DEQ
Montana Department of Environmental Quality

Air, Energy & Mining Division

Signal Peak Energy, LLC

SURFACE MINING PERMIT C1993017

BULL MOUNTAINS MINE #1

AMENDMENT 6

ROUNDUP, MT

April 4, 2024
Draft Environmental Assessment

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PROJECT OVERVIEW

COMPANY NAME: Signal Peak Energy, LLC
FINAL EA DATE:
PROJECT: Bull Mountains Coal Mine No. 1
PERMIT/LICENSE: Surface Mining Permit C1993017
AMENDMENT #: AM6

Location

46.243250°N, 108.405422°W County: Musselshell and Yellowstone
PROPERTY OWNERSHIP: FEDERAL ☐ STATE ☐ PRIVATE ☒
MINERAL OWNERSHIP: FEDERAL ☐ STATE ☐ PRIVATE ☒

Compliance with the Montana Environmental Policy Act

Under the Montana Environmental Policy Act (MEPA), Montana agencies are required to prepare an environmental review for state actions that may have an impact on the human environment. The proposed mine amendment is considered to be a state action that may have an impact on the human environment and, therefore, the Department of Environmental Quality (DEQ) must prepare an environmental review. In this Environmental Assessment (EA), DEQ will examine the proposed action and alternatives to the proposed action and disclose potential impacts that may result from the proposed and alternative actions. DEQ will determine the need for additional environmental review based on consideration of the criteria set forth in the Administrative Rules of Montana (ARM) 17.4.608. DEQ will decide whether to issue the pending amendment to permit C1993017 pursuant to the requirements of the Montana Strip and Underground Mine Reclamation Act (MSUMRA). DEQ may not withhold, deny, or impose conditions on the permit based on the information contained in this Environmental Assessment. § 75-1-201(4), MCA.

Proposed Action

DEQ would approve Amendment 6 (AM6) to Surface Mining Permit (SMP) C1993017, if DEQ has determined that Signal Peak Energy, LLC (SPE) has met the criteria set forth for amendments in Section 82-4-225, Montana Code Annotated (MCA). If approved, the amendment to the permit would be granted to expand mining operations within and outside of the current Bull Mountains Coal Mine No. 1 permit area and add 1,037 acres to the existing permit area.

Purpose and Need

DEQ's purpose and need in conducting this environmental review is to act upon SPE's application for a permit amendment for continued mining in compliance with the Strip and Underground Mine Reclamation Act. On November 7, 2023, SPE submitted an application for AM6 to SMP C1993017. DEQ provided completeness deficiencies to the company through two rounds of review. The initial deficiency review was completed by DEQ on December 22, 2023, and a response was submitted by the company on January 19, 2024. The second deficiency review was completed by DEQ on February 23, 2024, with a response sent to DEQ on March 8, 2024. Pursuant to ARM 17.24.401(2), DEQ determined, on April 1, 2024, that the deficiency responses and application updates provided are administratively complete and meet the requirements for amendments in ARM 17.24.401.

The applicant's purpose and need in proposing this action is to expand mine production through the addition of one coal mine cut, named Panel 1 East, to the eastern part of the current permit area. SPE is the operator of the only active underground coal mine in Montana and the surface of the current permit area is a mix of private, state, and federally owned land. The Life-of-Mine (LOM) plan, approved by DEQ as Amendment No. 3 (AM3) on July 12, 2016, was estimated to extend mine production for 11.5 years, and included areas that would be mined under federal coal leases. The AM3 mine plan authorization issued by the Office of Surface Mining Reclamation and Enforcement (OSMRE) in 2018 was vacated by the U.S. District Court for the District of Montana on February 10, 2023. This required SPE to immediately stop mining any remaining federal coal authorized under the vacated mining plan. OSMRE will now complete a new Environmental Impact Statement (EIS) under the National Environmental Policy Act (NEPA) to analyze the potential environmental effects of AM3.

As an interim measure to provide continued mining capacity at the site, the proposed plan for AM6 includes an expansion to develop one additional panel for longwall mining. The location of the proposed underground mine expansion would run perpendicular to the longwall panels 12 through 15 approved under Amendment 3. If approved, AM6 would add 1,037 acres to the existing permit area of 15,487 acres (new total permit area of 16,524 acres), representing an increase of less than 7% of the current permit area. The legal description for the amended permit area within the AM6 application is provided in **Table 1**.

Table 1: Legal Description for Amendment No. 6 Area

Section	Portion of Township	Acres
13	T6N, R27E	442
23	T6N, R27E	114
24	T6N, R27E	203
26	T6N, R27E	40
18	T6N, R28E	238
Total		**1,037**

Mining at the Bull Mountains Mine No. 1 consists of longwall mining and continuous ("room and pillar") mining. The two types of mining work in conjunction. Longwall mining first must have underground access tunnels ("gate roads") developed bordering the future longwall panel. These gate roads are developed by the continuous miner in a room and pillar style. The gate roads are used to move equipment into the panel, convey fresh air to the miners in the panel, and for a conveyor to be installed into the panel for carrying the extracted coal back to the facilities area. Mining in Panel 1 East would commence from the southwestern edge of the panel and move along the panel to the northeast. Mining would go back and forth along the short edge of the panel, traveling down the length to the farthest gate road.

The longwall miner consists of a series of support jacks, called shields, that support the overlying rock ("roof") at the coal face and a cutting arm called the shearer. The shields support the entirety of the overburden above the longwall miner, and they also act to protect workers from roof falls. As the longwall miner cuts coal, the coal is removed by conveyors. Once the shearer completed a pass of the coal face, the shields advance forward to set for the next cut. Without any support left behind the shields, the overburden over the mined-out area immediately starts to collapse into the void left by the longwall miner and results in subsidence. The collapsed material in the former coal seam is called gob.

After mining and subsidence, groundwater will eventually saturate the gob and re-establish groundwater flow paths through the mine area. From observations over past panels, subsidence usually takes two or more years to finish. Gate roads are not designed to immediately subside because pillars of coal are left in place. Gate roads may or may not subside at some point in the future. Backfilling of the mine voids, be it the gate roads or the longwall panel, with mine waste is not currently approved for the Bull Mountains Mine No. 1 permit. All mine processing waste is stored in above ground waste disposal areas (WDAs). However, MSUMRA does allow for an operator to backstow or backfill voids with approval from DEQ to mitigate subsidence and/or to permanently store mine waste; any change to the handling of mine waste would require a revision to the permit and a separate environmental analysis.

The proposed expansion would result in an increase to the currently approved permit area of 1,037 acres across privately owned land. The proposed underground mine cut—Panel 1 East and continuous miner areas 12 South, 13 South A, and 13 South B—would occur beneath an additional 464 acres (**Table 2**). Approximately 12.7 million tons of coal would be mined from within the proposed AM6 mine area. The mine expansion area is completely within private land and private mineral estates.

Table 2: Area Above AM6 Underground Mining

Type of Mining	Acres
Coal Added with AM6	
Longwall Miner: Panel 1 East	255.9
Continuous Miner: Panel 1 East	82.7
Continuous Miner: 12 South	70.3
Continuous Miner: 13 South A	27.1
Continuous Miner: 13 South B	27.1
Total	**463.1**
Coal in Panel 1 East Previously Approved	
Longwall Miner: Panel 1 East	121.9
Continuous Miner: Panel 1 East	61.4
Total	**183.3**
Grand Total	**646.4**

No specific surface disturbance features are proposed with this amendment; however, previous longwall mining indicates that approximately five acres of disturbance may occur for additional boreholes, small pads, minor roads, and subsidence crack repair. Potential surface disturbance and the associated impacts are discussed in this EA, but the exact location of any boreholes, pads, roads, subsidence cracks, and/or crack repair actions cannot yet be determined. Construction of any surface infrastructure such as small pads would require a minor revision to the permit, and an additional EA would be completed during review of the borehole and pad design. Bond amounts would be reviewed at the time of permitting, and additional bond may be required for construction of boreholes or pads. SPE would be required to submit specific permit revisions and supplemental information, including maps certified by a professional engineer, before the surface features and activities would be authorized by DEQ under MSUMRA.

If approved, AM6 would add the reserves listed in **Table 3** below.

Table 3: Minable and Recoverable Coal within AM6 (Tons)

Type of Mining	Coal Tons in Place	Percent Minable	Minable Tons	Percent Recoverable from Wash Plant	Recoverable / Saleable Tons
Coal Added with AM6					
Longwall Miner: Panel 1 East	6,327,039	100	6,327,039	83	5,251,443
Continuous Miner: Panel 1 East	2,029,239	36	730,526	83	606,337
Continuous Miner: 12 South	1,593,298	56	892,247	83	740,565
Continuous Miner: 13 South A	736,027	56	412,175	83	342,105
Continuous Miner: 13 South B	756,331	56	423,545	83	351,543
Total	**11,441,934**		**8,785,533**		**7,291,992**
Coal in Panel 1 East Previously Approved					
Longwall Miner: Panel 1 East	3,333,595	100%	3,333,595	83	2,766,884
Continuous Miner: Panel 1 East	1,667,603	36%	600,337	83	498,280
Total	**5,001,199**		**3,933,933**		**3,265,164**
Grand Total	**16,443,133**		**12,719,466**		**10,557,156**

Approximately 1/3 of the proposed Longwall Panel 1 East is part of the currently approved mine plan footprint; the amendment would change the orientation of the mining of a portion of approved Panels 12, 13, 14, and 15. The amount of coal included in Panel 1 East that was previously included in Panels 12, 13, 14, and 15 is listed in **Table 3** separate from the additional coal that is proposed to be mined.

In total, between re-orientation of the currently approved mineable coal and new coal, the AM6 application would recover 10,557,156 tons of saleable coal. While AM6 proposes three separate areas of mining, Panel 1 East, 12 South, 13 South A, and 13 South B, these areas will be referred to collectively as Panel 1 East mining or AM6 proposed mining in this EA interchangeably unless explicitly stated otherwise.

Table 4: Summary of Activities Proposed in Application

Summary of Proposed Activities in Application	
General Overview	The Bull Mountains Coal Mine No. 1 is an underground mine. Through AM6, SPE proposes the addition of one longwall mining coal cut, named Panel 1 East, to the east of the permit area. Three additional continuous miner blocks would be added to the south of Panels 12 and 13 (12 South, 13 South A, 13 South B). The underground mining on site consists mainly of longwall mining, supported by some continuous miner (room and pillar) mining. The proposed expansion of the permit area would increase the existing permit area by 1,037 acres across privately owned land, resulting in the total permit area increasing from 15,487 acres to 16,524 acres (<7% change from current). The proposed mine cut area would add 463 acres to the footprint of the mine plan. No specific surface disturbance features are proposed with this amendment, however previous longwall mining indicates that approximately five acres of surface disturbance may occur for additional boreholes, small pads, minor roads, and potential subsidence crack repair. The exact location of any boreholes, pads, roads, subsidence cracks, or crack repair actions cannot yet be determined. The addition of any surface infrastructure would require a revision to the permit and separate environmental impact analysis. The proposed new panel would be mined beginning in 2024 and production would occur for approximately one year. The current surface land uses within the amendment area consist of grazing and wildlife habitat. Grazing and wildlife habitat are also the approved post-mine land uses.
Proposed Dimensions	
Total new permit area (acres)	1,037
New underground mine cut area (acres)	463
Reorientation of existing underground mine cut area (acres)	183
Current disturbance (acres)	742
LOM approved disturbance (acres)	1,102
Total new surface disturbance	No new disturbance is proposed with this application.
Specific Proposed Activities	
Duration and timing	Mining proposed with AM6 would likely begin in 2024 and last approximately one year. Development of the gate roads would precede longwall mining. The applicant is prohibited from mining federal coal pending approval of a federal mine plan.

Equipment	There would be no changes to the current equipment used at the site. Above ground equipment currently includes: 1 ATV, 1 compactor, 1 crane, 11 dozers, 6 excavators, 6 forklifts, 1 grader, 9 haul trucks, 25 light duty trucks, 4 loaders, 2 manlifts, 14 skid steers, 2 telehandlers, and 2 water trucks. Underground equipment currently includes: 1 longwall miner, 1 continuous miner, 34 mantrips, 2 graders, 1 petitto mule (longwall shield retriever), 3 scoops, and 10 tractors.
Location and analysis area	Panel 1 East and the additional continuous miner areas would extend to the east and south of the current permit area, with an increase of 1,037 acres across privately owned land. Unless specifically stated in the following discussion of resources, the analysis area for this EA includes the area contained by the expanded permit boundary, which encompasses any area that may overlie the underground mine expansion, and it includes the portion of Panel 1 East that was previously approved with amendment AM3 for mining under a different configuration. See Table 2 for a detailed listing of acres for the total AM6 mining area.
Personnel on-site	The expansion of underground mining would not change the current personnel or employment at the site, which includes 255 employees and 30 full-time, temporary contractors.
Structures	The expansion of underground mining would not change the current structures and facilities at the site, which include offices and bath house, shops and warehouses, fueling pads, a rail loop and loadout, sediment control ponds, a conveyor, prep-plant, and plant press, power line substations, explosives magazine, storage silos, thickener plant, stack tubes, and crusher. These facilities can be generalized into three categories: 1) support for underground mining, 2) processing of extracted coal for loading onto trains, 2) processing of waste material to remove water and ready for compaction and disposal in the waste disposal area (WDA).
Project water source	The expansion of underground mining would not change the current use of water at the site, which is currently provided by Mammoth coal water produced while dewatering the mine. Deep Madison wells have been used in the past for production water and may be used again if Mammoth coal water is not sufficient. Potable water is supplied to the office area from a deep underburden well in the facilities area.
Supplemental lighting	The expansion of underground mining would not change the current use of surface lighting at the site, which includes 24-7 fixed lighting of the main facilities area and the occasional use of supplemental lighting. Two to three mobile light plants are used in dark hours in the WDA; their locations move depending on where the coal processing waste is being placed. Equipment lights are used on operating equipment in dark hours throughout the facilities area. Mobile light plants are infrequently used for emergency projects and urgent repairs such as borehole drilling and equipment maintenance. The limited surface activities that may be associated with the underground mine expansion (borehole drilling, minor roads, subsidence cracks, repair actions) would not occur at night unless an emergency borehole or crib pad construction was required.

Air quality	The expansion of underground mining would be a continuation of current site activities that may affect air quality, which include mobile equipment, facilities, roads, boilers, coal stockpiles and fugitive dust from wind erosion of soil and spoil stockpiles. The applicant is required to comply with the applicable local, county, state, and federal requirements pertaining to air quality. The operator maintains an air quality permit with Montana DEQ (MAQP #3179-13) for the coal preparation plant and coal handling facilities.
Water quality	The expansion of underground mining would be a continuation of current site activities that may affect water quality and quantity. Potential impacts to surface waters are generally confined to those impacts resulting from land subsidence, facilities area and WDA disturbance, and peripheral infrastructure (permit areas not including the main facilities and WDAs). These potential impacts are evaluated by monitoring water quantity and quality from a network of spring, stream and pond monitoring stations. The applicant is required to comply with the applicable local, county, state, and federal requirements pertaining to water quality and quantity. The operator maintains an industrial multi-sector general industrial permit (SWPPP MTR000499), a multi-sector general construction permit (SWPPP MTR106575, MTR110051, MTR110025, and MTR109874), and a surface water individual permit (MPDES MT028983). Permit MTR000499 covers storm water discharges from access roads, the rail loop, and overland conveyor belt. Permit MTR106575 covers storm water discharges from construction of the rail spur, MTR110051 covers storm water discharges from construction of Crib Pad 9, MTR110025 covers storm water discharges from Crib Pad 8, and MTR109874 covers storm water discharges from construction of Portal 4. Permit MT028983 covers mine discharges from outfalls at the main facilities area. A septic tank / drain field treats sewage and other wastewater from potable systems at the facilities area, and the mine also treats water from the deep under burden for use as a public water supply for the office area.
Erosion control and sediment transport	The expansion of underground mining would be a continuation of current site activities that may require controls for erosion and sediment transport, which include use of existing sediment control ponds in the facilities area to hold, at minimum, the 10-year, 24-hour precipitation event and ditching in the facilities area to route runoff to a designed pond. The limited surface activities that may be associated with the underground mine expansion (borehole drilling, minor roads, subsidence cracks, repair actions) would occur under currently approved methods for controlling erosion and sediment transport. This strategy includes permit commitments to use straw wattles and or silt fences adjacent to fill slopes where necessary, diverting runoff around drill pads, containing runoff from drill pads within the footprint of the site, and separating the toe of any fill material used for pad construction from the strip perimeter to prevent sediment from moving onto undisturbed ground. The applicant is required to comply with the applicable local, county, state, and federal requirements pertaining to erosion control and sediment transport.

Solid waste	The expansion of underground mining would be a continuation of current site activities that may include the generation, management, and disposal of solid waste. These activities include the placement of some non-coal rock in the WDA, and the placement of garbage and non-mineral waste in commercial dumpsters to be disposed of by a licensed commercial trash service. The applicant is required to comply with the applicable local, county, state, and federal requirements pertaining to solid waste.
Cultural resources	The expansion of underground mining would be a continuation of current site activities that may affect cultural resources in the area. The limited surface activities that may be associated with the underground mine expansion (borehole drilling, minor roads subsidence cracks, repair actions) would occur under currently approved plans for mitigating impacts to cultural resources. The applicant is required to comply with the applicable local, county, state, and federal requirements pertaining to cultural resources. The proposed expanded permit area would partially include one cultural site where the operator proposes to include a 100 ft no disturbance buffer. This area is not proposed to be undermined. One site within the AM6 project area will require mitigation prior to undermining.
Hazardous substances	The expansion of underground mining would be a continuation of current site activities that may include the generation, management, and disposal of hazardous substances. Grease, lubricants, paints, and flammable liquids are stored in steel drums at a designated area in the facilities and periodically picked up by, or delivered to, an appropriately licensed and bonded liquid waste disposal company. Accidental spills of contaminants are handled by mine personnel by removing contaminated soil and placing the material in leak proof containers for processing by a licensed facility; contaminated soils are not retained or treated on site. The permittee has no plans to generate any hazardous waste at the mine operations that would require handling according to the Resource Conservation and Recovery Act. If the permittee handles any such waste materials that are listed as hazardous, these materials would be picked up at the mine site by a licensed agent and transported to a licensed disposal site. Records of contaminated soil disposal are kept for a minimum of one year on site. The applicant is required to comply with the applicable local, county, state, and federal requirements pertaining to hazardous substances.
Reclamation Plans	No conceptual changes to the currently approved reclamation plan are proposed, since AM6 only addresses expansion of the permit area to allow continuation of underground mining. The existing requirements for reclamation would apply to the current surface features and potential disturbance areas associated with this amendment. The reclamation steps include removal of topsoil in two lifts, grading of subsidence features and/or supplemental facilities areas and roads, replacement of soil in two lifts, seeding of the area with an approved seed mix, and temporary sediment control measures around the disturbance area until vegetation is reestablished. Site specific plans for the repair or mitigation of impacts related to subsidence or other mining impacts would be developed as they are identified.

