EXECUTIVE SUMMARY

This environmental impact statement (EIS)[1] analyzes the environmental impacts of leasing four tracts of federal coal reserves adjacent to the Belle Ayr, Coal Creek, Caballo, and Cordero Rojo mines. All are operating surface coal mines in the east-central Powder River Basin (PRB) of Wyoming. The operators of the Belle Ayr, Coal Creek, Caballo, and Cordero Rojo mines filed four applications to lease the four tracts of federal coal included in maintenance coal tracts (federal coal tracts that would continue or extend the life of an existing coal mine) under the regulations at 43 CFR 3425, Leasing On Application. Figure ES-1 shows the four LBA tracts, other currently pending LBA tracts, and the existing federal leases, including previously leased LBA tracts, in the Wyoming PRB.

On July 6, 2004, RAG Coal West, Inc. (RAG) filed an application with the Bureau of Land Management (BLM) to lease federal coal reserves in a tract north of and immediately adjacent to the Belle Ayr Mine in Campbell County, Wyoming, approximately 10 miles south-southeast of Gillette (figures ES-1 and ES-2). The tract, which was originally referred to as the Belle Ayr Mine North Extension lease by application (LBA) Tract, was assigned case file number WYW161248. The federal coal reserves were applied for as a maintenance tract for the Belle Ayr Mine. BLM subsequently renamed the tract the Belle Ayr North LBA tract. In August 2004, RAG finalized the sale of the Belle Ayr Mine to Foundation Coal West (FCW), a directly held subsidiary of Foundation Coal Holdings, Inc. In this EIS, the applicant for the Belle Ayr North LBA tract will be referred to as FCW.

On February 10, 2006, Ark Land Company (ALC) filed an application with BLM to lease the federal coal reserves in a tract west of and immediately adjacent to the Coal Creek Mine in Campbell County, Wyoming, approximately 25 miles south-southeast of Gillette (figures ES-1 and ES-3). The tract, which is referred to as the West Coal Creek LBA tract, was assigned case number WYW172585. The federal coal reserves were applied for as a maintenance tract for the Coal Creek Mine. ALC is a wholly owned subsidiary of Arch Coal, Inc. Thunder Basin Coal Company (TBCC), a subsidiary of Arch Western Resources, LLC, operates the Coal Creek Mine. In this EIS, ALC is referred to as the applicant, and TBCC is referred to in discussions of mine operations.

On March 15, 2006, Caballo Coal Company (CCC) filed an application with BLM to lease the federal coal included in a tract located west of and immediately adjacent to the Caballo Mine in Campbell County, Wyoming, approximately 8 miles south-southeast of Gillette (figures ES-1 and ES-4). The tract, which is referred to as the Caballo West LBA tract, was assigned case number WYW172657. The federal coal reserves were applied for as a maintenance tract for the Caballo Mine. CCC is a directly held subsidiary of Peabody Holding Company, Inc., which in turn is a directly held subsidiary of Peabody Energy Corporation.

[1] Refer to page xxiii for a list of abbreviations and acronyms used in this document.

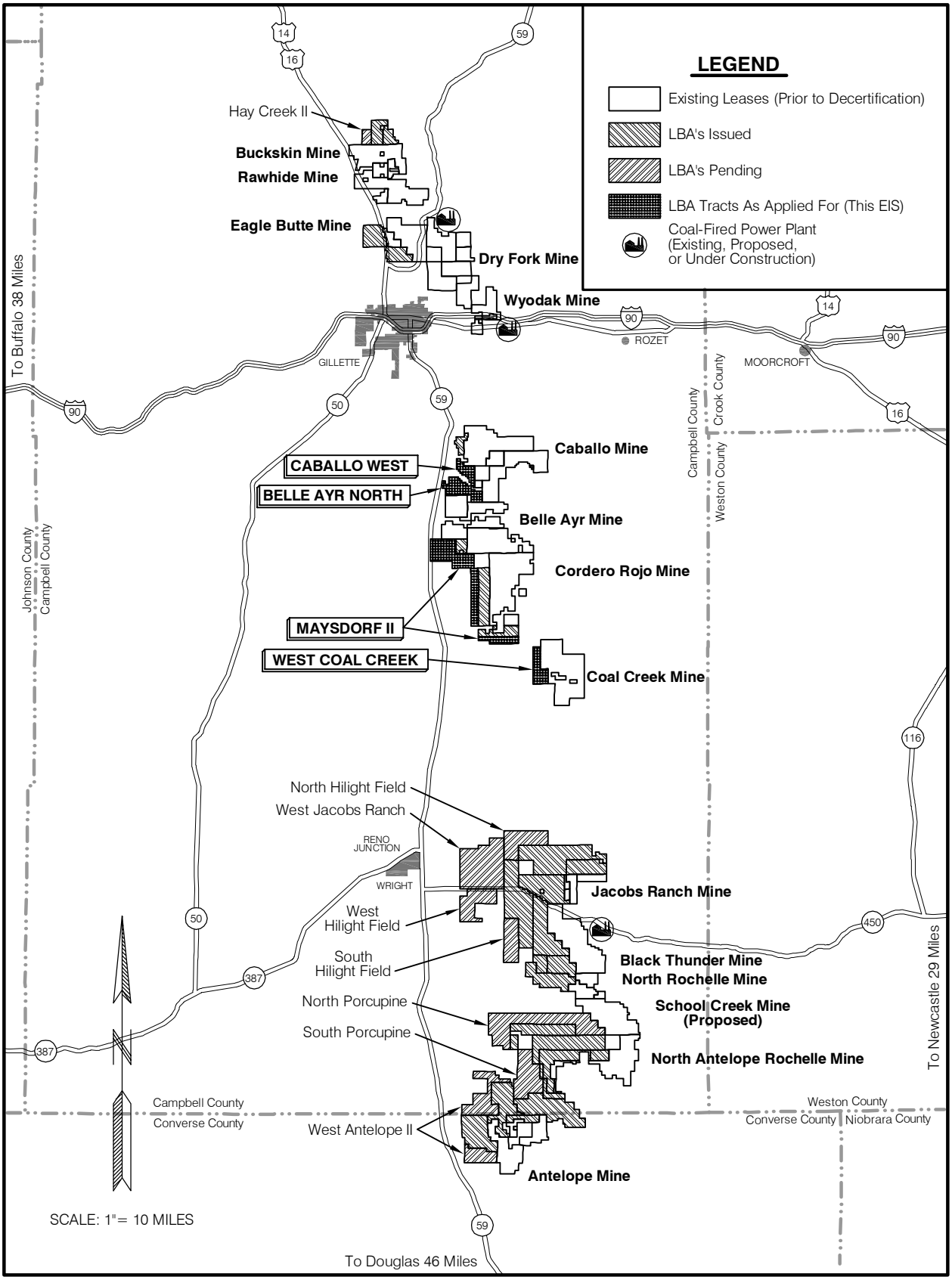

Figure ES-1. General Location Map with Federal Coal Leases and LBA Tracts.

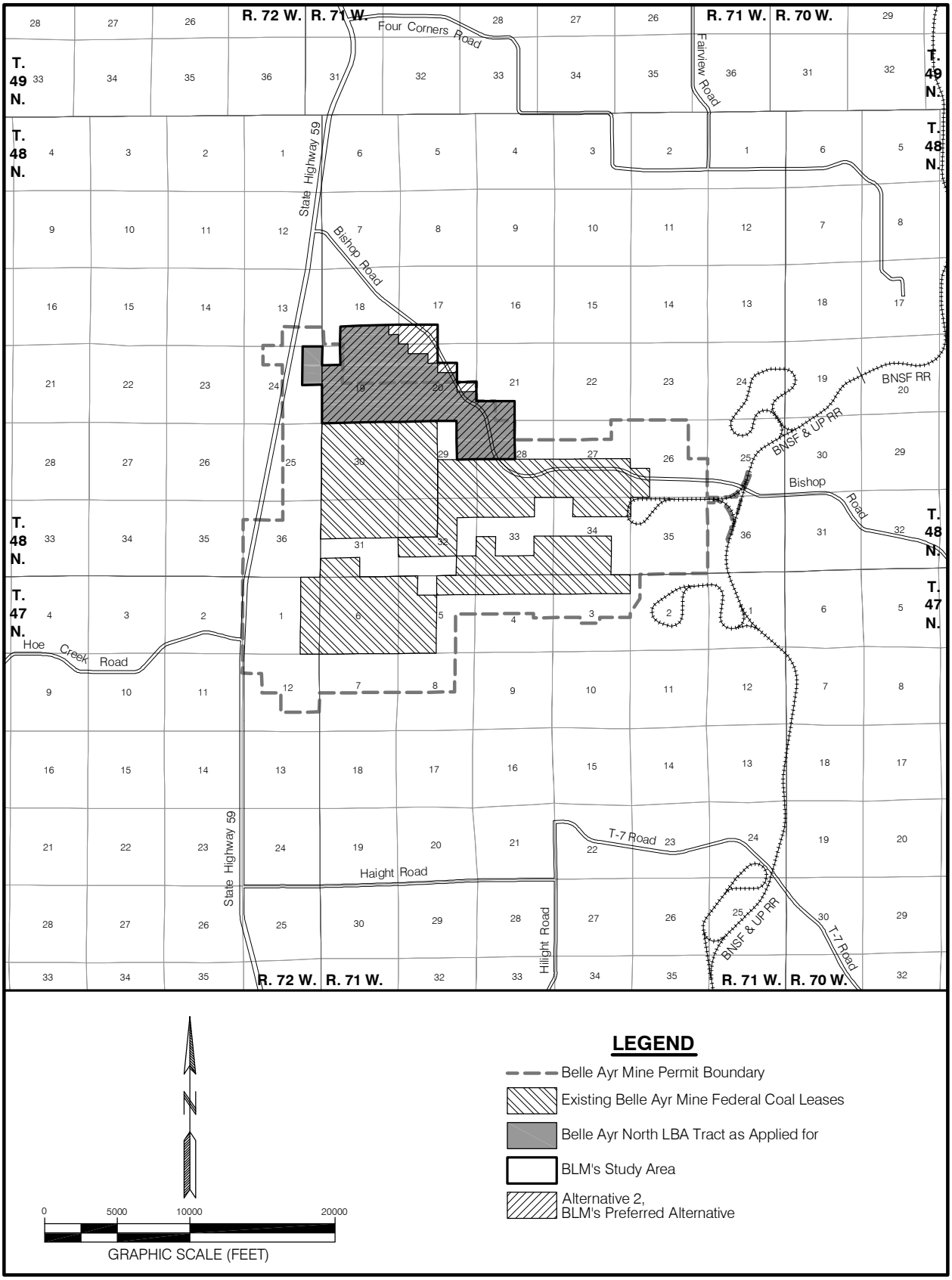

Figure ES-2. Belle Ayr North LBA Tract Alternatives.

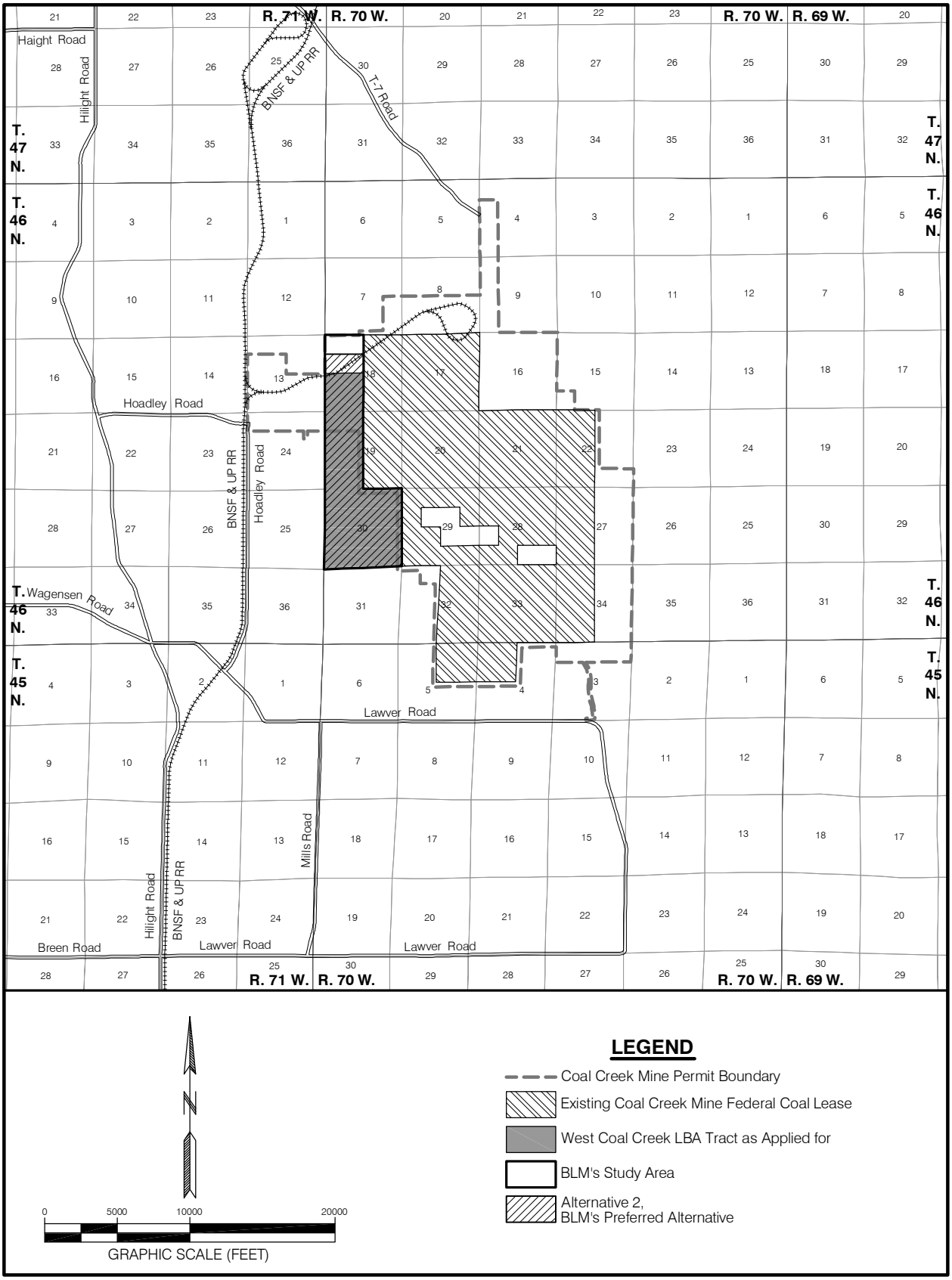

Figure ES-3. West Coal Creek LBA Tract Alternatives.

