

EXECUTIVE SUMMARY

BACKGROUND AND OVERVIEW

This Environmental Impact Statement (EIS) has been prepared by the Montana Department of Environmental Quality (DEQ) and the U.S. Department of the Interior (DOI), Office of Surface Mining Reclamation and Enforcement (OSMRE) Western Region Office, in cooperation with the DOI Bureau of Land Management (BLM) Miles City Field Office. This EIS analyzes the potential environmental effects of a proposed new permit area (C2011003F) known as Area F (project or project area) at the Rosebud Mine, which is an existing 25,455-acre surface coal mine annually producing 8.0 to 10.25 million tons of low-sulfur subbituminous coal (see **Section 2.2, Existing Operations**). Western Energy Company (Western Energy), a subsidiary of Westmoreland Coal Company (Westmoreland), is the operator of the Rosebud Mine and the project proponent.

The Rosebud Mine is located in Rosebud County and surrounds the city of Colstrip and the Colstrip Steam Electric Station, which is commonly known as the Colstrip Power Plant (**Figure S-1** and **Figure S-2**). Permit Areas D and E of the Rosebud Mine extend to the east of Colstrip for 3.5 miles, and Permit Areas A, B, and C extend 12 miles to the west of Colstrip. The project area would be located adjacent to the western boundary of Area C (**Figure S-2**) in Township 2 North, Range 38 and 39 East, and Township 1 North, Range 39 East, and would expand the mine to the west into Treasure County. Situated in the northern Powder River Basin, the Rosebud Mine is generally east and north of the Little Wolf Mountains. Tributaries of Horse Creek and West Fork Armells Creek, including Black Hank Creek, Donley Creek, Robbie Creek, and McClure Creek (all of which lie within the drainage of the Yellowstone River), drain the project area. A ridge in the western portion of the project area divides the Horse Creek and West Fork Armells Creek drainages.

If DEQ approves the Area F permit (C2011003F) and a new federal mining plan for the project area is approved as proposed, then 6,746 permit acres would be added to the Rosebud Mine (see **Section 2.4, Alternative 2 – Proposed Action**), and, at the current rate of production, the operational life of the mine would be extended by 8 years. Without the addition of the project, the operational life of the Rosebud Mine would be expected to end in 2030, which is the expected end of operation for the currently mined Permit Area B, one of three active permit areas (see **Section 2.2.6, Life of Operations**). Although the project area would be a new permit area and an expansion of the Rosebud Mine's surface disturbance, Western Energy does not propose to increase the total annual production output of the mine.

The area of disturbance within the project area would be 4,260 acres. Of these, 2,159 acres would be disturbed by mining; the remainder would be disturbed by highwall reduction, soil storage, scoria pits, haul-road construction, and other miscellaneous activities. The surface of the permit area is entirely privately owned, but the subsurface is both privately (3,479 acres) and federally (3,267 acres) owned. Western Energy holds leases for the federal (M82186) and private coal (G-002 and G-002-A). Current surface land uses in the project area include grazing land, pastureland, cropland, and wildlife habitat. A county road, a gas-transmission pipeline, and high-voltage electric transmission lines cross the project area.

Mining operations in the project area, which would commence after all permits and approvals have been secured and a reclamation and performance bond has been posted, would last 19 years. Western Energy estimates that 70.8 million tons of recoverable coal reserves exist in the project area and would be removed during the 19-year operations period. As with other permit areas of the Rosebud Mine, all coal would be sold and combusted locally at two power plants—the Colstrip and Rosebud Power Plants (see **Section 1.2.2, Coal Combustion**).

A single EIS has been prepared (DEQ and OSMRE 2013) to meet the requirements of the Montana Environmental Policy Act (MEPA) (Title 75, Chapter 1, Parts 1 through 3, of the Montana Code Annotated [MCA]) and its implementing rules (Administrative Rules of Montana [ARM] 17.4.601 et seq.); the National Environmental Policy Act (NEPA) (42 United States Code [USC] Section 4321 et seq.); the Council on Environmental Quality’s (CEQ’s) NEPA regulations (40 Code of Federal Regulations [CFR] Parts 1500 to 1508); DOI’s NEPA regulations (43 CFR 46) and Department Manual 516; and the OSMRE *NEPA Handbook* (OSMRE 1989). The BLM *NEPA Handbook* (BLM 2008) also was considered in the preparation of the document.

This EIS will help DEQ managers make a more fully informed decision with respect to the approval of Western Energy’s mine permit application package (PAP) for the project area (see **Appendix A** for links for digital download). DEQ will decide whether to approve the permit in accordance with the requirements of the Montana Strip and Underground Mine Reclamation Act (MSUMRA) (82-4-201 et seq., MCA) and its implementing regulations (ARM 17.24.301-1309). DEQ may not withhold, deny, or impose conditions on the Area F permit based on the information contained in this EIS per 75-1-201(4), MCA.

This EIS also will help DEQ managers make a more fully informed decision regarding two other Western Energy applications: (1) an application for a new Montana Pollutant Discharge Elimination System (MPDES) permit MT-0031828 for project area outfalls that would discharge into West Fork Armells Creek, and (2) an application to modify Montana Air Quality Permit (MAQP) #1570-07 to include the project area.

This EIS will help OSMRE prepare the Mining Plan Decision Document (MPDD) for the DOI Assistant Secretary for Land and Minerals (ASLM) recommending approval, disapproval, or conditional approval of the project area mine plan. A MPDD will be prepared because Western Energy’s proposed project constitutes a major revision to the current Rosebud Mine operations. BLM is a cooperating agency on this EIS because it is the federal agency responsible for leasing federal coal lands under the Mineral Leasing Act (MLA) of 1920, as amended (30 USC Section 181 et seq.).

The decision regarding a selected alternative and supporting reasoning will be documented in two Records of Decision (RODs), one issued by DEQ and one issued by OSMRE. DEQ’s ROD will be issued as a document identified as Written Findings at least 15 days after the Final EIS is published. OSMRE’s ROD will be released along with the ASLM decision on the MPDD within 90 days after the Final EIS is published. BLM will not issue a ROD but will make a finding and recommendation on OSMRE’s MPDD with respect to Western Energy’s Resource Recovery and Protection Plan and other requirements of the federal lease.

History of Mine Operations at Colstrip

Coal has been mined at Colstrip for over 90 years. The Northern Pacific Railway established the city of Colstrip and its associated mine in the 1920s to access coal from the Fort Union Formation. The Rosebud Mine operation began production in 1968. In 2001, Westmoreland purchased the Rosebud Mine; its subsidiary, Western Energy, continues to operate the mine today. Past and current mine operations are described in detail in **Section 2.2, Description of Past and Existing Mine and Reclamation Operations** and summarized below.

The Rosebud Mine produces 8.0 to 10.25 million tons of low-sulfur (0.64 percent) subbituminous coal annually and 300,000 tons of high-sulfur “waste coal” annually (Spang 2013). Between 1975 and 2016, Western Energy recovered a total of 462,192,473 tons of coal from the Rosebud Mine (Peterson 2017). Currently, three active pits at the Rosebud Mine operate under permits issued by DEQ: Area A (4,262

acres, permit C1986003A), Area B (6,231 acres, permit C1984003B), and Area C (9,382 acres, permit C1985003C). Two permitted mine areas are no longer actively mined and are being actively reclaimed: Area D (4,554 acres, permit C1986003D) and Area E (formerly 1,470 acres, now 1,026 acres after Phase IV Bond release, permit C1981003E).

Production from the Rosebud Mine is limited by the conditions of its DEQ-issued air quality permits. MAQP #1483-08 limits annual coal production from Areas A, B, and D to 13 million tons per year. Coal production from Areas C and F is limited to 8 million tons per year per MAQP #1570-08 with an Area F-specific production cap of 4 million tons per year per the Preliminary Determination (PD) for MAQP #1570-07 (see **Section 1.4.1.2, Montana Department of Environmental Quality, Clean Air Act of Montana**). Western Energy has one MPDES Permit (MT-0023965) that covers discharge of mine drainage and drainage from existing coal preparation areas, coal storage areas, and reclamation areas into 151 outfalls (see **Section 1.4.1.2, Montana Department of Environmental Quality, Montana Water Quality Act**).

Coal Combustion

Although the Rosebud Mine has shipped coal by rail as recently as 2010, all coal currently produced by the mine is consumed locally at the Colstrip Power Plant and the Rosebud Power Plant (**Figure S-2**). Coal mined in the proposed project area would be burned in Units 3 and 4 of the Colstrip Power Plant and in the Rosebud Power Plant. Operational information about the two power plants is summarized below and detailed in **Section 1.2.2, Coal Combustion**.

Colstrip Power Plant

The Colstrip Power Plant is located in the city of Colstrip and surrounded by permit areas A, B, D, and E of the Rosebud Mine. It is operated by Talen Energy (formerly PPL Montana) and currently owned by Talen Energy, Puget Sound Energy Inc., Portland General Electric Company, Avista Corporation, PacifiCorp, and NorthWestern Energy. The Rosebud Mine delivers between 7.7 and 9.95 million tons of coal annually to the Colstrip Power Plant primarily by a covered conveyor system (shown on **Figure S-2**), although some coal from Area A is transported by haul truck.

