United States Department of the Interior
Office of Surface Mining Reclamation and Enforcement

Spring Creek Mine Mining Plan Modification for Federal Coal Leases MTM 94378 and MTM 110693

Final Environmental Impact Statement

EISX-010-08-000-1732112528

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Office of Surface Mining Reclamation and Enforcement

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Abstract: The U.S. Department of the Interior, Office of Surface Mining Reclamation and Enforcement (OSMRE) has prepared the Final Environmental Impact Statement (EIS) for the Spring Creek Mine Mining Plan Modification for Federal Coal Leases MTM 94378 and MTM 110693, collectively referred to as the Lease by Application (LBA) 1 tracts, to address deficiencies in the 2016 *Spring Creek Mine LBA1 Mining Plan Modification Environmental Assessment* (2016 LBA1 EA) identified by the United States District Court for the District of Montana (*WildEarth Guardians v. Haaland*, No. CV 17-80-BLG-SPW, 2021 U.S. Dist.). The EIS analyzes the indirect and cumulative effects of coal transportation, indirect effects of non-greenhouse gas from downstream combustion emissions, and the effects related to the social cost of carbon that were not addressed in the 2016 LBA1 EA. The final EIS also considers new information available in analyzing potential impacts to other resources in the environment that could result if mining of the LBA1 tracts continues. Four alternatives are analyzed in this EIS: Alternative 1 – Proposed Action, Alternative 2 – Partial Mining Alternative, Alternative 3 – Accelerated Mining Rate Alternative, and Alternative 4 – No Action. The primary differences among the four alternatives are (1) remaining tons of recoverable LBA1 coal, (2) remaining years of LBA1 coal recovery, and (3) the remaining LBA1 area disturbance. OSMRE has identified Alternative 2 – Partial Mining Alternative as the preferred alternative.

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EXECUTIVE SUMMARY

The Office of Surface Mining Reclamation and Enforcement's (OSMRE's) purpose for preparing the final environmental impact statement (EIS) for the Spring Creek Mine Mining Plan Modification for Federal Coal Leases MTM 94378 and MTM 110693, collectively referred to as the Lease by Application (LBA) 1 tracts, is to address deficiencies in the 2016 Spring Creek Mine LBA1 Mining Plan Modification Environmental Assessment (2016 LBA1 EA) identified by the United States District Court for the District of Montana (*WildEarth Guardians v. Haaland*, No. CV 17-80-BLG-SPW (D. Mont. 2021)), in conjunction with the general requirements of—and discretion attendant to—the Secretary's approval of mine plans and mine plan modifications. Without disturbing those requirements or that discretion, the court deferred vacatur of the Federal mining plan modification to allow OSMRE time to complete a remedial NEPA analysis to address: (1) indirect and cumulative effects of diesel emissions, noise, vibrations, and coal dust emissions from rail cars based on the final destination and routes of coal shipments (Sections **4.4.3**, **4.14** and **4.15** in **Chapter 4**); (2) indirect effects of non-greenhouse-gases from downstream combustion emissions (**Section 4.4.4** in **Chapter 4**); and (3) effects related to the social cost of greenhouse gases (**Section 4.4.5** in **Chapter 4**). Supporting analyses, including an updated analysis of the social costs of greenhouse gas emissions, are provided in **Appendix A**. Under the most recent order from the court, the deferred vacatur will end on March 14, 2025.

The Spring Creek Mine (SCM) is an existing coal mine in Big Horn County, Montana, approximately 32 miles north of Sheridan, Wyoming (**Map 1.2-1** in **Chapter 1**). The SCM is currently operated by Navajo Transitional Energy Company, LLC (NTEC). For consistency in this EIS, the three tracts associated with Federal coal lease MTM 94378 and the tract associated with Federal coal lease MTM 110693 are referred to collectively as the LBA1 tracts (**Map 1.2-2** in **Chapter 1**).

Existing conditions at the SCM are described in **Section 2.1** in **Chapter 2**. Mining has been ongoing within the LBA1 tracts since the Federal mining plan modification was first approved in 2012. For the purposes of this analysis, OSMRE used December 31, 2023, as the cutoff date for existing conditions at the mine because calculations and potential impacts are evaluated on an annual basis. As of December 31, 2023, approximately 39.9 million tons (Mt) of Federal coal remains to be recovered and approximately 162.5 acres of approved disturbance associated with LBA1 tracts have yet to be disturbed.

Four alternatives are analyzed in this EIS and described in **Sections 2.2** of **Chapter 2**: Alternative 1 – Proposed Action; Alternative 2 – Partial Mining Alternative; Alternative 3 – Accelerated Mining Rate Alternative; and Alternative 4 – No Action. The primary differences among the four alternatives are: (1) remaining tons of recoverable LBA1 coal; (2) remaining years of LBA1 coal recovery; and (3) the remaining LBA1 area disturbance. **Table 2.2-1** in **Chapter 2** provides a summary comparison of the four alternatives.

Under Alternative 1, approximately 39.9 Mt of LBA1 coal would be mined and 162.5 acres would be disturbed over 16 years. Under Alternative 2, approximately 19.3 Mt of LBA1 coal would be mined and approximately 78.5 acres would be disturbed over five years. Under Alternative 3, 39.9 Mt of LBA1 coal would be mined and 162.5 acres would be disturbed over 2.2 years. Under Alternative 4, no additional LBA1 coal would be mined and no additional disturbance in the LBA1 area would occur.

In addition to the coal in the LBA1 tracts, the SCM continues to mine approximately 63.4 Mt of coal from other non-LBA1 tract Federal, state, and private leases, covering approximately 971 acres within the permit boundary. Under all alternatives, the SCM would mine the recoverable non-LBA1 tract Federal, state, and private coal reserves.

The resource-specific analysis areas and the affected environment considered in the EIS are described in **Chapter 3**. Impacts (direct and indirect) of the four EIS alternatives are described in **Chapter 4**. The cumulative effects of past, present, and reasonably foreseeable future actions are described in **Chapter 5**.

The environmentally preferable alternative is Alternative 4 and the preferred alternative is Alternative 2. Both are discussed in **Chapter 6**.

OSMRE published the Notice of Availability (NOA) for the draft EIS in the *Federal Register* on September 4, 2024, initiating a 45-day public comment period that ended on October 22, 2024. OSMRE also hosted an in-person public meeting in Hardin, Montana, on September 24, 2024. During the public comment period for the draft EIS, OSMRE received a total of 452 individual comment letters. Of these, 12 of the letters contained 96 substantive individual comments. OSMRE responded to all substantive comments in **Appendix D** and revised the final EIS based on those comments, where necessary.

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ACRONYMS

°C	degrees Celsius
°F	degrees Fahrenheit
$\mu g/m^3$	micrograms per cubic meter
A/D	Anderson-Dietz
ADEQ	Arizona Department of Environmental Quality
AERMOD	AMS/EPA Regulatory Model
AQRV	Air Quality Related Value
ARM	Administrative Rules of Montana
As	arsenic
ASLM	Assistant Secretary for Land and Minerals Management
AVFs	alluvial valley floors
BCC	Birds of Conservation Concern
BLM	Bureau of Land Management
BNSF	Burlington Northern Santa Fe Railway
CAA	Clean Air Act of 1972
CBNG	coal bed natural gas
CCAA	Candidate Conservation Agreement with Assurances
CCUS	carbon capture, utilization, and storage
CEQ	Council on Environmental Quality
C.F.R.	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CPE	Cloud Peak Energy
CPRG	Climate Pollution Reduction Grant
dBA	A-weighted decibels
DNRC	Montana Department of Natural Resource Conservation
DOI	U.S. Department of Interior
dv	deciview
EA	Environmental Assessment
EGLE	Michigan Department of Environmental Great Lakes, and Energy
EIA	U.S. Energy Information Administration
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FAS	Montana Federal-Aid Secondary Route
FLIGHT	Facility Level Information on Greenhouse Gases Tool
FONSI	Finding of No Significant Impact
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
GHG	greenhouse gas
GHGRP	Greenhouse Gas Reporting Program
GPO	Government Publishing Office
GRSG	Greater sage-grouse
Gt	gigaton
GWP	global warming potential
HAPs	hazardous air pollutants

Hg	Mercury
HRRP	Habitat Recovery and Replacement Plan
IMPROVE	Interagency Monitoring of Protected Environments
IPCC	Intergovernmental Panel on Climate Change
IRA	Inflation Reduction Act of 2022
IWG	Interagency Working Group
JMOE	Japan Ministry of the Environment
LAC	level of acceptable change
LBA	Lease by Application
L_{dn}	day-night noise level
LMU	logical mining unit
LOM	life of mine
MAAQS	Montana Ambient Air Quality Standards
MACT	Maximum Available Control Technology
MARPOL	International Convention for the Prevention of Pollution from Ships
MATS	Mercury and Air Toxics Standards
MBTA	Migratory Bird Treaty Act
MCA	Montana Code Annotated
MDEQ	Montana Department of Environmental Quality
MEPA	Montana Environmental Policy Act
MFWP	Montana Fish, Wildlife and Parks
mg/L	milligrams per liter
MMT	million metric ton
MOA	Memorandum of Agreement
MPCA	Minnesota Pollution Control Agency
MPDES	Montana Pollutant Discharge Elimination System
MSGHCP	Montana Sage Grouse Habitat Conservation Program
MSUMRA	Montana Strip and Underground Mine Reclamation Act
Mt	million tons
MTNHP	Montana Natural Heritage Program
Mtpy	million tons per year
MW	megawatt
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NADP	National Atmospheric Deposition Program
NCTF	United States National Climate Task Force
NDC	national determined contribution
NEI	National Emissions Inventory
NEPA	National Environmental Policy Act of 1969, as amended
NESHAP	Emissions Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NOI	Notice of Intent
NO_x	nitrogen oxides
NRHP	National Register of Historic Places
NSPS	New Source Performance Standards
NTEC	Navajo Transitional Energy Company
O_3	ozone
OSMRE	Office of Surface Mining Reclamation and Enforcement
PAP	permit application package
Pb	lead

PM_{10}	particulate matter smaller than 10 micrometers
$PM_{2.5}$	fine particulate matter
ppb	parts per billion
ppm	parts per million
PRB	Powder River Basin
PSD	Prevention of Significant Deterioration
R2P2	resource recovery and protection plan
ROK	Republic of Korea
$SC\text{-}CH_4$	social cost of methane
$SC\text{-}CO_2$	social cost of carbon dioxide
SC-GHG	social cost of greenhouse gases
SCM	Spring Creek Mine
$SC\text{-}N_2O$	social cost of nitrous oxide
SHPO	Montana State Historic Preservation Office
SMCRA	Surface Mining Control and Reclamation Act of 1977, as amended
SMP	State Mining Permit
SO_2	sulfur dioxide
SOSI	species of special interest
STB	Surface Transportation Board
STP	standard temperature and pressure
T&E	threatened and endangered
TBGPEA	Thunder Basin Grasslands Prairie Ecosystem Association
TDS	total dissolved solids
tpy	tons per year
TSP	total suspended particulate
TSS	total suspended solids
U.S.C.	United States Code
UNEP	United Nations Environment Programme
USDOT	U.S. Department of Transportation
USFWS	U.S. Fish & Wildlife Service
USGS	U.S. Geological Survey
VOCs	volatile organic compounds
VRM	Visual Resource Management

1.0 PURPOSE AND NEED

1.1 Introduction

This Environmental Impact Statement (EIS) analyzes the Spring Creek Mine Mining Plan Modification for Federal Coal Leases MTM 94378 and MTM 110693, collectively referred to as the Lease by Application (LBA) 1 tracts. The Office of Surface Mining Reclamation and Enforcement (OSMRE) initially published an environmental assessment (EA) for LBA1 on October 3, 2016 (hereafter 2016 LBA1 EA, OSMRE 2016). The United States District Court for the District of Montana (the Court) held in *WildEarth Guardians v. Haaland*, No. CV 17-80-BLG-SPW (D. Mont 2021) that the 2016 LBA1 EA failed to take a hard look at the following:

- Indirect and cumulative effects of diesel emissions, noise, vibrations, and coal dust emissions from rail cars based on the final destination and routes of coal shipments (addressed in Sections 4.4.3, 4.14 and 4.15 of this EIS).
- Indirect effects of non-greenhouse gas (GHG) from downstream combustion emissions (addressed in Section 4.4.4 of this EIS).
- Effects related to the social cost of greenhouse gases (SC-GHG) (addressed in Section 4.4.5 of this EIS).

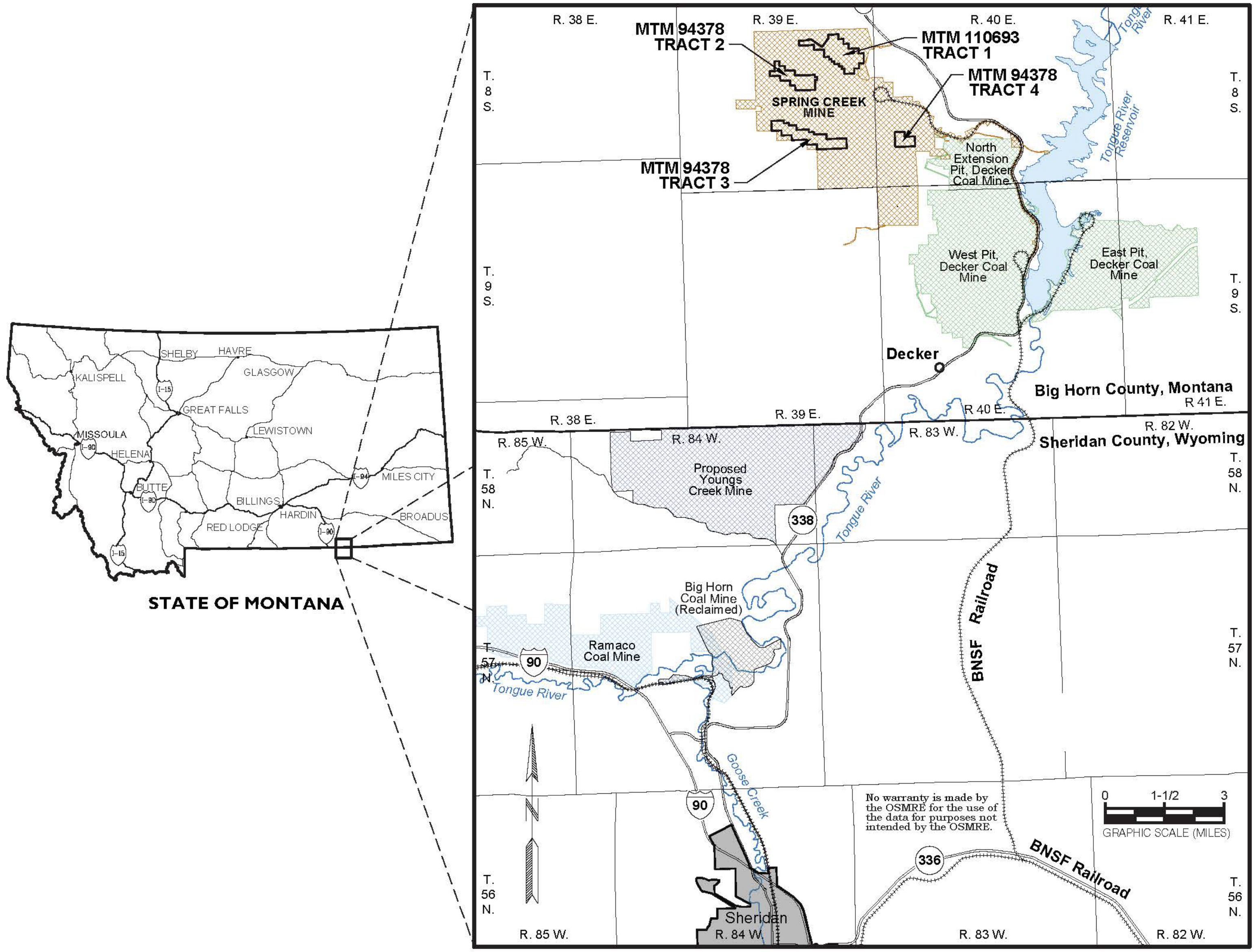
This EIS provides additional analysis on those three impacts, as well as updating the environmental analysis contained in the 2016 LBA1 EA, as appropriate. It has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA) as amended, 42 U.S.C. §§ 4321-4347 (2023); the Council on Environmental Quality's (CEQ's) regulations for implementing the NEPA, 40 Code of Federal Regulations (C.F.R.) Parts 1500 through 1508 (2022)[1]; the U.S. Department of the Interior (DOI) NEPA regulations, 43 C.F.R. Part 46; and the OSMRE NEPA Handbook.

1.2 Project Location

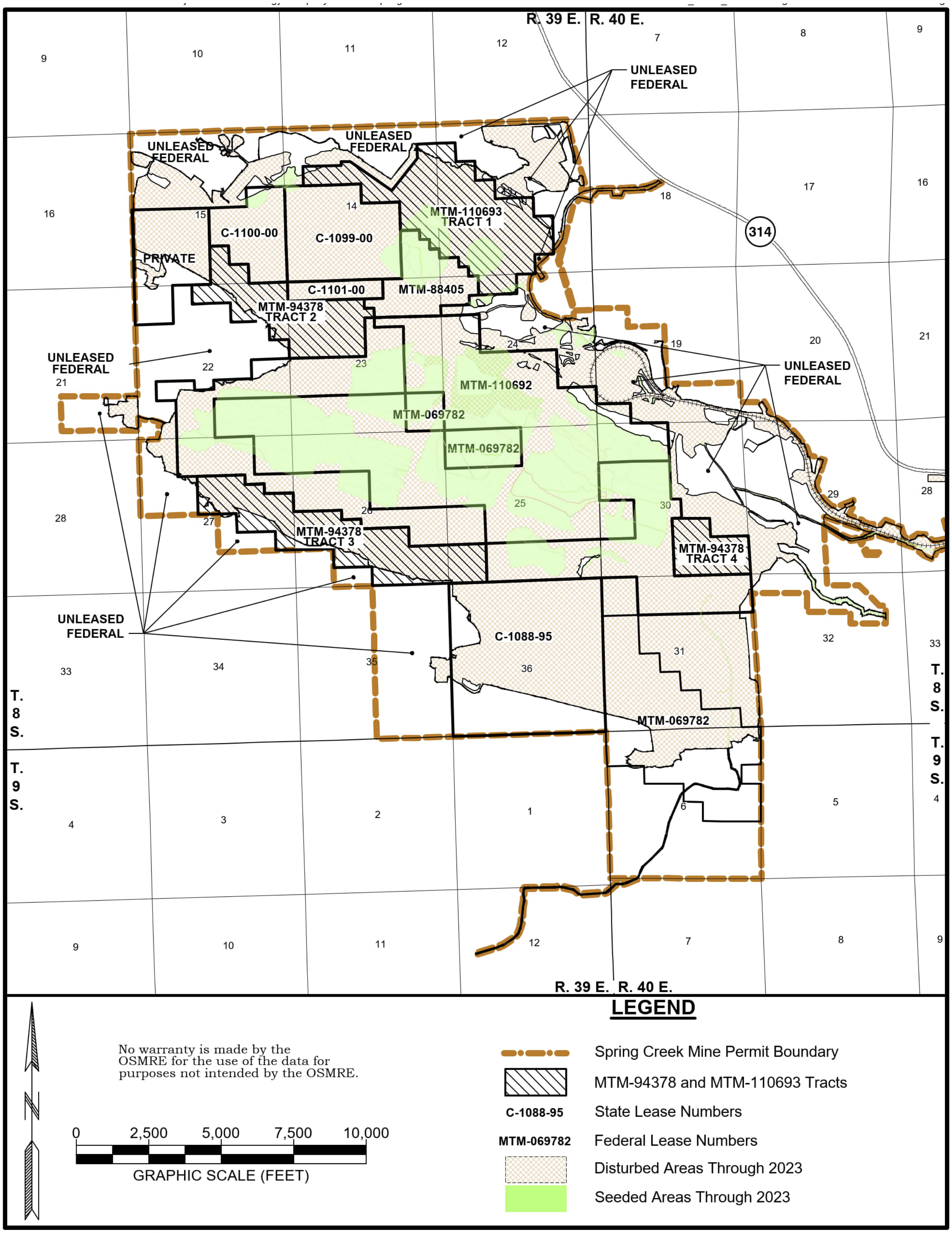
The Spring Creek Mine (SCM) is located in Big Horn County, Montana, approximately 32 miles north of Sheridan, Wyoming (Map 1.2-1). Coal has been mined on a commercial scale at the SCM since 1979. The SCM is currently operated by Navajo Transitional Energy Company, LLC (NTEC) following NTEC's acquisition in 2019 of substantially all the assets owned by Cloud Peak Energy, Inc. (CPE), including the assets held by Spring Creek Coal, LLC.

NTEC is a wholly owned limited liability company of the Navajo Nation. Ownership of the surface and mineral estate within the permit boundary was thoroughly discussed in Section 3.11 of the Bureau of Land Management (BLM) coal leasing EA for LBA MTM 94378 EA# MT-020-2007-34 (hereafter 2006 LBA EA; BLM 2006). The only update to the information in the 2006 LBA EA is to note the change of operator at the SCM and the related transfer of mineral leasehold interests to NTEC. The SCM recovers coal under ten distinct coal leases, as shown on Map 1.2-2.

1 OSMRE is aware of the November 12, 2024 decision in *Marin Audubon Society v. Federal Aviation Administration*, No. 23-1067 (D.C. Cir. Nov. 12, 2024). To the extent that a court may conclude that the CEQ regulations implementing NEPA are not judicially enforceable or binding on this agency action, OSMRE has nonetheless elected to follow those regulations at 40 C.F.R. Parts 1500–1508, in addition to the Department's procedures/regulations implementing NEPA at 43 C.F.R. Part 46, to meet the agency's obligations under NEPA, 42 U.S.C. §§ 4321 *et seq*.



Map 1.2-1 General Location of the LBA1 Tracts



Map 1.2-2 Configuration of the LBA1 Tracts and Coal Leases within the Spring Creek Mine Permit Boundary

1.3 Project Background

In 2018, Spring Creek Coal, LLC provided an application to the BLM to consolidate Federal coal leases into a logical mining unit (LMU), which included Tracts 2, 3, and 4 of MTM 94378 (BLM 2018). Because only a portion of the Federal coal lease MTM 94378 was included in the LMU, the remaining tract (Tract 1) was segregated into a new Federal coal lease (MTM 110693) per 43 C.F.R. § 3487.1(f)(3). For consistency in this EIS, the three tracts associated with MTM 94378, and the tract associated with MTM 110693 are referred to collectively as the LBA1 tracts. The lease configuration is presented on Map 1.2-2.

In anticipation of needing additional coal reserves, Spring Creek Coal, LLC, filed an application in 2005 with BLM to lease Federal coal in four separate tracts, under the leasing by application regulations at 43 C.F.R. § 3425.1 and the provisions of the Energy Policy Act of 2005 (Government Publishing Office (GPO) 1982 and U.S. Public Law No: 109-58 (2005), respectively). At the time, the SCM applied for the four tracts as maintenance tracts for the SCM to maintain operation at the mine's then average annual level of production of 18 million tons per year (Mtpy).

2006:	BLM issues EA for MTM 94378
2007:	BLM issues MTM 94378 to Spring Creek Coal, LLC.
2011:	MDEQ approves permit revision to add MTM 94378.
2012:	OSMRE adopts 2006 BLM EA and issues FONSI. ASLM approves Federal Mining Plan Modification.
2016:	2012 Federal Mining Plan Modification challenged. Court orders OSMRE to prepare an updated EA. OSMRE completes the 2016 LBA1 EA and issues FONSI.
2021:	2016 Federal Mining Plan Modification challenged. Court orders OSMRE to prepare a corrective NEPA analysis.
2023:	Court grants extension for OSMRE to complete NEPA to May 10, 2024, extended to March 14, 2025.

BLM prepared the 2006 LBA EA to satisfy NEPA requirements for the LBA. The 2006 LBA EA analyzed the potential impacts associated with approving the lease of the Federal coal associated with MTM 94378, which would allow the SCM to continue producing coal at the rate of 18 Mtpy instead of ceasing production, as recoverable coal reserves were nearly exhausted. OSMRE was a cooperating agency on the 2006 LBA EA. Based in part on the analysis in the 2006 LBA EA, BLM concluded that the coal within the tracts was acceptable for leasing and that maximum economic recovery of the Federal coal would be achieved by mining the tracts. BLM selected a modification of the 2006 LBA EA Proposed Action that removed approximately 89.9 acres of Federal coal from the proposed lease that was associated with a prairie falcon eyrie and a rock art site in Tract 1. The modified tracts included approximately 1,117.7 acres of Federal coal.

After providing the public with a 30-day public comment period and after conducting a public meeting on the proposed lease sale in Billings, Montana, BLM issued a Finding of No Significant Impact (FONSI) for the modified LBA, as modified by BLM, on March 2, 2007. The only comment received during the 30-day public comment period and BLM's December 6, 2006, public meeting was one verbal comment at the public meeting in support of the project. BLM offered lease MTM 94378 for competitive sale on April 17, 2007. BLM issued the Federal coal associated with MTM 94378 to Spring Creek Coal, LLC on November 9, 2007, with an effective date of December 1, 2007, at the noncompetitive bid offer of $19,902,200.

To comply with the Surface Mining Control and Reclamation Act of 1977 (SMCRA), as amended, Spring Creek Coal, LLC requested a permit revision from the Montana Department of Environmental Quality (MDEQ) to include the Federal coal from the newly acquired MTM 94378. Spring Creek Coal, LLC submitted the permit application package (PAP) to MDEQ on January 23, 2008, under the approved Montana State Program for a permit revision (Amendment Application 00183) for State Mining Permit (SMP) C1979012. The PAP included modifications to include production of coal from MTM 94378 and from previously approved leases MTM 069782 and MTM 088405, which would open access to MTM 94378. In August 2009, MDEQ determined Spring Creek Coal, LLC's application to be administratively complete and that an EIS under the Montana Environmental Policy Act (MEPA) was not necessary. The completion notice was published in the newspaper for four consecutive weeks followed by a 30-day public comment period. No comments were received on the application. MDEQ completed a checklist EA pursuant to the MEPA to assess the potential environmental impacts of the PAP in May 2011 (MDEQ 2011a). The MDEQ checklist EA fulfilled MEPA requirements based on the level of analysis and the anticipated degree of public involvement, which depended on the significance of the potential or identified environmental impacts. The MDEQ provided Determination of Acceptability and the EA followed by a public notice period in May 2011. No comments were received. MDEQ approved the permit revision on June 21, 2011 (MDEQ 2011b). It should be noted that the 2011 amendment to SMP C1979012 reduced the disturbance amount for MTM 94378 to 627.9 acres from the BLM previously approved 799 acres in the 2006 LBA EA. This total was reduced to 623.9 acres through the minor revision process.

Spring Creek Coal, LLC also received mining authorization for Federal lease MTM 94378 through the Federal mining plan modification process required by the Mineral Leasing Act of 1920. The Federal mining plan modification was initially proposed to OSMRE by Spring Creek Coal, LLC in 2008. On June 5, 2012, OSMRE conducted a NEPA adequacy review and determined that the 2006 BLM EA adequately analyzed the potential environmental impacts of the proposed Federal mining plan modification. OSMRE adopted the EA and issued a FONSI on June 5, 2012, recommending to the Assistant Secretary for Land and Minerals Management (ASLM) approval of the SCM Federal mining plan modification. The ASLM approved the Federal mining plan modification on June 27, 2012, to add approximately 1,117.7 acres of federal coal to the previously approved Federal mining plan, which also included all of leases MTM 069782 and MTM 088405.

Environmental groups filed a NEPA challenge to the ASLM's 2012 Federal mining plan modification approval. On January 21, 2016, the Court issued a decision holding that OSMRE had failed to fulfill certain of its obligations under NEPA when it approved the 2012 Federal mining plan modification in *WildEarth Guardians v. OSMRE*, Civil Nos. 14-13-SPW & 14-103-SPW (D. Mont. 2016). According to the Court, OSMRE failed to notify the public after it issued its FONSI for the Federal mining plan modification in contravention of 43 C.F.R. § 46.305(c). The Court also held that OSMRE failed to adequately demonstrate that OSMRE had taken a "hard look" at the environmental effects of approving the 2012 Federal mining plan modification. Because of these deficiencies, the Court ordered OSMRE to prepare an updated EA within 240 days to analyze the environmental effects of the mining plan modification for lease MTM 94378.

OSMRE prepared the 2016 LBA1 EA to correct the NEPA deficiencies identified by the Court in its 2016 ruling. OSMRE did not reevaluate all potential impacts previously analyzed in the 2006 LBA EA. Rather, the 2016 EA rectified those specific procedural deficiencies in OSMRE's documentation and approval of the NEPA analysis for the 2012 Federal mining plan modification and analyzed potential changes to the extent or nature of those potential impacts previously evaluated, based on information included in SMP C1979012 (Spring Creek Coal, LLC 2014) and new information related to the environmental consequences specific to the action. Disturbance and permit-boundary changes incorporated at the SCM since June 27, 2012, were included in the 2016 LBA1 EA. OSMRE completed the 2016 LBA1 EA in September 2016 and issued a FONSI on October 3, 2016, recommending to the ASLM approval of the SCM Federal mining plan modification. The ASLM approved the Federal mining plan modification on October 3, 2016. Environmental groups then challenged that approval (*WildEarth Guardians v. Haaland, No. CV 17-80-BLG-SPW* (D. Mont. 2021)). As discussed above, the court determined that OSMRE failed to take a hard look at several environmental impacts and directed OSMRE to complete a remedial NEPA analysis. The court deferred vacatur of the Federal mining plan modification to allow OSMRE time to complete the remedial NEPA analysis. Under the most recent order from the court, the deferred vacatur will end on March 14, 2025.

1.4 Purpose and Need

OSMRE's purpose in preparing this EIS is to fully analyze the environmental impacts from the Federal mining plan modification, with particular attention to addressing the deficiencies identified in the 2021 Court Order, so that OSMRE can make a recommendation to the ASLM (in the form of a mining plan decision document) to approve, disapprove, or conditionally approve the proposed Federal mining plan modification for the LBA1 tracts. The ASLM will decide whether the mining plan modification is approved, disapproved, or approved with conditions. Mining and reclamation would not have Federal authorization to proceed in the LBA1 tracts beyond March 14, 2025, (the deadline of deferred vacatur) without this approval.

Under the current Court Order, NTEC, the current operator, will not be able to access or recover the remaining LBA1 tracts coal reserves after March 14, 2025, unless OSMRE completes its NEPA analysis and the ASLM approves the Federal mining plan modification.

1.5 Agency Authority and Actions

This EIS satisfies OSMRE's NEPA obligation to fully disclose the potential direct, indirect, and cumulative effects of the Proposed Action. In response to the deficiencies identified by the Court, OSMRE notes that it has evaluated the potential indirect and cumulative effects of diesel emissions, noise, vibrations, and coal dust based on the final destinations and routes of SCM coal shipments; potential indirect effects of non-GHG from downstream combustion emissions; and potential effects to global climate using the social cost of carbon protocol.

In addition to this NEPA review, Federal law requires two other consultations, where necessary: Section 7 of the Endangered Species Act (ESA) and Section 106 of the National Historic Preservation Act (NHPA). OSMRE pursued these consultations parallel to the NEPA process. OSMRE determined that there were no ESA-listed species or designated critical habitats within the permit area or the adjacent area and that the proposed action would have no effect on any ESA-listed species or critical habitat. A "no effect" determination does not require Section 7 consultation. OSMRE initiated government to government consultation with the Tribes that would be affected by the Proposed Action at Spring Creek Mine. Letters were mailed to Tribes requesting initiation of consultation with OSMRE and informing the Tribes of the agency's intent to prepare an EIS in response to the Court's decision.

1.5.1 Lead Agency – Office of Surface Mining Reclamation and Enforcement

OSMRE is the lead agency directing EIS preparation for the Project. OSMRE will make a recommendation to the ASLM about whether to approve, disapprove, or conditionally approve the proposed mining plan modification, and associated reclamation activities, in the LBA1 tracts at the SCM.

1.5.2 Other Agencies

Table 1.5-1 provides a summary of the state and Federal permits and licenses, and their purposes. Table 1.5-1 is not a comprehensive list of all permits, consultations, or approvals, but it includes the primary Federal and state agencies with permitting responsibilities.

1.5.2.1 Montana Sage Grouse Habitat Conservation Program

The Montana Sage Grouse Habitat Conservation Program (MSGHCP) was established in 2015 from collaborative work of the Montana Sage Grouse Habitat Conservation Advisory Council and other diverse stakeholders. The MSGCHP was created to implement Montana Executive Orders (EOs) 12-2015 and 21-2015 across state government, federal land management agencies, and private entities wishing to develop projects in key Greater sage-grouse (GRSG) habitats. The MSGCHP is overseen by the Montana Sage Grouse Oversight Team and administratively hosted by the Montana Department of Natural Resources and Conservation (DNRC).