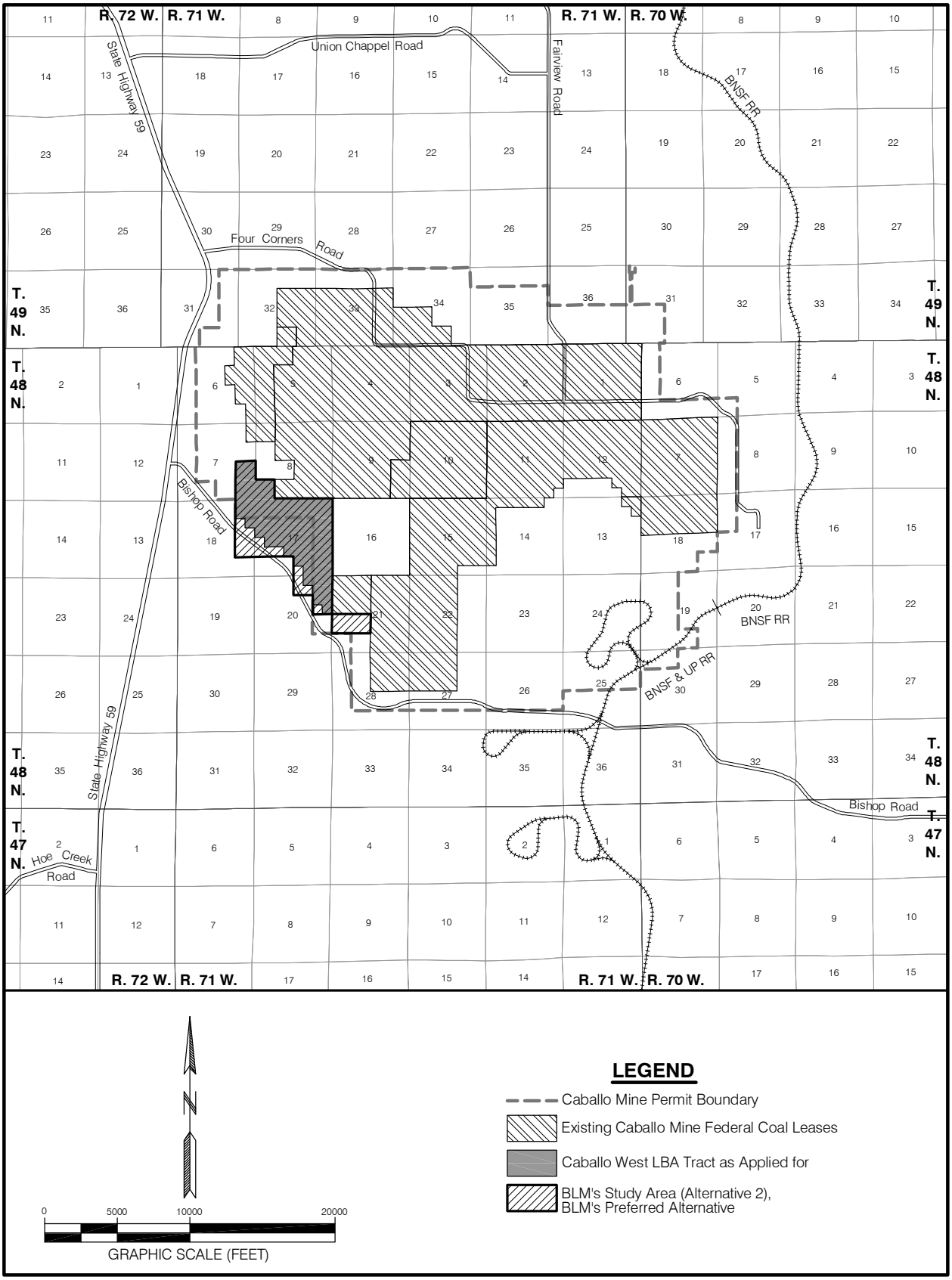

Figure ES-4. Caballo West LBA Tract Alternatives.

On September 1, 2006, Cordero Mining Company (CMC) filed an application with BLM to lease the federal coal included in a tract west and south of and immediately adjacent to the Cordero Rojo Mine in Campbell County, Wyoming, approximately 15 miles south-southeast of Gillette (figures ES-1 and ES-5). The tract, which is referred to as the Maysdorf II LBA tract, was assigned case number WYW173360. The federal coal reserves were applied for as a maintenance tract for the Cordero Rojo Mine, which is operated by CMC, a directly held subsidiary of Rio Tinto Energy America (formerly Kennecott Energy and Coal Company).

These lease applications were reviewed by BLM, Wyoming State Office, Division of Mineral and Lands Authorization, who determined that the applications and the lands involved met the requirements of the regulations governing coal leasing on application at 43 CFR 3425.1. The Powder River Regional Coal Team (PRRCT) reviewed the Belle Ayr North LBA tract at a public meeting held on April 24, 2005, in Gillette, Wyoming; the West Coal Creek and Caballo West LBA tracts were reviewed at a public meeting held on April 19, 2006, in Casper, Wyoming; and the Maysdorf II LBA tract was reviewed at a public meeting held on January 18, 2007, in Casper, Wyoming. The PRRCT recommended that BLM continue to process the Belle Ayr North, the West Coal Creek, the Caballo West, and the Maysdorf II coal lease applications at these respective meetings.

EVALUATION PROCESS

In order to process an LBA, BLM must evaluate the quantity, quality, maximum economic recovery, and fair market value of the federal coal and fulfill the requirements of the NEPA by evaluating the environmental consequences of leasing the federal coal.

To evaluate the environmental impacts of leasing the coal, BLM must prepare an environmental assessment (EA) or an EIS to evaluate the site-specific and cumulative environmental and socioeconomic impacts of leasing and developing the federal coal in an application area. Due to the proximity of the Belle Ayr North, West Coal Creek, Caballo West, and Maysdorf II LBA tracts, BLM made a decision to prepare a single EIS to evaluate the environmental impacts of coal mining that would result from the issuance of these four leases. BLM does not authorize mining by issuing a lease for federal coal, but the impacts of mining the coal are considered in this EIS because it is a logical consequence of issuing a maintenance lease to an existing mine.

The Environmental Protection Agency (EPA) published a notice announcing the availability of the draft EIS in the *Federal Register* on October 24, 2008. BLM published a Notice of Availability/Notice of Public Hearing in the *Federal Register* on October 17, 2008. The 60-day comment period on the draft EIS ended on December 24, 2008. A public hearing was held on November 19, in Gillette, Wyoming. One individual presented statements on the draft EIS during the hearing and written comments were received from 18 individuals, agencies, or organizations during the comment period. A summary of the statements

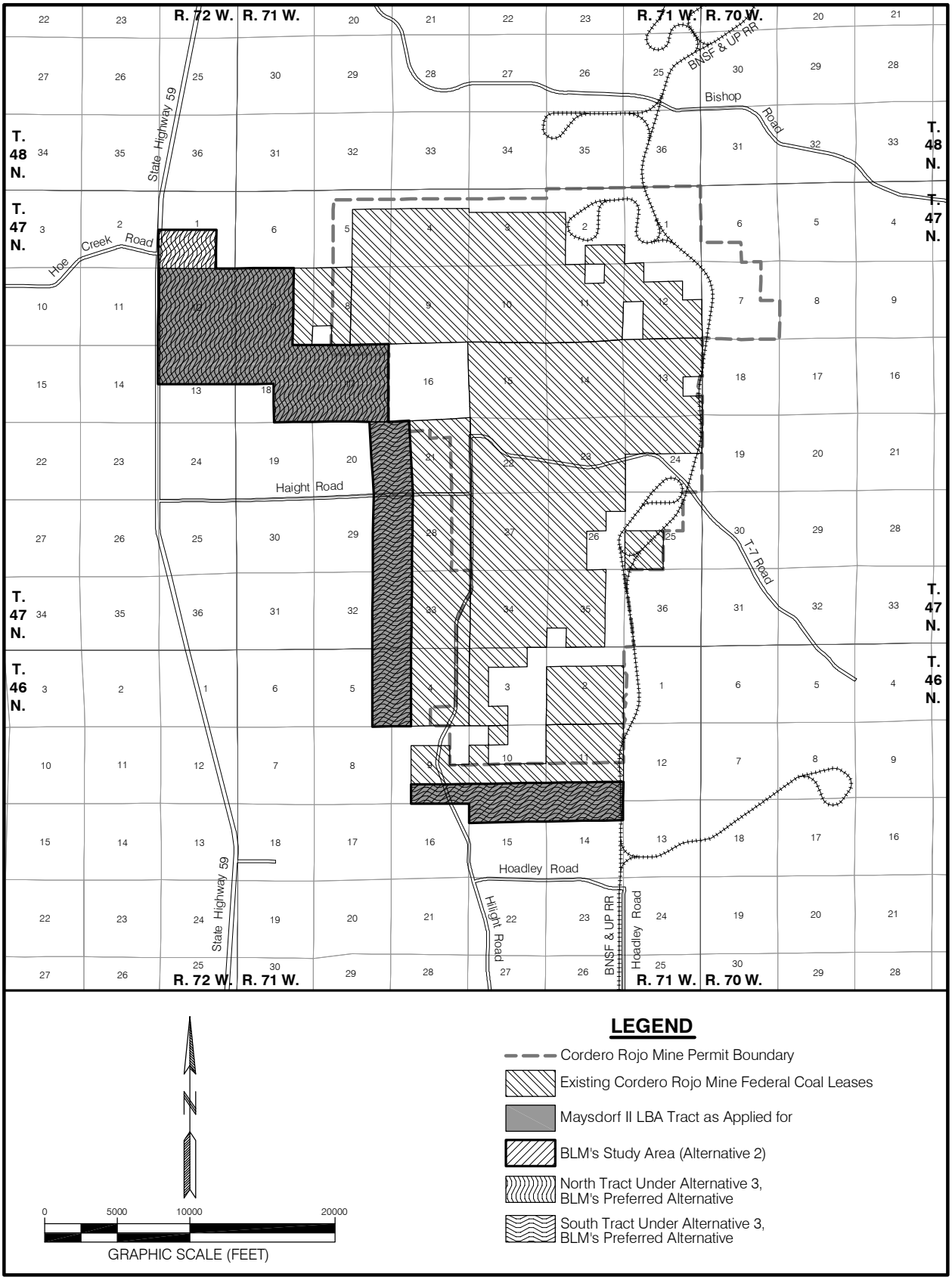

Figure ES-5. Maysdorf II LBA Tract Alternatives.

that were presented at the formal public hearing and the written comments, with agency responses, are included as appendix I of this FEIS.

BLM will use the analysis in this EIS to decide whether or not to hold a coal lease sale for each of the federal coal tracts and issue federal coal leases. The LBA sale process is, by law and regulation, an open, public, competitive sealed-bid process. Bidding at a lease sale would be open to any qualified bidder. If a lease sale is held for the Belle Ayr North, West Coal Creek, Caballo West, and the Maysdorf II LBA tracts, the applicants (FCW, ALC, CCC, and CMC, respectively) may not be the successful high bidders. If a lease sale is held, a federal sale panel selects the highest bidder at the sale. In order to be awarded a federal coal lease, the highest bid must meet or exceed the fair market value of the coal. The fair market value is determined by an economic evaluation done by the BLM. Additionally, the high bidder cannot have any antitrust violations. These are determined by the U.S. Department of Justice.

Cooperating agencies in the preparation of this EIS include Office of Surface Mining Reclamation and Enforcement (OSM), the Wyoming Department of Environmental Quality (WDEQ), and the Wyoming Department of Transportation (WYDOT)). Other agencies, including OSM, will also use this analysis to make decisions related to leasing and mining the federal coal in this tract.

A decision to lease the federal coal lands in this application would be in conformance with the BLM resource management plan for the Buffalo and Casper field offices. The Belle Ayr North, West Coal Creek, Caballo West, and the Maysdorf II LBA tracts are contiguous with the applicant mines (FCW, ALC, CCC, and CMC, respectively). The analysis in this EIS assumes that FCW would be the successful bidder on the Belle Ayr North LBA tract; ALC would be the successful bidder on the West Coal Creek LBA tract; CCC would be the successful bidder on the Caballo West LBA tract; and, CMC would be the successful bidder on the Maysdorf II LBA tract. The analysis also assumes that the sales would be held, and that each lease would be mined as maintenance tracts for the respective applicant mines.

Not all of the coal included in the Belle Ayr North LBA tract as applied for is considered mineable at this time. Bishop Road, a county road, overlies some of the coal included in the tract. The Surface Mining Control and Reclamation Act of 1977 (SMCRA) prohibits mining within 100 feet on either side of the right-of-way of any public road. However, the appropriate public road authority can allow 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)]. The coal underlying the portions of Bishop Road, its right-of-way, and the 100-foot buffer zone within the Belle Ayr North LBA tract is included for consideration for leasing because that coal could be mined if the Campbell County Board of Commissioners, the authorized agency, determines that the road can be moved [43 CFR 3461.5(c)(2)(iii)]. If the road is not moved, including the coal

underlying the road in the lease would allow maximum recovery of all the mineable coal adjacent to the 100-foot buffer zone on either side of the road right-of-way.

Not all of the coal included in the Maysdorf II LBA tract as applied for is considered by CMC to be mineable at this time. Coal included in the tract is located within the BNSF & UP railroad right-of-way (ROW). CMC does not consider the coal underlying the ROW to be recoverable at this time because the cost that would be associated with moving the railroad would make it economically unfeasible to recover the underlying coal.

A portion of Wyoming 59 and portions of the Haight Road (Campbell County Road 44) and the Hilight Road (Campbell County Road 52) overlie portions of the coal included in the Maysdorf II LBA tract. SMCRA prohibits mining within 100 feet on either side of the ROW of any public road. However, the appropriate public road authority can allow 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)]. The coal underlying the portion of Wyoming 59, Hilight Road, and Haight Road, their rights-of-way, and the 100-foot buffer zones within the Maysdorf II LBA tract are included for consideration for leasing. That coal could be mined if WYDOT or the Campbell County Board of Commissioners (authorized agencies), determine that the roads can be moved [43 CFR 3461.5(c)(2)(iii)]. Including the coal underlying the highway and Haight and Hilight roads in the lease would allow maximum recovery of all the mineable coal adjacent to the 100-foot buffer zones on either side of the highway and road ROWs if the highway and Haight and Hilight roads are not moved. CMC is evaluating the feasibility of relocating the county roads.

The Maysdorf Point Cemetery was a small rural cemetery owned by the Campbell County Cemetery District that overlaid some of the coal included in the Maysdorf II LBA tract. Cemetery remains were relocated during the summer of 2008 to the Mt. Pisgah Cemetery in Gillette, Wyoming. Mitigation is complete, and Cordero Mining Company is the surface owner.

ALTERNATIVES, INCLUDING THE PROPOSED ACTION

The proposed actions and alternatives to those actions are analyzed in detail in this FEIS.

- **Proposed Action** - The Proposed Action for each LBA tract is to hold a competitive coal lease sale and issue a maintenance lease to the successful bidder for the Belle Ayr North, the West Coal Creek, the Caballo West, and the Maysdorf II LBA tracts as applied for (figures ES-2, ES-3, ES-4, and ES-5, respectively). The proposed actions are described in tables ES-1 through ES-7.

Table ES-1. Summary Comparison of Coal Production, Surface Disturbance, Mine Life, and Revenues for Belle Ayr North LBA tract and Belle Ayr Mine if the Bishop Road (Campbell County Road 12) is Moved and the Underlying Coal is Recovered.

Item	No Action Alternative (Existing Belle Ayr Mine)	Added by Proposed Action	Added by Alternative 2 (Preferred Alternative)
In-Place Coal (as of 6/30/08)	250.9 mmt	208.1 mmt	221.1 mmt
Mineable Coal (as of 6/30/08)	250.9 mmt	204.2 mmt	217.6 mmt
Recoverable Coal (as of 6/30/08)[1]	235.8 mmt	191.9 mmt	204.6 mmt
Coal Mined (as of 6/30/08)	544.5 mmt	—	—
Lease Area[2]	4,945.5 ac	1,578.7 ac	1,671.0 ac
Total Area To Be Disturbed[2]	11,621 ac	1,936.6 ac	1,947.0 ac
Permit Area[2]	11,935 ac	1,727 ac	1,818 ac
Current Air Quality Permitted Production	45.0 mmt	0 mmt	0 mmt
Average Annual Post-2007 Coal Production	30.0 mmt	0 mmt	0 mmt
Remaining Life of Mine (post-2007)	8.3 yrs	6.4 yr	6.8 yr
Average Number of Employees	358	8	8
Total Projected State Revenues (post-2007)[3]	$382.9 million	$342.2 – $410.7 million	$364.9 - $437.8 million
Total Projected Federal Revenues (post-2007)[4]	$283.6 million	$261.5 – $329.9 million	$278.7 - $351.6 million

1 Assumes 94 percent recovery of mineable coal.

2 The lease area includes federal coal leases only and does not include state and private coal within the permit boundary. The disturbed area exceeds the leased area (total federal, state and private) 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.

3 Revenues to the state of Wyoming include severance taxes, property and production (ad valorum) taxes, sales and use taxes, and Wyoming's share of federal royalty payments, AML fees, and bonus bids. 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 valorum taxes × amount of recoverable coal, plus $0.0569 per ton estimate for sales and use taxes × amount of recoverable coal, plus $9.98 per ton (projected for 8,400-Btu coal) price × 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 payment on LBA leased coal of $0.30 to $0.97 per ton (based on the range of bonus payments made for the last 9 LBAs sold in 2004, 2005, 2008, and 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.

