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## CHAPTER 2: PROPOSED ACTION AND ALTERNATIVES

### 2.1 INTRODUCTION

This chapter describes the Proposed Action and alternatives to this action. The Proposed Action is to exchange the Gold Mine Draw AVF Tract (the offered lands at the Caballo Mine) for unleased Federal coal adjacent to one or more of the following mines; Caballo Mine, Rawhide Mine, and the North Antelope Rochelle Mine. This alternative assumes that the tracts would be developed as maintenance tracts for current operations.

NEPA requires the consideration and evaluation of other reasonable ways to meet proposal objectives while minimizing or avoiding environmental impacts. Thus, NEPA requires the evaluation of a No Action Alternative and a practical range of other "reasonable" action alternatives that may avoid or minimize project impacts. Reasonable alternatives are defined by NEPA as those that are technically, economically, and environmentally practical and feasible. Reasonable alternatives are formulated to address issues and concerns raised by the public and agencies during scoping. These alternatives should represent another means of satisfying the stated purpose and need for the federal action. Due to the requirement that an exchange be of equal value, including all of the selected tracts in the analysis allows for flexibility in equalizing values without combinations of tracts being specifically identified as action alternatives.

The No Action Alternative is to reject the Gold Mine Draw exchange application. Under the No Action Alternative, the exchange would not be completed as proposed, but would be reconsidered with changes; existing mining at the Caballo Mine, Rawhide Mine and North Antelope Rochelle Mine would continue as permitted.

Selection of the No Action Alternative could lead to the bypass of the coal reserves due to the location and configuration of the selected tracts (tracts #1-7). However, PRCC could apply for a coal lease modification to include tracts #1-7 that would otherwise be bypassed. The selected lands at the Caballo Mine (tract #8) could be included in a new coal lease application by the applicant or some other party in the future.

The Caballo Mine offered lands (Gold Mine Draw AVF) and the eight selected tracts as applied for (Proposed Action) are shown in Figures 2-1 thru 2-5.