Permit applications submitted in GRSG general, core, or connectivity habitat, dated on or after January 1, 2016, must include a consultation letter from the MSGCHP. According to Montana EO No. 12-2015, existing land uses and activities (including those authorized by existing permit but not yet conducted) are recognized and respected by state agencies, and those uses and activities that exist at the time the MSGCHP becomes effective would not be managed under the stipulations of the Montana Sage Grouse Conservation Strategy. Because the tracts evaluated under the Proposed Action are entirely within the SCM's currently approved permit boundary, these activities would not be managed according to the EO. However, NTEC has developed and implemented a detailed Habitat Recovery and Replacement Plan (HRRP) for GRSG at the mine and its voluntary participation in the Thunder Basin Grasslands Prairie Ecosystem Association (TBGPEA) to offset potential impacts to GRSG due to mine-related activities.

Table 1.5-1 Federal and State Permits, Consultations, and Approvals

Agency	Permit/Consultation	Approval Purpose
ASLM	Approval of Mining Plan Modification (30 C.F.R. Part 746)	To allow NTEC to mine Federal coal leases. Review of the proposed plan is coordinated with MDEQ and Federal agencies such as BLM. OSMRE recommends approval, disapproval, or conditional approval of the mining plan to the DOI ASLM.
BLM	Resource Recovery and Protection Plan (30 C.F.R. 746.13)	To allow NTEC to mine Federal coal leases. BLM must make a finding and recommendation to OSMRE with respect to NTEC's Resource Recovery and Protection Plan and other requirements of NTEC's lease.
U.S. Fish and Wildlife Service (USFWS)	ESA Section 7 Consultation (16 U.S.C. § 1536)	To protect Threatened and Endangered species and any designated critical habitat.
MDEQ	Montana Strip and Underground Mine Reclamation Act Surface Mine Operating Permit (MSUMRA; Section 82-4-201, et seq., Montana Code Annotated [MCA])	To regulate surface coal mining. Proposed activities must comply with state environmental standards and criteria, which are at least as stringent as those set by SMCRA. Approval may include stipulations for final design of facilities and monitoring plans. A sufficient reclamation bond must be posted with MDEQ before implementing an operating permit modification. MDEQ will coordinate with OSMRE.
	Clean Air Act of Montana Air Quality Permit (Section 75-2-102, et seq., MCA)	To control particulate emissions of more than 25 tons per year (tpy).
	Montana Water Quality Act Montana Pollutant Discharge Elimination System (MPDES) Permit No MT0024619 and storm water MTR000514 (Section 75-5-201 et seq., MCA)	To establish effluent limits, treatment standards, and other requirements for point source discharges, which includes storm water discharges to state waters. Coordinate with the U.S. Environmental Protection Agency (EPA). The MPDES and storm water permits have no changes associated with LBA1.
	Hazardous Waste and Solid Waste Registration (various laws)	To ensure safe storage and transport of hazardous materials to and from the site and proper storage, transport, and disposal of solid wastes.
Montana State Historic Preservation Office (SHPO)	NHPA Section 106 Review (16 U.S.C. § 470)	To review and comment on Federal compliance with the NHPA.

1.5.3 Cooperating Agencies

As defined in the NEPA regulations, (40 C.F.R. § 1508.1(g)), "cooperating agency" means any Federal, State, Tribal, or local agency with jurisdiction by law or special expertise with respect to any environmental impact involved in a proposal designated by the lead agency. OSMRE mailed letters to federal agencies, state agencies, tribes, counties, municipalities and conservation districts, non-government organizations, and individuals on March 17, 2022. No agencies indicated that they would like to participate as a cooperating agency on this project.

1.6 Public Participation

Public participation is an integral part of the NEPA process. OSMRE issued a Notice of Intent (NOI) to prepare an EIS in the *Federal Register* and announced the NOI through a news release and on their website on March 17, 2022, initiating the scoping period that ended April 15, 2022. OSMRE mailed letters to federal agencies, state agencies, tribes, counties, municipalities and conservation districts, non-government organizations, and individuals on March 17, 2022.

During the public scoping period, OSMRE hosted a virtual public scoping meeting on March 31, 2022, via Zoom. The public was provided the opportunity to comment on the project via mail, email, and/or during the virtual meeting.

OSMRE issued a Notice of Availability (NOA) for the draft EIS in the *Federal Register* and announced the NOA through a news release and on its website on September 4, 2024, initiating a 45-day public comment period that ended on October 22, 2024. OSMRE mailed letters to federal agencies, state agencies, tribes, counties, municipalities, and conservation districts, non-government organizations, and individual stakeholders on September 4, 2024.

During the public comment period, OSMRE hosted an in-person public meeting at the Big Horn County Courthouse in Hardin, Montana, on September 24, 2024. The public was provided the opportunity to comment on the project via mail, email, and/or during the public meeting.

During the public scoping period, OSMRE received a total of 6 comment submittals (i.e., emails) containing some 63 individual comments. During the public comment period for the draft EIS, OSMRE received a total of 452 individual comment letters. Of these, 12 of the letters contained 96 substantive individual comments.

Comments received during the scoping and public comment process were reviewed to identify additional significant environmental issues for the EIS (40 C.F.R. § 1503.4). Many comment letters received addressed more than one topic. The topics that received the greatest number of comments were related to air quality and climate change, water resources, cumulative impacts, wildlife, socioeconomics, environmental justice, and alternatives.

The public scoping and comment process identified several issues, which are addressed in the EIS, as described below:

- The potential for adverse effects to air quality from combustion of mined coal (Section 4.4.4).
- The potential effects of the Project on climate change, and subsequent effects to other resource areas (Sections 4.4.5 and 5.2.3.4, and as applicable, Sections 4.14, 4.15, and 4.16).
- The potential for the Project to adversely affect human health and safety (Section 4.18).
- The potential for the Project to adversely affect minority, low-income and indigenous communities (Section 4.18); and
- The potential for the Project to adversely affect the hydrologic balance of groundwater and surface water (Section 4.5).

A summary report of the public comments received and how they were addressed in the final EIS in included in Appendix D of this final EIS.

1.7 Financial Assurance

NTEC has an adequate performance bond in place to ensure that reclamation of the LBA1 tracts will be completed. As Federal lands are involved, the bond is payable jointly to MDEQ and OSMRE (30 C.F.R. § 926.30, Article IX). A complete description of MDEQ's performance bonding procedure, including bond release by reclamation phase, is provided in the Administrative Rules of Montana (ARM) 17.24.1101. The SCM's current bond that includes the LBA1 tracts is summarized in Section 2.1.2. of this EIS.

2.0 PROPOSED ACTION AND ALTERNATIVES

This chapter describes the four alternatives evaluated in this EIS: Alternative 1 - the Proposed Action, Alternative 2 – the Partial Mining, Alternative 3 – the Accelerated Mining Rate, and Alternative 4 – the No Action. This chapter also describes one alternative that was considered but not analyzed in detail.

2.1 Existing Conditions (Conditions Common to all Alternatives)

2.1.1 Mining Plan and Mining Operations

The SCM is currently permitted to mine coal under the ASLM-approved Federal Mining Plan (OSMRE 2016), the MDEQ-approved SMP C1979012 (MDEQ 2014), and the BLM-approved resource recovery and protection plan (R2P2; BLM 2017). The SCM is permitted to mine a maximum of 30 Mtpy under Montana Air Quality Permit #1120-12 (MDEQ/PCD 2014). Total saleable coal production since the 2016 EA and Federal mining plan modification were approved (2016-2023) is provided in Table 2.1-1, showing that production rose or fell by roughly 20% on average, year-on-year, with drops in production nearly as likely as gains.

Table 2.1-1 Annual Saleable Coal Production (Mt)

Year	2016	2017	2018	2019	2020	2021	2022	2023	Avg
Saleable Coal	10.2	12.7	13.8	11.9	9.5	13.2	11.6	12.5	11.9

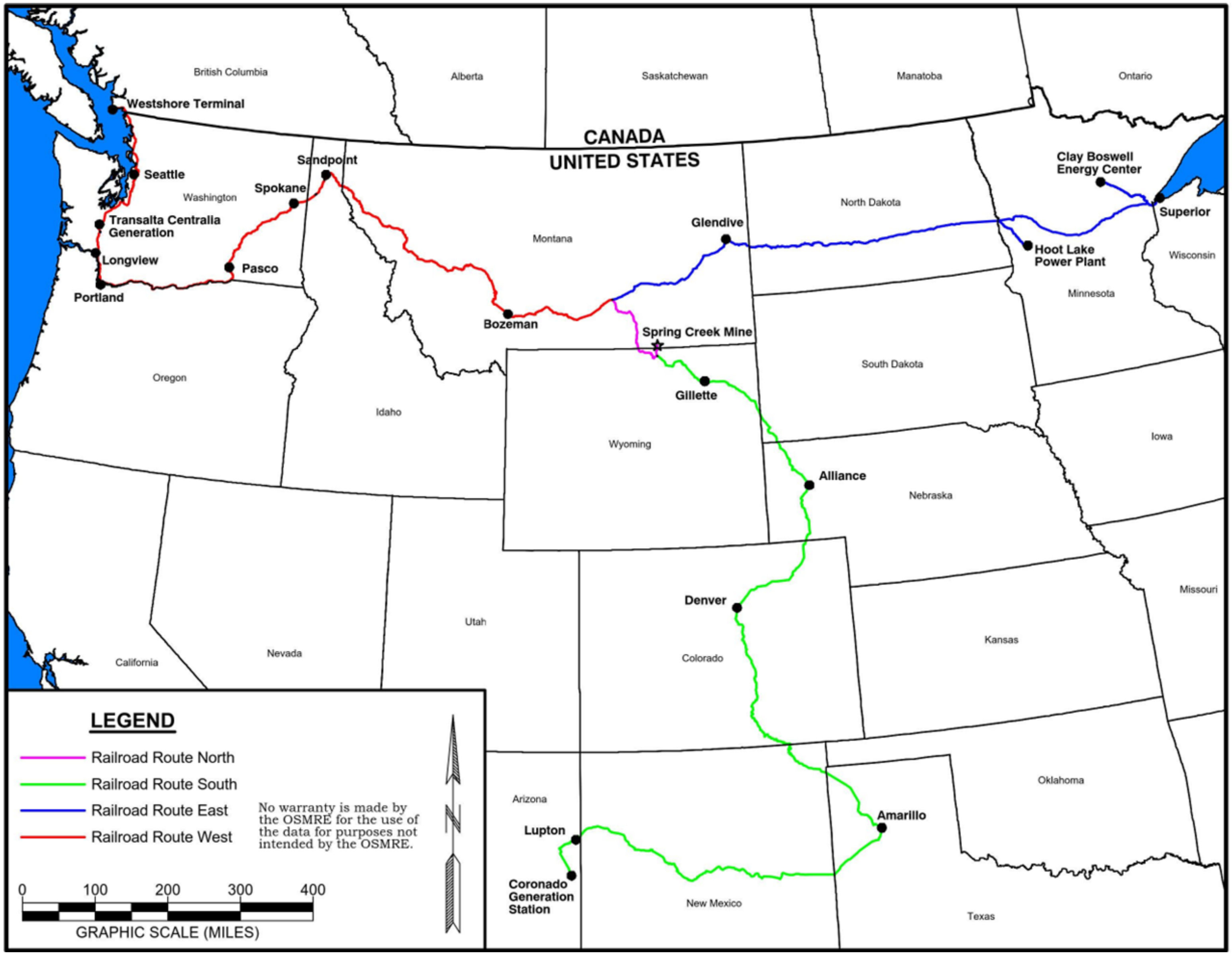
Source: U.S. Energy Information Administration (EIA) 2024, NTEC 2022a, 2024

Mining has been ongoing within the LBA1 tracts since the Federal mining plan modification was approved in 2012. For the purposes of this analysis, OSMRE used December 31, 2023, as the cutoff date for existing conditions at the mine, because calculations and potential impacts are evaluated on an annual basis. As of December 31, 2023, approximately 63.3 million tons (Mt) of the 103.2 Mt of Federal coal have been recovered and 461.4 acres of the 627.9 acres have been disturbed in association with recovering the Federal coal within the four LBA1 tracts. All the Federal coal has been removed from MTM 94378 Tract 4 and over 75% of the Federal coal in MTM 110693 Tract 1 has been removed. Approximately 39.9 Mt of Federal coal remains to be recovered and approximately 162.5 acres of approved disturbance associated with LBA1 tracts have yet to be disturbed. The 2012 Federal mining plan modification boundary and the Federal coal lease tracts in relation to the SCM, including the current disturbance, are shown on Map 1.2-2.

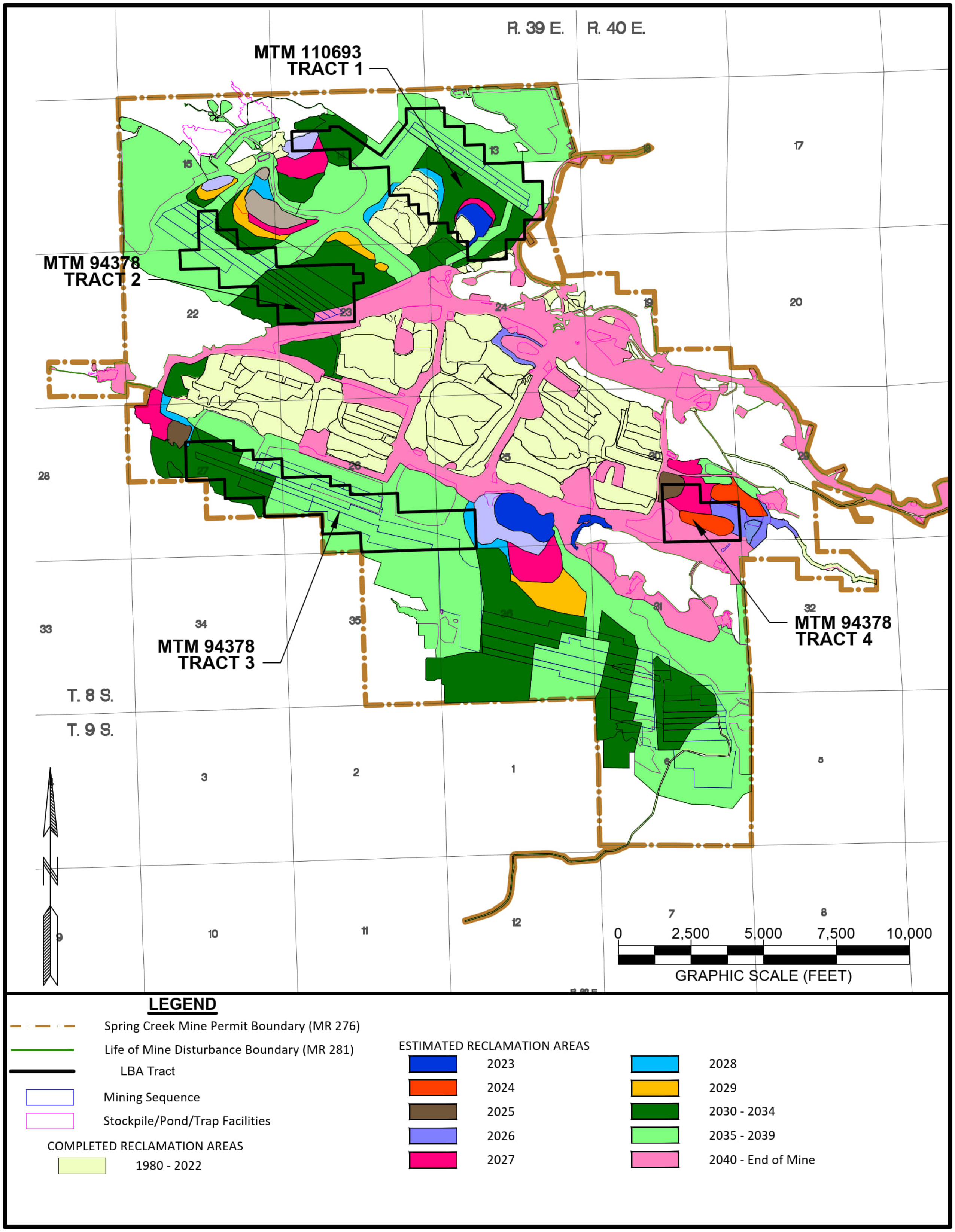
In addition to the LBA1 tracts coal, the SCM also mines coal from other non-LBA1 tract Federal, state, and private leases within the permit boundary. According to NTEC (2024), there is approximately 63.4 Mt of non-LBA tract federal, state, and private coal that cover approximately 971 acres. Coal from the various leases is blended due to variability in quality to fulfill contracts. Under all alternatives, the SCM would mine the recoverable non-LBA1 tract Federal, state, and private coal reserves.

Between 2016 and 2023, approximately 66 to 95 percent of the coal mined from the SCM was shipped to U.S. markets and the remaining coal was shipped to domestic industrial customers and foreign markets (NTEC 2022, 2024a). In the U.S., the coal was transported by rail from the SCM to various power plants including, TransAlta Centralia Generation in Washington, Coronado Generating Station in Arizona, Boswell Energy Center and Hoot Lake Plant in Minnesota, and D.E. Karn Generating Plant and Belle River and St. Clair Power Plants in Michigan. Coal was also transported by rail to terminals in Superior, Wisconsin and British Columbia, Canada for vessel transport. The primary routes for Burlington Northern Santa Fe Railway (BNSF) rail transport and vessel transport in North America are shown on Map 2.1-1.

Following mining, the SCM will return the land to its postmining land uses (grazing, wildlife habitat, pastureland, and cropland) by adhering to the Reclamation Plan in SMP C1979012. Reclamation is phased based on ongoing mining operations and consists of backfilling, regrading, topsoil application, and eventual revegetation which will conform to 82-4-233 MCA as described in Section 1 of 17.24.313 Reclamation Plan. Map 2.2-1 shows the proposed reclamation and schedule as of February 28, 2023. Under all alternatives, the SCM will reclaim the lands associated with the LBA1 tracts. The SCM will adhere to the vegetation monitoring described in the Section 1(h)(ix) of the Reclamation Plan in SMP C1979012. Monitoring starts the next calendar year after seeding, then every other year until Phase II bond release is achieved. After receiving Phase II bond release, the SCM continues monitoring every three years until Phase III sampling occurs.



Map 2.1-1 BNSF Railroad and Shipping Routes in North America Used to Transport Spring Creek Mine Coal



Map 2.2-1 Spring Creek Mine Reclamation as of February 28, 2023

2.1.2 Current Bonding and Bond Release Status

SMCRA provides that, as a prerequisite for obtaining or modifying a coal mining permit, permittees must post a reclamation bond to ensure that the regulatory authority will have sufficient funds to reclaim the site if the permittee fails to complete obligations set forth in the approved reclamation plan. The current SCM bond amount is $174.8 million and was approved by MDEQ on April 9, 2024. The bond is updated annually to meet the requirements in ARM 17.24.414(2). The bonds are updated in accordance with ARM 17.24.1104, which states “the amount of the performance bond must be increased, as required by the department, as the acreage in the permit area increases, methods of mining operation change, standards of reclamation change or when the cost of future reclamation, restoration or abatement work increases.” The annual bond calculation is submitted for MDEQ approval as a minor revision to the permit on or before April 15th of each year and is based on topography from December of the preceding year. The acres of reclamation at the SCM from 2016 through December 2023, by bond release phase are presented in Table 2.1-2.

Table 2.1-2 Total Mine Disturbance, Reclamation, and Bond Releases (acres)

Year	Total Disturbance	Facility Disturbance	Active Mining Area	Available for Seeding	Soiled and Seeded	Phase I	Phase II	Phase III	Phase IV[2]
2016	4,753	1,057	2,383	1,313	1,257	1,200	980	407	0
% of Total		22%	50%	28%	26%	25%	21%	9%	0%
2017	4,879	1,086	2,455	1,338	1,319	1,284	1,017	407	0
% of Total		22%	50%	27%	27%	26%	21%	8%	0%
2018	4,947	996	2,573	1,408	1,340	1,311	1,017	407	0
% of Total		20%	52%	28%	27%	26%	21%	8%	0%
2019	5,148	1,017	2,689	1,442	1,359	1,311	1,017	407	0
% of Total		20%	52%	28%	26%	25%	20%	8%	0%
2020	5,368	1,017	2,904	1,447	1,426	1,323	983	407	0
% of Total		19%	54%	27%	27%	25%	18%	8%	0%
2021	5,669	891	3,348	1,423	1,429	1,429	1,026	595	19
% of Total		16%	59%	25%	25%	25%	18%	10%	0%
2022	5,864	891	3,348	1,430	1,458	1,460	1,147	595	19
% of Total		15%	57%	24%	25%	25%	20%	10%	0%
2023	5,994	1,191	3,153	1,520	1,535	1,508	1,241	595	19
% of Total		20%	53%	25%	26%	25%	21%	10%	0%

Source:2016 through 2023 SCM Annual Mining Reports for SMP C1979012.

2.1.3 Existing Stipulations

The mitigation measures and lease stipulations presented in BLM’s Decision Record for the 2006 LBA EA remain in effect and would be carried forward if the Federal mining plan modification is approved by the ASLM. No other additional mitigation measures are proposed.

2.2 Description of the Alternatives

Table 2.2-1 provides a summary of the four alternatives evaluated in this EIS: Proposed Action, Partial Mining, Accelerated Mining Rate, and No Action. As explained in section 2.1.1, and for the purpose of this analysis, the remaining tons of recoverable coal in the LBA1 tracts and the

2 MDEQ’s Phase IV bond release is the final bond release when all reclamation requirements of SMCRA and the permit are fully met.

associated annual production rates, remaining years of mining, and remaining acres of approved disturbance are based on the existing conditions on December 31, 2023.

Table 2.2-1 Summary Comparison of Alternatives

Item	Alternative 1 Proposed Action	Alternative 2 Partial Mining	Alternative 3 Accelerated Mining Rate	Alternative 4 No Action
Remaining LBA1 Recoverable Federal Coal	39.9 Mt	19.3 Mt	39.9 Mt	0 Mt
Estimated Average Annual LBA1 Coal Production	Varies (see Table 2.2-2)	Varies (see Table 2.2-2)	18 Mt	0 Mt
Remaining Years from Recovering LBA1 Coal	16 years	5 years	2.2 years	0 years
Remaining LBA1 Area to be Disturbed	162.5 acres	78.5 acres	162.5 acres	0 acres

2.2.1 Alternative 1 – Proposed Action

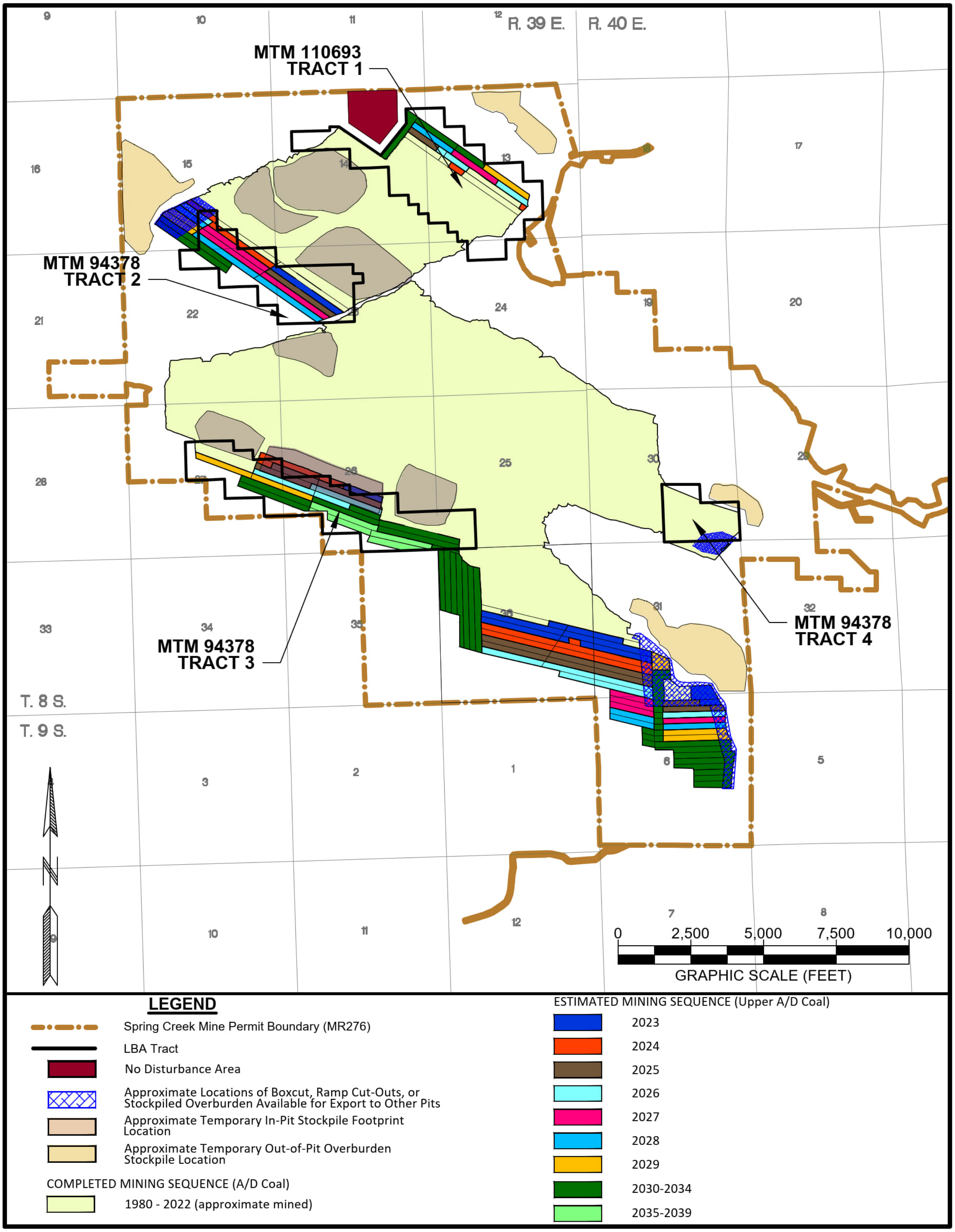
Under the Proposed Action alternative, the SCM would mine the remaining 39.9 Mt of coal within the LBA1 tracts in accordance with the life of mine (LOM) mining sequence outlined in the approved MDEQ SMP C1979012 (NTEC 2023a). Table 2.2-2 provides the annual estimated recoverable tons that would be mined from the LBA1 tracts as well as the annual estimated disturbance under the Proposed Action. Under the Proposed Action alternative, it is assumed that the remaining 39.9 Mt of coal would be mined from the LBA1 tracts and approximately 162.5 acres would be disturbed over a 16-year mine life.

Table 2.2-2 Estimated Recoverable Tons Remaining in LBA1 Tracts by Year

Year	LBA1 Coal (Mt)	Disturbance (acres)
2024	2.20	8.9
2025	4.51	18.3
2026	4.14	16.8
2027	4.87	19.8
2028	3.59	14.6
2029	4.21	17.1
2030	2.51	10.2
2031	2.51	10.2
2032	2.51	10.2
2033	2.51	10.2
2034	2.51	10.2
2035	0.78	3.2
2036	0.78	3.2
2037	0.78	3.2
2038	0.78	3.2
2039	0.78	3.2
Total	**39.9**	**162.5**

Source: NTEC 2023a

Map 2.2-2 shows the LOM mining sequence within each tract and Map 2.2-1 depicts the reclamation that has been completed at the SCM through February 28, 2023.



Map 2.2-2 Spring Creek Mine Life of Mine Mining Sequence

2.2.2 Alternative 2 – Partial Mining

Under the Partial Mining alternative, ASLM-approval of the mining plan modification for the LBA1 tracts would end after a five-year term, and any mining of the LBA1 tracts after this date would require a new recommendation from OSMRE to ASLM and a new mining plan modification approval from ASLM. Alternative 2 was developed to address recent NEPA caselaw highlighting the importance of identifying and evaluating a reasonable range of alternatives and acknowledging the volatility of the coal industry by evaluating an alternative that authorizes mining less than the full amount of leased federal coal.[3]

OSMRE has observed that the coal market has been in a state of flux in recent years, with production peaking in 2008 only to fall by almost half by 2020. The reasons for the volatility are varied and include, but are not limited to, competition from natural gas and renewable energy sources, the closure of coal fired power plants, and changes in international coal markets. As these trends are expected to continue into the foreseeable future, it has become difficult to predict what the landscape of coal demand will be over the life of a mine such as the SCM, which is expected to operate until 2039 (EIA 2023a; EIA 2023b; Feaster 2023; Kolstad 2017; Tan 2023; Wilson 2023). As a result, OSMRE determined that it would be prudent to analyze an alternative that limits the mining to a 5-year term from the date of ASLM mining plan approval. This timeframe is consistent with the approval periods under federal surface mining regulations.

For analytical purposes, OSMRE used the SCM's LOM mining sequence outlined in the approved SMP C1979012 (NTEC 2023a) to estimate the amount of LBA1 tract coal the SCM would mine during a representative 5-year term from 2024 through 2028. Under Alternative 2, it is assumed that the 5-year term would actually begin following the ASLM's approval of the Federal mining plan modification.

As analyzed in this EIS, during the 5-year term, approximately 19.3 Mt of coal would be mined from the LBA1 tracts and approximately 78.5 acres would be disturbed (Table 2.2-1). Under this alternative, if the operator would like to continue mining beyond the initial 5-year term, the operator can apply for an additional mining plan modification, which OSMRE will review under the circumstances that exist in the future.

2.2.3 Alternative 3 – Accelerated Mining Rate

Under the Accelerated Mining Rate alternative, it is assumed that the remaining 39.9 Mt of coal would be mined from the LBA1 tracts at a rate of 18 Mtpy. Using this annual production rate, mining would continue for another 2.2 years within the LBA1 tracts. Approximately 162.5 acres, the same as the Proposed Action, would be disturbed under this alternative.

The Accelerated Mining Rate alternative is the same alternative that was described and analyzed in the 2016 LBA1 EA as the Proposed Action, but the Accelerated Mining Rate alternative has been updated in this EIS to reflect the coal that has been mined from the LBA1 tracts through December 31, 2023. For consistency with the 2016 LBA1 EA, the annual production used for this alternative analysis is 18 Mt, which reflects a rate of mining that was anticipated to occur in 2016 but is unlikely to occur under current market conditions. Although this faster rate of mining is not likely to occur under current circumstances, the SCM has authorization under its air permit to mine at a rate of 30 Mtpy, and OSMRE determined that it would be helpful to decisionmakers to understand the differing environmental impacts from the varying rates of mining.

3 *Compare, e.g.*, 30 C.F.R. § 746.13(g) (requiring OSMRE to submit to the Secretary a recommendation with, *inter alia*, "findings and recommendations . . . with respect to the additional requirements of this subchapter") *with id*. § 740.13 740.13(b)(3)(iii)(A)(1) (requiring the "ability of public and private entities to provide goods and services necessary to support surface coal mining and reclamation operations").

2.2.4 Alternative 4 – No Action

Under the No Action alternative, the Federal mining plan modification for the LBA1 tracts would not be approved, and the SCM would no longer be authorized to mine Federal coal in the LBA1 tracts. This alternative assumes that the SCM would apply for and receive all appropriate approvals to fully reclaim any disturbed areas in accordance with SMCRA and its current approved mining and reclamation permit.

Under the No Action Alternative, ASLM would not approve the Federal mining plan modification. The Federal coal remaining within the LBA1 tracts as of March 14, 2025 (U.S. District Court for the District of Montana Order CV 17-80-BLG-SPW) would not be recovered. If the mining plan is not reapproved but is instead vacated, the SCM would be unable in the near-term to complete its required reclamation commitments within the boundaries of the LBA1 tracts. According to 30 C.F.R. §746.11, "[n]o person shall conduct surface coal mining and reclamation operations on lands containing Federal coal until the Secretary has approved the mining plan" (emphasis added) (GPO 2012). In addition, vacating the mining plan would require revisions to the MDEQ-approved SMP C1979012 and the BLM-approved R2P2 to modify the reclamation plan, maximum economic recovery conditions, and coal recovery plans for areas within boundaries of the SMP C1979012, but outside the LBA1 tracts.

2.3 Alternatives Considered but Eliminated from Detailed Analysis

OSMRE considered additional alternative scenarios to the alternatives detailed above. However, because ASLM's decision would be limited to approving, disapproving, or conditionally approving the mining plan modification, OSMRE concluded that there are no other reasonable action alternatives to the Proposed Action that would meet the agency's purpose and need. The following alternative was considered but eliminated from detailed analysis. The discussion includes reasons the alternative was eliminated from detailed analysis.