The Colstrip Power Plant has four coal-fired generating units capable of producing a total of 2,100 megawatts of electricity and is the second-largest coal-fired plant west of the Mississippi River. Units 1 and 2 were constructed in 1972 and began commercial operation in 1975 and 1976. Each unit has about 307 megawatts of generating capacity. Under a 2016 consent decree, Colstrip Units 1 and 2 must cease operations on or before July 1, 2022. Units 3 and 4 started operating in 1984 and 1986, and each has about 740 megawatts of generating capacity (PPL Montana 2014). Power from the Colstrip Power Plant is marketed through the Western Electricity Coordinating Council, a regional member of the North American Electricity Reliability Council that includes all of the western states and the Canadian provinces of Alberta and British Columbia.

Rosebud Power Plant

The Rosebud Power Plant is a 38-megawatt coal-fired power plant located 6 miles north of the city of Colstrip (shown on **Figure S-2**) that has been operating commercially since May 1990. It is owned by Rosebud Energy Corporation, Harrier Power Corporation (Paragon), and Colmac Montana Inc. The Rosebud Power Plant was designed to burn low-BTU (British thermal unit) “waste coal” from the Rosebud Mine, which is coal not suitable for use at the Colstrip Power Plant due to the high sulfur content and low calorific value. This waste coal is typically encountered horizontally in the top 1-foot layer of the Rosebud deposit (see **Section 3.6, Geology**). Western Energy hauls 300,000 tons of coal

annually from the Rosebud Mine (via a fleet of five covered haul trucks) to the Rosebud Power Plant (Spang 2013).

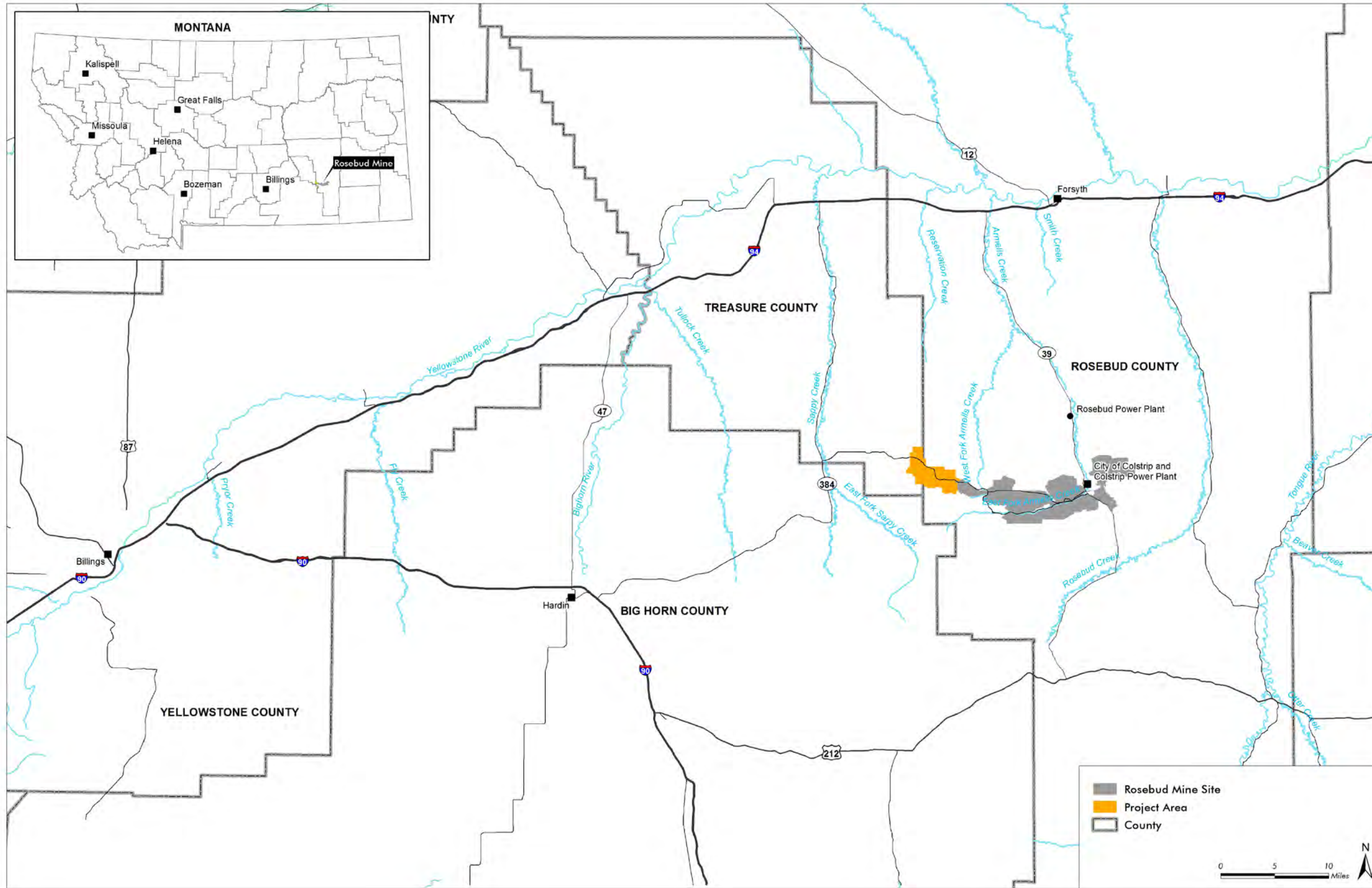


Figure S-1. Project Location.

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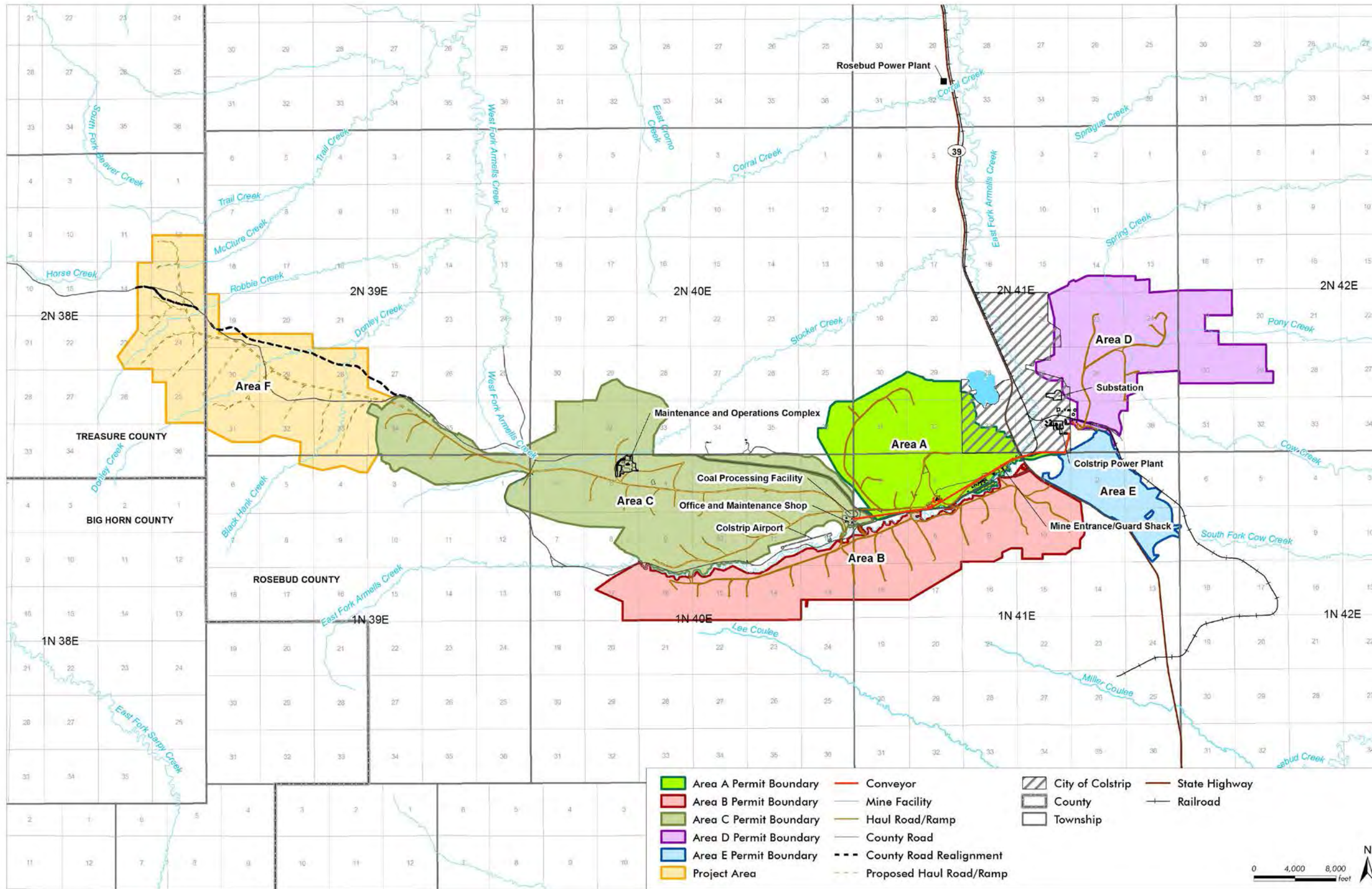


Figure S-2. Location of Mine Facilities and Permit Areas.