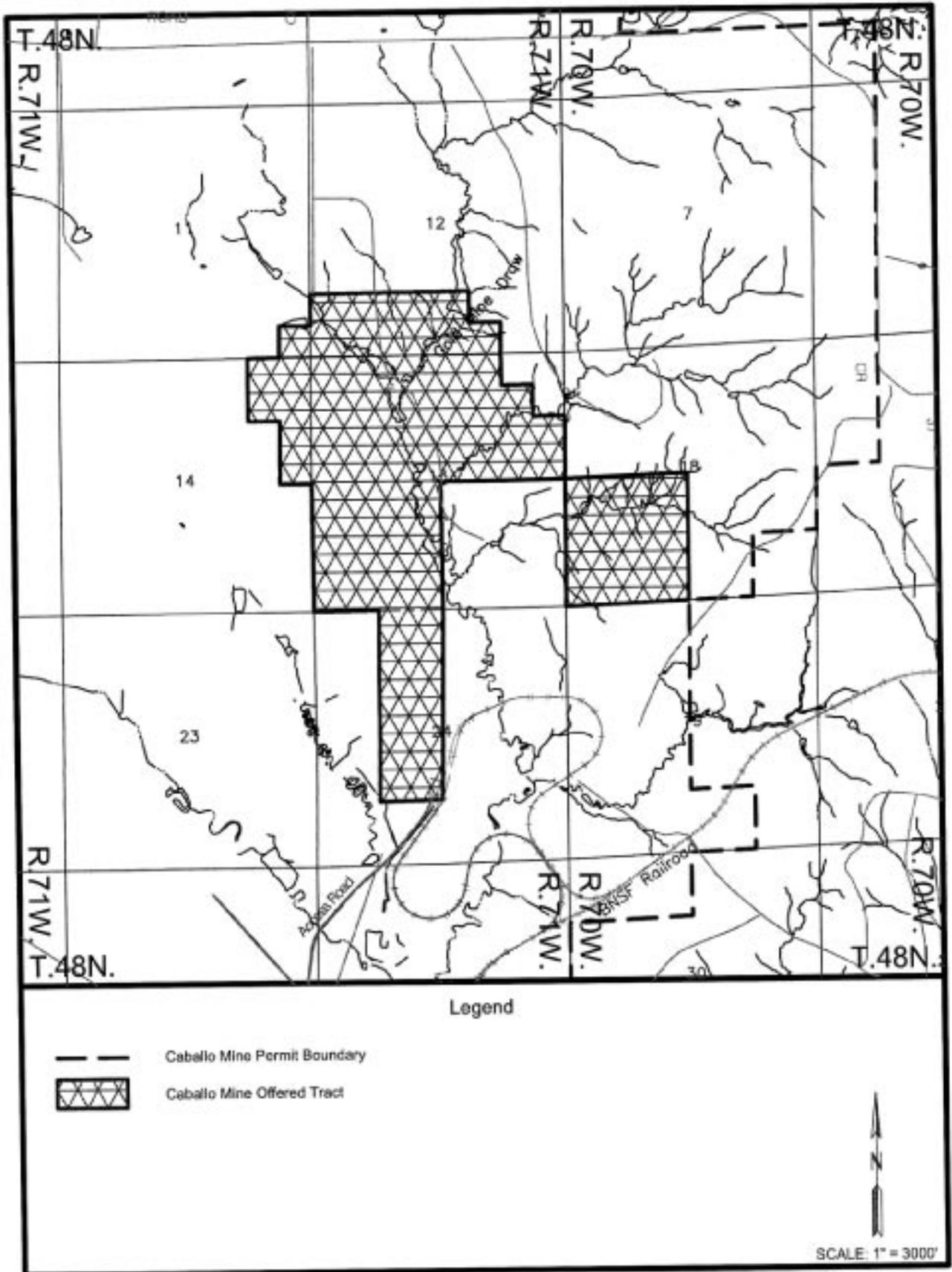


Figure 2-1 Caballo Mine Offered Tract

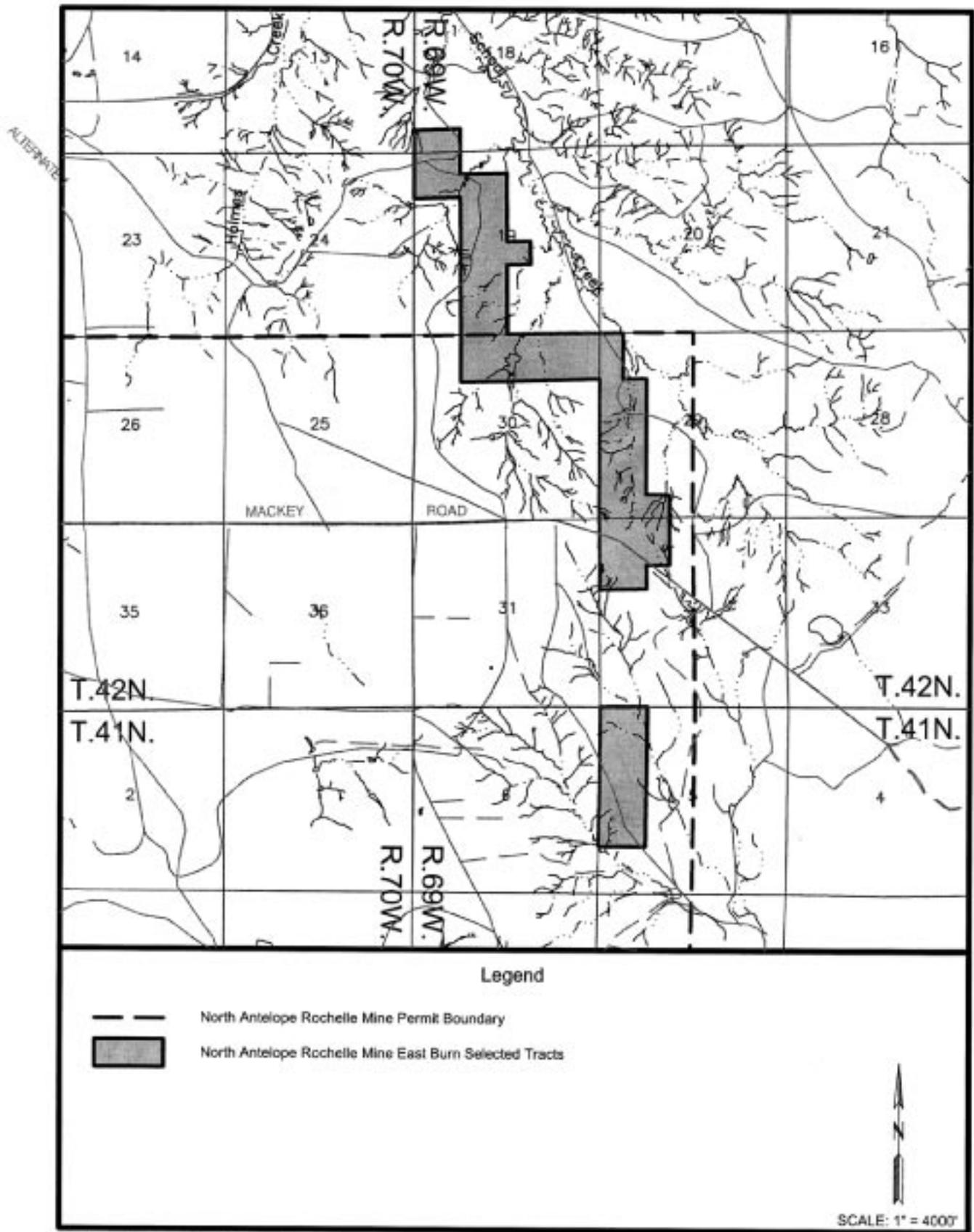


Figure 2-2 North Antelope Rochelle Mine East Burn Selected Tracts

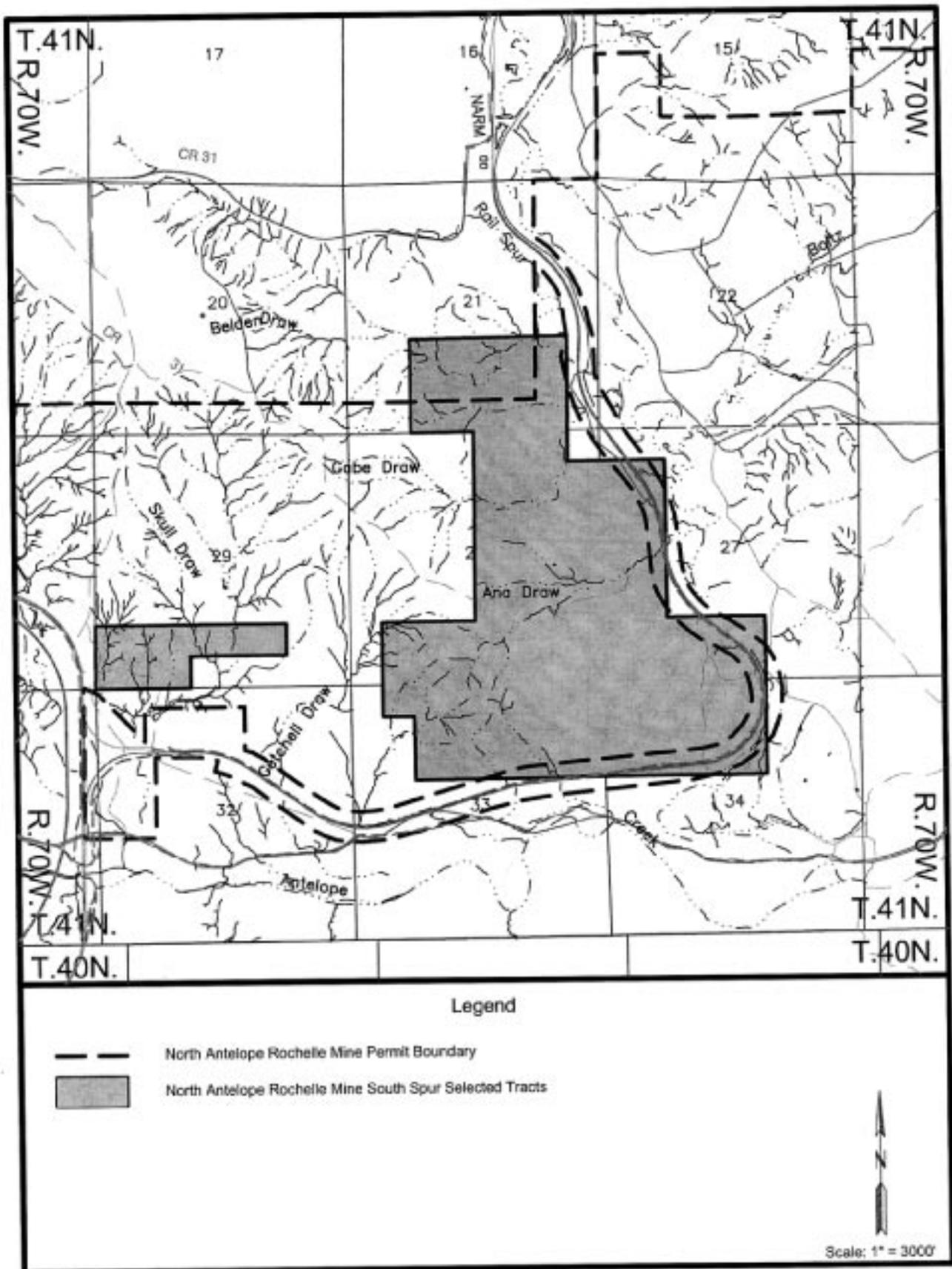


Figure 2-3 North Antelope Rochelle Mine South Spur Selected Tracts

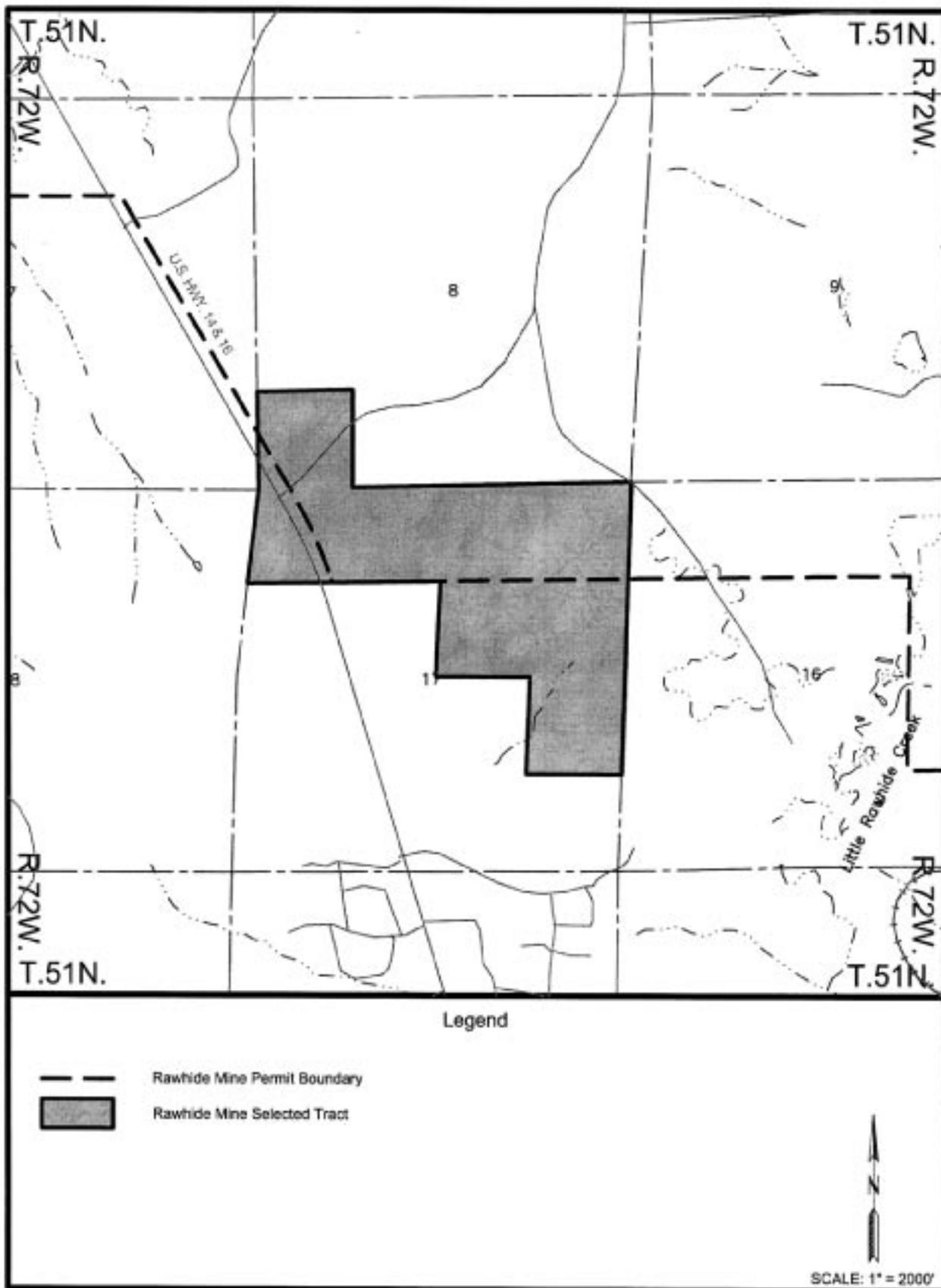


Figure 2-4 Rawhide Mine Selected Tract

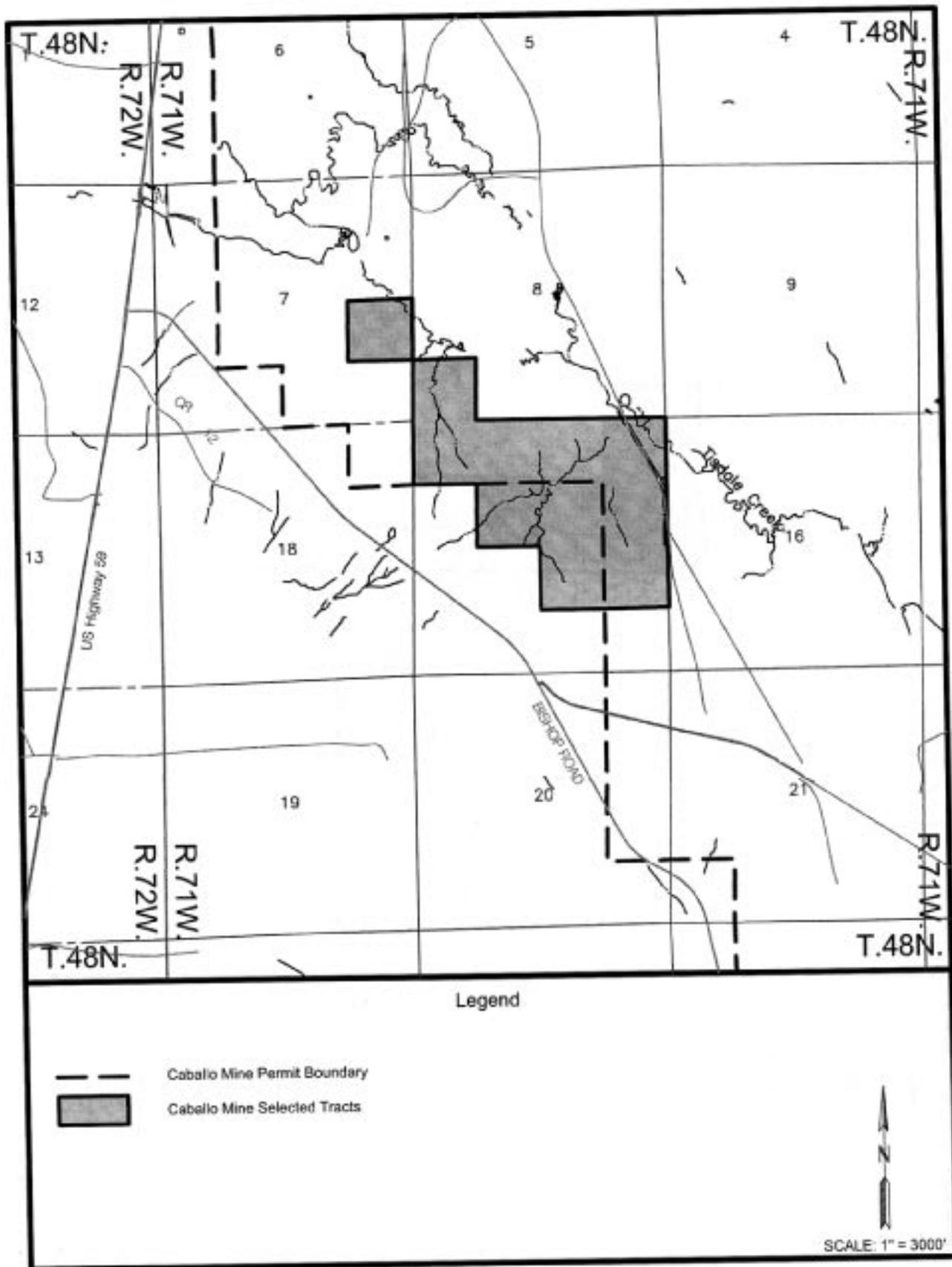


Figure 2-5 Caballo Mine Selected Tracts

The Proposed Action assumes 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 such as overstripping, matching undisturbed topography, and constructing flood control and sediment control structures.

## 2.2 THE PROPOSED ACTION

Under the Proposed Action, the Caballo offered tract, as applied for by Powder River Coal Company, would be offered for exchange for one or more of the eight selected tracts located at the North Antelope Rochelle Mine (#1-6), the Rawhide Mine (#7), and, the Caballo Mine (#8) and are subject to standard and special lease stipulations developed for the PRB. The boundaries of the tracts would be consistent with the tract configurations proposed in the Gold Mine Draw Alluvial Valley Floor Exchange (Figures 2-1 thru 2-5). The minerals within the offered lands would become unleased public minerals if the exchange is completed.

The legal description of the offered Gold Mine Draw exchange tract coal lease lands by Powder River under the Proposed Action is as follows:

T. 48 N., R. 70 W., 6th P.M., Campbell County, Wyoming

Section 18:	Lots 15-18,	156.129
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T. 48 N., R. 71 W., 6th P.M., Campbell County, Wyoming

Section 11:	Lot 16 (SE1/4),	10.054
Section 12:	Lots 13, 14, 15 (W1/2, SE1/4),	111.869
Section 13:	Lot 1 (SW1/4), Lots 2-8, 11-14,	460.604
Section 14:	Lots 1, 8 (E1/2),	60.92
Section 24:	Lots 1-3,	122.098

Total Acres		920.946 acres
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Land descriptions and acreage are based on the BLM Status of Public Domain Land and Mineral Title approved coal plat as of March 2, 2002.

As discussed in Chapter 1, the lands in the Gold Mine Draw AVF exchange tract were found to be unsuitable for mining. The tract as offered includes approximately 920.9 mineable acres. Powder River estimates that it includes approximately 66.8 million tons of in-place coal, and that about 58.1 million tons of that coal would be recoverable. BLM will independently evaluate the volume and average quality of the coal resources included in the tract as part of the fair market value determination process. BLM's estimate of the mineable reserves and average quality of the coal included in the tract will be published in the exchange notice if the tract is offered for exchange.

