mmt	320.0 mmt
Coal Mined Through 2008	1,087.9 mmt	--	--
Lease Area <sup>3</sup>	19,581.3 ac	1,976.7 ac	2,922.4 ac
Total Area To Be Disturbed <sup>3</sup>	26,490.2 ac	1,126.0 ac	2,731.4 ac
Permit Area <sup>3</sup>	29,212.0 ac	1,126.0 ac	2,731.4 ac
Average Annual Coal Production (by 2015) <sup>4</sup>	135 mmt	0 mmt	0 mmt
Remaining Life of Mine (post-2008)	9.3 yrs	1.6 yrs	2.4 yrs
Projected Number of Employees (by 2013) <sup>4</sup>	1,324	0	0
Total Projected State Revenues (post-2008) <sup>5</sup>	\$1,977.9 mm	\$396.1 – \$473.9 mm	\$593.4 – \$709.9 mm
Total Projected Federal Revenues (post-2008) <sup>6</sup>	\$1,541.1 mm	\$316.3 – \$394.1 mm	\$473.9 – \$590.4 mm

<sup>1</sup> Under the Proposed Action and Alternative 2, the mineable coal figure excludes all coal that would not be mined beneath BNSF & UP railroad ROW and associated buffer zone.

<sup>2</sup> Assumes 92 percent recovery of mineable coal that occurs during normal mining operation.

<sup>3</sup> The lease area figure includes federal coal leases only and does not include state and private coal within the permit boundary. The disturbed area typically exceeds the leased area (total federal and state) because of the need for highwall reduction, topsoil removal, and other mine support activities outside the lease boundaries. The permit area is larger than the leased or disturbed area to assure that all disturbed lands are within the permit boundary and to allow an easily defined legal land description.

<sup>4</sup> The mine projects to increase production rate from 100 mmtpy after 2008 to 135 mmtpy by 2015. The mine projects to increase employment from 1,080 to 1,324 as projected production increases.

<sup>5</sup> Revenues to the State of Wyoming include severance taxes, property and production taxes (ad valorem), sales and use taxes, and Wyoming's share of federal royalty payments, AML fees and bonus bid payments. State revenues are based on \$0.4312 per ton estimate for severance taxes × amount of recoverable coal, plus \$0.372 per ton estimate for ad valorem taxes × amount of recoverable coal, plus \$0.0569 per ton estimate for sales and use taxes × amount of recoverable coal, plus a projected coal price of \$11.06 per ton × amount of recoverable coal × federal royalty of 12.5 percent minus federal's 50 percent share, plus \$0.28 per ton for AML fees × amount of recoverable coal minus federal's 50 percent share, plus bonus bid payment on LBA leased coal of \$0.30 to \$0.97 per ton (based on the range of bonus bid payments for the last 9 LBAs sold from 2004 through early 2009) × amount of mineable coal minus federal's 50 percent share. These figures could change based on the outcome of recent legislation that changed the percent of distribution to states.

<sup>6</sup> Federal revenues include black lung taxes and the federal government's share of federal royalty payments, AML fees, and bonus bid payments. Federal revenues are based on a projected coal price of \$11.06 per ton × amount of recoverable coal × black lung tax of 4.4 percent, plus \$11.06 per ton price × amount of recoverable coal × federal royalty of 12.5 percent minus state's 50 percent share, plus \$0.28 per ton for AML fees × amount of recoverable coal minus state's 50 percent share, plus bonus bid payments on LBA leased coal of \$0.30 to \$0.97 per ton (based on the range of bonus payments for the last 9 LBAs sold from 2004 through early 2009) × amount of mineable coal minus state's 50 percent share. These figures could change based on the outcome of recent legislation that changed the percent of distribution to states.

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Table 2-6. Summary Comparison of Coal Production, Surface Disturbance, Mine Life, and Revenues for West Hilight Field LBA Tract and Black Thunder Mine – State Highway 450 and Hilight Road are Not Moved and the Underlying Coal is Not Recovered.

<b>Item</b>	<b>Alternative 1 – No Action Alternative (Existing Black Thunder Mine)</b>	<b>Added by Proposed Action</b>	<b>Added by Alternative 2</b>	<b>Added by Alternative 3</b>
In-Place Coal (as of 1/1/09)	1,271.1 mmt	440.4 mmt	1,147.9 mmt	1,373.4 mmt
Mineable Coal (as of 1/1/09) <sup>1</sup>	1,271.1 mmt	410.8 mmt	1,049.1 mmt	1,049.1 mmt
Recoverable Coal (as of 1/1/09) <sup>2</sup>	1,169.4 mmt	377.9 mmt	965.2 mmt	965.2 mmt
Coal Mined Through 2008	1,087.9 mmt	--	--	--
Lease Area <sup>3</sup>	19,581.3 ac	2,370.5 ac	7,191.3 ac	8,570.1 ac
Total Area To Be Disturbed <sup>3</sup>	26,490.2 ac	6,351.4 ac	10,250.8 ac	10,250.8 ac
Permit Area <sup>3</sup>	29,212.0 ac	6,351.4 ac	10,250.8 ac	10,250.8 ac
Average Annual Coal Production (by 2015) <sup>4</sup>	135 mmt	0 mmt	0 mmt	0 mmt
Remaining Life of Mine (post-2008)	9.3 yrs	2.8 yrs	7.1 yrs	7.1 yrs
Projected Number of Employees (by 2013) <sup>4</sup>		0	0	0
Total Projected State Revenues (post-2008) <sup>5</sup>	\$1,977.9 mm	\$700.8 – \$838.4 mm	\$1,789.9 – \$2,141.3 mm	\$1,789.9 – \$2,141.3 mm
Total Projected Federal Revenues (post-2008) <sup>6</sup>	\$1,541.1 mm	\$559.7 – \$697.3 mm	\$1,429.4 – \$1,780.8 mm	\$1,429.4 – \$1,780.8 mm

<sup>1</sup> Under the Proposed Action, the mineable coal figure excludes all coal that would not be mined beneath State Highway 450 ROW and associated buffer zone. Under Alternatives 2 and 3, the mineable coal figure excludes all coal that would not be mined beneath State Highway 450 and Hilight Road ROWs and associated buffer zones. Under Alternative 3, the mineable coal figure excludes all coal that would not be mined beneath the Northwest Rail Loop Amendment Area.

<sup>2</sup> Assumes 92 percent recovery of mineable coal, 1,324 occurs during normal mining operation.

<sup>3</sup> The lease area figure includes federal coal leases only and does not include state and private coal within the permit boundary. The disturbed area typically exceeds the leased area (total federal and state) because of the need for highwall reduction, topsoil removal, and other mine support activities outside the lease boundaries. The permit area is larger than the leased or disturbed area to assure that all disturbed lands are within the permit boundary and to allow an easily defined legal land description.

<sup>4</sup> The mine projects to increase production rate from 100 mmtpy after 2008 to 135 mmtpy by 2015. The mine projects to increase employment from 1,080 to 1,324 as projected production increases.

<sup>5</sup> Revenues to the State of Wyoming include severance taxes, property and production taxes (ad valorem), sales and use taxes, and Wyoming's share of federal royalty payments, AML fees and bonus bid payments. State revenues are based on \$0.4312 per ton estimate for severance taxes × amount of recoverable coal, plus \$0.372 per ton estimate for ad valorem taxes × amount of recoverable coal, plus \$0.0569 per ton estimate for sales and use taxes × amount of recoverable coal, plus a projected coal price of \$11.06 per ton × amount of recoverable coal × federal royalty of 12.5 percent minus federal's 50 percent share, plus \$0.28 per ton for AML fees × amount of recoverable coal minus federal's 50 percent share, plus bonus bid payment on LBA leased coal of \$0.30 to \$0.97 per ton (based on the range of bonus bid payments for the last 9 LBAs sold from 2004 through early 2009) × amount of mineable coal minus federal's 50 percent share. These figures could change based on the outcome of recent legislation that changed the percent of distribution to states.

<sup>6</sup> Federal revenues include black lung taxes and the federal government's share of federal royalty payments, AML fees, and bonus bid payments. Federal revenues are based on a projected coal price of \$11.06 per ton × amount of recoverable coal × black lung tax of 4.4 percent, plus \$11.06 per ton price × amount of recoverable coal × federal royalty of 12.5 percent minus state's 50 percent share, plus \$0.28 per ton for AML fees × amount of recoverable coal minus state's 50 percent share, plus bonus bid payments on LBA leased coal of \$0.30 to \$0.97 per ton (based on the range of bonus payments for the last 9 LBAs sold from 2004 through early 2009) × amount of mineable coal minus state's 50 percent share. These figures could change based on the outcome of recent legislation that changed the percent of distribution to states.

Table 2-7. Summary Comparison of Coal Production, Surface Disturbance, Mine Life, and Revenues for West Hilight Field LBA Tract and Black Thunder Mine – State Highway 450 and Hilight Road are Moved and the Underlying Coal is Recovered.

<b>Item</b>	<b>Alternative 1 – No Action Alternative (Existing Black Thunder Mine)</b>	<b>Added by Proposed Action</b>	<b>Added by Alternative 2</b>	<b>Added by Alternative 3</b>
In-Place Coal (as of 1/1/09)	1,271.1 mmt	440.4 mmt	1,147.9 mmt	1,373.4 mmt
Mineable Coal (as of 1/1/09) <sup>1</sup>	1,271.1 mmt	440.4 mmt	1,147.9 mmt	1,147.9 mmt
Recoverable Coal (as of 1/1/09) <sup>2</sup>	1,169.4 mmt	405.2 mmt	1,056.1 mmt	1,056.1 mmt
Coal Mined Through 2008	1,087.9 mmt	--	--	--
Lease Area <sup>3</sup>	19,581.3 ac	2,370.5 ac	7,191.3 ac	8,570.1 ac
Total Area To Be Disturbed <sup>3</sup>	26,490.2 ac	6,351.4 ac	11,629.5 ac	11,629.5 ac
Permit Area <sup>3</sup>	29,212.0 ac	6,351.4 ac	11,629.5 ac	11,629.5 ac
Average Annual Coal Production (by 2015) <sup>4</sup>	135 mmt	0 mmt	0 mmt	0 mmt
Remaining Life of Mine (post-2008)	9.3 yrs	3.0 yrs	7.8 yrs	7.8 yrs
Projected Number of Employees (by 2013) <sup>4</sup>		0	0	0
Total Projected State Revenues (post-2008) <sup>5</sup>	\$1,977.9 mm	\$751.4 – \$898.9 mm	\$1,958.4 – \$2,343.0 mm	\$1,958.4 – \$2,343.0 mm
Total Projected Federal Revenues (post-2008) <sup>6</sup>	\$1,541.1 mm	\$600.1 – \$747.6 mm	\$1,564.0 – \$1,948.6 mm	\$1,564.0 – \$1,948.6 mm

<sup>1</sup> Under the Proposed Action, the mineable coal figure excludes all coal that would not be mined beneath State Highway 450 ROW and associated buffer zone. Under Alternatives 2 and 3, the mineable coal figure excludes all coal that would not be mined beneath State Highway 450 and Hilight Road ROWs and associated buffer zones. Under Alternative 3, the mineable coal figure excludes all coal that would not be mined beneath the Northwest Rail Loop Amendment Area.