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PURPOSE, NEED, AND BENEFITS

As described in NEPA, purpose and need are used to define the range of alternatives analyzed in an EIS (40 CFR 1502.13). Each agency’s statutory authorities and policies determine its underlying purpose and need. MEPA and its implementing rules, ARM 17.4.614(1), require that any EIS prepared by a state agency include a description of the purpose and benefits of the proposed project. The purpose, need, and benefits of the Proposed Action are described in the sections below.

Purpose

The purpose of the Proposed Action is to allow continued operations at the Rosebud Mine by permitting and developing a new surface-mine permit area known as permit Area F. This EIS evaluates the environmental effects of the Proposed Action (and alternatives). DEQ’s purpose is to review and make a decision on Western Energy’s surface-mine operating permit application under MSUMRA, Section 82-4-221 et seq., MCA (see **Section 1.4.1.2, Montana Department of Environmental Quality**). OSMRE’s purpose is to review and make a recommendation to the ASLM (in the form of a MPDD) to approve, disapprove, or approve with conditions the proposed federal surface mine plan for the project area (see **Section 1.4.1.1, Office of Surface Mining Reclamation and Enforcement**). The ASLM will decide whether the mining plan is approved, disapproved, or approved with conditions.

Need

Western Energy is required to obtain a surface-mine operating permit (pursuant to MSUMRA) and approval of a federal surface-mine plan (30 CFR 746) for the project area in order to access additional coal reserves needed to fulfill contractual obligations to its customers, the Colstrip and Rosebud Power Plants. The OSMRE need for the action is to provide Western Energy the opportunity to exercise its valid existing rights (VER) granted by BLM under federal coal lease M82186 to access and mine undeveloped federal coal resources located in the project area. In addition, it is OSMRE’s responsibility under the Surface Mining Control and Reclamation Act (SMCRA) Public Law 95-87, Title I, Section 102 to “assure that the coal supply essential to the Nation’s energy requirements and to its economic and social well-being is provided and strike a balance between protection of the environment and agricultural productivity and the Nation’s need for coal as an essential source of energy.” Further, the need for the action is to provide Western Energy the opportunity to develop privately held leases (G-002 and G-002-A) for coal resources located in the project area within the bounds of all applicable laws, regulations, and policies.

The DEQ need for the action is to analyze the potential environmental impacts from the project in order to make a more fully informed decision prior to approval or disapproval of the permit application under Section 82-4-227, MCA. DEQ is responsible for ensuring that when there may be significant environmental impacts, a Final EIS is completed and published at least 15 days prior to the release of DEQ’s written findings on the permit application.

Benefits

The project would provide the following federal, state, and local benefits:

- an ongoing fuel source (70.8 million tons of coal) for the Colstrip Power Plant (Units 3 and 4) and the Rosebud Power Plant
- continued employment for workers at the mine
- an ongoing tax base to federal, state, and local governments
- ongoing royalty payments to mineral resource owners

- continued support to local businesses
- an ongoing source of income to Western Energy and its shareholders
- reliable electric power for an additional 8 years

AGENCY AUTHORITY AND ACTIONS

Two lead agencies are responsible for the analysis of this project: OSMRE and DEQ. BLM is acting as a cooperating agency. A single EIS for the Western Energy Area F Project is being prepared to provide a coordinated and comprehensive analysis of potential environmental impacts. Before implementation of the proposed project could begin, various other permits, such as an air quality permit and a MPDES permit from DEQ, as well as various other certificates, licenses, or approvals would be required from multiple state and federal agencies. The applicable statutes and regulations for each lead agency, as well as the decisions to be made, are described in the EIS in **Section 1.4, Agency Authority and Actions**. Two tables in that section summarize the other state and federal approvals needed for the project.

The State-Federal Cooperative Agreement (Agreement) between DEQ and OSMRE (codified in 30 CFR 926.30) outlines the decision process for a surface coal mine in Montana (MT). Under the Agreement, DEQ reviews an operator's (in this case, Western Energy's) PAP to ensure the permit application complies with the permitting requirements and that the coal-mining operation would meet the performance standards of the approved MT program as outlined in MSUMRA (Section 82-4-221 et seq., MCA) and its implementing regulations (ARM 17.24.301-1309). OSMRE, BLM, and other federal agencies such as the U.S. Fish and Wildlife Service (USFWS) review the PAP to ensure it complies with the terms of the coal lease(s), MLA, NEPA, and other federal laws and regulations. DEQ makes a decision to approve or deny the permit application component of the PAP in accordance with MSUMRA. OSMRE, in accordance with 30 CFR 746.1 through 746.18, reviews DEQ's permit and recommends approval, disapproval, or conditional approval of the mining plan to the ASLM.

SCOPING AND KEY ISSUE IDENTIFICATION

Scoping

During formal public scoping, DEQ and OSMRE sought input from the public, interested organizations, tribes, and government agencies. DEQ held its public scoping period between October 5 and November 5, 2012, and hosted two public open houses in Colstrip on October 16, 2012. OSMRE held its public scoping period between August 27 and November 8, 2013, and hosted an open house and hearing in Colstrip on September 12, 2013.

The intent of the scoping process was to gather comments and concerns from those who have interest in, or may be affected by, the Proposed Action and to identify key issues for analysis and alternatives development. A detailed accounting of DEQ and OSMRE scoping processes can be found in the Public Scoping Report (ERO 2013a) and Public Scoping Report II (ERO 2013b), respectively. Both reports are available on the agencies' websites: <http://deq.mt.gov/Public/eis> (DEQ) and <http://www.wrcc.osmre.gov/initiatives/westernEnergy.shtm> (OSMRE).

Key Analysis Issues

Eight key issues were identified through the public and agency scoping process and used to guide the EIS interdisciplinary team's analysis and alternatives development. These issues include effects on surface and ground water quality and quantity (Issues 1 and 2), effects on wetlands (Issue 3), effects on wildlife and key habitats (Issue 4), effects of the Proposed Action and continued operation of existing power

plants on climate change (Issues 5 and 6), effects on human health (Issue 7), and reclamation (Issue 8). See **Section 1.5.2.1, Key Issues Identified During Scoping for Detailed Analysis** for a description of these issues.

Tribal Consultation

OSMRE initiated tribal consultation with the Northern Cheyenne, Fort Peck Assiniboine and Sioux, and Crow Tribes on April 14, 2014, regarding the identification of and effects on traditional cultural properties and archeological sites of significance to the tribes (see **Section 6.1.3, Tribal Consultation Process**).

ALTERNATIVES ANALYZED

Alternatives were developed based on requirements for alternatives under regulations and rules implementing NEPA and MEPA. NEPA regulations do not specify the number of alternatives that need to be considered by federal agencies, including OSMRE, in the EIS but indicate that a reasonable range of alternatives should be evaluated (40 CFR 1502.14). Likewise, MEPA regulations require a “reasonable alternatives analysis.” In addition, both NEPA and MEPA regulations require analysis of a “no action alternative” in an EIS. Under MEPA, DEQ is required to consider alternatives that are realistic and technologically available and that represent a course of action that bears a logical relationship to the proposal being evaluated, per ARM 17.4.603(2)(b).

Besides the No Action Alternative (Alternative 1) and the Proposed Action (Alternative 2), one action alternative was considered (Alternative 3) in this EIS. Alternatives 1, 2, and 3 are summarized below and described fully in **Chapter 2**.

Alternative 1 – No Action

Alternative 1 (**Section 2.3, Alternative 1 – No Action**) considers a scenario where federal and private coal in the project area would not be mined; the project Purpose and Need (**Section 1.3, Purpose, Need, and Benefits**) relates to both lease types. As described in **Section 1.6.2, Private Coal Alternative**, it would not be economically feasible to mine private coal without the federal coal leases in the project area.

Under the No Action Alternative, Western Energy’s application for the project would not be approved by DEQ for one or more of the conditions outlined in **Section 1.4.1.2, Montana Department of Environmental Quality, Conditions for Denial**. Without an approved state permit, OSMRE would not make a recommendation to the ASLM regarding a federal mining plan for the project. Without an approved permit and federal mining plan, Western Energy would not develop the project, resulting in 33,885,390 tons of federal coal not being recovered from lease M-82816 and 37,036,115 tons of private coal not being recovered from private leases G-002 and G-002a. It would also result in 4,260 acres of previously undisturbed ground not being disturbed. The environmental, social, and economic conditions described in **Chapter 3** would continue, unaffected by the construction and operation of the project. The conditions under which OSMRE could select the No Action Alternative or DEQ could deny Western Energy’s application for an operating permit for the project area, MPDES permit, or air quality permit are described in **Section 1.4, Agency Authority and Actions**.