2.3.1 Limited Mining Based on Reclamation and Bonding

Comments were submitted during the public scoping period asking the agencies to consider an alternative that would limit mining based on the approved reclamation schedule and bonding amounts. This alternative would tie NTEC's ability to mine new coal reserves to reclamation success and bond release. Currently, the SCM blends coal from various leases within the permit boundary to meet the coal quality criteria for various coal customers. NTEC has indicated that limiting the mine's ability to mine at multiple locations throughout the permit area until reclamation and bonding levels have been met would negatively impact its ability to fulfill coal contracts that require blending coal from different areas of the mine. The blending scenario has been approved and in practice since the SCM was first permitted in 1979. This alternative was eliminated from detailed study because it would not be technically or economically feasible.

3.0 AFFECTED ENVIRONMENT

This chapter describes the existing conditions of relevant resources that could reasonably be impacted by the alternatives described in Chapter 2 of this EIS. These resources are present within and surrounding the project area and provide the basis to address substantive issues of concern brought forward during internal and public scoping. The information presented in this chapter provides quantitative data and spatial information, where appropriate, to serve as a baseline for comparison of the direct and indirect of the Proposed Action and alternatives.

3.1 General Setting

The LBA1 tracts are located adjacent to the western boundary of the Great Plains physiographic province and in sight of the Bighorn Mountains in Montana and Wyoming near the Montana-Wyoming state border. The area exhibits a semi-arid climate characterized by cold winters, warm summers, and notable variations in annual and seasonal precipitation and temperature. According to the Western Regional Climate Center, during the period between 1981 to 2010, the area experienced an average maximum temperature of 62.6 degrees Fahrenheit (°F) and an average minimum temperature of 31.4 °F. Total average precipitation was 13.4 inches and most precipitation occurs during the spring. The LBA1 tracts are located in the southeast corner of Big Horn County, Montana, approximately 16 miles north of the Montana-Wyoming State line and about 32 miles northeast of Sheridan, Wyoming. The SCM, deriving its name from the Spring Creek drainage, is situated west of the Tongue River Reservoir and spans approximately 10.7 square miles. Comprised mainly of the flat valley floors of Spring Creek, South Fork Spring Creek, and North Fork Spring Creek, alongside adjacent steep slopes and near-vertical bluffs, the area's topography features slopes ranging from 5 to 90 degrees. Surface drainage is directed by three ephemeral streams—Spring Creek, South Fork Spring Creek, and North Fork Spring Creek—that ultimately discharge into the Tongue River Reservoir.

3.2 Topography and Physiography

The SCM is physiographically located near the western edge of the Great Plains province. This province can be characterized as a plateau like area that is interrupted in the western portion by mountainous uplifts separated from one another by structural basins, one of which is the Powder River Basin (PRB). The PRB is a large structural depression that is bounded on the west by the Bighorn Mountains, on the east by the Black Hills Uplift, and on the south by the Laramie Mountains, the Casper Arches and Hartville Uplift. The basin extends northward in Montana where it is separated from the Williston Basin by the Miles City Arch (Glass 1976).

The LBA1 area is comprised of four distinct tracts. Tract 1 is broken up by small, incised drainages that flow towards the North Fork of Spring Creek. Numerous near vertical cliff features are present in the tract. Tract 2 is incised by several small drainages that flow into Spring Creek. Tract 3 consists of steep, north-facing slopes that drain into the South Fork of Spring Creek. Tract 4 is characterized by two bluff features, in the central and east portion of the track, that rise out of a relatively flat landscape. The Tongue River Reservoir lies down gradient of the tracts. The elevations within the tracts range from 3,605 to 4,165 feet above mean sea level with a maximum relief of 435 feet within any one tract.

3.3 Geology, Minerals, and Paleontology

3.3.1 Geology

SCM coal deposits are in the Paleocene age Fort Union Formation. The Fort Union Formation is divided into three members including, in descending order, the Tongue River, Lebo Shale, and the Tullock Members. The thick coal beds occur in the upper 900 feet of the Tongue River Member. The clastic beds in the Tongue River Member were deposited on floodplains of large rivers, in river and stream channels, or on deltas extending outward into swamps. The clastic beds tend to be lenticular in shape and limited in areal extent.

The Spring Creek and Carbone faults are the most important geologic features affecting the flow and interaction of surface water and groundwater. These northeast-trending normal faults offset the coal-bearing strata and influence the distribution of clinker at the surface, which impacts the migration of surface water into and through the subsurface.

3.3.2 Mineral Resources

The PRB contains large reserves of mineral resources, including coal, oil, natural gas, uranium, bentonite, and scoria.

3.3.2.1 Coal

Eight coal seams are generally found within the Fort Union Formation in the Tongue River area. Locally, these have been called (from youngest to oldest): Roland; Smith; Anderson; Dietz No. 1; Dietz No. 2; Canyon; D4: and D6. In the proposed lease areas, the Anderson, Dietz No. 1, and Dietz No. 2 are combined to form the Anderson-Dietz (A/D) seam. Only the A/D seam is considered economically recoverable within the LBA1 tracts. The A/D coal to be mined is a composite bed approximately 80 to 85 feet thick.

3.3.2.2 Oil and Gas

There are no known reserves of conventional oil and gas in the LBA1 tracts. Four oil and gas test holes were drilled in the vicinity of the SCM to depths of between 5,000 and 8200 feet and all four holes were dry.

Coal bed natural gas (CBNG) extraction from the Fort Union and Wasatch Formations began in 1989. Development expanded rapidly in the 1990s and early 2000s including areas adjacent to the SCM. The predominant CBNG production in the Montana portion of the PRB occurred from coal beds of the Wyodak-Anderson zone in seams, which are the same (or equivalent) seams being mined along the western margin of the basin, including the SCM. However, CBNG production has declined significantly since 2008. In Big Horn County, 1,560 CBNG wells are permitted (Montana BOGC 2024). Records indicate that the majority (55%) of these wells have been plugged and abandoned, 28% have permits that expired, 8% have been transferred to water wells, and 8% are shut in. The last production from any CBNG well in Big Horn County was in 2013.

3.3.2.3 Bentonite

No mineable bentonite reserves have been identified on the LBA1 tracts.

3.3.2.4 Uranium

No known uranium reserves have been identified on the LBA1 tracts.

3.3.2.5 Scoria

Several small pits have been excavated locally for use on roads in the SCM and local residences.

3.3.3 Paleontology

The sedimentary rocks exposed on the surface within the central portion of the PRB are the Eocene age Wasatch Formation and Paleocene age Fort Union Formation, both of which are known to contain fossil plant and animal remains. No significant or unique paleontological resource localities have been documented on federal lands in the tracts. The BLM recommended specific mitigation for paleontology or additional paleontological work if significant paleontological resources are encountered.

3.4 Air Quality

The following describes the air quality (including climate change and GHGs) of the project area and region. Air quality regulations applicable to surface coal mining include the National

Ambient Air Quality Standards (NAAQS), Montana Ambient Air Quality Standards (MAAQS), and Prevention of Significant Deterioration (PSD). Additional air quality regulations applicable to surface coal mining include the New Source Performance Standards (NSPS), Hazardous Air Pollutants (HAPs), Mercury and Air Toxics Standards (MATS), and the Federal Operating Permit Program (Title V).

3.4.1 Background

The Clean Air Act (CAA) of 1972, administered by the EPA, governs air emissions, and establishes NAAQS to regulate acceptable levels of pollutants. Montana's air quality management adheres to the Environmental Quality Act, along with the Air Quality Rules and Regulations overseen by the Air Quality Bureau of the MDEQ, all approved by the EPA under the CAA. This regulatory framework includes MAAQS, required to be as stringent as NAAQS, and allowances for the PSD to maintain air quality. The EPA establishes NAAQS for six principal pollutants deemed harmful to public health and the environment: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), particulate matter less than 2.5 micron ($PM_{2.5}$), particulate matter less than 10 micron (PM_{10}), and sulfur dioxide (SO_2). Table 3.4-1 provides the NAAQS and MAAQS.

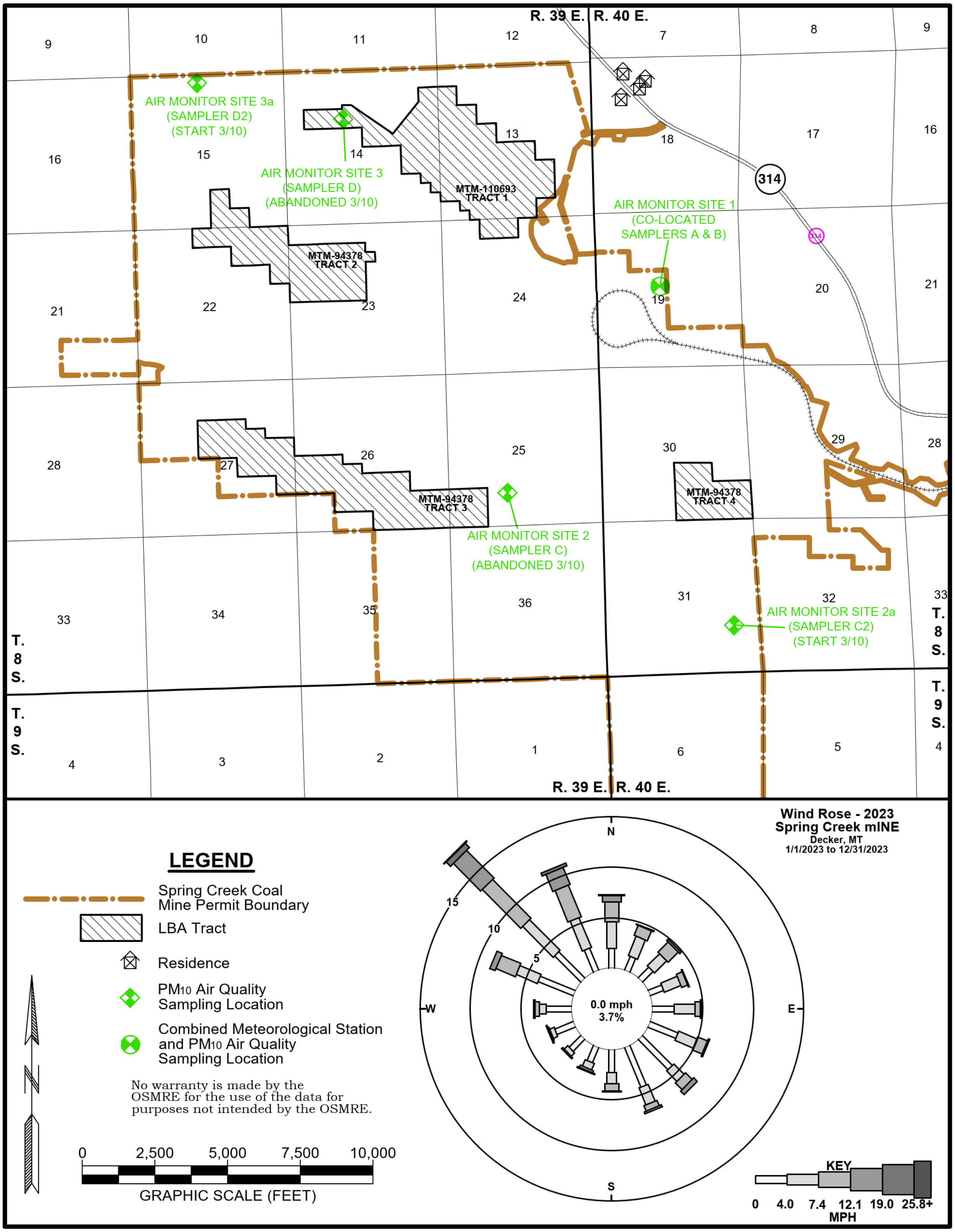
The PSD program regulates new major sources or major modifications at existing sources in areas meeting or in the process of meeting NAAQS. PSD increments, which specify allowable pollution increases, aim to maintain air quality below NAAQS levels. While NAAQS sets maximum concentration limits, PSD increments establish the maximum allowable concentration increase above baseline levels. The program curbs incremental pollutant rises from major sources, depending on the area’s classification. Despite available PSD increments, air quality cannot surpass NAAQS thresholds (EPA 2024a). The SCM, along with nearby locations, falls under PSD Class II, where allowable increases are less stringent than in Class I areas. The Northern Cheyenne Indian Reservation, approximately 16 miles northeast of the project, is the closest PSD Class I area.

States designate areas within their borders as being in “attainment” or “non-attainment” with the Ambient Air Quality Standards (AAQS). Because the tracts are near the border of Montana and Wyoming, the attainment status of nearby areas in both states is considered. The LBA tracts are in an area that is designated an attainment area for all pollutants. The town of Lame Deer, Montana, located about 35 miles north, is a non-attainment area for PM_{10}. The town of Sheridan, Wyoming, located about 32 miles south of the project area was a non-attainment area for PM_{10}, but is currently in maintenance status. Similarly, Billings, Montana, situated approximately 90 miles northwest of the project area, was designated as a non-attainment area for SO_2 and CO, but is currently in maintenance for both pollutants. The prevailing wind in the vicinity of the SCM is from the north/northwest, so these non-attainment areas are not downwind of the SCM (Map 3.4-1 depicts the prevailing wind).

Table 3.4-1 Federal and Montana Ambient Air Quality Standards

Pollutant	NAAQS Standard Type	Averaging Time	Federal (NAAQS)	State (MAAQS)
CO	Primary	1-Hour	35 ppm [a]	23 ppm [b]
	Primary	8-Hour	9 ppm [a]	9 ppm [a]
Pb	Primary & secondary	Rolling 3-month	0.15 μg/m^3 [c]	NA
	NA	Quarterly	1.5 μg/m^3 [a]	1.5 μg/m^3 [a]
NO_2	Primary	1-Hour	100 ppb [d]	0.30 ppm [a]
	Primary & secondary	Annual	53 ppb [e]	0.05 ppm [f]
O_3	Primary & secondary	1-Hour	NA	0.10 ppm [a]
	Primary & secondary	8-Hours	0.070 ppm [g]	NA
$PM_{2.5}$	Primary	Annual	9.0 μg/m^3 [h]	NA
	Secondary	Annual	15.0 μg/m^3 [a]	NA
	Primary & secondary	24-Hour	35 μg/m^3 [i]	NA
PM_{10}	Primary & secondary	24-Hour	150 μg/m^3 [j]	150 μg/m^3 [a]
	Primary & secondary	Annual	NA	50 μg/m^3 [k]
SO_2	Primary	1-Hour	75 ppb [l]	0.50 ppm [m]
	Secondary	3-Hour	0.5 ppm	NA
	Primary	24-Hour	NA	0.10 ppm [a]
	Primary	Annual	NA	0.02 ppm [a]

a Federal violation when exceeded more than once per calendar year.
b State violation when exceeded more than once over any 12 consecutive months.
c Not to be exceeded for the averaging period as described in the state and/or federal regulation.
d Federal violation when 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitoring site exceeds the standard.
e Federal violation when the annual arithmetic mean concentration for a calendar year exceeds the standard.
f State violation when the arithmetic average over any four consecutive quarters exceeds the standard.
g Federal violation when 3-year average of the annual fourth-highest daily maximum 8-hour concentration exceeds standard.
h Federal violation when 3-year average of the annual mean at each monitoring site exceeds the standard.
i Federal violation when 3-year average of the 98th percentile 24-hour concentrations at each monitoring site exceed the standard.
j State and federal violation when more than one expected exceedance per calendar year, averaged over three years.
k State violation when the 3-year average of the arithmetic means over a calendar year at each monitoring site exceed the standard.
l Federal violation when the 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitoring site exceeds the standard.
m State violation when exceeded more than 18 times in any 12 consecutive months.



Map 3.4-1 Wind Rose and Air Quality and Meteorological Stations at Spring Creek Mine

3.4.2 Existing Spring Creek Mine Air Quality

3.4.2.1 Particulate Matter

The SCM has monitored particulate matter levels around the mine throughout the life of the operation. The mine expressed particulate matter using total suspended particulate (TSP) concentrations until 1987. This measurement included all particulates generally less than 100 microns in diameter. In 1987, the form of the standard was changed from TSP to PM_{10} to better reflect human health effects. MDEQ removed the requirement for the SCM to sample for PM_{10} in September 2009, based on the SCM's history of relatively low downwind monitoring readings and MDEQ's confidence in current permit conditions. The SCM has voluntarily chosen to continue the PM_{10} sampling program. These data are used internally and not submitted to MDEQ, per MDEQ's request. $PM_{2.5}$ monitoring at the SCM is not required by MDEQ and is not conducted currently.

Air quality monitoring at the SCM consists of four samplers at three sites that monitor concentrations of PM_{10} as depicted on Map 3.4-1. Tables 3.4-2 and 3.4-3 provide the annual mean and high PM_{10} concentrations at standard temperature and pressure (STP) for the years 2016 through 2023, respectively. See Map 3.4-1 for site locations.

Table 3.4-2 Average Annual PM_{10} Concentrations (µg/m^3)

Site Name	2016	2017	2018	2019	2020	2021	2022	2023
A	14.1	24.2	25.1	18.7	24.4	26.9	24.1	23.3
B	13.6	24.2	26.2	18.5	25.9	24.2	26.4	25.7
C2	16.3	27.3	23.5	22.7	26.6	24.3	34.4	20.6
D2	10.3	16.5	15.7	12.2	15.3	16.2	16.2	13.2

Source: IML Air Science 2017-2024

Table 3.4-3 Annual High PM_{10} Concentrations (µg/m^3)

Site Name	2016	2017	2018	2019	2020	2021	2022	2023
A	31.9	60.3	60.8	88.9	69.0	72.9	61.9	99.3
B	33.2	54.0	78.4	88.9	78.5	71.8	71.1	119.8
C2	43.3	110.8	68.0	64.8	95.6	63.2	119.5	65.6
D2	24.6	50.0	44.2	29.4	56.1	57.6	60.3	59.3

Source: IML Air Science 2017-2024

The tables show that the average annual STP PM_{10} and the annual high STP PM_{10} were within established 24-hour (150 µg/m^3) and annual (35 µg/m^3) NAAQS and/or MAAQS between 2016 and 2023. These results are consistent with previous years.

Because $PM_{2.5}$ monitoring is not required by MDEQ, data were not gathered onsite. Therefore, data from one $PM_{2.5}$ monitor (Site ID 560330002) located in Sheridan, Wyoming, was used. Regional monitoring results presented in Table 3.4-5 demonstrate that ambient concentrations of $PM_{2.5}$, as determined by the 98th percentile 24-hour standard and annual average values, generally were within established 24-hour (35 µg/m^3) and annual (12 µg/m^3) standards. See Map 3.4-1 for site locations.

Table 3.4-4 Annual Mean $PM_{2.5}$ Ambient Concentrations (µg/m^3)

Monitor Number	2016	2017	2018	2019	2020	2021	2022	2023
1	6.6*	6.9*	7.4	6.7*	6.7	8.7*	NA	NA
2	5.9*	7.7*	6.9	6.0	6.1	9.3*	NA	NA
3	NA	NA	NA	NA	NA	4.8*	7.7*	6.8
11	6.4	6.4*	6.8*	5.7	5.9	5.3*	NA	NA

Source: EPA 2024b

* The mean does not satisfy minimum data completeness criteria.

Table 3.4-5 Annual High $PM_{2.5}$ Ambient Concentrations (µg/m³)

Monitor Number	2016	2017	2018	2019	2020	2021	2022	2023
1	17	21	21	27	34	35	NA	NA
2	19	24	18	18	17	33	NA	NA
3	NA	NA	NA	NA	NA	9	21	24
11	23	17	27	15	29	29	NA	NA

Source: EPA 2024b

To further evaluate potential $PM_{2.5}$ emissions at the SCM, PM_{10} monitoring data from the SCM were used to estimate $PM_{2.5}$ ambient concentrations by applying a 0.2 factor, as determined by Pace (2005). The estimated annual mean and maximum 24-hour $PM_{2.5}$ values are presented in Tables 3.4-6 and 3.4-7, respectively. The estimated $PM_{2.5}$ concentrations were below the prescribed 24-hour NAAQS (35 µg/m³) and the annual NAAQS (12 µg/m³). These estimates are supported by the regional $PM_{2.5}$ data presented in Table 3.4-4. See Map 3.4-1 for site locations.

Table 3.4-6 Estimated Annual Mean $PM_{2.5}$ Concentrations (µg/m³)

Site Name	2016	2017	2018	2019	2020	2021	2022	2023
A	2.8	4.8	5.0	3.7	4.9	5.4	4.8	4.7
B	2.7	4.8	5.2	3.7	5.2	4.8	5.3	5.1
C2	3.3	5.5	4.7	4.5	5.3	4.9	6.9	4.1
D2	2.1	3.3	3.1	2.4	3.1	3.2	3.2	2.6

Table 3.4-7 Estimated Annual High $PM_{2.5}$ Concentrations (µg/m³)

Site Name	2016	2017	2018	2019	2020	2021	2022	2023
A	6.4	12.1	12.2	17.8	13.8	14.6	12.4	19.9
B	6.6	10.8	15.7	17.8	15.7	14.4	14.2	24.0
C2	8.7	22.2	13.6	13.0	19.1	12.6	23.9	13.1
D2	4.9	10.0	8.8	5.9	11.2	11.5	12.1	11.9

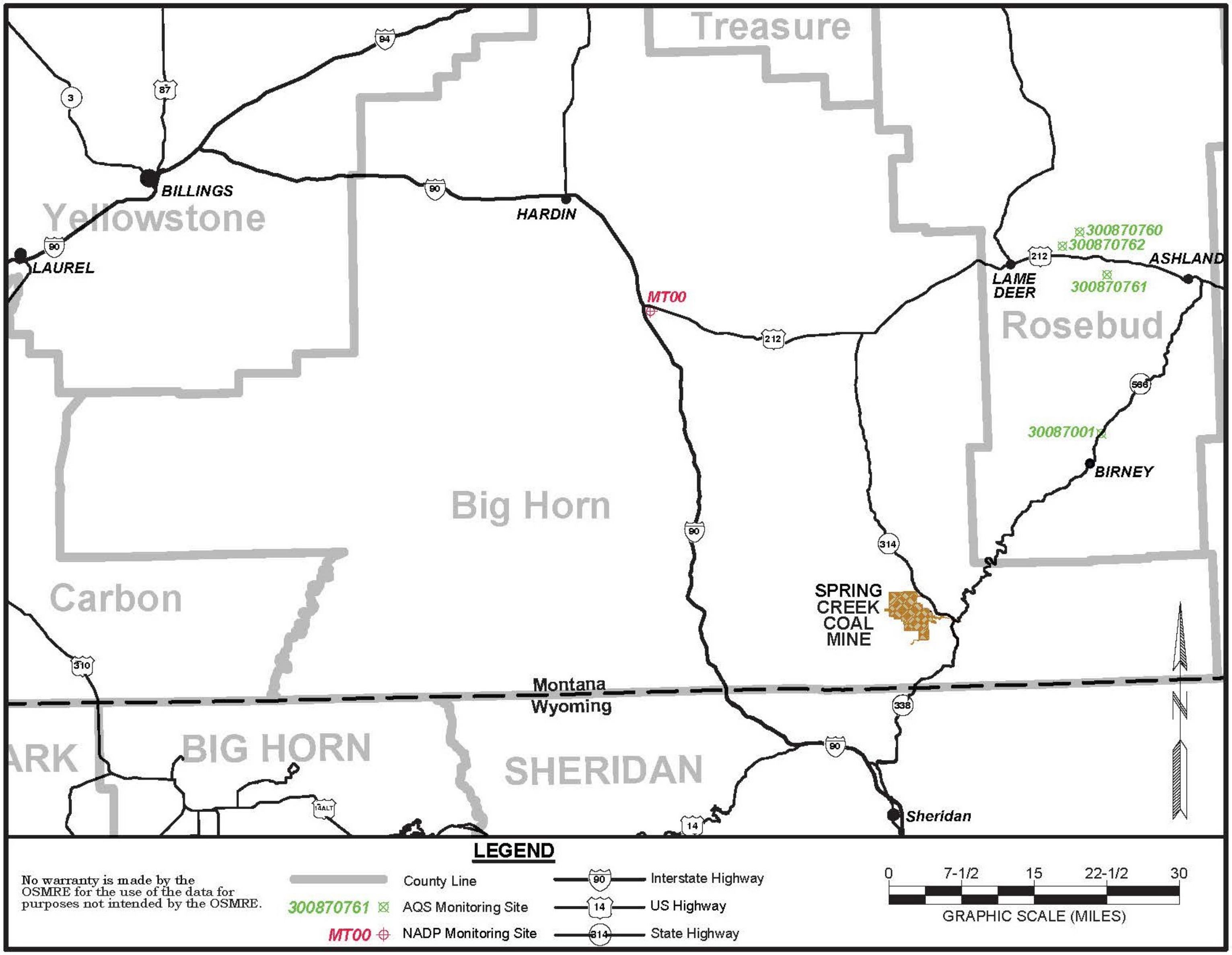
3.4.2.2 Nitrogen Dioxide

NO_2 concentrations (98th percentile, 1-hour) are currently being monitored at four sites in Rosebud County including one Air Quality System (AQS) monitoring site near Birney and three AQS monitoring sites near Lame Deer. NO_2 data from the AQS monitoring sites are presented in Table 3.4-8. The Birney, Montana site was deactivated at the end of 2021. These monitoring sites are the closest to the SCM with the distances from the LBA1 tracts ranging from approximately 28 to 44 miles. See Map 3.4-2 for site locations.

Table 3.4-8 NO_2 Concentrations (ppb) in Rosebud County

AQS Site ID	Sampler ID	2016	2017	2018	2019	2020	2021	2022	2023
300870001	Birney	6	13	7	6	6	11	NA	NA
300870761	Garfield Peak	49	17	11	9	5	5	6	6
300870762	Badger Peak	13	9	8	9	6	5	NA	NA
300870760	Morningstar	11	12	12	12	6	8	NA	NA

Source: EPA 2024c



Map 3.4-2 Regional Air Quality Monitoring Sites

3.4.2.3 Ozone

O_3 monitoring is not required at the SCM but levels were monitored at the AQS monitoring site near Birney, until the site was deactivated in 2021. Table 3.4-9 presents the O_3 data between 2016 and 2021. An exceedance of the O_3 8-hour standard occurs if the 4th-highest daily maximum value is above the level of the standard (0.075 ppm). Table 3.4-9 shows that no exceedances of the 8-hour or O_3 standard occurred between 2016 and 2021. See Map 3.4-2 for site locations.

Table 3.4-9 O_3 Concentrations (ppm) in Rosebud County

AQS Site ID	Sampler ID	2016	2017	2018	2019	2020	2021
300870001	Birney	0.057	0.059	0.059	0.057	0.059	0.066

Source: EPA 2024c

3.4.2.4 Sulfur Dioxide

SO_2 monitoring data were available from three sites in Rosebud County. As presented in Table 3.4-10, SO_2 data collected at the three sites were below the 1-hour NAAQS (75 ppb or 0.075 ppm) 99th percentile concentration and the 1-hour MAAQS (0.50 ppm) average concentration. Data collected in 2016 from the Garfield Peak site show that SO_2 1-hour concentrations exceeded the MAAQS (0.10 ppm) standard in 2016. Overall, the data shows that it is likely that ambient air quality within the vicinity of the SCM is currently in compliance with the SO_2 MAAQS and NAAQS. See Map 3.4-2 for site locations.

Table 3.4-10 SO_2 Concentrations (ppm) in Rosebud County

AQS Site ID	Sampler ID	Statistic	2016	2017	2018	2019	2020	2021	2022	2023
300870760	Morningstar	1-hr 99th	0.008	0.009	0.008	0.004	0.005	0.005	NA	NA
		1-hr Avg	0.002	0.002	0.001	0.001	0.001	0.001	NA	NA
		1-hr Max	0.014	0.015	0.010	0.006	0.007	0.008	NA	NA
300870761	Garfield	1-hr 99th	0.007	0.008	0.011	0.006	0.004	0.003	0.006	0.006
		1-hr Avg	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.002
		1-hr Max	0.106	0.017	0.016	0.009	0.005	0.005	0.015	0.009
300870762	Badger Peak	1-hr 99th	0.006	0.006	0.006	0.005	0.004	0.003	NA	NA
		1-hr Avg	0.002	0.001	0.0003	0.001	0.001	0.001	NA	NA
		1-hr Max	0.011	0.010	0.009	0.011	0.007	0.005	NA	NA

Source: EPA 2024c

3.4.2.5 Mercury, Lead, and Carbon Monoxide

Annual mercury (Hg; a HAP), lead (Pb; a criteria pollutant), and carbon monoxide (CO; an indirect GHG) monitoring values are not collected specifically for the SCM. For a general discussion on mercury emissions, mercury air emissions (stack plus fugitive) for 2016 through 2022 (2023 data are not available) from three coal-fired power plants and one coal mine in Big Horn and Rosebud counties were evaluated (Table 3.4-11).

Similarly, annual lead monitoring values are not collected at the SCM. Table 3.4-12 shows the lead emissions from the three power stations and one coal mine in Big Horn and Rosebud counties for 2016 through 2022 (2023 data are not available). A direct comparison between the monitored values at the power plants/mines and NAAQS and MAAQS is not possible because the monitored values were presented in pounds, rather than the NAAQS and MAAQS units ($\mu g/m^3$).

Table 3.4-11 Annual Mercury Air Emissions (lbs) in Big Horn and Rosebud Counties

AQS Site ID	2016	2017	2018	2019	2020	2021	2022
Colstrip Energy LP Rosebud Power Plant							
Total emissions	1.4	0.9	1.14	1.56	0.61	0.94	1.29
Stack (air) emissions	1.4	0.9	1.14	1.56	0.61	0.94	1.29
Percent Emitted to air	100%	100%	100%	100%	100%	100%	100%
Colstrip Steam Electric Station							
Total emissions	1,316.7	1,433.4	1,034.6	1,053.8	700.8	762.4	807.3
Stack (air) emissions	130.0	140.0	110	110	60	70	80
Percent emitted to air	9.9%	9.8%	10.6%	10.4%	8.6%	9.2%	9.9
Hardin Generating Station							
Total emissions	24.4	18.0	4.1	4.7	1.21	13.2	14.2
Stack (air) emissions	5.7	3.7	0.9	2.2	0.3	0.45	1.5
Percent Emitted to air	23.4%	20.6%	22.0%	46.8%	2.5%	3.4%	10.2%
Decker Coal Company							
Total emissions	0.006	0.006	0.132	0.079	0.064	0.040	0.0015
Stack (air) emissions	0.002	0.002	0.002	0.002	0.002	0.002	0
Percent Emitted to air	33.3%	33.3%	1.7%	2.8%	3.4%	5.4%	0%
Total emissions from Four Sources							
Total emissions	1,342.5	1,452.3	1,040.0	1,060.1	702.7	776.6	822.8
Stack (air) emissions	137.1	144.6	112.0	113.8	60.9	71.4	82.8
Percent Emitted to air	10.2%	10.0%	10.8%	10.7%	8.7%	9.2%	10.1%

Source: EPA 2024d

Table 3.4-12 Annual Lead Air Emissions (lbs) in Big Horn and Rosebud Counties

AQS Site ID	2016	2017	2018	2019	2020	2021	2022
Colstrip Energy LP Rosebud Power Plant							
Total emissions	145.2	518.7	679.4	714	679.5	816.5	866.3
Stack (air) emissions	114.9	67.8	113.3	104.3	97.2	111.6	108.2
Percent Emitted to air	79.1%	13.1%	16.7%	14.6%	14.3%	13.7%	12.5%
Colstrip Steam Electric Station							
Total emissions	97,979.0	91,612.0	83,566	89,757	54,846	63,350.8	65,513.4
Stack (air) emissions	730.0	730.0	690	730	440	530	510.0
Percent emitted to air	0.7%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%
Hardin Generating Station							
Total emissions	1,550.0	1,281.5	516.4	436.9	159.4	2,035.8	1,774.0
Stack (air) emissions	103.0	39.5	50	52.2	25	155.8	172.2
Percent Emitted to air	6.6%	3.1%	9.7%	11.9%	15.7%	7.7%	9.7%
Decker Coal Company							
Total emissions	2.65	3.3	2.71	2.53	2.25	0.8827	0.0029
Stack (air) emissions	0.05	0.05	0.05	0.05	0.05	0.05	0
Percent Emitted to air	1.9%	1.5%	1.8%	2.0%	2.2%	5.6%	0%
Total emissions from Four Sources							
Total emissions	99,676.9	93,415.5	84,764.5	90,910.4	55,687.2	66,204.0	68,153.7
Stack (air) emissions	948.0	837.4	853.4	886.6	562.3	797.5	790.4
Percent Emitted to air	1.0%	0.9%	1.0%	1.0%	1.0%	1.2%	1.2%

Source: EPA 2024d

3.4.2.6 Air Quality Related Values

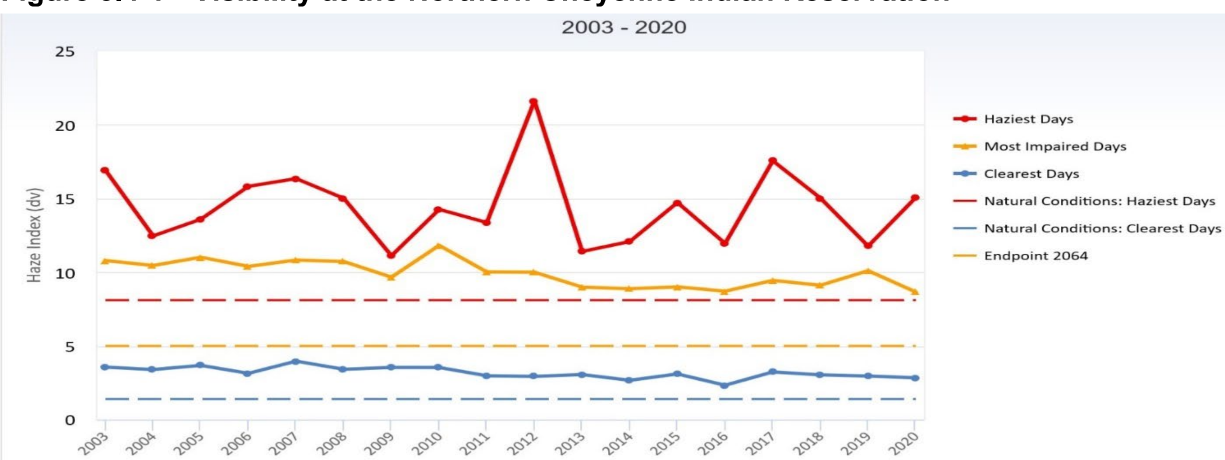
Air Quality Related Values (AQRVs) are environmental standards or benchmarks used to assess and manage air quality in specific locations, particularly in sensitive areas such as national parks, wilderness areas, and PSD Class I areas. These values are defined based on the potential impacts of air pollutants on ecological resources, human health, and visibility. Updated information regarding air quality related values is included below. AQRVs are evaluated by the land management agency responsible for a Class I area, according to the agency's level of acceptable change (LAC). These AQRVs include potential air pollutant effects on visibility and the acidification of lakes and streams. The AQRVs, and the associated LAC, are applied to PSD Class I and sensitive

Class II areas and are the land management agency's policy and are not legally enforceable as a standard. MDEQ MAAQS do include a standard for visibility. Class I areas are afforded specific AQRV protection under the Clean Air Act. The Class I designation allows very little deterioration of air quality. The AQRVs associated with this action include visibility and acidification of lakes. The nearest Class I area is located approximately 19 miles north of the proposed tracts at the Northern Cheyenne Indian Reservation.