<sup>2</sup> Assumes 92 percent recovery of mineable coal that occurs during normal mining operation.

<sup>3</sup> The lease area figure includes federal coal leases only and does not include state and private coal within the permit boundary. The disturbed area typically exceeds the leased area (total federal and state) because of the need for highwall reduction, topsoil removal, and other mine support activities outside the lease boundaries. The permit area is larger than the leased or disturbed area to assure that all disturbed lands are within the permit boundary and to allow an easily defined legal land description.

<sup>4</sup> The mine projects to increase production rate from 100 mmtpy after 2008 to 135 mmtpy by 2015. The mine projects to increase employment from 1,080 to 1,324 as projected production increases.

<sup>5</sup> Revenues to the State of Wyoming include severance taxes, property and production taxes (ad valorem), sales and use taxes, and Wyoming's share of federal royalty payments, AML fees and bonus bid payments. State revenues are based on \$0.4312 per ton estimate for severance taxes × amount of recoverable coal, plus \$0.372 per ton estimate for ad valorem taxes × amount of recoverable coal, plus \$0.0569 per ton estimate for sales and use taxes × amount of recoverable coal, plus a projected coal price of \$11.06 per ton × amount of recoverable coal × federal royalty of 12.5 percent minus federal's 50 percent share, plus \$0.28 per ton for AML fees × amount of recoverable coal minus federal's 50 percent share, plus bonus bid payment on LBA leased coal of \$0.30 to \$0.97 per ton (based on the range of bonus bid payments for the last 9 LBAs sold from 2004 through early 2009) × amount of mineable coal minus federal's 50 percent share. These figures could change based on the outcome of recent legislation that changed the percent of distribution to states.

<sup>6</sup> Federal revenues include black lung taxes and the federal government's share of federal royalty payments, AML fees, and bonus bid payments. Federal revenues are based on a projected coal price of \$11.06 per ton × amount of recoverable coal × black lung tax of 4.4 percent, plus \$11.06 per ton price × amount of recoverable coal × federal royalty of 12.5 percent minus state's 50 percent share, plus \$0.28 per ton for AML fees × amount of recoverable coal minus state's 50 percent share, plus bonus bid payments on LBA leased coal of \$0.30 to \$0.97 per ton (based on the range of bonus payments for the last 9 LBAs sold from 2004 through early 2009) × amount of mineable coal minus state's 50 percent share. These figures could change based on the outcome of recent legislation that changed the percent of distribution to states.

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Table 2-8. Summary Comparison of Coal Production, Surface Disturbance, Mine Life, and Revenues for West Jacobs Ranch LBA Tract and Jacobs Ranch Mine – State Highway 450 and Hilight Road are Not Moved and the Underlying Coal is Not Recovered.

<b>Item</b>	<b>Alternative 1 - No Action Alternative (Existing Jacobs Ranch Mine)</b>	<b>Added by Proposed Action</b>	<b>Added by Alternative 2</b>
In-Place Coal (as of 1/1/09)	403.6 mmt	957.0 mmt	1,269.0 mmt
Mineable Coal (as of 1/1/09) <sup>1</sup>	403.6 mmt	744.0 mmt	1,014.0 mmt
Recoverable Coal (as of 1/1/09) <sup>2</sup>	379.4 mmt	669.6 mmt	912.6 mmt
Coal Mined Through 2008	671.1 mmt	--	--
Lease Area <sup>3</sup>	7,381.0 ac	5,944.4 ac	8,076.2 ac
Total Area To Be Disturbed <sup>3</sup>	15,261.5 ac	7,023.0 ac	9,370.0 ac
Permit Area <sup>3</sup>	15,625.0 ac	8,066.0 ac	10,766.0 ac
Average Annual Coal Production (post-2008)	40 mmt	0 mmt	0 mmt
Remaining Life of Mine (post-2008)	9.6 yrs	16.7 yrs	22.8 yrs
Projected Number of Employees	630	155	155
Total Projected State Revenues (post-2008) <sup>4</sup>	\$641.7 mm	\$1,244.1 – \$1,493.4 mm	\$1,695.6 – \$2,035.3 mm
Total Projected Federal Revenues (post-2008) <sup>5</sup>	\$500.0 mm	\$994.1 – \$1,243.3 mm	\$1,354.8 – \$1,694.5 mm

<sup>1</sup> Under the Proposed Action and Alternative 2, the mineable coal figure excludes all coal that would not be mined beneath State Highway 450 and Hilight Road ROWs and associated buffer zones.

<sup>2</sup> Assumes 94 percent recovery of mineable coal that occurs during normal mining operation under Alternative 1, and 90 percent recovery of mineable coal that occurs during normal mining operation under the Proposed Action and Alternative 2.

<sup>3</sup> The lease area figure includes federal coal leases only and does not include state and private coal within the permit boundary. The disturbed area typically exceeds the leased area (total federal and state) because of the need for highwall reduction, topsoil removal, and other mine support activities outside the lease boundaries. The permit area is larger than the leased or disturbed area to assure that all disturbed lands are within the permit boundary and to allow an easily defined legal land description.

<sup>4</sup> Revenues to the State of Wyoming include severance taxes, property and production taxes (ad valorem), sales and use taxes, and Wyoming's share of federal royalty payments, AML fees and bonus bid payments. State revenues are based on \$0.4312 per ton estimate for severance taxes × amount of recoverable coal, plus \$0.372 per ton estimate for ad valorem taxes × amount of recoverable coal, plus \$0.0569 per ton estimate for sales and use taxes × amount of recoverable coal, plus a projected coal price of \$11.06 per ton × amount of recoverable coal × federal royalty of 12.5 percent minus federal's 50 percent share, plus \$0.28 per ton for AML fees × amount of recoverable coal minus federal's 50 percent share, plus bonus bid payment on LBA leased coal of \$0.30 to \$0.97 per ton (based on the range of bonus bid payments for the last 9 LBAs sold from 2004 through early 2009) × amount of mineable coal minus federal's 50 percent share. These figures could change based on the outcome of recent legislation that changed the percent of distribution to states.

<sup>5</sup> Federal revenues include black lung taxes and the federal government's share of federal royalty payments, AML fees, and bonus bid payments. Federal revenues are based on a projected coal price of \$11.06 per ton × amount of recoverable coal × black lung tax of 4.0 percent, plus \$11.06 per ton price × amount of recoverable coal × federal royalty of 12.5 percent minus state's 50 percent share, plus \$0.28 per ton for AML fees × amount of recoverable coal minus state's 50 percent share, plus bonus bid payments on LBA leased coal of \$0.30 to \$0.97 per ton (based on the range of bonus payments for the last 9 LBAs sold from 2004 through early 2009) × amount of mineable coal minus state's 50 percent share. These figures could change based on the outcome of recent legislation that changed the percent of distribution to states.

Table 2-9. Summary Comparison of Coal Production, Surface Disturbance, Mine Life, and Revenues for West Jacobs Ranch LBA Tract and Jacobs Ranch Mine – State Highway 450 and Hilight Road are Moved and the Underlying Coal is Recovered.

<b>Item</b>	<b>Alternative 1 - No Action Alternative (Existing Jacobs Ranch Mine)</b>	<b>Added by Proposed Action</b>	<b>Added by Alternative 2</b>
In-Place Coal (as of 1/1/09)	403.6 mmt	957.0 mmt	1,269.0 mmt
Mineable Coal (as of 1/1/09) <sup>1</sup>	403.6 mmt	957.0 mmt	1,269.0 mmt
Recoverable Coal (as of 1/1/09) <sup>2</sup>	379.4 mmt	861.3 mmt	1,142.1 mmt
Coal Mined Through 2008	671.1 mmt	--	--
Lease Area <sup>3</sup>	7,381.0 ac	5,944.4 ac	8,076.2 ac
Total Area To Be Disturbed <sup>3</sup>	15,261.5 ac	7,023.0 ac	9,370.0 ac
Permit Area <sup>3</sup>	15,625.0 ac	8,066.0 ac	10,766.0 ac
Average Annual Coal Production (post-2008)	40 mmt	0 mmt	0 mmt
Remaining Life of Mine (post-2008)	9.6 yrs	21.5 yrs	28.6 yrs
Projected Number of Employees	630	155	155
Total Projected State Revenues (post-2008) <sup>4</sup>	\$641.7 mm	\$1,600.3 – \$1,920.9 mm	\$2,122.0 – \$2,547.2 mm
Total Projected Federal Revenues (post-2008) <sup>5</sup>	\$500.0 mm	\$1,278.6 – \$1,599.2 mm	\$1,695.5 – \$2,120.6 mm

<sup>1</sup> Under the Proposed Action and Alternative 2, the mineable coal figure includes all coal that would be mined beneath State Highway 450 and Hilight Road ROWs and associated buffer zones.

<sup>2</sup> Assumes 94 percent recovery of mineable coal that occurs during normal mining operation under Alternative 1, and 90 percent recovery of mineable coal that occurs during normal mining operation under the Proposed Action and Alternative 2.

<sup>3</sup> The lease area figure includes federal coal leases only and does not include state and private coal within the permit boundary. The disturbed area typically exceeds the leased area (total federal and state) because of the need for highwall reduction, topsoil removal, and other mine support activities outside the lease boundaries. The permit area is larger than the leased or disturbed area to assure that all disturbed lands are within the permit boundary and to allow an easily defined legal land description.

<sup>4</sup> Revenues to the State of Wyoming include severance taxes, property and production taxes (ad valorem), sales and use taxes, and Wyoming's share of federal royalty payments, AML fees and bonus bid payments. State revenues are based on \$0.4312 per ton estimate for severance taxes × amount of recoverable coal, plus \$0.372 per ton estimate for ad valorem taxes × amount of recoverable coal, plus \$0.0569 per ton estimate for sales and use taxes × amount of recoverable coal, plus a projected coal price of \$11.06 per ton × amount of recoverable coal × federal royalty of 12.5 percent minus federal's 50 percent share, plus \$0.28 per ton for AML fees × amount of recoverable coal minus federal's 50 percent share, plus bonus bid payment on LBA leased coal of \$0.30 to \$0.97 per ton (based on the range of bonus bid payments for the last 9 LBAs sold from 2004 through early 2009) × amount of mineable coal minus federal's 50 percent share. These figures could change based on the outcome of recent legislation that changed the percent of distribution to states.