Under the No Action Alternative, project coal would not be available for combustion in the Colstrip Power Plant or the Rosebud Power Plant. For analysis purposes, this EIS assumes that the power plants would continue operations as described in **Section 1.2.2, Coal Combustion at Colstrip**. Selection of the No Action Alternative would not change the status of the other five areas of the Rosebud Mine that are currently permitted and being mined and/or reclaimed by Western Energy (see **Section 2.2, Description**

of Existing Mine and Reclamation Operations), nor would it change the status of other areas of the Rosebud Mine that are in the permitting process (see **Section 5.2.2, Related Future Actions**).

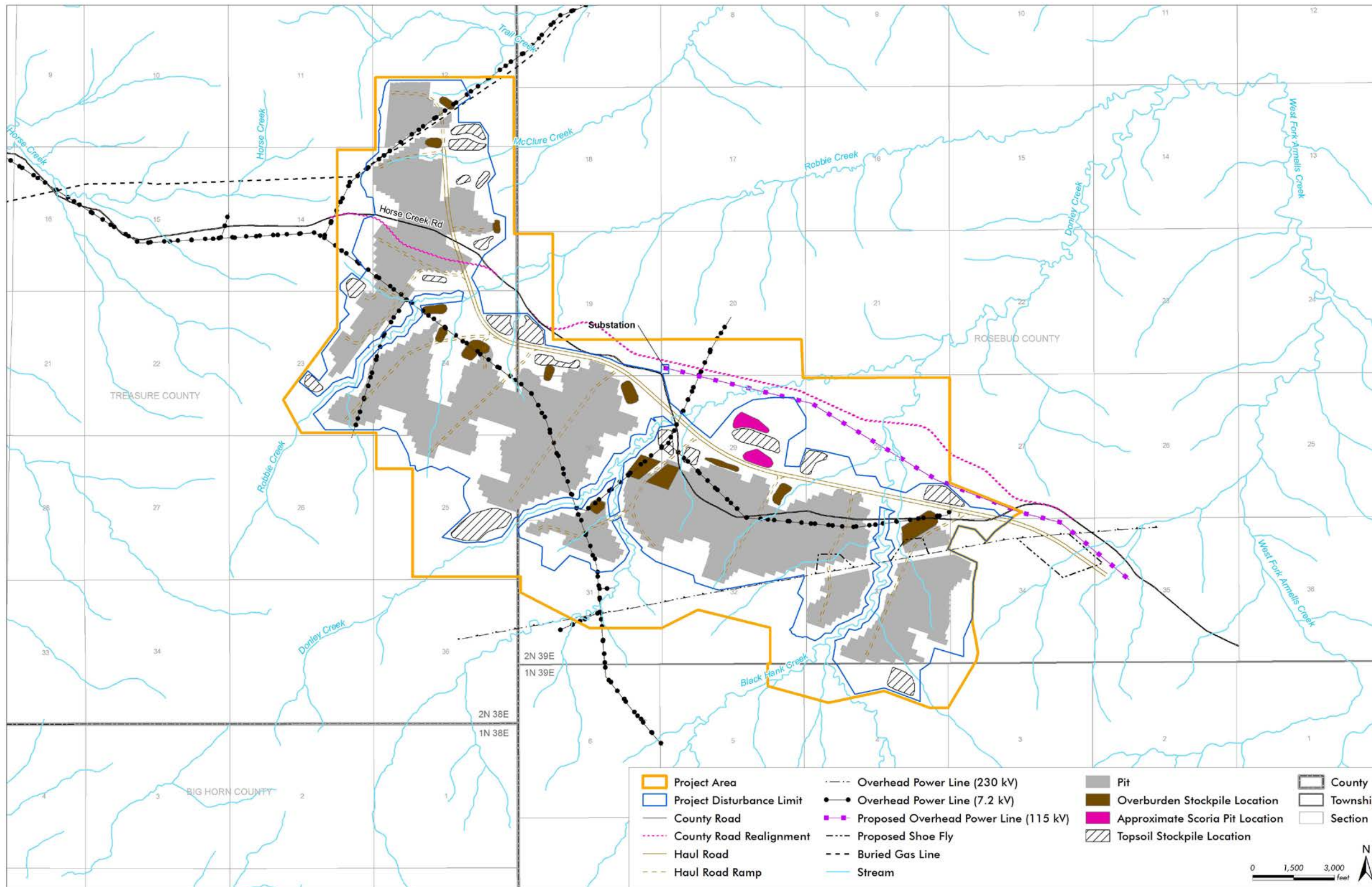


Figure S-3. Proposed Project Area, Alternative 2.

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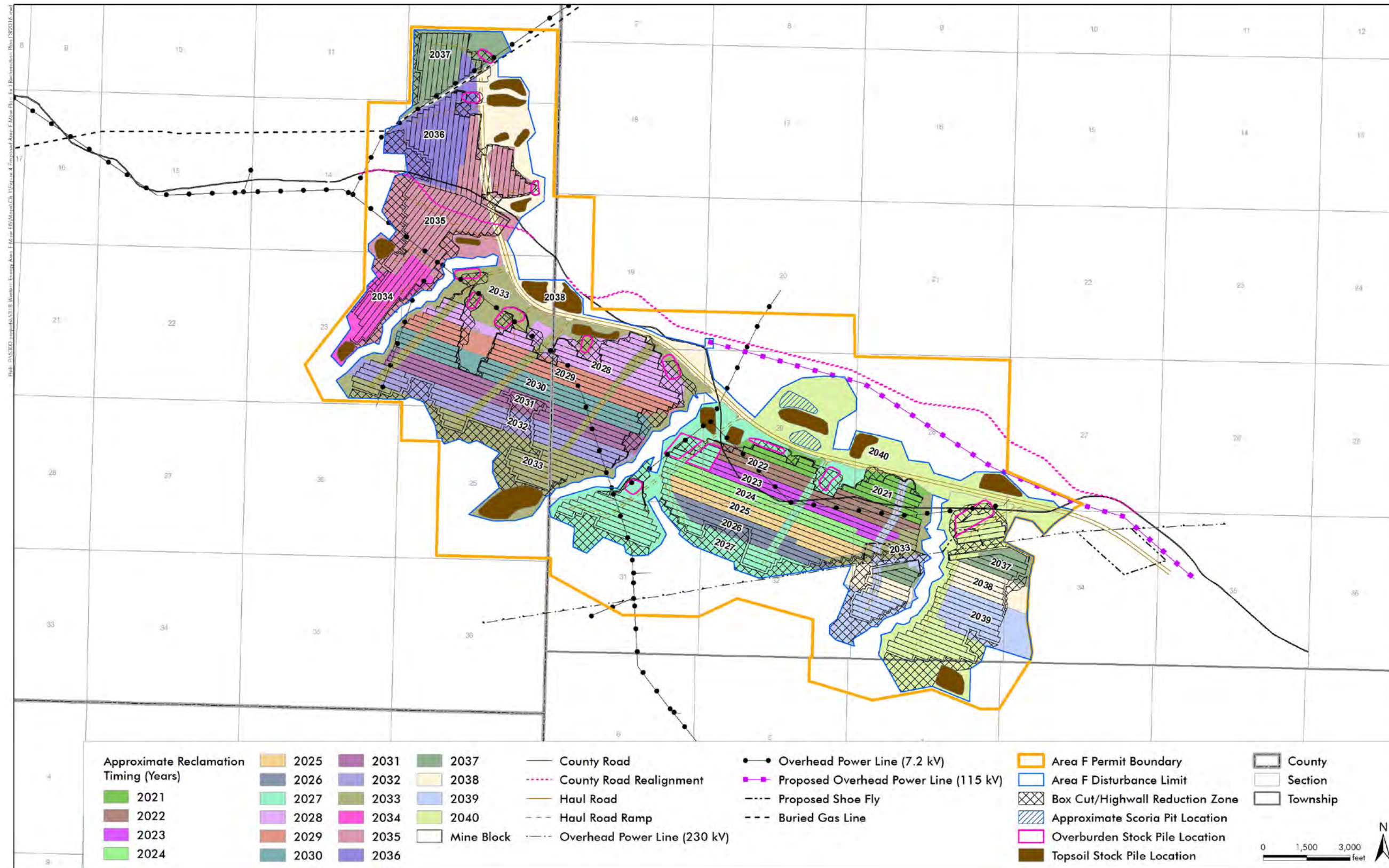


Figure S-4. Proposed Area F Reclamation Plan (Grading, Application of Soil, and Seeding). [Please note that years in the figure show the relative sequence, but may not be the actual year of reclamation]

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Alternative 2 – Proposed Action

Alternative 2 is the Proposed Action as put forward by Western Energy in its application to DEQ for a new surface-mine operating permit for the project area; it is summarized below and described in detail, including the proposed sequence of operations, reclamation plan, measures to protect the hydrologic balance, and proposed monitoring and mitigation measures, in **Section 2.4, Alternative 2 – Proposed Action**. For purposes of preparing this EIS, Alternative 2 assumes that Western Energy has addressed all of the permit application deficiencies identified by DEQ (see **Appendix B** for DEQ’s most recent deficiency letter).

After operational start-up, Western Energy proposes to mine 2,159 acres within the proposed 6,746-acre permit area (**Figure S-3**). During the first 12 years of production, 4 million tons of coal would be mined annually, with the rate dropping to 3.25 million tons annually during the last 7 years of production. Proposed mine features for the project area include mine pits, scoria pits, soil stockpiles, overburden stockpiles, haul roads, haul-road ramps, and the area of disturbance.