3.4.2.6.1 Visibility

In accordance with ARM 17.8.818, the state of Montana does not require mines to evaluate visibility impacts on Class I areas (MDEQ/PCD 2014). Because MDEQ has determined that the SCM is not a major stationary source and because the SCM is not required by MDEQ to monitor visibility, a direct comparison to MAAQS standards is not possible. The current visibility discussions have been inferred from the currently permitted mining activities related to the existing coal leases at the SCM. Visibility can be defined as the distance one can see and the ability to perceive color, contrast, and detail. $PM_{2.5}$ are the main cause of visibility impairment. Visibility impairment is expressed in terms of deciview (dv). A change in visibility of 1.0 dv represents a "just noticeable change" by an average person under most circumstances. Increasing deciview values represent proportionately larger perceived visibility impairment (BLM 2003). Figure 3.4-1 shows annual averages for the haziest, most impaired, and clearest visibility days at the Northern Cheyenne Indian Reservation monitoring site (the nearest PSD Class I area) for 2003 through 2020 (Interagency Monitoring of Protected Environments [IMPROVE] 2024). As indicated on Figure 3.4-1, the long-term trend in visibility at the Northern Cheyenne Indian Reservation appears to be relatively stable.

Figure 3.4-1 Visibility at the Northern Cheyenne Indian Reservation



Source: IMPROVE 2024

3.4.2.6.2 Acidification of Lakes

Acid deposition causes acidification of lakes and streams, which can have direct impacts on aquatic habitats and contribute to the damage of trees at high elevations and many sensitive forest soils. Acid rain is measured as acidity and alkalinity using a pH for which 7.0 is neutral. The lower a substance's pH, the more acidic it is. Normal rain has a pH of about 5.6 (EPA 2024e). The National Atmospheric Deposition Program (NADP) monitors precipitation chemistry at various sites around the U.S. The nearest site to the tract is Site MT00 (see Map 3.4-2), located approximately 40 miles northwest of the SCM. Table 3.4-13 provides the pH for the years 2014 through 2022.

Table 3.4-13 Measured pH in Big Horn County

Parameter	2014	2015	2016	2017	2018	2019	2020	2021	2022
pH	5.4	5.6	5.5	5.5	5.7	N/A	5.6	6.0	5.8

Source: NADP 2024

3.4.3 Baseline Transportation Diesel Emissions

3.4.3.1 Non-Greenhouse Gas Emissions

Transportation diesel emissions associated with coal mined from the SCM are based on the transportation segment (i.e., locomotive, seaport handling, ocean vessel). Coal mined at the SCM is shipped to power plants in Minnesota, Washington, and Arizona and terminals in Superior, Wisconsin and British Columbia, Canada. At the Superior Midwest Energy Terminal in Superior, Wisconsin coal is blended and loaded on vessels for transport to three power plants in the Great Lakes region (NTEC 2021). At the Westshore Terminal in British Columbia, Canada, coal is loaded onto vessels for transport to power plants in the Republic of Korea (ROK) and Japan.

Diesel fuel, when burned in engines, results in emissions of CO, nitrogen oxides (NO_x), PM, SO_2, volatile organic compounds (VOCs), mercury, arsenic (As), and lead. Note that several of the segments do not include mercury, arsenic, or lead emissions since emission factors could not be found. Estimated baseline coal transportation diesel emissions related to the SCM for the maximum production year over the last 8 years (2018) and the minimum production year of the last 8 years (2020) are summarized in Tables 3.4-14 and 3.4-15, respectively. Supporting information, including calculations, are provided in Appendix A of this EIS.

Table 3.4-14 2018 Estimated Transportation Diesel Emissions (tons)

Segment	PM_{10}	$PM_{2.5}$	NO_x	CO	VOC	SO_2	Hg	As	Pb
Rail transport	136	132	5,397	1,180	217	4	NA	NA	NA
Terminal Handling[1,2]									
Westshore	10	3	76	11	4	4	NA	NA	NA
MERC	9	3	63	9	3	3	NA	NA	NA
Vessel Shipment[3]									
Overseas	155	142	651	268	115	1,870	6.0E-06	3.7E-03	1.8E-02
Great Lakes	8	7	32	13	6	92	2.9E-07	1.8E-04	8.8E-04
Total	318	287	6,219	1,481	345	1,973	6.3E-06	3.9E-03	1.9E-02

Table 3.4-15 2020 Estimated Transportation Diesel Emissions (tons)

Segment	PM_{10}	$PM_{2.5}$	NO_x	CO	VOC	SO_2	Hg	As	Pb
Rail transport	95	92	3,758	822	151	3	NA	NA	NA
Terminal Handling[1,2]									
Westshore	7	2	54	8	3	3	NA	NA	NA
MERC	4	1	32	4	1	1	NA	NA	NA
Vessel Shipment[3]									
Overseas	111	102	466	192	82	1,337	4.3E-06	2.6E-03	1.3E-02
Great Lakes	4	4	16	7	3	46	1.5E-07	9.1E-05	4.4E-04
Total	221	201	4,326	1,033	240	1,390	4.5E-06	2.7E-03	1.3E-02

1 Terminal handling and seaport handling based on CO_2e from EnviroChem 2021, calculated using IPCC Fourth Assessment Report GWP values of 1, 25, and 298 for CO_2, CH_4, and N_2O, respectively.

2 Assumes that 32% of the LBA1 Tract coal will be handled at the Westshore Terminal and 24% will be handled at the MERC Terminal.

3 Assumes that 32% of the LBA1 Tract coal will be shipped overseas from the Westshore Terminal and 24% will be shipped over the Great Lakes from the MERC Terminal.

3.4.3.2 Greenhouse Gas Emissions

GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated gases (hydrofluorocarbons, perfluorocarbons, nitrogen trifluoride, and sulfur hexafluoride). For consistency between projects, OSMRE describes GHG emissions in terms of "CO_2-equivalents" (CO_2e). For climate, climate change, and GHG analysis, there is no specific analysis area and project emissions are used as a proxy.

One source of CO_2 emissions is from the combustion of fossil fuels, including coal. CH_4 can be emitted during the production and transport of coal. N_2O is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste. Fluorinated gases are synthetic, powerful GHGs that are emitted from a variety of industrial processes. CO_2 and other GHGs are naturally occurring gases in the atmosphere; their status as a pollutant is not related to their toxicity but instead is due to the added long-term impacts they have on climate because of their increased levels in the earth's atmosphere. Because they are non-toxic and nonhazardous at normal ambient concentrations, CO_2 and other naturally occurring GHGs do not have applicable ambient standards or emission limits under the major environmental regulatory programs. Each GHG has a different lifetime in the atmosphere and a different ability to trap heat in the atmosphere. To allow different gases to be compared and added together, emissions can be converted into CO_2e emissions using the global warming potential (GWP) concept developed by the Intergovernmental Panel on Climate Change (IPCC). The EPA uses a 100-year time horizon in its Inventory of Greenhouse Gas Emissions and Sinks: 1990-2020 (EPA 2022a) and Mandatory Greenhouse Gas Reporting rule. Therefore, project-related emissions are shown based on the 100-year GWP values for comparison to state and national GHG emissions. Additionally, total CO_2e from the project based on a 20-year time horizon is also shown for reference. The GWPs used to calculate CO_2e emissions presented in this section are based on the IPCC's Synthesis Report of the Sixth Assessment Report (AR6; IPCC 2021).

The estimated CO_2e emissions generated work by transporting the coal via rail to final destinations at power plants and loading terminals and from overseas vessel transport for 2018 and 2020 are included in Table 3.4-16. Assumptions and calculations are provided in Appendix A of this EIS.

Table 3.4-16 2018 and 2020 Estimated Transportation CO_2e Emissions (tons)

Source	2018		2020	
	100-yr Time Horizon	20-yr Time Horizon	100-yr Time Horizon	20-yr Time Horizon
Rail transport	454,105	455,973	316,160	317,461
Terminal Handling[1,2]				
Westshore	7,518	7,518	5,375	5,375
MERC	6,272	6,272	3,138	3,138
Vessel Shipment[3]				
Overseas	115,188	115,309	82,355	82,442
Great Lakes	5,663	5,669	2,833	2,836
Total CO_2e Emissions	588,746	590,741	409,861	411,252

1 Terminal handling and seaport handling based on CO_2e from EnviroChem 2021, calculated using IPCC Fourth Assessment Report GWP values of 1, 25, and 298 for CO_2, CH_4, and N_2O, respectively.

2 Assumes that 32% of the LBA1 Tract coal will be handled at the Westshore Terminal and 24% will be handled at the MERC Terminal.

3 Assumes that 32% of the LBA1 Tract coal will be shipped overseas from the Westshore Terminal and 24% will be shipped over the Great Lakes from the MERC Terminal.

3.4.4 Baseline Coal Combustion Emissions

3.4.4.1 Domestic Combustion Emissions

Ambient air quality is influenced by local and upwind emissions including both natural sources (wildfires, biogenic) and anthropogenic sources including stationary point sources, area sources, and mobile sources. The EPA regulates emissions for the six criteria air pollutants. In addition to criteria pollutants, the EPA also regulates HAPs under Section 112 of the CAA, known as the National Emission Standards for Hazardous Air Pollutants (NESHAP). HAPs consist of 187 toxic air pollutants that are known or suspected to cause cancer or other serious health effects. The EPA publishes a comprehensive summary of air emissions data, known as the National Emissions Inventory (NEI). The most recent NEI data that is available is from 2020. Table 3.4-17 provides the 2020 emissions for the six criteria air pollutants and HAPs for each of the U.S counties with power plants that burn coal from the SCM and other sources.

Table 3.4-17 2020 Emissions Summary for Counties that Burn Spring Creek Mine Coal

County, State	CO (tons)	NO_x (tons)	PM_{10} (tons)	$PM_{2.5}$ (tons)	SO_2 (tons)	VOC (tons)	HAPs (lbs)
Lewis County, Washington	3,117	5,296	405	366	1,609	141	25.8
Apache County, Arizona	1,976	2,634	547	547	60	49	11.1
Itasca County, Minnesota	1,505	2,039	429	227	491	9.2	31.5
Otter Tail County, Minnesota	35	316	112	69	749	3.8	1.5
Bay County, Michigan	285	663	421	414	629	33	6.4
St. Clair County, Michigan	714	7,535	48	28	21,756	121	44.9

Source: EPA 2024f

In general, anthropogenic sources may be categorized as stationary sources or mobile sources. Stationary sources, which include both stack or vent sources and fugitive sources, may be further classified as major or minor sources based on whether they emit a regulated air pollutant above the CAA threshold. Generally, a major stationary source is defined as one that emits or has the potential to emit any air pollutant at more than 100 tpy (CAA § 302(j), 42 U.S.C. § 7602(j)). Sources that do not emit any regulated pollutant in quantities above the CAA threshold may be classified as minor or area sources.

Major stationary sources are also required by the CAA to obtain Title V operating permits. The Title V permits require the power plants to comply with the CAA including sections of the NSPS, Maximum Available Control Technology (MACT), PSD, and NESHAPs among others, resulting in additional requirements including opacity limits, pollution controls, monitoring, recordkeeping, testing, and reporting.

- The TransAlta Centralia Generation, located in Lewis County, Washington, operates under Title V Permit No. SW98-8-R5. The facility consists of two 670 net megawatt (MW) units (Unit #1 and Unit #2). In 2020, Unit #1 was retired (TransAlta 2024). Unit 2 is set to retire at the end of 2025. TransAlta Centralia Generation is equipped with pollution control technology that meets or exceeds the level of emission reductions required under the Southwest Clean Air Agency and EPA regulations (SWCAA 2021).
- The Coronado Generating Station, located in Apache County, Arizona operates under Title V Permit No. 64169. The facility capacity is 762 MW, from one 382 MW unit and one 380 MW unit (SRP 2024). The Coronado Generating Station is equipped with pollution control technology that meets or exceeds the level of emission reductions required under the Arizona Department of Environmental Quality (ADEQ) and EPA regulations (ADEQ 2016).
- The Boswell Energy Center, located in Itasca County, Minnesota, operates under Title V Permit No. 06100004. The facility is composed of two sub-bituminous coal-fired electric utility steam generation units (Units 3 and 4) for a combined capacity of 940 MW (Minnesota

Power 2024). The Boswell Energy Center is equipped with pollution control technology that meets or exceeds the level of emission reductions required under the Minnesota Pollution Control Agency (MPCA) and EPA regulations (MPCA 2022).

- The Hoot Lake Plant, located in Otter Tail County, Minnesota, operated under Title V Permit No. 11100002-005. The facility stopped receiving coal in 2019 and was retired on May 27, 2021 (Otter Tail Power Company 2024).
- The D.E. Karn Generating Plant, located in Bay County, Michigan, operated under Title V Permit No. MI-ROP-B2840-2014c. The facility was composed of two units (Units 1 and 2) for a combined capacity of 544 MW and was retired in June 2023 (Consumers Energy 2024).
- The St. Clair/Belle River Power Plant, located in St. Clair County, Michigan, operates under Title V Permit No. MI-ROP-B2796-2024 (EGLE 2024a). The St. Clair facility capacity was 1,400 MW from six units which have all been retired. The Belle River Power Plant is located across the river from the St. Clair Power Plant. The Belle River facility capacity is 1,260 MW from two units, which are scheduled to be retired by 2028. The Belle River facility is equipped with pollution control technology that meets or exceeds the level of emission reductions required under the EGLE and EPA regulations.

Power plants submit annual emission data to the state environmental agencies. Table 3.4-18 provides the annual air emissions from the power plants that burn coal mined from the SCM and other sources.

Table 3.4-18 Annual Power Plant Air Emissions (tons) Summary

TransAlta Centralia Generation (Lewis County, Washington)

Year	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC
2016	3,313	8,129	595	518	2,276	533
2017	870	5,939	347	281	1,502	12
2018	1,392	6,232	423	201	1,707	11
2019	2,101	5,019	299	254	1,438	29
2020	3,117	5,296	405	366	1,609	141
2021	2,449	3,160	208	177	788	85

Coronado Generating Station (Apache County, Arizona)

Year	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC
2016	3,387	5,090	421	421	589	91
2017	3,519	4,156	695	695	222	71
2018	1,869	3,474	655	655	137	68
2019	481	1,835	405	405	87	39
2020	1,975	2,634	260	260	60	49
2021	1,854	3,450	598	593	155	62

Boswell Energy Center (Itasca County, Minnesota)

Year	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC
2016	3,703	4,314	1,438	951	3,644	68
2017	3,297	4,083	944	709	3,139	65
2018	3,477	4,133	548	319	3,192	64
2019	2,360	2,354	421	229	577	9
2020	1,505	2,039	429	227	491	9
2021	2,400	2,430	446	255	551	12

Hoot Lake Plant (Otter Tail County, Minnesota)

Year	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC
2016	63	332	131	76	941	4
2017	67	380	132	85	941	5
2018	NA	NA	NA	NA	NA	NA
2019	NA	NA	NA	NA	NA	NA
2020	NA	NA	NA	NA	NA	NA
2021	NA	NA	NA	NA	NA	NA

D.E. Karn Generating Plant (Bay County, Michigan)*

Year	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC
2016	464	1,229	90/9.7	31/9	2,229	6
2017	468	789	34/11	8.4/10	845	6
2018	410	733	30/6.0	8.8/5.6	761	3
2019	314	614	16/439	6.2/434	569	3
2020	286	663	14/417	5.8/411	629	3
2021	551	1,206	27/721	11/713	1,078	8

St. Clair/Belle River Power Plant (St. Clair County, Michigan)*

Year	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC
2016	1,668	13,294	16/38	4/37	37,165	32
2017	1,656	13,186	44/15	11/15	36,919	7
2018	1,946	14,469	55/24	13/23	41,384	10
2019	2,752	10,212	60/82	15/82	30,752	9
2020	714	7,536	29/7	6/7	21,757	15
2021	1,177	12,238	-/108	6/26	35,494	8

Sources: Department of Ecology, State of Washington 2024; ADEQ 2022, 2024; MPCA 2024; EGLE 2024b
* Michigan power plant PM_{10} and $PM_{2.5}$ data are reported as filterable/primary.

The 2020 NEI provides an inventory of HAPs for each of the power plants that burn SCM coal. Table 3.4-19 provides the total HAPs for each power plant, which includes lead and mercury. All the power plants are classified as major sources for HAPs and subject to the MATS. The MATS set MACT standards. The MACT standards set under the toxics program are federal air pollution limits that individual facilities must meet by a set date. The EPA requires power plants to report GHG emissions on an annual basis. Table 3.4-20 provides the carbon dioxide equivalent (CO_2e) emissions for each power plant for years 2018 to 2022.

Table 3.4-19 2020 Power Plant Hazardous Air Pollutants Emissions (tons)

Power Plant	HAPs	Pb	Hg
TransAlta Centralia Generation	25.8	0.011	0.027
Coronado Generating Station	11.1	0.013	0.010
Boswell Energy Center	31.8	0.350	0.003
Hoot Lake Plant	1.5	0.006	0.001
D.E. Karn Generating Plant	6.4	0.005	0.007
Belle River/St. Clair Power Plant	44.9	0.029	0.021

Source: EPA 2024f

Table 3.4-20 Annual Power Plant CO_2e Emissions (tons)

Power Plant	2018	2019	2020	2021	2022
TransAlta Centralia Generation	6,096,503	7,999,849	5,843,328	3,482,246	3,951,409
Coronado Generating Station	4,191,820	2,557,341	3,164,633	3,941,898	3,541,448
Boswell Energy Center	7,812,909	5,078,529	4,582,680	5,302,287	5,343,621
Hoot Lake Plant	618,122	364,128	238,890	147,370	NA
D.E. Karn Generating Plant	2,655,627	1,978,243	1,869,285	3,249,240	3,136,922
Belle River Power Plant	7,647,725	5,532,781	4,329,616	7,216,713	6,730,048
St. Clair Power Plant	4,699,563	4,172,511	1,881,002	3,510,422	1,677,363

Source: EPA 2024g

Note: Total Facility Emissions in metric tons CO_2 equivalent (mt CO_2e) (AR4 GWPs, excluding Biogenic CO_2).

3.4.4.2 Overseas Combustion Emissions

As discussed in Section 2.2.1 of this EIS, a portion of the coal mined at the SCM is sold to power generators in the ROK and Japan. These countries therefore comprise the affected environment for analysis of overseas combustion effects on air quality. Both countries maintain a structure of regulations designed to maintain or improve air quality by limiting pollutant emissions from industrial and other emitting sources.

3.4.4.2.1 Republic of Korea

The ROK's Framework Act on Environmental Policy (ROK 2024a) describes fundamental environmental policy goals for preventing pollution and managing natural resources for sustainable use. Air quality is managed under the Clean Air Conservation Act (ROK 2024b). This act establishes examination and assessment of air pollutants, control on emissions of climate/ecosystem-changing substances, formulation of comprehensive plans to improve the atmospheric environment and permissible emission levels.

3.4.4.2.2 Japan

Japan's Air Pollution Control Act directs the control and monitoring of air pollution under the direction of the Japan Ministry of the Environment (JMOE). JMOE established the Air Pollution Control Act (JMOE 2024). JMOE established national standards limiting air pollutant emissions from stationary sources, and prefectural governors can set more stringent emissions standards within their jurisdiction as needed. Emission standards include maximum permissible limits for each type and size of facility; special standards which are stricter for areas where air pollution has or is likely to exceed the limits; more stringent prefectural emission standard in areas where national emission standards might be insufficient to protect human health or living conditions; and standards for controlling total emissions that prescribe maximum limits for specific large-scale factories (UNEP n.d.).

Appendix A of this EIS provides estimated emissions of criteria pollutants and heavy metals HAPs (i.e., lead, mercury, and arsenic), generated from combusting 1.0 Mt of coal at utility-scale power plants in the ROK and Japan. Because specific power plants are not known, the range of estimates generated reflects the varying types of boilers and effectiveness of pollution control technologies that may be implemented at power plants in both countries. A low emission range assumes that a relatively effective pollution control technology is in place, while a high emission range assumes a relatively ineffective pollution control technology is in place. Estimated ranges of baseline pollutant emissions from combusting 3.0 Mt of coal in 2020 are presented in Table 3.4-21.

Table 3.4-21 2020 Estimated Range of Overseas Combustion Emissions (tons)

Emission Range	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	Pb	Hg	As
Low	377	161	3,691	4,533	190	27	0.152	0.056	0.134
High	102	95	944	907	15	2	0.008	0.009	0.007

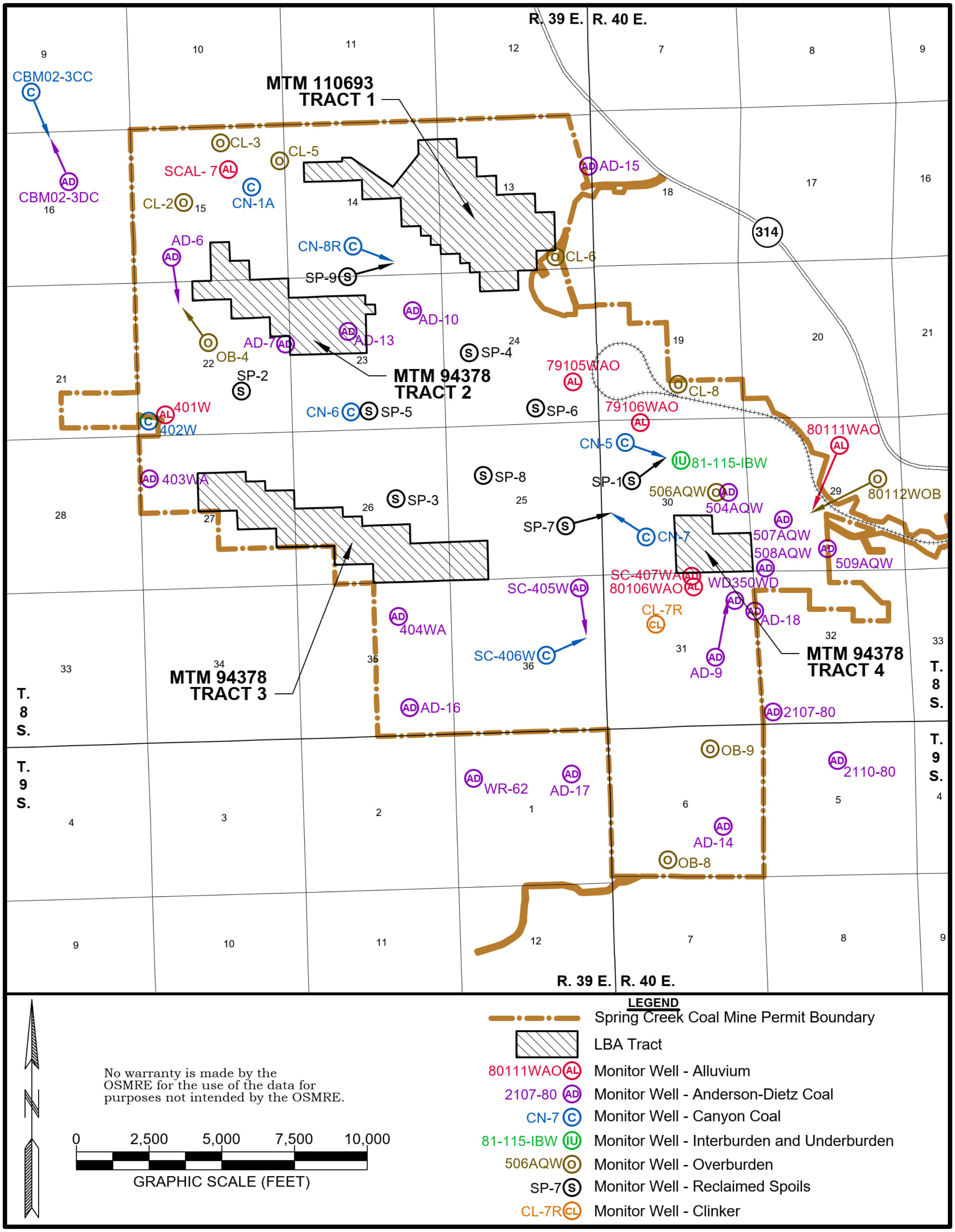
3.4.5 Coal Dust Emissions

Coal dust, a form of particulate matter, originates from loaded coal trains during transit. Currently, there are no federal or state guidelines or standards for ambient dust deposition. BNSF enforces the Safe Harbor provision in the BNSF Coal Loading Rule (BNSF 2015) to limit deposition which has been in effect since October 1, 2011. Coal dust emissions, dispersion, and deposition have been studied in several recent NEPA analyses. The results of the reviews indicate that the majority of coal dust from rail cars is generated from the top surface of the loaded rail cars. The amount of dust emitted is dependent on the type and composition of coal, moisture content, ambient wind speed and direction, precipitation, use of topper agents, size of the rail car top opening, the shape of the coal surface, the position of the rail car, time and distance traveled, and train speed.

3.5 Hydrology

3.5.1 Groundwater

Groundwater recharge occurs typically to the west of the SCM in outcrops in the Wolf Mountains. Groundwater typically flows to the east and discharges to the Tongue River Reservoir east of the SCM. Groundwater occurs in various aquifers within the SCM including the alluvium, overburden/clinker, A/D coal, interburden/underburden, underlying Canyon coal, and spoils. The current groundwater monitoring at the SCM includes 50 wells, comprising six alluvium wells, 11 overburden/clinker wells, one interburden/underburden well, 23 coal wells, and nine backfill/spoil wells. Current groundwater monitor well locations are indicated on Map 3.5-1. Monitor wells are identified by well number and completion aquifer.



Map 3.5-1 Active Groundwater Monitor Well Network at Spring Creek Mine

According to groundwater quality monitoring results included in the SCM 2023 Annual Hydrology Report submitted to MDEQ, groundwater quality analyzed during the October 1, 2022, through September 30, 2023, reporting period were within historic ranges, with few water quality trends (NTEC 2023b). The following summarizes the 2023 Annual Hydrology Report water quality.

Measured total dissolved solids (TDS) in coal aquifers varies, with a mean of about 2,044 milligrams per liter (mg/L) in the A/D coal and a maximum of 7,800 mg/L. The Canyon Coal aquifer contains lower TDS with a mean of 965 mg/L and a maximum of 1,290 mg/L. Spoils, which have replaced the mined A/D coal and have become re-saturated, have variable TDS concentrations with a mean of 5,230 mg/L and a maximum of 9,000 mg/L. The 2020 Cumulative Hydrologic Impact Assessment for the TR1 Tract states that initial recovery of groundwater in the SCM will be relatively rapid with flow towards the depleted areas (MDEQ 2020b). As groundwater levels approach equilibrium, natural flow patterns will begin to reestablish. Resaturation at the SCM will come almost entirely from local groundwater flow and most areas will not receive additional recharge from the Tongue River Reservoir. Until water levels have recovered fully, groundwater gradients will produce flow toward the spoil areas, and little or no spoil groundwater will leave the permit area. As long as the flow is exclusively inward, salinity will be higher than baseline, as dissolved constituents are unable to exit.

The quality of groundwater from the A/D coal seam is generally suitable for domestic and livestock purposes; however, due to the high sodium adsorption ratio (average 21.1), only crops with high salt tolerance can be irrigated with water directly from the A/D coal seam (Ayers and Westcot 1976).

Historic mining at the SCM has interrupted the flow of groundwater in the A/D coal due to mining activities and pit dewatering. In some portions of the SCM, spoils have already been used to backfill the excavation and a new spoils aquifer is beginning to form where the mined A/D coal aquifer was previously. Groundwater extracted from the mined A/D coal is typically collected and used for dust control or other process water.

Water quality is highly variable depending on the source aquifer. The dominant ionic constituents within the coal waters are sodium and bicarbonate. As the groundwater moves downward through the overburden and into the coalbed aquifers, the water becomes less mineralized, which is due mainly to cation exchange (softening and sulfate reduction) mechanisms.

Based on premining potentiometric maps (Van Voast and Hedges 1975), the flow direction of the pre-mine groundwater system was from recharge zones in highlands east and west of the mine toward the hydrologic discharge boundary formed by the Tongue River. Current groundwater flow is to the southeast in both the reclaimed spoil and A/D coal aquifers.

There are three public water supplies (PWS) in the vicinity of the LBA1 tracts including SCM (PWS ID MT0003952), Tongue River Campers Point (PWS ID MT0043957), and Tongue River Pee Wee Point (PWS ID MT0043594). The SCM water system is a non-transient system and serves 200 people. The system is served by one active well (Well 2 GWIC 258992) which is completed at a depth of 495 feet. The Tongue River Campers Point is a transient system and serves 300 people. The system is served by one active well (Well 3 GWIC 228388) which is completed at a depth of 286 feet. The Tongue River Pee Wee Point is a transient system and serves 300 people. The system is served by one active well (Well 3 GWIC 165080) which is completed at a depth of 127 feet. All the water wells adhere to the sample and compliance schedules and results are reported on the Safe Drinking Water Information System (SDWIS) that can be accessed online (MDEQ 2024a). Water monitoring results show that the MT0003952 system most recently had violations for coliform (in 2013) and nitrate/nitrite (in 2023). In both cases, compliance was achieved. For the MT0043957 system, the most recent violations were reported in 2016 and 2018 for nitrate/nitrite and in 2014 and 2015 for coliform. In all cases, the compliance was achieved. The MT0043594 system reported violations for nitrate/nitrite most recently in 2016 and 2018 and E. coli in 2017. In all cases, compliance was achieved.

3.5.2 Surface Water

The LBA1 tracts are located within the Spring Creek drainage basin, an ephemeral tributary of the Tongue River watershed. The main surface water features within and adjacent to the LBA1 areas are depicted on Map 3.5-2 and include the Tongue River Reservoir, North Fork Spring Creek, South Fork Spring, and Spring Creek. The hydrologic function of the ephemeral stream channels within the SCM area is primarily to convey runoff and transport sediment loads based on the magnitude of the runoff event. The duration and frequency of surface flow events are typically not sufficient to build and maintain fluvial depositional features and maintain dominant bankfull channel characteristics.