Cumulative Impact Considerations	
General setting	The proposed AM6 area is rural cattle rangeland and is similar to the rangeland found elsewhere within the Bull Mountains Mine No. 1 permit area. The area encompasses the headwater basin areas for three ephemeral drainages with moderate to steep slopes and rough terrain dominated by grassland. There are no domestic or public buildings in the proposed AM6 area.
Past actions	The Roundup area had numerous small surface and underground coal mines. These mines existed prior to the enactment of MSUMRA and were not regulated by DEQ. The largest mines were the Divide (or Carlson) Mine and the adjacent Gildroy Mine, each with about 70 to 80 acres of underground room and pillar mining. These mines are approximately 1.5 miles south of the Bull Mountains Mine No. 1 facilities portals area, and the operators extracted Mammoth coal. The Divide Mine also had a small surface mine operation. Other small mines near the permit area include the Akenson Mine, Buckey Mine, Holland Mine, and a few locations for Northern Pacific Mining. Two mines, the PM Mine and Meridian Test Pit, are the predecessors of Bull Mountains Mine No. 1. The PM Mine included 51 acres of room and pillar mining. The Meridian test pit included 90 acres of strip mining that were reclaimed upon completion of mining. The PM Mine was operated as an underground coal mine in the 1930's and was converted to a surface mine in 1972 by the Maged Family. In 1989, Meridian Minerals Company (Meridian) opened the Meridian Test Pit surface mine to the southeast. PM Coal Company then reopened the underground mine in 1991. The Meridian Test Pit surface mine and the underground mine combined were termed the Bull Mountains Mine. The remaining mines in the area were all much smaller underground operations that used room and pillar or other simple mining techniques and have been abandoned. The majority of mines are located where the Mammoth coal crops out at the surface, and that seam is the coal seam that was most likely mined. The operator is currently permitted to mine 16 longwall panels and their associated gate roads. Each longwall panel at the Bull Mountains Mine No. 1 consists of a large block of coal, approximately 1,250 feet in width by 15,000 feet to 23,300 feet in length. Some small areas of room and pillar mining, mined through the use of a continuous miner, are also approved in areas near the facilities. As of December 2023, Panels 1 through 9 have been fully mined (Panel 9 was cut short 2,600 feet short of its full length with no plans to mine the federal coal that was abandoned). Panel 10 was partially mined in a shortened area to avoid mining federal coal reserves that are not currently approved for mining. Work on Panel 11 was likewise shortened to avoid mining unapproved federal coal reserves, and Panel 0 has been started. Gate roads for the shortened Panel 11 have been fully developed. Approximately 5,400 acres of longwall panels and 740 acres (not including pillars) of continuous miner room and pillar mining have been mined as of December 2023.

	Subsidence has been measured over Panels 1 through 7. Most subsidence has been between five and seven feet in depth and has been mostly confined to the footprint of each panel. Areas that experience a greater amount of subsidence are generally associated with areas of thicker overburden and thicker coal, while areas that experience a smaller amount of subsidence are generally associated with areas of thinner overburden and thinner coal. Some minor subsidence (less than three feet in depth) has been measured over a few gate roads, especially between Panels 2 and 3 and again between Panels 4 and 5, but this subsidence was from the longwall panels; no gate roads have collapsed or subsided to date. Surface expression of subsidence includes linear surface fractures, minor rockslides, and small sink-like depressions (approximately five feet in depth).
Present actions	Although the federal mine plan has been vacated until a revised federal EIS is published, the mine still retains an approved mine plan for Panels 0 through 15 under Montana DEQ. Underground mining would continue where approved and the existing surface facilities would continue to be utilized to support mining operations, manage and dispose of waste materials, and to prepare, load, and transport coal away from the site. If authorization to access federal coal is reinstated, the mine would resume its plan to mine the remainder of Panels 10 through 15. Current land uses on the surface of the permit area consist primarily of grazing and wildlife habitat. Some residential land parcels are located in the northern portion of the mine area. One domestic well, owned by Dale Wallace, is planned to be undermined and replaced with the development of Panel 12. Numerous residential homes are located in rural subdivisions to the north and to the west of the mine. Facilities discharge permit MT028983 has been administratively continued since 2018. An update to the discharge permit is currently under review by DEQ. SPE has an approved air quality permit, MAQP #3179-13, issued by DEQ on November 6, 2023. The air quality permit underwent a separate Environmental Assessment by DEQ.
Related future actions	Unplanned potential surface disturbance may be associated with this amendment and the impacts are discussed in this EA, but the exact location of any boreholes, pads, roads, subsidence cracks, and/or crack repair actions cannot yet be determined. SPE would be required to submit specific permit revisions and supplemental information, including maps certified by a professional engineer, and a review of bonding, before the surface features and activities would be authorized by DEQ under MSUMRA. Repair of subsidence cracks does not always require a minor revision. Before mining of federal coal can continue, OSMRE must complete an updated EIS under NEPA to analyze the potential environmental effects of the AM3 mine plan, including potential effects on climate from project-related greenhouse gas emissions. The EIS would analyze the potential

	environmental effects of mining all the federal coal under the originally proposed AM3 mine plan, including the mining that already occurred under the now-vacated approval, and the mining of the remaining federal coal. SPE submitted to DEQ an application for a major permit revision (TR4) on September 12, 2022, that would raise the elevation of the waste disposal area by 180 feet and increase capacity by 28.5 million tons. This application is currently under deficiency review and has not been approved. This proposed revision would expand the capacity of waste disposal to allow future operations, but it is not required for the implementation of the Proposed Action in this EA (AM6), and the revision would be analyzed as a separate action for DEQ's review of potential environmental impacts.

Figure 1: General Location Map

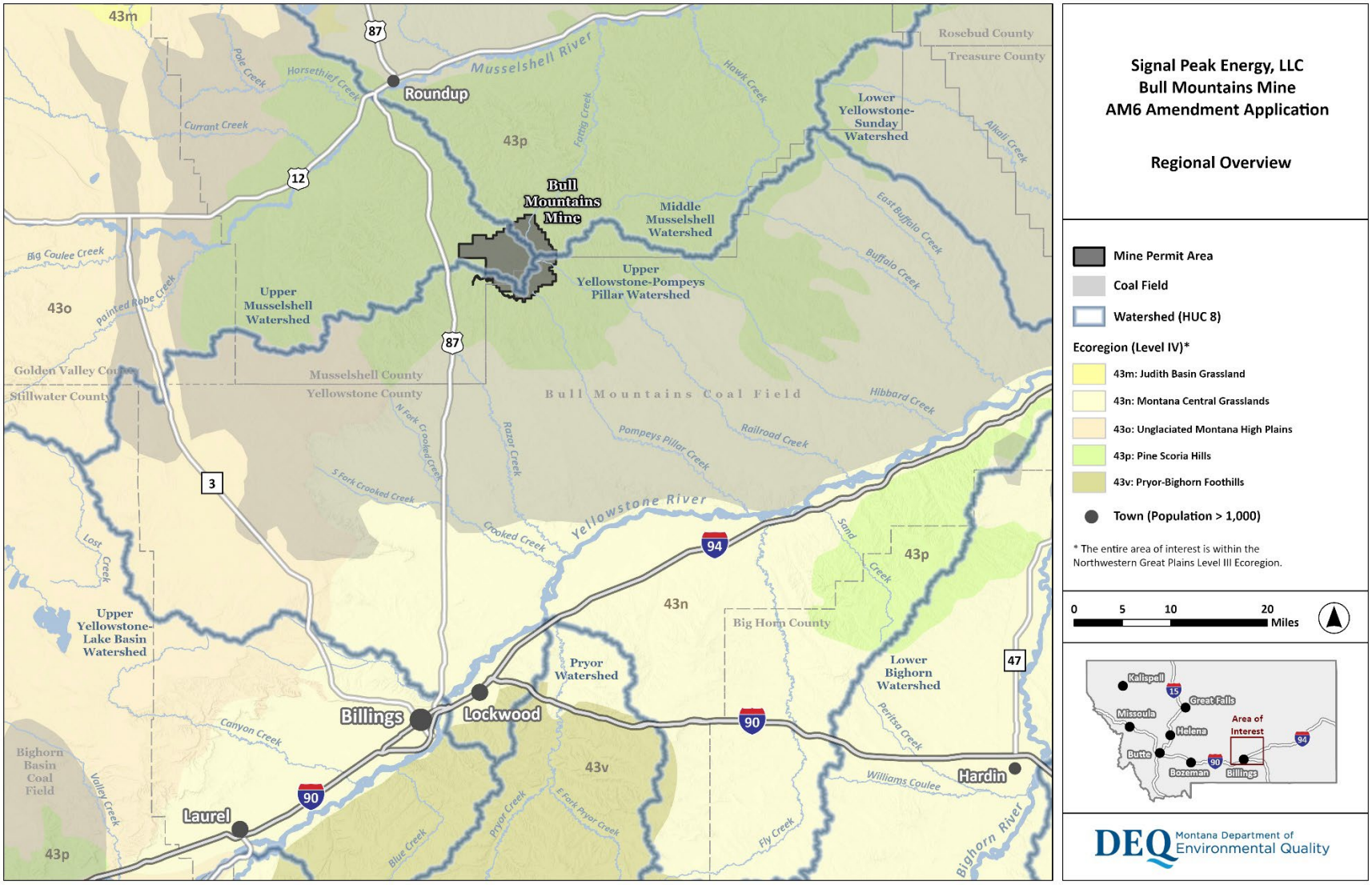
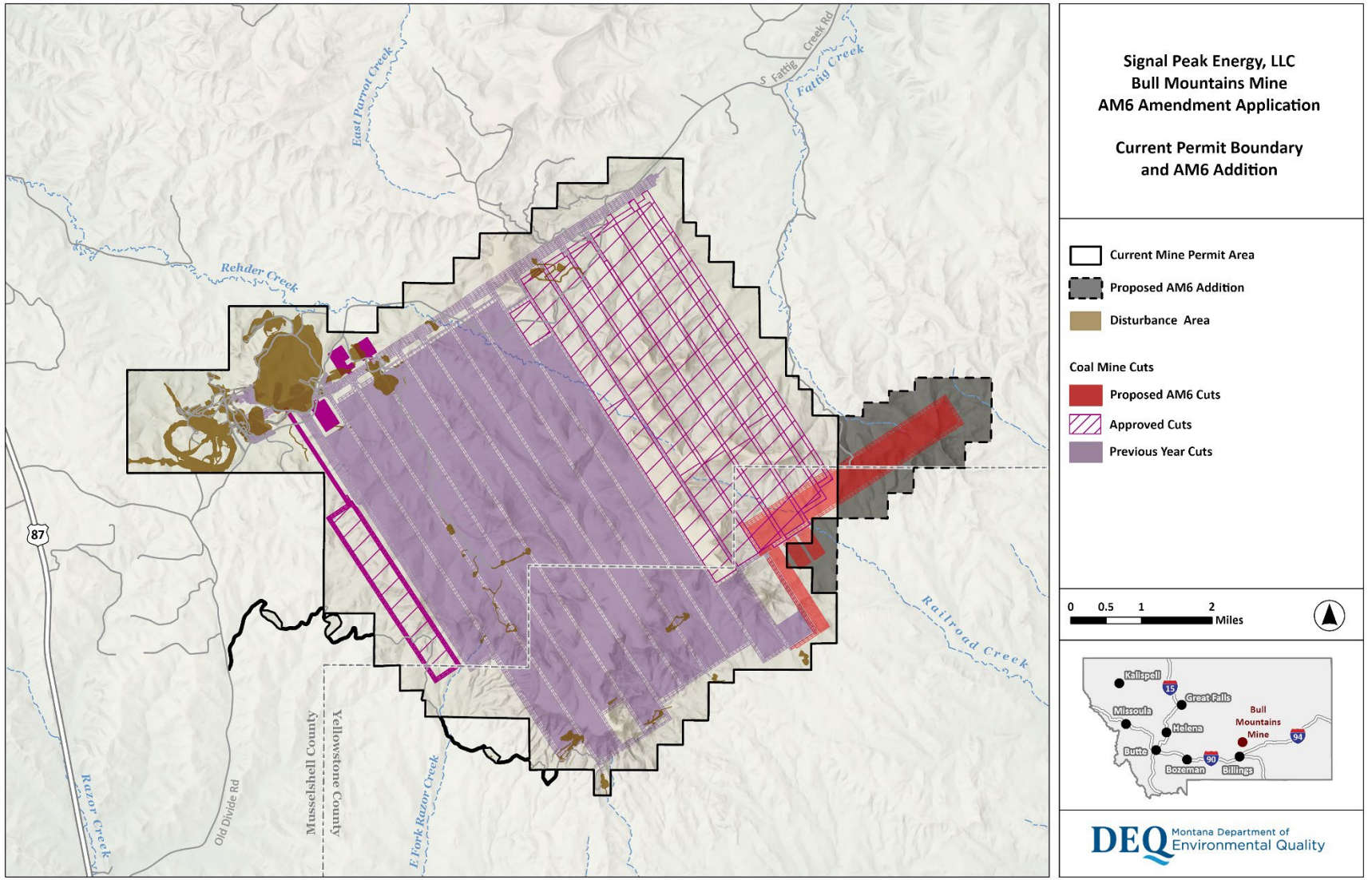


Figure 2: Amendment 6 Proposed Action



SUMMARY OF POTENTIAL IMPACTS

The impact analysis will identify and estimate whether the impacts are direct or secondary impacts. Direct impacts occur at the same time and place as the action that causes the impact. Secondary impacts are a further impact to the human environment that may be stimulated, or induced by, or otherwise result from a direct impact of the action (ARM 17.4.603(18)). Where impacts would occur, the impacts will be described.

Cumulative impacts are the collective impacts on the human environment of the Proposed Action when considered in conjunction with other past and present actions related to the Proposed Action by location and generic type. ARM 17.4.603(7). Related future actions must also be considered when these actions are under concurrent consideration by any state agency through pre-impact statement studies, separate impact statement evaluation, or permit processing procedures. Id. The projects identified in **Table 4** were analyzed as part of the cumulative impacts assessment for each resource.

1. Geology and Soil Quality, Stability, and Moisture

[Are soils present, which are fragile, erosive, susceptible to compaction, or unstable? Are there unusual or unstable geologic features? Are there special reclamation considerations?]

The area of proposed mining would be in Musselshell County, near the town of Roundup, Montana and approximately 50 miles north of Billings, Montana. The permit area for Bull Mountains Mine No. 1 and the proposed amendment area are situated in the Bull Mountains that range in elevation from about 3,700 feet to 4,700 feet above mean sea level (AMSL). Geologic information is described in previous environmental reviews (DSL, 1992a) (DEQ, 2017) (DEQ, 2016) and summarized here to provide background information for AM6. Tertiary period continental rocks (alternating sandstones, siltstones, shales, clinker, and coals) of the Tongue River member of the Fort Union Formation outcrop in the area and are the principal rock units that would be disturbed by expanded longwall coal mining under AM6. Topography of the area is a rugged, generally mountainous terrain, dissected by ephemeral streams with higher areas or plateaus commonly capped by resistant sandstone and clinker. Resistant clinker is formed when coal burns in situ, causing metamorphic changes to the overburden.

Soil survey data are described in previous environmental reviews (DSL, 1992a), (DEQ, 2016), (DEQ, 2017) and in section 17.24.304(1)(k) of the permit and are incorporated herein by reference. There are nine well developed soil series in the permit area and vicinity that are dominated by silty or sandy loams. Some of these soils are reported to have moderate to high susceptibility to wind and water erosion. The area has been previously disturbed through fire, grazing, and general rangeland use.

Areas of currently approved surface disturbance include facility areas like office buildings, roads, a rail loop, ponds, and support for the processing of the coal. Soil and suitable material salvage associated with development of the waste disposal area (WDA) created the largest surface disturbance outside the facilities area. Salvage was conducted within the conditions of law and rules while following permit commitments for soil handling and protection of the soil resource (DEQ, 2017). The reclamation requirements for various surface features and the replacement of suitable materials and soil are further described within previous analyses (DSL, 1992a) (DEQ, 2017) (DEQ, 2016).

Direct Impacts:

Resembling previously mined areas, the Mammoth coal seam would be the primary target for mine production in the mine cut areas proposed through AM6. Mining would occur beneath approximately 646 acres within the proposed longwall panel and continuous miner blocks. Coal in Panel 1 East is approximately fourteen to fifteen feet thick, thicker than in panels that have been previously mined. Overburden ranges from 200 to 400 feet thick, with most of the area under 400 feet or less of overburden. The coal in Panel 1 East has less overburden than areas that have been previously mined.

Other areas of existing disturbance (e.g. facilities areas) were previously permitted with a reclamation plan that follows applicable rules and regulations set forth in the ARMs. The operation of these facilities would continue through the mine activities proposed for Panel 1 East, within the previously approved permit. No disturbance or salvaging of soil or suitable material is requested through this amendment, and the existing permit requirements for material replacement and reclamation of surface features would not change under this amendment. Accordingly, no direct impacts are expected from AM6.