<sup>5</sup> Federal revenues include black lung taxes and the federal government's share of federal royalty payments, AML fees, and bonus bid payments. Federal revenues are based on a projected coal price of \$11.06 per ton × amount of recoverable coal × black lung tax of 4.4 percent, plus \$11.06 per ton price × amount of recoverable coal × federal royalty of 12.5 percent minus state's 50 percent share, plus \$0.28 per ton for AML fees × amount of recoverable coal minus state's 50 percent share, plus bonus bid payments on LBA leased coal of \$0.30 to \$0.97 per ton (based on the range of bonus payments for the last 9 LBAs sold from 2004 through early 2009) × amount of mineable coal minus state's 50 percent share. These figures could change based on the outcome of recent legislation that changed the percent of distribution to states.

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Table 2-10. Summary Comparison of Coal Production, Surface Disturbance, Mine Life, and Revenues for North Porcupine LBA Tract and North Antelope Rochelle Mine – Mackey Road is Not Moved and the Underlying Coal is Not Recovered.

<b>Item</b>	<b>Alternative 1 - No Action Alternative (Existing North Antelope Rochelle Mine)</b>	<b>Added by Proposed Action</b>	<b>Added by Alternative 2</b>
In-Place Coal (as of 1/1/09)	1,049.9 mmt	756.9 mmt	955.8 mmt
Mineable Coal (as of 1/1/09) <sup>1</sup>	1,015.0 mmt	653.5 mmt	810.2 mmt
Recoverable Coal (as of 1/1/09) <sup>2</sup>	933.8 mmt	601.2 mmt	745.4 mmt
Coal Mined Through 2008	1,230.8 mmt	--	--
Lease Area <sup>3</sup>	16,666.1 ac	5,795.8 ac	7,366.8 ac
Total Area To Be Disturbed <sup>3</sup>	27,443.0 ac	9,864.0 ac	11,444.0 ac
Permit Area <sup>3</sup>	45,975.0 ac	1,760.0 ac	3,120.0 ac
Average Annual Coal Production (post-2008)	95 mmt	0 mmt	0 mmt
Remaining Life of Mine (post-2008)	9.9 yrs	6.3 yrs	7.8 yrs
Projected Number of Employees	1,150	0	0
Total Projected State Revenues (post-2008) <sup>4</sup>	\$1,579.4 mm	\$1,114.9 – \$1,333.8 mm	\$1,382.3 – \$1,653.7 mm
Total Projected Federal Revenues (post-2008) <sup>5</sup>	\$1,230.6 mm	\$890.3 – \$1,109.3 mm	\$1,103.9 – \$1,375.3 mm

<sup>1</sup> Under the Proposed Action, the mineable coal figure excludes all coal that would not be mined beneath BNSF & UP railroad ROW and associated buffer zone, Teckla Substation buffer zone, and Mackey Road ROW and associated buffer zone. Under Alternative 2, the mineable coal figure excludes all coal that would not be mined beneath BNSF & UP railroad ROW and associated buffer zone, Teckla Substation buffer zone, a portion of Matheson Road ROW and associated buffer zone, and Mackey Road ROW and associated buffer zone.

<sup>2</sup> Assumes 92 percent recovery of mineable coal that occurs during normal mining operation.

<sup>3</sup> The lease area figure includes federal coal leases only and does not include state coal within the permit boundary. The disturbed area typically exceeds the leased area (total federal and state) because of the need for highwall reduction, topsoil removal, and other mine support activities outside the lease boundaries. The permit area is larger than the leased or disturbed area to assure that all disturbed lands are within the permit boundary and to allow an easily defined legal land description.

<sup>4</sup> Revenues to the State of Wyoming include severance taxes, property and production taxes (ad valorem), sales and use taxes, and Wyoming's share of federal royalty payments, AML fees and bonus bid payments. State revenues are based on \$0.4312 per ton estimate for severance taxes × amount of recoverable coal, plus \$0.372 per ton estimate for ad valorem taxes × amount of recoverable coal, plus \$0.0569 per ton estimate for sales and use taxes × amount of recoverable coal, plus a projected coal price of \$11.06 per ton × amount of recoverable coal × federal royalty of 12.5 percent minus federal's 50 percent share, plus \$0.28 per ton for AML fees × amount of recoverable coal minus federal's 50 percent share, plus bonus bid payment on LBA leased coal of \$0.30 to \$0.97 per ton (based on the range of bonus bid payments for the last 9 LBAs sold from 2004 through early 2009) × amount of mineable coal minus federal's 50 percent share. These figures could change based on the outcome of recent legislation that changed the percent of distribution to states.

<sup>5</sup> Federal revenues include black lung taxes and the federal government's share of federal royalty payments, AML fees, and bonus bid payments. Federal revenues are based on a projected coal price of \$11.06 per ton × amount of recoverable coal × black lung tax of 4.4 percent, plus \$11.06 per ton price × amount of recoverable coal × federal royalty of 12.5 percent minus state's 50 percent share, plus \$0.28 per ton for AML fees × amount of recoverable coal minus state's 50 percent share, plus bonus bid payments on LBA leased coal of \$0.30 to \$0.97 per ton (based on the range of bonus payments for the last 9 LBAs sold from 2004 through early 2009) × amount of mineable coal minus state's 50 percent share. These figures could change based on the outcome of recent legislation that changed the percent of distribution to states.

Table 2-11. Summary Comparison of Coal Production, Surface Disturbance, Mine Life, and Revenues for North Porcupine LBA Tract and North Antelope Rochelle Mine – Mackey Road is Moved and the Underlying Coal is Recovered.

<b>Item</b>	<b>Alternative 1 - No Action Alternative (Existing North Antelope Rochelle Mine)</b>	<b>Added by Proposed Action</b>	<b>Added by Alternative 2</b>
In-Place Coal (as of 1/1/09)	1,049.9 mmt	756.9 mmt	955.8 mmt
Mineable Coal (as of 1/1/09) <sup>1</sup>	1,015.0 mmt	688.3 mmt	845.0 mmt
Recoverable Coal (as of 1/1/09) <sup>2</sup>	933.8 mmt	633.3 mmt	777.4 mmt
Coal Mined Through 2008	1,230.8 mmt	--	--
Lease Area <sup>3</sup>	16,666.1 ac	5,795.8 ac	7,366.8 ac
Total Area To Be Disturbed <sup>3</sup>	27,443.0 ac	10,167.0 ac	11,767.0 ac
Permit Area <sup>3</sup>	45,975.0 ac	1,760.0 ac	3,120.0 ac
Average Annual Coal Production (post-2008)	95 mmt	0 mmt	0 mmt
Remaining Life of Mine (post-2008)	9.9 yrs	6.7 yrs	8.2 yrs
Projected Number of Employees	1,150	0	0
Total Projected State Revenues (post-2008) <sup>4</sup>	\$1,579.4 mm	\$1,174.4 – \$1,405.0 mm	\$1,441.6 – \$1,724.7 mm
Total Projected Federal Revenues (post-2008) <sup>5</sup>	\$1,230.6 mm	\$937.9 – \$1,168.4 mm	\$1,151.3 – \$1,434.4 mm

<sup>1</sup> Under the Proposed Action, the mineable coal figure excludes all coal that would not be mined beneath BNSF & UP railroad ROW and associated buffer zone and Teckla Substation buffer zone. Under Alternative 2, the mineable coal figure excludes all coal that would not be mined beneath BNSF & UP railroad ROW and associated buffer zone, Teckla Substation buffer zone, and a portion of Matheson Road ROW and associated buffer zone.

<sup>2</sup> Assumes 92 percent recovery of mineable coal that occurs during normal mining operation.

<sup>3</sup> The lease area figure includes federal coal leases only and does not include state coal within the permit boundary. The disturbed area typically exceeds the leased area (total federal and state) because of the need for highwall reduction, topsoil removal, and other mine support activities outside the lease boundaries. The permit area is larger than the leased or disturbed area to assure that all disturbed lands are within the permit boundary and to allow an easily defined legal land description.

<sup>4</sup> Revenues to the State of Wyoming include severance taxes, property and production taxes (ad valorem), sales and use taxes, and Wyoming's share of federal royalty payments, AML fees and bonus bid payments. State revenues are based on \$0.4312 per ton estimate for severance taxes × amount of recoverable coal, plus \$0.372 per ton estimate for ad valorem taxes × amount of recoverable coal, plus \$0.0569 per ton estimate for sales and use taxes × amount of recoverable coal, plus a projected coal price of \$11.06 per ton × amount of recoverable coal × federal royalty of 12.5 percent minus federal's 50 percent share, plus \$0.28 per ton for AML fees × amount of recoverable coal minus federal's 50 percent share, plus bonus bid payment on LBA leased coal of \$0.30 to \$0.97 per ton (based on the range of bonus bid payments for the last 9 LBAs sold from 2004 through early 2009) × amount of mineable coal minus federal's 50 percent share. These figures could change based on the outcome of recent legislation that changed the percent of distribution to states.

<sup>5</sup> Federal revenues include black lung taxes and the federal government's share of federal royalty payments, AML fees, and bonus bid payments. Federal revenues are based on a projected coal price of \$11.06 per ton × amount of recoverable coal × black lung tax of 4.4 percent, plus \$11.06 per ton price × amount of recoverable coal × federal royalty of 12.5 percent minus state's 50 percent share, plus \$0.35 per ton for AML fees × amount of recoverable coal minus state's 50 percent share, plus bonus bid payments on LBA leased coal of \$0.30 to \$0.97 per ton (based on the range of bonus payments for the last 9 LBAs sold from 2004 through early 2009) × amount of mineable coal minus state's 50 percent share. These figures could change based on the outcome of recent legislation that changed the percent of distribution to states.

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Table 2-12. Summary Comparison of Coal Production, Surface Disturbance, Mine Life, and Revenues for South Porcupine LBA Tract and North Antelope Rochelle Mine – 2.25-Mile Section of Antelope Road is Not Moved and the Underlying Coal is Not Recovered.