The approved Caballo Mine permit (Caballo Coal Company 2005a) includes

monitoring and mitigation measures that are required by SMCRA and Wyoming state law. The Gold Mine Draw offered lands have been covered by all baseline studies included in the Caballo Mine permit.

The legal description of the selected tracts of coal lease lands by Powder River under the Proposed Action is as follows:

**North Antelope Rochelle Mine – Tract #1**

T. 42 N., R. 69 W., 6th P.M., Campbell County, Wyoming

Section 18:	Lot 13 (S1/2),	19.75
Section 19:	Lots 6 (S1/2), 7, 9, 11(NW1/4), 12	151.091
Total Acres		170.841 acres

**North Antelope Rochelle Mine – Tract #2**

T. 42 N., R. 69 W., 6th P.M., Campbell County, Wyoming

Section 19:	Lot 15,	40.570
Section 29:	Lot 4, (W1/2),	20.298
Section 30:	Lots 5-7,	123.287
Total Acres		184.155 acres

**North Antelope Rochelle Mine – Tract #3**

T. 42 N., R. 69 W., 6th P.M., Campbell County, Wyoming

Section 29:	Lots 5, 12, 13, 14 (SW1/4)	131.479
Section 32:	Lots 3, (W1/2), 4, 5 (N1/2),	83.054
Total Acres		214.533 acres

**North Antelope Rochelle Mine – Tract #4**

T. 41 N., R. 69 W., 6th P.M., Campbell County, Wyoming

Section 5:	Lots 8, 9, 16,	123.373
Total Acres		123.373 acres

### **North Antelope Rochelle Mine – Tract #5**

T. 41 N., R. 70 W., 6th P.M., Campbell and Converse Counties, Wyoming

Section 21: Lots	9 (SW1/4), 10 (S1/2), 11 (S1/2), 14, 15, 16 (W1/2),	149.628
Section 27: Lots	4, (S1/2), 5, 12-14, 15 (W1/2)	205.428
Section 28: Lots	1 (W1/2, SE1/4), 2, 7-10, 12 (E1/2), 13-15,	370.422
Section 33: Lots	1-3, 4(NE1/4), 6 (N1/2), 7 (N1/2), 8 (N1/2),	191.662
Section 34: Lots	2 (W1/2), 3, 4, 5 (N1/2), 6 (N1/2), 7 (NW1/4),	154.456

Total Acres 1071.556 acres

### **North Antelope Rochelle Mine – Tract #6**

T. 41 N., R. 70 W., 6th P.M., Converse County, Wyoming

Section 29: Lots	13, 14 (N1/2, SW1/4), 15 (N1/2),	91.262
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Total Acres 91.262 acres

### **Rawhide Mine – Tract #7**

T. 51 N., R. 72 W., 6th P.M., Campbell County, Wyoming

Section 8: Lot	13,	40.081
Section 17: Lots	1-4, 7-9,	274.857

Total Acres 314.938 acres

### **Caballo Mine – Tract #8**

T. 48 N., R. 71 W., 6th P.M., Campbell County, Wyoming

Section 7: Lot	12,	40.376
Section 8: Lot	10,	39.650
Section 17: Lots	1-4, 6-10,	408.551

Total Acres 448.577 acres

The approved mine permits (Caballo Coal Company, 2005a and 2005b, Powder River Coal Company, 2005) include monitoring and mitigation measures that are required by SMCRA and Wyoming state law. A large portion of the selected lands at all three existing mines have been included in previous monitoring and mitigation measures.

If Powder River acquires any of the selected lands within the Proposed Action, these monitoring and mitigation measures would be extended to cover operations on the selected tracts when the coal mining permits are revised to include mining the tracts. The permits would have to be approved before coal removal could take place.

### **2.2.1 North Antelope Rochelle Selected Tracts (#1-6)**

The North Antelope Rochelle selected tracts consist of two separate areas that would be mined as an integral part of the North Antelope Rochelle Mine under the Proposed Action. The North Antelope Rochelle Mine is already operating under both an approved state mining permit and an MLA mining plan. As shown on Figures 2-2 and 2-3, a portion of the selected tracts as applied for are located within the current North Antelope Rochelle Mine permit boundary, and all environmental baseline studies have been conducted on those lands. Several baseline studies have also covered the portion outside of the permit area. Both the existing approved state mining permit and the MLA mining plan would require revision to include mining the tract as applied for. Since the selected 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 for the North Antelope Rochelle Mine and the BLM's resource recovery and protection plan (R2P2) for the North Antelope Rochelle Mine.

North Antelope Rochelle's currently approved air quality permit from the WDEQ/AQD allows up to 99 million tons of coal per year. In 2004, the North Antelope Rochelle Mine produced 82.5 million tons. In 2005, the mine produced approximately 82.7 million tons. Under the No Action Alternative, the 1587.1 million tons of in-place leased federal coal reserves remaining as of January 1, 2005 will be mined in approximately 26 years at an average annual production rate of 61.0 million tons per year. Under the Proposed Action, Powder River currently estimates that average annual production would be 61.0 million tons per year, and the life of the existing mine would be extended by approximately 0.8 years.

If North Antelope Rochelle Mine acquires the selected tract as applied for, they estimate that a total of 1633.7 million tons of federal coal would be mined after January 1, 2005, with an estimated 46.6 million tons coming from the selected tract. This estimate of recoverable reserves assumes that about 6.5% of the coal would be lost under normal mining practices, based on historical recovery factors at the North Antelope Rochelle Mine. As of December 31, 2004, about 881.8 million tons of coal had been mined from within the current permitted area of the mine.