Secondary Impacts:

The expansion of underground mining under AM6 is predicted to result in little surface disturbance, which may include an area up to five acres for subsidence crack repair. Boreholes may be drilled from the surface as unpredicted underground conditions are encountered, but no pads are proposed with this panel. No crib pads are proposed with this amendment. The installation of boreholes may potentially be required for: 1) emergency breathable air, 2) utility, or 3) mitigation boreholes. Emergency breathable air boreholes are constructed to provide air to underground workings. These are no longer required by MSHA because the mine is designed with rescue chambers at specific underground locations. However, MSHA may still direct the operator to install an air borehole. Utility boreholes are constructed to provide operational surface support, such as a supply of pumpable cribbing material, communications, electricity, or compressed air to the underground workings. Mitigation boreholes are constructed to maintain compliance with MSHA ventilation or roof control plans, in response to underground roof falls, or as otherwise directed by MSHA. These boreholes may be used for lowering equipment such as thermal cameras, air sampling equipment, injection of nitrogen gas, and/or concrete. All three types of boreholes require approval through a minor revision process, and an additional EA would be completed during review of the borehole and pad design. Bond amounts would be reviewed at the time of permitting, and additional bond may be required for construction of boreholes or crib pads. However, in the event of an immediate emergency where there is an immediate risk to health and safety and/or an immediate need to protect the facilities (such as the need for an emergency breathable air borehole), a borehole may be constructed without prior approval. In such cases, DEQ would be notified at the earliest opportunity of the location and construction of the borehole.

Secondary impacts may occur in surface soil disturbance through subsidence cracks. These impacts to date have been very localized and low frequency. Where cracks have occurred in steep terrain of southern aspect slopes, the greatest impacts occur. These slopes are challenging for access and repair, and the southern aspect proves difficult to establish vegetation. These surface crack features may experience increased soil erosion compared to adjacent areas until filling with sediment or equilibrating naturally, but the extent would be relatively small.

Previous mining experience shows that upon removal of the Mammoth coal seam (10 to 12 feet thick), the thinly bedded overburden fractures and collapses into the mine void. Subsidence features generally include minor surface cracks, although cracks with widths up to a few feet wide or scarps with a few feet of differential movement may occur. Maps of subsidence from previous mining panels were submitted with the AM6 application, and they indicate vertical displacement that ranges from less than one foot up to eleven feet, with an average of five to nine feet. This degree of subsidence has been observed over the open voids in recovery rooms and longwall panels, while narrower gate roads and access adits may or may not collapse.

Based on subsidence monitoring results found on permit Maps 901-F (A-G) Mine Subsidence, areas with the greatest amount of subsidence were generally associated with areas of thicker overburden and thicker coal seams, while areas that sustain smaller subsidence are generally associated with thinner overburden and thinner coal seams (see **Figure 3**). Due to the shallower overburden and thicker coal seam associated with Panel 1 East, it would be expected that subsidence would be on the medium to high side of what has been observed to date. Based on subsidence measured over the southeastern edge of Panels 6 and 7 where there is a similar coal thickness and overburden thickness, Panel 1 East would be expected to generally have six to nine feet of subsidence with possibly up to the eleven-foot maximum subsidence near slope features as observed in previous mine panels 7 and 8 with similarly sloped topography.

An example of surface fracturing, maximum measured subsidence, and repair work is evident in panels 7 and 8, located central and to the W1/2 of Section 27 R6N T27E (See **Figure 4**). The area was mined in 2017 and 2018. Following mining, cracks were discovered on the surface above panels 7 and 8, and repairs were conducted where the slope gradient was deemed safe for equipment use. The largest repair occurred at the foot of the slope (panel scar **Figure 4**). Repairs continued up slope to a zone exceeding safety requirements, where cracks are unrepaired. As the slope gradient reduces toward the plateau repairs were continued (inset **Figure 4**). The largest disturbance at the foot of the slope measures approximately 5.5 acres with repaired cracks measuring tenths of an acre and un-repaired cracks measuring hundredths of an acre. Observations over the other mined panels have not found more extensive subsidence. This example supports the initial statement," very little surface disturbance, which may include an area up to five acres for borehole drilling, minor roads, and subsidence crack repair actions." There is similar terrain above proposed Panel 1 east. And without borehole drilling and road development, planned surface disturbances are not expected to exceed the five acres.

Proposed mining activities under AM6 would further increase the potential of the ground surface directly above the panel and within the angle of draw to be adversely affected by subsidence. Shallow sink-like depressions, linear surface fractures, and minor rockslides associated with previous subsidence have not had a noticeable effect upon the soil profile. Upon the completion of mining, cracks that interrupt the flow of water or sustain soil disturbance and that can be safely accessed without causing damage to the existing land surface would be repaired. Where cracks are unsafe to access, do not interrupt the flow of water, or contribute to soil erosion, they will be left to recover naturally. If a natural recovery does not occur, repairs will be initiated. Over the life of the permit the subsidence is monitored and managed to reduce or eliminate long-term impacts. Most features to date have been ameliorated in approximately two years or less.

Repairs consist of windrowing topsoil to allow room for repair work, crack manipulation or filling if necessary, and then respreading topsoil. This practice has been observed for current mining crack repairs and demonstrates no discernable loss of topsoil into these features. Repair of subsidence features, as represented in **Figure 4**, can create additional damage to soils and may not be warranted. However, repair or mitigation of subsidence features would be completed when necessary to restore stream profiles, drainages, and to ensure that premine land use is maintained.

The exact location of any boreholes, pads, roads, subsidence cracks, and/or crack repair actions cannot yet be determined. SPE would be required to submit specific permit revisions and supplemental information, including maps certified by a professional engineer before the surface features and activities would be authorized by DEQ under MSUMRA.

Cumulative Impacts:

Cumulative impacts to soil and geology consist of the continuation of mining activity adjacent to previously mined areas, causing collapse of the overburden into the mine void and any resultant secondary impacts from surface settling. The longwall method of mining employed at the Bull Mountains Mine No. 1 has been in place for more than 10 years.

Each longwall panel subsides independently and immediately. Since AM6 is perpendicular to existing mining and does not utilize gate roads from other panels except over areas already approved for mining, the subsidence from Panel 1 East would not interact with existing mine subsidence or approved future mine subsidence for areas of the panel northeast of the remainder of approved mining. This is mostly the mining that would be added through AM6. Subsidence from AM6 would interact with subsidence from Panels 12 through 15. This mining was already approved through AM3 in a different configuration. The room and pillar mining may or may not subside and may or may not result in any surface expression.

Figure 3: Overburden Thickness and Subsidence Measured over Panels 1 Through 7

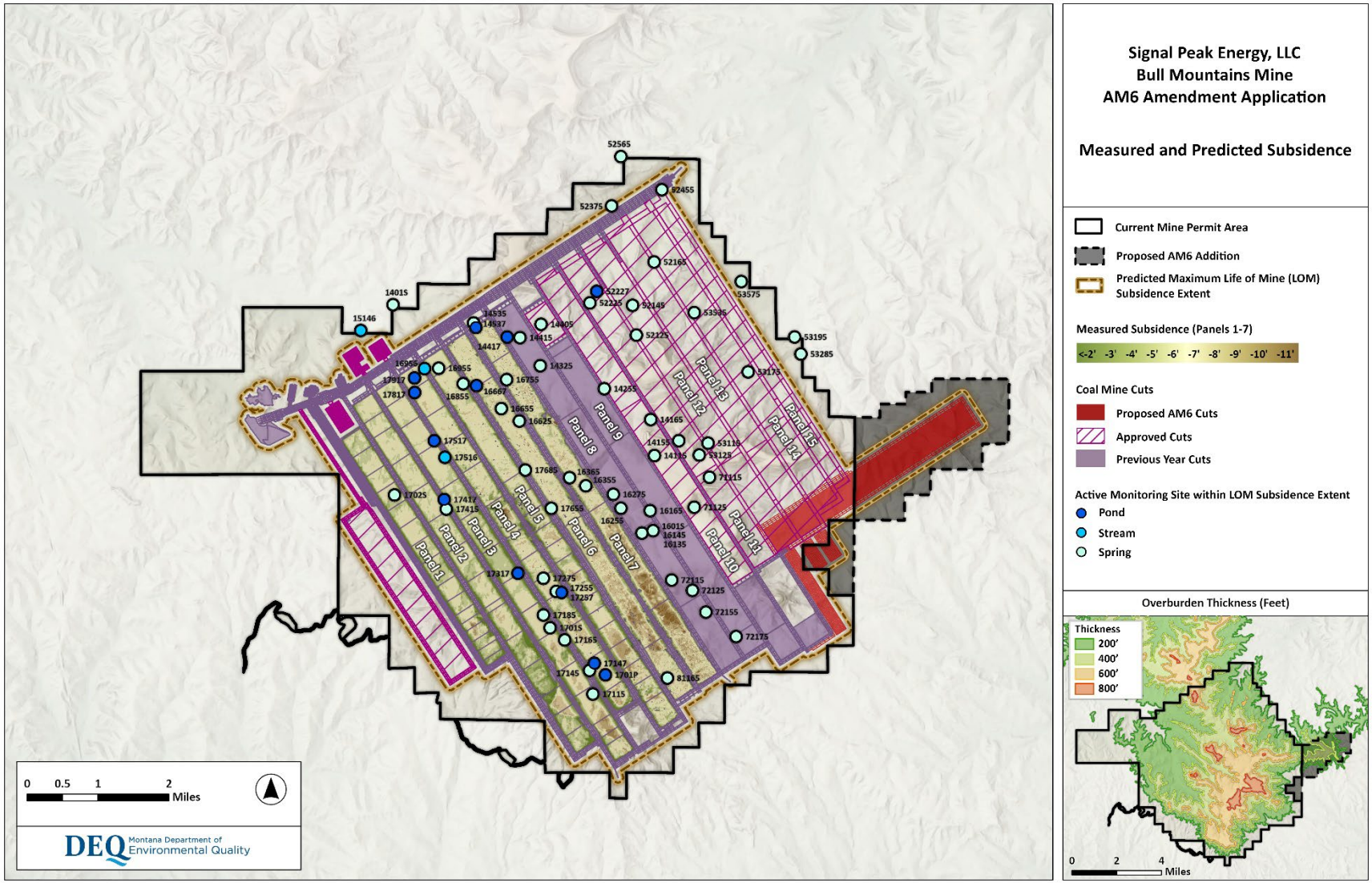
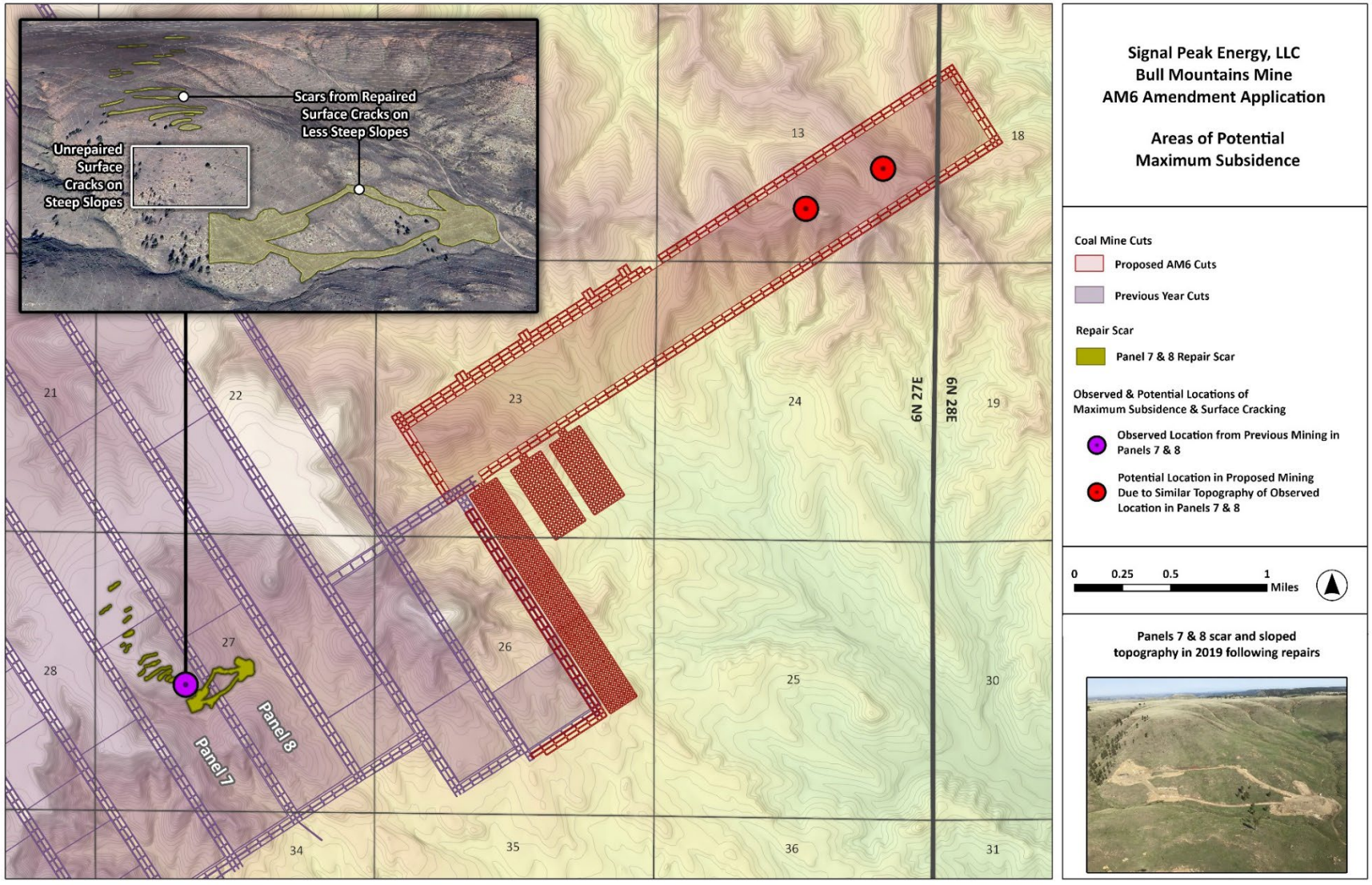


Figure 4: Example of Subsidence and Repair Over Panels 7 and 8



2. Water Quality, Quantity, and Distribution

[Are important surface or groundwater resources present? Is there potential for violation of ambient water quality standards, drinking water maximum contaminant levels, or degradation of water quality?]

The project area receives an average of 14 inches of precipitation annually. Surface waters in the Bull Mountains include springs/seeps, streams, and stock ponds. The region is drained by tributaries of the Musselshell and Yellowstone rivers north and south of the permit area, respectively. The nearest intermittent or perennial stream is lower Halfbreed Creek which flows into the Musselshell River approximately 18 miles to the north. Streams within the permit area are ephemeral, flowing in response to precipitation and snowmelt. Surface waters in the region are classified as C-3 waters by the state. The marginal nature of the water quality of C-3 waters in the Bull Mountains limits their ability to naturally support all beneficial uses established for C-3 waters. Ponds in the area are created by landowners to water cattle, and most are instream dams.

A wetland survey in the AM6 mine expansion area was conducted in the summer of 2023. The survey mapped approximately 2.5 acres of wetlands inside the study area. Of those 2.5 acres, 1.1 acres of wetlands are over longwall or continuous miner areas within the AM6 amendment area, and 50% of those 1.1 acres are over areas previously approved for mining by AM3. The wetlands in the AM6 area are narrow and constrained by valley bottoms. They are all palustrine emergent wetlands that are seasonally flooded or saturated. Due to their location in ephemeral drainageways, the wetlands are unlikely to be classified as jurisdictional wetlands by the U.S. Army Corps of Engineers.

The availability of surface and subsurface water for wetlands comes from two geologic sources: localized spring and seep discharges and drainage bottoms where less permeable mudstones are at or near the surface. Mudstones slow or prevent vertical infiltration thereby retaining water for a sufficient duration to allow for wetland soils and plants to establish. The surface and subsurface water originates from either runoff and snow melt or from springs and seeps. Measurements from groundwater wells and geologic models created from borehole lithology confirm that the local groundwater table in the AM6 area is too deep to provide groundwater baseflow to the drainage bottom and therefore the drainageways do not meet the criteria of intermittent streams per ARM 17.24.301(61).

The presence of an alluvial valley floor (AVF) is determined by the presence of geologic, hydrologic, and biologic properties necessary to support agriculture, meeting the definition of Section 82-4-203(3)(a) and (b), MCA. An AVF determination was made for Rehder Creek in 1992. This determination found that Rehder Creek north of the WDA down to the confluence with Halfbreed Creek met the criteria for a significant alluvial valley floor (DSL, 1992b). Mining of AM6 would utilize the facilities area that has MPDES outfall locations that discharge to the AVF. No additional AVFs have been identified in or near the AM6 amendment area.

Numerous springs and seeps are located throughout the permit area. The volume and unpredictable production of water by most of the springs limits their uses to livestock and wildlife. Based on hydrographs and water quality data that cover decades of frequent measurement, few springs have shown negative effects to discharge or water quality from

undermining. Those that have been affected have had interim mitigation measures enacted to provide appropriate replacement water quality and quantity while monitoring continues to determine if the impacts are temporary or permanent. The variable discharge at all springs appears responsive to precipitation. Most springs have been identified in the permit as sourced from overburden, although Mammoth coal and underburden units are also identified as sources. Baseline water quality conditions have been affected by livestock use and grazing in the Bull Mountains, with most wet areas exhibiting impacts from livestock use.

Groundwater monitoring wells were installed in alluvium, overburden units, the Mammoth Coal, the shallow underburden, and the deep underburden. Groundwater samples have also been collected from the mine "gob", the fracture zone that infills the mined out Mammoth Coal panels. Bedrock groundwater flow is generally toward the northwest. Groundwater sources include alluvium, overburden, Mammoth coal and underburden. Alluvium is commonly dry in the upper drainages except following precipitation or snow melt; however, alluvium becomes more saturated with distance down Rehder Creek. Perched groundwater, subsurface water that forms a saturated horizon within porous media at an elevation higher than the local or regional groundwater table (Leonhart, 2005), is found in the overburden and is limited in quantity. More substantial groundwater sources are the Mammoth coal and two underburden units. Due to the limited thickness of the Mammoth coal, water quantity is not adequate for domestic or agricultural uses, and no domestic or stock wells are known that rely solely upon the Mammoth coal unit. Reliable and more substantial groundwater sources are found in the underburden units, particularly the confined deep underburden aquifer, which provides domestic needs in the area.

Groundwater is sporadic in the mine area and the surrounding region. The climate is semi-arid, which limits recharge, and the sediments of the Tongue River member of the Fort Union Formation are variable and mostly in the siltstone to very fine sandstone range. Typical for continental fluvial and lacustrine sediments, natural salinity and sulfate concentrations are fairly high. The Mammoth coal unit acts as a marginal aquifer, and in some areas localized sandstone units may supply some groundwater from the overburden and underburden. A fairly persistent sandstone unit is found 300-350 feet below the Mammoth coal unit, generally described as the "deep underburden".