<b>Item</b>	<b>Alternative 1 - No Action Alternative (Existing North Antelope Rochelle Mine)</b>	<b>Added by Proposed Action</b>	<b>Added by Alternative 2</b>
In-Place Coal (as of 1/1/09)	1,049.9 mmt	422.2 mmt	470.9 mmt
Mineable Coal (as of 1/1/09) <sup>1</sup>	1,015.0 mmt	336.6 mmt	368.8 mmt
Recoverable Coal (as of 1/1/09) <sup>2</sup>	933.8 mmt	309.7 mmt	339.3 mmt
Coal Mined Through 2008	1,230.8 mmt	--	--
Lease Area <sup>3</sup>	16,666.1 ac	3,186.0 ac	3,568.0 ac
Total Area To Be Disturbed <sup>3</sup>	27,443.0 ac	3,366.0 ac	4,068.0 ac
Permit Area <sup>3</sup>	45,975.0 ac	200.0 ac	400.0 ac
Average Annual Coal Production (post-2008)	95 mmt	0 mmt	0 mmt
Remaining Life of Mine (post-2008)	9.9 yrs	3.3 yrs	3.6 yrs
Projected Number of Employees	1,150	0	0
Total Projected State Revenues (post-2008) <sup>4</sup>	\$1,579.4 mm	\$574.3 – \$687.1 mm	\$629.2 – \$752.7 mm
Total Projected Federal Revenues (post-2008) <sup>5</sup>	\$1,230.6 mm	\$458.6 – \$571.4 mm	\$502.5 – \$626.0 mm

<sup>1</sup> Under the Proposed Action and Alternative 2, the mineable coal figure excludes all coal that would not be mined beneath BNSF & UP railroad ROW and associated buffer zone and 2.25-mile section of Antelope Road and associated buffer zone.

<sup>2</sup> Assumes 92 percent recovery of mineable coal that occurs during normal mining operation.

<sup>3</sup> The lease area figure includes federal coal leases only and does not include state coal within the permit boundary. The disturbed area typically exceeds the leased area (total federal and state) because of the need for highwall reduction, topsoil removal, and other mine support activities outside the lease boundaries. The permit area is larger than the leased or disturbed area to assure that all disturbed lands are within the permit boundary and to allow an easily defined legal land description.

<sup>4</sup> Revenues to the State of Wyoming include severance taxes, property and production taxes (ad valorem), sales and use taxes, and Wyoming's share of federal royalty payments, AML fees and bonus bid payments. State revenues are based on \$0.4312 per ton estimate for severance taxes × amount of recoverable coal, plus \$0.372 per ton estimate for ad valorem taxes × amount of recoverable coal, plus \$0.0569 per ton estimate for sales and use taxes × amount of recoverable coal, plus a projected coal price of \$11.06 per ton × amount of recoverable coal × federal royalty of 12.5 percent minus federal's 50 percent share, plus \$0.28 per ton for AML fees × amount of recoverable coal minus federal's 50 percent share, plus bonus bid payment on LBA leased coal of \$0.30 to \$0.97 per ton (based on the range of bonus bid payments for the last 9 LBAs sold from 2004 through early 2009) × amount of mineable coal minus federal's 50 percent share. These figures could change based on the outcome of recent legislation that changed the percent of distribution to states.

<sup>5</sup> Federal revenues include black lung taxes and the federal government's share of federal royalty payments, AML fees, and bonus bid payments. Federal revenues are based on a projected coal price of \$11.06 per ton × amount of recoverable coal × black lung tax of 4.4 percent, plus \$11.06 per ton price × amount of recoverable coal × federal royalty of 12.5 percent minus state's 50 percent share, plus \$0.28 per ton for AML fees × amount of recoverable coal minus state's 50 percent share, plus bonus bid payments on LBA leased coal of \$0.30 to \$0.97 per ton (based on the range of bonus payments for the last 9 LBAs sold from 2004 through early 2009) × amount of mineable coal minus state's 50 percent share. These figures could change based on the outcome of recent legislation that changed the percent of distribution to states.

Table 2-13. Summary Comparison of Coal Production, Surface Disturbance, Mine Life, and Revenues for South Porcupine LBA Tract and North Antelope Rochelle Mine – 2.25-Mile Section of Antelope Road is Moved and the Underlying Coal is Recovered.

<b>Item</b>	<b>Alternative 1 - No Action Alternative (Existing North Antelope Rochelle Mine)</b>	<b>Added by Proposed Action</b>	<b>Added by Alternative 2</b>
In-Place Coal (as of 1/1/09)	1,049.9 mmt	422.2 mmt	470.9 mmt
Mineable Coal (as of 1/1/09) <sup>1</sup>	1,015.0 mmt	408.4 mmt	440.6 mmt
Recoverable Coal (as of 1/1/09) <sup>2</sup>	933.8 mmt	375.7 mmt	405.4 mmt
Coal Mined Through 2008	1,230.8 mmt	--	--
Lease Area <sup>3</sup>	16,666.1 ac	3,186.0 ac	3,568.0 ac
Total Area To Be Disturbed <sup>3</sup>	27,443.0 ac	3,908.0 ac	4,610.0 ac
Permit Area <sup>3</sup>	45,975.0 ac	200.0 ac	400.0 ac
Average Annual Coal Production (post-2008)	95 mmt	0 mmt	0 mmt
Remaining Life of Mine (post-2008)	9.9 yrs	4.0 yrs	4.3 yrs
Projected Number of Employees	1,150	0	0
Total Projected State Revenues (post-2008) <sup>4</sup>	\$1,579.4 mm	\$696.7 – \$833.5 mm	\$751.8 – \$899.4 mm
Total Projected Federal Revenues (post-2008) <sup>5</sup>	\$1,230.6 mm	\$556.4 – \$693.2 mm	\$600.4 – \$748.0 mm

<sup>1</sup> Under the Proposed Action and Alternative 2, the mineable coal figure excludes all coal that would not be mined beneath BNSF & UP railroad ROW and associated buffer zone.

<sup>2</sup> Assumes 92 percent recovery of mineable coal that occurs during normal mining operation.

<sup>3</sup> The lease area figure includes federal coal leases only and does not include state coal within the permit boundary. The disturbed area typically exceeds the leased area (total federal and state) because of the need for highwall reduction, topsoil removal, and other mine support activities outside the lease boundaries. The permit area is larger than the leased or disturbed area to assure that all disturbed lands are within the permit boundary and to allow an easily defined legal land description.

<sup>4</sup> Revenues to the State of Wyoming include severance taxes, property and production taxes (ad valorem), sales and use taxes, and Wyoming's share of federal royalty payments, AML fees and bonus bid payments. State revenues are based on \$0.4312 per ton estimate for severance taxes × amount of recoverable coal, plus \$0.372 per ton estimate for ad valorem taxes × amount of recoverable coal, plus \$0.0569 per ton estimate for sales and use taxes × amount of recoverable coal, plus a projected coal price of \$11.06 per ton × amount of recoverable coal × federal royalty of 12.5 percent minus federal's 50 percent share, plus \$0.28 per ton for AML fees × amount of recoverable coal minus federal's 50 percent share, plus bonus bid payment on LBA leased coal of \$0.30 to \$0.97 per ton (based on the range of bonus bid payments for the last 9 LBAs sold from 2004 through early 2009) × amount of mineable coal minus federal's 50 percent share. These figures could change based on the outcome of recent legislation that changed the percent of distribution to states.

<sup>5</sup> Federal revenues include black lung taxes and the federal government's share of federal royalty payments, AML fees, and bonus bid payments. Federal revenues are based on a projected coal price of \$11.06 per ton × amount of recoverable coal × black lung tax of 4.4 percent, plus \$11.06 per ton price × amount of recoverable coal × federal royalty of 12.5 percent minus state's 50 percent share, plus \$0.28 per ton for AML fees × amount of recoverable coal minus state's 50 percent share, plus bonus bid payments on LBA leased coal of \$0.30 to \$0.97 per ton (based on the range of bonus payments for the last 9 LBAs sold from 2004 through early 2009) × amount of mineable coal minus state's 50 percent share. These figures could change based on the outcome of recent legislation that changed the percent of distribution to states.

## *2.0 Proposed Action and Alternatives*

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Table 2-5 presents the comparisons assuming that Reno Road is moved and the underlying coal is recovered from the South Hilight Field tract.

Table 2-6 presents the comparisons assuming that State Highway 450 and Hilight Road are not moved and the underlying coal is not recovered from the West Hilight Field tract. Table 2-7 presents the comparisons assuming that State Highway 450 and Hilight Road are moved and the underlying coal is recovered from the West Hilight Field tract.

Table 2-8 presents the comparisons assuming that State Highway 450 and Hilight Road are not moved and the underlying coal is not recovered from the West Jacobs Ranch tract. Table 2-9 presents the comparisons assuming that State Highway 450 and Hilight Road are moved and the underlying coal is recovered from the West Jacobs Ranch tract.

Table 2-10 presents the comparisons assuming that Mackey Road is not moved and the underlying coal is not recovered from the North Porcupine tract. Table 2-11 presents the comparisons assuming that Mackey Road is moved and the underlying coal is recovered from the North Porcupine tract.

Table 2-12 presents the comparisons assuming that the remaining 2.25-mile section of Antelope Road is not moved and the underlying coal is not recovered from the South Porcupine tract. Table 2-13 presents the comparisons assuming that the remaining 2.25-mile section of Antelope Road is moved and the underlying coal is recovered from the South Porcupine tract.

Table 2-14 presents a comparative summary for all six LBA tracts of the direct and indirect environmental impacts of implementing each alternative as compared to the No Action Alternative. Each No Action Alternative assumes completion of currently permitted mining at the applicant mine for comparison to anticipated mining if the associated LBA tract is leased. Table 2-15 presents a comparative summary for the six LBA tracts regarding the cumulative environmental impacts of implementing each alternative for each tract. The environmental consequences of the Proposed Action and alternatives for each of the six LBA tracts are analyzed in Chapters 3 and 4. 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

Table 2-14. Summary Comparison of Magnitude<sup>1</sup> and Duration of Direct and Indirect Impacts for Alternative 1 (No Action), the Proposed Action, Alternative 2, and Alternative 3 for the North Hilight Field, South Hilight Field, West Hilight Field, West Jacobs Ranch, North Porcupine, and South Porcupine LBA Tracts<sup>2</sup>.