4 Federal revenues include black lung taxes and the federal government's share of federal royalty payments, AML fees, and bonus bids. Federal revenues are based on $9.98 per ton (projected for 8,400-Btu coal) price × amount of recoverable coal × black lung tax of 4.40 percent, plus $9.98 per ton (for 8,400-Btu coal) 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 payment on LBA leased coal of $0.30 to $0.97 per ton (based on the range of bonus payments made for the last 9 LBAs sold in 2004, 2005, 2008, and 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 the federal government.

Table ES-2. Summary Comparison of Coal Production, Surface Disturbance, Mine Life, and Revenues for Belle Ayr North LBA tract and Belle Ayr Mine if the Bishop Road (Campbell County Road 12) is Not Moved and the Underlying Coal is Not Recovered.

Item	No Action Alternative (Existing Belle Ayr Mine)	Added by Proposed Action	Added by Alternative 2 (Preferred Alternative)
In-Place Coal (as of 6/30/08)	250.9 mmt	208.1 mmt	221.1 mmt
Mineable Coal (as of 6/30/08)	250.9 mmt	164.7 mmt	159.6 mmt
Recoverable Coal (as of 6/30/08)[1]	235.8 mmt	154.8 mmt	150.1 mmt
Coal Mined (as of 6/30/08)	544.5 mmt	—	—
Lease Area[2]	4,945.5 ac	1,578.7 ac	1,671.0 ac
Total Area To Be Disturbed[2]	11,621 ac	1,274.9 ac	1,658.4 ac
Permit Area[2]	11,935 ac	1,727 ac	1,818 ac
Current Air Quality Permitted Production	45.0 mmt	0 mmt	0 mmt
Average Annual Post-2007 Coal Production	30.0 mmt	0 mmt	0 mmt
Remaining Life of Mine (post-2007)	8.3 yrs	5.2 yr	5.0 yr
Average Number of Employees	358	8	8
Total Projected State Revenues (post-2007)[3]	$382.9 million	$276.1 – $331.3 million	$267.7 - $321.1 million
Total Projected Federal Revenues (post-2007)[4]	$283.6 million	$210.9 – $266.1 million	$204.5 - $258.0 million

1 Assumes 94 percent recovery of mineable coal. This table excludes all coal that would not be mined beneath the Bishop County Road right-of-way.

2 The lease area includes federal coal leases only and does not include state and private coal within the permit boundary. The disturbed area exceeds the leased area (total federal, state and private) 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.

3 Revenues to the state of Wyoming include severance taxes, property and production (ad valorum) taxes, sales and use taxes, and Wyoming's share of federal royalty payments, AML fees, and bonus bids. 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 valorum taxes × amount of recoverable coal, plus $0.0569 per ton estimate for sales and use taxes × amount of recoverable coal, plus $9.98 per ton (projected for 8,400-Btu coal) price × 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 payment on LBA leased coal of $0.30 to $0.97 per ton (based on the range of bonus payments made for the last 9 LBAs sold in 2004, 2005, 2008, and 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.

4 Federal revenues include black lung taxes and the federal government's share of federal royalty payments, AML fees, and bonus bids. Federal revenues are based on $9.98 per ton (projected for 8,400-Btu coal) price × amount of recoverable coal × black lung tax of 4.40 percent, plus $9.98 per ton (for 8,400-Btu coal) 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 payment on LBA leased coal of $0.30 to $0.97 per ton (based on the range of bonus payments made for the last 9 LBAs sold in 2004, 2005, 2008, and 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 the federal government.

Table ES-3. Summary Comparison of Coal Production, Surface Disturbance, Mine Life, and Revenues for West Coal Creek LBA tract and Coal Creek Mine.

Item	No Action Alternative (Existing Coal Creek Mine)	Added by Proposed Action	Added by Alternative 2 (Preferred Alternative)
In-Place Coal (as of 6/30/08)	241.7 mmt	63.3 mmt	69.3 mmt
Mineable Coal (as of 6/30/08)	241.7 mmt	63.3 mmt	63.3 mmt
Recoverable Coal (as of 6/30/08)[1]	217.5 mmt	57.0 mmt	57.0 mmt
Coal Mined (as of 6/30/08)	68.9 mmt	—	—
Lease Area[2]	5,918.0 ac	1,151.3 ac	1,232.2 ac
Total Area To Be Disturbed[2]	8,354.9 ac	1,925.4 ac	2,210.1 ac
Permit Area[2]	9,722.7 ac	3,162 ac	3,162 ac
Current Air Quality Permitted Production	25.0 mmt	0 mmt	0 mmt
Average Annual Post-2007 Coal Production	13.4 mmt	0 mmt	0 mmt
Remaining Life of Mine (post-2007)	16.2 yrs	4.3 yr	4.3 yr
Average Number of Employees	125	0	0
Total Projected State Revenues (post-2007)[3]	$353.2 million	$102.1 – $123.3 million	$102.1 - $123.3 million
Total Projected Federal Revenues (post-2007)[4]	$261.6 million	$78.1 - $99.3 million	$78.1 - $99.3 million

1 Assumes 90 percent recovery of mineable coal.

2 The lease area includes federal coal leases only and does not include state and private coal within the permit boundary. The disturbed area exceeds the leased area (total federal, state and private) 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.

3 Revenues to the state of Wyoming include severance taxes, property and production (ad valorum) taxes, sales and use taxes, and Wyoming's share of federal royalty payments, AML fees, and bonus bids. 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 valorum taxes × amount of recoverable coal, plus $0.0569 per ton estimate for sales and use taxes × amount of recoverable coal, plus $9.98 per ton (projected for 8,400-Btu coal) price × 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 payment on LBA leased coal of $0.30 to $0.97 per ton (based on the range of bonus payments made for the last 9 LBAs sold in 2004, 2005, 2008, and 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 of mineral royalties to states.

4 Federal revenues include black lung taxes and the federal government's share of federal royalty payments, AML fees, and bonus bids. Federal revenues are based on $9.98 per ton (projected for 8,400-Btu coal) price × amount of recoverable coal × black lung tax of 4.40 percent, plus $9.98 per ton (for 8,400-Btu coal) 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 payment on LBA leased coal of $0.30 to $0.97 per ton (based on the range of bonus payments made for the last 9 LBAs sold in 2004, 2005, 2008, and 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 of mineral royalties to the federal government.

Table ES-4. Summary Comparison of Coal Production, Surface Disturbance, Mine Life, and Revenues for Caballo West LBA tract and Caballo Mine if the Bishop Road (Campbell County Road 12) is Moved and the Underlying Coal is Recovered.

Item	No Action Alternative (Existing Caballo Mine)	Added by Proposed Action	Added by Alternative 2 (Preferred Alternative)
In-Place Coal (as of 6/30/08)	893.7 mmt	98.2 mmt	131.4 mmt
Mineable Coal (as of 6/30/08)	687.8 mmt	87.5 mmt	105.5 mmt
Recoverable Coal (as of 6/30/08)[1]	584.8 mmt	81.8 mmt	98.6 mmt
Coal Mined (as of 6/30/08)	510.4 mmt	—	—
Lease Area[2]	11,704.5 ac	777.5 ac	1,024.0 ac
Total Area To Be Disturbed[2]	16,898.0 ac	1,349.9 ac	1,390.4 ac
Permit Area[2]	19,974.7 ac	1,294.1 ac	1,518.4 ac
Current Air Quality Permitted Production	50.0 mmt	0 mmt	0 mmt
Average Annual Post-2007 Coal Production	37.8 mmt	0 mmt	0 mmt
Remaining Life of Mine (post-2007)	15.4 yrs	2.2 yr	2.6 yr
Average Number of Employees	549	0	0
Total Projected State Revenues (post-2007)[3]	$949.6 million	$146.0 – $175.3 million	$175.9 - $211.3 million
Total Projected Federal Revenues (post-2007)[4]	$703.4 million	$111.5 - $140.8 million	$134.4 - $169.8 million

1 Assumes 93.5 percent recovery of mineable coal.

2 The lease area includes federal coal leases only and does not include state and private coal within the permit boundary. The disturbed area exceeds the leased area (total federal, state and private) 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.

3 Revenues to the state of Wyoming include severance taxes, property and production (ad valorum) taxes, sales and use taxes, and Wyoming's share of federal royalty payments, AML fees, and bonus bids. 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 valorum taxes × amount of recoverable coal, plus $0.0569 per ton estimate for sales and use taxes × amount of recoverable coal, plus $9.98 per ton (projected for 8,400-Btu coal) price × amount of recoverable coal × federal royalty of 12.5 percent minus federal's 50 percent share, plus $0.28per ton for AML fees × amount of recoverable coal minus federal's 50 percent share, plus bonus payment on LBA leased coal of $0.30 to $0.97 per ton (based on the range of bonus payments made for the last 9 LBAs sold in 2004, 2005, 2008, and 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 of mineral royalties to states.

4 Federal revenues include black lung taxes and the federal government's share of federal royalty payments, AML fees, and bonus bids. Federal revenues are based on $9.98 per ton (projected for 8,400-Btu coal) price × amount of recoverable coal × black lung tax of 4.40 percent, plus $9.98 per ton (for 8,400-Btu coal) 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 payment on LBA leased coal of $0.30 to $0.97 per ton (based on the range of bonus payments made for the last 9 LBAs sold in 2004, 2005, 2008, and 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 of mineral royalties to the federal government.

Table ES-5. Summary Comparison of Coal Production, Surface Disturbance, Mine Life, and Revenues for Caballo West LBA tract and Caballo Mine if the Bishop Road (Campbell County Road 12) is Not Moved and the Underlying Coal is Not Recovered.

Item	No Action Alternative (Existing Caballo Mine)	Added by Proposed Action	Added by Alternative 2 (Preferred Alternative)
In-Place Coal (as of 6/30/08)	893.7 mmt	98.2 mmt	131.4 mmt
Mineable Coal (as of 6/30/08)	687.8 mmt	87.5 mmt	98.1 mmt
Recoverable Coal (as of 6/30/08)[1]	584.8 mmt	81.8 mmt	91.7 mmt
Coal Mined (as of 6/30/08)	510.4 mmt	—	—
Lease Area[2]	11,704.5 ac	777.5 ac	1,024.0 ac
Total Area To Be Disturbed[2]	16,898.0 ac	1,213.0 ac	1,253.6 ac
Permit Area[2]	19,974.7 ac	1,294.1 ac	1,518.4 ac
Current Air Quality Permitted Production	50.0 mmt	0 mmt	0 mmt
Average Annual Post-2007 Coal Production	37.8 mmt	0 mmt	0 mmt
Remaining Life of Mine (post-2007)	15.4 yrs	2.2 yr	2.4 yr
Average Number of Employees	549	0	0
Total Projected State Revenues (post-2007)[3]	$949.6 million	$146.0 – $175.3 million	$163.6 - $196.5 million
Total Projected Federal Revenues (post-2007)[4]	$703.4 million	$111.5 - $140.8 million	$125.0 - $157.9 million

1 Assumes 93.5 percent recovery of mineable coal. This table excludes all coal that would not be mined beneath the Bishop County Road right-of-way.

2 The lease area includes federal coal leases only and does not include state and private coal within the permit boundary. The disturbed area exceeds the leased area (total federal, state and private) 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.

3 Revenues to the state of Wyoming include severance taxes, property and production (ad valorum) taxes, sales and use taxes, and Wyoming's share of federal royalty payments, AML fees, and bonus bids. 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 valorum taxes × amount of recoverable coal, plus $0.0569 per ton estimate for sales and use taxes × amount of recoverable coal, plus $9.98 per ton (projected for 8,400-Btu coal) price × 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 payment on LBA leased coal of $0.30 to $0.97 per ton (based on the range of bonus payments made for the last 9 LBAs sold in 2004, 2005, 2008, and 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 of mineral royalties to states.

4 Federal revenues include black lung taxes and the federal government's share of federal royalty payments, AML fees, and bonus bids. Federal revenues are based on $9.98 per ton (projected for 8,400-Btu coal) price × amount of recoverable coal × black lung tax of 4.40 percent, plus $9.98 per ton (for 8,400-Btu coal) 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 payment on LBA leased coal of $0.30 to $0.97 per ton (based on the range of bonus payments made for the last 9 LBAs sold in 2004, 2005, 2008, and 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 of mineral royalties to the federal government.

Table ES-6. Summary Comparison of Coal Production, Surface Disturbance, Mine Life, and Revenues for Maysdorf II LBA tract, Assuming Wyoming Highway 59 and the BNSF & UP Railroad are Not Moved and the Underlying Coal is Not Recovered and if the Haight and Hilight Roads are Moved and the Underlying Coal is Recovered.

Item	**No Action Alternative (Existing Cordero Rojo Mine)**	**Added by Proposed Action**	**Added by Alternative 2**	**Added by Alternative 3 (Preferred Alternative)**	
				(North Tract)	**(South Tract)**
In-Place Coal (as of 6/30/08)	572.9 mmt	504.2 mmt	533.2 mmt	326.4 mmt	206.8 mmt
Mineable Coal (as of 6/30/08)	571.5 mmt	499.7 mmt	527.5 mmt	322.5 mmt	205.0 mmt
Recoverable Coal (as of 6/30/08)[1]	525.9 mmt	449.8 mmt	474.7 mmt	290.2 mmt	184.5 mmt
Coal Mined (as of 6/30/08)	769.3 mmt	—	—	—	—
Lease Area[2]	13,529.31 ac	4,653.8 ac	4,895.6 ac	2,825.4 ac	2,070.3 ac
Total Area To Be Disturbed[2]	14,694.0 ac	6,675.0 ac	6,917.3 ac	3,429.6 ac	3,487.7 ac
Permit Area[2]	16,910.6 ac	16,832.4 ac	16,832.4 ac	6,850.3 ac	10,683.4 ac
Current Air Quality Permitted Production	65.0 mmt	0 mmt	0 mmt	0 mmt	0 mmt
Average Annual Post-2007 Coal Production	46.3 mmt	0 mmt	0 mmt	0 mmt	0 mmt
Remaining Life of Mine (post-2007)	11.4 yrs	9.7 yr	10.3 yr	6.3 yr	4.0 yr
Average Number of Employees	510	60	63	8	2
Total Projected State Revenues (post-2007)[3]	$854.0 million	$805.4 – $972.7 million	$850.1 - $1026.9 million	$519.6 - $627.7 million	$330.4 – $399.0 million
Total Projected Federal Revenues (post-2007)[4]	$632.6 million	$616.0 - $783.4 million	$650.2 - $827.0 million	$397.4 - $505.5 million	$252.7 - $321.3 million

[1] Assumes 90 percent recovery of mineable coal. This table excludes all coal that would not be mined beneath the Wyoming Highway 59 right-of-way and the BNSF & UP railroad right-of-way.

[2] The lease area includes federal coal leases only and does not include state and private coal within the permit boundary. The disturbed area exceeds the leased area (total federal, state and private) 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.

[3] Revenues to the state of Wyoming include severance taxes, property and production (ad valorum) taxes, sales and use taxes, and Wyoming's share of federal royalty payments, AML fees, and bonus bids. 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 valorum taxes × amount of recoverable coal, plus $0.0569 per ton estimate for sales and use taxes × amount of recoverable coal, plus $9.98 per ton (projected for 8,400-Btu coal) price × 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 payment on LBA leased coal of $0.30 to $0.97 per ton (based on the range of bonus payments made for the last 9 LBAs sold in 2004, 2005, 2008, and 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 of mineral royalties to states.

[4] Federal revenues include black lung taxes and the federal government's share of federal royalty payments, AML fees, and bonus bids. Federal revenues are based on $9.98 per ton (projected for 8,400-Btu coal) price × amount of recoverable coal × black lung tax of 4.40 percent, plus $9.98 per ton (for 8,400-Btu coal) 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 payment on LBA leased coal of $0.30 to $0.97 per ton (based on the range of bonus payments made for the last 9 LBAs sold in 2004, 2005, 2008, and 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 of mineral royalties to the federal government.

Table ES-7. Summary Comparison of Coal Production, Surface Disturbance, Mine Life, and Revenues for Maysdorf II LBA tract, Assuming Wyoming Highway 59, the Haight and Hilight Roads, and the BNSF & UP Railroad are Not Moved and the Underlying Coal is Not Recovered.