Mining in the first 6 years would occur between Donley Creek and Black Hank Creek and in a small section east of Black Hank Creek. In years 7 through 13, mining would occur between Robbie and Donley Creeks, except for several passes on the west side of Robbie Creek. In years 14 through 16, mining would occur between McClure Creek and Robbie Creek. In year 17, mining would be north of McClure Creek before moving to the area west of Black Hank Creek that would be mined in the final 2 years of mine life in the project area.

The coal-mining method proposed for the project area would be the same area surface-mining method that Western Energy currently uses in other permitted areas (A, B, C, D, and E) of the Rosebud Mine. In advance of each mining pass, soil would be removed from the area and stockpiled according to type for later use during reclamation. Next, the overburden (material covering the coal seams) would be drilled and blasted. Overburden from the initial cut would be stockpiled as spoil. A dragline (or mobile equipment in some limited instances) would then be used to strip the overburden from succeeding mine passes. Spoil would be cast into the mined-out pit created by the preceding pass.

After the dragline exposes the coal seam in each pass, the coal would be drilled and blasted. A loading shovel, front-end loader, or backhoe would load blasted coal into coal haulers. The coal would be transported on an established haul road to Area C or Area A for crushing (**Figure S-2**). After crushing, most of the coal would be sent via an existing 4.2-mile conveyor to the Colstrip Power Plant. Coal with higher sulfur content (an estimated 105,000 tons/year from the project area) would be trucked to the Rosebud Power Plant, which is also in Colstrip.

To accommodate the proposed mine plan, Western Energy proposes to mine around an electric-transmission line and a gas-transmission pipeline that cross the project area and to relocate portions of the electric distribution lines that run throughout the project area. Western Energy also proposes to relocate Horse Creek Road, a county road that transverses the project area. Specifically, a 4.2-mile segment of Horse Creek Road in the northwest/north-central portion of the permit area (owned and maintained by Rosebud County) and a 1.3-mile segment in the northwestern portion of the permit area (owned and maintained by Treasure County) would be rerouted. The road relocation would be done in two phases. The longer segment, which is in Rosebud County, would be relocated during initial development of the project. The west end of the realignment, which is in Treasure County, would be relocated when mining moves into the northwestern corner of the project area (about 12 years later).

Reclamation would begin within two years of mining the initial pass and would continue as subsequent mine passes are completed until Phase IV bond release (**Figure S-4**). Reclamation would facilitate the

following postmine land uses: grazing land, cropland, and wildlife habitat. The major reclamation steps planned to occur before and after mining include, but are not limited to, soil-material salvage and redistribution, pit backfilling, grading and contouring to the postmining topography, drainage construction, revegetation, and postmine monitoring. In addition to the reclamation of the landscape disturbed by mining operations, other disturbed areas that would require reclamation include the road system, mine plant facilities, sedimentation ponds, and temporary diversion structures.

Alternative 3 – Proposed Action Plus Environmental Protection Measures

Alternative 3 is summarized below and described in **Section 2.5, Alternative 3 – Proposed Action Plus Environmental Protection Measures**. Under this alternative, which is sometimes referred to as the Action alternative in this EIS, OSMRE would require Western Energy to implement additional environmental protection measures that are above and beyond the requirements of MSUMRA. These measures are conceptual in nature and were designed to minimize environmental effects and to address key issues identified during the scoping process (see **Section 1.5.2.1, Key Issues Identified During Scoping for Detailed Analysis**).

Under this alternative, Western Energy would develop, mine, and reclaim the project area as proposed in the PAP with the exception of those areas where OSMRE has prescribed environmental protection measures. Required measures would include development of a water-management plan, additional requirements for the wetland mitigation plan, and development of practices designed to improve reclamation (soil stockpiling, soil redistribution, and drainage-basin design) and revegetation success for wildlife habitat. Alternative 3 also includes requirements for a geological survey and paleontology mitigations.

Alternatives Considered but Dismissed

Alternatives considered but dismissed from further analysis are also described in **Chapter 2**. Seven alternatives were suggested by the public in scoping comments or by specialists based on professional experience but were not analyzed in detail for a variety of reasons, including operational feasibility and failure to meet the project Purpose and Need. Dismissed alternatives include: (1) coal conservation; (2) private coal-mining; (3) underground mining; (4) mining within a smaller disturbance area, for a shorter duration, and/or within a different timeframe; (5) transporting coal by rail to western and international ports; (6) alternative land uses; and (7) alternative energy generation.

AFFECTED ENVIRONMENT

Twenty-three resource areas were analyzed in detail in the EIS. The following paragraphs provide a brief summary of the resources, analysis areas, and baseline conditions described in **Chapter 3, Affected Environment**. One resource, alluvial valley floors (AVF), was considered but was dismissed from detailed analysis following DEQ's AVF determination (see **Section 3.25, Resources Considered but Dismissed**).

Topography (Section 3.2). The project area is located in the Pine Breaks region of southeastern MT and is distinguished from neighboring plains areas by its more rugged topography. Prominent monoliths of eroded sandstone exist in some parts of the project area. The analysis area used to assess direct and indirect effects on topography is the 4,260-acre mining disturbance area, which includes all mining areas, stockpiles, scoria pits, haul roads, and haul-road ramps.

Air Quality (Section 3.3). The analyses are used to assess direct and indirect effects on air quality in a rectangular region that encompasses a 300-kilometer-radius extent from the power plants. This area was

conservatively chosen due to the long-range transport of pollutants from the elevated stacks of the Colstrip and Rosebud Power Plants. All of the reported concentrations from monitoring sites in MT are well below the national and state standards, and in the entire analysis area, only a single SO₂ monitor, located over 400 kilometers from the project area, reported values that exceeded the national standard.

Climate and Climate Change (Section 3.4). The Rosebud Mine falls within the Great Plains climate region, where winters are long and severe in the north (including MT) with average annual temperatures around 40°F. Regional greenhouse gas emissions were assessed using the same analysis area as for air quality. The Great Plains region has seen heavier and more frequent rainfall and has seen a 16-percent increase in rainfall from heavy precipitation events since 1958. Rising temperatures are leading to increased demand for water and energy, and changes in crop growth cycles due to warming winters and changes in rainfall have been observed. Trends in greenhouse gas emissions at national and global scales show a long-term increase in global carbon dioxide concentrations—the primary indicator of global warming.

Public Health (Section 3.5). The analysis area for direct effects on public health is the project area; for indirect effects, the analysis area was expanded to include local communities and populations including the city of Colstrip, the Northern Cheyenne Indian Reservation, the Crow Reservation, and the town of Lame Deer. Quality of life in the analysis area is relatively low compared to other MT counties. Rates of premature deaths are nearly twice that of MT as a whole, while adult smoking, obesity, and physical inactivity occur at greater rates. Chronic disease (cardiovascular disease, diabetes, cancer, asthma, etc.) rates generally are higher in the analysis area than in the rest of MT. Incidence rates of infectious diseases within the analysis area are not remarkably different from the state's rates, except for sexually transmitted diseases and salmonellosis incidence, which are both higher in the analysis area than in the rest of MT. Deaths by injury rates are higher compared to the rest of the state. The analysis area has a relatively poor food environment compared to both MT and the United States, indicating that nutritional health of the communities is poor, and access to healthy food is limited.

Geology (Section 3.6). The Rosebud Mine is located in the northwestern portion of the Powder River structural basin, a broad northeast-trending synclinal structural basin in eastern Wyoming and southeastern MT bounded on three sides by mountain uplifts. The analysis area for direct and indirect effects on geology was defined as the project area. The Paleocene Fort Union Formation is the predominant bedrock unit within this analysis area and consists of gently dipping (less than a few degrees) sedimentary rocks. The Fort Union Formation is composed of sandstone, siltstone, mudstone, claystone, and coal beds. Coal targeted for removal in the project area is within the Tongue River Member of the Fort Union Formation.

Water Resources – Surface Water (Section 3.7). The analysis area for direct effects on surface water quantity and quality was defined as streams that may be impacted by mining in the project area by changes in flow and/or changes in water quality. The analysis area included locations where project mining and related disturbances would occur and the watersheds of the streams in and downstream of the project area that flow through or receive water from the mining disturbance area (e.g., West Fork Armells Creek). The water quality of surface water resources in the direct effects analysis area, specifically within the proposed Area F permit boundary, represents largely natural conditions that have been minimally affected by human-made disturbances within or upstream of the project area. Water quality is variable in the project area primarily due to the dominance of either direct runoff from snowmelt or rainfall or ground water discharge to surface water during various times of the year.

Indirect effects were assessed in an analysis area that included all of the Armells Creek watershed and parts of the Sarpy Creek and Rosebud Creek watersheds within and downstream of a 32-kilometer circular area determined by mercury-deposition modeling completed for special status species. Within the

last 5 years, mercury, selenium, and copper concentrations in the streams where data have been collected have nearly all been low: most results were well below standards except for selenium in the East Fork Armells Creek in Colstrip and in Spring Creek. Within the last 5 years, nitrate+nitrite and total nitrogen concentrations in the streams where data have been collected have nearly all been low: there were total nitrogen concentrations approaching the standard in Rosebud Creek upstream of Pony Creek and in Spring Creek near the mouth.