Monitoring wells indicate that overburden unit OB-5 has a water column that currently ranges between 4 and 6 feet, but the water column can fluctuate widely, indicating that the overburden unit is likely responsive to short term changes in precipitation. Other stratigraphically higher overburden units modeled for the greater Bull Mountains Mine area are not present in the AM6 amendment area. Mammoth coal monitoring wells indicate that the coal unit has a water column of approximately 28 ft indicating that water in the unit is confined. The premine groundwater gradient in the Mammoth coal was from the southeast to the northwest.

The headwater areas of three ephemeral drainages would be undermined by Panel 1 East, creating the potential for subsidence: Fattig Creek, Upper Railroad Creek, and unnamed tributary drainages to Dutch Oven Creek.

Direct Impacts:

Removal of the Mammoth coal causes drawdown in the aquifer and it is dry where it has been mined. Panel 1 East would remove one additional cut of 522 acres of Mammoth coal to the east

of the existing mining. Room and pillar mining in blocks 12 South, 13 South A and 13 South would affect 124 acres. As longwall mining progresses, material above the mined-out area subsides. The rocks immediately above the void are fragmented and fall to the mine floor, creating a broken and chaotic zone referred to as “gob”. Above the fragmented zone is an interval of fractured rock that mostly subsides as a unit. Above the fractured zone, rocks deform slightly as they subside, but generally do not fracture except at the edges of the mine panel, where subsided and undisturbed areas meet.

The direct effects of mining include higher hydraulic conductivity in the gob, potentially higher vertical conductivity in the fractured zone, and possible minor changes in gradient within the deformed zone. In the immediate mine footprint and within a short distance around it, flow directions and velocities may change somewhat. Increased vertical conductivity may alter recharge in some areas. Geochemical impacts are likely to occur in the gob and in semisaturated areas. In the natural environment, groundwater flows through preferential paths within the rock. Ion exchange within these pathways is at a fairly stable rate. When the intact rock fractures into gob, the flow pathways change. New opportunities for ion exchange are available, and the system is out of equilibrium. Sodium and sulfate, in particular, would increase in the groundwater as the geochemical regime responds to the changes. Eventually, the groundwater chemistry would establish a new equilibrium level. This new equilibrium is likely to be somewhat higher in salinity and sulfate than the baseline, as increased surface area in the gob would remain.

A Total Dissolved Solids (TDS) transport model included with the AM6 application estimates a postmine TDS increase outside of the permit boundary of less than 10 mg/L in the downgradient Fattig Creek alluvium from AM6 mining. The transport model also predicts a TDS increase of less than 400 mg/L in the Mammoth coal unit outside the permit boundary, and less than 100 mg/L in the shallow underburden unit. Inside the permit boundary the TDS transport model predicts an increase in TDS of up to 1,500 mg/L in the former Mammoth coal unit (a.k.a the gob) and 1,000 mg/L in the shallow underburden unit (Water & Environmental Technologies, 2024b). TDS increases in the groundwater system would diminish with distance from the mine due to dilution, adsorption processes, and dispersion. The modeled TDS increase outside of the expanded permit boundary will likely be within the range of natural variation already measured in the groundwater system such that impacts on TDS concentrations are not expected to be significant.

Alluvial water quality at well BMP125, drilled into the Fattig Creek alluvium, ranged from a minimum of 1,600 mg/L TDS in 2014 to a maximum of 2,630 mg/L TDS in 2019; the equivalent specific conductance (SC) values place the alluvial groundwater quality at this location as Class III water quality which is marginally suitable for drinking water for livestock and wildlife, the primary current and future use of alluvial groundwater in the area. An increase in TDS of 10 to 20 mg/L would not change the beneficial use of this water. Mammoth coal and shallow underburden groundwater TDS in the proposed general AM6 expansion area are similarly between 2,000 mg/L and 3,000 mg/L, the equivalent of Class III specific conductance (SC) values. An increase of 50 to 1,500 mg/L would result in no overall groundwater class change inside or outside of the permit boundary; the postmine hydrologic balance of the groundwater system would remain marginally suitable for livestock use. As such, changes to alluvial water quality from AM6 are not expected to be significant.

Twenty feet of additional drawdown in the OB-5 unit is predicted by modeling due to the proposed mining of Panel 1 East (Water & Environmental Technologies, 2024b). The five-foot drawdown contour from the addition of Panel 1 East is mostly contained within the permit boundary.

Longwall mining of the Mammoth coal will remove the unit in its entirety within the panel footprint. Continuous mining will leave some coal in place postmine; however full desaturation of the coal during mining is predicted. After mining, controlled subsidence will cause overburden units to collapse into the mine void and eventually create a new groundwater bearing strata. The five-foot drawdown contour from the proposed addition of Panel 1 East is almost entirely contained within the permit boundary; the five-foot drawdown may extend approximately 500 feet in some areas beyond the proposed permit boundary (Water & Environmental Technologies, 2024b). The Mammoth Coal cropline is within a mile to the southeast of Panel 1 East and partially constrains the extent of drawdown impacts from mining the panel. Drawdown models indicate that the postmine steady state groundwater head of OB-5, the replaced Mammoth Coal gob layer, and UB1A would have permanent changes in the potentiometric head from the proposed AM6 mining; some areas are modeled as a net increase in head and some areas as a net decrease in head. This is similar to mining impacts predicted from previously approved mining. Subsidence over the longwall panels have a permanent impact on the groundwater units immediately above and below the mined coal unit.

Underburden units are predicted to experience minor to insignificant drawdown from mining AM6. SPE's groundwater model indicates a potential for five feet of additional drawdown in the upper underburden, immediately below the Mammoth coal (Water & Environmental Technologies, 2024b). No drawdown is predicted in the deep underburden from existing or proposed mining. The deep underburden sandstone unit is where most viable water supply wells are drilled.

Direct impacts to springs are limited to impacts from groundwater drawdown to their source hydrogeologic unit. Impacts to springs are site dependent and variable. From past observations, discharge at springs may decrease, increase, or stay the same. The issue point of a spring may even change location. No springs are predicted to be impacted by AM6 mining outside of the permit area due to distance from the additional mining and due to the nearby springs being sourced from lithologic units that are not predicted to be impacted by the proposed mining. One spring, 71355, would be undermined by the continuous miner for room and pillar mining. This spring is currently outside of the permit boundary and would be incorporated into the permit upon the approval of AM6. This spring has had sporadic discharge, indicating discharge is dependent on high recharge events and is likely sourced by weathered alluvium. No direct impact from groundwater drawdown is predicted at this spring.

Direct impacts to ephemeral drainageways are not anticipated because these drainageways convey runoff from precipitation and snow melt. Impacts to channelized surface flow associated with runoff events are expected to be minimal due to the limited area of drainage affected. Any offsets are considered short-term as they are routinely repaired by the mine. Potential impacts to surface waters from the longwall panels and gate roads are confined to those impacts resulting from land subsidence for drainages that do not receive spring contributions. Springs may be additionally impacted by groundwater drawdown.

There are no ponds within the Panel 1 East footprint or AM6 amendment area.

Secondary Impacts:

Where subsidence features occur within established ephemeral watercourses, the profiles of these drainages may be modified by small ridges held up over barriers, pillars, mains, and gate roads, and by depressions over the longwall panels. Changes to water quality in ephemeral drainageways would be anticipated to be limited to a temporary increase in sediment caused by a change in the drainage profile or from subsidence reclamation activities. Changes in water quantity in ephemeral drainageways would be anticipated to be limited to temporary changes in grade from subsidence causing either an increase or decrease in velocity and ponding of water in drainages over the longwall panels. AM6 would create subsidence over minor unnamed headwaters drainages to Fattig Creek, Railroad Creek, and Dutch Oven Creek as well as the main ephemeral drainageway for upper Railroad Creek. Based on subsidence impacts measured to date, the drainage profiles are expected to sag over the longwall panel between the gate roads. Abrupt changes in the drainage profiles are not expected.

Stock ponds are most likely to be impacted by underground mining from subsidence causing cracks in the ponds or disturbing the contributing drainage leading to the pond. The minor headwater drainageways do not contribute significant runoff to any downstream ponds, and therefore the proposed mining would not have an impact on pond water quality and is unlikely to have any effect on pond water quantity.

Wetlands and naturally seasonally ponded areas of runoff in the drainage bottoms may be impacted by subsidence. Soil saturation for wetland development is primarily controlled by the presence of less permeable mudstone units that are found in some of the drainageways in the area. These units prevent runoff from infiltrating into the ground. Subsidence may fracture the mudstone units thereby reducing or eliminating enhanced soil saturation for impacted wetlands unless the subsidence cracks were repaired. Neither the location nor the extent of subsidence cracks are predictable; the appearance of surface subsidence cracks are dependent on multiple complex geologic factors. Subsidence cracks may even create new or larger wetlands if cracks fracture water bearing units and create new springs or seeps.

Subsidence impacts on the overall groundwater recharge rate of the AM6 area due to fracturing above the fragmented zone would be temporary to permanent, as some of the fractures fill with dislodged sediments or are cemented by precipitation of mineral material. In some areas, subsidence may bring formerly unsaturated materials below the water table. Increased ion exchange and solution of these materials may raise salinity and sulfate levels in shallow groundwater; the duration of impact and the establishment of a new equilibrium cannot be predicted precisely. Similar to the gob, a new equilibrium would develop, likely slightly higher in specific conductivity (SC) than baseline.

Spring 71355 is over room and pillar mining. Since subsidence may or may not occur at this location, impacts to this spring may or may not occur. Subsidence would only impact this spring if cracks developed in the contributing groundwater units of the spring, namely the weather alluvium and bedrock mantle.

Impacts from subsidence to water quality, quantity, and distribution from AM6 would not be a significant impact to the human environment. The groundwater units that would be impacted

are not currently used in the area of impact as a groundwater source. The springs in the area are not predicted to be impacted from mining of the AM6 coal due to their contributing groundwater coming from stratigraphic units that are not predicted to be impacted by groundwater drawdown or are located at a sufficient distance from mining to be outside the predicted area of drawdown.

Cumulative Impacts:

Processing waste from AM6 would be placed in the previously permitted waste disposal area (WDA) and would be processed in the previously permitted facilities area. Discharges from outfalls, regulated under DEQ's MPDES program, flow into two ephemeral drainages: PM Draw and Rehder Creek. Approval of AM6 would continue the use of the facilities area and WDA. During mine operations, ditches and culverts are employed to handle surface runoff within and around the mine facilities area. All ditches and culverts are routinely inspected to ensure that accelerated erosion is not occurring at the outfalls. Mining disturbance in the drainage basin above the Rehder Creek AVF has been limited to minor disturbances such as culverts for road crossing, crib pads, and small areas of subsidence reclamation. None of these impacts would measurably impact runoff quantity or quality to the Rehder Creek AVF. Increases in Sodium Adsorption Ratio (SAR) and Specific Conductivity (SC) from surface water discharges under the approved MPDES permit have not created a change in water quality that would significantly impact the capability of the Rehder Creek AVF to support agricultural activities. No additional crib pads or roads for facilities access are proposed as part of the AM6 amendment; any disturbance from mine reclamation is predicted to be minor.

The additional mining proposed with AM6 is expected to produce the same type of waste coal and rock byproducts which would be added to the approved WDAs. No major changes to the design, operations, or closure of WDA1 or WDA2 were proposed as part of AM6. Water quality samples have been collected from surface water and ground water monitoring sites directly downgradient of the WDA. Water quality samples from the alluvial wells have had total acidity either below detection or one to two orders of magnitude smaller than total alkalinity, indicating that the water still maintains a high buffering capacity. There is no indication that the WDA is acid producing. Mining of AM6 is highly unlikely to change the existing geochemistry of the WDA, and it is not predicted to produce acid.

Table 8 in the permit application's Probable Hydrologic Consequences summarizes the probable hydrologic consequences of all cumulative mining at the Bull Mountains Mine No. 1 (Water & Environmental Technologies, 2024a). The largest impact to water quality from coal mining in the area is the creation of the gob. Additional mining would remove more of the Mammoth coal, and this marginal groundwater source is predicted to be replaced with groundwater moving through gob. Gob is the collection of void space and collapsed rock in the longwall panel. Postmine water quality in the gob from mining the areas proposed in AM6 is predicted to be a continuation of the postmine water quality predicted from existing approved mining. Mine gob water is predicted to be somewhat higher in total dissolved solids (TDS) than the premine Mammoth coal water quality. The broken overburden filling the mine area would expose a greater surface area of overburden rock to water resulting in greater cation and anion exchange than premine. These newly exposed mineral surfaces increase TDS until dissolution of the minerals is complete and in equilibrium. TDS is predicted to decrease over time and distance from the mine as gob water mixes with other groundwater sources outside of the mine permit area and with recharge sources. Groundwater outside the permit area is not expected to be

significantly affected by the accumulation of gob mine water and is predicted to sustain the current beneficial uses of the groundwater, such that cumulative impacts are not anticipated to be significant. The deeper confined aquifer in the underburden is forecast to show small but widespread drawdowns at the end of mining. These drawdowns would have a cumulative effect with increasing exploitation of the deep underburden aquifer by expanding subdivisions and residential development near the permit area. Because of the water volume in the deep underburden aquifer, cumulative impacts of mining, residential, and agricultural use of the deep underburden aquifer would not interfere with future development.

Facilities discharge permit MT028983 has been administratively continued since 2018. An update to the discharge permit is currently under review by DEQ. Changes to the discharge permit include but are not limited to removal of outfalls that are no longer needed by the operator in the facilities area.

DEQ will prepare a Cumulative Hydrologic Impact Assessment (CHIA) as part of the written findings of the AM6 final decision. The CHIA process includes the following: 1) evaluating impacts to the hydrologic system, 2) defining the cumulative hydrologic impact area, 3) describing the hydrologic system, the baseline values, and natural variability, 4) identifying hydrologic resources likely to be affected, 5) estimating the impacts of mining on hydrologic resources, and 6) making a material damage determination and preparing a statement of findings.

3. Air Quality

[Will pollutants or particulate be produced? Is the project influenced by air quality regulations or zones (Class I airshed)?]

Permittees are required to comply with all laws relating to air, such as the Federal Clean Air Act, National Ambient Air Quality Standards set by the Environmental Protection Agency (EPA), and the Clean Air Act of Montana. In addition, the Administrative Rules of Montana (ARM 17.8.308) require that the permittee would need to take reasonable precautions to control airborne particulate matter.

The air quality in this area is currently unclassifiable/attainment for all National Ambient Air Quality Standards (NAAQS) and Montana Ambient Air Quality Standards (MAAQS) pollutants. The closest nonattainment areas (NAA) are the 1-hour and 24-hour SO2 NAA in Laurel, located approximately 45 miles southwest of the mine.

The current approved air quality permit (#3179-13), issued by DEQ on December 20, 2023, regulates the production of coal, stockpiling and processing of coal in the facilities, and dust control. The air quality permit allows for 15 million tons of coal production from the facility during a rolling 12-month period. Emission control techniques to minimize particulate emissions include enclosing coal and waste conveyors, use of chutes at the coal loadout and transfer points, and use of water and/or chemical dust suppressants and contouring techniques on coal stockpiles, the waste disposal area, topsoil storage piles, and active roads.

Direct Impacts:

No direct impacts to air quality are expected due to the proposed action and continuation of mining operations. Some fugitive dust may be anticipated due to the ongoing operations (e.g. run-of-mine storage, coal processing, and haulage), as well as emissions from mobile equipment. SPE must operate within the confines of the approved Air Quality Permit, MAQP #3179-13. The significance assessment is presented in **Table 5**. Changes to the air permit would undergo a separate Environmental Assessment by DEQ.

Secondary Impacts:

No secondary impacts to air quality are expected from the proposed action.

Cumulative Impacts:

Impacts to air quality from the proposed action would add to existing impacts from historic mining, current mining, and other industrial activity in the area. The significance assessment is presented in **Table 5**. Since approval of the proposed AM6 amendment would continue the already existing mine operations practices with no modifications, there would be no increase in impacts to air quality beyond the currently approved impacts assessed and permitted by Air Quality Permit #3179-13. Therefore, the mining from AM6 would not result in a significant impact to air quality.

4. Vegetation Cover, Quantity, and Quality

[Will vegetative communities be significantly impacted? Are any rare plants or cover types present?]

The baseline land cover in the project area varies and is dominated by shrub grassland and thin breaks and rock outcrop communities, along with minor areas of pine forest and pine savannah as well as grasslands in the lower areas located on the surface above the proposed expansion area. Baseline communities in the mine area are further described in the Final EIS completed for the initial permit application (DSL, 1992a). There are two grazing allotments administered by the United States Department of Interior, Bureau of Land Management (BLM) in the general area of the proposed AM6 amendment, known as Johnston Mountain (#009680) and Con Coal Co (#09682), which cover approximately 8,788 acres and 14,024 acres, respectively. In addition to public lands under the jurisdiction of the BLM, allotments may include private lands, State lands, and lands under the jurisdiction of other federal agencies. The Con Coal Co allotment is north of the AM6 expanded permit area while the Johnston Mountain allotment includes a majority of the expanded AM6 surface area.

Direct Impacts:

Expansion of underground mining activities within the proposed amendment would have no direct impact on vegetative communities or ongoing grazing activities in the area.

Secondary Impacts:

Subsidence resulting from underground mining would result in local areas of surface disturbance (e.g. fractures, areas of sloughing, etc.) similar to subsidence features recorded during extraction of previous panels. Areas of surface disturbance would be evaluated, and a site-specific repair-mitigation plan would be developed and implemented unless it was determined that natural

healing was the best alternative. Repair could include soil salvage, grading, soil replacement, and seeding with an approved seed mix. Subsidence of the additional panel associated with the proposed AM6 amendment would result in sequential subsidence that would have minimal effect on deep rooted plant species, such as ponderosa pine; some trees may be damaged, especially if they are located on a slough, subsidence fracture, or depression. Along with any subsidence, small pads, boreholes, and roads associated with the project may disturb up to five acres within the proposed project area. The exact location of any boreholes, pads, roads, subsidence cracks, and/or crack repair actions cannot yet be determined. SPE would be required to submit specific permit revisions and supplemental information, including maps certified by a professional engineer, before crib pads would be authorized by DEQ under MSUMRA. Subsidence crack repair would follow existing permit requirements and specifications.