Item	No Action Alternative (Existing Cordero Rojo Mine)	Added by Proposed Action	Added by Alternative 2	Added by Alternative 3 (Preferred Alternative)	
				(North Tract)	(South Tract)
In-Place Coal (as of 6/30/08)	572.9 mmt	504.2 mmt	533.2 mmt	326.4 mmt	206.8 mmt
Mineable Coal (as of 6/30/08)	571.5 mmt	482.7 mmt	510.5 mmt	322.5 mmt	188.0 mmt
Recoverable Coal (as of 6/30/08)[1]	525.9 mmt	434.5 mmt	459.5 mmt	290.2 mmt	169.3 mmt
Coal Mined (as of 6/30/08)	769.3 mmt	—	—	—	—
Lease Area[2]	13,529.31 ac	4,653.8 ac	4,895.6 ac	2,825.4 ac	2,070.3 ac
Total Area To Be Disturbed[2]	14,694.0 ac	6,200.8 ac	6,422.5 ac	3,353.9 ac	3,068.6 ac
Permit Area[2]	16,910.6 ac	16,832.4 ac	16,832.4 ac	6,850.3 ac	10,683.4 ac
Current Air Quality Permitted Production	65.0 mmt	0 mmt	0 mmt	0 mmt	0 mmt
Average Annual Post-2007 Coal Production	46.3 mmt	0 mmt	0 mmt	0 mmt	0 mmt
Remaining Life of Mine (post-2007)	11.4 yrs	9.4 yr	9.9 yr	6.3 yr	3.7 yr
Average Number of Employees	510	60	63	8	2
Total Projected State Revenues (post-2007)[3]	$854.0 million	$778.0 – $939.7 million	$822.8 - $993.7 million	$519.6 - $627.7 million	$303.2 – $366.1 million
Total Projected Federal Revenues (post-2007)[4]	$632.6 million	$595.1 - $756.7 million	$629.3 - $800.3 million	$397.4 - $505.5 million	$231.9 - $294.8 million

1 Assumes 90 percent recovery of mineable coal. This table excludes all coal that would not be mined beneath the Wyoming Highway 59 right-of-way, BNSF & UP railroad right-of-way, and the Haight and Hilight Roads rights-of-way.

2 The lease area includes federal coal leases only and does not include state and private coal within the permit boundary. The disturbed area exceeds the leased area (total federal, state and private) 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.

3 Revenues to the state of Wyoming include severance taxes, property and production (ad valorum) taxes, sales and use taxes, and Wyoming's share of federal royalty payments, AML fees, and bonus bids. 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 valorum taxes × amount of recoverable coal, plus $0.0569 per ton estimate for sales and use taxes × amount of recoverable coal, plus $9.98 per ton (projected for 8,400-Btu coal) price × 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 payment on LBA leased coal of $0.30 to $0.97 per ton (based on the range of bonus payments made for the last 9 LBAs sold in 2004, 2005, 2008, and 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 of mineral royalties to states.

4 Federal revenues include black lung taxes and the federal government's share of federal royalty payments, AML fees, and bonus bids. Federal revenues are based on $9.98 per ton (projected for 8,400-Btu coal) price × amount of recoverable coal × black lung tax of 4.40 percent, plus $9.98 per ton (for 8,400-Btu coal) 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 payment on LBA leased coal of $0.30 to $0.97 per ton (based on the range of bonus payments made for the last 9 LBAs sold in 2004, 2005, 2008, and 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 of mineral royalties to the federal government.

- **Alternative 1** - Under Alternative 1, the No Action alternative for each tract, the LBA tracts would not be leased, but the existing leases at the adjacent Belle Ayr, Coal Creek, Caballo, and Cordero Rojo mines would be developed according to the existing approved mining plans. The No Action alternatives are described in tables ES-1 through ES-7. Rejection of the lease applications would not preclude an application to lease the tracts in the future.

- **Alternative 2** - Under Alternative 2 for each tract, BLM would reconfigure the tract to include some or the entire LBA tract as applied for and may increase the size of the tract. BLM would hold a competitive lease sale and issue a maintenance lease for a tract that is larger than the applied-for tract. Alternative 2 is the Preferred Alternative for the Belle North, West Coal Creek, and Caballo West LBA tracts. Alternative 2 for each LBA tract is shown on figures ES-2 through ES-5 and described in tables ES-1 through ES-7.

- **Alternative 3** - Under Alternative 3 (for the Maysdorf II LBA tract only), BLM would divide the tract into two tracts and offer one or both of those tracts for sale. A separate, competitive sealed bid sale would be held for each tract that is offered for sale. Alternative 3 is the Preferred Alternative for the Maysdorf II LBA tract. Alternative 3 is shown on figures ES-4 and ES-5 and described in tables ES-6 and ES-7.

BLM identified a study area for each LBA tract in order to evaluate the potential that an alternate configuration of the tract would provide more efficient recovery of the federal coal, increase competitive interest in the 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 includes the tract as applied for plus adjacent unleased federal coal, which is depicted as the additional area evaluated under Alternatives 2 and 3 in figures ES-2 through ES-7.

One alternative that was considered but not analyzed in detail included holding competitive coal lease sales and issuing leases for one or more of the tracts to the successful bidder (not the applicants) for the purpose of developing new stand-alone mines. Another alternative called for delaying the sale of one or more of the tracts as applied for to increase the benefit to the public afforded by higher coal prices or to allow more complete recovery of the potential coal bed natural gas (CBNG) resources in the tracts prior to mining.

Tables ES-2, ES-5, and ES-7 summarize estimated coal production, surface disturbance, and mine life for the Belle Ayr, Caballo, and Cordero Rojo mines if the public highway/county roads are not moved. The environmental impacts of mining the LBA tracts would be similar under the Proposed Action and action alternatives. The following discussion assumes that the county roads are not moved.

ENVIRONMENTAL CONCERNS

Critical elements of the human environment that could be affected by the proposed project include air quality, cultural resources, Native American religious concerns, threatened and endangered (T&E) plant and animal species, migratory birds, hazardous or solid waste, water quality, wetlands/riparian zones, floodplains, environmental justice, and invasive nonnative species (BLM 1988). Four other critical elements (areas of critical environmental concern, prime and unique farmland, wild and scenic rivers, and wilderness) are not present in the project areas and are not addressed further. In addition to the critical elements that are potentially present in the project areas, the EIS discusses the status and potential effects of the project on topography and physiography, geology, mineral resources, soils, water availability and quality, alluvial valley floors (AVFs), vegetation, wildlife, land use and recreation, paleontological resources, visual resources, noise, transportation resources, and socioeconomics.

Topography

The general South Gillette analysis area (the general area around all four LBA tracts) is located in the PRB, a part of the Northern Great Plains that includes most of northeastern Wyoming. The Belle Ayr North, West Coal Creek, Caballo West, and Maysdorf II LBA tracts are located in the eastern part of the PRB, in an area consisting primarily of a dissected rolling upland plain with low relief, broken by low red-capped buttes, mesas, hills, and ridges. Playas are common in the basin, as are buttes and plateaus capped by clinker or sandstone. Elevations in the general South Gillette analysis area range from about 4,515 feet to 4,885 feet above sea level and slopes range from flat to around 57 percent. In the individual tracts, the average slopes range from 4 to 5 percent.

The existing topography on each LBA tract that is leased would be substantially changed during mining. A highwall with a vertical height equal to overburden plus coal thickness would exist in the active pits. Following reclamation, the average surface elevation would be lower due to removal of the coal. The reclaimed land surface would approximate premining contours, and the basic drainage network would be retained; however, the reclaimed surface would typically contain fewer and gentler topographic features. This could contribute to reduced habitat diversity and wildlife carrying capacity on the LBA tracts. These topographic changes would not conflict with regional land use, and the postmining topography would adequately support anticipated postmining land use for each tract.

Geology and Coal Resources

The mineable coal seams in the PRB are part of the Tongue River Member of the Fort Union. These are referred to as the Anderson and Canyon, Wyodak-Anderson, and Wyodak coal beds by mines in the eastern PRB. There is one mineable coal zone within the general South Gillette analysis area. Locally,

this coal zone is referred to as either the Wyodak or the Wyodak-Anderson. The average thickness of the Wyodak coal seam ranges between 36 feet within the West Coal Creek LBA tract to 74 feet within the Caballo West LBA. Up to five noncoal splits or partings occur within the seam, but they are typically local, discontinuous lenses of carbonaceous clay or shale that are less than 1 foot thick.

The geology from the base of the coal to the land surface would be subject to considerable permanent change on each LBA tract under all alternatives. The coal would be permanently removed. The replaced overburden would be a relatively homogeneous mixture compared to the premining layered overburden.

Other Minerals

Development of other minerals potentially present on the tracts could not occur during mining but could occur after mining. According to the January 2008 reserve estimate of conventional oil and gas resources that was prepared by Allen & Crouch Petroleum Engineers, Inc. of Casper, Wyoming, there are currently 18 wells capable of producing oil or conventional gas located on the four LBA tract study areas. Of the 18 wells, 13 are considered to have recoverable reserves, using in-place oil and gas recovery methods. Estimated remaining recoverable reserves from these 13 wells are just over 273,700 barrels of oil and 12 million cubic feet (mmcf) of gas. Any oil and conventional wells on the tracts would have to be plugged and abandoned during mining but could be recompleted after mining if the remaining reserves justify the expense of the recompletion.

Wyoming Oil and Gas Conservation Commission (WOGCC) records show that as of December 13, 2007, 445 wells had been drilled for CBNG production in the 57-section area encompassing or immediately adjacent to the general South Gillette analysis area and 288 were capable of producing (WOGCC 2007). There are 153 CBNG wells within the four LBA tracts. CBNG is also being produced locally from other deeper seams in the PRB. Fifteen wells have been completed in the deeper Pawnee coal seam on and west of the Maysdorf II LBA tract. All of these Pawnee wells are either shut in or are producing water (WOGCC 2007). CBNG resources that are not recovered prior to mining would be vented to the atmosphere and irretrievably lost when the coal is removed. BLM's policy is to optimize recovery of both resources, ensure the public receives a reasonable return, and encourage agreements between lessees or use BLM authority to minimize loss of publicly owned resources.

Paleontology Resources

Significant or unique paleontological resources have not been reported by the SGAC mines, although additional surveys for paleontological resources may be required.

Air Quality

Surface coal mining activities generate fugitive dust and particulate and gaseous tailpipe emissions from large mining equipment. Specifically, activities such as blasting, excavating, loading and hauling of overburden and coal, and wind erosion of disturbed and unreclaimed mining areas produce fugitive dust. Coal crushing, storage, and handling facilities are the most common stationary or point sources associated with surface coal mining and preparation. Particulate matter is the pollutant emitted from coal mine point sources. Since 1989, the regulated particulate pollutant in Wyoming has been PM_{10} (particulate matter with an aerodynamic diameter of 10 microns or less). Wyoming also adopted a fine particulate, $PM_{2.5}$ (particulate matter with a mean aerodynamic diameter of 2.5 microns or less), standard in March 2000. EPA has revoked the annual PM_{10} standard of 50 $\mu g/m^3$ but retained the 24-hour PM_{10} standard of 150 $\mu g/m^3$. Until the state of Wyoming enters into rulemaking to revise the WAAQS, the annual PM_{10} standard of 50 $\mu g/m^3$ is still effective.

Blasting is also responsible for another type of emission from surface coal mining. Overburden and coal blasting sometimes produces gaseous, orange-colored clouds that contain nitrous dioxide (NO_2). Exposure to NO_2 may have adverse health effects. NO_2 is one of several products resulting from the incomplete combustion of explosives used in the blasting process.

Other existing air pollutant emission sources within the region include:

- CO and nitrogen oxides (NO_x) from internal combustion engines used at natural gas and CBNG pipeline compressor stations;
- CO, NO_x, particulates (PM_{10} and $PM_{2.5}$), sulfur dioxide (SO_2), and volatile organic compounds (VOCs) from gasoline and diesel vehicle tailpipe emissions;
- Particulate matter (dust) generated by vehicle travel on unpaved graded roads, agricultural activities such as plowing, and paved road sanding during the winter months, as well as windblown dust from neighboring areas;
- NO_2 and PM_{10} emissions from railroad locomotives used to haul coal;
- SO_2 and NO_x from power plants. The closest coal-fired power plants are the Dave Johnston plant, located about 40-60 miles south-southwest of these six LBA tracts, and the Wyodak, Wygen, and Neil Simpson plants, located about 35-55 miles north of these four LBA tracts; and
- Air pollutants transported from emission sources located outside the PRB.

Moderately adverse short-term impacts to air quality would be extended onto the Belle Ayr North LBA tract. Long-term modeling predicted no exceedances of the annual PM_{10} National Ambient Air Quality Standards (NAAQS) at the permitted 45-mmtpy production rate. There have been no exceedances of the 24-hour and annual PM_{10} NAAQS at the Belle Ayr Mine. The dispersion model

showed a maximum PM_{10} concentration on the boundary of the Belle Ayr lands necessary to conduct mining (LNCM) of 42.02 micrograms per cubic meter (µg/m$^{3)}$ in 2013 (figure ES-6).

Moderately adverse short-term impacts to air quality would be extended onto the West Coal Creek LBA tract. Long-term modeling predicted no exceedances of the annual PM_{10} NAAQS at the permitted 50-mmtpy production rate. There have been no exceedances of the 24-hour and annual PM_{10} NAAQS at the Coal Creek Mine. The dispersion model showed a maximum PM_{10} concentration on the Coal Creek LNCM boundary of 38.88 µg/m^3 in 2016 (figure ES-7).

Moderately adverse short-term impacts to air quality would be extended onto the Caballo West LBA tract. Long-term modeling predicted no exceedances of the annual PM_{10} NAAQS at the permitted 50-mmtpy production rate and there have been no exceedances of the 24-hour and annual PM_{10} NAAQS. The dispersion model showed a maximum PM_{10} concentration on the Caballo LNCM boundary of 46.98 µg/m^3 in 2014 (figure ES-8).

Moderately adverse short-term impacts to air quality would be extended onto the Maysdorf II LBA tract. Long-term modeling predicted no exceedances of the annual PM_{10} NAAQS at the permitted 65-mmtpy production rate. There have been no exceedances of the 24-hour and annual PM_{10} NAAQS. The dispersion model showed a maximum PM_{10} concentration on the Cordero Rojo LNCM boundary of 45.6 µg/m^3 in 2007 (figure ES-9).

There would be an increase in stripping ratio in each of the LBA tracts compared to the applicant mines' current leases. That could result in an increase in fugitive emissions per ton of coal mined from current levels due to the increased volume of overburden that would have to be removed to recover the coal. The increase in fugitive dust emissions could potentially be moderated somewhat if removal of the larger volume of overburden material results in a slower rate of mining advancement through the LBA tracts. This would potentially decrease the number of acres disturbed annually and cause haul distances to increase more slowly. Particulate emissions are expected to remain within daily and annual limits.