Water Resources – Ground Water (Section 3.8). The analysis area for direct effects on ground water hydrology and quality was defined as the project area and the surrounding area where direct effects on ground water are predicted to occur based on ground water modeling. Six hydrostratigraphic units, which combine various lithologic units, were modeled and assessed: alluvium, overburden (all lithologies that overlie the Rosebud Coal, including clinker), Rosebud Coal, interburden (Tongue River Member between the Rosebud and McKay Coals), McKay Coal, and Sub-McKay (Tongue River Member below the McKay Coal). Ground water in the area around the project area is used for both stock and rural domestic water needs. Well yields are generally low (less than 10 gallons per minute [gpm]) but adequate for the intended use, which is stock watering. Ground water wells produce water from the various sandstone units of the Tongue River Member and the thicker coals, such as the Rosebud and McKay Coals.

The analysis area for indirect effects on ground water was defined as the property boundary of the Colstrip Power Plant and the area around the Rosebud Power Plant. The analysis area includes similar geology and ground water hydrology as the project area.

Water Resources – Water Rights (Section 3.9). The analysis area for direct impacts on surface water rights and ground water rights was defined as the project area as well as the surrounding area that may be affected by mining in the project area. Indirect impacts on surface water rights were assessed within the same analysis area as for surface water. Indirect impacts on ground water rights were assessed within the same analysis area as for ground water. There are 122 surface water and ground water rights on record within and near the project area as well as downgradient water rights that may be affected by mine operations; nearly all are for stock water use, and a few are for domestic use.

Vegetation (Section 3.10). The analysis area for direct effects on vegetation was defined as the project area. The analysis area for indirect effects on vegetation was defined as the operational boundaries of the Colstrip and Rosebud Power Plants plus a 32-kilometer area around each of the power plants using trace-metal deposition modeling completed for special status species. Both the direct and indirect effects analysis areas have limited human disturbance, but some vegetation communities have been affected by livestock grazing, agriculture, roads, utility corridors, and wildfire. Six major vegetation communities were identified in the direct effects analysis area: grassland, conifer (Ponderosa pine)/sumac, sagebrush, pastureland, mixed shrubland, and woody draw. Similar communities were identified in the indirect effects analysis area.

Wetlands and Riparian Zones (Section 3.11). Based on baseline inventories of wetlands, the analysis area for direct impacts on wetlands and riparian zones was defined as the project area plus a 500-foot buffer. Indirect impacts on wetlands and riparian zones were assessed within the same indirect effects analysis area as for surface water resources. The project area supports few (11) wetlands because of its location near the top of the watershed and the semiarid climate; however, more wetlands are present within the proposed Area F permit boundary than in other Rosebud Mine permit areas.

Fish and Wildlife Resources (Section 3.12). The analysis area for direct impacts on fish and wildlife species and their habitats was defined as the project area plus a 1-mile perimeter buffer. Indirect impacts on fish and wildlife species and their habitats were assessed within the operational boundaries of the Colstrip and Rosebud Power Plants plus a 32-kilometer area around each of the power plants based on

trace-metal deposition modeling completed for special status species. Wildlife habitat types within the direct effects analysis area consist primarily of grasslands, conifer/sumac woodlands, and upland shrublands, which together encompass about 80 percent of all habitat types. Agricultural lands and pasture comprise about 15 percent, and interspersed patches of lowlands, sandstone piles/cliffs, and disturbed/developed lands comprise the remaining 5 percent.

Special Status Species (Section 3.13). The analysis area for direct impacts on special status species and their habitats was defined as the project area plus a 15-mile perimeter buffer that included portions of Rosebud and Treasure Counties. Indirect impacts on special status species and their habitats were assessed within the operational boundaries of the Colstrip and Rosebud Power Plants plus a 32-kilometer area around each of the power plants based on trace-metal deposition modeling. A total of 3 federally-listed endangered species and 42 species of concern (7 mammal, 21 bird, 6 reptile, 6 fish, and 2 amphibian species) may be found within the direct and indirect effects analysis areas. Three plant species are listed as federally threatened in MT but do not occur within the direct and indirect effects analysis areas. Thirteen vegetation species of concern potentially occur in the indirect effects analysis area; the direct effects analysis area contains suitable habitat for nine of these species, but none were documented in the project area during the field assessments in 2005–2007 (updated in 2014).

Cultural and Historic Resources (Section 3.14). Impacts on cultural resources were assessed within the 8,280-acre area of potential effect (APE) by two Class III cultural resource surveys completed in 2010 (PAP, Appendix A-1) and 2012 (PAP, Appendix A-2). The APE was defined as the entirety of the project area or the proposed permit boundary. A total of 105 cultural resources were documented within the APE; however, the majority of the sites (81) have been evaluated as not eligible for listing on the National Register of Historic Places (NRHP). Sixteen sites are recommended eligible for listing on the NRHP. Both historic districts intersecting the APE—the Castle Rock and Lee Historic Districts—have been recommended eligible for the NRHP. A programmatic agreement that provides for continued Section 106 compliance for the life of mining operations has been executed between OSMRE, Western Energy, SHPO, DEQ, and BLM.

Socioeconomic Conditions (Section 3.15). The analysis area for direct and indirect socioeconomic impacts was defined as Rosebud, Treasure, and Big Horn Counties. Affected incorporated municipalities in the analysis area include Colstrip, Forsyth, Hysham, and Hardin. Two reservations—the Northern Cheyenne Indian Reservation and the Crow Reservations—are also within the analysis area and comprise the majority of Big Horn County. Coal mining and agriculture both play major roles in Big Horn County's economy. Rosebud County's traditional major industries of coal mining, the railroad, and agriculture remain the driving forces of the area's economy. Rosebud County has experienced a declining economy within the last several decades. Treasure County's principal industries are farming and ranching.

Environmental Justice (Section 3.16). Environmental justice impacts were assessed using the same analysis area as for socioeconomic conditions. The populations living in the analysis area meet the environmental justice guidelines for minority and low-income residents.

Visual Resources (Section 3.17). The analysis area for direct effects on visual resources was defined as the viewshed of the project area, which included the project area and surrounding lands with potential views of the proposed operations (and associated infrastructure). Indirect visual impacts (regional haze) were assessed using the same analysis area as for air quality. The surface within the analysis area has limited visible human disturbance, but some changes to vegetation are evident from livestock grazing, agriculture, roads, utility corridors, and wildfire. The existing Rosebud Mine is located west, south, and east of Colstrip. As expected, the existing mine operations look industrial, with large buildings, conveyors, coal piles, large equipment, draglines, evaporative ponds, and land scars of bare soil from the open pits, maintenance, and haul roads.

Recreation (Section 3.18). The analysis area for direct effects on recreation was defined as the project area plus a 2,000-foot buffer. Hunting for big game (mule deer, white-tailed deer, pronghorn, and elk) and upland birds is the main form of recreation in the analysis area, which is primarily privately owned. Western Energy allows public access to inactive areas of the mine through Montana Fish, Wildlife & Parks' (FWP) Block Management Program.

Paleontology (Section 3.19). Direct and indirect effects on paleontological resources were assessed within the same analysis area as for Geology. A Class III cultural resources and paleontological inventory was conducted in 2012, and no paleontological resources were noted in the analysis area. A 2015 pre-disturbance paleontological resources survey identified nine fossil localities and found that the most common fossils in the analysis area are plant elements.

Access and Transportation (Section 3.20). The analysis area for direct and indirect effects on access and transportation was defined as the project area and the transportation network surrounding the Rosebud Mine and Colstrip and Rosebud Power Plants (i.e., the existing haul road and access roads of the Rosebud Mine, county roads [i.e., Castle Rock Road and Horse Creek Road], the section of State Highway [SH] 39 between the Rosebud Mine and the Rosebud Power Plant, and the Rosebud and Colstrip Power Plants plus an approximate 0.5-mile buffer area around the power plants). The Rosebud Mine is primarily accessed from the east via Castle Rock Road, a Rosebud County road that runs west off of SH 39 about 1 mile south of Colstrip. Major mine facilities such as the mine office, the maintenance shop, and the operations and maintenance complex are located on Castle Rock Road.

Solid and Hazardous Waste (Section 3.21). The analysis area for direct effects from solid and hazardous waste was defined as the Rosebud Mine site, including the proposed project area. The analysis area for indirect effects from coal combustion residuals (CCR) was defined as the sites of the Colstrip and Rosebud Power Plants and the CCR storage area associated with the Colstrip Power Plant. Wastes generated as part of active coal mining within areas A, B, and C of the Rosebud Mine are handled under Western Energy's Waste Management Program, which consists of a Solid and Hazardous Waste Management Plan, a Spill Prevention Control and Counter-Measure Plan, and a Contingency and Emergency Response Plan. Hazardous wastes generated at the Rosebud Mine include greases, lubricants, paints, flammable liquids, solvents, and any other material that meets the definition of a hazardous waste. CCR generated at the Colstrip Power Plant is impounded in ponds at the plant site and at two separate locations about 3 miles east and northwest of Colstrip. CCR generated at the Rosebud Power Plant is conveyed pneumatically to an ash silo for temporary storage, then periodically transferred into a plant-ash truck and transported to an on-site ash monofill disposal area where it is hydrated with industrial wastewater from the plant to consolidate and solidify the ash.