Land disturbance at the site may result in propagation of noxious weeds. Any surface disturbances would be reclaimed and seeded with an appropriate seed mix. If the action were approved, weed control during and after the activity would be a requirement. The permit requires the operator to control weeds under their approved weed control plans. SPE has two weed control plans, both updated in 2020, for the two counties the mine spans: Musselshell County and Yellowstone County. In addition, in areas of the permit that are also within the General Habitat for sage grouse, reclamation of surface disturbed areas would also include control of cheatgrass and Japanese brome.

Cumulative Impacts:

Impacts to vegetation cover, quantity, and quality from the proposed action would add to existing impacts from mining and agricultural use (i.e. grazing) in the area. For a comprehensive discussion on existing impacts from mining and agricultural use, please refer to the previous EIS (DSL, 1992a), and previous EAs (DEQ, 2016) (DEQ, 2017).

5. Terrestrial, Avian, and Aquatic Life and Habitats

[Is there substantial use of the area by important wildlife, birds or fish?]

Based on habitat associations reported in Hart et al. (1998), about 155-165 birds, 50-52 mammals, 6 amphibians and 9-11 reptiles might reasonably be expected to be observed at least seasonally in the Wildlife Monitoring Area (WMA) which includes the existing permit area, the proposed amendment, and a 1-mile buffer (Westech, 2009). During 2022, the mine recorded the presence of 80 bird species (not including three unidentified species of duck, swallow, and waterfowl), 23 mammal species (including likely bat detections), 2 amphibian species, and 2 reptile species (Catena Consulting, LLC, 2023).

The Bull Mountains are outside of the range of the Northern Long-eared Bat (NLEB) species as delineated with verified records. Despite extensive acoustic and mist net surveys performed by regional bat experts familiar with NLEBs and western Myotis bat species, no evidence has emerged that the species occurs within this area. Identification of NLEBs remains challenging with considerable potential for misidentification of both acoustic recordings and in-hand animals. Previous records that locate the species within this area appear to be spurious based on review of identification methods used during these surveys and data quality. Additional survey effort targeting areas where the species was reported and following best practices for detection

of the species has failed to detect the species. The weight of evidence is that the species is not present in this area (Bachen, 2023).

There are no aquatic habitats or associated aquatic life within the proposed amendment area. The ephemeral drainages do not have sufficient hydrology to support aquatic life adapted to flowing water for a portion of their lifecycle.

Direct Impacts:

The removal of habitat can impact species through direct habitat loss, habitat fragmentation, and avoidance of the mining operation and presence of humans. Habitat removal could directly cause loss of nests, loss of lekking habitat, loss of individuals during removal, and displacement of animals. No direct impacts to wildlife or aquatic life and habitat are expected.

Secondary Impacts:

Subsidence from underground mining associated with the proposed action could result in approximately five acres of surface disturbance. Construction of any surface infrastructure would require a minor revision to the permit, and an additional EA would be completed during review of the borehole and pad design. This review would include an assessment of impacts on wildlife and any mitigation that may be required. The avoidance of mining activities including human presence and noise can reduce the carry capacity of an area similar to that of direct habitat destruction by reducing vital rates and thereby population abundance. Noise can interfere with courtship and reduce reproductive success. This disturbance could result in potential loss of terrestrial and avian habitat in the proposed AM6 amendment area. The potential disturbance is relatively small in comparison to the mine facilities and other existing surface disturbance.

Secondary impacts could include changes in habitat quality (increase in invasive species, woody encroachment, and reduction in food availability), changes in predator communities, and increase of diseases. These impacts can reduce vital rates by lowering nest survival, causing brood failure, reducing adult and juvenile survival, along with other vital rates. Secondary impacts to terrestrial and avian life and habitat would be similar to existing secondary impacts from currently approved mining activities. No secondary impacts to aquatic life are expected.

Cumulative Impacts:

Small impact areas have occurred during longwall mining at the Bull Mountains Mine. An additional longwall panel could induce additional surface disturbance areas associated with subsidence of that panel, which would add to cumulative impacts to wildlife from mining and agriculture in the project area.

6. Unique, Endangered, Fragile, or Limited Environmental Resources

[Are any federally listed threatened or endangered species or identified habitat present? Any wetlands? Species of special concern?]

Previous consultation with the United States Fish and Wildlife Service (USFWS) determined that there are no Threatened or Endangered Species, Proposed Species, or Critical Habitat within the project area (USFWS, 2023b). DEQ is consulting with USFWS for the proposed AM6 amendment. The Monarch Butterfly is a Candidate Species that may occur within the proposed amendment

and existing permit area (Catena Consulting, LLC, 2023) (USFWS, 2023b). All three species of milkweed expected to occur in the Bull Mountains were incidentally observed and recorded in or near the mine permit area in 2022 (Catena Consulting, LLC, 2023). Should a Threatened or Endangered Species be observed, the mine would immediately contact the USFWS and DEQ to determine appropriate actions.

Based on the Montana Natural Heritage Program data, habitat conditions, and historical and recent monitoring records at Bull Mountains Mine No. 1, 47 Species of Concern (13 mammals, 28 birds, two amphibians, and four reptiles) could occur in the habitats of the WMA at least occasionally, although some are likely very rare if they occur at all (e.g., whooping crane) (Catena Consulting, LLC, 2023).

Golden eagles and bald eagles have been observed on the project site and there has been documentation of golden eagles nesting within the WMA. There are no active eagle nests within two miles of the project area. Sixteen species of raptors were previously recorded in the permit and surrounding area, including 14 diurnal species and three species of owls. One inactive nest and one undetermined nest exist within the proposed amendment area (Catena Consulting, LLC, 2023).

DEQ and SPE consulted with the Montana Sage Grouse Habitat Conservation Program (DNRC, 2023) regarding potential sage grouse habitat within the Project area. The proposed action for AM6 would add zero acres of surface disturbance to the existing coal mine permit area in designated General Habitat for sage grouse. A portion of the additional continuous miner mining, approximately 40 acres, within the approved permit boundary is within the Sage Grouse General Habitat. The proposed project is located beyond two miles of any active sage grouse lek. The closest General Habitat lek is located approximately 8.3 miles south of the proposed project location. SPE has never observed a sage grouse during the annual wildlife monitoring survey (Catena Consulting, LLC, 2023).

Direct Impacts:

There are no Threatened and Endangered Species within the proposed area and therefore no direct impacts to those species are expected. The project would not contribute to the listing of the species. Montana is generally considered to be in between the main Monarch Butterfly populations across the US and does not represent high significance habitat. There are no expected direct impacts to sage grouse.

Secondary Impacts:

Subsidence from underground mining, small pads, minor roads, and boreholes associated with the proposed action could result in approximately five acres of surface disturbance. Construction of surface infrastructure would require a minor revision to the permit, and an additional EA would be completed during review of the borehole and pad design. This review would include an assessment of impacts on wildlife and any mitigation that may be required. The removal of habitat through surface disturbance could impact species through direct habitat loss, habitat fragmentation, and avoidance of the mining operation and presence of humans. There is a very low chance that those five acres may cause direct removal of Monarch Butterfly habitat or individuals.

There are no Threatened and Endangered Species, or sage grouse leks within the proposed area and therefore there are no secondary impacts expected. Weed spraying efforts would be conducted in adherence to the county weed plans and consist of spot spraying target weeds while native species are avoided. This would limit impacts on important habitat and protect it from competition associated with noxious weeds.

Cumulative Impacts:

There are no Threatened and Endangered Species or sage grouse within the proposed area and therefore there are no cumulative impacts to Threatened and Endangered species, sage grouse, or wetlands expected. Impacts to the Monarch Butterfly could add to cumulative impacts from mining and agriculture in the project area.

7. Historical and Archaeological Sites

[Are any historical, archaeological or paleontological resources present?]

Over the course of many years, a number of archeological and investigations have been conducted on the Bull Mountains. The current project area overlaps several of these investigations, including reports over multiple years (Ferguson & McElroy, 2023) (Aaberg & Crofutt, 2013) (Aaberg & Crofutt, 2014) (Meyer, 2017) (Ferguson D. , 2009). The results of these investigations are summarized below:

Author	Date	# of Sites	# of Historic Properties (NRHP eligible or undetermined)
Ferguson	2009	0	0
Aaberg and Crofutt	2013	93	38
Aaberg and Crofutt	2014	50	10
Meyer	2017	42	9
Fergison and McElroy	2023	81	6

From these reports, only two historic properties, 24YL2144 and 24YL2145 (located by Meyer (2017)) are located within the proposed AM6 project area. In 2024, GCM Services, Inc., conducted test evaluations of both sites. The results determined that only site 24YL2144 is eligible for the National Register of Historic Places (NRHP).

In addition, tribal consultation with the Blackfeet and Crow (Personal Communication, February 14, 2024) is ongoing to determine if any sites identified by the previous investigations might qualify as a Traditional Cultural Property (TCP), or if the tribes have other regional concerns regarding TCP's.

A Data Recovery Plan has been prepared and approved by DEQ and Montana State Historic Preservation Office for 24YL2144 to address the potential impacts to the site due to the possibility of subsidence. Mining under the site will not be allowed until a mitigation plan is approved and in place. DEQ has agreed to allow an alternative mitigation in the form of an ethnographic or land use study in place of data recovery. Should SPE decide to pursue this avenue of mitigation, the plan will need to be in place prior to mining under 24YL2144.

Direct Impacts:

Expansion of underground mining activities within the proposed amendment has the potential to have a direct impact on Historic Property 24YL2144. Though steps can be taken to avoid impacts to the site from surface activities, the subsidence caused by the underground mining has the potential to disrupt intact contiguous depositional elements through uneven subsidence, matrix mixing, soil compression, or surface cracking. To avoid the potential impacts and data loss, data recovery at the site should take place before mining occurs below the site boundary. The significance assessment is presented in **Table 5.**

Secondary Impacts:

Potential surface disturbance and the associated impacts are discussed in this EA, but the exact location of any subsidence cracks, and/or crack repair actions cannot yet be determined. No boreholes, pads, or roads are proposed with AM6. Construction of any surface infrastructure would require a minor revision to the permit, and an additional EA would be completed during review of the borehole and pad design, including additional assessment of the impact on historic properties. Subsidence from longwall mining beneath cultural sites may impact the integrity of the site. Surface cracks and any associated reclamation could disturb surface features and in situ artifacts. For sites located in cliffs and steep terrain, subsidence has the potential to cause cliff failures thereby destroying or altering a site.

Cumulative Impacts:

Cumulative impacts to historic properties from the proposed action would add to existing impacts from historic and current mining and agriculture.

8. Aesthetics

[Is the project on a prominent topographic feature? Will it be visible from populated or scenic areas? Will there be excessive noise or light?]

No surface facilities would be added under the proposed amendment. Mining associated with proposed action could lower the relief of the undermined area by approximately 0 to 11 feet or up to 70 percent of the extraction height. Generally, this amount of subsidence is minor compared to the amount of topographic relief in the area and should not be noticed, especially from a distance. However, there may be noticeable changes to the topography if subsidence and associated surface disturbance is greater than expected.

Direct Impacts:

The proposed activities would not significantly increase surface disturbance. The proposed project may be visible to or heard by the sparsely populated surrounding area and to receptors located at observation points that are unobstructed by topography or forested vegetation. Aesthetic impacts from mining activities would not be excessive to receptors in the area. The significance assessment is presented in **Table 5**.

Secondary Impacts:

Disturbance up to approximately five acres from subsidence features on the surface above the added mine cut, including cracks and scarps, is possible. Construction of any surface infrastructure would require a minor revision to the permit, and an additional EA would be completed during review of the borehole and pad design. Subsidence cracks on steep slopes may be visible to some landowners adjacent to the Panel 1 East area within the proposed AM6 amendment area. However, cracks are expected to heal over time by closing naturally, filling in gradually with sediment, or through direct reclamation by the operator. Subsidence cracks may be visible on steep terrain for years; cracks on slopes greater than 20% will usually be allowed to heal naturally. Reclamation of subsidence cracks would cause areas of disturbance that would be visible until vegetation was established to premine densities. Final reclamation of surface disturbance would be required to occur a minimum of ten years prior to final bond release.

Cumulative Impacts:

Noise and light from the proposed project would be a continuation of the current noise and light from approved mining activities, including operation of the facilities area. The impact of noise from the surface facilities was discussed in the 1992 EIS and these impacts would be expected to continue with the approval of AM6 (DSL, 1992a). In the EIS, rural sound levels of 35 dBA were expected in the area prior to construction of the mine. Noise levels in the facilities from construction equipment were anticipated to range between 72 to 95 dBA, primarily from running of construction equipment. Cumulative impacts to aesthetic resources from the proposed action would add to existing impacts from historic and current mining and agriculture.

9. Demands on Environmental Resources of Land, Water, Air, or Energy

[Will the project use resources that are limited in the area? Are there other activities nearby that will affect the project?]

The proposed project would use water supplied from existing wells drilled on site as well as water produced during the extraction of the Mammoth coal for mining use. Impacts from this water use are described in the EA prepared for Amendment 3 (DEQ, 2016). Mining under the proposed action contemplates economic exploitation of coal resources that would not result in significant decrease in the total amount of exploitable coal reserves in Montana.

Direct Impacts:

Impacts to water and energy resources would continue as part of the proposed action. No additional impacts on land or air would be expected from the proposed action. The significance assessment is presented in **Table 5**.

Secondary Impacts:

Secondary impacts on the environmental resources of land, water, air, or energy are not expected from the proposed action.

Cumulative Impacts:

Cumulative impacts from the proposed action to the environmental resources of water and energy would add to existing impacts from historic and current mining and agriculture in the

area. No additional cumulative impacts on the environmental resources of land or air are expected from the proposed action.

10. Impacts on Other Environmental Resources

[Are there other activities nearby that will affect the project?]

DEQ queried the following websites, databases, and organizations for nearby activities that may affect the project.

- Montana Department of Environmental Quality (DEQ)
- Montana Department of Natural Resource and Conservation (DNRC)
- Montana Department of Transportation (MDT)
- Yellowstone and Musselshell Counties
- United States Department of Interior, Bureau of Land Management (BLM)
- United States Forest Service (USFS)

The MDT website shows the Yellowstone County Line North maintenance project on US 87 adjacent to the permit area. The project, epoxy striping, is scheduled for calendar year 2024. This maintenance project does not have any anticipated effects on the proposed action.

Direct Impacts:

Impacts on other environmental resources are not likely to occur as a result of the proposed action.

Secondary Impacts:

Secondary impacts to other environmental resources are not expected from the proposed action.

Cumulative Impacts:

Cumulative impacts to other environmental resources are not expected from the proposed action.

11. Human Health and Safety

[Will this project add to health and safety risks in the area?]

The applicant would be required to adhere to all applicable state and federal safety laws. Industrial work such as the work proposed by the applicant is inherently dangerous. The Mine Safety and Health Administration (MSHA) has developed rules and guidelines to reduce the risks associated with this type of labor. Few, if any, members of the public would be in the general project area during mining operations.

Direct Impacts:

There would be a continuation of potential impacts to human health and safety, primarily in the occupational setting rather than the general public, with extended mining capacity as a result of the proposed action. The significance assessment is presented in **Table 5**.

Secondary Impacts:
Secondary impacts to health and human safety are not expected from the proposed action.

Cumulative Impacts:
Cumulative impacts to health and human safety are not expected from the proposed action.

12. Industrial, Commercial, and Agricultural Activities and Production

[Will the project add to or alter these activities?]

Land above the proposed mine panel is currently used for livestock production; livestock use would continue during mining. The project area is remote and, with the exception of livestock grazing, there are no industrial or commercial activities near the proposed amendment area. There are two grazing allotments administered by the BLM in the general area for AM6, known as Johnston Mountain (#009680) and Con Coal Co (#09682), which cover approximately 8,788 acres and 14,024 acres, respectively. In addition to public lands under the jurisdiction of the BLM, allotments may include private lands, State lands, and lands under the jurisdiction of other federal agencies.

Direct Impacts:
Direct impacts on the industrial, commercial, and agricultural activities and production in the area are not expected from the proposed action.

Secondary Impacts:
Disturbance up to approximately five acres from subsidence features on the surface above the added mine cut, including cracks and scarps, is possible. Construction of any surface infrastructure would require a minor revision to the permit, and an additional EA would be completed during review of the borehole and pad design. Grazing or pre-mining land use would not be significantly impacted by any subsidence associated with the proposed action. Subsidence features have not impacted livestock production in current mined areas and are not expected to impact production under the proposed AM6. It is expected that any surface impacts would be short-term; the operator would be required to repair the damage if it were to be extensive or impact the post-mine land use. Final reclamation of surface disturbance would require a minimum of ten years prior to final bond release. The significance assessment is presented in **Table 5**.

Cumulative Impacts:
Cumulative impacts on the industrial, commercial, and agricultural activities and production in the area are not expected from the proposed action.

13. Quantity and Distribution of Employment

[Will the project create, move, or eliminate jobs? If so, estimated number.]

The AM6 Proposed Action would be a continuation of mining operations. It would not change the existing workforce at the mine, which includes 255 employees and 30 full-time, temporary

contractors. SPE was listed as the top employer of Musselshell County as of 2021 (DLI, 2023). It is not anticipated that this project would create, move, or eliminate jobs.

Direct Impacts:

The Proposed Action impacts on quantity and distribution of employment would not likely result from this project. The Proposed Action would not extend the mine's operational timeframe, but rather would expand mining capacity on lands with private mineral estates for the Bull Mountains Mine No. 1. No lasting adverse impacts to employment would be expected from this project.

Under the No Action alternative, the extent of remaining mining activities would be limited to the permit area, coal volumes, existing mine operation timeframe and reclamation plan approved through previous amendments (DEQ, 2016). It is anticipated that employment would decrease when coal production ceases and it would further decline as reclamation is completed. The significance assessment is presented in **Table 5**.

Secondary Impacts:

Secondary impacts on the quantity and distribution of employment are not expected from the proposed action.

Cumulative Impacts:

Cumulative impacts on the quantity and distribution of employment are not expected from the proposed action.

14. Local and State Tax Base and Tax Revenues

[Will the project create or eliminate tax revenue?]