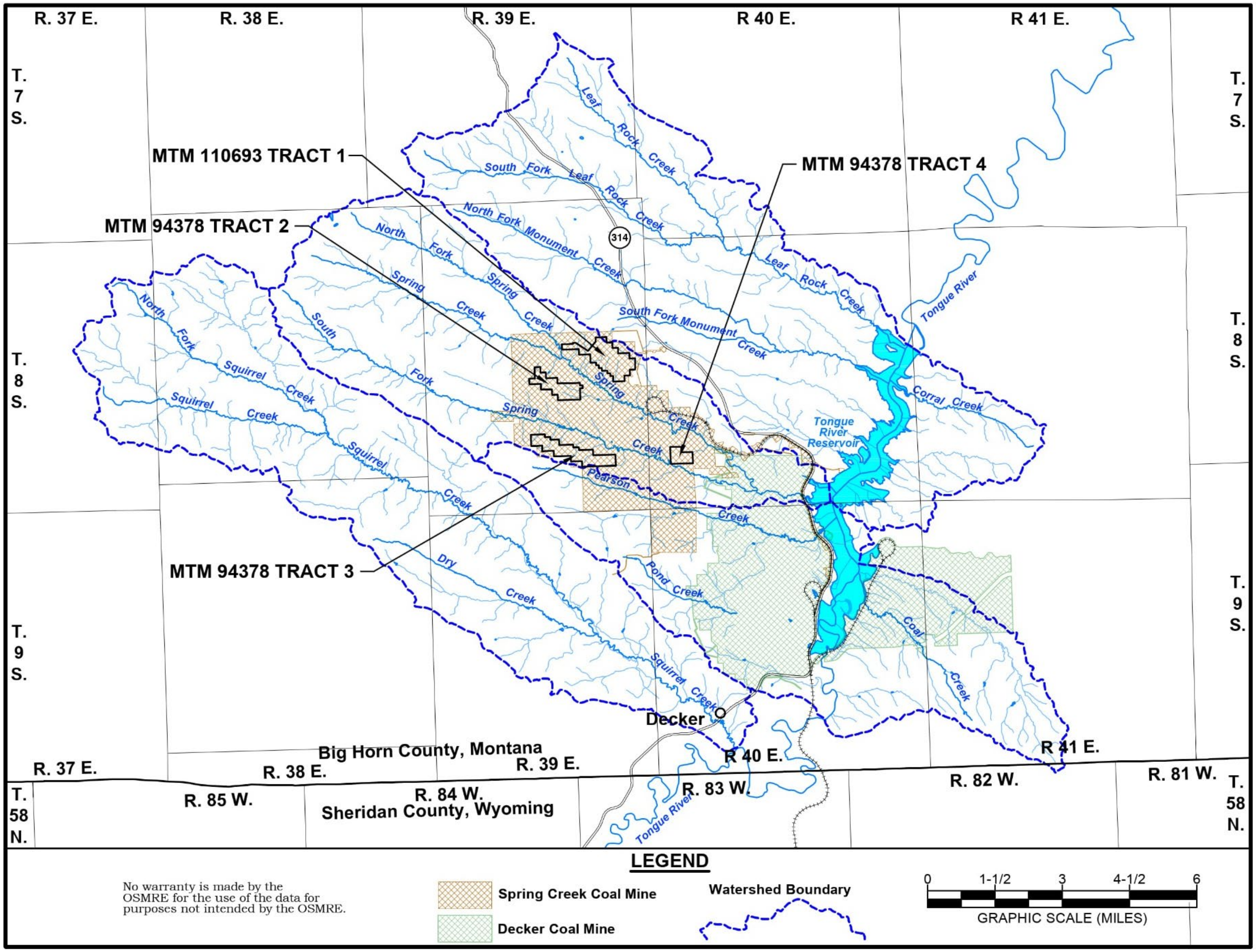
The tracts are located primarily within the Pearson Creek and Spring Creek watersheds. A very small portion of Tract 1 is within the Monument Creek watershed. Monument Creek, Pearson Creek, and Spring Creek are ephemeral tributaries of the Tongue River watershed and only flow in direct response to rainfall or snowmelt runoff events. Snowmelt runoff events can last for several days or more but rarely have large peak flows. Most of the peak annual flow events occur during the late spring and summer as a result of thunderstorms.

The flows of Spring Creek and its north and south forks are currently detained in flood control reservoirs located upstream from the mining operation to keep the runoff out of the SCM pits. Pearson Creek flow is currently detained by the mine. In addition, downstream flows on Pearson Creek have been substantially altered by a constructed diversion and impoundment associated with the West Pit of the nearby Decker Mine. These flood controls have been in place for many years, effectively cutting off Spring Creek and Pearson Creek flows upstream of the Tongue River during mining.

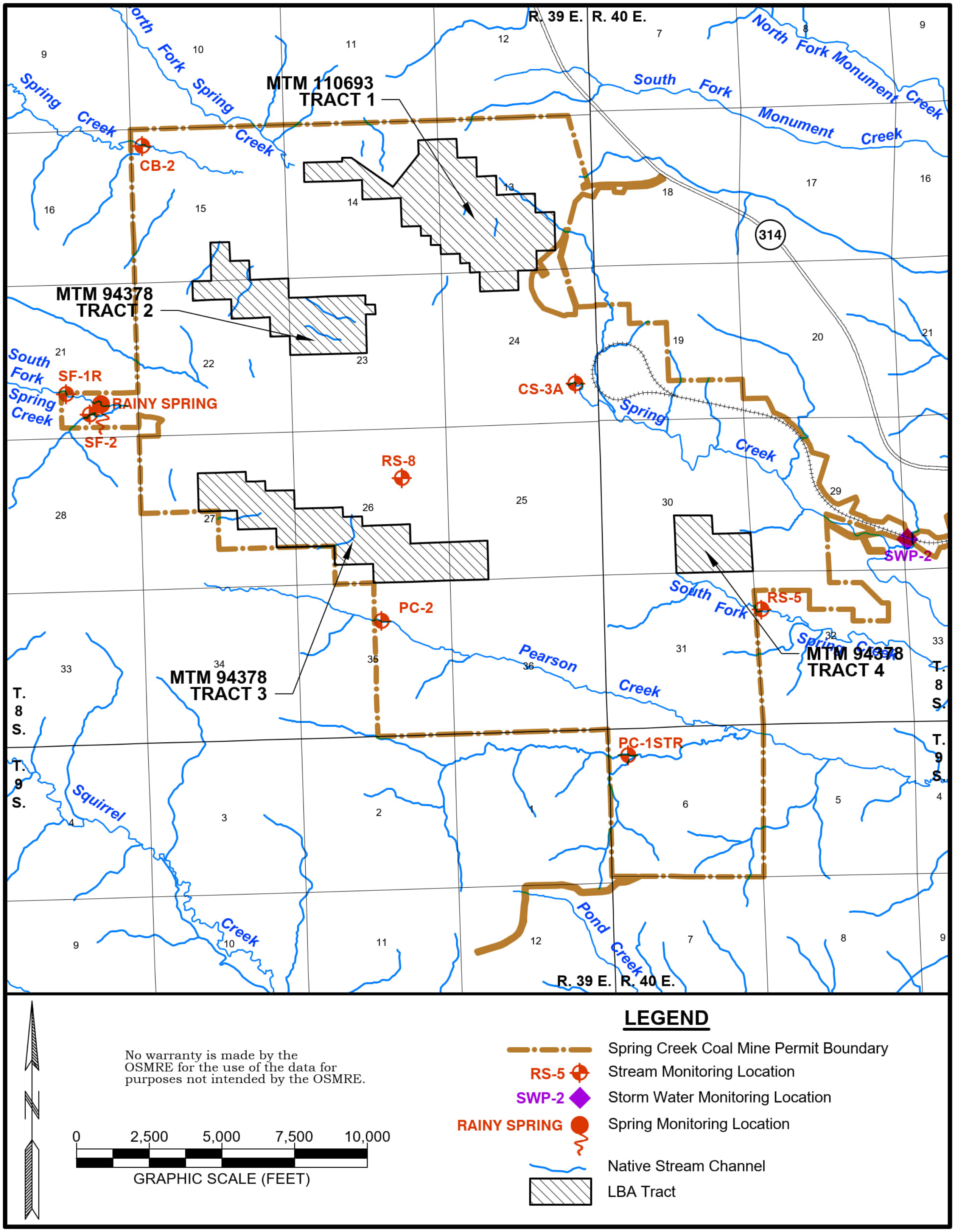
The surface-water quality varies with stream flow rate, the higher the flow rate, the lower the TDS concentration but the higher the suspended solids concentration. Due to the flow fluctuations in South Fork of Spring Creek and Pearson Creek, the surface water quality is usually unsuitable for domestic use but suitable for irrigation and livestock use (Ayers and Westcot 1976). There is one spring, Rainy Spring, locate within the permit boundary. Samples have generally not been collected at the spring due to either dry conditions or inundation from South Fork Spring Creek Flood Control Reservoir.

Streamflow and surface-water quality associated with the SCM are currently being monitored at eight monitoring sites (Map 3.5-3) on Spring Creek, South Fork Spring Creek, South Fork Pearson Creek, and Pearson Creek. The most recent stream monitoring results are provided in the SCM 2023 Annual Hydrology Report and summarized below.

Flow was measured at all the sites during the 2023 water year (October 1, 2022, through September 30, 2023). Auto samplers collected samples at five of the sites and were analyzed for total suspended solids (TSS). Grab samples were collected at one site on Spring Creek (SF-1R), one site on South Fork Spring Creek (site RS-8), and one site on Pearson Creek (PC-2) (NTEC 2023b).



Map 3.5-2 Watershed and Surface Drainages Associated with the Spring Creek Mine



Map 3.5-3 Active Surface Water Monitoring Network at Spring Creek Mine

3.5.3 Water Rights

The Montana Department of Natural Resource Conservation (DNRC) oversees surface water and groundwater rights in Montana. Currently, mining companies hold most of the water rights in the vicinity of the project area. Records of the Montana DNRC (2024) were searched for surface water and groundwater rights within a 2-mile radius of each tract to update water-rights information.

Montana DNRC records indicate that as of January 2024, there were 118 surface water rights within the 2-mile search area, of which 72 were owned by NTEC and were related to industrial uses. Of the remaining permitted surface water rights, 31 were permitted for livestock, 5 were permitted for irrigation, 5 were permitted for wildlife/fishery, 4 were permitted for pollution abatement, and 1 was permitted for multiple domestic use.

Montana DNRC records indicate that, as of January 2024, there were 170 permitted water wells within two miles of the tracts, of which 82 are owned by NTEC. The remaining non-coal mine related are permitted for the following uses: livestock (55 wells), domestic (19 wells), lawn and garden (four wells), commercial (four wells), irrigation (three wells), fishery (two wells), and recreation (one well).

3.6 Alluvial Valley Floors

The provisions of SMCRA (30 U.S.C. §1265(b)(10)(F)) include a specific prohibition on mining certain alluvial valley floors (AVFs), stringent reclamation standards for those AVFs not prohibited from mining, and requirements that mining operations not materially damage the hydrologic function of any AVFs that would otherwise be prohibited from mining. Two possible AVFs, Spring Creek and South Fork Spring Creek, were investigated in 1980 to determine their AVF status (Volume 1, Section 17.24.325, Spring Creek Coal Company 2001). Spring Creek was found not to be an AVF and South Fork Spring Creek was found to be an AVF that is insignificant to agriculture. Approximately 90 acres of AVF were delineated on South Fork Spring Creek. Hydrologic investigations of valley fill deposits of Spring Creek since 1979 and on North Fork Spring Creek since 1993 within the Pit 4 area were conducted by the SCM to assess whether these ephemeral streams meet the definitions of an AVF (Volume 1, Section 17.24.325, SCCC 2001). Based on the results of these investigations, the previously unsurveyed portions of Spring Creek and North Fork Spring Creek were found not to be AVFs. There are no unconsolidated stream laid deposits holding streams where water availability is sufficient for subirrigation or flood irrigation agricultural activities within the LBA tracts therefore no AVFs have been delineated within the tracts.

3.7 Wetlands

No potential jurisdictional wetlands were identified during field surveys of the LBA1 tracts. Stock ponds and water impoundments with wetland soils, plants, and hydrology are present, but they are not considered jurisdictional because they either lack a continuous ordinary high-water mark or do not have a continuous nexus to other waters of the U.S.

3.8 Soils

Soils in the LBA1 tracts areas have not been designated as “unique” farmland and have not been specified as land of “statewide importance.”

Like the overburden, the topsoil is removed and replaced during mining and reclamation. The postmining topsoil is a composite of premining soils. However, there are important differences between premining and postmining soils. Premining soils occur in mappable units, or soil series, which are distinguishable by their physical and chemical characteristics, depths, locations in the landscape, and other factors. Before mining, the operator is required to map the soils, test them for physical and chemical suitability to support plant growth, and provide a plan for their salvage and replacement. Soil material determined to be unsuitable due to physical or chemical limitations is not salvaged or replaced.

3.9 Vegetation

Mapping indicated that there are 14 vegetation communities with the LBA1 tracts, all of which are representative of the Montana Mixed Prairie Association. Sites with sparse vegetative cover and impeded soil drainages exist within the tracts; thus, erosional problems do occur. Saline-alkali soils in the area can limit forage productivity and restrict vegetation to saline-tolerant species. These factors and others related to post-grazing use attribute to overall livestock carrying capacities of between 6 to10 acres per animal unit month, depending on the site. No crop lands are present within the LBA1 tracts.

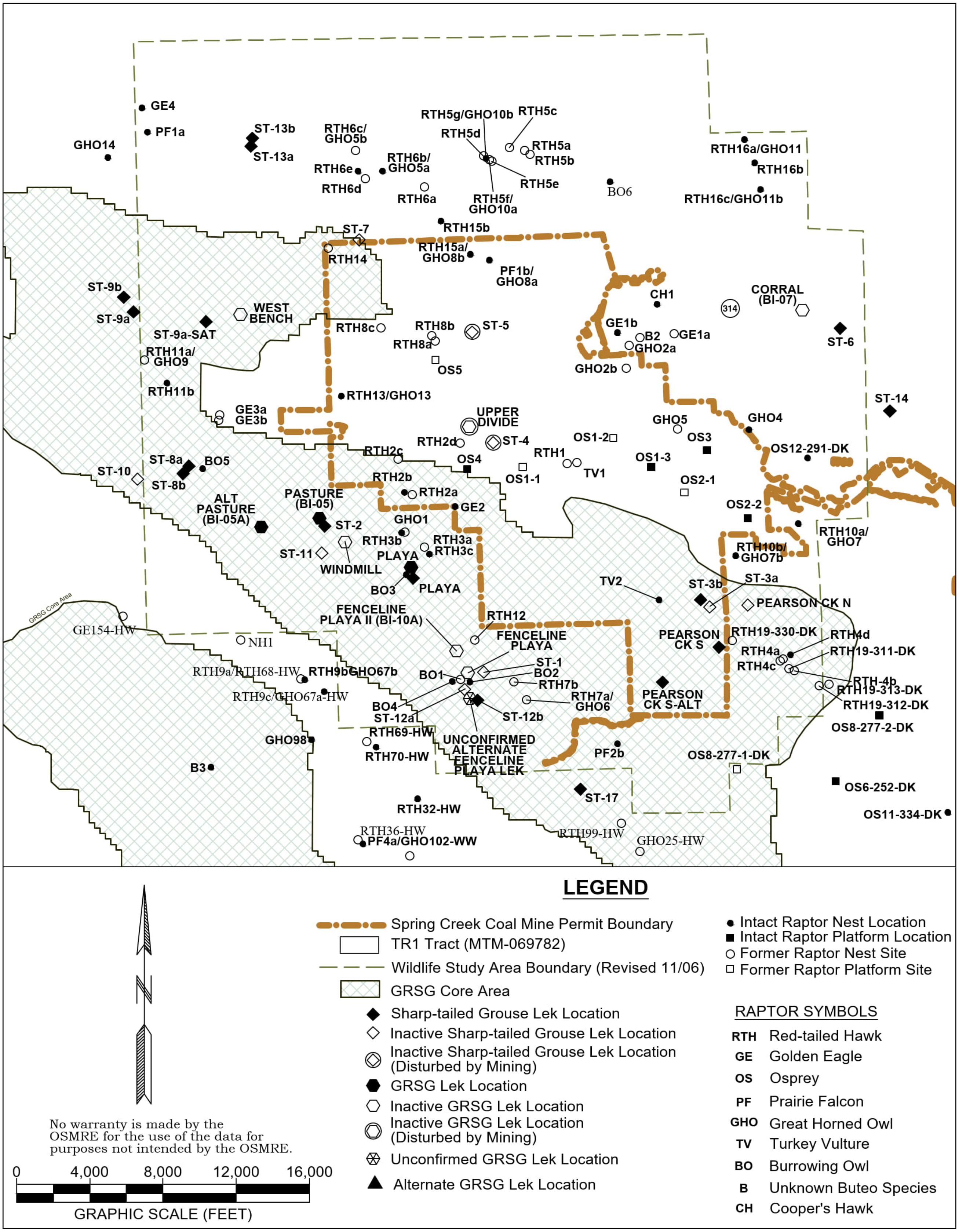
Wildfires in Montana are common and typically occur between late June and lasts around 13 weeks. Between November 2023 and November 2024 there were 544 Visible Infrared Imaging Radiometer Suite (VIIRS) fire alerts which is normal compared to previous years going back to 2012 (Global Forest Watch 2024). In Big Horn County there were 95 VIIRS fire alerts between November 2023 and November 2024, which was unusually high compared to previous years going back to 2012. In 2024 there were four wildfires near the SCM including the Barber Draw fire (6,739 acres burned), Deadman fire (47,827 acres burned), Four Mile fire (2,082) and Badger fire (8,028 acres burned). None of the wildfires impacted operations at the SCM.

Surveys for threatened and endangered (T&E) plant species were performed for the SCM area. No T&E plant species (including Ute Ladies' Tresses) were present within the LBA1 tracts.

The Montana Natural Heritage Program (MTNHP) provides information on the Species of Concern occurring in vicinity of the SCM. Species of Concern includes plants that are rare, threatened, and/or have declining populations. The 2022 Plant Species of Concern list includes 5 species occurring and 13 species with the potential of occurring within and in the vicinity of the SCM (MTNHP 2024). Two species of concern have been documented within the SCM permit boundary during surveys: Barr's milkvetch (*Astragalus barrii*) and woolly twinpod (*Physaria didymocarpa var. lanata*). Barr's milkvetch has an S3 State rank (potentially at risk because of limited range, population and/or habitat) and woolly twinpod has a S2S3 State rank (at risk because of very limited and/or potentially declining population numbers, range, and/or habitat).

3.10 Wildlife

The initial wildlife baseline inventory for the SCM was conducted in 1974, with additional baseline inventories conducted periodically since that time to accommodate permit expansion. Annual monitoring was initiated in 1978 and continues at present. Information is derived from the baseline data, subsequent studies, which have been conducted in accordance with the SCM's Wildlife Monitoring Plan (SCM 2017), and the MDEQ Annual Reports. No substantial changes to wildlife use areas for other mammals, upland game birds (excluding the GRSG), other birds, reptiles and amphibians, and aquatic species populations have been noted since 2006. Annual reports are submitted to MDEQ, which discuss species occurrences, potential mine-related impacts to those species, agency coordination, and specific measures taken to avoid, minimize, or compensate for mine-related impacts within that year. The wildlife monitoring analysis area for evaluating impacts on wildlife is the SCM permit area plus an approximate 2-mile buffer (Map 3.10-1) in accordance with MDEQ's *Fish and Wildlife Guidelines for the Montana Strip and Underground Mine Reclamation Act* (as revised July 1994, updated March 2021).



Map 3.10-1 2022 Spring Creek Mine Wildlife Monitoring

3.10.1 Greater Sage-grouse

The MSGHCP, as implemented under Montana EOs 12-2015 and 21-2015, typically manages land uses and activities that may affect key GRSG habitat within Montana. However, activities associated with the LBA1 tracts would not be managed according to the MSGHCP because the tracts are entirely within the SCM's currently approved SMP C1979012 permit boundary and are exempt because, as explained in EO 12-2015, the permit was received and deemed complete in 2013 before the EO effective date.

In lieu of the management requirements specified in the MSGHCP, NTEC has developed and implemented a detailed HRRP for the management of GRSG at the mine and is voluntarily participating in the TBGPEA to offset potential impacts to GRSG due to mine-related activities. The SCM also voluntarily participates in the USFWS Candidate Conservation Agreement with Assurances (CCAA) program to help minimize impacts to GRSG in the area.

Based on the Montana Fish, Wildlife and Parks (MFWP) current classification system for grouse leks , the wildlife monitoring area includes two Confirmed Active lek sites, six Confirmed Inactive leks, and one Confirmed Extirpated (mined through) lek (Map 3.10-1). However, no GRSG have been recorded at either of the two Confirmed Active leks in the last 6 to 7 years, depending on the site.

As discussed in the 2022 Wildlife Annual Monitoring Report, peak GRSG counts for leks within the wildlife monitoring area have been below the current long-term average of 3.4 males/lek/year during 34 of the last 43 years in which separate records are available (Great Plains Wildlife Consulting, Inc. 2023). Average peak male counts exceeded five birds per lek in only 8 of the 43 years with separate counts; an average of more than 10 males per lek was recorded in only 4 years. The last years for those exceedances were 1989 and 1980, respectively. The highest average peak male count recorded in any given year was 27 males per lek in 1978 and the highest male count at an individual lek was 37 in 1978.

No GRSG broods have ever been observed during annual targeted surveys along drainage routes and no broods have been observed from 2000 to 2022 (Great Plains Wildlife Consulting, Inc. 2023). No GRSG or their sign were encountered during at least 159 individual winter surveys conducted for wintering sage-grouse or other wintering species (e.g., big game, bald eagles) over the last 28 years (1995-2022) (Great Plains Wildlife Consulting, Inc. 2023).

3.10.2 Raptors

Map 3.10-1 shows the locations of historical and active raptor nests within the wildlife monitoring area, as of 2022. The nearest known human activity to the active nests observed during the 2022 breeding season (March 1 to July 31) is also shown on Map 3.10-1.

As discussed in the SCM 2022 Wildlife Annual Monitoring Report, a total of 77 known raptor nest sites had been identified within the annual monitoring area through 2022 (Great Plains Wildlife Consulting, Inc. 2023). Thirty-two nesting sites were intact through that breeding season, with one additional site temporarily barricaded from use during proximate mining operations. Ten of the 32 intact nests were in the SCM permit area and the rest were in the surrounding perimeter. The 32 intact nests included: nine red-tailed hawk (*Buteo jamaicensis*) nests, five osprey (*Pandion haliaetus*) nesting platforms, five burrowing owl (*Athene cunicularia*) nest sites, five red-tailed hawk/great horned owl (*Bubo virginianus*) nests, three golden eagle (*Aquila chrysaetos*) nests, two prairie falcon (*Falco mexicanus*) eyries, one Cooper's hawk (*Accipiter cooperii*) nest, one great horned owl nest, one turkey vulture (*Cathartes aura*) nest site (barricaded), and one prairie falcon/great horned owl nest.

3.10.3 Threatened and Endangered Species

No USFWS federally listed T&E species are known to occur in the project area (USFWS 2024). The USFWS has not designated critical habitat for any T&E species in the vicinity of the project area currently. No current federally listed vertebrate species or other species associated with the ESA listing process were observed within the combined monitoring area during 2022 (Great Plains Wildlife Consulting, Inc. 2023).

3.10.4 Other Species of Special Interest

For the purposes of this discussion, other species of special interest (SOSI) include USFWS Birds of Conservation Concern (BCC), BLM Sensitive Species, and MTNHP and MFWP Species of Concern. The MTNHP Environmental Summary Report was reviewed and compared to annual plant and wildlife monitoring data for the mine to obtain a comprehensive list of SOSI within the wildlife monitoring area (MTNHP 2024). The USFWS list of BCC identifies the migratory and non-migratory bird species (beyond those already designated as federally threatened or endangered) that represent the USFWS' highest conservation priorities (USFWS 2024). MTNHP Species of Concern are native taxa considered to be at-risk due to declining population trends, threats to their habitats, restricted distribution, and/or other factors. Each species is ranked based on various risk factors, with ranks ranging from 1 (highest risk, greatest concern) to 5 (demonstrably secure). According to the MTNHP there are a total of 26 species of concern present in the wildlife monitoring analysis area as listed in Table 3.10-1, this includes eight mammals, 11 bird species, one amphibian species, five reptiles, and one fish species.

Table 3.10-1 Species of Special Interest within Wildlife Monitoring Analysis Area

Species Group	Common Name	Scientific Name	Global Rank	MT State Rank
Amphibian	Great Plains Toad	*Anaxyrus cognatus*	G5	S2
Birds	Great Blue Heron	*Ardea herodias*	G5	S3
	Bald Eagle	*Haliaeetus leucocephalus*	G5	S4
	Brewer's Sparrow	*Spizella breweri*	G5	S3B
	Greater Sage-Grouse	*Centrocercus urophasianus*	G3G4	S2
	Sage Thrasher	*Oreoscoptes montanus*	G4	S3B
	Pinyon Jay	*Gymnorhinus cyanocephalus*	G3	S3
	Yellow-billed Cuckoo	*Coccyzus americanus*	G5	S3B
	Golden Eagle	*Aquila chrysaetos*	G5	S3
	Loggerhead Shrike	*Lanius ludovicianus*	G4	S3B
	Burrowing Owl	*Athene cunicularia*	G4	S3B
	Clark's Nutcracker	*Nucifraga columbiana*	G5	S3
Fish	Sauger	*Sander canadensis*	G5	S2
Mammals	Eastern Red Bat	*Lasiurus borealis*	G3G4	S3B
	Long-eared Myotis	*Myotis evotis*	G5	S3
	Townsend's Big-eared Bat	*Corynorhinus townsendii*	G4	S3
	Long-legged Myotis	*Myotis volans*	G4G5	S3
	Little Brown Myotis	*Myotis lucifugus*	G3G4	S3
	Black-tailed Prairie Dog	*Cynomys ludovicianus*	G4	S3
	Hoary Bat	*Lasiurus cinereus*	G3G4	S3B
	Fringed Myotis	*Myotis thysanodes*	G4	S3
Reptiles	Plains Hog-nosed Snake	*Heterodon nasicus*	G5	S2
	Snapping Turtle	*Chelydra serpentina*	G5	S3
	Western Milksnake	*Lampropeltis gentilis*	G5	S2
	Spiny Softshell	*Apalone spinifera*	G5	S3
	Greater Short-horned Lizard	*Phrynosoma hernandesi*	G5	S3

Source: MTNHP 2024

3.11 Ownership and Use of Land

Surface ownership in the area includes BLM and private. Map 1.2-2 depicts coal ownership and Federal coal leases on and adjacent to the tracts. The premining land use of the tracts is rangeland. The primary land use was for cattle grazing.

3.12 Cultural Resources

Cultural resources are defined as the physical remains of past human activity, generally inclusive of all manifestations more than 50 years old. Cultural resources can be classified as artifacts, features, sites, districts, or landscapes. The goal of cultural resource management is conservation of archaeological and historical remains and information for research, public interpretation, and enjoyment, and for appreciation by future generations. Prehistoric resources are physical locations with remains that are the result of human activities occurring prior to written records. Historic resources are most recorded as sites, clusters of artifacts, and/or features with definable boundaries.

Prehistoric site types common to the region and potentially occurring within the study area include campsites, rock shelters, rock structures (i.e., eagle trapping pits, hunting blinds, vision quests or fortification structures), lithic quarries, stone (tipi) rings, stone cairns, stone alignments, ceramic remains, rock art, bison processing areas, and lithic reduction areas. Historic cultural resources expected in the vicinity of the project area include homesteads, ranches, irrigation related structures, and refuse dumps.

Comprehensive investigations (BLM Class III inventory) of cultural resources within the LBA1 tracts and much of the surrounding area have been completed. As of 2018, 116 cultural sites have been identified within the permit boundary, of which 11 have been designated as eligible for listing on the National Register of Historic Places (NRHP). Only two of the 11 NRHP eligible sites within the permit boundary are within the LBA1 tracts.

Native American tribes were consulted during the preparation of the 2006 and 2016 LBA1 EAs. In response to the 2006 LBA EA consultation, the Northern Cheyenne Tribe Preservation Office requested additional information and participated in a discussion of the cultural resource issues related to the LBA1 tracts and accompanied mine personnel on tour of several of the sites on February 14, 2006. As a result of the discussions, it was agreed that the Northern Cheyenne Tribe would conduct a tribal cultural survey for SCC and surveys have been conducted on all tracts. On February 11, 2016, OSMRE requested continued consultation with Native American tribes for the stages of the proposal development and implementation of the final federal action. On May 23, 2016, the Cheyenne and Arapahoe Tribes provided a letter in response to OSMRE’s consultation request, confirming no properties would be affected. No other Native American tribes responded to OSMRE’s consultation request.

Site 24BH404 is the most culturally significant site within the LBA1 tracts because it was the only site stipulated in the lease requiring mitigation after the lease size was reduced. Since the 2006 LBA EA, the coal under site 24BH404 was removed from the lease and the associated disturbance was also removed. In 2015 mitigation was done for the purpose of recording the site for historical record because the sandstone rock art features will eventually either be destroyed by the weather or fall off. The original mitigation was to remove or plaster the panels; however, the panel was instead photographed with 3D imagery so it can be recreated if needed. No other sites within the LBA1 tracts require mitigation.

3.13 Visual Resources

Scenic quality classes are defined by a system that rates seven key factors: Landform, vegetation, water, color, influence of adjacent scenery, scarcity, and cultural modification. Visual sensitivity levels are determined by peoples’ concern for what they see and the frequency of travel through the area. For management purposes, the BLM conducts a Visual Resource Management (VRM) inventory that identifies, sets, and meets objectives for the maintenance of scenic values and visual quality and is based on research designed to objectively assess aesthetic qualities of the landscape. The VRM classification ratings range from I to IV as follows:

- **Class I Objective - No Visible Change** – The objective of this class is to preserve the existing character of the landscape. Only Congressionally authorized areas or areas approved through the Management Framework Plan/RMP process where the goal is to provide a landscape setting that appears unaltered by man should be placed in this class. The level of change to the characteristic landscape should be extremely low because only very limited development such as hiking trails should occur in these areas.
- **Class II Objective - Change Visible but Does Not Attract Attention -** The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
- **Class III Objective - Change Attracts Attention but Is Not Dominant -** The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
- **Class IV Objective - Change is Dominant but Mitigated -** The objective of this class is to provide for management activities that require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements. The land included in the proposed tracts is classified as visual resource management Class III.

The LBA1 tracts are classified as visual resource management Class III. The Class III objective is to partially retain the existing character of the landscape but allows for a moderate level of change. The SCM facilities and some mining activities are visible from Montana Federal-Aid Secondary Route (FAS) 314. The closest tract (Tract 1) is located over ½-mile from FAS 314. No tracts would be plainly visible from the transportation corridor. Most people traveling this road are commuting to work at the SCM and the nearby Decker Mine. However, during periods of peak recreational activity this highway generates higher traffic volume. Landscapes found within and adjacent to the SCM area, and visible from FAS 314, include gently rolling benches of sagebrush, and mid-short-grass prairie. Major man-made intrusions include ranching, farming, transportation facilities and electrical power lines.

3.14 Noise

An individual's judgment of the loudness of a noise correlate well with the A-weighted sound level system of measurement. The A-weighted sound level, or A-scale, has been used extensively in the US for the measurement of community and transportation noises. A weighted decibels (dBA) readings for some typical sounds commonly heard in daily life are as follows:

- 10 dB—Normal breathing.
- 20 dB—Whispering from five feet away.
- 30 dB—Whispering nearby.
- 40 dB—Quiet library sounds.
- 50 dB—Refrigerator.
- 60 dB—Electric toothbrush.
- 70 dB—Washing machine.
- 80 dB—Alarm clock.
- 90 dB—Subway train.
- 100 dB—Factory machine.
- 110 dB—Car horn.
- 120 dB—Ambulance siren.

Existing noises in the LBA1 tracts, include coal mining activities, agricultural and recreational activities, and traffic on FAS 314. These noise sources have not changed since 2006. Modeling performed for the SCM indicates the internal criterion for maximum off-site noise 65 dBA would not be exceeded at point less than 4,800 feet from the pit boundary. The closest residence is located approximately 3,250 feet from Tract 1 and Route FAS 314 is within 3,870 ft of Tract 1 (see Map 3.4-1). The nearest recreationist on the Tongue River Reservoir could be within approximately 15,000 ft from the proposed tracts. Traffic on FAS 314 is heaviest during the daylight hours and at shift changes. The SCM has developed internal criteria on noise performance to ensure the protection of local community health and the environment.