Noise (Section 3.22). The analysis area for direct effects from noise was defined as the nearest residences around the existing Rosebud Mine and proposed project area and within the city of Colstrip. Indirect effects were assessed at residences near the Rosebud and Colstrip Power Plants. Within the Colstrip city limits, existing noise sources include traffic on SH 39 and other local roads, the activities of residents, operation of the Colstrip and Rosebud Power Plants (the Rosebud Power Plant is about 6 miles to the north of Colstrip), and the coal conveyors.

Land Use (Section 3.23). Direct effects on land use were assessed using the same analysis area as for recreation (the project area plus a 2,000-foot buffer). Current surface land uses in the project area include grazing, pastureland, cropland, and wildlife habitat. Indirect effects on land use were assessed at the locations of the Colstrip and Rosebud Power Plants plus a 0.5-mile buffer. The land uses in the indirect effects analysis area primarily consist of agricultural crop production, grasslands, forest/grazing, open grazed sparse woods, and irrigated land.

Soil (Section 3.24). The analysis area for direct effects on soil was defined as the project's 4,260-acre mining disturbance area. Indirect effects on soil were assessed within the operational boundaries of the Colstrip and Rosebud Power Plants plus a 32-kilometer radius around each of the power plants based on trace-metal deposition modeling completed for special status species. According to the baseline soil study, all of the soil in the project area is suitable for use in reclamation and revegetation with the exception of some areas of subsoil that are very rocky and exceed DEQ's guidelines for rock fragments.

POTENTIAL ENVIRONMENTAL IMPACTS

This EIS discloses and analyzes the environmental effects that may result from selection and implementation of the Proposed Action and alternatives described in **Chapter 2**; these effects are presented in **Table S-1** below. Detailed resource impacts analyses are provided in **Chapter 4** (direct and indirect effects) and **Chapter 5** (cumulative effects).

Table S-1. Summary Comparison of Direct and Indirect Environmental Impacts.

| Resource | Alternative 1 – No Action | Alternative 2 – Proposed Action | Alternative 3 – Proposed Action Plus Environmental Protection Measures |
|----------------------------|---------------------------|---|--|
| Topography | No impacts | Changes in topography during mining would be noticeable and would be short-term, major, and adverse. In the years immediately following reclamation, impacts from erosion would be negligible. Over time, differential erosion of the spoil would create a hummocky terrain with fragments of more resistant stone scattered throughout the analysis area; these impacts would be long-term, minor, and adverse. Differential erosion of backfilled areas and unmined drainage basins would result in topographic inversion of the analysis area; these impacts would be long-term, major, and adverse. | Impacts would be similar to those described for Alternative 2. Improved water management during mining may result in decreased short-term erosion rates, and tighter elevation control may result in a more stable land surface. |
| Air Quality | No impacts | Air emissions would not result in exceedances of any NAAQS. Direct and indirect impacts on air quality would be short-term, negligible to minor, and adverse. Deposition impacts would be long-term, negligible to minor, and adverse. | Impacts would be the same as those described for Alternative 2. |
| Climate and Climate Change | No impacts | Direct and indirect greenhouse gas emissions would contribute incrementally to climate change. Direct impacts on climate change would be negligible relative to other sources. The difference in indirect impacts on climate change between the Proposed Action and the No Action Alternative would be negligible. | Impacts would be the same as those described for Alternative 2. |

Table S-1. Summary Comparison of Direct and Indirect Environmental Impacts.

| Resource | Alternative 1 – No Action | Alternative 2 – Proposed Action | Alternative 3 – Proposed Action Plus Environmental Protection Measures |
|---------------|--|---|---|
| Public Health | <p>There would be no immediate effects on the public health of the analysis area’s overall population and sensitive subpopulations, including those with chronic disease and American Indian populations. There may be long-term negligible impacts on public health within the direct effects analysis area resulting from fugitive dust from reclamation activities. If and when the Rosebud Mine does close, revenues that support access to public health services, such as hospitals, libraries, schools, and other services, would cease, resulting in direct and indirect moderate to major long-term effects on social services and resources.</p> | <p>The public’s exposure to diesel particulate matter (DPM) and fugitive dust, including coal dust, would be low due to limited exposure time and extent. Deposition of airborne contaminants of potential concern on soils and surface waters may occur, but it is not likely that the public would be exposed to these except incidentally. Project impacts on air concentrations of PM would result in a short-term minor adverse impact on public health within the project area and public access roads. Members of the public would not be permitted within the project area where PM and other hazardous substances would be present at higher concentrations. Any potential exposure of sensitive receptors to PM would be incidental and limited in duration. Therefore, the direct impacts on public health from PM2.5 and PM10, including from DPM and coal dust, would be short-term, negligible to minor, and adverse. There is a low likelihood that human consumption or contact with contaminated surface or ground water would occur from the Proposed Action. With monitoring and mitigation activities, increased risk to public health from exposure to water because of the Proposed Action is not likely. The Proposed Action would have a short-term moderate beneficial impact on public health as it relates to economics and social services; a short-term negligible impact on community health; and a short-term minor adverse effect on land use as it relates to public health. Effects on public safety from noise and from solid and hazardous waste would be none to negligible.</p> | <p>Impacts would be similar as those described for Alternative 2.</p> |
| Geology | <p>No impacts</p> | <p>Horizontal continuity of the geology in the analysis area would be lost during mining, and the overburden would be vertically altered. Rock-outcrop features of historical significance would also be lost. Impacts would be short- and long-term, major, and adverse. Impacts would last until the spoil used to replace the geologically distinct layers was eroded away.</p> | <p>Impacts would be similar to those described for Alternative 2. Rock-outcrop features of historical significance would be identified prior to disturbance as part of a geological resources survey, and if DEQ determines the feature should remain in place, the mine plan would be adjusted to avoid long-term major adverse impacts.</p> |

Table S-1. Summary Comparison of Direct and Indirect Environmental Impacts.

| Resource | Alternative 1 – No Action | Alternative 2 – Proposed Action | Alternative 3 – Proposed Action Plus Environmental Protection Measures |
|---------------------------------|--|--|--|
| Water Resources – Surface Water | Impacts due to current and future mining and/or reclamation in other areas of the Rosebud Mine would continue. | Impacts on stream and spring flows, pond levels, and hydrologic balance due to road relocation and construction would be short-term, minor, and adverse. Impacts from changes in flow volumes, timing of flows, and frequency of flows would be long-term, minor to moderate, and adverse. Impacts due to mining activities within the 100-year floodplains would be short-term, minor, and adverse. Impacts on surface water quality due to mining would be long-term, minor to moderate, and adverse. Some surface water resources would be permanently lost or changed. | Impacts on stream and spring flows, pond levels, and hydrologic balance would be similar to those described for Alternative 2. Pit water would be managed to protect surface water quality outside of the analysis area. Postmine topography would be designed using 5-foot (instead of 10-foot) contours. DEQ approval would be required for drainage designs with estimated 2-year, 24-hour peak flows greater than 5 cfs (vs. the standard 15 cfs). |
| Water Resources – Ground Water | No impacts | Mining of the project area would permanently remove the Rosebud Coal aquifer and result in long-term reduction or elimination of the bedrock ground water contribution to baseflow in the perennial and intermittent reaches of the major tributaries. Long-term ground water drawdown due to mining would extend upgradient to the south beyond the mine area. Drawdown may affect existing water users of the Rosebud Coal aquifer. Mining would permanently remove springs in the project area whose ground water source is either the Rosebud Coal or overburden that would be removed. Replacement of the Rosebud Coal with spoil would have long-term, moderate, adverse impacts on ground water quality in the analysis area. When the spoil is sufficiently resaturated to discharge to alluvium in the major tributaries, impacts on alluvial ground water quality would likely be long-term, minor to moderate, and adverse. | Impacts would be similar to those described for Alternative 2. Pit-water handling requirements during mining would reduce potential impacts on alluvial ground water downgradient of storage ponds. |

Table S-1. Summary Comparison of Direct and Indirect Environmental Impacts.

| Resource | Alternative 1 – No Action | Alternative 2 – Proposed Action | Alternative 3 – Proposed Action Plus Environmental Protection Measures |
|--------------------------------|--|--|---|
| Water Resources – Water Rights | Impacts due to current and future mining and/or reclamation in other areas of the Rosebud Mine would continue. | If a surface or ground water right became unusable for its specified purpose due to flow or water quality changes, the impact would be short-term, moderate, and adverse; a suitable replacement source would be provided by Western Energy. If a water right were impacted by mining but still contained sufficient water of adequate quality to meet beneficial use needs, the impact would be short-term, negligible to minor, and adverse. | Impacts would be the same as those described for Alternative 2. |
| Vegetation | No impacts | The removal of 4,260 acres of vegetation for mining activities would result in direct impacts that are short-term, moderate, and adverse. Decreased vegetation production, vigor, or diversity, and the potential for changes to vegetation communities from a reduced amount of surface and ground water in the area, would result in impacts that are long-term, minor, and adverse. The indirect impacts on vegetation from power-plant emissions would be long-term, minor, and adverse. | Impacts would be similar to those described for Alternative 2. Development of a water-management plan and modifications to reclamation practices related to soil stockpiling, soil redistribution, and seeding to better manage water and improve reclamation success would have a beneficial effect on vegetation. |
| Wetlands and Riparian Zones | No impacts | Surface disturbance and changes to surface and ground water during mining activities would result in impacts that are short- and long-term, moderate, and adverse. A wetland mitigation plan would reduce the loss of wetland function and values. Indirect impacts on wetlands from power-plant emissions would be negligible. | Impacts would be similar to those described for Alternative 2. Development of a water-management plan and additional requirements for the wetland mitigation plan would have a beneficial effect on wetlands and would reduce long-term adverse impacts. |