The AM6 Proposed Action would be a continuation of mining operations on private mineral estates within the previously approved mine operating timeframe and it would not change the workforce, the rate of coal production, or tax revenue related to the payroll taxes from the project. Montana also collects a tax on mined coal. The tax is divided among multiple state funds as shown in the diagram below (**Figure 5**), based on the 2021 distributions (Montana Legislative Branch, 2021). Previous distributions of funds have also created large funds that now earn interest but are not currently directly funded by coal sales, such as the Treasure State Endowment Fund, TSEF Regional Water System Fund, and Coal Severance Tax Permanent Fund.

Direct Impacts:

The AM6 Proposed Action would be a continuation of mining operations on private mineral estates within the previously approved mine operation timeframe. The positive, yet limited, impacts to the local and state economy would continue similarly to current conditions.

Additional mining would continue to provide the coal severance tax available to the state. Employment of the current workforce, which includes 255 employees and 30 full-time, temporary contractors, would result in continued income taxes. Musselshell and Yellowstone counties would collect taxes based on the mine development within the respective county. Property taxes would be collected on the mine facilities and equipment based on its location. It

is possible that lands within the amendment area may be reassessed and taxed at a lower rate if the county determines that the value of the land has been impacted by subsidence.

Under the No Action alternative, the extent of remaining mining activities would be limited to the permit area, coal volumes, previously approved mine operation timeframe, and reclamation plan approved through previous amendments (DEQ, 2016). It is anticipated that payroll taxes and coal taxes would cease or greatly decrease when coal production ends and the reclamation plan is completed. The significance assessment is presented in **Table 5**.

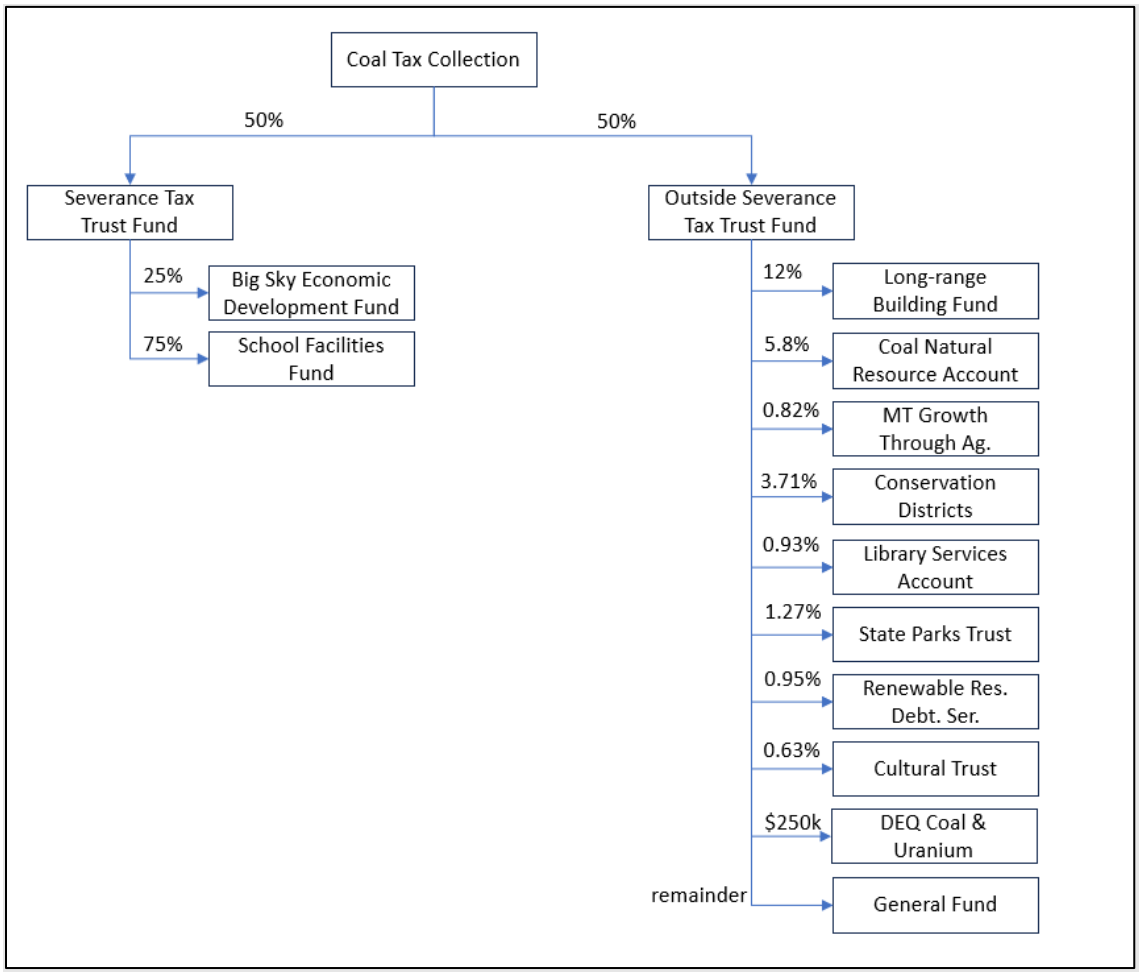
Secondary Impacts:

Secondary impacts to local and state tax base and tax revenue are not expected from the proposed action.

Cumulative Impacts:

Cumulative impacts to local and state tax base and tax revenue are not expected from the proposed action.

Figure 5: 2021 Distribution of Coal Tax



15. Demand for Government Services

[Will substantial traffic be added to existing roads? Will other services (fire protection, police, schools, etc.) be needed?]

The proposed project would not add substantial traffic to existing roads and the demand for government services would not exceed demands previously disclosed in the Final EIS (DSL, 1992a) and AM3 EA (DEQ, 2016).

Direct Impacts:

Direct impacts on the demand for government services are not expected from the proposed action.

Secondary Impacts:

Secondary impacts to demand on government services are not expected from the proposed action.

Cumulative Impacts:

Cumulative impacts to demand on government services are not expected from the proposed action.

16. Locally Adopted Environmental Plans and Goals

[Are there State, County, City, USFS, BLM, Tribal, etc. zoning or management plans in effect?]

The proposed additional activities would occur on private land. The project area would be subject to the 2017 Montana Noxious Weed Management Plan and to any plans or rules set forth by Musselshell and Yellowstone Counties, including the Musselshell County Weed Management Plan and the Yellowstone County Weed District Weed Management Plan. The mine has weed control plans last updated in 2020 for Musselshell and Yellowstone counties in their permit.

The Montana Forest Action Plan was created in 2010 as a response to the federal 2008 Farm Bill, which required states and territories to develop an assessment of state forest conditions (both privately and publicly owned) and work to address issues identified through that assessment. The most recent version of the plan, updated in 2020, identifies “Priority Areas for Focused Attention” across the state. Areas are broken into three categories: areas with elevated fire risk, areas with degraded forest health, and areas with both elevated fire risk and degraded forest health. Approximately 31,635 acres of land designated under “Priority Areas for Focused Attention” are located within 20 miles of the proposed action boundary; two of these areas overlap the currently approved mine permit boundary (**Figure 6**). Designation of priority areas under the Forest Action Plan is for planning purposes only; there are no required actions or mitigations from the mine for the priority areas in or adjacent to the permit area (Holzwarth, 2023).

Direct Impacts:

Weed control in the proposed project area is expected to prevent weed infestations. The mine has an approved fire control plan which would not change with the proposed action. Impacts

from or to locally-adopted environmental plans and goals would not be expected as a result of this project.

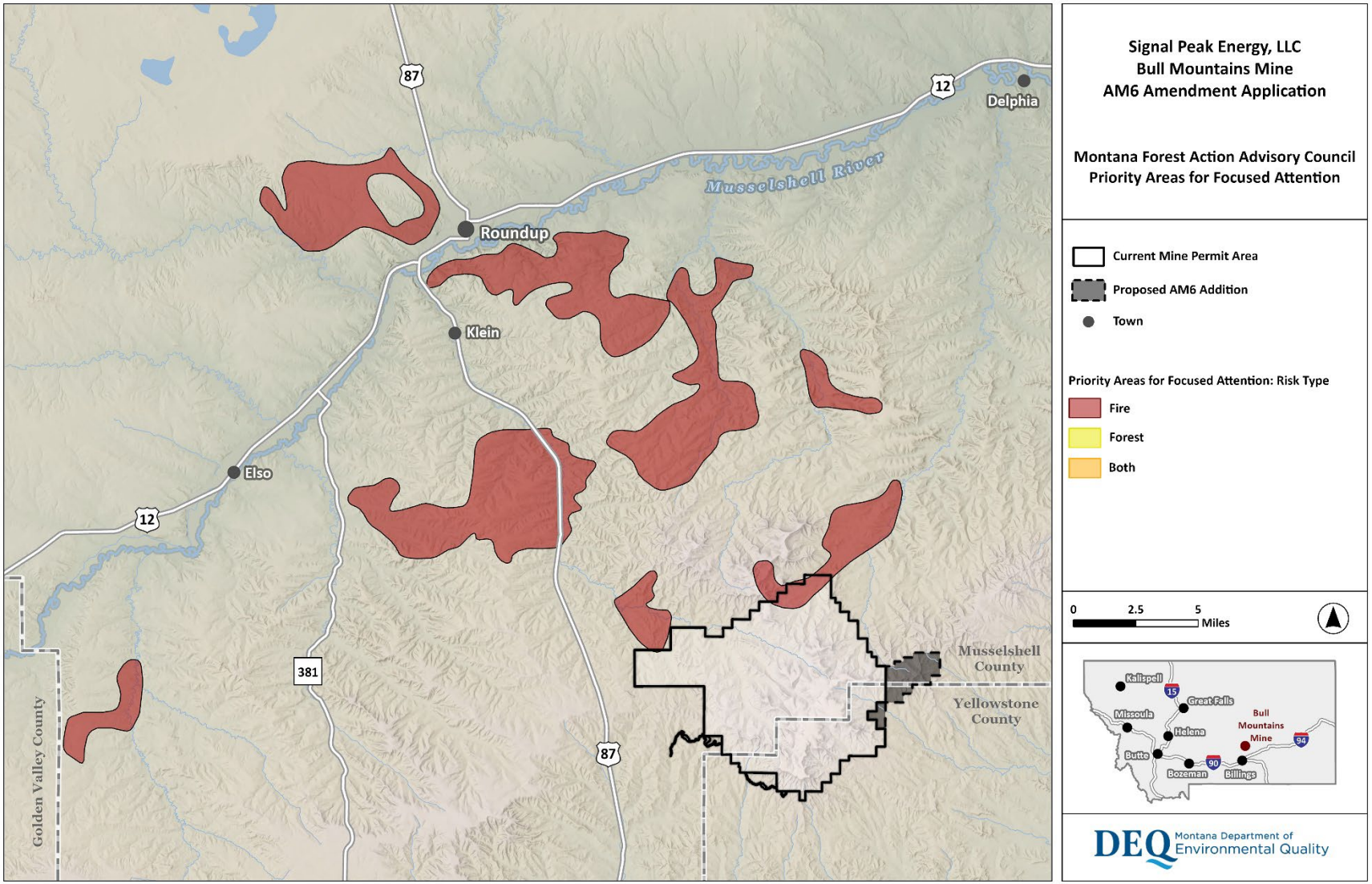
Secondary Impacts:

Secondary impacts from or to locally-adopted environmental plans and goals are not expected from the proposed action.

Cumulative Impacts:

Cumulative impacts from or to locally-adopted environmental plans and goals are not expected from the proposed action.

Figure 6: Montana Forest Action Plan - Priority Areas for Focused Attention



17. Access to and Quality of Recreational and Wilderness Activities

[Are wilderness or recreational areas nearby or accessed through this tract? Is there recreational potential within the tract?]

The proposed activities would occur on private land. Wilderness, recreational areas, public parks, or historic sites are not nearby or accessed through the proposed permit area. Expanded underground mining would not adversely affect any publicly owned park or place included in the national register of historic sites. Except for limited hunting and camping on private land, the area is not typically used for recreational activities.

Direct Impacts:

Direct impacts to access or quality of recreational and wilderness activities are not expected from the proposed action.

Secondary Impacts:

The areas where the permit boundary would be expanded are on private land, and therefore the expansion would not impact the public's access to public land areas. The significance assessment is presented in **Table 5**.

Cumulative Impacts:

Cumulative impacts from the proposed action to the quality of recreational and wilderness activities would add to existing impacts from historic and current mining and agriculture in the area (DSL, 1992a) (DEQ, 2016). No additional cumulative impacts on the access to recreational and wilderness activities are expected from the proposed action.

18. Density and Distribution of Population and Housing

[Will the project add to the population and require additional housing?]

The nearest community of Roundup had a total population of 1,723 in 2020 (Census Bureau, 2020). The AM6 Proposed Action would be a continuation of mining operations on private and public land within the previously approved mine operation timeframe and it would not change the existing workforce at the mine.

Direct Impacts:

The AM6 Proposed Action would not change the workforce necessary to continue operations, which includes 255 employees and 30 full-time, temporary contractors, nor would it extend the projected mine operation timeframe. There would be no direct impacts to population density or housing in the area from this project.

Under the No Action alternative, the extent of remaining mining activities would be limited to the permit area, coal volumes, mine operation timeframe, and reclamation plan approved through previous amendments (DEQ, 2016). It is anticipated that employment would decrease when coal production ceases and it would further decline as reclamation is completed. The reduction in employment could result in declining population and housing demand in the area, in the absence of employment provided elsewhere. The significance assessment is presented in **Table 5**.

Secondary Impacts:
Secondary impacts to population density and housing are not expected from the proposed action.

Cumulative Impacts:
Cumulative impacts to population density and housing are not expected from the proposed action.

19. Social Structures and Mores

[Is some disruption of native or traditional lifestyles or communities possible?]

An ethnographic study was conducted prior to the development of the Bull Mountains Mine No. 1 by Kooistra-Manning and Deaver (1993). The study found that many interested tribes were concerned with adverse impacts to the spiritual environment, cultural resources, and wildlife habitat. The prior study encompassed the general area included in AM6 and concerns would be similar to what were previously identified. Other local communities or lifestyles are typically related to ranching and agricultural practices.

Direct Impacts:
The continued mining of coal may be seen as an adverse impact to traditional lifestyles as it affects the spiritual environment. Though the concern for affects to the spiritual environment is recognized, the project is primarily located on private lands with limited potential surface disturbance, and the areas are unlikely to be utilized by any native groups as a traditional area. Impacts to social structures and mores are not expected from the proposed action. It is not anticipated that this project would disrupt native, traditional, or other lifestyles or communities, given the remote location of the proposed permit expansion and minimal level of human activity in the area (i.e. ranching).

Secondary Impacts:
Secondary impacts to social structures and mores are not expected from the proposed action.

Cumulative Impacts:
Cumulative impacts to social structures and mores are not expected from the proposed action.

20. Cultural Uniqueness and Diversity

[Will the action cause a shift in some unique quality of the area?]

The general area is known to the Crow and other Tribal groups as a sacred area and was used historically by Tribal members for spiritual and communal purposes. A famous Crow leader, Two Leggings, is known to have performed vision quests in the Bull Mountains. Other human activities and lifestyles in the general area include ranching and agricultural practices, which are not culturally unique compared to the surrounding region. The nearest community of Roundup has ethnic diversity that is similar to other areas in Montana, which includes approximately

91.3% White (non-Hispanic), 2.5% Multiracial (non-Hispanic), 1.8% Asian (non-Hispanic), 1.2% Native American, and remaining fractions of Hispanic or Other ethnicities (Census Bureau, 2020).

Direct Impacts:

Impacts to cultural uniqueness and diversity in the area are not expected from the proposed action, which is primarily located on private lands with limited potential surface disturbance. The continuation of mining would not change the existing population or demographics of the mine workforce or nearby communities.

Secondary Impacts:

Secondary impacts to cultural uniqueness and diversity are not expected from the proposed action.

Cumulative Impacts:

Cumulative impacts to cultural uniqueness and diversity are not expected from the proposed action.

21. Private Property Impacts

The mineral estate in the AM6 permit expansion area and underneath Panel 1 East is privately owned coal owned by Bull Mountain Coal Properties Inc, Great Northern Properties LP, and Yellowstone Mineral Holdings, LLC. Surface ownership consists of private land: Musselshell Resources, LLC, Two Lazy Two Ranch, Inc, Great Northern Properties, LP, and My Green Earth, LP. By issuing the permit, there are no regulatory impacts on the surface estate, but only regulatory impacts affiliated with SPE's private mineral interests.

The proposed project would take place on private land owned by the applicant. DEQ's approval of AM6 to Permit C1993017 with conditions, would affect the applicant's real property. DEQ has determined, however, that the permit conditions are reasonably necessary to ensure compliance with applicable requirements under MSUMRA and demonstrate compliance with those requirements or have been agreed to by the applicant. Further, if the application is complete, DEQ must take action on the permit pursuant to ARM 17.24.404. DEQ, therefore, does not have discretion to take alternative action that would have less impact on private property. Therefore, DEQ's approval of AM6 to Permit C1993017 would not have private property-taking or damaging implications. DEQ will prepare a final assessment of private property takings to be included in the final decision documents.

22. Other Appropriate Social and Economic Circumstances

Due to the nature of the proposed mining activities, and the limited project duration, no further direct or secondary impacts would be anticipated from this project.

23. Greenhouse Gas Assessment

The assessment area for greenhouse gas (GHG) emissions is focused on the activities regulated by the issuance of the coal permit which is construction, operation and reclamation of the area encompassed by the request to expand mining operations within and outside of the current Bull Mountains Coal Mine No. 1 permit area and add 1,037 acres to the existing permit area. DEQ

used the EPA Simplified GHG Calculator (ESGC) May 2023 version (EPA, 2024) for its assessment of GHG emissions.

Approval of the AM6 amendment would authorize the use of various equipment and vehicles to mine and process coal and reclaim the site. Coal mining surface equipment on site includes ATV, compactor, crane, dozers, excavators, forklifts, grader, haul trucks, light duty trucks, loaders, manlifts, skid steers, telehandlers, and water trucks. Underground equipment includes a longwall miner, a continuous miner, mantrips, graders, a petitto mule (longwall shield retriever), scoops, and tractors. The expected duration of the project proposed in AM6 is approximately one to two years.