<b>DESCRIPTION OF POTENTIAL IMPACT BY RESOURCE</b>	<b>MAGNITUDE AND DURATION OF IMPACT</b>	
<b>RESOURCE NAME</b>	<b>ALTERNATIVE 1</b>	<b>PROPOSED ACTION, ALTERNATIVE 2 and ALTERNATIVE 3</b>
<b>TOPOGRAPHY &amp; PHYSIOGRAPHY</b>		
<b>(Applicable to all six tracts)</b>		
Lower surface elevation	Moderate, permanent on existing mine areas	Same as Alternative 1 on expanded mine areas
Permanent topographic moderation, which could result in:		
Microhabitat reduction	Moderate, long term on existing mine areas	Same as Alternative 1 on expanded mine areas
Habitat diversity reduction	Moderate, long term on existing mine areas	Same as Alternative 1 on expanded mine areas
Big game carrying capacity reduction	Moderate, long term on existing mine areas	Same as Alternative 1 on expanded mine areas
Reduction in water runoff and peak flows	Moderate, beneficial, long term on existing mine areas	Same as Alternative 1 on expanded mine areas
Increased precipitation infiltration	Moderate, beneficial, long term on existing mine areas	Same as Alternative 1 on expanded mine areas
Reduction in erosion	Moderate, beneficial, long term on existing mine areas	Same as Alternative 1 on expanded mine areas
Potential enhanced vegetative productivity	Moderate, beneficial, long term on existing mine areas	Same as Alternative 1 on expanded mine areas
Potential acceleration of groundwater recharge	Moderate, beneficial, long term on existing mine areas	Same as Alternative 1 on expanded mine areas
<b>GEOLOGY AND MINERALS</b>		
<b>(Applicable to all six tracts)</b>		
Removal of coal	Moderate, permanent on existing mine areas	Same as Alternative 1 on expanded mine areas
Removal and replacement of topsoil and overburden	Moderate, permanent on existing mine areas	Same as Alternative 1 on expanded mine areas
Physical characteristic alterations in replaced overburden	Moderate, permanent on existing mine areas	Same as Alternative 1 on expanded mine areas
Loss of unrecovered CBNG through venting and/or depletion of hydrostatic pressure	Moderate to substantial, permanent on existing mine areas	Same as Alternative 1 on expanded mine areas
Loss of access for development of sub-coal oil and gas resources and other minerals	Moderate, short term on existing mine areas	Same as Alternative 1 on expanded mine areas
Destruction of paleontological resources that are not exposed on the surface	Moderate, permanent on the existing mine areas	Same as Alternative 1 on expanded mine areas
<b>AIR QUALITY</b>		
<b>(Applicable to all six tracts)</b>		
Particulate Emissions:		
Elevated concentrations associated with projected average production of 270 mmtpy in compliance with ambient standards	Moderate, short term on existing mines and surrounding areas	Same as Alternative 1 on expanded mines and surrounding areas for 1.6 to 22.8 additional years
Potential for public exposure to particulate emissions along State Highway 450, various county roads, and occupied dwellings in area	Minor to moderate, short term on existing mines and surrounding areas	Same as Alternative 1 on expanded mines and surrounding areas for 1.6 to 22.8 additional years
Potential for human health impacts as a result of exposure to particulate emissions	Minor to moderate, short term on existing mines and surrounding areas	Same as Alternative 1 on expanded mines and surrounding areas for 1.6 to 22.8 additional years

<sup>1</sup> Refer to Chapter 3 for a discussion on magnitude of impacts.

<sup>2</sup> All impacts are assumed to be adverse unless noted otherwise.

## 2.0 Proposed Action and Alternatives

Table 2-14. Summary Comparison of Magnitude<sup>1</sup> and Duration of Direct and Indirect Impacts for Alternative 1 (No Action), the Proposed Action, Alternative 2, and Alternative 3 for the North Hilight Field, South Hilight Field, West Hilight Field, West Jacobs Ranch, North Porcupine, and South Porcupine LBA Tracts<sup>2</sup> (Continued).

<b>DESCRIPTION OF POTENTIAL IMPACT BY RESOURCE</b>	<b>MAGNITUDE AND DURATION OF IMPACT</b>	
<b>RESOURCE NAME</b>	<b>ALTERNATIVE 1</b>	<b>PROPOSED ACTION, ALTERNATIVE 2 and ALTERNATIVE 3</b>
<b>AIR QUALITY (Continued)</b>		
<b>(Applicable to all six tracts)</b>		
NO <sub>x</sub> Emissions from Machinery:		
Elevated concentrations associated with average production of 270 mmtpy in compliance with ambient standards	Moderate, short term on existing mines and surrounding areas	Same as Alternative 1 on expanded mines and surrounding areas for 1.6 to 22.8 additional years
Potential for public exposure to NO <sub>x</sub> emissions from machinery along State Highway 450, various county roads, and occupied dwellings in area	Moderate, short term on existing mines and surrounding areas	Same as Alternative 1 on expanded mines and surrounding areas for 1.6 to 22.8 additional years
Potential for human health impacts as a result of exposure to NO <sub>x</sub> emissions	Moderate, short term on existing mines and surrounding areas	Same as Alternative 1 on expanded mines and surrounding areas for 1.6 to 22.8 additional years
NO <sub>x</sub> Emissions from Blasting (in compliance with Black Thunder, Jacobs Ranch, and North Antelope Rochelle Mine Permit Blasting Conditions):		
Potential for public exposure	No projected events	No events projected
Potential for human health impacts as a result of exposure to NO <sub>x</sub> emissions	No projected events	No events projected
Visibility:		
Elevated concentrations of fine particulate matter associated with average production of 270 mmtpy	Moderate, short term on existing mines and surrounding areas	Same as Alternative 1 on expanded mines and surrounding areas for 1.6 to 22.8 additional years
Acidification of Lakes:		
SO <sub>2</sub> emissions derived from burning Black Thunder, Jacobs Ranch, and North Antelope Rochelle mines' coal to produce power	Moderate, short term in vicinity of power plants	Same as Alternative 1
<b>WATER RESOURCES</b>		
<b>(Applicable to all six tracts)</b>		
<u>GROUNDWATER</u>		
Removal of coal and overburden aquifers	Moderate, short term on existing mine areas	Same as Alternative 1 on expanded mine areas
Replacement of existing coal and overburden with unconsolidated backfill material	Moderate, permanent on existing mine areas	Same as Alternative 1 on expanded mine areas
Depressed water levels in overburden and coal aquifers adjacent to mines	Moderate, short to long term on existing mines and surrounding areas	Same as Alternative 1 on expanded mines and surrounding areas
Change in hydraulic properties in backfilled areas	Negligible, long term on existing mine areas	Same as Alternative 1 on expanded mine areas
Increase in TDS concentrations in backfilled areas	Moderate, long term on existing mine areas	Same as Alternative 1 on expanded mine areas
Use of subcoal aquifers for water supply	Negligible, short term on existing mines and surrounding areas	Same as Alternative 1 on expanded mines and surrounding areas

<sup>1</sup> Refer to Chapter 3 for a discussion on magnitude of impacts.

<sup>2</sup> All impacts are assumed to be adverse unless noted otherwise.

Table 2-14. Summary Comparison of Magnitude<sup>1</sup> and Duration of Direct and Indirect Impacts for Alternative 1 (No Action), the Proposed Action, Alternative 2, and Alternative 3 for the North Hilight Field, South Hilight Field, West Hilight Field, West Jacobs Ranch, North Porcupine, and South Porcupine LBA Tracts<sup>2</sup> (Continued).

<i>DESCRIPTION OF POTENTIAL IMPACT BY RESOURCE</i>	<i>MAGNITUDE AND DURATION OF IMPACT</i>	
<b>RESOURCE NAME</b>	<b>ALTERNATIVE 1</b>	<b>PROPOSED ACTION, ALTERNATIVE 2 and ALTERNATIVE 3</b>
<b>WATER RESOURCES (Continued)</b> <b>(Applicable to all six tracts)</b>		
<u>GROUNDWATER (Continued)</u>		
Decrease in water supply for groundwater-right holders having wells completed in the coal or overburden aquifers within the 5-foot drawdown areas for each mine	Moderate, long term on existing mines and surrounding areas	Same as Alternative 1 on expanded mines and surrounding areas
<u>SURFACE WATER</u>		
Diversion and disruption of surface drainage systems	Moderate, short term on existing mine areas	Same as Alternative 1 on expanded mine areas
Reconstruction of surface drainage systems	Permanent on existing mine areas	Same as Alternative 1 on expanded mine areas
Increased runoff and erosion rates on disturbed lands due to vegetation removal	Moderate, short term on existing mine areas	Same as Alternative 1 on expanded mine areas
Increased infiltration on reclaimed lands due to topographic moderation	Moderate, beneficial, long term on existing mine areas	Same as Alternative 1 on expanded mine areas
Increased runoff on reclaimed lands due to loss of soil structure	Moderate, long term on existing mine areas	Same as Alternative 1 on expanded mine areas
Potential for adverse downstream effects as a result of sediment produced by large storms	Moderate, long term for existing mining operations	Same as Alternative 1 on expanded mining operations
<b>ALLUVIAL VALLEY FLOORS</b>		
<b>(Applicable to all six tracts)</b>		
While final determinations have not been made by WDEQ/LQD, it is believed that there are no AVFs significant to agriculture on the proposed lease tracts		
Removal and restoration of AVFs determined not to be significant to agriculture	Moderate, short term for existing mining operations	Same as Alternative 1 on expanded mine areas
Disruptions to streamflows supplying downstream AVFs	Negligible, short term on existing leases	Same as Alternative 1 on expanded mine areas
<b>WETLANDS</b>		
<b>(Applicable to all six tracts)</b>		
Removal of jurisdictional wetlands and loss of wetland function until reclamation occurs	Moderate, short term on existing mining operations; jurisdictional wetlands would be replaced as required under Section 404 of the Clean Water Act	Same as Alternative 1 on expanded mine areas
Removal of non-jurisdictional wetlands and loss of wetland function until reclamation occurs	Moderate, short term to long term on existing mining operations; non-jurisdictional wetlands would be replaced as required by the surface land owner or WDEQ/LQD	Same as Alternative 1 on expanded mine areas

<sup>1</sup> Refer to Chapter 3 for a discussion on magnitude of impacts.

<sup>2</sup> All impacts are assumed to be adverse unless noted otherwise.

## 2.0 Proposed Action and Alternatives

Table 2-14. Summary Comparison of Magnitude<sup>1</sup> and Duration of Direct and Indirect Impacts for Alternative 1 (No Action), the Proposed Action, Alternative 2, and Alternative 3 for the North Hilight Field, South Hilight Field, West Hilight Field, West Jacobs Ranch, North Porcupine, and South Porcupine LBA Tracts<sup>2</sup> (Continued).