Low-lying, gaseous orange clouds containing nitrogen oxides (NO_X) that can be transported by wind can sometimes form from overburden blasting prior to coal removal. EPA has expressed concerns that NO_X levels in some blasting clouds may be sufficiently high at times to cause human health effects. Because of these incidents, Wyoming Department of Environment Quality/Land Quality Division (WDEQ/LQD) has directed some mines to take steps designed to mitigate the effects of NO_2 emissions occurring from overburden blasting. To date, there have been no reported events of public exposure to NO_2 from blasting activities at the Belle Ayr, Coal Creek, Caballo, and Cordero Rojo mines. There were two reports of off-site NO_X clouds related to cast blasts at the Caballo Mine prior to September 2007 but no actual exposure complaints

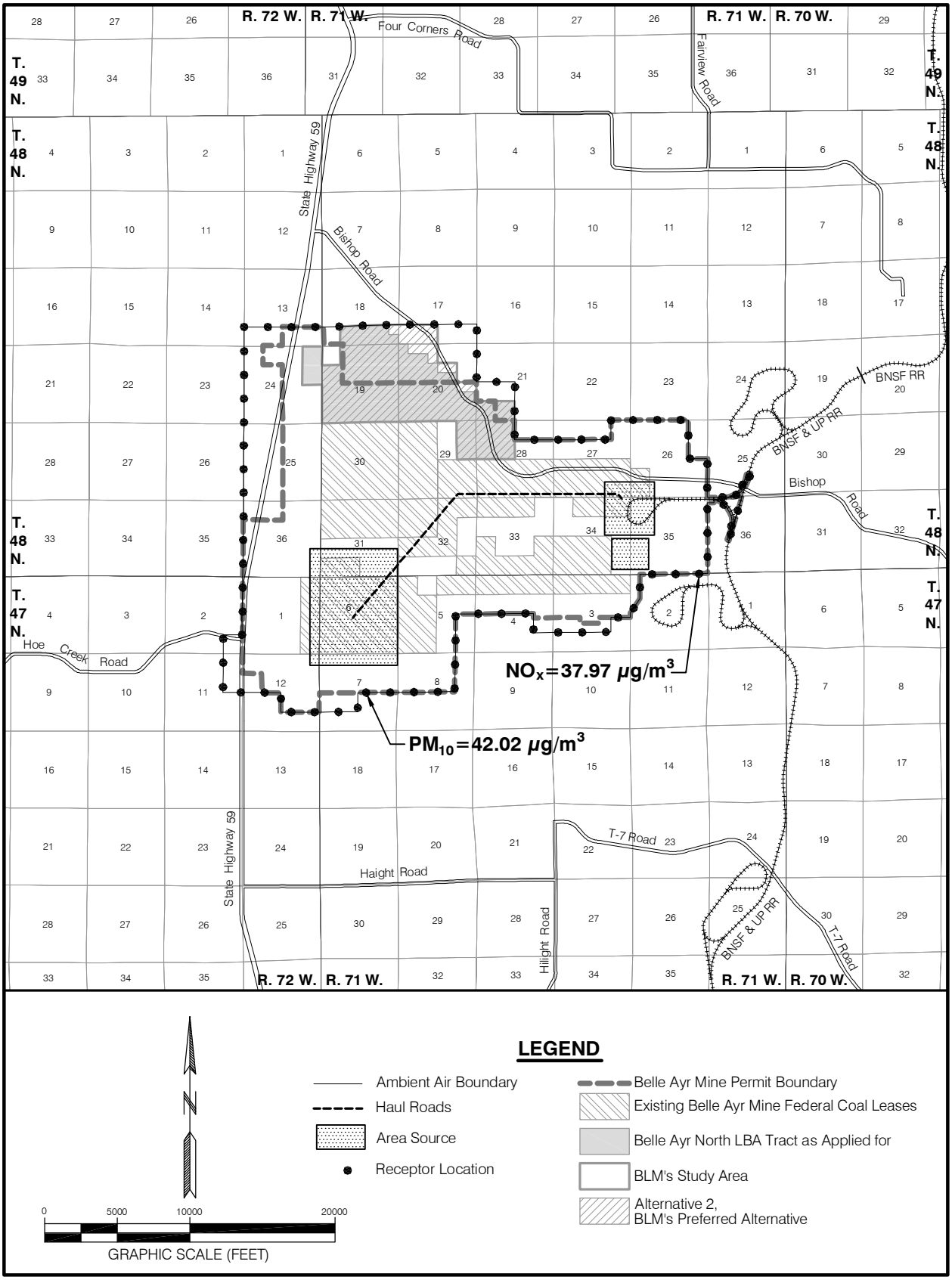

Figure ES-6. Maximum Modeled PM_{10} and NO_X Concentrations at the Belle Ayr Mine Ambient Air Boundary for the Year 2013.

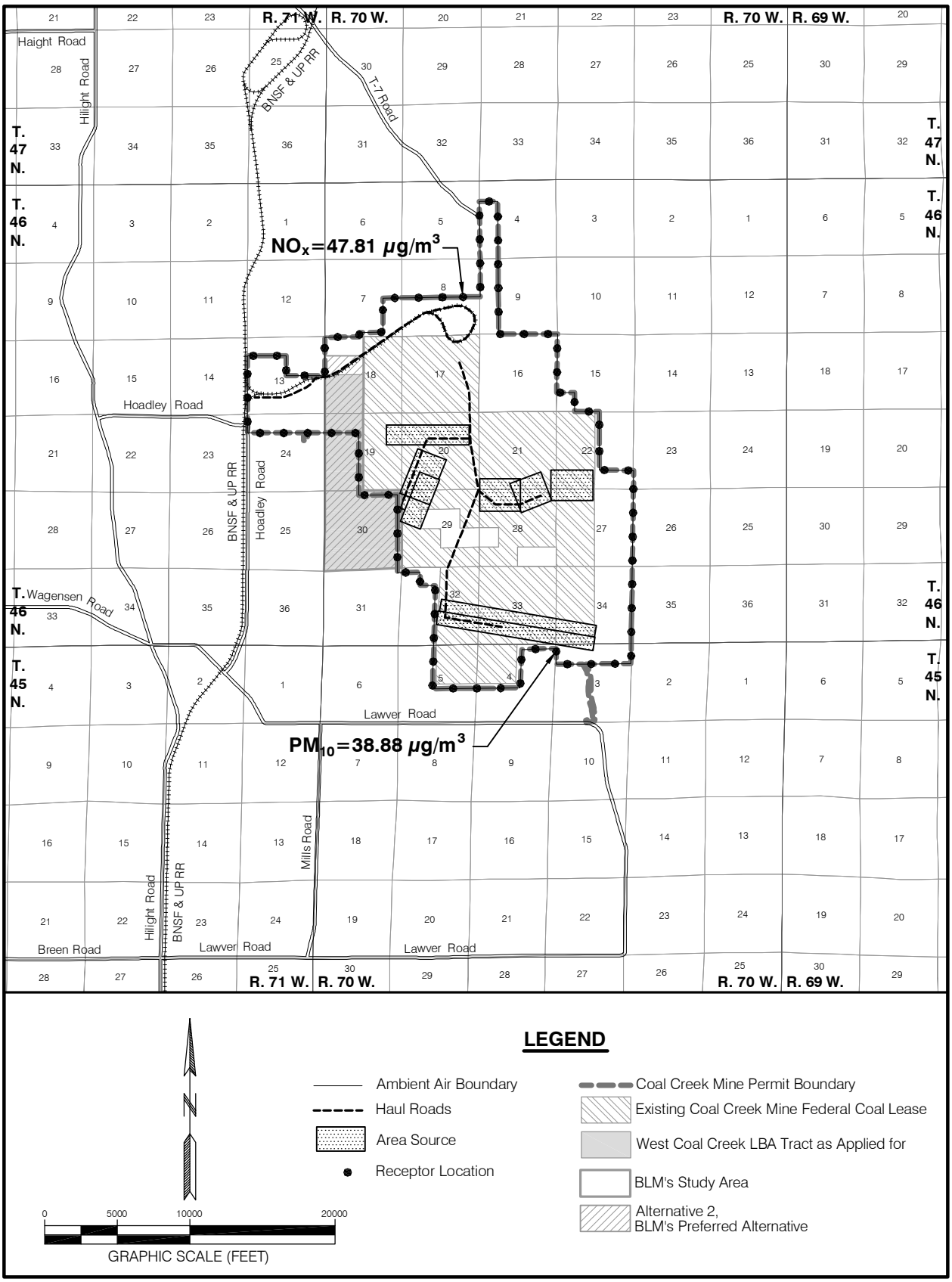

Figure ES-7. Maximum Modeled PM_{10} and NO_X Concentrations at the Coal Creek Mine Ambient Air Boundary for the Year 2016.

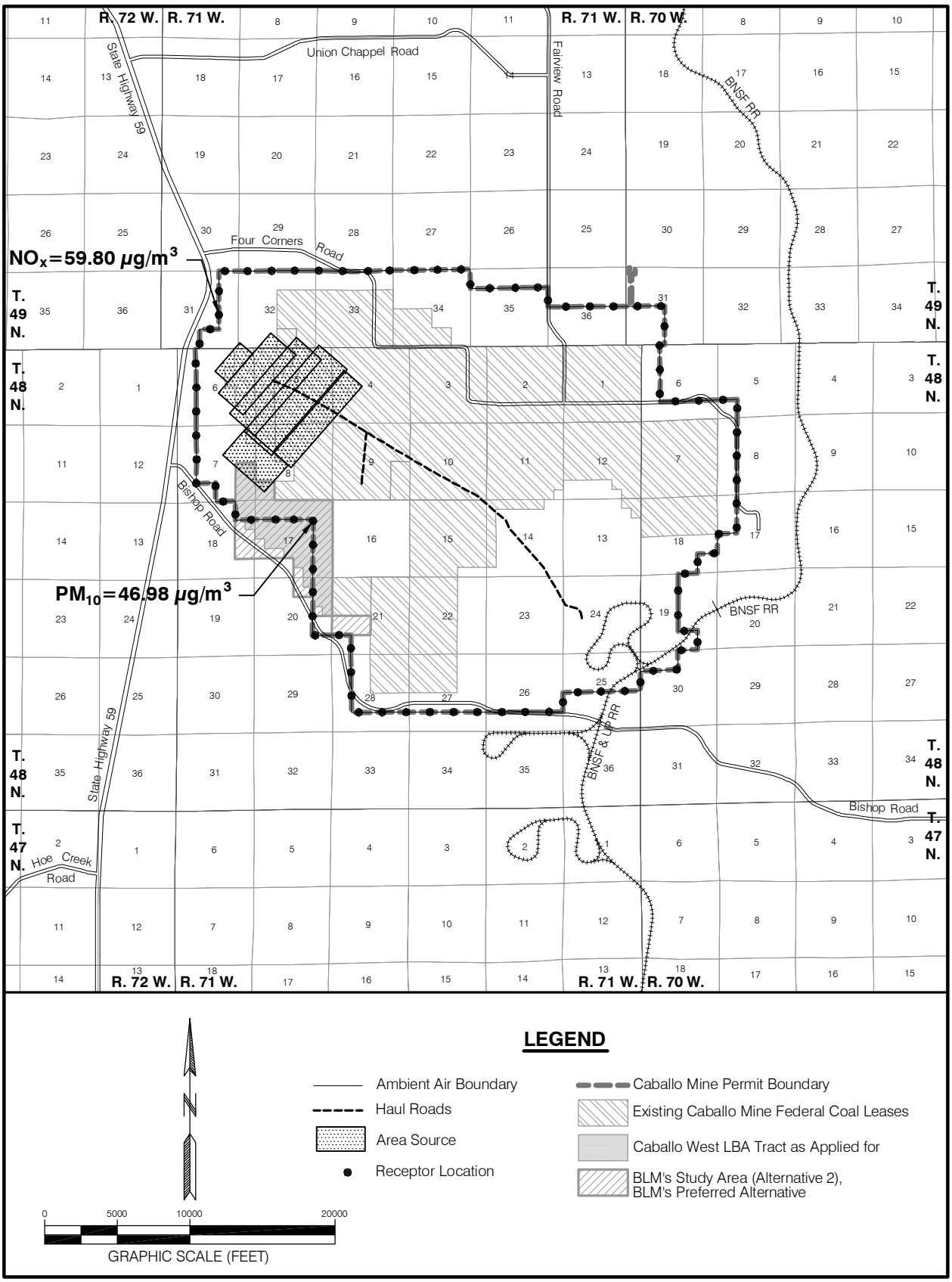

Figure ES-8. Maximum Modeled PM_{10} and NO_x Concentrations at the Caballo Mine Ambient Air Boundary for the Year 2014.

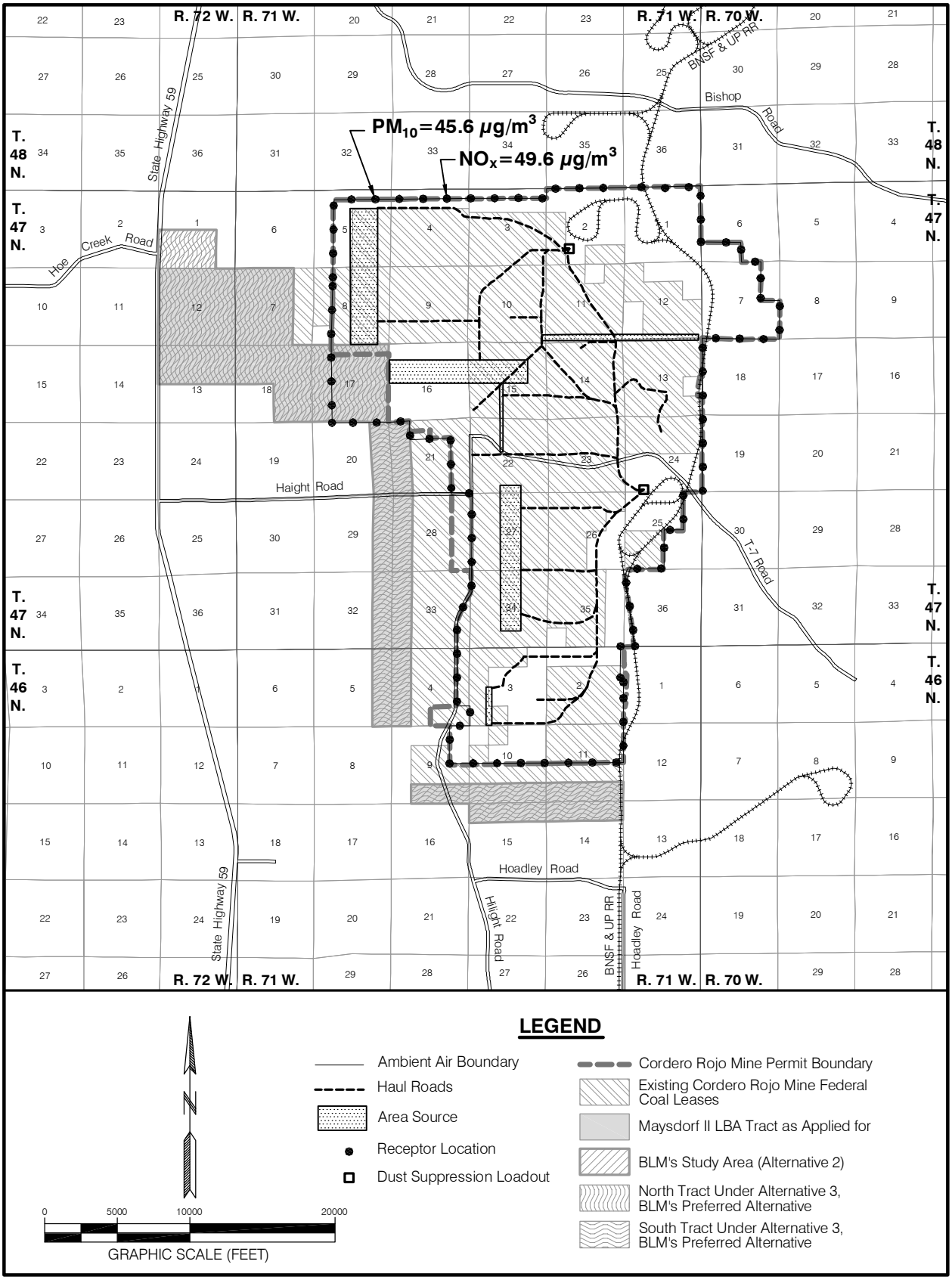

Figure ES-9. Maximum Modeled PM_{10} and NO_x Concentrations at the Cordero Rojo Mine Ambient Air Boundary for the Year 2007.

were reported. The WDEQ has not required the mines to implement any specific measures to control or limit public exposure to NO_2 from blasting.

Public exposure to emissions caused by surface mining operations is most likely to affect occupants of dwellings or businesses near the area of mining operations. Travelers on publicly accessible roads and highways that pass through and near the area of the mining operations could also be affected. There are occupied dwellings located approximately 0.75 mile north of the Belle Ayr North LBA tract, and three school bus stops are located on Bishop Road, one within the LBA tract (figure ES-10). There are occupied dwellings located approximately 0.2 mile and 1 mile west of the West Coal Creek LBA tract, and two school bus stops are located on Hoadley Road, approximately 1 mile west of the LBA tract (figure ES-11). There are occupied dwellings located 0.6 mile west of the Caballo West LBA tract, and three school bus stops are located along Bishop Road, adjacent to the LBA tract (figure ES-12). There are occupied dwellings located approximately 0.4 mile south of the northern portion of the Maysdorf II LBA tract and over 0.5 mile east of the LBA tract, and a school bus stop is located along Hoadley Road, approximately 1.25 miles south of the LBA tract (figure ES-13).