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

The North Antelope Rochelle Mine is one of several coal mines currently operating in the PRB where the coal seams are notably thick, and the overburden is relatively thin. The overburden is excavated and loaded into trucks by electric-

powered shovels and also removed by dragline operations. Overburden would be removed within the selected tract by truck-shovel and dragline operations. Most overburden and all coal would be drilled and blasted to facilitate efficient excavation. As overburden is removed, most would be directly placed into areas where coal has already been removed. Elevations consistent with an approved post-mining topography (PMT) plan would be established as quickly as possible. Under certain conditions, the PMT may not be immediately achievable. This would occur when there is an excess of material which may require temporary stockpiling; when there is insufficient material available from current overburden removal operations; or when future mining could redisturb an area already mined.

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

Current employment at the North Antelope Rochelle Mine is 812. Production plans for the North Antelope Rochelle Mine call for an increase to 88.0 million tons per year in 2006, with employment estimated at 877. If the selected tract is acquired, North Antelope Rochelle Mine anticipates that production and employment would remain the same.

### **2.2.2 Rawhide Mine Selected Tract (#7)**

The Rawhide Mine selected tract would be mined as an integral part of the Rawhide Mine under the Proposed Action. The Rawhide Mine is already operating under both an approved state mining permit and an MLA mining plan. As shown on Figure 2-4, most of the selected tract as applied for is within the current Rawhide Mine permit boundary, and all environmental baseline studies have been conducted on that portion. Several baseline studies have also been conducted on the lands outside of the permit area. Both the existing approved state mining permit and the MLA mining plan would require revision to include mining the tract as applied for. Since the selected tract would be an extension of the existing Rawhide Mine, the facilities and infrastructure would be the same as those identified in the WDEQ/LQD Mine Permit 240 for the Rawhide Mine and the BLM's resource recovery and protection plan (R2P2) for the Rawhide Mine.

Rawhide's currently approved air quality permit from the WDEQ/AQD allows up to 24 million tons of coal per year. In 2004, the Rawhide Mine produced 6.9 million

tons. In 2005, the mine produced approximately 12.4 million tons. Under the No Action Alternative, the 422.3 million tons of in-place leased federal coal reserves remaining as of January 1, 2005 will be mined in approximately 20 years at an average annual production rate of 21.1 million tons per year. Under the Proposed Action, Powder River currently estimates that average annual production would be 21.0 million tons per year, and the life of the existing mine would be extended by approximately 1.6 years.

If Rawhide Mine acquires the selected tract as applied for, they estimate that a total of 456.9 million tons of federal coal would be mined after January 1, 2005, with an estimated 34.6 million tons coming from the selected tract. This estimate of recoverable reserves assumes that about 6.5% of the coal would be lost under normal mining practices, based on historical recovery factors at the Rawhide Mine. As of December 31, 2004, about 216.7 million tons of coal had been mined from within the current permitted area of the mine.

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

The Rawhide Mine is one of several coal mines currently operating in the PRB where the coal seams are notably thick, and the overburden is relatively thin. The overburden is excavated and loaded into trucks by electric-powered shovels. Overburden would also be removed within the selected tract by truck-shovel operations. The Rawhide Mine is evaluating adding a dragline in October of 2006. Most overburden and all coal would be drilled and blasted to facilitate efficient excavation. As overburden is removed, most would be directly placed into areas where coal has already been removed. Elevations consistent with an approved post-mining topography (PMT) plan would be established as quickly as possible. Under certain conditions, the PMT may not be immediately achievable. This would occur when there is an excess of material which may require temporary stockpiling; when there is insufficient material available from current overburden removal operations; or when future mining could redisturb an area already mined.

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

Current employment at the Rawhide Mine is 131. Production plans for the Rawhide Mine call for an increase to 20 million tons per year in 2006, with employment estimated at 158. If the selected tract is acquired, Rawhide Mine anticipates that production and employment would remain the same.

### **2.2.3 Caballo Mine Selected Tract (#8)**

The Caballo Mine selected tract would be mined as an integral part of the Caballo Mine under the Proposed Action. The Caballo Mine is already operating under both an approved state mining permit and an MLA mining plan. As shown on Figure 2-5, all but approximately 120 acres located in Section 17 of the selected tract is within the current Caballo Mine permit boundary, and all environmental baseline studies have been conducted on those lands. Several baseline studies have also covered the lands outside the permit area. Both the existing approved state mining permit and the MLA mining plan would require revision to include mining the tract as applied for. Since the selected tract would be an extension of the existing Caballo Mine, the facilities and infrastructure would be the same as those identified in the WDEQ/LQD Mine Permit 433 for the Caballo Mine and the BLM's resource recovery and protection plan (R2P2) for the Caballo Mine.

Caballo's currently approved air quality permit from the WDEQ/AQD allows up to 40 million tons of coal per year. In 2004, the Caballo Mine produced 26.4 million tons. In 2005, the mine produced approximately 30.6 million tons. Under the No Action Alternative, the 699.5 million tons of in-place leased federal coal reserves remaining as of January 1, 2005 will be mined in approximately 19 years at an average annual production rate of 36.8 million tons per year. Under the Proposed Action, Powder River currently estimates that average annual production would remain at 36.8 million tons per year, and the life of the existing mine would be extended by approximately 1.5 years.

If Caballo Mine acquires the selected tract as applied for, they estimate that a total of 754.7 million tons of federal coal would be mined after January 1, 2005, with an estimated 55.2 million tons coming from the selected tract. This estimate of recoverable reserves assumes that about 5% of the coal would be lost under normal mining practices, based on historical recovery factors at the Caballo Mine. As of December 31, 2004, about 394.5 million tons of coal had been mined from within the current permitted area of the mine.

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

The Caballo Mine is one of several coal mines currently operating in the PRB where the coal seams are notably thick, and the overburden is relatively thin. The overburden is excavated and loaded into trucks by electric-powered shovels. Overburden would be removed within the selected tract by truck-shovel operations. Most overburden and all coal would be drilled and blasted to facilitate efficient excavation. As overburden is removed, most would be directly placed into areas where coal has already been removed. Elevations consistent with an approved post-mining topography (PMT) plan would be established as quickly as possible. Under certain conditions, the PMT may not be immediately achievable. This would occur when there is an excess of material 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.