3.14.1 Rail Transport Corridor

Noise and vibration are linked in this EIS for rail because the two disciplines are perceived to have many physical characteristics in common. Railroad operation noise can result from diesel locomotive engine and wheel/rail noise and horn noise, which includes locomotive warning horns sounding at grade rail/roadway crossings (Surface Transportation Board 2015). Noise from trains is primarily a function of train speed, train length, track construction, and number and type of locomotives. Vibration caused by trains radiates energy into the adjacent soil in the form of different types of waves that propagate through the various soil and rock strata to nearby structures and other receptors.

3.14.1.1 Existing Regulations and Guidelines

Several federal noise and vibration statutes, regulations, and guidelines are applicable to rail transport, including the Noise Control Act of 1972 (42 U.S.C. §4910), Surface Transportation Board (STB) and Federal Railroad Administration (FRA) regulations and guidance, EPA's Noise Emission Standards for Interstate Rail Carriers (40 C.F.R. Part 201), Federal Transit Administration (FTA) assessment methods, and noise limits related to occupational safety.

3.14.1.2 Thresholds and Basis for Analysis

Because OSMRE does not regulate rail traffic, this EIS relies upon STB regulations, which only require analysis of noise where rail traffic increases at least 100 percent (i.e., doubles) or increases by at least eight trains per day on any segment (49 C.F.R. §1105.7(e)(6)). Where such thresholds are exceeded, noise effects are compared to two additional thresholds: (a) an increase in noise exposure as measured by a day-night noise level (L_{dn}) of 3 dBA or more; or (b) an increase to a noise level of 65 L_{dn} or more.

L_{dn} is defined as a receiver's cumulative noise exposure from all events over a full 24 hours and generally recognized as the standard by which to assess transit noise associated with residential land uses (FTA 2006). FTA also specifies human annoyance criteria for residences related to the frequency of events (e.g., frequency of train passage), whereby doubling the number of events is required for a significant increase for heavily used rail corridors (more than 12 trains per day).

Baseline noise and vibration conditions associated with existing rail traffic along the rail lines would vary depending upon the day and the location. Existing conditions are assumed to be in conformance with Federal regulations for the purposes of this EIS.

3.15 Transportation

There are no primary transportation systems in the LBA1 tracts. Nearby transportation facilities include the FAS 314 (which is a continuation of Wyoming Secondary Route 87), a railroad spur owned by NTEC and used by BNSF Railroad, and local access roads.

3.15.1 Rail Transportation

3.15.1.1 Regulatory Environment

Railroads are regulated by two separate Federal agencies, each with their own responsibilities.

- **STB -** STB is an independent adjudicatory and economic-regulatory agency charged by Congress with resolving railroad rate and service disputes and reviewing proposed railroad mergers. STB has jurisdiction over railroad rate and service issues and rail restructuring transactions (e.g., mergers, line sales, line construction, and line abandonments) and has authority to investigate rail service matters of regional and national significance. STB regulations preempt State and local laws (e.g., noise ordinances) that would otherwise manage or govern rail transportation.
- **FRA -** As part of the US Department of Transportation (USDOT), FRA formulates and enforces rail safety regulations, administers rail funding, and researches rail improvement strategies and technologies. FRA also facilitates national and regional rail planning to maintain current services and infrastructure and expand and improve the rail network. For the most part, all railroad operational procedures are subject to FRA regulations, including highway-railroad crossing signals, train speeds, train horn use, and track condition.

STB and FRA conduct reviews required by NEPA and consider environmental impacts before making final decisions pertaining to actions under their jurisdiction. STB’s Office of Environmental Analysis is responsible for directing the environmental review process, conducting independent analysis of all environmental data, and making environmental recommendations to the STB. STB's environmental rules are found at 49 C.F.R. Part 1105. FRA conducts environmental reviews according to FRA's Environmental Procedures (FRA 1999).

3.15.1.2 Coal Transport Routes and Rail Traffic

Coal mined at the SCM is shipped to various destinations using a railroad spur owned by NTEC and used by BNSF and BNSF-owned/maintained mainline railroad tracks. Trains departing from the SCM use four routes, as depicted on Map 2.1-1 of this EIS. None of the transportation routes pass through any Class I areas. Class 1 areas, as designated in the CAA, have special air quality and visibility protection. Class I areas include international parks, national wilderness areas larger than 5,000 acres, national memorial parks larger than 5,000 acres and national parks larger than 6,000 acres.

Destinations of the SCM coal for the maximum production year over the last 8 years (2018) and the minimum production year of the last 8 years (2020) are summarized in Tables 3.15-1 and 3.15-2, respectively. The information provided in the tables is based on data provided by the U.S. Energy Information Administration (EIA) and the SCM. In 2018 coal shipments utilized approximately

2,170,000 miles of rail lines for 883 round trips (EIA 2024). In 2020, coal shipments utilized approximately 1,517,000 miles of rail lines for 610 round trips. For comparison purposes, in 2018 rail freight was hauled by rail in the U.S. over 476,500,000 miles (USDOT 2021). Therefore, the annual rail transport of coal resulting from the 2018 and 2020 SCM coal shipments represent approximately 0.45 and 0.32 percent of the total 2018 U.S. rail freight traffic, respectively.

The SCM does not maintain records of train accidents involving domestic coal shipments of SCM coal. Once the coal is loaded it transfers ownership from the SCM to the customer. The SCM does maintain train accident records for exported coal (coal sent by train to the Westshore Port in British Columbia, Canada). Since 2016, there have been no train derailments involving coal from the LBA1 tracts on the rail lines from the SCM to the Westshore Port (SCM 2024).

3.15.2 Vessel Transportation

Coal from the SCM is shipped to two coal terminals, the DTE-BRSC Shared Storage terminal in Superior, Wisconsin and the Westshore terminal in British Columbia, Canada. At the DTE-BRSC terminal, coal is loaded onto vessels for transport to three power plants located on the Great Lakes. The average lake transport distance is 588 miles (SeaRoutes 2021). At the Westshore Port, coal is loaded onto ocean-going vessels for overseas transport to ports in the ROK and Japan. The average ocean transport distance between Westshore and possible coal ports in the ROK and Japan is estimated to be approximately 4,300 and 4,600 nautical miles one-way, respectively (SeaRoutes 2021).

Table 3.15-1 2018 Coal Transportation Destinations, Tonnages, and Distances

Destination	Tons Shipped	Percent of Shipments	Number of Trips[1]	Round-trip Rail Miles[2]	Total Rail Miles
DTE-BRSC Shared Storage (Wisconsin)	3,756,426	27%	241	2,064	497,004
TransAlta Centralia Generation (Washington)	2,361,244	17%	151	2,400	363,268
Clay Boswell (Minnesota)	659,895	5%	42	1,954	82,656
Coronado Generating Station (Arizona)	563,243	4%	36	2,876	103,839
Hoot Lake (Minnesota)	326,360	2%	21	1,660	34,728
Presque Isle (Wisconsin)	260,860	2%	17	2,064	34,514
Sub-total (from EIA)	***7,928,028***	***58%***	***508***	***13,018***	***1,116,009***
Asia (Westshore Port, British Columbia)	4,503,000	33%	289	3,000	865,962
Additional Shipments (Information not publicly available)	1,337,027	10%	86[3]	2,196[1]	188,210
Total	**13,768,055**	**100%**	**883**	**18,214**	**2,170,181**

Source: EIA 2024

1 Round-trip mileage based on an estimated 15,600 tons of coal per train.

2 Approximate miles.

3 Estimated value.

Table 3.15-2 2020 Coal Transportation Destinations, Tonnages, and Distances

Destination	Tons Shipped	Percent of Shipments	Number of Trips[1]	Round-trip Rail Miles[2]	Total Rail Miles
DTE-BRSC Shared Storage (Wisconsin)	1,879,560	20%	120	2,064	248,680
TransAlta Centralia Generation (Washington)	1,959,814	21%	126	2,400	301,510
Clay Boswell (Minnesota)	908,001	10%	58	1,954	113733
Coronado Generating Station (Arizona)	313,995	3%	20	2,876	57,888
Sub-total (from EIA)	***5,061,370***	***53%***	***324***	***9,294***	***721,811***
Japan (Westshore Port, British Columbia)	531,862	6%	34	3,000	102,281
Korea (Westshore Port, British Columbia)	2,687,618	28%	172	3,000	516,850
Additional Shipments (Information not publicly available)	1,232,406	13%	79[1]	2,225[3]	175,756
Total	**9,513,255**	**100%**	**610**	**17,519**	**1,516,697**

Source: EIA 2024

3.16 Hazardous and Solid Waste

Non-hazardous waste, which is similar to domestic or municipal solid waste, is currently disposed of onsite or shipped offsite. The SCM is permitted to dispose of used tires, concrete with rebar cut off, and non-greasy wood/steel/aluminum at the SCM, as described in the mine's existing MDEQ permit to mine. All other non-hazardous waste is shipped offsite to a permitted landfill. No solid wastes will be deposited within 8 feet of any coal outcrop or coal storage area, or at refuse embankments or impoundment sites. At the SCM, materials that may be classified as hazardous or are handled as hazardous include some greases, solvents, paints, flammable liquids, and other combustible materials determined to be hazardous by the EPA under the Resource Conservation and Recovery Act (RCRA). These types of wastes are disposed of at an off-site EPA-permitted hazardous waste facility. No noteworthy impacts are anticipated as a result of any of the alternatives.

3.17 Socioeconomics

The social and economic study area for the project involves primarily the Federal and Montana state governments (tax revenues) and Sheridan County, Wyoming, and the City of Sheridan. Sheridan and Sheridan County were included in the study area because a majority of the SCM employees commute from the Sheridan Area. As discussed in Section 1.3 of this EIS, the SCM was the successful bidder for the coal lease (MTM 94378) at $19,902,200.

3.17.1 Local Economy

Montana relies on its natural resources as a primary source of tax revenue. Generally, natural resource taxes are categorized as either severance/license taxes or some form of ad valorem (property) taxes. Total natural resource tax collection for the State of Montana in 2022 was $314,384,399. Montana coal severance taxes accounted for approximately 21 percent of the total 2020 revenues (Montana Department of Revenue 2022).

Coal production, as reported by the EIA (2024), showed Montana's coal production was 28.2 Mt in 2022. This was a decrease of approximately 1.4 percent over the 28.6 Mt produced in 2021 and a decrease of approximately 13 percent from the 32.4 Mt produced in 2016. The 2022 production

1 Round-trip mileage based on an estimated 15,600 tons of coal per train.

2 Approximate miles.

3 Estimated value.

was less than the record 44.9 Mt produced in 2008. Coal production figures for Montana between 2016 and 2022 are shown on Table 3.17-1.

Table 3.17-1 Historic Annual Coal Production (tons) for Montana

	2016	2017	2018	2019	2020	2021	2022
Montana	32.4	35.3	38.5	34.8	26.5	28.6	28.2
Percent Change	-23.2%	9.0%	9.3%	-9.8%	-23.9%	7.9%	-1.4%

Sources: Montana Coal Council 2024, EIA 2024

Table 3.17-2 provides total cumulative royalties from the SCM. The table shows that the state and federal governments are the major beneficiaries of these payments, whereas private owners of premining land leases are minor beneficiaries of these payments. Mineral royalties are collected on the amount of production and the value of that production. The current royalty rate for Federal coal leases at surface mines is 12.5 percent, with half of this revenue returned to the state. Coal severance taxes are collected by the state of Montana. Currently, Montana collects 15 percent of the price of the coal as severance tax.

Table 3.17-2 Annual Royalty Collections from Coal Production

Collections	2016	2017	2018	2019	2020	2021	2022
Federal	$10,877,622	$16,826,193	$14,277,892	$12,293,469	$8,679,110	$14,074,577	$15,155,698
State	$6,868,968	$3,592,071	$7,851,047	$7,096,519	$7,148,611	$13,729,215	$11,569,054
Private	$525,128	$563,911	$699,490	$445,502	$1,952,833	$2,384,873	$2,952,543
Total	$18,271,718	$20,982,175	$22,828,429	$19,835,489	$17,780,554	$30,188,665	$29,677,295

Source: NTEC 2022a

3.17.2 Population

According to U.S. census data, in 2020 Sheridan County had a population of 30,921 (U.S. Census Bureau 2024). The 2010 population of Sheridan County was 29,116. Therefore, there was an increase of 1,805 persons or 6.2 percent.

Population in Big Horn County, Montana continues to be sparse. According to the U.S. Census Bureau, Big Horn County had a population of 13,124 in 2020. The 2010 population of Big Horn County was 12,865. Between 2010 and 2020, the population of Big Horn County grew by approximately 2.0 percent (U.S. Census Bureau 2024).

3.17.3 Employment

Most of the employees at the SCM reside in Sheridan County, Wyoming. The labor force in Sheridan County in October 2023 stood at 16,424 with an unemployment rate of 2.3 percent, compared to 3.2 percent in October 2022 (Wyoming Department of Workforce Services 2024). In June 2023, 336 people in Sheridan County were employed in natural resources and mining (U.S. Bureau of Labor Statistics 2024). In June 2023, the largest employment sector in Sheridan County was goods-producing. As of June 2024, the SCM employed 256 full-time employees (SCM 2024a).

The SCM is the primary mining employer in Big Horn County. Montana receives payroll taxes, royalties, and production taxes, but most of the employees reside in Sheridan County.

3.17.4 Housing

In 2020, Sheridan County contained 14,884 housing units with 9,006 housing units located in the City of Sheridan and 5,878 housing units in other towns and unincorporated area. Of the 14,884 housing units, 13,349 were occupied and 1,535 were vacant (U.S. Census Bureau 2024). Nearly 69 percent of occupied housing units are owner-occupied, and 31 percent are renter-occupied (Gruen Gruen+Associates 2021). The countywide vacancy rate has declined since 2010 (11.3% in 2010 and 10.3% in 2020), but higher for areas outside of the City of Sheridan. The number of residential housing permits peaked in 2006 with most permits for detached single-family units. New permits reached a low in 2009 of less than 100 units. Residential permit activity has increased steadily since 2014 but remains far below pre-recession levels of the mid-2000s. Nearly 900 units have been permitted in the county between 2016 and 2020. The trend of increasing permit activity is expected to continue in 2021 and persist into 2022. The recent housing study for Sheridan County states that over the next 10 years the area will need about 1,000 units to support the total workforce and senior housing needs.

3.18 Environmental Justice

Environmental justice is defined by the EPA as “[t]he fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental, and commercial operations or the execution of Federal, State, local and tribal programs and policies” (EPA 2017). EO 12898 titled, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations” (59 FR 7629) also addresses this issue. Its purpose is to identify and address the disproportionately high and adverse human health or environmental effects of their actions on minority and low-income populations with the goal of achieving environmental protection for all communities.

The CEQ’s environmental justice guidance (CEQ 1997) identifies groups as minority populations when either (1) the minority population of the affected area exceeds 50%, or (2) the minority population percentage in the affected area is meaningfully greater than the respective minority or low-income population percentage in the general population or appropriate unit of geographical analysis. As shown in Table 3.18-1, the percentage of the population classified as low income1 in each of the blockgroups within Bighorn and Rosebud counties analyzed is significantly higher than that of the State of Montana, which serves as the reference population for this analysis. Both Bighorn and Rosebud counties contain census tracts which meet the criteria for low-income communities.[2] A low-income environmental justice population, therefore, is present for the purposes of this analysis.

Table 3.18-1 shows that the percentage of the population classified as people of color[3] in most of the blockgroups within Big Horn and Rosebud counties is meaningfully greater than that of the State of Montana. There are two Native American reservations within 50 miles of the SCM including the Crow Reservation in Big Horn County, Montana and the Northern Cheyenne Reservation in Big Horn and Rosebud counties, Montana. A people of color environmental justice population, therefore, is present for the purposes of this analysis.

1 Percent of individuals whose ratio of household income to poverty level in the past 12 months was less than 2 (as a fraction of individuals for whom ratio was determined).

2 To meet the IRS criteria for a low-income census tract, the poverty rate is at least 20 percent, or the median family income does not exceed 80 percent of statewide median family income.

3 The percent of individuals in a block group who list their racial status as a race other than white alone and/or list their ethnicity as Hispanic or Latino. That is, all people other than non-Hispanic white-alone individuals. The word "alone" in this case indicates that the person is of a single race, not multiracial.

Table 3.18-1 Environmental Justice Populations Summary

Population	Total Population	Low Income (%)	People of Color (%)
MONTANA	**1,084,225**	**32**	**16**
Big Horn County, MT	**13,090**	**54**	**74**
Blockgroup: 300030001001	1,036	53	52
Blockgroup: 300030001001	1,751	54	68
Blockgroup: 300039405001	1,443	48	77
Blockgroup: 300039405002	865	45	74
Blockgroup: 300039406001	1,405	70	89
Blockgroup: 300039406002	1,932	67	95
Blockgroup: 300039407001	1,443	48	77
Blockgroup: 300039407002	750	66	96
Rosebud County, MT	**8,310**	**44**	**48**
Blockgroup: 300870002001	652	41	13
Blockgroup: 300870002002	552	47	35
Blockgroup: 300879404001	2,055	71	98
Blockgroup: 300879404002	836	51	90
Blockgroup: 300039404001	1,675	62	93
WYOMING	**576,851**	**28**	**9**
Sheridan County, WY	**31,176**	**22**	**9**
Blockgroup: 560330006002	1,754	41	4
Blockgroup: 560330004001	1,471	35	11
Blockgroup: 560330004001	1,834	42	8
Blockgroup: 560330003001	1,147	39	10
Blockgroup: 560330003002	1,109	34	21
Blockgroup: 560330002001	752	38	8
Blockgroup: 560330002002	1,401	37	10
Blockgroup: 560330001002	1,208	26	14

Source: EPA 2024k

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Introduction

This chapter discusses the potential direct and indirect effects of the Proposed Action (Alternative 1), Partial Mining alternative (Alternative 2), Accelerated Mining Rate alternative (Alternative 3), and the No Action alternative (Alternative 4), as described in Chapter 2. The discussion is organized by affected resource in the same order as they are described in Chapter 3, and then by alternative.

An impact, or effect, is defined as a modification to the environment brought about by an outside action. Impacts vary in significance from no change, or only slightly discernible change, to a full modification or elimination of the resource. Impacts can be beneficial (positive) or adverse (negative). Impacts are described by their level of significance (i.e., significant, moderate, minor, negligible, or no impact). For purposes of discussion and to enable use of a common scale for all resources, resource specialists considered the following impact levels in qualitative terms.

Significant Impact:	Impacts that potentially could cause irretrievable loss of a resource; significant depletion, change, or stress to resources; or stress within the social, cultural, and economic realm.
Moderate Impact:	Impacts that potentially could cause some change or stress to an environmental resource, but the impact levels are not considered significant.
Minor Impact:	Impacts that potentially could be detectable but slight.
Negligible Impact:	Impacts in the lower limit of detection that potentially could cause an insignificant change or stress to an environmental resource or use.
No Impact:	No discernible or measurable impacts.

Direct impacts are defined as those impacts which are caused by the action and occur at the same time and place (40 C.F.R. § 1508.1(i)(1)). Indirect impacts are those that are caused by the action and are later in time or are farther removed in distance but are still reasonably foreseeable (40 C.F.R. § 1508.1(i)(2)).

Impacts can be short-term meaning these impacts generally occur over a short period during a specific point in the mining process and these changes generally revert to pre-disturbance conditions at or within a few years after the ground disturbance has taken place. Long-term impacts are defined as those that substantially would remain beyond short-term ground-disturbing activities. Long-term impacts would generally last the life of the federal mining plan modification approval and beyond. Permanent impacts are defined as those that would remain indefinitely. Permanent impacts would permanently alter a resource and/or result in permanent loss of a resource.

4.2 Topography and Physiography

4.2.1 Direct and Indirect Effects

4.2.1.1 Alternative 1 – Proposed Action

The Proposed Action would permanently impact the topography and physiography of the remaining 162.5 acres within the LBA1 tracts. The impacts would be similar to those currently occurring on the existing SCM coal leases as coal is mined and mined-out areas are reclaimed. Topsoil would be removed from the land and stockpiled or placed directly on recontoured areas. Overburden would be blasted and stockpiled or directly placed into the already mined pit, and coal would be removed. Highwalls with vertical heights equal to overburden plus coal thickness would exist in active pits.

The direct effects on topography and physiography resulting from the Proposed Action are expected to be moderate and permanent on all tracts. Typically, a direct permanent impact of coal mining and reclamation is topographic moderation. After reclamation, the restored land surfaces are generally gentler, with more uniform slopes and restored basic drainage networks. Portions of the original topography of the tracts are somewhat rugged. As a result, the expected postmining topography would be more subdued but would blend with the undisturbed surroundings.

Following reclamation, the average postmining topography would be slightly lower in elevation than the premining topography due to removal of the coal. The removal of the coal would be partially offset by the swelling that occurs when the overburden and interburden are blasted, excavated, and backfilled. The MDEQ, through the PAP process, considered and approved the impacts of mining coal related to the LBA1 tracts, including effects to topography and physiography and reclaiming the area to approximate original contour as required by provisions included in SMP C1979012. Table 2.1-2 provides comparisons between the acres of disturbance versus the acres of reclamation, by bond release phase for the years 2016 through 2023. The reclamation acres have increased since 2016 as has the percentage of advanced stages of reclamation. The SCM is bound by reclamation responsibilities included in the MDEQ-approved SMP C1979012 and the BLM-approved R2P2.

Direct adverse impacts resulting from topographic moderation include a reduction in microhabitats (e.g., cutbank slopes and bedrock bluffs) for some wildlife species and a reduction in habitat diversity, particularly a reduction in slope dependent shrub communities and associated habitat. The approximate original drainage pattern would be restored. Any topographic changes would not conflict with regional land use and the postmining topography would adequately support anticipated land use of the tracts. These measures are required by state regulations and are therefore considered part of the Proposed Action.

4.2.1.2 Alternative 2 – Partial Mining

Under the Partial Mining alternative, the SCM will continue to mine the remaining LBA1 tracts, but mining would be limited to a 5-year term. The types of topography and physiography impacts would be the same as described for the Proposed Action, but impacts would be reduced to approximately 78.5 acres of disturbance.[1] Any mining of Federal coal within the LBA1 tracts beyond this 5-year term would require reevaluation of the mining operations by OSMRE before any further disturbance could occur. Reclamation would occur as required by MEQ-approved SMP C1979012. The impacts would be moderate and permanent on the 78.5 acres disturbed under this alternative. The remaining LBA1 tracts area would be undisturbed unless future authorization is applied for and granted.

4.2.1.3 Alternative 3 – Accelerated Mining Rate

Under this alternative, the potential impacts to topography and physiography would be the same as the Proposed Action but impacts would occur at a faster rate. Instead of occurring over a longer time period, under this alternative the remaining LBA1 tracts coal would be mined in 2.2 years. Under this alternative, the potential impacts to topography and physiography would be moderate and permanent. Reclamation would occur as required by MEQ-approved SMP C1979012.

1 For analytical purposes, the EIS uses the SCM’s LOM mining sequence (Table 2.2-1) to estimate the amount of coal mined from the LBA1 tracts and the amount of disturbance during a representative 5-year term of 2024 through 2028. The actual start of the 5-year term would be dependent on the date of the ASLM decision.

4.2.1.4 Alternative 4 – No Action

Under the No Action alternative, the SCM would terminate Federal coal recovery operations within the boundaries of the LBA1 tracts. The SCM would proceed with reclamation of lands within the boundaries of the LBA1 tracts. The topography impacts would be less than Alternatives 1, 2, and 3 because the remaining 162.5 acres within the LBA1 tracts would not be disturbed.

4.3 Geology, Mineral Resources, and Paleontology

4.3.1 Direct and Indirect Effects

4.3.1.1 Alternative 1 – Proposed Action

The geology from the base of the A/D coal seam to the land surface would be permanently changed within the LBA1 tracts. Mining would substantially alter the resulting subsurface physical characteristics of the lands associated with the LBA1 tracts. The replaced overburden (backfill) would be relatively homogenous (compared to the premining layers of shale, siltstone, and sandstone overburden) and partly recompacted mixture. The replaced backfill would range from 180 to 300 feet thick. These impacts are occurring on the existing SCM coal leases as coal is mined and the mined-out areas are reclaimed.

Drilling and sampling programs are conducted by all mine operators to identify overburden material that may be unsuitable for reclamation (i.e., material that is not suitable for use in reestablishing vegetation or that may affect groundwater quality due to high concentrations of certain constituents such as selenium or adverse pH levels). As part of the mine permitting process, each mine operator is required to develop a management plan to ensure that this unsuitable material is not placed in areas where it may affect groundwater quality or revegetation success. Each mine operator must also develop backfill monitoring plans as part of the mine permitting process to evaluate the quality of the replaced overburden. These plans are currently in place on the SCM permit.

Overall, direct, and indirect effects on geology would be moderate and permanent. The geology within the LBA1 tracts would be permanently changed as they are replaced with backfill material during reclamation.

Mineral resources within the vicinity of the LBA1 tracts have changed since publication of the 2006 LBA EA and 2016 LBA1 EA. Since these documents were published, CBNG development has ceased. As described in Section 3.3.2.2 of this EIS, there has not been any CBNG production in Big Horn County since 2013. There are no CBNG, oil, or natural gas wells in the SCM permit area. Based on this, direct and indirect effects on mineral resources would be negligible on the LBA1 tracts.

No unique or significant paleontological resources have been identified or are suspected to exist on the tracts. The likelihood of encountering significant paleontological resources is very small. Lease and permit conditions require that should previously unknown, potentially significant paleontological sites be discovered, work in that area must stop and measures must be taken to assess and protect the site. The direct and indirect effects on paleontology would be negligible on the LBA1 tracts.

4.3.1.2 Alternative 2 – Partial Mining

Under the Partial Mining alternative, the SCM will continue to mine the remaining LBA1 tracts but mining would be limited to a 5-year term. The type of geology, mineral resource, and paleontological impacts would be the same as described for the Proposed Action, but the impacted area would be reduced because only a portion of the remaining coal within the LBA1 tracts would be mined. Any mining of Federal coal within the LBA1 tracts beyond this 5-year term would require reevaluation of the mining operations by OSMRE and reauthorization from the ASLM. The SCM would adhere to the backfill monitoring plans as required by MEQ-approved SMP C1979012. Under this alternative, the direct and indirect effects on mineral resources and paleontology would be negligible on the LBA1 tracts because there is no CBNG, oil, or natural gas wells in the SCM permit area or vicinity and no unique or significant paleontological resources have been identified or are suspected to exist on the tracts.

4.3.1.3 Alternative 3 – Accelerated Mining Rate

Under this alternative, the potential impacts to geology, mineral resource, and paleontological would be the same as the Proposed Action but would occur at a faster rate (2.2 years). The SCM would adhere to the backfill monitoring plans as required by MEQ-approved SMP C1979012. Direct and indirect effects on mineral resources and paleontology would be negligible on the LBA1 tracts under this alternative because there is no CBNG, oil, or natural gas wells in the SCM permit area or vicinity and no unique or significant paleontological resources have been identified or are suspected to exist on the tracts.

4.3.1.4 Alternative 4 – No Action

Under the No Action alternative, the SCM would terminate Federal coal recovery operations within the boundaries of the LBA1 tracts. Impacts to the geological resources that have resulted from current mining activities within the LBA1 tracts are permanent; however, geology, mineral resources, and potential paleontological resources within the 162.5 acres that have not been mined would not be impacted. Based on this direct and indirect effect to geology, mineral resources, and paleontology under the No Action alternative would be negligible.

4.4 Air Quality

4.4.1 Particulate Matter

4.4.1.1 Direct and Indirect Effects

4.4.1.1.1 Alternative 1 – Proposed Action

Direct effects from particulate matter from the Proposed Action would include fugitive emissions generated from coal excavation and reclamation activities and tailpipe emissions from equipment. Fugitive particulate emissions would also result from dust being generated during dragline operation, coal haulage, bulldozers, scrapers, loaders, baghouse, and other equipment operating at the SCM. Public exposure to particulate emissions from the Proposed Action is most likely to occur along publicly accessible roads and highways that pass near the area of the mining operations. Occupants of residences in the area could also be affected. The closest residence is located approximately 3,000 feet from Tract 1 disturbance and the closest public transportation route is FAS 314, approximately 3,271 feet from disturbance associated with Tract 1. The nearest recreational opportunities are at the Tongue River Reservoir, approximately 15,000 feet from the LBA1 tracts.

Indirect effects from particulate matter include the potential for cardiovascular and respiratory problems for exposed individuals. As described in Section 3.14, the nearest residence is located approximately 3,250 feet from Tract 1 and the nearest recreationist on the Tongue River Reservoir could be within approximately 15,000 ft from the LBA1 tracts.

Dispersion modeling was conducted for a revision to SCM’s Montana air quality permit in 2014 using AMS/EPA Regulatory Model (AERMOD). For the model, PM_{10} and $PM_{2.5}$ inventories for the mining activities at the SCM were prepared and two years were then selected for worst-case dispersion modeling of PM_{10} and $PM_{2.5}$ based on mining plan parameters and emission inventories (Years 2016 and 2018). The modeling was completed for a production rate of 30 Mtpy, which is nearly 6 times greater than the anticipated production for the LBA1 tracts. The results of 24-hour and annual dispersion modeling are included in Table 4.4-1.

Table 4.4-1 Particulate Matter Dispersion Modeling Results (µg/m³)

Mine Year	Pollutant	Averaging Period	Modeled Concentration	Background Concentration	Total Concentration	NAAQS/MAAQS
2016	PM_{10}	24-hour	76.55 [a]	33.0	109.55	150 [b]
		Annual	20.22 [c]	17.5	37.72	50 [d]
	$PM_{2.5}$	24-hour	11.15 [a]	15.0	26.15	35 [a]
		Annual	4.13 [a]	5.5	9.63	12 [a]
2018	PM_{10}	24-hour	90.82 [a]	33.0	123.82	150 [a]
		Annual	23.98 [a]	17.5	41.48	50 [a]
	$PM_{2.5}$	24-hour	14.53 [a]	15.0	29.53	35 [e]
		Annual	4.14 [a]	5.5	9.64	12 [f]

The modeling indicated that mine activities to remove 30 Mtpy of coal would comply with the 24-hour and annual PM_{10} and $PM_{2.5}$ ambient air standard for the life of the SCM.

Since 2008, there have been no recorded exceedances of the 24-hour or annual PM_{10} NAAQS or MAAQS at the SCM, and, based on estimated PM2.5 values, there were no exceedances of the 24-hour or annual $PM_{2.5}$ NAAQS at the mine. The 2014 AERMOD modeling predicted no future exceedances of the 24-hour and annual PM_{10} NAAQS/MAAQS at a 30 Mtpy production rate. The 2014 AERMOD modeling also predicted no future exceedances of the 24-hour or annual $PM_{2.5}$ NAAQS at a 30-Mtpy production rate (CPE/Redhorse 2014).

An inventory of all point sources, controls, and emissions for the SCM Montana air quality permit showed a maximum potential to emit 21 tpy; therefore, a PSD increment consumption analysis was not necessary (a value below the 100 tpy major source threshold limit specified in ARM 17.8, Subchapter 8 – PSD and Subchapter 12 – Operating Permit Program means that the SCM would not be subject to the Title V operating permit program).

Under the Proposed Action, mining in the LBA1 tracts would continue for 15 to 16 years. Activities during mining would likely increase fugitive dust emissions; however, fugitive dust emissions are projected to remain within daily and annual NAAQS and MAAQS limits. The direct and indirect effects from particulate matter emissions resulting from the Proposed Action are expected to be moderate and short-term.

4.4.1.1.2 Alternative 2 – Partial Mining

Under the Partial Mining alternative, the SCM would continue to mine the LBA1 tracts coal but mining would be limited to a 5-year term. The particulate matter emission impacts would be the same intensity as described for the Proposed Action, but the duration would be reduced by 10 to 11 years. Any mining of Federal coal within the LBA1 tracts beyond this 5-year term would require reevaluation of the mining operations by OSMRE and reauthorization by the ASLM. The direct and indirect effects from particulate matter emissions resulting from the Partial Mining alternative are expected to be moderate and shorter-term than the Proposed Action.

a Highest, second-high modeled value.

b Violation occurs with more than one expected exceedance per calendar year, averaged over 3 years.

c Highest modeled value.

d Violation occurs when the 3-year average of the arithmetic means over a calendar year exceeds the value. EPA revoked the annual PM_{10} standard, effective December 17, 2006.

e Violation occurs when the 3-year average of the 98th percentile values exceed the standard. Per EPA policy, use the maximum modeled concentration for comparison to the standard.

f Violation occurs when the 3-year average of the spatially averaged calendar year means exceed the standard.