Ozone (O_3) has been included in discussions on emissions of NO_X since NO_X is one of the main ingredients involved in the formation of ground level O_3. Motor vehicle exhaust and industrial emissions, gasoline vapors, and chemical solvents as well as natural sources emit NO_X and volatile organic compounds that help form O_3. Ozone monitoring is not required by WDEQ at the SGAC mines but levels have been monitored at WDEQ/AQD operated and maintained ambient air quality monitor sites in the PRB since 2001. No exceedances of the O_3 standard have occurred at either of the two monitoring sites if evaluated under the standard in place at the time the values were recorded. If the strengthened 2008 standard was applied retroactively, one exceedance would have occurred in 2003 at the South Campbell County site.

Water Resources

Mining would disturb the coal aquifer and the aquifers in the overburden above the coal within the Belle Ayr North, West Coal Creek, Caballo West, and Maysdorf II LBA tracts. The coal aquifer and any water-bearing strata in the overburden would be removed and replaced with unconsolidated backfill. A continuous cone of depression currently exists around the Belle Ayr, Coal Creek, Caballo, and Cordero Rojo mines due to their closeness to each other and the cumulative drawdown effects from pit dewatering and nearby CBNG discharges. The extent of drawdown west of the mines that is specifically attributable to mine dewatering can no longer be defined due to much greater and areally extensive drawdown caused by CBNG development. Roughly 30 years of surface mining and the more recent CBNG development have resulted in complete dewatering of the coal aquifer in localized areas, particularly near the mines' pits and where the coal seams are structurally highest. Figure ES-14 shows the extrapolated extent of life-of-mine cumulative drawdown within

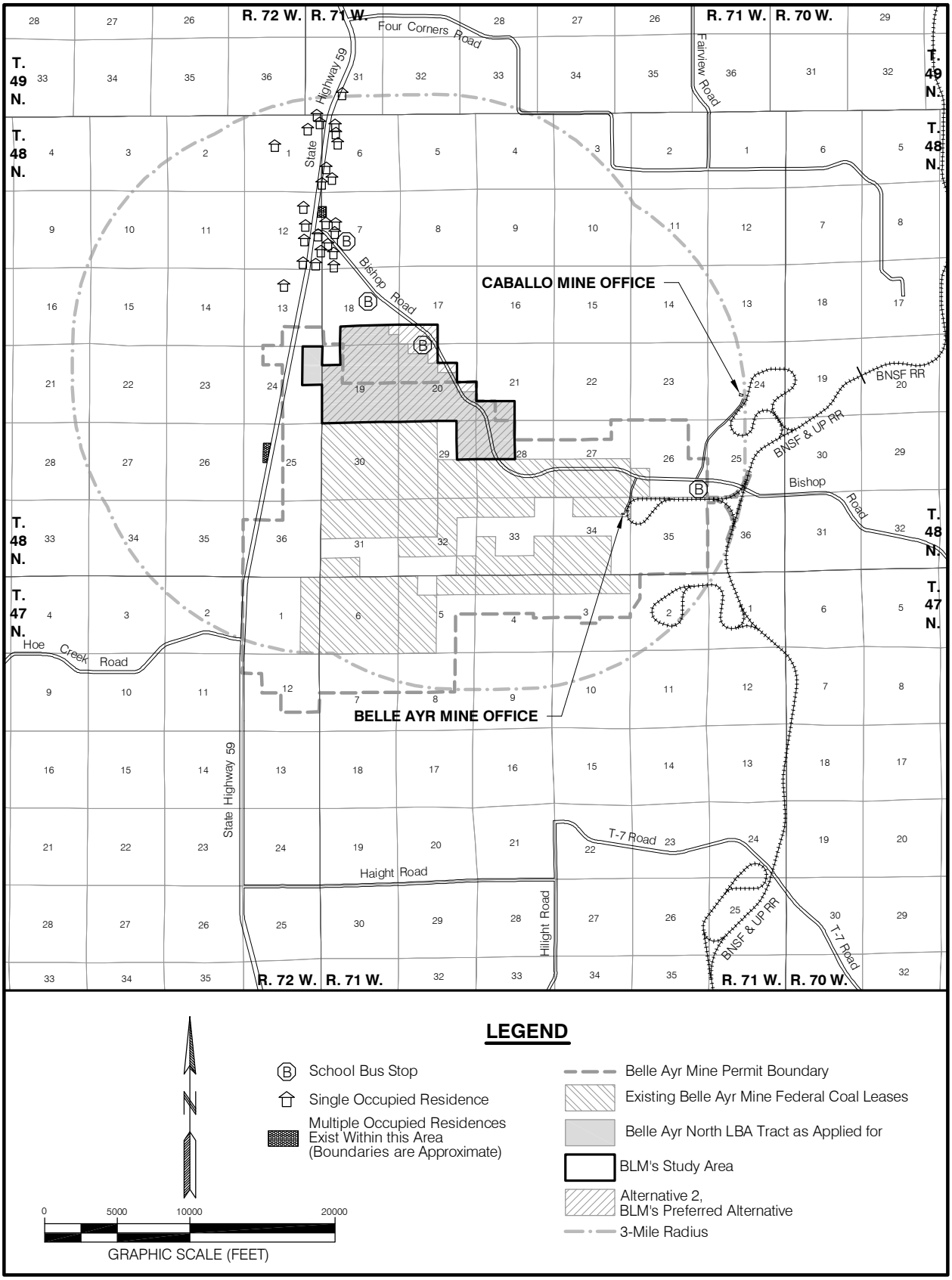

Figure ES-10. Residences, School Bus Stops, Public Roads, and Other Publicly Accessible Facilities Within 3 Miles of the Belle Ayr North LBA Study Area.

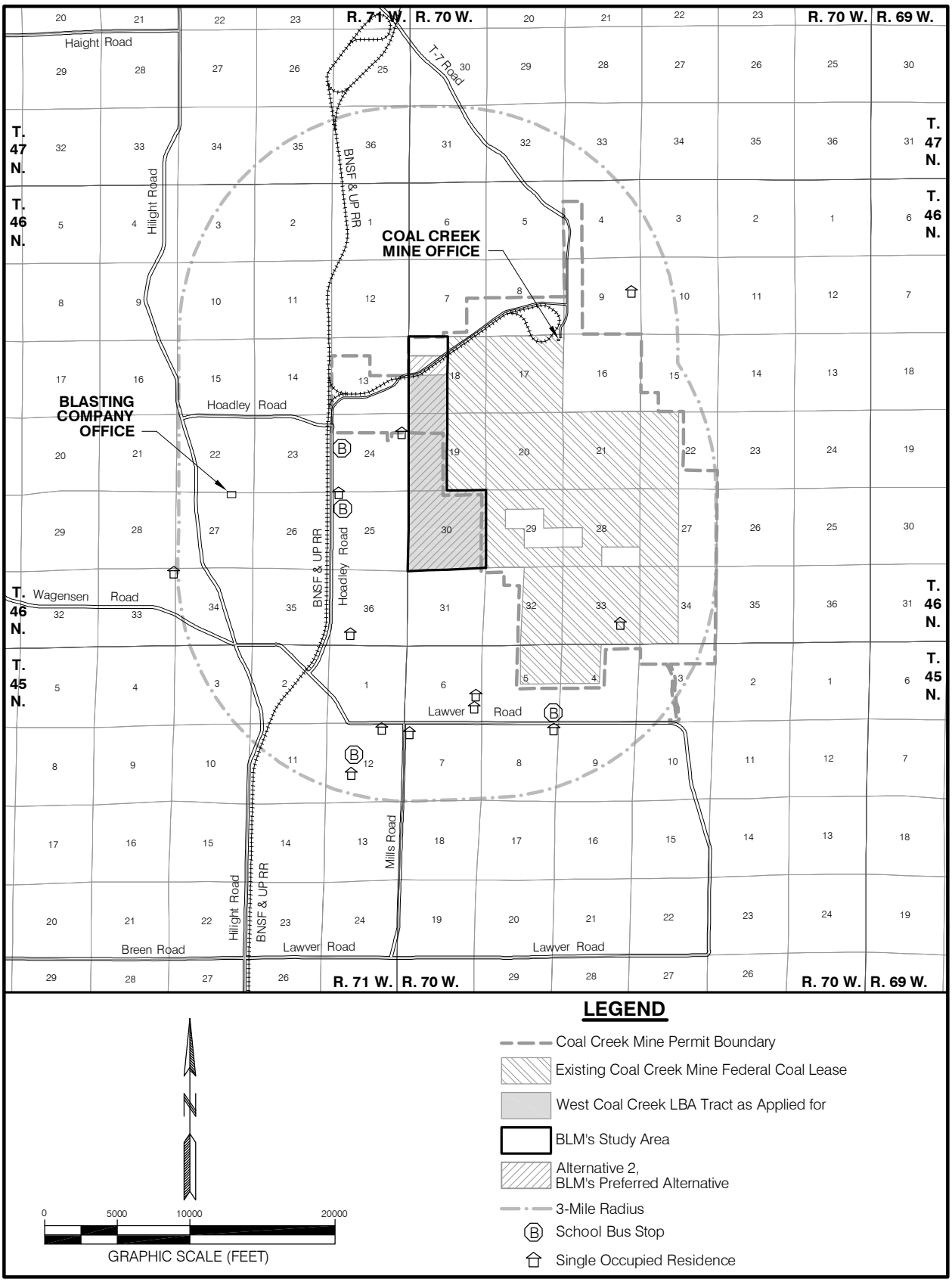

Figure ES-11. Residences, School Bus Stops, Public Roads, and Other Publicly Accessible Facilities Within 3 Miles of the West Coal Creek LBA Study Area.

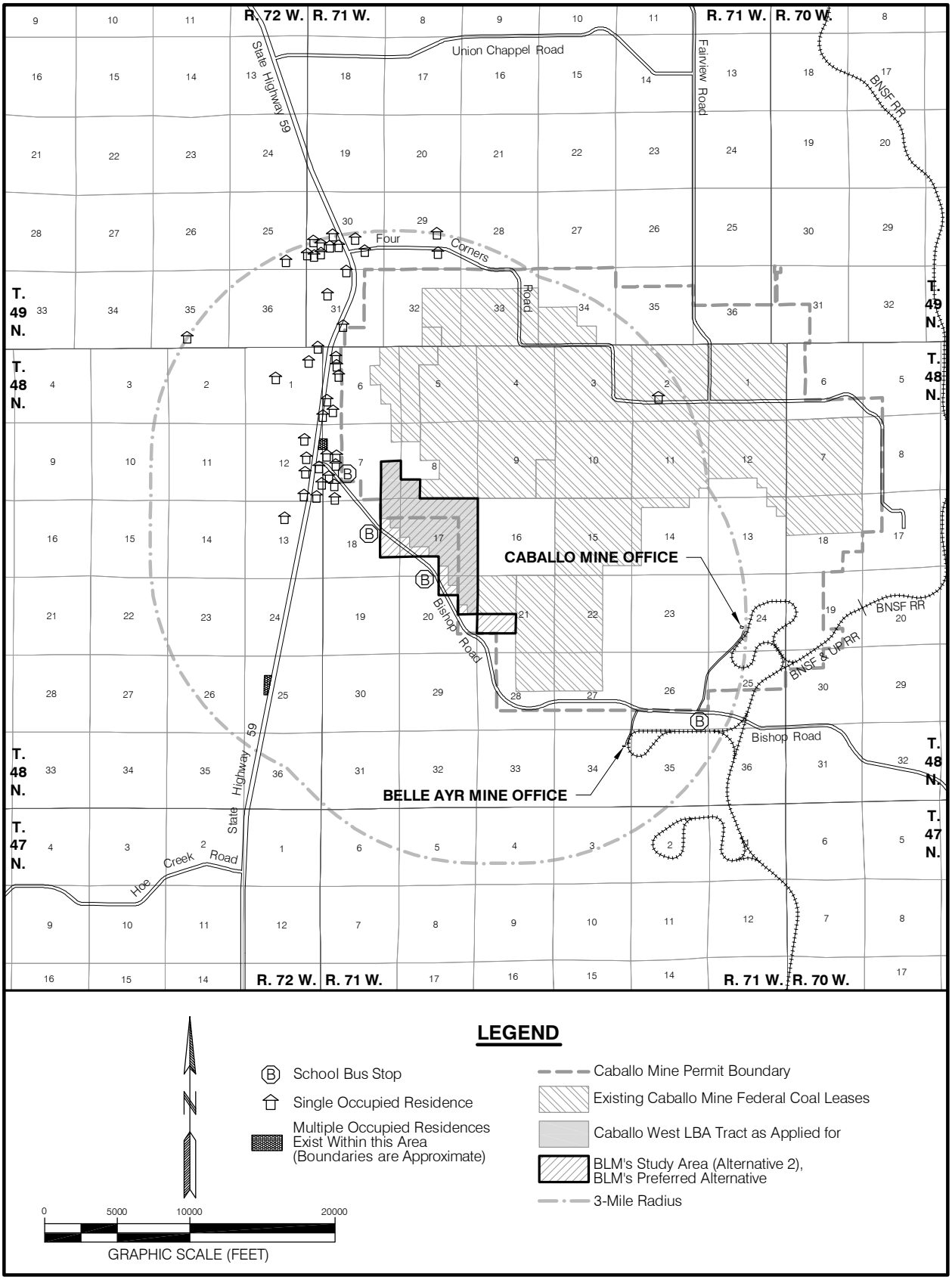

Figure ES-12. Residences, School Bus Stops, Public Roads, and Other Publicly Accessible Facilities Within 3 Miles of the Caballo West LBA Study Area.

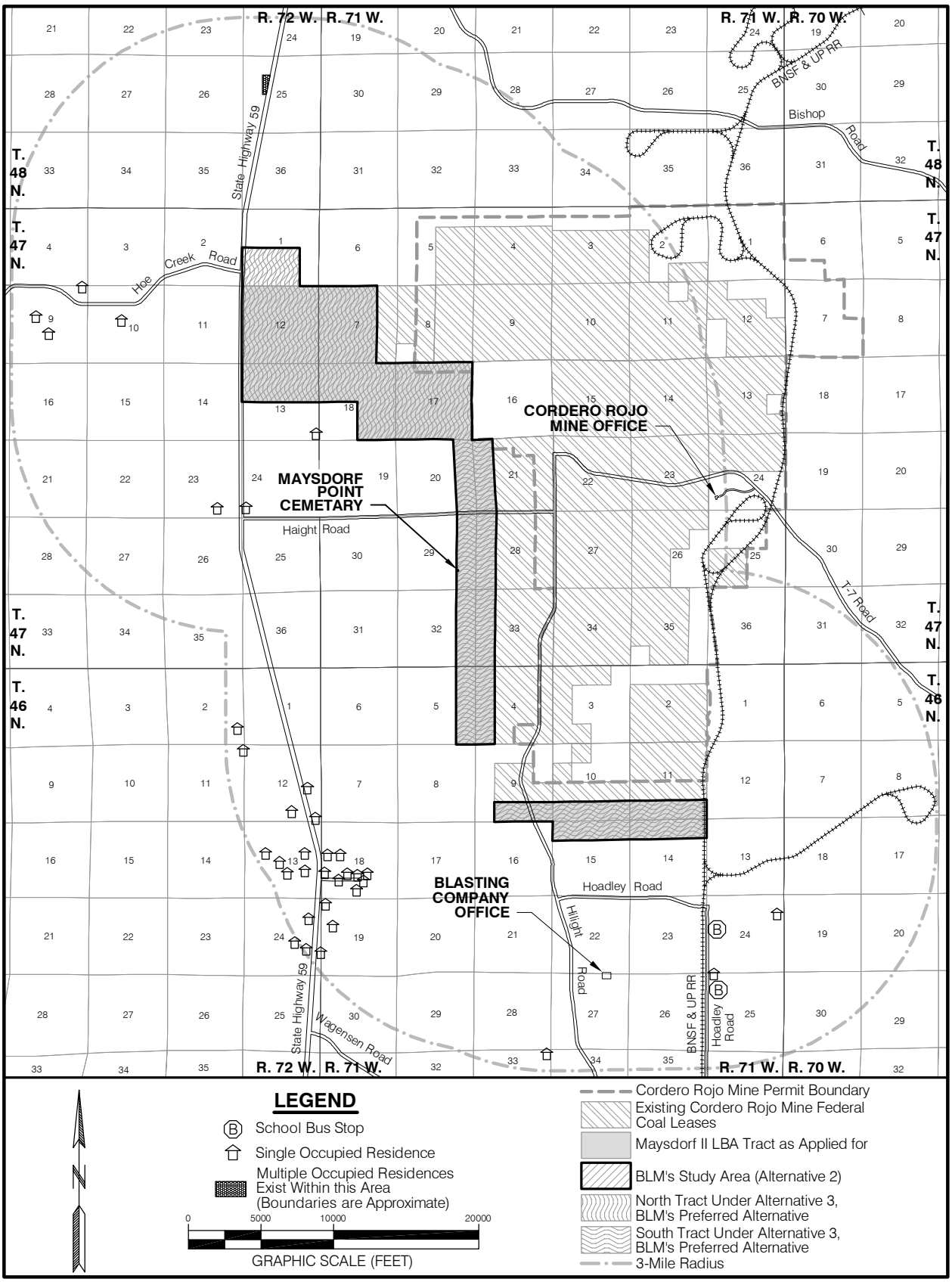

Figure ES-13. Residences, School Bus Stops, Public Roads, and Other Publicly Accessible Facilities Within 3 Miles of the Maysdorf II LBA Study Area.