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

Current employment at the Caballo Mine is 299. Production plans for the Caballo Mine call for an increase to 29.8 million tons per year in 2006, with employment estimated at 335. If the selected tract is acquired, Caballo Mine anticipates that production and employment would remain the same.

#### **2.2.4 Hazardous and Solid Waste**

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

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

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

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

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

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

- Spill prevention control and countermeasure plans;
- Spill response plans;
- Inventories of hazardous chemical categories pursuant to section 312 of SARA, as amended; and
- Emergency response plans.

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

Compliance with these rules is the current practice at the Caballo Mine, Rawhide Mine and North Antelope Rochelle Mine. Acquisition of the selected tracts by Powder River would not change these current practices nor the amount or type of any wastes generated or disposed at the mine, although quantities of some wastes would increase in proportion to anticipated increases in coal production (fuel, lubricants, and shop and office wastes).

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

Under the No Action Alternative, Powder River's coal lease exchange application would be rejected in its current form, the Gold Mine Draw AVF tract would not be offered for exchange, and the coal contained within the selected tracts would not be leased as a part of this exchange proposal. Rejection of the application would not affect permitted mining activities on existing leases at the adjacent Caballo Mine, North Antelope Rochelle Mine or Rawhide Mine. The Caballo Mine currently leases approximately 11,959.6 acres of federal coal, about 160.1 acres of private coal, and about 648.0 acres of state coal (of which all acres are within the permit boundary). Approximately 13,497.8 acres will eventually be affected. Under the No Action Alternative, Powder River estimates that average annual production at the Caballo Mine after 2005 will be 36.8 mmpy, and average employment will be 335 persons. Portions of the surface of the selected tract will be disturbed 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 EA analysis was prepared under the assumption that the Gold Mine Draw tract offered for exchange would not be exchanged for the selected lands and the selected lands may not be mined in the near future or ever, if the No Action Alternative were selected. However, selection of this alternative would not preclude leasing of the selected tracts through lease modification, lease by application, or modified exchange application. However, due to the proximity of the current mining operations, some of the tracts may be permanently bypassed if not leased in the near future.

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

No other alternatives were identified. The selected tracts are limited in size to reflect the requirement that the exchange be of equal value. As the offered tract is fairly small, the selected tracts are also relatively small. This precludes the tracts being developed independently from the adjacent mining operations.

## 2.5 COMPARISON OF ALTERNATIVES

Figures 2-1 thru 2-5 illustrate the locations of the selected tracts of the Proposed Action for the Gold Mine Draw tract.

Table 2-1 presents a comparative summary of the direct and indirect environmental impacts of implementing the proposed alternative as compared to the No Action Alternative. The No Action Alternative assumes that the exchange is rejected and that a new exchange proposal will be pursued. The environmental consequences of the Proposed Action and alternatives are analyzed in Chapter 4.

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

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

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

**TABLE 2-1**

**SUMMARY COMPARISON OF DIRECT AND INDIRECT IMPACTS**

(Chapter 4 contains an additional description of the impacts.)

RESOURCE	MAGNITUDE TYPE AND DURATION OF IMPACT (Impacts are assumed to be adverse unless otherwise indicated)	
	NO ACTION ALTERNATIVE	PROPOSED ACTION
<b>TOPOGRAPHY AND PHYSIOGRAPHY</b>		
The topography following reclamation would be gentler and more uniform. This topographic moderation would be permanent and would potentially result in: - a potential reduction in microhabitats habitat diversity, and big game carrying capacity. - A reduction in water runoff and peak flows which would potentially help reduces erosion, enhance vegetative productivity, and accelerate groundwater recharge.	No impact.	Impacts would be moderate but long term on the existing mine area. Some impacts would be beneficial.
<b>GEOLOGY AND MINERALS</b>		
Coal, overburden and topsoil would be removed; topsoil and overburden would be replaced. The physical characteristics of the overburden and topsoil would be permanently altered when it is replaced. Unsuitable overburden material would be placed in areas where it would not affect groundwater quality or revegetation success. Coal bed natural gas would be lost through venting and depletion of hydrostatic pressure. Subcoal conventional oil and gas resources could not be developed during mining.	No impact.	Impacts would be moderate and long term to permanent on existing mine area.
<b>SOILS</b>		
Changes to physical properties would include increased near-surface bulk density and more uniformity in soil type, thickness, and texture. Soil material that is not suitable to support plant growth would not be salvaged for use in reclamation	No impact.	Impacts would be moderate but long-term on the existing mine area. Some changes to the physical properties would be beneficial.  Changes to the chemical properties would have a beneficial, long-term effect on existing mine area.
Changes in chemical properties would include more uniform soil nutrient distribution.	No impact.	
Changes in biological properties would include a reduction in organic matter and microorganism populations. The existing plant habitat in stockpiled soils would be reduced.	No impact.	Changes in biological properties would be moderate and short-term to long-term on the existing mine area.
<b>AIR QUALITY</b>		
Overburden and coal blasting, coal hauling and dumping, and operation of mining equipment would cause elevated concentrations of particulate matter and gaseous emissions. Public would potentially be exposed to elevated particulate and gaseous emissions along publicly accessible roads and in occupied dwellings located near mining operations.	No impact.	Impacts would be moderate and short term on the existing mine permit and surrounding area.