4.4.1.1.3 Alternative 3 – Accelerated Mining Rate

Under this alternative, the potential impacts would be of the same type as the Proposed Action, but the faster rate of mining would increase the intensity of fugitive dust emissions compared to the Proposed Action. As described above, dispersion modeling at 30 Mtpy indicated that mine activities would be in compliance with the 24-hour and annual PM_{10} and $PM_{2.5}$ ambient air standard for the life of the SCM. The direct and indirect effects from particulate matter emissions resulting from this alternative are expected to be moderate, but slightly greater in intensity than the Proposed Action, and of the shortest duration of all of the alternatives.

4.4.1.1.4 Alternative 4 – No Action

Under the No Action alternative, the SCM would terminate Federal coal recovery operations within the boundaries of the LBA1 tracts. The SCM would proceed with reclamation of lands within the boundaries of the LBA1 tracts. The direct and indirect effects from particulate matter emissions resulting from the No Action alternative would be minor and limited to reclamation of the currently disturbed areas within the LBA1 tracts. Effects would be short-term, only occurring during active reclamation activities.

4.4.1.2 Mitigation Measures

Mitigation measures required by the SCM Montana air quality permit are sufficient to reduce potential effects associated with emissions of particulate matter and are enforceable under the air quality permit. No other mitigation measures outside of those required by the air quality permit are proposed.

4.4.2 Emissions of Nitrogen Oxides and Ozone

4.4.2.1 Direct and Indirect Effects

4.4.2.1.1 Alternative 1 – Proposed Action

NO_x may be emitted directly during blasting operations and from diesel fueled mining equipment operating within the LBA1 tracts and indirectly from mobile emissions transporting the LBA1 tracts coal and the power plants burning the LBA1 tracts coal. Once the NO_x is emitted into the atmosphere it has the potential to react with air and ultraviolet light in sunlight to form O_3 which in turn can cause smog. Direct effects of NO_x and O_3 are similar to PM_{10} and can cause respiratory infections and asthma in nearby residents and recreationists. Indirect effects of NO_x and O_3 include smog and their contribution to global warming.

As described in Section 3.4.1.2 of this EIS, the SCM is not required to monitor NO_x or O_3 and the nearest monitoring station, located near Birney, Montana, was deactivated at the end of 2021. However, while the monitoring station was active between 2010 and 2021, none of the NO_2 and O_3 concentrations exceeded the NAAQS or MAAQS.

NO_x modeling at the SCM was completed in conjunction with the dispersion modeling in 2014. The model predicted that the maximum total annual NO_x emission rate would be 558.9 tons. This value was included in the SCM Montana air quality permit application submitted to MDEQ Air Quality Bureau for a revision to MAQP #1120-12 (CPE/Redhorse 2014). MDEQ determined that, based on the modeling analysis and past monitoring, the permit modification request would not likely substantially degrade air quality (MDEQ/PCD 2014).

Public exposure to NO_x and O_3 emissions caused by the Proposed Action is most likely to occur along publicly accessible roads and highways that pass through the area of the mining operations. Occupants of residences in the area could also be affected. Overall, the direct and indirect effects from NO_x and O_3 emissions resulting from the Proposed Action are expected to be minor to moderate and short-term.

4.4.2.1.2 Alternative 2 – Partial Mining

Under the Partial Mining alternative, the SCM would continue to mine the LBA1 tracts but mining would be limited to a 5-year term. The impacts would be the same type and intensity as described for the Proposed Action, but the duration of the impacts would be limited to 5 years. Any mining of Federal coal within the LBA1 tracts beyond this 5-year term would require reevaluation of the mining operations by OSMRE. The direct and indirect effects from NO_x and O_3 emissions resulting from the Partial Mining alternative are expected to be minor and short-term.

4.4.2.1.3 Alternative 3 – Accelerated Mining Rate

Under this alternative, the potential impacts from NO_x emissions would be greater than the Proposed Action because more blasting would occur on an annual basis under this alternative to mine the remaining LBA1 tracts coal within 2.2 years. These impacts would most likely affect those traveling along publicly accessible roads and highways that pass through the area of the mining operations and nearby residences. The potential impacts from O_3 emissions from the Accelerated Mining Rate alternative would be similar to the Proposed Action and would be minor to moderate and short-term.

4.4.2.1.4 Alternative 4 – No Action

Under the No Action alternative, the SCM would terminate Federal coal recovery operations within the boundaries of the LBA1 tracts. The SCM would proceed with reclamation of lands within the boundaries of the LBA1 tracts. Impacts from NO_x and O_3 emissions under the No Action alternative would be limited to the equipment used during active reclamation and would be minor and short-term.

4.4.2.2 Mitigation Measures

No mitigation measures beyond those required by the SCM Montana air quality permit would be required.

4.4.3 Transportation Diesel Emissions

4.4.3.1 Direct and Indirect Effects

4.4.3.1.1 Alternative 1 – Proposed Action

Under the Proposed Action, the SCM will continue to mine the LBA1 tracts at the annual production rate listed in Table 2.2-2. Estimated average annual non-GHG pollutant emissions for each transportation segment are provided in Table 4.4-2. The table assumes that 44% percent of the annual coal production will be transported to power plants in the U.S., 32% will be transported to the Westshore terminal in British Columbia, Canada, for vessel transport to Asia, and 24% will be transported to the MERC terminal in Superior, Wisconsin, for vessel transport to power plants located along the Great Lakes. The calculations are provided in Appendix A of this EIS.

Table 4.4-2 Estimated Average Annual Transportation Non-GHG Emissions (tons) – Proposed Action

Transport Type	PM_{10}	$PM_{2.5}$	NO_x	CO	VOC	SO_2	Hg	As	Pb
Worker Commute	0.003	0.003	0.037	2	0.09	NA	5.8E-08	2.3E-06	NA
Locomotive	24	23	934	204	29,157	0.72	NA	NA	NA
Terminal Handling									
Westshore	2	1	21	39	31	17	NA	NA	NA
MERC	1	1	16	29	23	13	NA	NA	NA
Vessel Shipments									
Overseas	27	25	116	48	20.40	332	1.1E-06	6.5E-04	3.2E-03
Great Lakes	1	1	5	2	0.90	15	4.7E-08	2.9E-05	1.4E-04
Total Emissions	**55**	**51**	**1,092**	**324**	**29,232**	**378**	**1.2E-06**	**6.8E-04**	**3.3E-03**

For comparison, Table 4.4-3 includes the national and Montana emissions from the 2020 NEI for mobile sources, including commercial marine vessels, non-road diesel equipment, and locomotives. The 2020 NEI data is the most recent NEI data that is currently available. The next NEI dataset for 2023 data will not be available until 2026.

Table 4.4-3 2020 Transportation Non-GHG Emissions (tons)

	Transport Type	PM_{10}	$PM_{2.5}$	NO_x	CO	VOC	SO_2	Hg	As	Pb
National	Locomotives	11,824	11,403	462,507	97,689	20,046	173	0.03	11	NA
	Non-Road Equipment – Diesel	45,176	43,628	654,389	300,416	57,320	277	8.0	0.05	NA
	Commercial Marine Vessels	5,574	5,314	240,086	31,518	9,522	4,713	NA	2.5	0.55
Montana	Locomotives	283	275	11,035	2,370	452	8	0.002	0.3	NA
	Non-Road Equipment – Diesel	616	598	7,831	3,694	675	4	0.03	NA	NA
	Commercial Marine Vessels	0	0	0	0	0	0	0	0	0

Source: EPA 2024f

A comparison of the Proposed Action transportation emissions to the 2020 national transportation emissions shows that the Proposed Action would contribute a small percentage of emissions to each transportation segment. Similarly, a comparison of the Proposed Action to the 2020 Montana transportation emissions shows that the Proposed Action would contribute a small percentage. Note that Montana does not include any commercial marine vessel emissions.

OSMRE has elected to quantify direct and indirect GHG emissions and evaluate these emissions, in part, in the context of national GHG emission inventories based on 100-year and 20-year time horizons, as described in Section 3.4.2 of this EIS. The estimated CO_2e emissions generated by transporting the coal via rail to final destinations at power plants and loading terminals and from overseas vessel transport for 2018 and 2020 were estimated in Section 3.4.2 of this EIS. The same variables were used to calculate annual average CO_2e emissions for the Proposed Action (Table 4.4-4). The estimated average annual CO_2e emissions for the Proposed Action were calculated using the estimated recoverable tons remaining in LBA1 tracts by year in Table 2.2-2. Calculations for each year are provided in Appendix A of this EIS and effects from GHG emissions are discussed in greater detail in section 4.4.5.

Table 4.4-4 Estimated Average Annual Transportation CO_2e Emissions (tons) – Proposed Action

Source	100-year Time Horizon	20-year Time Horizon
Worker Commute	465	465
Locomotive	78,603	78,927
Terminal Handling		
Westshore	51,003	51,003
MERC	38,252	38,252
Vessel Shipment		
Overseas	20,449	20,470
Great Lakes	904	905
Total CO_2e Emissions	**189,676**	**190,022**

Indirect effects related to transportation diesel emissions include impacts to human health and the environment. Exposure to diesel exhaust can cause health conditions in humans such as asthma and respiratory illnesses. Diesel engine emissions can also contribute to ground-level ozone, which has the potential to cause breathing problems, especially in people with asthma, children, and older adults, impair visibility, and damage vegetation, including crops.

EPA has various standards to reduce emissions from heavy duty diesel vehicles and engines. EPA regulates emissions from heavy equipment with diesel engines by adopting multiple tier emission standards. The program aims to reduce emissions by requiring emission control technologies on new engines. EPA has established tiered emissions standards that apply to locomotive engines based on the year of manufacture or remanufacture (40 C.F.R. Part 1033). The standards, which limit emissions of NO_x, particulate matter, hydrocarbons, and CO_2, establish four tiers of increasingly stringent limits for newer engines. The most stringent limits apply to engines manufactured in 2015 or later. Overall air pollutant emissions from locomotive fleets should decrease over time as older engines are retired and replaced with newer models.

Under current regulations (40 C.F.R. Part 1042) EPA has established domestic regulations for emissions from marine diesel engines. The emission standards vary by engine category and model year. The standards limit emissions of CO, particulate matter, NO_x, and hydrocarbons. In addition, the International Convention for the Prevention of Pollution from Ships (MARPOL), is concerned with preventing marine pollution from ships. Specifically, Annex VI of MARPOL addresses the prevention of air pollution from ships. The international air pollution requirements of Annex VI sets limits on So_x and NO_x emissions from ship exhausts and requires the use of fuel with lower sulfur content (EPA 2022b).

Overall impacts to air quality from diesel emissions associated with transportation of SCM coal are expected to be minor and short-term, lasting 15 to 16 years. In addition, emissions would be distributed over long distances and are transitory in nature. As discussed in Section 3.15.1 of this EIS, none of the rail routes pass through any Class I areas.

4.4.3.1.2 Alternative 2 – Partial Mining

Under the Partial Mining alternative, the SCM will continue to mine the remaining LBA1 tracts coal but would be limited to a 5-year term. For the purposes of this analysis, the average for years 2024 through 2028 are used; however, the actual start of the 5-year term will be dependent on the date of the ASLM decision. Table 4.4-5 provides the estimated average annual non-GHG pollutant emissions for each transportation segment for the 5-year term. The calculations are provided in Appendix A of this EIS.

Table 4.4-5 Estimated Average Annual Transportation Non-GHG Emissions (tons) – Partial Mining Alternative

Transport Type	PM_{10}	$PM_{2.5}$	NO_x	CO	VOC	SO_2	Hg	As	Pb
Worker Commute	0.005	0.005	0.057	3.1	0.14		8.9E-08	3.5E-06	NA
Locomotive	36	35	1,444	316	45,076	1.1	NA	NA	NA
Terminal Handling									
Westshore	3	2	32	60	47	26	NA	NA	NA
MERC	2	1	24	45	35	19	NA	NA	NA
Vessel Shipments									
Overseas	42	39	179	74	32	513	1.6E-06	1.0E-03	4.9E-03
Great Lakes	2	2	8	3	1.4	23	7.2E-08	4.5E-05	2.2E-04
Total Emissions	**85**	**79**	**1,687**	**501**	**45,192**	**582**	**1.8E-06**	**1.0E-03**	**5.1E-03**

The non-GHG transportation emissions are similar to the Proposed Action but limited to a 5-year term. Overall, the transportation emissions from the partial mining alternative would contribute a small percentage of 2020 National and Montana transportation emissions.

The estimated average annual CO_2e emissions for the Partial Mining alternative are provided in Table 4.4-6 and were calculated using the estimated recoverable tons remaining in LBA1 tracts for 2024 through 2028 in Table 2.2-2; however, the actual start of the 5-year term will be dependent on the date of the ASLM decision. Calculations for each year are provided in Appendix A of this

EIS. Indirect effects would be the same as the Proposed Action but would be limited to the 5-year term.

Table 4.4-6 Estimated Average Annual Transportation CO_2e Emissions (tons) – Partial Mining Alternative

Source	100-year Time Horizon	20-year Time Horizon
Worker Commute	719	719
Locomotive	121,518	122,018
Terminal Handling		
Westshore	78,848	78,848
MERC	59,136	59,136
Vessel Shipment		
Overseas	31,613	31,646
Great Lakes	1,397	1,399
Total CO_2e Emissions	**293,231**	**293,776**

4.4.3.1.3 Alternative 3 – Accelerated Mining Rate

Under this alternative, the SCM would produce and transport up to 18 Mt of LBA1 Federal coal annually. Estimated annual non-GHG pollutant emissions for each transportation segment is provided in Table 4.4-7. The calculations are provided in Appendix A of this EIS.

Table 4.4-7 Estimated Average Annual Transportation Non-GHG Emissions (tons) – Accelerated Mining Rate Alternative

Transport Type	PM_{10}	$PM_{2.5}$	NO_x	CO	VOC	SO_2	Hg	As	Pb
Worker Commute	0.018	0.018	0.20	11	0.48	NA	3.1E-07	1.2E-05	NA
Locomotive	125	122	4,974	1,088	155,232	4	NA	NA	NA
Terminal Handling									
Westshore	10	7	112	208	163	89	NA	NA	NA
MERC	7	5	84	156	122	67	NA	NA	NA
Vessel Shipments									
Overseas	146	135	616	253	109	1,768	5.6E-06	3.5E-03	1.7E-02
Great Lakes	6	6	27	11	4.8	78	2.5E-07	1.5E-04	7.4E-04
Total Emissions	**294**	**275**	**5,813**	**1,727**	**155,631**	**2,006**	**6.2E-06**	**3.7E-03**	**1.8E-02**

The per year non-GHG transportation emissions are the highest for this alternative because this alternative evaluates mining 18 Mt of LBA1 coal annually (see Table 2.2-2). However, compared to the 2020 national and Montana transportation emissions, the transportation emissions from the Accelerated Mining Rate alternative would still only contribute a small to moderate percentage.

The estimated average annual CO_2e emissions for the Accelerated Mining Rate alternative are provided in Table 4.4-8. Calculations are provided in Appendix A of this EIS.

Overall impacts to air quality from diesel emissions associated with transportation of SCM coal are expected to be moderate and short-term, lasting 2.2 years under the Accelerated Mining Rate alternative. Emissions would be distributed over long distances and are transitory in nature and, as discussed in Section 3.15.1 of this EIS, none of the rail routes pass through any Class I areas.

Table 4.4-8 Estimated Average Annual Transportation CO_2e Emissions (tons) – Accelerated Mining Rate Alternative

Source	100-year Time Horizon	20-year Time Horizon
Worker Commute	2,475	2,476
Locomotive	418,484	420,206
Terminal Handling		
Westshore	271,539	271,539
MERC	203,654	203,654
Vessel Shipment		
Overseas	108,870	108,984
Great Lakes	4,812	4,817
Total CO_2e Emissions	**1,009,834**	**1,011,676**

4.4.3.1.4 Alternative 4 – No Action

Under the No Action alternative, the SCM would terminate Federal coal recovery operations within the boundaries of the LBA1 tracts. The SCM would reclaim the lands within the boundaries of the LBA1 tracts. The No Action alternative would not cause impacts to air quality from diesel emissions associated with transportation of SCM coal.

4.4.3.2 Mitigation Measures

No mitigation measures beyond those required by EPA and international standards for international shipping would be required for diesel emissions from transportation.

4.4.4 Coal Combustion

4.4.4.1 Direct and Indirect Effects

4.4.4.1.1 Alternative 1 – Proposed Action

Estimated average annual pollutant emissions from the Proposed Action for power generation in the U.S., ROK, and Japan is provided in Table 4.4-9. The information and calculations are provided in Appendix A of this EIS.

Table 4.4-9 Estimated Ranges of Annual Coal Combustion Air Emissions (tons) – Proposed Action

	Emission Range	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	Pb	Hg	As
United States	Low	210	90	2060	2530	106	15	0.085	0.031	0.075
	High	57	53	527	506	8	1	0.004	0.005	0.004
ROK & Japan	Low	99	42	969	1190	50	7	0.040	0.015	0.035
	High	27	25	248	238	4	1	0.002	0.002	0.002

For comparison, Table 4.4-10 provides the national annual coal-fired power plant emissions for the U.S. from the 2020 NEI, the most recent year with data.

Table 4.4-10 2020 National Annual Coal Combustion Emissions (tons)

	PM_{10} (tons)	$PM_{2.5}$ (tons)	NO_x (tons)	SO_2 (tons)	CO (tons)	VOC (tons)	Pb (lbs)	Hg (lbs)	As (lbs)
2020	61,596	48,525	575,037	773,088	268,220	10,936	30,224	7,231	25,282

Source: EPA 2024f

Indirect effects of coal combustion include possible human health and environmental effects. Sulfur dioxide and particulate emissions have the potential to contribute to acid rain and respiratory illnesses, while nitrogen oxides and particulates can contribute to smog and respiratory illnesses. Carbon monoxide and VOCs can contribute to ozone formation. In addition, mercury, and other heavy metals (lead and arsenic) emissions have the potential to cause neurological and development delays in humans and animals.

Effects of most industrial source air pollutants are limited to the immediate area or, at most, the region surrounding the source. However, mercury emissions can have a global effect. Because it does not degrade in the environment, mercury emitted to the atmosphere eventually deposits onto land or water bodies. Through a series of chemical transformations and environmental transport processes, deposited mercury can eventually accumulate in the food chain (EPA 2017). Exposure to mercury threatens human health, with developing fetuses and young children most at risk. Mercury pollution can also harm wildlife and ecosystems (EPA 2024h).

Mercury's fate after it is emitted into the air depends primarily on its as-emitted chemical form and dispersion characteristics of the emitting source, such as stack height, and of the receiving atmosphere, such as wind currents. Depending on these factors, emitted mercury can travel thousands of miles in the atmosphere before eventually depositing in rainfall or in dry gaseous form. Recent estimates of annual global mercury emissions from anthropogenic sources are approximately 2,220 metric tpy (EPA 2024i).

In the U.S., mercury, and other HAP emissions from coal-fired power plants with a capacity of more than 25 MW are regulated by EPA's MATS rule. EPA (2024j) indicates that by 2017 mercury emissions dropped by 86 percent and acid gas HAP and non-mercury metals are down 96 percent and 81 percent, respectively, compared to 2010 levels. As domestic coal-fired power plants have worked to comply with these standards, mercury controls have also progressed and are available for coal-fired generation plants of various designs and ages in Japan and the ROK.

Overall impacts to air quality from coal combustion emissions associated with SCM coal are expected to be short-term, lasting 15 to 16 years. Typically, OSMRE would evaluate the emissions from coal combustion in conjunction with the surrounding background air quality relative to the locally enforceable air quality standards. For this action, OSMRE does not know the exact location of the final coal combustion with enough certainty to conduct such an analysis. Pursuant to 40 C.F.R. 1502.21(c) OSMRE is disclosing that this information is unavailable. That said, as described in Section 3.4.4 of this EIS, combustion emissions at power plants in the U.S. Japan and ROK are subject to air quality control laws designed to ensure emissions and resultant air quality are within acceptable regulatory limits considered protective of human health and the environment. It is therefore reasonable to assume that impacts to air quality from coal combustion are likely to be moderate.

Estimated annual CO_2e emissions from coal combustion from the Proposed Action are provided in Table 4.4-11. As described above, OSMRE has elected to quantify direct and indirect GHG emissions and evaluate these emissions in the context of national GHG emission inventories based on 100-year and 20-year time horizons. The estimated CO_2e emissions generated by combustion of coal mined at the SCM for 2018 and 2020 were estimated in Section 3.4.4 of this EIS. The same variables were used to calculate annual CO_2e emissions for 2024-2039. The estimated annual CO_2e emissions for the Proposed Action were based on the annual average LBA1 coal production from Table 2.2-2 (2.5 Mtpy). Calculations are provided in Appendix A of this EIS, and effects from GHG emissions are discussed in greater detail in section 4.4.5.

Table 4.4-11 Estimated Average Annual Coal Combustion CO_2e Emissions (tons) – Proposed Action

Source	100-year Time Horizon	20-year Time Horizon
Coal Combustion	3,598,612	3,628,443

According to the EPA in 2020 (the most recent year of available data), estimated CO_2e emissions from fossil fuel combustion by coal to generate electric power in the U.S. totaled 835.6 million metric tons (MMT)(EPA 2024g). Using the 2020 U.S. estimate for comparison purposes, the estimated annual 100-year CO_2e contribution from combustion of coal mined from the LBA1 tracts would be approximately 0.4 percent of the 2020 U.S. total.

4.4.4.1.2 Alternative 2 – Partial Mining

Under the Partial Mining alternative, the SCM would be limited to mining coal in the LBA1 tracts to a 5-year term. Estimated average annual pollutant emissions related to LBA1 tracts coal combustion for power generation in the U.S., ROK, and Japan for the Partial Mining alternative are provided in Table 4.4-12 and were calculated using the estimated recoverable tons remaining in LBA1 tracts for 2024 through 2028 in Table 2.2-2; however, the actual start of the 5-year term would be dependent on the date of the ASLM decision. The information and calculations are provided in Appendix A of this EIS.

Table 4.4-12 Estimated Ranges of Annual Coal Combustion Air Emissions (tons) – Partial Mining Alternative

	Emission Range	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	Pb	Hg	As
United States	Low	325	139	3,184	3,911	164	23	0.131	0.048	0.116
	High	88	82	814	782	13	2	0.007	0.008	0.006
ROK & Japan	Low	153	65	1,498	1,840	77	11	0.062	0.023	0.054
	High	41	38	383	368	6	1	0.003	0.004	0.003

The average annual emissions from this alternative are higher than the Proposed Action because the average annual coal production during the 5-year term would be 3.86 Mtpy, compared to 2.5 Mtpy under the Proposed Action. Overall, the emissions would be minor compared to the national annual coal-fired power plant emissions for the U.S. from the 2020 NEI.

Overall impacts to air quality from coal combustion emissions associated with SCM coal under the Partial Mining alternative are expected to be short-term, lasting 5 years. Typically, OSMRE would evaluate the emissions from coal combustion in conjunction with the surrounding background air quality relative to the locally enforceable air quality standards. For this action, OSMRE does not know the exact location of the final coal combustion with enough certainty to conduct such an analysis. Pursuant to 40 C.F.R. 1502.21(c), OSMRE is disclosing that this information is unavailable. That said, as described in Section 3.4.4 of this EIS, combustion emissions at power plants in the U.S., Japan, and ROK are subject to air quality control laws designed to ensure emissions and resultant air quality are within acceptable regulatory limits considered protective of human health and the environment. It is therefore reasonable to assume that impacts to air quality from coal combustion are likely to be moderate.

Estimated average annual CO_2e emissions from coal combustion for the Partial Mining alternative are provided in Table 4.4-13 and were calculated using the estimated recoverable tons remaining in LBA1 tracts for 2024 through 2028 in Table 2.2-2; however, the actual start of the 5-year term would be dependent on the date of the ASLM decision.

Table 4.4-13 Estimated Average Annual Coal Combustion CO_2e Emissions (tons) – Partial Mining Alternative

Source	100-year Time Horizon	20-year Time Horizon
Coal Combustion	5,563,308	5,609,425

Using the 2020 U.S. estimate for comparison purposes, the estimated annual 100-year CO_2e contribution from combustion of coal mined from the LBA1 tracts under the Partial Mining alternative would be approximately 0.6 percent of the 2020 U.S. total. Calculations are provided in Appendix A of this EIS, and effects from GHG emissions are discussed in greater detail in section 4.4.5.

4.4.4.1.3 Alternative 3 – Accelerated Mining Rate

Under the Accelerated Mining Rate alternative, the SCM would mine the LBA1 tract coal at a rate of 18 Mtpy. Table 4.4-14 provides the estimated average annual pollutant emissions related coal combustion for power generation in the U.S., ROK, and Japan. Calculations are provided in Appendix A of this EIS.

Table 4.4-14 Estimated Ranges of Annual Coal Combustion Air Emissions(tons) – Accelerated Mining Rate Alternative

	Emission Range	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	Pb	Hg	As
United States	Low	1,119	479	10,966	13,468	565	79	0.452	0.166	0.398
	High	302	281	2,804	2,694	45	6	0.023	0.027	0.020
ROK & Japan	Low	527	226	5,160	6,338	266	37	0.213	0.078	0.187
	High	142	132	1,319	1,268	21	3	0.011	0.013	0.009

The average annual emissions from this alternative are highest because all the coal in the LBA1 tracts would be mined at a higher rate compared to the Proposed Action and the Partial Mining Alternative.

Overall impacts to air quality from coal combustion emissions associated with SCM coal under the accelerated mining alternative are expected to be short-term, lasting 2.2 years. Typically, OSMRE would evaluate the emissions from coal combustion in conjunction with the surrounding background air quality relative to the locally enforceable air quality standards. For this action, OSMRE does not know the exact location of the final coal combustion with enough certainty to conduct such an analysis. Pursuant to 40 C.F.R. 1502.21(c) OSMRE is disclosing that this information is unavailable. That said, as described in Section 3.4.4 of this EIS, combustion emissions at power plants in the U.S. Japan and ROK are subject to air quality control laws designed to ensure emissions and resultant air quality are within acceptable regulatory limits considered protective of human health and the environment. It is therefore reasonable to assume that impacts to air quality from coal combustion are likely to be moderate.

Estimated annual CO_2e emissions from coal combustion from the Accelerated Mining Rate alternative are provided in Table 4.4-15.

Table 4.4-15 Estimated Average Annual Coal Combustion CO_2e Emissions (tons) – Accelerated Mining Rate Alternative

Source	100-year Time Horizon	20-year Time Horizon
Coal Combustion	19,158,984	19,317,803

Using the 2020 U.S. estimate for comparison purposes, the estimated annual 100-year CO_2e contribution from combustion of coal mined from the LBA1 tracts under the Accelerated Mining Rate alternative would be approximately 2.1 percent of the 2020 U.S. total. Calculations are provided in Appendix A of this EIS, and effects from GHG emissions are discussed in greater detail in section 4.4.5.

4.4.4.1.4 Alternative 4 – No Action

Under the No Action alternative, the SCM would terminate Federal coal recovery operations within the boundaries of the LBA1 tracts. The SCM would proceed with reclamation of lands within the boundaries of the LBA1 tracts. Because no additional coal within the LBA1 tracts would be mined under the No Action alternative, the impacts from combustion emissions would be negligible.

4.4.4.2 Mitigation Measures

No mitigation measures beyond those required by the state, federal, and other government permits would be required for emissions from coal combustion.

4.4.5 Climate Change and Social Cost of Greenhouse Gases

Tables 4.4-16 through 4.4-18 summarize the average annual GHG emissions for each alternative, including the 100-year and 20-year GWPs. The tables show that the annual GHG emissions are dependent on the annual coal production. Under the Proposed Action the GHG emissions would be spread over 15 to 16 years, while Alternative 2 would only mine a portion of the LBA1 tract coal and emissions would be limited to 5 years. The average annual GHG emissions for the Partial Mining alternative were calculated using the estimated recoverable tons remaining in LBA1 tracts for 2024 through 2028 (Table 2.2-2); however, the actual start of the 5-year term would be dependent on the date of the ASLM decision. Alternative 3 assumes that all the LBA1 tract coal would be mined within 2.2 years, leading to the largest annual emissions but with a shorter duration than Alternatives 1 and 2. It should be noted that reclamation was not included in the GHG emissions for any of the alternatives. In all cases the reclamation GHG emissions would be similar but less than the mining GHG emissions because less equipment would be used. Additionally, a summary table for Alternative 4 is not provided since the GHG emission would be zero. Impacts from mining the other non-Federal, State, and Private coal at the SCM are discussed in Chapter 5.

Consistent with the CEQ's 2023 Climate Change Guidance, the following translates the GHG emissions in CO_2e terms for each alternative into equivalencies. Table 4.4-16 estimates that the Proposed Action (Alternative 1) would contribute approximately 3.77 Mt CO_2e per year for 15-16 years, which is equivalent to 797,893 gasoline powered passenger vehicles driven for 15-16 years. Under the Partial Mining Alternative (Table 4.4-17), the annual CO_2e would be approximately 5.83 Mt per year for 5 years, which is equivalent to 1,233,511 gasoline powered passenger vehicles driven for 5 years. The Accelerated Rate Mining Alternative (Table 4.4-18) would contribute approximately 20.1 Mt CO_2e per year for 2.2 years, which is equivalent to 4,247,978 gasoline powered passenger vehicles driven for 2.2 years. It should be noted that in all cases, the majority (94%) of the CO_2e emissions are from coal combustion.

Table 4.4-16 Summary for Potential Annual GHG Emissions (tons) – Proposed Action

Segment	CO_2	CH_4	N_2O	100-Yr GWP CO_2e	20-Yr GWP CO_2e
Worker transport	464	0.004	0.002	465	465
Mine operations	21,663	405	17	38,236	59,569
Rail transport	77,876	6.1	2.0	78,603	78,927
Terminal Handling					
Westshore	NA	NA	NA	51,003	51,003
MERC	NA	NA	NA	38,252	38,252
Vessel Shipment					
Overseas	20,168	0.41	0.87	20,449	20,470
MERC	891	0.02	0.04	904	905
Coal combustion	3,559,266	566	82	3,598,612	3,628,443
Total	**3,680,328**	**977**	**102**	**3,826,524**	**3,878,034**

Table 4.4-17 Summary for Potential Annual GHG Emissions (tons) – Partial Mining Alternative

Segment	CO_2	CH_4	N_2O	100-Yr GWP CO_2e	20-Yr GWP CO_2e
Worker transport	718	0.006	0.004	719	719
Mine operations	33,490	625.787	25.542	59,112	92,091
Rail transport	120,393	9.489	3.084	121,518	122,018
Terminal Handling					
Westshore	NA	NA	NA	78,848	78,848
MERC	NA	NA	NA	59,136	59,136
Vessel Shipment					
Overseas	31,178	0.631	0.868	31,613	31,646
MERC	1,378	0.028	0.067	1,397	1,399
Coal combustion	5,502,481	875.092	127.286	5,563,308	5,609,425
Total	**5,689,638**	**1,511**	**157**	**5,915,651**	**5,995,283**

Table 4.4-18 Summary for Potential Annual GHG Emissions (tons) – Accelerated Mining Rate Alternative

Segment	CO_2	CH_4	N_2O	100-Yr GWP CO_2e	20-Yr GWP CO_2e
Worker transport	2,471	0.021	0.013	2,475	2,476
Mine operations	115,334	2,155	88	203,570	317,143
Rail transport	414,611	33	11	418,484	420,206
Terminal Handling					
Westshore	NA	NA	NA	271,539	271,539
MERC	NA	NA	NA	203,654	203,654
Vessel Shipment					
Overseas	107,372	2.2	5.2	108,870	108,984
MERC	4,746	0.10	0.23	4,812	4,817
Coal combustion	18,949,508	3,014	438	19,158,984	19,317,803
Total	**19,594,041**	**5,204**	**542**	**20,372,388**	**20,646,624**

4.4.5.1 Trends in Global, United States, and Montana Greenhouse Gas Emissions

4.4.5.1.1 Emission Levels

Preliminary estimates from the Rhodium Group for 2022 show global emissions at 50.6 gigatons (Gt) of CO_2e, representing a 1.1% increase from 2021 levels. Global emissions dropped in 2020 primarily due to the COVID-19 pandemic and a global recession. In 2022, China accounted for 26% of all global emissions, the U.S. accounted for approximately 12% of global GHG emissions, while India and the European Union accounted for 7% each. In 2021 (the latest year for which there is sufficient data to provide sectoral level detail) GHGs were emitted across the following primary economic sectors globally: industry (29%); electric power generation (29%); land use, agriculture, and waste (20%); transportation (15%); and buildings (7%) (Rivera et. al. 2023). Annual emissions from mining, rail transport, vessel shipment, and combustion attributable to the Proposed Action are expected to be approximately 0.007% of global emissions.