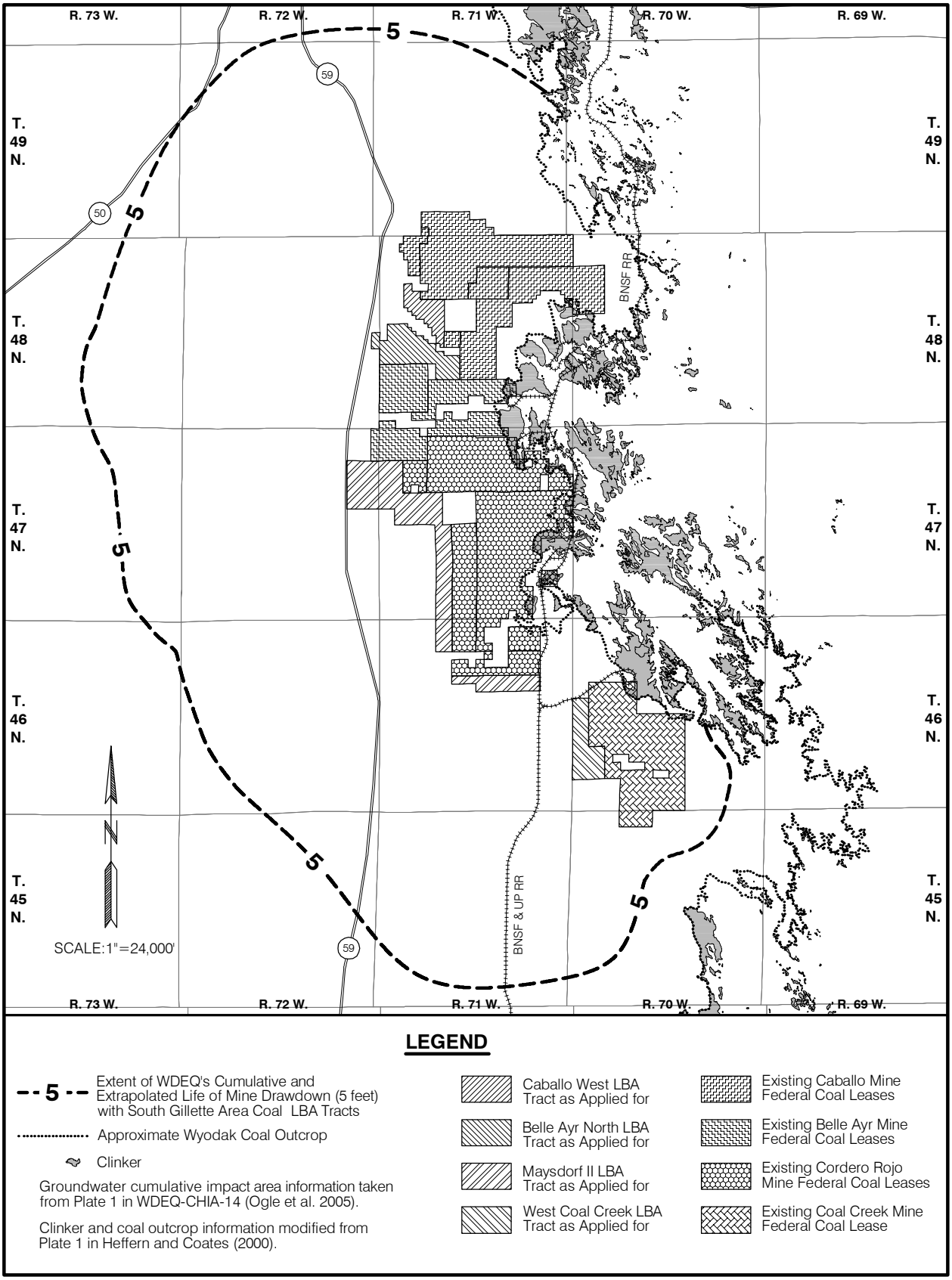

Figure ES-14. Extrapolated Extent of Life of Mine Cumulative Drawdown Within the Wyodak Coal Aquifer With the Addition of the South Gillette Area Coal LBA Tracts.

the Wyodak coal aquifer with the addition of the four LBA tracts discussed in this EIS, which are defined as the South Gillette Area Coal (SGAC) LBA tracts. The area of drawdown in the discontinuous overburden aquifers would be smaller. The data available indicate that, after reclamation, the hydraulic properties of the backfill would be comparable to the properties of the premining overburden and coal aquifers. Total dissolved solids (TDS) levels in groundwater from the backfill could initially be expected to be higher than in the premining overburden and coal aquifers, but would be expected to meet Wyoming Class III standards for use as livestock water.

Mining does not directly disturb the hydrogeologic units below the mineable coal, but many PRB mines use them for industrial water supply wells. In a few cases there have been drawdowns in the subcoal aquifer due to leakage into mine pits, dewatering, and CBNG development (BLM 2001). All four of the applicant mines located within the general South Gillette analysis area utilize water supply wells completed in aquifers stratigraphically below the Wyodak coal. If these four LBA tracts are leased and mined by the applicants, water would be produced from these wells for a longer period of time, but none of the mines would require additional sub-coal wells to continue mining and reclaiming operations.

The Belle Fourche River and its tributaries drain the general South Gillette analysis area. The Belle Fourche River has been diverted around active pits and mine facilities within the existing Cordero Rojo Mine permit area. The river would also be diverted during mining of the Maysdorf II LBA tract, but would be restored during reclamation. After mining and reclamation are complete, surface water flow, quality, and sediment discharge would approximate premining conditions.

Surface water quality varies with flow and/or season. Changes in runoff characteristics and sediment discharges would occur during mining of the LBA tracts, and erosion rates could reach high values on the disturbed areas as a result of vegetation removal. However, state and federal regulations require that surface runoff from mined lands be treated to meet effluent standards, so sediment would be deposited in ponds or other sediment-control devices.

AVF investigations conducted within the general South Gillette analysis area have identified an AVF that occurs along Duck Nest Creek on the Belle Ayr North LBA tract. AVFs have also been identified along Tisdale and Caballo Creeks; however, those lands are located at considerable distances downstream of any of the LBA tracts. Approximately 14.9 acres of declared AVF on Duck Nest Creek are located within the Belle Ayr North general analysis area, but the WDEQ/LQD has declared them not to be significant to farming (WDEQ 1988). No other AVFs have been identified within the LBA tracts.

A preliminary wetlands inventory, based on U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) mapping and vegetation mapping in the field, was conducted for the wetland analysis area for each tract. A total

of approximately 193.9 acres of "waters of the U.S.", including a total of 14.4 acres of jurisdictional waters of the U.S., occur within the wetlands analysis area for the Belle Ayr North LBA tract. Approximately 11.9 of those acres are jurisdictional wetlands that occur along the watercourse of Duck Nest Creek. The 2.5 acres of jurisdictional other waters of the U.S. that did not qualify as jurisdictional wetlands consist primarily of open water that is held within the in-channel impoundments and intermittent pools along Duck Nest Creek. The non-jurisdictional waters of the U.S. contained in the wetlands analysis area consists of the internally drained playas and total approximately 179.5 acres in area. As a result of recent court directives, playas are no longer identified as jurisdictional waters of the U.S. under Section 404 of the Clean Water Act (CWA). These non-jurisdictional wetland features can, however, have significant biological and hydrological importance.

A total of approximately 16.9 acres of wetlands and other waters of the U.S. occur within the West Coal Creek wetlands analysis area. Non-jurisdictional wetlands and other waters of the U.S. were included in the above acreages and were not identified separately because only the Corp of Engineers (COE) has the authorization to make such determinations. Non-jurisdictional wetlands are generally associated with internally drained depressions/playas that are isolated, and non-jurisdictional other waters of the U.S. generally occur where areas of open water are ponded in a depression/playa area. No internally drained playas have been identified within the West Coal Creek general analysis area.

A total of approximately 15.0 acres of waters of the U.S., including a total of 8.6 acres of jurisdictional waters of the U.S., occur within the entire Caballo West wetlands analysis area. Approximately 6.5 of those acres are jurisdictional wetlands that occur along the water courses of Tisdale Creek. A playa, located adjacent to the LBA tract as applied for and within the wetlands analysis area, was delineated in 1996 as a jurisdictional wetland, but was later declared non-jurisdictional by the COE. Approximately 6.4 acres of non-jurisdictional wetlands are included in this playa.

A total of approximately 140.1 acres of wetlands and other waters of the U.S. occur within the Maysdorf II wetlands analysis area. Of this 140.1 acres identified, approximately 133.5 acres are vegetated wetlands and the remaining 6.6 acres are other waters of the U.S. Non-jurisdictional wetlands and other waters of the U.S. were included in the above acreages and were not identified separately because only the COE has the authorization to make such determinations. Non-jurisdictional wetlands are generally associated with internally drained depressions/playas that are isolated, and non-jurisdictional other waters of the U.S. generally occur where areas of open water are ponded in a depression/playa area. Approximately 49.9 acres of playas occur in the area, and those internally drained areas would probably be considered non-jurisdictional by the COE.

Existing wetlands located in the LBA tracts would be destroyed by mining operations. Jurisdictional wetlands that are disturbed by mining must be replaced during the reclamation process.

Soils and Vegetation Resources

Consequences to soil resources from mining the LBA tracts would include changes in the physical, biological, and chemical properties. Following reclamation, the soils would be unlike premining soils in texture, structure, color, accumulation of clays, organic matter, microbial populations, and chemical composition. The replaced topsoil would be more uniform in type, thickness, and texture. It would be adequate in quantity and quality to support planned postmining land uses (i.e., wildlife habitat and rangeland).

The predominant vegetation types, in terms of total acres of occurrence in the combined vegetation general analysis areas, are the sagebrush/grassland (38.1 percent) and sandy grassland (18.4 percent). Common plant species on these types include crested wheatgrass, smooth brome, needleandthread, threadleaf sedge, western wheatgrass, blue grama, and cheatgrass brome. Dominant shrubs/subshrubs in these vegetation communities include Wyoming big sagebrush and fringed sage. Lichens and manyspine plains pricklypear cactus are frequently large components of the vegetation cover. Mining would progressively remove this native vegetation. Reclamation and revegetation of mined areas would occur contemporaneously with mining on adjacent lands. Reestablished vegetation would be dominated by species mandated in the reclamation seed mixtures, which are approved by the WDEQ/LQD. The majority of these species would be native to the LBA tracts. Initially, the reclaimed land would be dominated by grassland vegetation, which would be less diverse than the premining vegetation. Estimates for the time it would take to restore sagebrush to premining density levels range from 20 to 100 years. An indirect long-term impact associated with this vegetative change would potentially be a decrease in available habitat for shrub-dependent species. However, a diverse, productive, and permanent vegetative cover would be established on the LBA tracts within about 10 years following reclamation, prior to release of the final reclamation bond. The decrease in plant diversity would not seriously affect the potential productivity of the reclaimed areas, and the proposed postmining land uses (wildlife habitat and rangeland) should be achieved even with the changes in vegetation composition and diversity. The reclamation plans for the LBA tracts would also include steps to control invasion by weedy (invasive, nonnative) plant species.

Wildlife Resources

Direct impacts of surface coal mining on wildlife occur during mining and are short term. They include road kills by mine-related traffic, direct losses of less mobile wildlife species, restrictions on wildlife movement created by fences, spoil piles and pits, displacement of wildlife from existing habitat in areas of active mining (including abandonment of nests or nesting and breeding habitat

for birds), increased competition between animals in areas adjacent to mining operations, and increased noise, dust, and human presence. Habitat for aquatic species would also be lost during mining operations. Indirect impacts are longer term and include alterations in topography and vegetative cover following reclamation, which may decrease wildlife carrying capacity and habitat diversity. The Belle Ayr North, West Coal Creek, Caballo West, and Maysdorf II LBA tracts do not include any unique or crucial big game habitat, and habitat disturbance would be incremental, with reclamation progressing as new disturbance occurs. The West Coal Creek LBA tract is adjacent to a sage-grouse "core population area", as defined by the Sage-Grouse Implementation Team (Sage-Grouse Implementation Team 2008). A total of 14 sage-grouse leks have been documented on and within 2 miles of the general analysis areas for these four LBA tracts. Six of the leks have been active during recent survey years and are classified as occupied; three leks have not been attended by displaying grouse for at least the last 10 years and are classified as unoccupied/abandoned; and five leks have been removed by mining activities and are classified as unoccupied/destroyed. In the long term, following reclamation, wildlife carrying capacity and habitat diversity may be reduced due to gentler topography, less diverse vegetative cover, and reduction in sagebrush density. Mining companies have initiated efforts in recent years to increase the diversity of post-mine topography and to increase the amount of sagebrush in the reclamation.

Threatened and Endangered Species

T&E plant and animal species that could be present on the tracts include the Ute ladies'-tresses orchid, blowout penstemon, and black-footed ferret. Areas of suitable habitat for the Ute ladies'-tresses orchid within the Belle Ayr North, West Coal Creek, Caballo West, and Maysdorf II LBA tracts and adjacent study areas were surveyed in August 2006 and 2007, July 2007, August 2007, and in August 2005 and 2006, respectively, and no individuals were located. The LBA tracts are not within the documented historical range of the blowout penstemon. No suitable sand dunes (whether stable or blown out) are currently present on tract general analysis areas. The black-footed ferret is a nocturnally active mammal that depends almost entirely upon the prairie dog for its survival. No black-tailed prairie dog colonies are currently present on the LBA tracts as proposed and the area added by action alternatives. One small colony (approximately 40 acres) is within the Maysdorf II wildlife general analysis area and one small colony (approximately 56 acres) is located just over 1 mile southwest of the Maysdorf II wildlife general analysis area. One small colony (approximately 34 acres in size) is located approximately 1 mile south of the West Coal Creek LBA tract study area.

Land Use and Recreation

Approximately 97 percent of the surface estate of the SGAC LBA tracts is owned by private individuals/companies. Most of the subsurface minerals (all of the coal and approximately 90 percent of the oil and gas estate) are federally

owned, which results in split estate situations. The BLM's split estate policy only applies to situations where the surface rights are in private ownership and the rights to development of the mineral resources are publicly held and managed by the federal government.

Active mining within the LBA tracts would preclude other land uses. Recreational and grazing uses of the tracts would be severely limited during mining. Oil and gas development would be curtailed, and coal within the targeted seams containing any unrecovered CBNG would be removed. Within 10 years after initiation of each reclamation phase, rangeland and wildlife use would return to near premining levels.