**TABLE 2-1**  
(continued)

RESOURCE	MAGNITUDE TYPE AND DURATION OF IMPACT (Impacts are assumed to be adverse unless otherwise indicated)	
	NO ACTION ALTERNATIVE	PROPOSED ACTION
<b>WATER RESOURCES</b>		
<b>Surface water:</b> Changes in runoff characteristics and sediment discharge would be associated with disruption of surface drainage systems. Sediment control structures would moderate peak flows and help control sediment downstream. Vegetation removal during mining could result in increased erosion rates. Loss of soil structure after reclamation would act to increase runoff rates, but topographic moderation would help increase infiltration.	No impact.	Impacts would be moderate and short term to long term on existing mine area.
<b>Groundwater:</b> Coal and overburden aquifers would be removed; the replaced overburden would have altered hydraulic properties; water levels in affected coal and overburden aquifers adjacent to the mine would be depressed. Groundwater quality in backfilled areas would be changed but would be expected to be similar to premining aquifers.	No impact.	Impacts would be minor to moderate and long term on the existing mine area.
<b>ALLUVIAL VALLEY FLOORS (AVFs)</b>		
AVF's significant to agriculture can not be disturbed. AVFs not significant to agriculture could be removed and restored.	No impact.	No AVFs on expanded area of coal removal.
<b>WETLANDS</b>		
Wetlands would be removed by mining operations.	No impact.	Impacts would be moderate and long term on existing mine area. Jurisdictional wetlands would be replaced in accordance with section 404 of the Clean Water Act; non-jurisdictional wetlands would be replaced as required by the surface land owner or WDEQ/LQD.
<b>VEGETATION</b>		
During mining, progressive removal of native vegetation would result in increased erosion, loss of wildlife and livestock habitat, and loss of wildlife habitat carrying capacity.	No impact.	Impacts would be moderate and long term on existing mine area.
After reclamation, vegetation patterns would be changed, vegetation diversity would be decreased, shrub density could be reduced and wildlife carrying capacity would potentially be reduced. Nonnative plant species would potentially invade.	No impact.	Impacts would be minor to moderate and long term on existing mine area. Steps to control invasion by nonnative plant species would be implemented.

**TABLE 2-1**  
(continued)

RESOURCE	MAGNITUDE TYPE AND DURATION OF IMPACT (Impacts are assumed to be adverse unless otherwise indicated)	
	NO ACTION ALTERNATIVE	PROPOSED ACTION
<b>WILDLIFE</b>		
During mining, wildlife would be displaced from and habitat would be lost in active mining areas. Wildlife movement through mine permit area would be restricted. Small mammal mortality would increase. Foraging and nesting habitat for raptors and migratory birds and breeding and brood-rearing habitat for sage grouse would be lost. Habitat for waterfowl and aquatic species would be disturbed. Mine-related traffic would be responsible for road kills.	No impact.	Impacts would be moderate and long term on existing mine area.
After reclamation, big game habitat carrying capacity and habitat diversity on reclaimed lands would potentially be decreased. Changes in sagebrush density on reclaimed lands may limit sage grouse repopulation until premining conditions are restored. Post mining aquatic habitat may not duplicate premining habitat.	No impact.	Impacts would be moderate and long term on existing mine area.
<b>THREATENED, ENDANGERED, AND PROPOSED SPECIES</b>		
Black-footed ferret	No impact.	No effect
Bald eagle habitat.		May affect, not likely to adversely affect
Ute ladies'-tresses		May affect, not likely to adversely affect
<b>LAND USE AND RECREATION</b>		
Livestock grazing use and wildlife habitat in active mining areas would be reduced before reclamation. Oil and gas production and transportation facilities would be removed prior to mining. Subcoal oil and gas reservoirs would not be accessible for development during mining and before reclamation. CBNG not recovered prior to mining would be permanently lost. Hunting access would be restricted during mining and reclamation.	No impact.	Impacts would be moderate and short term to long term on existing mine area.
<b>CULTURAL RESOURCES</b>		
Historic and prehistoric sites and isolated artifacts would be disturbed. All sites that meet the eligibility requirements for the NRHP would be avoided or mitigated through data recovery. Potential for vandalism and unauthorized collection would increase.	No impact.	Eligible or unevaluated sites on existing mine area must be avoided or mitigated through data recovery; ineligible sites may be destroyed without further work.

**TABLE 2-1**  
(continued)

RESOURCE	MAGNITUDE TYPE AND DURATION OF IMPACT (Impacts are assumed to be adverse unless otherwise indicated)	
	NO ACTION ALTERNATIVE	PROPOSED ACTION
<b>NATIVE AMERICAN CONCERNS</b>	No impact identified on existing mine area. Native American consultation completed for existing mine permit area.	Same as the No Action Alternative on expanded area of coal removal. OSM completed Native American consultation on the lands within the analysis area in 2000.
<b>PALEONTOLOGICAL RESOURCES</b>		
Plant, invertebrate, and vertebrate fossil material in overburden and coal would potentially be lost. Potential for unauthorized collection and vandalism would increase. Buried fossil material would potentially be exposed for scientific examination.	No impact.	Minor, long-term to permanent on existing mine area, some impacts would be beneficial.
<b>VISUAL RESOURCES</b>		
During mining, a landscape altered by presence of facilities and mining operations would be visible from roads and dwellings in the area. Following reclamation, slopes would be smoother and sagebrush would be less dense.	No impact.	Impacts would be moderate and short term on existing mine area during mining and reclamation. Following reclamation, impacts would be minor and long-term.
<b>NOISE</b>		
Increased noise levels during mining could affect occupied dwellings within 1 mile and wildlife in immediate vicinity.	No impact.	Impacts would be moderate and short term on the existing mine and the surrounding area.
<b>TRANSPORTATION</b>		
Railroads would be used to ship coal, employees would travel to and from work on existing roads, existing pipelines, phone lines, and electrical lines would be removed prior to mining.	No impact.	Impacts would be moderate, short-term for mining operations on existing mine area
<b>SOCIOECONOMICS</b>		
State and federal governments would receive revenues from royalties and taxes. Campbell and Converse counties would benefit from economic development, stable employment, and taxes.	No impact.	Impacts would be moderate, beneficial, and short term for mining operations on expanded area of coal removal.