<b>DESCRIPTION OF POTENTIAL IMPACT BY RESOURCE</b>	<b>MAGNITUDE AND DURATION OF IMPACT</b>	
<b>RESOURCE NAME</b>	<b>ALTERNATIVE 1</b>	<b>PROPOSED ACTION, ALTERNATIVE 2 and ALTERNATIVE 3</b>
<b>SOILS</b>		
<b>(Applicable to all six tracts)</b>		
Changes in physical properties after reclamation would include:		
Increased near-surface bulk density and decreased soil infiltration rate resulting in increased potential for soil erosion	Moderate, long term on existing mine areas	Same as Alternative 1 on expanded mine areas
More uniformity in soil type, thickness, and texture	Moderate, beneficial, long term on existing mine areas	Same as Alternative 1 on expanded mine areas
Decreased runoff due to topographic modification	Moderate, beneficial, long term on existing mine areas	Same as Alternative 1 on expanded mine areas
Changes in biological properties in soils that are stockpiled before reclamation would include:		
Reduction in organic matter	Moderate, short to long term on existing mine areas	Same as Alternative 1 on expanded mine areas
Reduction in microorganism population	Moderate, short to long term on existing mine areas	Same as Alternative 1 on expanded mine areas
Reduction in seeds, bulbs, rhizomes, and live plant parts	Moderate, short to long term on existing mine areas	Same as Alternative 1 on expanded mine areas
Changes in chemical properties would include:		
More uniform soil nutrient distribution	Moderate, beneficial, long term on existing mine areas	Same as Alternative 1 on expanded mine areas
<b>VEGETATION</b>		
<b>(Applicable to all six tracts)</b>		
During mining:		
Progressive removal of existing vegetation	Moderate, short term on existing mine areas	Same as Alternative 1 on expanded mine areas
Increased erosion	Moderate, short term on existing mine areas	Same as Alternative 1 on expanded mine areas
Wildlife habitat and livestock grazing loss	Moderate, short term on existing mine areas	Same as Alternative 1 on expanded mine areas
After revegetation:		
Changes in vegetation patterns	Negligible, long term on existing mine areas	Same as Alternative 1 on expanded mine areas
Reduction in vegetation diversity	Negligible, long term on existing mine areas	Same as Alternative 1 on expanded mine areas
Reduction in shrub density	Moderate, long term on existing mine areas	Same as Alternative 1 on expanded mine areas
Decreased big game habitat carrying capacity	Moderate, long term on existing mine areas	Same as Alternative 1 on expanded mine areas
Decreased habitat for shrub dependent species	Moderate, long term on existing mine areas	Same as Alternative 1 on expanded mine areas
Potential invasion of non-native plant species	Moderate, short term on existing mine areas	Same as Alternative 1 on expanded mine areas

<sup>1</sup> Refer to Chapter 3 for a discussion on magnitude of impacts.

<sup>2</sup> All impacts are assumed to be adverse unless noted otherwise.

Table 2-14. Summary Comparison of Magnitude<sup>1</sup> and Duration of Direct and Indirect Impacts for Alternative 1 (No Action), the Proposed Action, Alternative 2, and Alternative 3 for the North Hilight Field, South Hilight Field, West Hilight Field, West Jacobs Ranch, North Porcupine, and South Porcupine LBA Tracts<sup>2</sup> (Continued).

<b>DESCRIPTION OF POTENTIAL IMPACT BY RESOURCE</b>	<b>MAGNITUDE AND DURATION OF IMPACT</b>	
<b>RESOURCE NAME</b>	<b>ALTERNATIVE 1</b>	<b>PROPOSED ACTION, ALTERNATIVE 2 and ALTERNATIVE 3</b>
<b>WILDLIFE</b>		
<b>(Applicable to all six tracts)</b>		
Big game displacement from active mining areas	Moderate, short term on existing mine areas	Same as Alternative 1 on expanded mine areas
Increased competition on adjacent undisturbed or reclaimed lands, especially big game	Moderate, short term on adjacent areas	Same as Alternative 1 on adjacent areas
Restriction of wildlife movement, especially big game	Moderate, short term on existing mine areas	Same as Alternative 1 on expanded mine areas
Increased mortality of small mammals	Moderate, short term on existing mine areas	Same as Alternative 1 on expanded mine areas
Displacement of small and medium-sized mammals	Moderate, short term on existing mine areas	Same as Alternative 1 on expanded mine areas
Surface and noise disturbance of active sage grouse leks	Moderate, short to long term on existing mine areas	Same as Alternative 1 on expanded mine areas
Disturbance of sage grouse nesting habitat during mining	Moderate, short term on existing mine areas	Same as Alternative 1 on expanded mine areas
Loss of sage grouse nesting habitat after reclamation	Moderate, long term on existing mine areas	Same as Alternative 1 on expanded mine areas
Alteration of plant and animal communities after reclamation	Negligible, short term on existing mine areas	Same as Alternative 1 on expanded mine areas
Abandonment of raptor nests	Negligible, short term on existing mine areas	Same as Alternative 1 on expanded mine areas
Loss of foraging habitat for raptors	Negligible, short to long term on existing mine areas	Same as Alternative 1 on expanded mine areas
Loss of nesting and foraging habitat for Migratory Birds of Management Concern (including sage-grouse)	Negligible, short to long term on existing mine areas	Same as Alternative 1 on expanded mine areas
Reduction in waterfowl resting and feeding habitat	Negligible, short term on existing mine areas	Same as Alternative 1 on expanded mine areas
Loss of habitat for aquatic species, amphibians and reptiles	Negligible, short term on existing mine areas	Same as Alternative 1 on expanded mine areas
Road kills by mine-related traffic	Moderate, long term on existing mine areas	Same as Alternative 1 on expanded mine areas
Reduction in habitat carrying capacity and habitat diversity on reclaimed lands	Moderate, long term on existing mine areas	Same as Alternative 1 on expanded mine areas
Potential reduction in microhabitats on reclaimed lands	Moderate, long term on existing mine areas	Same as Alternative 1 on expanded mine areas
<b>THREATENED, ENDANGERED, PROPOSED, AND CANDIDATE SPECIES (Refer to Appendix G in this EIS)</b>		
<b>(Applicable to all six tracts)</b>		
Ute ladies'-tresses (Threatened)	As determined by previous consultation with USFWS	No effect
Blowout penstemon (Endangered)	for all listed species at the time	No effect
Greater sage-grouse (Candidate)		
<b>LAND USE AND RECREATION</b>		
<b>(Applicable to all six tracts)</b>		
Reduction of livestock grazing	Moderate, long term on existing mine areas	Same as Alternative 1 on expanded mine areas
Loss of wildlife habitat	Moderate, long term on existing mine areas	Same as Alternative 1 on expanded mine areas
Loss of access for sub-coal oil and gas development	Moderate, short term on existing mine areas	Same as Alternative 1 on expanded mine areas
Removal of oil and gas production facilities	Moderate, short term on existing mine areas	Same as Alternative 1 on expanded mine area
Loss of access to public land available for recreation and grazing	Moderate, short term on existing mine areas	Same as Alternative 1 on expanded mine areas

<sup>1</sup> Refer to Chapter 3 for a discussion on magnitude of impacts.

<sup>2</sup> All impacts are assumed to be adverse unless noted otherwise.

## 2.0 Proposed Action and Alternatives

Table 2-14. Summary Comparison of Magnitude<sup>1</sup> and Duration of Direct and Indirect Impacts for Alternative 1 (No Action), the Proposed Action, Alternative 2 and Alternative 3 for the North Hilight Field, South Hilight Field, West Hilight Field, West Jacobs Ranch, North Porcupine, and South Porcupine LBA Tracts<sup>2</sup> (Continued).

<b>DESCRIPTION OF POTENTIAL IMPACT BY RESOURCE</b>	<b>MAGNITUDE AND DURATION OF IMPACT</b>	
<b>RESOURCE NAME</b>	<b>ALTERNATIVE 1</b>	<b>PROPOSED ACTION, ALTERNATIVE 2 and ALTERNATIVE 3</b>
<b>CULTURAL RESOURCES</b> <b>(Applicable to all six tracts)</b>		
Sites that are not eligible for NRHP	Ineligible sites may be destroyed without further work on existing mine areas	Same as Alternative 1 on expanded mine areas
Sites that are eligible for NRHP	Impacts to sites that are eligible for the NHRP are not permitted; eligible sites would be avoided or mitigated through data recovery prior to mining on existing mine areas	Same as Alternative 1 on expanded mine areas
Sites that are unevaluated for eligibility	Impacts to unevaluated sites are not permitted; unevaluated sites would be evaluated prior to mining on existing mine areas	Same as Alternative 1 on expanded mine areas
<b>NATIVE AMERICAN CONCERNS</b> <b>(Applicable to all six tracts)</b>		
	No impact identified on existing mine areas	Same as Alternative 1 on expanded mine areas
<b>VISUAL RESOURCES</b> <b>(Applicable to all six tracts)</b>		
During mining:		
Alteration of landscape by mining facilities and operations	Moderate, short term on existing mine areas	Same as Alternative 1 on expanded mine areas
Visibility of mining operations from highway	Moderate, short term on existing mine areas	Same as Alternative 1 on expanded mine areas
Following reclamation:		
Smoother sloped terrain	Negligible, long term on existing mine areas	Same as Alternative 1 on expanded mine areas
Reduction in sagebrush density	Moderate, short to long term on existing mine areas	Same as Alternative 1 on expanded mine areas
<b>NOISE</b> <b>(Applicable to all six tracts)</b>		
Increased noise levels	Moderate to substantial, short term on existing mines, surrounding areas (including occupied dwellings and businesses) within 2,500 feet of mining activities	Same as Alternative 1 on expanded mine areas and surrounding areas
<b>TRANSPORTATION FACILITIES</b> <b>(Applicable to all six tracts)</b>		
Use of railroads and existing Black Thunder, Jacobs Ranch, and North Antelope Rochelle mine infrastructure to ship coal	Moderate, for duration of existing approved mining operations	Same as Alternative 1 for additional 1.6 to 22.8 years
Employee and service contractor use of highways to and from mine sites	Moderate, for duration of existing approved mining operations	Same as Alternative 1 for additional 1.6 to 22.8 years

<sup>1</sup> Refer to Chapter 3 for a discussion on magnitude of impacts.

<sup>2</sup> All impacts are assumed to be adverse unless noted otherwise.

Table 2-14. Summary Comparison of Magnitude<sup>1</sup> and Duration of Direct and Indirect Impacts for Alternative 1 (No Action), the Proposed Action, Alternative 2, and Alternative 3 for the North Hilight Field, South Hilight Field, West Hilight Field, West Jacobs Ranch, North Porcupine, and South Porcupine LBA Tracts<sup>2</sup> (Continued).