Cultural Resources

The Belle Ayr North, West Coal Creek, Caballo West, and Maysdorf II LBA tracts have been surveyed for cultural resources at the Class I level. A majority of the tracts have been surveyed to a Class III level. A total of 73 cultural sites and 67 isolated finds were documented in the survey areas. Of the 73 cultural sites, 44 are prehistoric, 20 are historic, and nine are multi-component. Eight of the sites are recommended as eligible to the National Register of Historic Places (NRHP) and 11 are unevaluated. Until consultation with State Historic Preservation Office (SHPO) has occurred and agreement regarding NRHP eligibility has been reached, all sites would be protected from disturbance. Any area within the LBA tracts not yet surveyed to a Class III level would require a Class III survey prior to disturbance.

No sites of Native American religious or cultural importance have been identified on the Belle Ayr North, West Coal Creek, Caballo West, and Maysdorf II LBA tracts. Appropriate action must be taken to address concerns related to those sites if such sites or localities are identified at a later date.

Visual Resources

Some mining activities on the Belle Ayr North, West Coal Creek, Caballo West, and Maysdorf II LBA tracts would be visible from Wyoming 59 and several county roads in the vicinity of the tracts. Mining would affect landscapes classified by BLM as visual resource management (VRM) Class V. The landscape character would not be significantly changed following reclamation. No unique visual resources have been identified on or near the LBA tracts.

Noise

There are occupied dwellings and businesses located in the vicinity of the Belle Ayr North, West Coal Creek, Caballo West, and Maysdorf II LBA tracts (figures ES-11, ES-12, ES-13, and ES-14, respectively). These facilities would experience an adverse noise impact if mining activities (particularly blasting) occur within 2,500 feet (0.47 mile) of them under either the proposed actions or action alternatives. At distances of approximately 2,500 feet or greater, the

noise intensity of mining activities would be reduced to 55 dBA (no adverse impact level).

Transportation

Leasing the Belle Ayr North, West Coal Creek, Caballo West, and Maysdorf II LBA tracts would extend the length of time that coal is shipped from the permitted Belle Ayr, Coal Creek, Caballo, and Cordero Rojo mines, respectively, which would extend the length of time that coal transportation facilities would be required. Vehicular traffic to and from the mines would continue for over 10 additional years, depending on the LBA tracts involved and which alternatives are selected. Lands within 100 feet of the outside line of the ROW of a public road are considered unsuitable for leasing; however, they could be included in a tract to allow recovery of economically mineable coal outside of the ROW and buffer zone. Active pipelines and utility/power transmission lines would have to be relocated in accordance with previous agreements, or agreements would have to be negotiated for their removal or relocation.

Socioeconomics

Royalty and bonus payments for the coal in the LBA tract would be collected by the federal government and split with the state. Assuming an average coal price of $9.98 per ton recovered and a potential range of bonus payments of 30 to 97 cents per ton, the potential additional federal revenues from the four LBA tracts would range from approximately $1.1 to $1.4 billion, depending on the alternative selected and the bonus price at the time the coal is leased. The potential additional revenue to the state of Wyoming from the four LBA tracts would range from $1.4 to $1.8 billion, depending on the alternative selected, the bonus price at the time the coal is leased, and the selling price of the coal. Mine life and employment (at or slightly above current levels) would be extended for over 10 additional years, depending on the LBA tracts involved and which alternatives are selected.

Greenhouse Gas Emissions

Equivalent carbon dioxide (CO_2e) emissions are projected to increase at the Belle Ayr, Coal Creek, Caballo, and Cordero Rojo mines if the Belle Ayr North, West Coal Creek, Caballo West, and Maysdorf II LBA tracts are added to the mining operations. The increase in CO_2e emissions would result from the additional fuels (especially diesel) that would be used in consideration of the increased coal and overburden haul distances, as well as increased use of electricity and explosives related to increasing overburden thicknesses. With the addition of the Belle Ayr North, West Coal Creek, Caballo West, and Maysdorf II LBA tracts, the estimated total CO_2e emissions at the four applicant mines would represent 1.7 percent of the projected 2020 statewide CO_2e emissions.

Environmental Justice

Potentially adverse impacts do not disproportionately affect minorities, low-income groups or Native American tribes or groups. No tribal lands or Native American communities are included in this area, and no Native American treaty rights or Native American trust resources are known to exist for this area.

No Action Alternatives (Alternative 1)

Under the No Action alternatives for each tract, the coal lease applications would be rejected and the areas contained in the applications would not be offered for lease at this time. The tracts could be nominated for lease again in the future. Also under the No Action alternative, the impacts described in the preceding paragraphs to topography and physiology, geology and minerals, soils, air quality, water resources, AVFs, wetlands, vegetation, wildlife, T&E species, land use and recreation, cultural resources, Native American concerns, paleontological resources, visual resources, noise, transportation, and socioeconomics would occur due to mining the existing Belle Ayr, Coal Creek, Caballo, and Cordero Rojo Mine coal leases, but these impacts would not be extended by mining onto the Belle Ayr North, West Coal Creek, Caballo West, and Maysdorf II LBA tracts, respectively.

Mitigation

The Belle Ayr, Coal Creek, Caballo, and Cordero Rojo mines currently approved mining permits include extensive baseline information, ongoing monitoring information and commitments, and mitigation measures that are required by SMCRA and Wyoming State Law. Compliance, mitigation, and monitoring measures that are required by regulation are considered to be part of the proposed actions and alternatives considered in this EIS. These regulatory requirements, mitigation measures and monitoring commitments are in place for the No Action alternative as part of the currently approved mining and reclamation plans for the four applicant mines and would be included in the permitting processes that would be required to mine the four South Gillette area LBA tracts.

If impacts are identified during the leasing process that are not mitigated by existing required mitigation measures, BLM can include additional mitigation measures, in the form of stipulations on a new lease, within the limits of its regulatory authority. Any special stipulations identified by BLM where additional or increased monitoring measures are recommended to be added to the BLM leases are included in appendix D of this EIS.

Cumulative Impacts

Cumulative impacts result from the incremental impacts of an action added to other past, present, and reasonably foreseeable future actions, regardless of

who is responsible for such actions. Cumulative impacts can result from individually minor, but collectively significant, actions occurring over time.

Since decertification of the Powder River federal coal region in 1990, 20 coal leases containing more than 5.8 billion tons of federal coal have been issued following competitive sealed-bid sales. Three exchanges of federal coal in the Wyoming portion of the Powder River Federal Coal Region have also been completed. Twelve additional coal lease applications, including the Belle Ayr North, West Coal Creek, Caballo West, and Maysdorf II LBA tract applications, are pending. The pending LBA applications contain over 3.8 billion tons of coal.

Currently, BLM is completing a regional technical study, called the PRB Coal Review, to help evaluate the cumulative impacts of coal and other mineral development in the PRB. The study evaluates conditions as of a baseline year (2002 or 2003) and projects development levels and potential associated cumulative impacts related to coal and coal-related development, oil and gas and related development, and other development through 2020. Due to variables associated with future coal production, two projected coal production scenarios (representing an upper and a lower production level) were developed. The projected development levels are based on projected demand and coal market forecasts and include production at the Belle Ayr, Coal Creek, Caballo, and Cordero Rojo mines during the baseline year and projected production for 2010, 2015, and 2020.

The Wyoming portion of the PRB is the primary focus of the PRB Coal Review, but the Montana portion of the PRB is included in some studies. A series of reports have been prepared or are being prepared to present the result of the PRB Coal Review studies. The results of the PRB Coal Review studies that have been completed are summarized in section 4.0 of this EIS.

Cumulative impacts vary by resource, with potential impacts to air quality, groundwater quantity, wildlife habitat, and socioeconomics generally being the greatest concerns.

The original PRB Coal Review air quality study documented the modeled air quality impact of existing operations during a baseline year, 2002, and of projected development activities in 2010. BLM updated the model in 2008 and conducted the cumulative air quality impact analysis using a revised baseline year of 2004 with development levels projected for year 2015. The model was used to evaluate impacts of baseline and projected source emissions on several source groups, including near-field receptors in Wyoming and Montana, receptors in nearby federally designated “Class I” areas, and receptors at “Class II” sensitive areas. The EPA guideline CALPUFF model system was used for the modeling analysis.

The existing regional air quality conditions are generally very good, but the modeling showed substantial impacts at some receptors for 2004 and 2015.

The model results should not be construed as predicting an actual exceedance of any standard, but are at best forecasts that indicate potential impacts (BLM 2008e). Table ES-8 presents the maximum modeled impacts on ambient air quality at the near-field receptors in Wyoming and Montana for 2004 and for the 2015 upper and lower coal development scenarios. Table ES-9 lists the projected modeled visibility impacts for 2004 for all analyzed Class I and sensitive Class II areas. For the upper and lower coal production scenarios, it shows the number of additional days that the impacts were projected to be greater than 1.0 dv (10 percent in extinction) for each site in 2015.

The PRB Coal Review provides an assessment of the cumulative impact to surface and groundwater resources associated with future projected levels of coal mining, coal mine dewatering, CBNG groundwater withdrawal and surface disposal, and coal mine and conventional oil and gas surface disposal of groundwater. The groundwater portion of the impact analysis has not yet been completed. The surface water analysis addresses the cumulative impacts to surface water quality and channel stability because of surface discharge of groundwater by CBNG development and coal mine dewatering. The surface water quality portion of this analysis has been completed, but the channel stability portion has not. A number of modeling analyses have previously been conducted to help predict the impacts of surface coal mining on groundwater resources in the PRB. In addition, each mine must monitor groundwater levels in the coal and underlying and overlying aquifers and assess the probable hydrologic consequences of mining as part of the mine permitting process. The monitoring programs track the extent of groundwater drawdown propagation to the west and the extent of recharge and quality of the water in the backfill areas of the mines. The monitoring data indicate that recharge is occurring in the backfill, and that water from the backfill will generally be acceptable for premining uses (primarily livestock watering). Modeling and monitoring indicate that the groundwater drawdown impacts of coal mining and CBNG development are overlapping.

The PRB Coal Review studies include an evaluation of the impacts to wildlife and aquatic species as of 2003 and an evaluation of the projected levels of disturbance in the PRB in 2010, 2015, and 2020, based on the projected development levels in those years. As discussed above, impacts to wildlife and fisheries can be classified as short-term and long-term. Short-term impacts are related to habitat disturbance during project development and operation. Long-term impacts result from changes in habitat after reclamation is completed. Habitat fragmentation can result from activities such as roads, well pads, mines, pipelines, and electrical power lines, as well as increased noise, elevated human presence, dispersal of noxious and invasive weed species, and dust from unpaved road traffic.

The cumulative impacts of energy development (coal mining, oil and gas) in the PRB are and will continue to contribute to a reduction in hunting opportunities for some animals (pronghorn, mule deer, and sage grouse).

Table ES-8. Projected Maximum Potential Near-field Impacts (µg/m³).

Pollutant	Averaging Time	Base Year (2004) Impacts	2015 Lower Coal Development Scenario Impacts	2015 Upper Coal Development Scenario Impacts	NAAQS	Wyoming AAQS	Montana AAQS	PSD Class II Increments
Wyoming Near-field								
NO_2		31.3	46.7	47.4	100	100	--[1]	25
SO_2	Annual	15.3	16.2	16.2	80	60	---	20
		112.3	119.6	119.6	365	260	---	91
		462.0	814.1	814.1	1,300	1,300	---	512
PM_{10}	Annual	38.4	**53.5**	**61.0**	---	50	---	17
		250.4	**512.8**	**512.9**	150	150	---	30
Montana Near-field								
NO_2	Annual	3.3	6.5	6.5	100	---	100	25
	3-hour	409.0	**826.3**	**826.4**	---	---	564	---
SO_2	Annual	1.6	1.7	1.7	80	---	80	20
	24-hour	16.1	16.5	16.6	365	---	365	91
		65.0	66.5	66.5	1,300	---	1,300	512
	1-hour	162.9	166.6	166.6	---	---	1,300	---
PM_{10}	Annual	2.8	5.2	5.3	---	---	50	17
	24-hour	29.1	44.0	58.5	150	---	150	30

[1] No standard or increment.
Bold values indicate exceedance of ambient air quality standards (AAQS).
Source: PRB Coal Review Task 3A Report (BLM 2008h)

Table ES-9. Modeled Change in Visibility Impacts at Class I and Sensitive Class II Areas.

Location	2004 No. of Days >10%	2015 Lower Development Scenario Change in No. of Days > 10%	2015 Upper Development Scenario Change in No. of Days > 10%
Federally and Tribally Designated Class I Areas			
Badlands National Park	218	26	26
Bob Marshall Wilderness Area	8	0	0
Bridger Wilderness Area	144	2	2
Fitzpatrick Wilderness Area	91	2	2
Fort Peck Indian Reservation	105	10	10
Gates of the Mountain Wilderness Area	55	0	0
Grand Teton National Park	70	2	2
North Absaroka Wilderness Area	61	3	3
North Cheyenne Indian Reservation	243	32	47
Red Rock Lakes	42	2	2
Scapegoat Wilderness Area	27	1	1
Teton Wilderness Area	57	4	4
Theodore Roosevelt National Park	178	5	9
UL Bend Wilderness Area	77	8	10
Washakie Wilderness Area	83	5	5
Wind Cave National Park	262	18	19
Yellowstone National Park	84	2	2
Sensitive Class II Areas			
Absaroka Beartooth Wilderness Area	101	2	3
Agate Fossil Beds National Monument	251	20	20
Big Horn Canyon NRA	331	1	3
Black Elk Wilderness Area	236	34	36
Cloud Peak Wilderness Area	126	18	18
Crow Indian Reservation	360	4	4
Devils Tower National Monument	274	25	26
Fort Belknap Indian Reservation	66	6	7
Fort Laramie National Historic Site	260	10	10
Jedediah Smith Wilderness Area	79	1	1
Jewel Cave National Monument	261	19	21
Lee Metcalf Wilderness Area	97	2	2
Mount Naomi Wilderness Area	51	1	1
Mount Rushmore National Monument	222	36	36
Popo Agie Wilderness Area	139	4	4
Soldier Creek Wilderness Area	268	18	18
Wellsville Mountain Wilderness Area	130	10	10
Wind River Indian Reservation	217	2	5

Source: PRB Coal Review Task 3A Report (BLM 2008h)

The PRB Coal Review used the Regional Economic Models Inc's. (REMI) Policy Insight regional economic model to project cumulative employment and population levels and associated impacts in the PRB for the upper and lower coal production scenarios in 2010, 2015, and 2020. Table ES-10 presents the recent and projected population levels for the counties included in the PRB Coal Review socioeconomic analysis.

Table ES-10. Recent and Projected PRB Population.

Year	Campbell County	Converse County	Crook County	Johnson County	Sheridan County	Weston County	Total Study Area
Census							
2000	33,698	12,104	5,895	7,108	26,606	6,642	92,053
2003	36,438	12,314	5,986	7,554	27,115	6,671	96,078
2007	40,433	12,868	6,284	8,142	27,998	6,854	102,579
Lower Coal Production Scenario							
2010	45,925	13,103	6,542	8,389	28,459	7,108	109,526
2015	48,905	13,671	6,759	8,867	30,016	7,174	115,392
2020	50,995	14,193	6,989	9,326	31,467	7,208	120,178
Upper Coal Production Scenario							
2010	47,662	13,160	6,570	8,424	28,579	7,137	111,532
2015	51,558	13,763	6,802	8,924	30,214	7,219	118,480
2020	54,943	14,313	7,045	9,403	31,733	7,266	124,703

Source: U.S. Census Bureau (2007 - historical data) and PRB Coal Review Task 3C Report (BLM 2005e)

This FEIS presents BLM's analysis of environmental impacts under authority of the NEPA and associated rules and guidelines. BLM will use this analysis to make a leasing decision. The decision to lease these lands is a necessary requisite for mining, but it is not in itself the enabling action that will allow mining. The most detailed analysis prior to mine development would occur after the lease is issued, when the lessee files an application for a surface mining permit and mining plan approval, supported by extensive mining and reclamation plans, to the WDEQ/LQD.