The amount of diesel fuel utilized at this site may be impacted by several factors including seasonal weather impediments and equipment malfunctions. To ensure a comprehensive assessment, DEQ utilized the maximum amount of diesel utilized at the Bull Mountains Mine No. 1 over a single year (1,301,887 gallons) rather than the last 5-yr annual average amount (787,440 gallons) to assess the amount of greenhouse gas emissions resulting from mobile sources in the proposed AM6 amendment. By utilizing a maximum fuel utilization, any additional GHG emissions from incidental use of gasoline or other vehicles during operation of the mine will be well within the GHG emission assessment.

For the purpose of this assessment, DEQ has defined greenhouse gas emissions as the following gas species: carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Other pollutants can have some properties that also are similar to those mentioned above, but the EPA has clearly identified the species above as the primary GHGs. Water vapor is also technically a greenhouse gas, but its properties are controlled by the temperature and pressure within the atmosphere, and it is not considered an anthropogenic species.

The combustion of diesel fuel at the site would release GHG emissions primarily being carbon dioxide (CO_2), nitrous oxide (N_2O) and much smaller concentrations of uncombusted fuel components including methane (CH_4) and other volatile organic compounds (VOCs).

DEQ has assessed GHG emissions using the ESGC, for the purpose of totaling GHG emissions. This tool totals carbon dioxide (CO_2), nitrous oxide (N_2O), and methane (CH_4) and reports the total as CO_2 equivalent (CO_2e) in metric tons CO_2e ($MTCO_2e$). The calculations in this tool are widely accepted to represent reliable calculation approaches for developing a GHG inventory.

Direct Impacts:

Operation of diesel-fueled vehicles throughout the life of the proposed project would produce exhaust fumes containing GHGs. Using the EPA's simplified GHG Emission Calculator for mobile sources, the maximum greenhouse gas emissions produced by the proposed action by mobile sources would be 13,690 $MTCO_2e$ per year of operation. The significance assessment is presented in **Table 5**.

Secondary Impacts:

GHG emissions contribute to changes in atmospheric radiative forcing, resulting in climate change impacts. GHGs act to contain solar energy loss by trapping longer wave radiation emitted from the Earth's surface and act as a positive radiative forcing component (BLM, 2022). The

impacts of climate change throughout the south-central portion of Montana may include changes in flooding and drought, rising temperatures, and the spread of invasive species (BLM, 2022). The significance assessment is presented in **Table 5**.

Cumulative Impacts:

Montana recently used the EPA State Inventory Tool (SIT) to develop a greenhouse gas inventory (DEQ, 2024) in conjunction with preparation of a possible grant application for the Climate Pollution Reduction Grant (CPRG) program. This tool was developed by EPA to help states develop their own greenhouse gas inventories, and this relies upon data already collected by the federal government through various agencies. The inventory specifically deals with carbon dioxide, methane and nitrous oxide and reports the total as CO_2e. The SIT consists of eleven Excel-based modules with pre-populated data that can be used as default settings or in some cases, allows states to input their own data when the state believes their own data provides a higher level of quality and accuracy. Once each of the eleven modules is filled out, the data from each module is exported into a final "synthesis" module which summarizes all of the data into a single file. Within the synthesis file, several worksheets display the output data in a number of formats such as emissions by sector, emissions by type of greenhouse gas, etc.

DEQ has determined the use of the default data provides a reasonable representation of the greenhouse gas inventory for the various sectors of the state, and an estimated annual greenhouse gas inventory by year. The SIT data is currently only updated through year 2021, as it takes several years to validate and make new data available within revised modules.

Future GHG emissions from operations such as this site would be represented within the module Carbon Dioxide Emissions from the Industrial sector. At present, the Industrial Sector accounts for 4.4 million metric tons of CO_2e ($MMTCO_2e$). The estimated emissions of 13,690 $MTCO_2e$ annually over the life of the project will contribute 0.31% of Montana's annual emissions from the Industrial sector. The significance assessment is presented in **Table 5**.

PROPOSED ACTION ALTERNATIVES

In addition to the proposed action, DEQ also considered the "No Action" alternative. The "No Action" alternative would deny the approval of AM6. The applicant would lack the authority to expand mine production through the addition of the Panel 1 East coal mine cut to the eastern part of the current permit area. Any potential impacts that would be authorized under AM6 would not occur. The extent of remaining mining activities would be limited to the permit area, coal volumes, mine operation timeframe, and reclamation plan approved through previous amendments (DEQ, 2016). However, DEQ does not consider the "No Action" alternative to be appropriate because the applicant has demonstrated compliance with all applicable rules and regulations as required for approval. The No Action alternative forms the baseline from which the impacts of the proposed action can be measured.

CONSULTATION

DEQ engaged in internal and external efforts to identify substantive issues and/or concerns related to the proposed project. Internal scoping consisted of internal review of the EA document by DEQ staff and site visits. DEQ consulted with the Montana State Historic Preservation Office with regards to historic properties within the proposed AM6 permit expansion area. Notice of completeness and the availability of a draft EA for review was sent to the following agencies:

- Montana Department of Environmental Quality, Water Protection Bureau
- Montana Department of Environmental Quality, Air Resources Management
- Montana Department of Fish, Wildlife, and Parks, Region 5
- Montana Department of Fish, Wildlife, and Parks, Headquarters
- Montana Department of Labor and Industry, Safety Bureau
- Montana Department of Natural Resources and Conservation, Water Resources Division
- Montana Department of Natural Resources and Conservation, Trust Land Management Division
- Montana Department of Natural Resources and Conservation, Lewistown Regional Office
- Lower Musselshell Conservation District
- Mayor of Melstone, MT
- Mayor of Roundup, MT
- Montana Association of Counties
- Musselshell County Commissioners
- Musselshell County Planner
- Musselshell County Weed Department
- Yellowstone County Commissioners
- Yellowstone County Planning Department
- Yellowstone County Public Works Department
- US Army Corps of Engineers, Omaha District
- Office of Surface Mining, Reclamation, and Enforcement
- US Bureau of Land Management (BLM), Miles City office
- US Bureau of Land Management (BLM), Billings office
- US Environmental Protection Agency, Region VIII Montana Office
- US Fish and Wildlife Service, Helena Office

PUBLIC INVOLVEMENT

A draft EA was published on the DEQ website when the AM6 application was ruled complete. A final EA will be published when the application is approved by DEQ and will be incorporated into the final written findings.

OTHER GOVERNMENTAL AGENCIES WITH JURISDICTION

The proposed expansion of mining would be located on private. All applicable state and federal rules must be adhered to, which, at some level, may also include other state, federal, or tribal agency jurisdiction.

This environmental review analyzes the proposed project submitted by the applicant. The majority of impacts from the project would be short term and would be fully reclaimed at the conclusion of the project and thus, would not contribute to the long-term cumulative effects of mining in the area. Final reclamation of surface disturbance would be required at a minimum of ten years prior to final bond release.

In Montana, DEQ retains primacy under the Surface Mining Control and Reclamation Act (SMCRA) and thereby enjoys "exclusive" regulatory authority over the environmental effects of surface coal mining (SMCRA, Section 503(a)) in Montana. Exclusive jurisdiction was vested in the states, specifically, "because of the diversity in terrain, climate, biologic, chemical, and other physical conditions" in the mining

regions of the country (SMCRA, Section 101(f)). DEQ's program is authorized under The Montana Strip and Underground Mine Reclamation Act (MSUMRA) 82-4-201, Montana Code Annotated (MCA), et.seq. The federal Office of Surface Mining Reclamation and Enforcement (OSMRE) has federal oversight of Montana's program with an obligation to inspect and monitor the operations of Montana's program.

NEED FOR FURTHER ANALYSIS AND SIGNIFICANCE OF POTENTIAL IMPACTS

When determining whether the preparation of an environmental impact statement is needed, DEQ is required to consider the seven significance criteria set forth in ARM 17.4.608, which are as follows:

1. The severity, duration, geographic extent, and frequency of the occurrence of the impact;
2. The probability that the impact will occur if the proposed action occurs; or conversely, reasonable assurance in keeping with the potential severity of an impact that the impact will not occur;
3. Growth-inducing or growth-inhibiting aspects of the impact, including the relationship or contribution of the impact to cumulative impacts;
4. The quantity and quality of each environmental resource or value that would be affected, including the uniqueness and fragility of those resources and values;
5. The importance to the state and to society of each environmental resource or value that would be affected;
6. Any precedent that would be set as a result of an impact of the proposed action that would commit the department to future actions with significant impacts or a decision in principle about such future actions; and
7. Potential conflict with local, state, or federal laws, requirements, or formal plans.

The severity, duration, geographic extent and frequency of the occurrence of the impacts associated with the proposed mining activities would be limited. The applicant is proposing to expand mining capacity on lands with private mineral estates for the Bull Mountains Mine No. 1. The proposed action would result in the expansion of the permit area by 1,037 acres, less than 7% of the current total permit area, and the extent of potential new surface disturbance would be up to five acres. Any additional surface infrastructure would require a minor revision with an additional EA review. Bond amounts would be reviewed at the time of permitting, and additional bond may be required for construction of boreholes or crib pads. Subsidence cracks would be covered by existing bond amounts for repair of subsidence associated with the progression of the mining. This activity would not represent an extension of the mine operation timeframe approved by DEQ for AM3 in 2016. The land that may be disturbed does not contain unique, endangered, fragile, or limited environmental resources. Final reclamation of surface disturbance would be required a minimum of ten years prior to final bond release.

As discussed in this EA, DEQ has not identified any significant impacts associated with the proposed mining activities for any environmental resource. DEQ does not believe that the proposed mining activities by the applicant would have any growth-inducing or growth-inhibiting aspects, or significant contribution to cumulative impacts. The proposed operating permit site does not contain unique or fragile resources. There would be minor impacts to geology through removal of rock product, although limited in area. The site would be reclaimed "to make those lands capable of supporting the uses that those lands were capable of supporting prior to any mining or to higher or better uses" per 82-4-203(43), MCA.

All drainages within the proposed permit amendment area are ephemeral and only flow in response to precipitation or snow melt. There are no ponds within the AM6 mining area. One spring, 71355, is above

proposed room and pillar mining. However, this spring is not predicted to be impacted by mining due to the spring likely being sourced by weathered alluvium. Groundwater in the Mammoth coal, overburden units, and the shallow underburden would experience drawdown from mining of the coal. There are no private wells in the AM6 area utilizing water from the Mammoth coal or overburden units. The main impact to water resources would be from subsidence potentially altering the gradient of ephemeral channels and from mining of the Mammoth coal and the resulting subsidence fracturing of the overburden. Due to the lack of substantive surface water or groundwater resources in the area, impacts to water resources from mining are minor.

No direct impacts to air quality are expected due to the proposed action and continuation of mining operations. Some fugitive dust may be anticipated due to the ongoing operations (e.g. run-of-mine storage, coal processing, and haulage), as well as emissions from mobile equipment. SPE must operate within the confines of the approved Air Quality Permit, MAQP #3179-13.

No direct impacts to vegetation communities are expected due to the proposed action and continuation of mining operations. Subsidence resulting from underground mining would result in local areas of surface disturbance (e.g. fractures, areas of sloughing, etc.) similar to subsidence features recorded during extraction of previous panels. Areas of surface disturbance would be evaluated and a site-specific repair-mitigation plan developed and implemented unless it was determined that natural healing was the best alternative. Weed control would take place and meet county standards as described in the approved weed management plan with both Musselshell and Yellowstone Counties.

There may be minor impacts to terrestrial and avian habitats, estimated at approximately five acres, if additional surface disturbance is required for subsidence crack repair or supporting infrastructure. Any additional surface infrastructure would require a minor revision with an additional EA review. The potential disturbance is relatively small in comparison to the mine facilities and other existing surface disturbance. The ephemeral drainages do not have sufficient hydrology to support aquatic life dependent on flowing water for a portion of their life cycle. Unique, endangered, fragile, or limited environmental resources have been evaluated. There are no unique or endangered fragile resources in the project area.

Cultural resource evaluations to date have identified one site that is potentially eligible for the National Historic Register that will require mitigation. Mitigation would be required to be complete before mining occurs beneath the site.

There would be minor impacts to viewshed aesthetics, as no surface facilities would be added under the proposed amendment. Mining associated with proposed action could lower the relief of the undermined area by approximately zero to six feet or up to 70 percent of the extraction height. Generally, this amount of subsidence is minor compared to the amount of topographic relief in the area and should not be noticed, especially from a distance.

Demands on environmental resources of land, water, air, or energy would be minor. The proposed project would use water supplied from existing wells drilled on site as well as water produced during the extraction of the Mammoth Coal for mining and processing use. Existing impacts to water and energy resources would continue as part of the proposed action. No additional impacts on land or air would be expected from the proposed action.

Impacts to human health and safety would be minor as the inherent occupational risks of underground coal mining and support activities at the surface would continue for the mine workforce. Few, if any, members of the public would be in the general project area during mining operations. The applicant would be required to adhere to all applicable state and federal safety laws. The Mine Safety and Health Administration (MSHA) has developed rules and guidelines to reduce the risks associated with this type of labor.

As discussed in this EA, DEQ has not identified any long-term or significant impacts associated with the proposed activities on any environmental resource.

Issuance of an amendment to the applicant's operating permit does not set any precedent that commits DEQ to future actions with significant impacts or a decision in principle about such future actions. If the applicant submits another operating permit, amendment, or revision application to conduct additional mining, DEQ is not committed to issuing those authorizations based upon this approval. DEQ would conduct an environmental review for any subsequent authorizations sought by the applicant that require environmental review. DEQ would make a permitting decision based on the criteria set for in the Strip and Underground Mine Reclamation Act.

Issuance of the permit to the applicant does not set a precedent for DEQ's review of other applications for permits, including the level of environmental review. The level of environmental review decision is made based on case-specific consideration of the criteria set forth in ARM 17.4.608.

Finally, DEQ does not believe that the proposed mining activities by the applicant would have any growth-inducing or growth-inhibiting aspects that would conflict with any local, state, or federal laws, requirements, or formal plans.

Based on consideration of the criteria set forth in ARM 17.4.608, the proposed mining activities are not predicted to significantly impact the quality of the human environment. Therefore, preparation of an EA is the appropriate level of environmental review for MEPA.

Table 5: Assessment of Significance (ARM 17.4.608)

Affected Resource and Section Reference	Potential Impact	Severity[1], Extent[2], Duration[3], Frequency[4], Uniqueness and Fragility (U/F)	Probability impact will occur[5]	Cumulative impacts	Measures to reduce impact as proposed by applicant	Significance (yes/no)
1. Geology and Soil Quality, Stability, and Moisture	Soil disturbance or loss related to subsidence cracks.	**Severity-** Low: Approximately 646 acres of ground would be directly over the proposed mine cut (including mine void and gate roads) susceptible to possible subsidence cracks. Of these acres, 463 acres would be new mining that was not previously approved. Subsidence cracks can create localized, limited soil disturbance. Most cracks would close on their own and would not require reclamation. Cracks that appear on hillsides of >20% slope may not be reclaimed and may be left due to safety considerations. **Extent-** Small: The potential area for crack formation due to subsidence is estimated at less than five acres, within the expanded mine footprint acres. Disturbance would only be realized where surface cracks develop. Current mining shows cracking limited to localized areas of linear cracks up to a few feet wide. These sites are generally equal to or less than a few acres per occurrence. **Duration-** Short-term and long-term- Most subsidence cracks would close within 2 years of panel completion. Cracks that appear on hillsides >20% slope may not be reclaimed due to safety; these cracks would gradually erode and fill in with material naturally. Cracks that have not closed within 2 years after panel completion and are on shallower slopes <20% would be repaired and revegetated. **Frequency**- Low: Where cracks have developed an occasional storm event may cause soil disturbance. **Unique/Fragile**- Low: No unique or particularly fragile soils or geologic features were identified in baseline studies.	Probable	Disturbance or soil loss from subsidence cracks would add to cumulative impacts associated with potential soil loss for existing surface disturbances of mine roads, facilities surfaces, and other historical disturbances in the proposed project area.	- BMPs include hydroseeding, straw wattles, or erosion matting on exposed and disturbed surfaces including subsidence cracks appearing in areas >20% in slope with high erosion potential. - Seeding would be performed by the first favorable season after any repair work to these disturbance sites.	No
2. Water Quality, Quantity, and Distribution	Subsidence impacts to surface drainage features and overburden groundwater resources; removal of the Mammoth coal aquifer; replacement of coal with mine gob water.	**Severity**- Medium: A relatively small area of the headwaters to Railroad Creek, Fattig Creek, and Dutch Oven Creek overlie the AM6 mining area. Impacts to ephemeral runoff in these drainage basins from subsidence would be negligible. Room and pillar mining would pass under Spring 71355. This spring only discharges after large precipitation years and therefore is sourced from near surface overburden or alluvium. These units are not predicted to have any hydrologic impacts from mining. Other springs downstream from mining impacts in Railroad Creek, Fattig Creek, and Dutch Oven Creek are either similarly dependent on geologic units above the Mammoth coal or are not dependent on mining impacted units for their discharge. Impacts to springs are predicted to be small and insignificant. Wetlands in the area may lose or gain water as subsidence lowers the drainageways while simultaneously subsidence cracks could reduce near surface ponding and soil moisture. Mining of the Mammoth coal is modeled as adding to local	Impacts to ephemeral drainages – Probable Impacts to springs – Unlikely Impacts to groundwater - Certain	Removal of the Mammoth coal would convert more of the Mammoth coal aquifer to gob thereby increasing the area of geochemical and physical changes to the aquifer. Mining is in the ephemeral headwaters of basins. There would be no cumulative mining impacts in Dutch Oven Creek. Railroad Creek and Fattig Creek have approved mine passes that subsidence from AM6 could cumulatively add to.	-SPE would repair/mitigate damage from subsidence to springs, wells, ponds, and streams. Mitigation will be determined successful if at the time the liability period has expired, SPE has demonstrated mitigation measures can provide water for consumptive use by livestock and wildlife of seasonal quality and quantity. -SPE has an approved hydrologic monitoring plan; impacts from mining must be monitored until final bond release.	No