<b>DESCRIPTION OF POTENTIAL IMPACT BY RESOURCE</b>		<b>MAGNITUDE AND DURATION OF IMPACT</b>	
<b>RESOURCE NAME</b>	<b>ALTERNATIVE 1</b>	<b>PROPOSED ACTION, ALTERNATIVE 2 and ALTERNATIVE 3</b>	
<b>TRANSPORTATION FACILITIES (Continued) (Applicable to all six tracts)</b>			
Relocation of pipelines	Negligible, short to long term on existing mine areas	Same as Alternative 1 on expanded mine areas	
Relocation of utility lines	Negligible, short to long term on existing mine areas	Same as Alternative 1 on expanded mine areas	
Relocation of county roads, if approved by Campbell County Commissioners, to allow recovery of coal under lease	No impact on existing mine areas	Moderate, long term to permanent on expanded mine areas	
Mining operations near State Highway 450	Moderate, for duration of existing approved mining operations (Black Thunder Mine only)	Same as Alternative 1 for additional 1.6 to 22.8 years (Black Thunder and Jacobs Ranch Mines only)	
<b>HAZARDOUS AND SOLID WASTE (Applicable to all six tracts)</b>			
Waste generated by mining operations	Negligible, for duration of existing approved mining operations	Same as Alternative 1 for additional 1.6 to 22.8 years	
<b>SOCIOECONOMICS (Applicable to all six tracts)</b>			
Employment	Substantial benefit, short term for existing approved mining operations	Same as Alternative 1 for additional 1.6 to 22.8 years	
Revenues from royalties and taxes to the state and local government	Substantial benefit, short term for existing approved mining operations	Same as Alternative 1 for additional 1.6 to 22.8 years	
Revenues from royalties and taxes to the federal government	Substantial benefit, short term for existing approved mining operations	Same as Alternative 1 for additional 1.6 to 22.8 years	
Economic development	Moderate, beneficial short term for existing approved mining operations	Same as Alternative 1 for additional 1.6 to 22.8 years	
Additional housing and infrastructure needs	No new impact related to existing approved mining operations	Same as Alternative 1 for additional 1.6 to 22.8 years	

<sup>1</sup> Refer to Chapter 3 for a discussion on magnitude of impacts.

<sup>2</sup> All impacts are assumed to be adverse unless noted otherwise.

## 2.0 Proposed Action and Alternatives

Table 2-15. Summary Comparison of Magnitude and Duration of Cumulative Impacts<sup>1, 2</sup>.

<b>DESCRIPTION OF POTENTIAL IMPACT BY RESOURCE</b>		<b>MAGNITUDE, TYPE, AND DURATION OF IMPACT</b>	
<b>RESOURCE NAME</b>	<b>ALTERNATIVE 1</b>	<b>PROPOSED ACTION, ALTERNATIVE 2 and ALTERNATIVE 3</b>	
<b>TOPOGRAPHY &amp; PHYSIOGRAPHY</b>			
▪ Alteration of topography following reclamation of coal disturbance areas	▪ Permanent topographic moderation following reclamation	▪ Same as Alternative 1	
▪ Alteration of topography to accommodate coal-related, oil and gas, and oil- and gas-related facilities	▪ Long term to permanent limited changes in discrete, scattered areas	▪ Same as Alternative 1	
<b>GEOLOGY AND MINERALS</b>			
▪ Recovery of coal resulting in reduction in coal resources and disturbance and replacement of overburden and topsoil	▪ Moderate, long term to permanent	▪ Same as Alternative 1	
▪ Surficial disturbance and reclamation on oil and gas well sites and associated facilities	▪ Moderate, long term to permanent	▪ Same as Alternative 1	
<b>PALEONTOLOGY</b>			
▪ Coal, coal-related, oil and gas, and oil- and gas-related development disturbance of PFYC Class 5 Wasatch and Class 3 Fort Union formations	▪ Permanent potential adverse effects to scientifically significant fossils that are present but not visible prior to disturbance	▪ Same as Alternative 1	
<b>AIR QUALITY</b>			
Impacts to Wyoming near-field receptors:			
▪ 24-hour PM <sub>10</sub> and PM <sub>2.5</sub>	▪ Maximum modeled impacts occurring at isolated receptors show localized exceedances of the WAAQS and NAAQS for the base year (2004) as well as for both coal production scenarios for 2015 and 2020	▪ Same as Alternative 1	
▪ Annual PM <sub>10</sub>	▪ Maximum modeled impacts at peak receptors show 20% increase from base year (2004) but in compliance with WAAQS for both coal production scenarios for 2020, but exceed the WAAQS for both coal production scenarios for 2015	▪ Same as Alternative 1	
▪ Annual PM <sub>2.5</sub>	▪ Maximum modeled impacts at peak receptors show 20% increase from base year (2004) and localized exceedances of the WAAQS and NAAQS for both coal production scenarios for 2015 and 2020	▪ Same as Alternative 1	
▪ All other parameters	▪ Modeled impacts in compliance with WAAQS and NAAQS for both coal production scenarios for 2015 and 2020	▪ Same as Alternative 1	
Impacts to Montana near-field receptors:			
▪ All parameters	▪ Impacts at all Montana receptors would be in compliance with NAAQS and Montana AAQS for all pollutants and averaging periods. Impacts are predicted to decrease for annual NO <sub>2</sub> , PM <sub>10</sub> and PM <sub>2.5</sub> relative to the base year (2004)	▪ Same as Alternative 1	

<sup>1</sup> Cumulative impact discussion in this table and in Chapter 4 is based on the PRB Coal Review analyses (BLM 2005a-f, 2006b-d, 2008h-i, 2009b-f).

<sup>2</sup> All impacts are assumed to be adverse unless noted otherwise.

Table 2-15. Summary Comparison of Magnitude and Duration of Cumulative Impacts<sup>1, 2</sup> (Continued).

<b>DESCRIPTION OF POTENTIAL IMPACT BY RESOURCE</b>	<b>MAGNITUDE, TYPE, AND DURATION OF IMPACT</b>	
<b>RESOURCE NAME</b>	<b>ALTERNATIVE 1</b>	<b>PROPOSED ACTION, ALTERNATIVE 2 and ALTERNATIVE 3</b>
<b>AIR QUALITY (Continued)</b>		
Non-regulatory PSD Impacts at Class I and Sensitive Class II Areas:		
<ul style="list-style-type: none"> <li>▪ Class I Northern Cheyenne Indian Reservation</li> </ul>	<ul style="list-style-type: none"> <li>▪ Modeled impacts above Class I increment levels for 24-hour PM<sub>10</sub> for base year (2004) and both coal production scenarios for 2020; for 24-hour SO<sub>2</sub> for both coal production scenarios for 2020; for 3-hour SO<sub>2</sub> for upper coal production scenario for 2020</li> </ul>	<ul style="list-style-type: none"> <li>▪ Same as Alternative 1</li> </ul>
<ul style="list-style-type: none"> <li>▪ Class I Badlands National Park</li> </ul>	<ul style="list-style-type: none"> <li>▪ Modeled impacts above Class I increment levels for 24-hour PM<sub>10</sub> for both coal production scenarios for 2020</li> </ul>	<ul style="list-style-type: none"> <li>▪ Same as Alternative 1</li> </ul>
<ul style="list-style-type: none"> <li>▪ Class I Wind Cave National Park</li> </ul>	<ul style="list-style-type: none"> <li>▪ Modeled impacts above Class I increment levels for 24-hour PM<sub>10</sub> for base year (2004) and both coal production scenarios for 2020</li> </ul>	<ul style="list-style-type: none"> <li>▪ Same as Alternative 1</li> </ul>
<ul style="list-style-type: none"> <li>▪ All Sensitive Class II Areas (including Cloud Peak Wilderness Area and Crow Indian Reservation)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Modeled impacts below Class II increments for all Sensitive Class II areas for base year (2004) and both coal production scenarios for 2020</li> </ul>	<ul style="list-style-type: none"> <li>▪ Same as Alternative 1</li> </ul>
Visibility Impacts:		
<ul style="list-style-type: none"> <li>▪ Class I Areas</li> </ul>	<ul style="list-style-type: none"> <li>▪ Modeled impacts show 200 or more days a year during the base year (2004) with a change of 1.0 dv or greater at the Northern Cheyenne Indian Reservation, Badlands National Park, and Wild Cave National Park.; the same three Class I areas have the highest predicted visibility change in 2020</li> </ul>	<ul style="list-style-type: none"> <li>▪ Same as Alternative 1</li> </ul>
<ul style="list-style-type: none"> <li>▪ Sensitive Class II Areas</li> </ul>	<ul style="list-style-type: none"> <li>▪ All but four areas have more than 100 days a year during the base year (2004) with a change of 1.0 dv or greater</li> </ul>	<ul style="list-style-type: none"> <li>▪ Same as Alternative 1</li> </ul>
Acid Deposition Impacts:		
<ul style="list-style-type: none"> <li>▪ Florence Lake</li> </ul>	<ul style="list-style-type: none"> <li>▪ All modeled impacts below the deposition threshold values for nitrogen and sulfur compounds</li> </ul>	<ul style="list-style-type: none"> <li>▪ Same as Alternative 1</li> </ul>
<ul style="list-style-type: none"> <li>▪ Upper Frozen Lake</li> </ul>	<ul style="list-style-type: none"> <li>▪ Modeled impact above 10 percent ANC threshold for both coal production scenarios for 2015 and 2020</li> </ul>	<ul style="list-style-type: none"> <li>▪ Same as Alternative 1</li> </ul>
<ul style="list-style-type: none"> <li>▪ All other modeled sensitive lakes</li> </ul>	<ul style="list-style-type: none"> <li>▪ Modeled impact above 1 µeq/L ANC for both coal production scenarios for 2015 and 2020</li> </ul>	<ul style="list-style-type: none"> <li>▪ Same as Alternative 1</li> </ul>
<b>GROUNDWATER RESOURCES</b>		
<ul style="list-style-type: none"> <li>▪ Removal of coal aquifer and replacement with backfill material</li> </ul>	<ul style="list-style-type: none"> <li>▪ Moderate, permanent for mining areas</li> </ul>	<ul style="list-style-type: none"> <li>▪ Same as Alternative 1</li> </ul>
<ul style="list-style-type: none"> <li>▪ Lowering of water levels in aquifers around the mines</li> </ul>	<ul style="list-style-type: none"> <li>▪ Moderate, long term in area immediately west of mines</li> </ul>	<ul style="list-style-type: none"> <li>▪ Same as Alternative 1</li> </ul>
<ul style="list-style-type: none"> <li>▪ Water level decline in sub-coal aquifers as a result of all development</li> </ul>	<ul style="list-style-type: none"> <li>▪ No cumulative impacts anticipated</li> </ul>	<ul style="list-style-type: none"> <li>▪ Same as Alternative 1</li> </ul>
<ul style="list-style-type: none"> <li>▪ Change in groundwater quality as a result of all development</li> </ul>	<ul style="list-style-type: none"> <li>▪ No cumulative impacts anticipated</li> </ul>	<ul style="list-style-type: none"> <li>▪ Same as Alternative 1</li> </ul>
<ul style="list-style-type: none"> <li>▪ Overlapping drawdown in the coal aquifer caused by surface mining and CBNG development</li> </ul>	<ul style="list-style-type: none"> <li>▪ Additive, long term in area immediately west of surface coal mines</li> </ul>	<ul style="list-style-type: none"> <li>▪ Same as Alternative 1</li> </ul>

<sup>1</sup> Cumulative impact discussion in this table and in Chapter 4 is based on the PRB Coal Review analyses (BLM 2005a-f, 2006b-d, 2008h-i, 2009b-f).