Table S-1. Summary Comparison of Direct and Indirect Environmental Impacts.

| Resource | Alternative 1 – No Action | Alternative 2 – Proposed Action | Alternative 3 – Proposed Action Plus Environmental Protection Measures |
|---------------------------------|---------------------------|--|---|
| Fish and Wildlife Resources | No impacts | Mining activities would result in loss of habitat due to surface disturbances that remove vegetation, direct mortality or injury due to vehicle or construction equipment collisions, and behavioral shifts such as a change in movement or displacement to other areas due to increased human activity and noise from blasting and mining operations. Direct impacts on small mammals, carnivores, big game, migratory birds, shorebirds, raptors, reptiles and amphibians, and aquatic species would be short- and long-term, negligible to minor, and adverse. Impacts on bats would be short- and long-term, moderate, and adverse. Indirect impacts from power-plant emissions would be negligible. | Impacts would be the same as those described for Alternative 2. Development of a water-management plan in conjunction with a nonjurisdictional wetland mitigation plan would result in potential beneficial impacts on most wildlife species that depend on wetland and riparian habitat. |
| Special Status Species | No impacts | Mining activities would result in loss of habitat due to surface disturbances that remove vegetation, direct mortality or injury due to vehicle or construction equipment collisions, and behavioral shifts such as a change in movement or displacement to other areas due to increased human activity and noise from blasting and mining operations. There would be no impacts on federally listed threatened and endangered species. Direct impacts on state species of concern would be short- and long-term, moderate, and adverse. Indirect impacts from power-plant emissions would be negligible. | Impacts would be the same as those described for Alternative 2. Development of a water-management plan in conjunction with a nonjurisdictional wetland mitigation plan would result in potential beneficial impacts on most wildlife species that depend on wetland and riparian habitat. |
| Cultural and Historic Resources | No impacts | Surface disturbance from mining and wetland mitigation activity may result in disturbance or destruction of historic properties located within the analysis area, and these impacts would be long-term, major, and adverse. Adverse impacts would be resolved through both a property-specific Memorandum of Agreement and a long-term PA stipulating measures for continued Section 106 compliance. | Wetland mitigation has the potential to adversely affect known and unknown historic properties. A PA would stipulate measures for Section 106 compliance prior to undertaking wetland mitigation. |

Table S-1. Summary Comparison of Direct and Indirect Environmental Impacts.

| Resource | Alternative 1 – No Action | Alternative 2 – Proposed Action | Alternative 3 – Proposed Action Plus Environmental Protection Measures |
|--------------------------|---|---|--|
| Socioeconomic Conditions | Annual economic impacts associated with continued operation of the Rosebud Mine would be short-term and negligible since the mine would continue to support local economic activity. With the retirement of the Colstrip Power Plant Units 1 and 2 in 2022, impacts of changes in mine operation would likely be short-term and moderate since the mine would support local economic activity at a reduced level. Eventual mine closure would likely result in long-term, moderate to major negative impacts. | Impacts would be the same as those described for Alternative 1. | Impacts would be the same as those described for Alternative 1. |
| Environmental Justice | When the Rosebud Mine eventually closes, all populations within Rosebud County will be negatively affected, including the substantial environmental justice populations. Impacts would be long-term, negligible, and adverse. | Alternative 2 would delay the onset of adverse economic impacts, possibly allowing time for other sectors to develop. Therefore, impacts would be short-term and minor because the mine would continue to support local economic activity during the life of the mine. | Impacts would be the same as those described for Alternative 2. |
| Visual Resources | No impacts | Mining activities would change the visual landscape for drivers traveling along Horse Creek Road through the project area through changes to geology and topography, and removal of vegetation; the impact would be short-term, moderate, and adverse. For seven residences adjacent to the Rosebud Mine, active mining adjacent to existing mining areas may be visible in a small portion of the viewshed from a few locations. Depending on location, impacts would range from none to long-term, moderate, and adverse. | Impacts would be similar to those described for Alternative 2. Measures to improve revegetation success and a pre-mining geological resource survey to identify rock-outcrop features to be left intact may help the area return to pre-mine visual conditions more quickly. |

Table S-1. Summary Comparison of Direct and Indirect Environmental Impacts.

| Resource | Alternative 1 – No Action | Alternative 2 – Proposed Action | Alternative 3 – Proposed Action Plus Environmental Protection Measures |
|---------------------------|---|---|---|
| Recreation | No impacts | All current use of the land for recreation (primarily hunting) would be unavailable during mine operations. Hunting opportunities on mine-related disturbance areas would be lost until revegetation and forage production were comparable to pre-mining levels associated with adjacent land. Impacts would be long-term, moderate, and adverse. | Impacts would be the same as those described for Alternative 2. |
| Paleontology | No impacts | Paleontological resources not identified or salvaged prior to mining would be permanently lost, resulting in impacts that are short- and long-term, major, and adverse. However, previously unknown paleontological resources may also be identified during mining activities and potentially salvaged, resulting in a beneficial impact. | The Unanticipated Discovery Plan required under Alternative 3 would increase the potential for discovery of paleontological resources of scientific interest. Discovery would not ensure protection but would help minimize unintentional destruction of these resources. |
| Access and Transportation | The haul road from Area C West would likely be decommissioned 15 to 20 years earlier. | A 4.2-mile segment of Horse Creek Road in the northwest/north-central portion of the analysis area would be relocated, and a 1.3-mile segment in the northwestern portion would be rerouted. Impacts from the relocation/reroute of Horse Creek Road would be short-term, minor, and adverse. The impacts due to haul, ramp, and service roads would be short-term, negligible, and adverse because the overall transportation system would not be disrupted. | Impacts would be the same as those described for Alternative 2. |
| Solid and Hazardous Waste | No impacts | Potential leaks or releases of solid or hazardous wastes would result in impacts that are short-term, negligible, and adverse. Impacts from boron toxicity related to the receipt and use of bottom ash at other permit areas of the mine would be short-term, negligible, and adverse. | Impacts would be the same as those described for Alternative 2. |
| Noise | No impacts | Direct impacts due to noise from mining and reclamation in the project area would be short- and long-term, negligible to minor, and adverse for the nearest rural residences. Indirect impacts due to noise from operation of the Rosebud and Colstrip Power Plants would continue to be moderate to minor for the residences in Colstrip and for those adjacent to the Rosebud Power Plant. | Impacts would be the same as those described for Alternative 2. |

Table S-1. Summary Comparison of Direct and Indirect Environmental Impacts.

| Resource | Alternative 1 – No Action | Alternative 2 – Proposed Action | Alternative 3 – Proposed Action Plus Environmental Protection Measures |
|----------|---------------------------|---|---|
| Land Use | No impacts | All current land uses within the analysis area would be temporarily disturbed during mine operations based on the timing of the approved mine plan. Impacts on grazing land would be long-term, moderate, and beneficial. Impacts on cropland would be long-term, moderate, and adverse. Impacts on cropland would be long-term, moderate, and adverse. | Impacts would be similar to those described for Alternative 2. Loss of soil productivity and associated loss of cropland/grazing-land productivity would vary slightly, with productivity potentially returning to postmine conditions more quickly. |
| Soil | No impacts | Soil salvage, storage, and respreading would result in soil erosion and changes to physical, chemical, and biological soil characteristics. During mining, soil erosion impacts would be short-term, minor, and adverse. Erosion rates in reclaimed areas would return to pre-mine rates within 2 years once vegetation stabilizes the surface. It would be many years before physical, chemical, and biological soil characteristics return to pre-mine conditions; impacts in reclaimed areas would be long-term, minor, and adverse. | Contouring soil stockpiles during mining would reduce short-term erosion from stockpiles compared to Alternative 2. Applying organic amendments such as grass to the upper 4 inches of soil in small problem areas (i.e., areas lacking sufficient organic matter, areas with limited vegetation cover, or areas susceptible to erosion) would enhance soil productivity and reduce erosion when compared to Alternative 2. Long-term impacts on soil would be the same as those described for Alternative 2. |

WHERE TO OBTAIN MORE INFORMATION

More information on the Rosebud Mine and the project area can be found on the agencies' websites (DEQ: <http://deq.mt.gov/Public/ea/coal> and OSMRE: <https://www.wrcc.osmre.gov/initiatives/westernenergy.shtm>). If you have any additional questions or concerns, please contact the individuals listed below.

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