Affected Resource and Section Reference	Potential Impact	Severity[1], Extent[2], Duration[3], Frequency[4], Uniqueness and Fragility (U/F)	Probability impact will occur[5]	Cumulative impacts	Measures to reduce impact as proposed by applicant	Significance (yes/no)
		drawdown of the coal unit, the OB-5, OB-6, and UB1A units. A Total Dissolved Solids (TDS) transport model predicts that increases in TDS outside of the permit boundary will not result in the local water sources changing groundwater classes. **Extent**- Medium: The extent of additional drawdown from AM6, as delineated by the 5 ft drawdown contour, will be limited to the area within and immediately adjacent to the proposed permit boundary. Overburden units are relatively thin and discontinuous with perched, isolated groundwater. The extent of stream impacts would be limited to the subsidence area within the permit boundary. No intermittent or perennial streams have been identified in the subsidence area for AM6. Ephemeral streams may be impacted by subsidence within the AM6 area. **Duration**- Short-term to long-term- Any areas subject to subsidence would be reclaimed if deemed necessary. Impacts to ephemeral drainageways would be short-term. Recovery of a postmine aquifer in place of the Mammoth Coal would be long-term. Recovery is not expected to change from the currently approved recovery time of over fifty years after the end of mining. **Frequency**- Occasionally: Runoff in ephemeral drainageways that have experienced subsidence may be impacted during occasional storm events until subsidence cracks have been reclaimed. **Unique/Fragile**- Not unique or particularly fragile.				
3. Air Quality	Dust from roads, dust from erosion of subsidence disturbance, equipment exhaust	**Severity**- Low: The impacts would be limited to the proposed expanded permit area of 16,524 acres (1,037 acres added). **Extent**- Small: Dust and equipment exhaust would be limited to roads and any additional surface infrastructure of subsidence repair work over the Panel 1 East area. **Duration**- Short-term: Dust and production of equipment exhaust would cease upon final reclamation of the site. **Frequency**- Occasionally: Mining would be limited to underground, so there would be limited activity at the surface that would cause dust from roads and equipment exhaust within the proposed permit area. Subsidence features could potentially occur within the proposed permit area to an extent that would cause dust from erosion of the soil surface. **Unique/Fragile**- Not unique or particularly fragile.	Probable	Impacts to air quality would add to cumulative impacts associated with mining and other industrial activities in and around the permit area.	-SPE would comply with its existing Air Quality Permit MAQP #3179-13 issued by the State of Montana. -Fugitive emissions would be controlled by onsite water trucks or other dust suppression means.	No
4. Vegetation Cover, Quantity, and Quality	Local areas of surface disturbance to vegetative communities from subsidence or surface activities	**Severity**- Low: Of the 1,037 acres of ground that would be added to the permit, up to five acres would be disturbed if those areas have subsidence related impacts or have roads, small pads, or boreholes. **Extent**- Small: Total surface area susceptible to vegetation impacts would be minimal.	Probable	Impacts to vegetative cover, quantity, and quality would add to cumulative impacts associated with mining and agriculture in the project area.	-A site-specific repair-mitigation plan would be developed and implemented for areas of surface disturbance. Repair could include soil salvage, grading,	No

Affected Resource and Section Reference	Potential Impact	Severity[1], Extent[2], Duration[3], Frequency[4], Uniqueness and Fragility (U/F)	Probability impact will occur[5]	Cumulative impacts	Measures to reduce impact as proposed by applicant	Significance (yes/no)
		Duration- Short-term: Any areas subject to subsidence or surface disturbance would be reclaimed if deemed necessary. Those areas reclaimed would be seeded with native species and monitored for a minimum of 10 years before they would be eligible for final bond release. **Frequency**- Infrequently: Surface disturbance would occur where subsidence occurs and would likely happen shortly after mining with the longwall. **Unique/Fragile-** Not unique or particularly fragile. No threatened or endangered species are identified in the baseline area.			soil replacement, and/or seeding with an approved seed mix	
5. Terrestrial, Avian, and Aquatic Life and Habitats	Local areas of surface disturbance to terrestrial and avian habitat from subsidence or surface activities	**Severity**- Low: Of the 1,037acres of ground that would be added to the permit, only a small fraction (approximately five acres) would be disturbed if those areas suffer from subsidence related impacts and minimal operational activities such as boreholes. There are no substantial changes in human activity within the proposed project area expected. The ephemeral drainages do not support aquatic life. **Extent**- Small: Total surface area susceptible to wildlife impacts would be minimal. **Duration**- Any areas subject to subsidence would be reclaimed if deemed necessary. Those areas reclaimed would be seeded with native species which would provide wildlife habitat. **Frequency**- Infrequently: Surface disturbance would occur where subsidence occurs and would likely happen shortly after mining with the longwall. **Unique/Fragile**- No threatened or endangered species are identified in the baseline area.	Probable	Impacts to terrestrial and avian life and habitats would add to cumulative impacts associated with mining and agriculture in the project area. No impacts to aquatic life and habitats are expected.	-Activities would be conducted in compliance with the 17.24.312 Fish and Wildlife Plan. -A site-specific repair-mitigation plan would be developed and implemented for areas of surface disturbance. Repair could include soil salvage, grading, soil replacement, and/or seeding with an approved seed mix.	No

Affected Resource and Section Reference	Potential Impact	Severity[1], Extent[2], Duration[3], Frequency[4], Uniqueness and Fragility (U/F)	Probability impact will occur[5]	Cumulative impacts	Measures to reduce impact as proposed by applicant	Significance (yes/no)
6. Unique, Endangered, Fragile, or Limited Environmental Resources	Local areas of surface disturbance to terrestrial and avian habitat from subsidence or surface activities	**Severity**- Low: No T&E species are identified in the baseline area. The Monarch Butterfly, a candidate species, may exist in the project area. Activities are not expected to impact the Monarch Butterfly. **Extent**- Small: Total surface area susceptible to vegetation and wildlife impacts and human activity would be minimal. **Duration**- Any areas subject to subsidence would be reclaimed if deemed necessary. Those areas reclaimed would be seeded with native species which would provide wildlife habitat. **Frequency**- Infrequently: Surface disturbance (approximately five acres) would occur where subsidence occurs and would likely happen shortly after mining with the longwall. **Unique/Fragile-** No T&E species are identified in the baseline area. The Monarch Butterfly, a candidate species, may exist in the project area. A portion of the additional continuous miner mining, approximately 40 acres, within the approved permit boundary is within the Sage Grouse General Habitat. None of the additional AM6 permit area nor any of the longwall panel is within Sage Grouse General Habitat.	Unlikely	Impacts to unique, fragile, or limited environmental resources would add to cumulative impacts associated with mining and agriculture in the project area. No impacts to threatened resources are expected.	-Activities would be conducted in compliance with the 17.24.312 Fish and Wildlife Plan. If a Threatened or Endangered Species is observed, SPE would immediately contact DEQ and USFWS. -Focused weed management would occur within General Habitat for sage grouse. Reclamation of disturbed areas must include control of noxious weeds and invasive plant species, including cheatgrass and Japanese brome. No mitigations are needed for this project under the Montana Sage Grouse Habitat Conservation Program because of the lack of proximity to any active sage grouse lek.	No
7. Historical and Archaeological Sites	Local areas of surface disturbance to Historic Properties from secondary subsidence or surface activities	**Severity**- High: One Historic Property, are Eligible to the NRHP, is located above the proposed mine area and may experience secondary impacts from underground mining. However, mitigation efforts are planned to reduce the impact on these sites to the level of No Adverse Effect which would reduce the Severity to Low. **Extent**- Small: Areas of secondary subsidence impacts (cracks, rock falls, etc) are localized and small; not all subsided areas experience a surface expression of subsidence. Locations of cracks or rock falls cannot be predicted ahead of mining. **Duration**- Long Term: Though subsidence occurs within two years after completion of mining, impacts to Historic Properties are permanent, and the resource is finite. It is recognized that after the initial subsidence, future subsidence is not predicted to occur. **Frequency**- Infrequently: Subsidence impacts would happen shortly after completion of longwall mining and would not be sustained. **Unique/Fragile**- One site over the longwall panel area has been identified as culturally significant (Historic Properties). This site would require mitigation prior to undermining.	Possible	Impacts to Historic Properties would add to cumulative impacts associated with mining and agriculture in the project area.	-A mitigation plan for the one Historic Property determined to be culturally significant and eligible to the NRHP is required to be approved and implemented prior to undermining. -All other sites above the longwall and gate roads have been determined to be ineligible for the NRHP, and no mitigation is required prior to undermining. -One site within the permit boundary that will not be undermined will have a 100 ft no disturbance buffer.	No
8. Aesthetics	Local areas of surface disturbance	**Severity**- Low: Of the 1,037 acres of ground that would be added to the permit, only a small fraction (approximately five	Probable	Impacts to aesthetic resources would add to cumulative impacts	-A site-specific repair-mitigation plan would be	No

Affected Resource and Section Reference	Potential Impact	Severity[1], Extent[2], Duration[3], Frequency[4], Uniqueness and Fragility (U/F)	Probability impact will occur[5]	Cumulative impacts	Measures to reduce impact as proposed by applicant	Significance (yes/no)
	from subsidence or surface activities	acres) would be disturbed if those areas suffer from subsidence related impacts and minimal operational activities such as boreholes, small pads, and minor roads. Subsidence cracks on steep terrain may be visible to nearby landowners. **Extent**- Medium: Mining would lower the relief of the undermined area of Panel 1 East between 0 and 10 feet. Subsidence could occur throughout the added mining cut. **Duration**- Short- and Long-Term: Subsidence would be reclaimed if deemed necessary. Subsidence cracks may be visible on steep terrain for years; cracks on slopes greater than 20% will be allowed to heal naturally. Lowering the topographical relief of the undermined area would be permanent. **Frequency**- Infrequently: Regrade work for subsidence mitigation (approximately five acres) would occur where subsidence occurs and would likely happen shortly after mining with the longwall. Most subsidence cracks will naturally close or fill in with sediment. **Unique/Fragile**-Not unique or particularly fragile.		associated with mining and agriculture in the project area.	developed and implemented for areas of surface disturbance. Repair could include soil salvage, grading, soil replacement, and/or seeding with an approved seed mix	
9. Demands on Environmental Resources of Land, Water, Air, or Energy	Water use from wells drilled on site and produced during mining; economic exploitation of coal resources	**Severity**- Medium: Water use and coal resource exploitation would be limited to 646 acres of coal mining within the proposed mine panel and continuous miner areas. **Extent**- Small: 646 acres of coal would be mined within the mine cuts with 183 of those acres already approved for mining under the current mine plan. 6,140 acres of coal that have been mined under the permit as of December 2023. **Duration**-: Short- and Long-Term: Water would be used during mining and would cease at the end of mine life. Economic exploitation of coal would be permanent. **Frequency**- Continuous through operations period. **Unique/Fragile**- Not unique or fragile.	Certain	Impacts to the environmental resources of water and energy would add to cumulative impacts associated with mining and agriculture in the project area.	-SPE would repair/mitigate damage from subsidence to springs, wells, ponds, and streams. Mitigation will be determined successful if at the time the liability period has expired, SPE has demonstrated mitigation measures can provide water for consumptive use by livestock and wildlife of seasonal quantity. -SPE has an approved hydrologic monitoring plan; impacts from mining must be monitored until final bond release.	No
10. Impacts on Other Environmental Resources	No anticipated impacts	N/A	N/A	N/A	N/A	No
11. Human Health and Safety	Continuation of mining would include inherent occupational risks for the mine workforce, but with no anticipated	**Severity**- High: Incidents could range from minor injuries to fatalities for the mine workforce, depending on the nature and severity of a particular situation. **Extent**- Small: The inherent occupational risks of underground coal mining and support activities at the surface would continue for the mine workforce. Few, if any, members of the public would be in the general project area during mining operations.	Possible	N/A	Mining activities and mitigation measures (e.g. engineering controls, notices and signage, operating procedures and protocols) must comply with state and federal safety and health regulations.	No

Affected Resource and Section Reference	Potential Impact	Severity[1], Extent[2], Duration[3], Frequency[4], Uniqueness and Fragility (U/F)	Probability impact will occur[5]	Cumulative impacts	Measures to reduce impact as proposed by applicant	Significance (yes/no)
	impacts to general public.	**Duration**: Short-term: Through the continuation of mining within the previously approved mining operation timeframe. **Frequency**: Continuous through operations period. **Unique/Fragile**: Not unique or fragile.				
12. Industrial, Commercial, and Agricultural Activities and Production	Local areas of surface disturbance impacting livestock production from subsidence or surface activities	**Severity**- Low: Of the 1,037 acres of ground that would be added to the permit, up to five acres would be disturbed if those areas have subsidence related impacts or have roads, small pads, or boreholes. **Extent**- Small: Total surface area susceptible to impacts would be minimal. **Duration**- Short-term: Any areas subject to subsidence or surface disturbance would be reclaimed if deemed necessary. Those areas reclaimed would be seeded with native species and monitored for a minimum of 10 years before they would be eligible for final bond release. **Frequency**- Infrequently: Surface disturbance would occur where subsidence occurs and would likely happen shortly after mining with the longwall. **Unique/Fragile**- Not unique or particularly fragile. No threatened or endangered species are identified in the baseline area.	Probable	Impacts to agricultural production would add to cumulative impacts associated with mining and agriculture in the project area.	A site-specific repair-mitigation plan would be developed and implemented for areas of surface disturbance. Repair could include soil salvage, grading, soil replacement, and/or seeding with an approved seed mix.	No
13. Quantity and Distribution of Employment	The continuation of current conditions and benefits related to workforce employment.	**Severity**- Medium: The mine is the top employer in Musselshell County. Current employment at the site includes 255 employees and 30 full time temporary contractors. **Extent**- Medium: The continued employment associated with expanded mining activities would benefit the workforce at the local and county levels. **Duration**: Through the continuation of mining within the previously approved mining operation timeframe, short term. **Frequency**: Continuous through mine operations period, based on individual duties **Unique/Fragile**: Not unique or fragile.	Probable	N/A	N/A	No
14. Local and State Tax Base and Tax Revenues	The continuation of current conditions and benefits related to revenue from property, payroll, and coal production taxes.	**Severity**- Medium: The mine is the top employer in Musselshell County. Current employment at the site includes 255 employees and 30 full time temporary contractors. **Extent**- Large: The tax revenue associated with continued mining activities would benefit various funds at the local, county, and state levels. **Duration**: Through the continuation of mining within the previously approved mining operation timeframe, short term. **Frequency**: Variable, based on different tax collection cycles **Unique/Fragile**: Not unique or fragile.	Certain	Certain	Certain	No
15. Demand for Government Services	None	N/A	N/A	N/A	N/A	No

Affected Resource and Section Reference	Potential Impact	Severity[1], Extent[2], Duration[3], Frequency[4], Uniqueness and Fragility (U/F)	Probability impact will occur[5]	Cumulative impacts	Measures to reduce impact as proposed by applicant	Significance (yes/no)
16. Locally Adopted Environmental Plans and Goals	None	N/A	N/A	N/A	N/A	No
17. Access to and Quality of Recreational and Wilderness Activities	Local areas of surface disturbance from subsidence or surface activities	**Severity**- Low: Of the 1,037 acres of ground that would be added to the permit, only a small fraction (approximately five acres) may be disturbed if those areas have subsidence related impacts and minimal operational activities such as boreholes, small pads, and minor roads. **Extent**- Small: Approximately five acres of potential impact, mostly on private land. **Duration**- Through the continuation of mining within the previously approved mining operation timeframe, short term. **Frequency**- Continuous through the mine operations period. **Unique/Fragile**- Not unique or fragile.	Unlikely	Impacts to the quality of recreational and wilderness activities would add to cumulative impacts associated with mining and agriculture in the project area.	A site-specific repair-mitigation plan would be developed and implemented for areas of surface disturbance. Repair could include soil salvage, grading, soil replacement, and/or seeding with an approved seed mix.	No
18. Density and Distribution of Population and Housing	The continuation of current employment would likely maintain the population and associated housing demand.	**Severity**- Medium: The mine is a top employer of Musselshell County. Current employment at the site includes 255 employees and 30 full time temporary contractors. **Extent**- Medium: The continued employment associated with expanded mining activities would likely maintain the current population and associated housing demand at the local and county levels. **Duration**: Through the continuation of mining within the previously approved mining operation timeframe, short term. Frequency: Continuous through mine operations period **Unique/Fragile**: Not unique or fragile.	Probable	N/A	N/A	No
19. Social Structures and Mores	None	N/A	N/A	N/A	N/A	No
20. Cultural Uniqueness and Diversity	None	N/A	N/A	N/A	N/A	No
21. Private Property Impacts	Development of SPE's private coal interest requires compliance with the conditions in the permit and MSUMRA.	N/A	Certain	N/A	N/A	No
22. Other Social and Economic Circumstances	None	N/A	N/A	N/A	N/A	No
23. Greenhouse Gas Assessment	A. Emission of GHGs B. Changes in atmospheric radiative forcing	A. **Severity**-High: All vehicles and equipment that utilize diesel fuel within the Permit area, and some areas outside of the Permit area would emit GHGs. **Extent**-Small: GHG emissions would occur within the Permit area and areas beyond the Permit where GHGs are emitted before being diluted into the atmosphere. **Duration**: Through the continuation of mining within the previously approved mining operation timeframe.	A. Certain B. Probable	GHGs from this site would add to emissions from nearby highway travel and other agricultural, industrial, and commercial activities in the project area.	N/A	No

Affected Resource and Section Reference	Potential Impact	Severity[1], Extent[2], Duration[3], Frequency[4], Uniqueness and Fragility (U/F)	Probability impact will occur[5]	Cumulative impacts	Measures to reduce impact as proposed by applicant	Significance (yes/no)
		Frequency: Continuous through mine operations period, based on individual duties **Unique/Fragile**: Not unique or fragile. B. **Severity**-Low: GHGs would dissipate and be spread throughout the broader atmosphere instead of remaining densely clustered around the source. **Extent**-Large: GHGs would dissipate into the broader atmosphere. **Duration**- Through the continuation of mining within the previously approved mining operation timeframe. **Frequency**-Daily during mining and reclamation activities. **Unique/Fragile**-Not unique or particularly fragile.				

1. Severity describes the density at which the impact may occur. Levels used are low, medium, high.
2. Extent describes the land area over which the impact may occur. Levels used are small, medium, and large.
3. Duration describes the time period over which the impact may occur. Descriptors used are discrete time increments (day, month, year, and season).
4. Frequency describes how often the impact may occur.
5. Probability describes how likely it is that the impact may occur without mitigation. Levels used are: impossible, unlikely, possible, probable, certain

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