<sup>2</sup> All impacts are assumed to be adverse unless noted otherwise.

## 2.0 Proposed Action and Alternatives

Table 2-15. Summary Comparison of Magnitude and Duration of Cumulative Impacts<sup>1, 2</sup> (Continued).

<b>DESCRIPTION OF POTENTIAL IMPACT BY RESOURCE</b>		<b>MAGNITUDE, TYPE, AND DURATION OF IMPACT</b>	
<b>RESOURCE NAME</b>	<b>ALTERNATIVE 1</b>	<b>PROPOSED ACTION, ALTERNATIVE 2 and ALTERNATIVE 3</b>	
<b>SURFACE WATER RESOURCES</b>			
▪ Surface disturbance of intermittent and ephemeral streams and scattered ponds and reservoirs as a result of coal mining, coal-related, oil and gas, and oil- and gas-related development	▪ Moderate, short term	▪ Same as Alternative 1	
▪ Discharge of coal mining and CBNG produced waters into intermittent and ephemeral streams	▪ Moderate, short term	▪ Same as Alternative 1	
▪ Sediment input into intermittent and ephemeral streams and scattered ponds and reservoirs as a result of coal mining, coal-related, oil and gas, and oil- and gas-related development	▪ Moderate, short term	▪ Same as Alternative 1	
<b>ALLUVIAL VALLEY FLOORS</b>			
▪ Coal mining disturbance of AVFs determined to be significant to agriculture	▪ Not permitted by regulation	▪ Same as Alternative 1	
▪ Coal mining disturbance of AVFs determined not to be significant to mining	▪ AVFs disturbed by mining must be restored to essential hydrologic function; no cumulative impacts anticipated	▪ Same as Alternative 1	
<b>SOILS</b>			
▪ Coal mining, coal-related, oil and gas, and oil- and gas-related disturbance and replacement of soil resources	▪ Moderate, short term and long term impacts through accelerated wind or water erosion, declining soil quality factors through compaction, reduced microbial populations and organic matter, and potential mixing of soil zones	▪ Same as Alternative 1	
▪ CBNG water disposal impacts to soil resources	▪ Potential increase in soil alkalinity depending on SAR levels in water and method of water disposal	▪ Same as Alternative 1	
<b>VEGETATION</b>			
▪ Coal mining, coal-related, oil and gas, and oil- and gas-related removal and replacement of native vegetation	▪ Moderate, short to long term impacts due to potential differences in species composition and presence and size of woody species on reclaimed lands	▪ Same as Alternative 1	
▪ Coal mining, coal-related, oil and gas, and oil- and gas-related impacts to Special Status Plant Species	▪ Potential incremental loss of alteration of potential or known habitat	▪ Same as Alternative 1	
▪ Coal mining, coal related, oil and gas, and oil- and gas-related dispersal of noxious and invasive species	▪ Potential displacement of native species and changes in species composition	▪ Same as Alternative 1	
<b>WETLAND AND RIPARIAN VEGETATION</b>			
▪ CBNG-related discharge of produced water	▪ Moderate, short to long term creation of wetlands in areas that previously supported upland vegetation	▪ Same as Alternative 1	
<b>WILDLIFE</b>			
▪ Direct and indirect coal mining, coal-related, oil and gas, and oil- and gas-related development impacts to game and non-game species, including direct mortality, habitat fragmentation, animal displacement, noise and increased human presence	▪ Moderate, short term	▪ Same as Alternative 1	
▪ Coal mining, coal-related, oil and gas, and oil- and gas-related disturbance of game and nongame species habitat during project development and operation	▪ Moderate, short term loss of all types of habitat present in disturbed areas	▪ Same as Alternative 1	
▪ Coal mining, coal related, oil and gas, and oil- and gas-related habitat changes after reclamation	▪ Moderate, long term change in habitat with potential changes in associated wildlife populations	▪ Same as Alternative 1	

<sup>1</sup> Cumulative impact discussion in this table and in Chapter 4 is based on the PRB Coal Review analyses (BLM 2005a-f, 2006b-d, 2008h-i, 2009b-f).

<sup>2</sup> All impacts are assumed to be adverse unless noted otherwise.

Table 2-15. Summary Comparison of Magnitude and Duration of Cumulative Impacts<sup>1, 2</sup> (Continued).

<b>DESCRIPTION OF POTENTIAL IMPACT BY RESOURCE</b>		<b>MAGNITUDE, TYPE, AND DURATION OF IMPACT</b>	
<b>RESOURCE NAME</b>	<b>ALTERNATIVE 1</b>	<b>PROPOSED ACTION, ALTERNATIVE 2 and ALTERNATIVE 3</b>	
<b>FISHERIES</b>			
▪ Alteration or loss of habitat due to coal mining, coal-related, oil and gas, and oil- and gas-related development	▪ Moderate, short to long term	▪ Same as Alternative 1	
▪ Changes in water quality as a result of surface disturbance or introduction of contaminants into drainages caused by coal mining, coal-related, oil and gas, and oil- and gas-related development	▪ Moderate, short to long term	▪ Same as Alternative 1	
▪ Changes in available habitat as a result of water withdrawals or discharges related to coal mining, coal-related, oil and gas, and oil- and gas-related development	▪ Moderate, short term	▪ Same as Alternative 1	
<b>SPECIAL STATUS SPECIES</b>			
▪ Direct and indirect coal mining, coal-related, oil and gas, and oil- and gas-related development impacts, including direct mortality, breeding area, nest or burrow abandonment, sage-grouse lek abandonment, noise and increased human presence	▪ Moderate, short term	▪ Same as Alternative 1	
▪ Coal mining, coal-related, oil and gas, and oil- and gas-related disturbance of habitat (breeding and nesting) during project development and operation	▪ Moderate, short term loss of all types of special status species habitat present in disturbed areas	▪ Same as Alternative 1	
▪ Coal mining, coal related, oil and gas, and oil- and gas-related habitat changes after reclamation	▪ Moderate, long term change in habitat with potential changes in associated populations of special status species	▪ Same as Alternative 1	
<b>LAND USE AND RECREATION</b>			
▪ Loss of forage and range improvements and restriction of livestock movement due to coal mining, coal-related, oil and gas, and oil- and gas-related development	▪ Moderate, short term	▪ Same as Alternative 1	
▪ Disturbance of developed recreation sites by coal mining, coal-related, oil and gas, and oil- and gas-related development	▪ Negligible, short term	▪ Same as Alternative 1	
▪ Reduction or degradation of opportunities for dispersed recreation activities related to coal mining, coal-related, oil and gas, and oil- and gas-related development	▪ Moderate, short term on existing mine areas	▪ Same as Alternative 1	
<b>CULTURAL RESOURCES</b>			
▪ Disturbance of cultural resource sites	▪ Moderate, permanent	▪ Same as Alternative 1	
<b>TRANSPORTATION AND UTILITIES</b>			
▪ Movement of segments of existing public roads, pipelines, transmission lines, or railroads to accommodate coal mining development	▪ Moderate, long term to permanent, disruptive effects would be minimized	▪ Same as Alternative 1	
▪ Increased vehicular traffic on roads and highways due to coal mining, coal-related, oil and gas, and oil- and gas-related development, and associated impacts including traffic accidents, road wear, air emissions, dust, noise, and vehicle collisions with wildlife and livestock	▪ Moderate, short term	▪ Same as Alternative 1	
▪ Construction and operation of additional railroad and pipeline facilities and transmission lines to transport coal, oil and gas, and electricity	▪ Moderate, short to long term	▪ Same as Alternative 1	

<sup>1</sup> Cumulative impact discussion in this table and in Chapter 4 is based on the PRB Coal Review analyses (BLM 2005a-f, 2006b-d, 2008h-i, 2009b-f).

<sup>2</sup> All impacts are assumed to be adverse unless noted otherwise.

## 2.0 Proposed Action and Alternatives

Table 2-15. Summary Comparison of Magnitude and Duration of Cumulative Impacts<sup>1, 2</sup> (Continued).

<b>DESCRIPTION OF POTENTIAL IMPACT BY RESOURCE</b>		<b>MAGNITUDE, TYPE, AND DURATION OF IMPACT</b>	
<b>RESOURCE NAME</b>	<b>ALTERNATIVE 1</b>	<b>PROPOSED ACTION, ALTERNATIVE 2 and ALTERNATIVE 3</b>	
<b>SOCIOECONOMICS</b>			
▪ Increases in employment related to coal mining, coal-related, oil and gas, and oil- and gas-related development	▪ Significant, short to long term	▪ Same as Alternative 1	
▪ Increases in personal income due to employment increases related to coal mining, coal-related, oil and gas, and oil- and gas-related development	▪ Significant, beneficial, short to long term	▪ Same as Alternative 1	
▪ Increase in population due to employment increases related to coal mining, coal-related, oil and gas, and oil- and gas-related development	▪ Significant, short to long term	▪ Same as Alternative 1	
▪ Expansion of housing supply due to employment increases related to coal mining, coal-related, oil and gas, and oil- and gas-related development	▪ Significant, short to long term	▪ Same as Alternative 1	
▪ Increases in school enrollment due to employment increases related to coal mining, coal-related, oil and gas, and oil- and gas-related development	▪ Moderate, short term	▪ Same as Alternative 1	
▪ Need for additional local government facilities and services due to employment increases related to coal mining, coal-related, oil and gas, and oil- and gas-related development	▪ Moderate, short to long term	▪ Same as Alternative 1	
▪ Increased federal, state, and local revenues related to coal mining, coal-related, oil and gas, and oil- and gas-related development	▪ Significant, beneficial, short to long term	▪ Same as Alternative 1	
<sup>1</sup> Cumulative impact discussion in this table and in Chapter 4 is based on the PRB Coal Review analyses (BLM 2005a-f, 2006b-d, 2008h-i, 2009b-f). <sup>2</sup> All impacts are assumed to be adverse unless noted otherwise.			

- (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 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 insignificant following completion of reclamation.