GHG emissions in the U.S. are tracked by the EPA through two complementary programs. First is the Inventory of U.S. Greenhouse Gases and Sinks, which is the annual U.S. GHG emissions inventory published by EPA that represents all U.S. emissions (EPA 2022a). The second is the Greenhouse Gas Reporting Program (GHGRP), which generally applies to facilities that emit more than 25,000 MMT of CO_2e each year. The facility level emissions reported under GHGRP are published through the Facility Level Information on Greenhouse Gases Tool (FLIGHT) (EPA 2024g). EPA estimates that the FLIGHT data reported by large emitters reflect 85% to 90% of the total U.S. emissions.

In 2020, total gross U.S. GHG emissions were 5,981 MMT CO_2e, and net emissions were 5,222 MMT CO_2e. Net GHG emissions include both anthropogenic and natural emissions of GHGs as well as removals by sinks (e.g., carbon uptake by forests). From 2005 to 2020, net GHG emissions in the U.S. declined 21%. This decline reflects the combined impacts of long-term trends in population and economic growth, energy markets, technological changes including energy efficiency, and energy fuel choices. Net GHG emissions decreased from 2019 to 2020 by 11%. The primary driver for the decrease was an 11% decrease in CO_2 emissions from fossil fuel combustion, primarily due to a 13% decrease in transportation emissions and a 10% decrease in electric power sector emissions, reflecting both a decrease in demand from the COVID-19 pandemic and a continued shift from coal to less carbon intensive natural gas and renewables. CO_2 is the primary GHG contributing to total U.S. emissions, accounting for 79% of the total GHG emissions in 2020. By comparison, CH_4 accounted for 11%, N_2O accounted for 7% of emissions and fluorinated gases accounted for nearly 3% of emissions. In 2020, GHGs were emitted across the following primary economic sectors in the U.S.: transportation (27%), electric power/electricity generation (25%), industry (24%), agriculture (11%) residential homes (7%), and commercial businesses (6%) (EPA 2022a). Under the Proposed Action, annual CO_2e emissions are expected to be approximately 0.06% of U.S. emissions.

In 2022, total Montana GHG emissions were 17.6 MMT CO_2e. GHGs were emitted across the following primary economic sectors in Montana: electric power/electricity generation (75%), refineries (11%), mineral mining (6%), chemicals (5%), waste management (2%), and other sources (1%) (EPA 2024g). The Proposed Action would only contribute worker commute and mining emissions, which would total approximately 0.3% of the annual Montana GHG emissions.

Federal lands are responsible for GHG emissions from activities such as fossil fuel extraction and combustion, as well as carbon sequestration, which is the process of capturing and storing atmospheric CO_2 through uptake into soils, vegetation, aquatic environments, and other ecosystems (biologic sequestration) or through injection into porous underground rock formations (geologic sequestration). The U.S. Geological Survey (USGS) has estimated GHG emissions and carbon sequestration on Federal lands for the 10-year period from 2005 to 2014 (Merrill et. al. 2018). GHG emissions (when considering just CO_2) associated with the combustion and extraction of fossil fuels from U.S. Federal lands increased from 1,362 MMT CO_2e in 2005, to 1,429 MMT CO_2e in 2010, and then decreased to 1,279 MMT CO_2e in 2014. CH_4 and N_2O emissions from Federal lands also decreased over the same 10-year period. When the Federal lands' fossil fuel extraction and combustion emissions are combined with ecosystem emissions and sequestration estimates, the annual net carbon emissions from Federal lands within the conterminous U.S. (48 contiguous states) ranged from 683 MMT CO_2e to 783.5 MMT CO_2e from 2005 to 2014, indicating a net increase in carbon emission from Federal lands within the conterminous U.S. The annual net carbon emissions from Montana Federal lands ranged from 15.6 MMT CO_2e to 20.2 MMT CO_2e from 2005 to

2014, indicating a net increase in carbon emissions from Montana Federal lands (Merrill et. al. 2018).

The BLM Specialist Report on Annual Greenhouse Gas Emissions and Climate Trends presents the estimated emissions of GHGs attributable to fossil fuels produced on lands and mineral estate managed by the BLM. More specifically, the report estimates GHG emissions from coal, oil, and gas development that is occurring, and is projected to occur, on the federal onshore mineral estate. BLM estimated a total of 1,201 Mt CO_2e from all coal production on Federal lands in 2022 and 30.5 Mt CO_2e from all coal production on Federal lands in Montana in 2022 (BLM 2023). The Proposed Action's annual emissions represent approximately 0.3% of national 2022 Federal coal emissions, and 12.0% of Montana's 2022 federal coal emissions. The Partial Mining alternative's annual emissions represent approximately 0.5% of national 2022 Federal coal emissions, and 12.6% of Montana's 2022 federal coal emissions. The Partial Mining alternative's annual emissions represent approximately 0.5% of the national 2022 Federal coal emissions and 19.4% of Montana's 2022 federal coal emissions. The Accelerated Mining Rate alternative's annual emissions represent approximately 1.7% of national 2022 Federal coal emissions, and 66.8% of Montana's 2022 federal coal emissions.

4.4.5.1.2 National Emission Goals

The IPCC Special Report Global Warming of 1.5°C estimates with high confidence that to limit global warming to 1.5 °C, global GHG emissions in 2030 would need to be 40% to 50% lower than 2010 emissions (IPCC 2021). Based on the IPCC findings, the United Nations Environment Programme (UNEP) Emissions Gap Report estimates global GHG emissions in 2030 would need to be 55% lower than currently projected 2030 emissions to limit global warming to 1.5°C and would need to be 30% lower in order to limit warming to 2°C (UNEP 2021). The Paris Agreement is a legally binding international climate change treaty designed to encourage individual countries to pledge specific emissions reductions so that the world can meet the necessary GHG reduction levels to limit global warming to 1.5°C (UN 2022).

The United States National Climate Task Force (NCTF) was established on January 27, 2021, by the EO on Tackling the Climate Crisis at Home and Abroad (EO 14008). EO 14008 was issued to facilitate the organization and deployment of a government-wide approach to combat the climate crisis. The NCTF performed an analysis of potential and measured impacts of various policies and measures (both potential and existing) at all levels of government and in all relevant sectors to develop the U.S. national determined contribution (NDC) under the Paris Agreement. This analysis was conducted using input from all federal government agencies as well as other stakeholders, such as scientists, activists, local and state governments, and various local institutions. For the industrial sector, the NDC outlines that the U.S. government will support research on and implementation of very low- and zero-carbon industrial processes and products, including introducing these products to market. The U.S. government will also incentivize carbon capture, utilization, and storage (CCUS) and the use of new sources of hydrogen for powering industrial facilities (UNFCCC 2021).

The U.S. NDC established an economy-wide target of reducing U.S. net GHG emissions by 50% to 52% below 2005 levels in 2030 (UNFCCC 2021). The U.S. also established the goal of net-zero emissions no later than 2050 and 100% carbon pollution-free electricity by 2035 (White House 2021 and EO 14057). In 2020, U.S. net GHG emissions totaled 5,222 MMT CO_2e, representing a 21% emissions reduction below the 2005 level (EPA 2022a). The U.S. is broadly on-track to meet the 2025 goal of 26% to 28% emissions reductions below 2005 levels (UNFCCC 2021). On August 16, 2022, President Biden signed the Inflation Reduction Act of 2022 (IRA) into law, which is the single largest action ever taken by the United States government to combat climate change. The IRA included several additional economic incentives to support the development of CCUS (White House 2022). However, it should be acknowledged that at this time, CCUS is not yet adequately developed or deployed to fully mitigate all GHGs associated with electricity generation from coal. According to analysis from the Rhodium Group, the net result of all the provisions in the IRA is anticipated to help U.S. net GHG emissions decline to 32-42% below 2005 levels in 2030, which represents a substantial step towards its goals, but still short of the climate target of 50-52% below 2005 levels by 2030 (Larsen et. al. 2022).

The net U.S. emissions in 2005 were 6,635 MMT CO_2e (UNFCCC 2021); therefore, the 2030 net emissions goals are estimated to be between approximately 3,185 and 3,318 MMT CO_2e. Comparing the 2020 net GHG emissions of 5,222 MMT CO_2e to the low end of the 2030 estimated emissions of 3,185 MMT CO_2e shows that annual net U.S. GHG emissions must be reduced by 2,037 MMT CO_2e between 2020 and 2030. Under the Proposed Action, 3.8 MMT CO2e would be emitted annually from 2024 to 2039, representing approximately 0.2% of the necessary emissions reduction of 2,037 MMT CO_2e to meet the 2030 emissions goals.

4.4.5.1.3 Montana Emission Goals

In 2023, Montana was awarded a four-year $3 million planning grant under the EPA’s Climate Pollution Reduction Grant (CPRG) program (MDEQ 2024b). Montana’s Governor Gianforte designated MDEQ as the lead agency to oversee the planning and coordination involved in this program. In collaboration with various state agencies and stakeholders, MDEQ developed the Montana Climate Pollution Reduction Priorities Plan which was published in March 2024 and submitted to the EPA. The Plan identifies pollution reduction measures that are eligible for federal funding under the next phase of the EPA’s CPRG program, including improving forest management, expanding urban and community forests, mitigating coal seam fires, and supporting local initiatives to improve soil health and reduce pollution from agriculture. In October 2024, Montana was awarded a $49.7 million implementation grant from the EPA’s CRPG program. Using these funds, MDEQ is developing the Big Sky Emissions Roadmap, a comprehensive plan built on Montana’s existing climate strategies and priorities, due December 2025.

One of the priority measures identified in Montana’s Pollution Reduction Priorities Plan is mitigating and extinguishing coal seam fires. These underground fires act as uncontrolled point sources of harmful GHGs, including CO_2, CH_4, and N_2O. Increasing drought and dry conditions allow the seams to easily catch fire and then continue burning underground. In 2021, it was estimated that 60% of Rosebud County’s roughly 70 wildland fires were ignited by coal seams. An estimated $10 million of Montana’s awarded CPRG grant will be used to build upon existing coal seam fire data and expertise, collaborative mapping initiatives, and mitigating and extinguishing actively burning coal seams, which often requires specialized equipment and techniques and can be cost-prohibitive for many communities.

4.4.5.1.4 Carbon Budget

The global carbon budget is an estimate for the total amount of anthropogenic CO_2 that can be emitted to have a certain chance of limiting the global average temperature increase to below 2 degrees Celsius (°C), or 3.6 F, relative to preindustrial levels. The U.S. does not currently have a carbon budget to compare to the Proposed Action’s potential emissions. While a global carbon budget does exist, a comparison of the Proposed Action’s emissions to the global carbon budget would not be useful given the relative size of the global carbon budget. This EIS however includes a discussion of the global carbon budget for background. IPCC estimates that if cumulative global CO_2 emissions from 1870 onwards are limited to approximately 1,000 Gt of carbon (3,670 Gt CO_2), then the probability of limiting the temperature increase to below 2°C (3.6°F) is greater than 66 percent (IPCC 2014). Since this IPCC report was published, various studies have produced differing estimates of the remaining global carbon budget; some estimates have been larger (Millar et al. 2017) and others have been smaller (Mitchel et al. 2018). Most notably, the IPCC Sixth Assessment Report (IPCC 2021) detailed the implications of methodological advancements in estimating the remaining carbon budget. The report concluded that, due to a variety of factors, estimates for limiting warming to 2°C (3.6°F) are about 11 to 14 Gt of carbon (40 to 50 Gt CO_2) higher than estimates in the IPCC Fifth Assessment Report IPCC 2014). In other words, the global carbon budget presented in IPCC Sixth Assessment Report was slightly larger than would have been expected based on the Fifth Assessment Report global carbon budget. Estimates of the remaining global carbon budget vary depending on a range of factors, such as the assumed conditions and the climate model used (Rogelj et al. 2019). Because of underlying uncertainties and assumptions, no one number for the remaining global carbon budget can be considered definite.

Using IPCC's estimated carbon budget in Sixth Assessment Report, as of 2019, approximately 655 Gt of carbon (2,403 Gt CO_2) of this budget has already been emitted, leaving a remaining global budget of 358 Gt of carbon (1,313 Gt CO_2) (IPCC 2021). The emissions reductions needed to keep global emissions within this carbon budget would require dramatic reductions in all United States sectors, as well as from the rest of the world. Even with the full implementation of global emissions reduction commitments to date, global emissions in 2030 would still be roughly 11 Gt CO_2e higher than what is consistent with a scenario that limits warming to 2°C [3.6°F] from preindustrial levels (UNEP 2021).

4.4.5.2 Social Cost of Greenhouse Gases

The social cost of carbon (SC-CO_2), social cost of nitrous oxide (SC-N_2O), and social cost of methane (SC-CH_4), collectively referred to as the "social cost of greenhouse gases" (SC-GHG) are estimates of the monetized damages associated with incremental increases in GHG emissions each year.

On January 20, 2021, President Biden issued EO 13990, *Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis.*[a] Section 1 of EO 13990 establishes an Administration policy to, among other things, listen to the science; improve public health and protect our environment; ensure access to clean air and water; reduce GHG emissions; and bolster resilience to the impacts of climate change. Section 2 of the EO calls for Federal agencies to review existing regulations and policies issued between January 20, 2017, and January 20, 2021, for consistency with the policy articulated in the EO and to take appropriate action.

4.4.5.2.1 Social Cost of Greenhouse Gases Analysis Published in the Draft EIS

Consistent with EO 13990, the CEQ issued interim National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change (2023 GHG Guidance).[b] The guidance recommends that agencies provide additional context for GHG emissions, including through the use of the best available SC-GHG estimates, to translate climate impacts into the more accessible metric of dollars, allow decision-makers and the public to make comparisons, help evaluate the significance of an action's climate change effects, and better understand the tradeoffs associated with an action and its alternatives.

At the time of the publication of the draft EIS in September 2024, the best available estimates of the SC-GHG were the interim estimates developed by the Interagency Working Group (IWG) on the SC-GHG. Select estimates are published in the Technical Support Document (IWG 2021) and the complete set of annual estimates are available on the Office of Management and Budget's website.[c]

The SC-GHG estimates published in the draft EIS followed the IWG's recommendations and are available in Appendix B of this final EIS.

a 86 FR 7037 (January 25, 2021)
b 88 FR 1196 (Jan. 9, 2023)
c https://www.whitehouse.gov/omb/information-regulatory-affairs/regulatory-matters/#scghgs

4.4.5.2.2 Updated Social Cost of Greenhouse Gases Analysis

In November 2023, the EPA published its *Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances* (EPA 2023). This report provides updated estimates of the SC-GHGs that reflect advancements in the scientific literature on climate change and its economic impacts and incorporates recommendations made by the National Academies of Science, Engineering, and Medicine (National Academies 2017). The methodologies used in the report allow for a more holistic treatment of uncertainty than in past estimates by the EPA.

The SC-GHG estimates include the value of all future climate change impacts (both negative and positive), including changes in net agricultural productivity, human health effects, property damage from increased flood risk, changes in the frequency and severity of natural disasters, disruption of energy systems, risk of conflict, environmental migration, and the value of ecosystem services. Uncertainty in the starting rate is addressed by using three near-term target rates (1.5%, 2.0%, and 2.5%) based on multiple lines of evidence on observed real market interest rates. This approach results in dynamic discount rate paths and is consistent with the National Academies (2017) recommendation to use three sets of Ramsey parameters that reflect a range of near-term certainty-equivalent discount rates and are consistent with theory and empirical evidence on consumption rate uncertainty.

In October 2024, DOI issued a determination that the EPA report estimates of SC-GHG constitute the best available science for the purposes of Departmental decision-making and/or analysis and directed all DOI bureaus to immediately begin calculating SC-GHG using those estimates.

In accordance with the DOI memorandum, the updated SC-GHG estimates presented in this final EIS were calculated using the EPA report. It should be noted that SC-GHG estimates do not include the contribution from terminal emissions because the emissions were based on CO_2e reported in the 2021 Westshore Terminal Air Emissions Inventory (EnviroChem 2021). Emissions for CO_2, CH_4, and N_2O were not included in the report and, therefore, could not be entered into the EPA's SC-GHG workbook to calculate SC-GHGs.

4.4.5.3 Alternative 1 – Proposed Action

Under the Proposed Action, the SCM would mine the remaining 39.9 Mt of mineable Federal coal within the LBA1 tracts through 2039 at an annual rate based on the LOM mining sequence (see Table 2.2-2). The SC-GHGs associated with estimated emissions from future potential development are reported in Table 4.4-19. These estimates represent the present value (from the perspective of future market and nonmarket costs associated with CO_2, CH_4, and N_2O emissions). Estimates were calculated using EPA Workbook for Applying SC-GHG Estimates v1.0.1 (EPA 2024l) along with the ton of CO_2, CH_4, and N_2O emissions for each year. The estimates assume emissions will start in 2024 and end in 2039, based on the current mining plan.

Table 4.4-19 Present Value (millions, 2023$) of GHG Emission Changes – Proposed Action

Social Cost Metric	2.5% Discount Rate	2.0% Discount Rate	1.5% Discount Rate
SC-CO_2	$8,505.60	$13,965.07	$24,017.93
SC-CH_4	$29.86	$38.41	$52.23
SC-N_2O	$72.83	$111.25	$177.84
Total	**$8,608.28**	**$14,114.73**	**$24,247.99**

4.4.5.4 Alternative 2 – Partial Mining

Under the Partial Mining alternative, the SCM would be limited to mining the Federal coal within the LBA1 tracts to a 5-year term at the annual rate in the current mining plan (see Table 2.2-2).

The SC-GHGs associated with estimated emissions from the Partial Mining alternative are reported in Table 4.4-20. These estimates were calculated using the methods described in Section 4.4.5.3. The estimates assume emissions will start in 2024 and end in 2028; however, the actual start of the 5-year term will be dependent on the date of the ASLM decision. Any mining of Federal coal within the LBA1 tracts beyond this 5-year term would require reevaluation of the mining operations by OSMRE.

Table 4.4-20 Present Value (millions, 2023$) of GHG Emission Changes – Partial Mining Alternative

Social Cost Metric	2.5% Discount Rate	2.0% Discount Rate	1.5% Discount Rate
SC-CO_2	$4,179.11	$6,829.22	$11,694.22
SC-CH_4	$13.85	$17.73	$24.07
SC-N_2O	$35.42	$53.77	$85.50
Total	**$4,228.37**	**$6,900.72**	**$11,803.79**

4.4.5.5 Alternative 3 – Accelerated Mining Rate

Under the Accelerated Mining Rate alternative, the SCM would mine the remaining Federal coal within the LBA1 tracts at a rate of 18 Mtpy. Under this alternative, all of the LBA1 tracts coal would be mined in 2.2 years. The SC-GHGs associated with estimated emissions from the Accelerated Mining Rate alternative are reported in Table 4.4-21. These estimates were calculated using the methods described in Section 4.4.5.3. The estimates assume emissions will start in 2024 and end in 2026.

Table 4.4-21 Present Value (millions, 2023$) of GHG Emission Changes – Accelerated Mining Rate Alternative

Social Cost Metric	2.5% Discount Rate	2.0% Discount Rate	1.5% Discount Rate
SC-CO_2	$8,684.77	$14,172.73	$24,228.82
SC-CH_4	$27.92	$35.73	$48.54
SC-N_2O	$73.65	$111.53	$176.99
Total	**$8,786.34**	**$14,319.99**	**$24,454.35**

4.4.5.6 Alternative 4 – No Action

Under the No Action alternative, the SCM would terminate Federal coal recovery operations within the boundaries of the LBA1 tracts. The SCM would proceed with reclamation of lands within the boundaries of the LBA1 tracts. The SC-GHGs would be reduced by the amounts provided in Tables 4.4-19 through 4.4-21 of this EIS.

4.4.5.7 Unavoidable Adverse, Irretrievable, and Irreversible Effects

The SCM does not currently employ any CCUS technology, and there are no permit requirements to employ CCUS or reduce GHG emissions through other means; therefore, GHG emissions from the Proposed Action and their contribution to cumulative GHG levels and climate change are unavoidable and irretrievable throughout the life of the mine. Cumulative climate change impacts may be irreversible, depending on what future steps are taken to address future cumulative GHG emissions worldwide, i.e., if the world is unable to limit GHG emissions, climate change impacts may be irreversible.

4.4.5.8 Climate Change Conclusions

Annual GHG emissions from mining, rail transport, vessel shipment, and combustion will contribute to climate change for each alternative. Under the Proposed Action, average annual emissions from mining, rail transport, vessel shipment, and combustion would be slightly less than the Accelerated Mining Rate alternative and more than the Partial Mining alternative. Annual GHG emissions for the Partial Mining alternative would be roughly half of the emissions for the Proposed Action because the mining would be limited to a 5-year term. The Accelerated Mining Rate alternative would have the greatest impact on annual GHG emissions because coal would be mined at a faster rate. Overall, the total SC-GHG associated with emissions from mining, commuting, transportation, and combustion would vary from a low of $0 (Alternative 4) to a high of $8,786.34 million (Alternative 3) assuming a 2.5% discount rate.

There are currently no set specific thresholds for allowable GHG emissions, therefore, it is not possible to determine if any of the alternatives would significantly impact global GHG emissions on their own; however, all anthropogenic GHG emissions may cumulatively have a significant impact on global climate change.

4.5 Hydrology

4.5.1 Groundwater

4.5.1.1 Direct and Indirect Effects

4.5.1.1.1 Alternative 1 – Proposed Action

The mining process will involve removing the coal aquifer and any overlying alluvial aquifers and overburden. The removed aquifer materials will be replaced with backfilled overburden material. If any of the overburden or alluvial aquifer is critical to the hydrologic balance in the area, essential hydrologic functions will only be restored by reestablishing the aquifer. This can be accomplished by selectively salvaging and replacing removed materials. In general, the permeability and porosity of the backfilled materials will be greater than those of the removed aquifers. Vertical hydraulic conductivity in the backfilled materials will also be greater than in the removed aquifers. These differences will result in changes to local recharge and groundwater flow patterns. The permeability, porosity and vertical hydraulic conductivity of the backfilled materials will decrease as the materials consolidate over time.

Static water levels will be lowered as the coal and overlying aquifers are dewatered during mining. As discussed in the 2020 MDEQ EIS, dewatering may also affect water levels in surrounding and underlying aquifers, which could impact nearby wells. Water levels in all aquifers will recover as recharge occurs once mined areas are reclaimed and will eventually stabilize near premining levels.

As described in Section 3.5.1, there are three PWSs in the vicinity of the project. All of the PWSs are monitored on a routine basis and results to date show that operations at the SCM have not impacted these water supplies. Based on this, it can be assumed that continued mining of the LBA1 tracts would not impact these water supplies.

During reclamation, groundwater recharge through the backfilled materials will cause water quality changes. Initial removal of the material used for backfill creates fractures and exposes particle surfaces. TDS concentrations will increase as groundwater contacts newly exposed particle surfaces and dissolves minerals contained in the backfill. In past mining at the SCM, concentrations of sulfate, sodium, and bicarbonate in groundwater have been higher in backfilled materials than in the undisturbed aquifers. In the 2023 Annual Hydrology Report, the results for the spoil wells water quality indicates that TDS has increased in most wells, although one well has exhibited a downward trend. TDS in well SP-1 has increased about 2,000 mg/L since 2004, while the TDS in well SP-7 has increased over 4,000 mg/L since installation in 2010. The TDS is well SP-2 has decreased about 1,000 mg/L since 2010. These water quality changes are not anticipated to change the suitability of groundwater for beneficial use (MDEQ 2020a). Over time, groundwater quality will eventually equilibrate to background levels.

Overall, the direct and indirect effects of the Proposed Action on groundwater are expected to be moderate and long term.

4.5.1.1.2 Alternative 2 – Partial Mining

Under the Partial Mining alternative, impacts to groundwater quantity and quality would be as described under the Proposed Action, but would be limited to only the areas mined during the 5-year term. During the 5-year term, only a portion of the remaining coal in the LBA1 tracts would be recovered and the remaining area would remain undisturbed. This would reduce the overall impacts that would occur compared to the Proposed Action. Overall, the direct and indirect effects of the Partial Mining alternative on groundwater are expected to be moderate and long term where mining is authorized but would not impact as large an area as the Proposed Action or the Accelerated Mining Rate alternative.

4.5.1.1.3 Alternative 3 – Accelerated Mining Rate

The overall effects of the Accelerated Mining Rate alternative would be similar to the Proposed Action but would occur at a faster rate. Under this alternative, the mining would be complete in 2.2 years, followed by reclamation. This would result in earlier recharge into the area compared to the Proposed Action. The Accelerated Mining Rate alternative would not impact the three PWSs since previous and current operations have not impacted these water supplies. Between 2008 and 2015, the SCM produced an average of 17.9 Mtpy. During this time, the only violations for the PWSs were for nutrients and bacteria as described in Section 3.5.1. Overall, the direct and indirect effects of the Accelerated Mining alternative on groundwater are expected to be moderate and long term.

4.5.1.1.4 Alternative 4 – No Action

Under the No Action alternative, the SCM would cease coal recovery within the LBA1 tracts and would begin reclamation. The area mined, the amount of aquifer material removed (and backfill placed), and the duration of dewatering would be reduced compared to the other alternatives. Overall, the No Action alternative would not contribute any additional effect on the extent of impacts to groundwater.

4.5.1.2 Mitigation Measures

Montana State regulations require surface coal mine permittees to replace any domestic, agricultural, industrial, or any other legitimate use groundwater supplies if, as a result of mining, a supply is diminished, interrupted, or contaminated, to the extent of precluding use of the water. The Montana State regulations also require surface coal mine permittees to restore the essential hydrologic function of disturbed land surfaces. Mining operations must be designed and conducted in a way to prevent material damage. According to MCA 82-4-203(35), material damage means, with respect to protection of the hydrologic balance, degradation or reduction by coal mining and reclamation operations of the quality or quantity of water outside of the permit area in a manner or to an extent that land uses or beneficial uses of water are adversely affected, water quality standards are violated, or water rights are impacted.

The SCM will continue the groundwater monitoring program until final bond release. The results will continue to be provided to MDEQ in an Annual Hydrology Report.

4.5.2 Surface Water

4.5.2.1 Direct and Indirect Effects

4.5.2.1.1 Alternative 1 – Proposed Action

During mining, removal of materials will disrupt stream channels and their watersheds. The mining process will involve diverting and impounding surface water to prevent excess runoff from entering the mined area, and to allow sediments to settle out of the water prior to discharge. This is consistent with the existing practices.

Three surface water drainages have been impacted by mining of the LBA1 tracts: Spring Creek, North Fork Spring Creek, and South Fork Spring Creek. Spring Creek flow is currently stored in impoundments at the SCM and upstream of the West Decker mine. The impounded water is used on site. Additional impoundments are located in the North and South Forks of Spring Creek, and further limit flow in Spring Creek. The impoundments on Spring Creek cut off flows to the Tongue River Reservoir. The CHIA for SCM's TR1 Tract states that mining operations in the Tongue River watershed have not resulted in decreased flow in the Tongue River (MDEQ 2020b). Diversion and impoundment will end when mining is complete, and restoration will reconnect stream channels.

Reclaimed soils may initially have lower infiltration rates and more runoff than the premining land surface (Reynolds and Reddy 2012). As vegetation increases infiltration rates become higher. The reclaimed land surface may have less variation in elevation than the premining land surface, which could result in higher infiltration rates and less runoff. Infiltration rates of reclaimed soils eventually return to premining levels, and peak discharges in stream channels compare favorably pre- and postmining.

Surface erosion of reclaimed soils could increase sediment production. The SCM uses stormwater best management practices to reduce the impact of sediment on surface water. Sedimentation control measures are used until revegetation of reclaimed areas is sufficient. Runoff is diverted to sedimentation ponds and prevented from flowing untreated off the mine site (MDEQ 2020b). Surface water control and treatment plans have been designed to protect the hydrologic balance within the permit area and adjacent areas in accordance with ARM 17.24.314(2)(a)-(b) and 17.24.631 through 17.24.652. In the 2020 CHIA, MDEQ stated that it does not anticipate that surface water runoff from existing and proposed surface facilities will impact surface or groundwater systems outside the permit area.

The direct and indirect effects of the Proposed Action on surface water are expected to be moderate and short term.

4.5.2.1.2 Alternative 2 – Partial Mining

Direct and indirect effects of the Partial Mining alternative on surface water would be similar to the Proposed Action alternative but predominantly limited to the area mined within the 5-year term. Because the SCM would be limited to mining only a portion of the remaining coal in the LBA1 tracts under this alternative, the effects would be moderate where mining occurs, but the impacts would be limited to the disturbed area.

4.5.2.1.3 Alternative 3 – Accelerated Mining Rate

Under the Accelerated Mining Rate alternative, impacts to surface water would be similar to the Proposed Action but would be completed more quickly, allowing reclamation to occur earlier. Instead of mining until 2039, under this alternative the SCM would mine the remaining LBA1 tract coal at a rate of 18 Mtpy, for an additional 2.2 years. While the disturbance would occur over a shorter time frame and reclamation may occur earlier under this alternative, the impacts would be the same as the Proposed Action.

4.5.2.1.4 Alternative 4 – No Action

Under the No Action alternative, the SCM would cease coal recovery within the LBA1 tracts and would begin reclamation. Under the No Action alternative, the area mined and the amount of land surface disturbed (and backfill placed) would be reduced. Implementation of the No Action alternative would slightly reduce the total mined area and the duration of mining and would have a minor effect on the extent of impacts to surface water.

4.5.2.2 Mitigation Measures

Montana State regulations require surface coal mine permittees to restore the essential hydrologic function of disturbed land surfaces. As previously described in Section 4.5.1.2, mining operations must be designed and conducted in a way to prevent material damage to the hydrologic balance outside the permit area.

The SCM will continue the surface water monitoring program until final bond release. The results will continue to be provided to MDEQ in an Annual Hydrology Report.

4.5.3 Water Rights

4.5.3.1 Direct and Indirect Effects

4.5.3.1.1 Alternative 1 – Proposed Action

The Proposed Action has the potential to impact water rights by reducing the amount or quality of groundwater or surface water available to fulfill other water rights.

Dewatering will lower groundwater levels, which may reduce the amount of groundwater that can be pumped from nearby wells. MDEQ has identified 13 wells that could be impacted by lower water levels (MDEQ 2020a). Reclamation will increase concentrations of TDS in groundwater but is not anticipated to change the suitability of groundwater for beneficial use. Water levels and water quality will eventually stabilize near premining levels.

Two surface water rights have been identified between the SCM and the Tongue River, both of which are rights for a pond that was destroyed by mining at West Decker (MDEQ 2020b). Consequently, the nearest downstream surface water rights that could be affected by the Proposed Action would be located on Tongue River. Current mining operations have not decreased flow or degraded water quality in Tongue River (MDEQ 2020b).

The direct and indirect effects of the Proposed Action on groundwater rights are expected to be moderate and long term. The direct and indirect effects of the Proposed Action on surface water rights are expected to be negligible.

4.5.3.1.2 Alternative 2 – Partial Mining

The impacts from the Partial Mining alternative would be the same as the Proposed Action on groundwater and surface water rights but would be limited to a 5-year term. The temporary lowering of groundwater levels in nearby wells would likely still occur; however, the impacts would likely resolve quicker because mining would be limited to the 5-year term. The direct and indirect effects of the Partial Mining alternative on groundwater rights are expected to be moderate and long term. Direct and indirect effects of the Partial Mining alternative on surface water rights would be negligible.

4.5.3.1.3 Alternative 3 – Accelerated Mining Rate

The impacts from the Accelerated Mining Rate alternative would be similar to the Proposed Action on groundwater but dewatering may occur at a quicker rate. Under this alternative the groundwater levels in nearby wells may also recover quicker because the mining would be complete in 2.2 years. The direct and indirect effects of the Accelerated Mining Rate alternative on groundwater rights are expected to be moderate and long term. Direct and indirect effects of the Partial Mining alternative on surface water rights would be negligible.

4.5.3.1.4 Alternative 4 – No Action

Under the No Action alternative, the SCM would cease coal recovery within the LBA1 tracts and would begin reclamation. The area mined and the amount of aquifer material removed (and backfill placed) would be reduced. The duration of dewatering would also be reduced. Overall, the No Action alternative would not contribute any additional effect on the extent of impacts to groundwater rights. The effect of the No Action alternative on surface water rights are expected to be negligible.

4.6 Alluvial Valley Floors

4.6.1 Direct and Indirect Effects

No AVFs have been delineated within the tracts so there would be no direct or indirect effects to AVFs from any of the alternatives considered in this EIS.

4.7 Wetlands

4.7.1 Direct and Indirect Effects

No wetlands have been delineated within the tracts so there would be no direct or indirect effects to wetlands from any of the alternatives considered in this EIS.

4.8 Soil

4.8.1 Direct and Indirect Effects

4.8.1.1 Alternative 1 – Proposed Action

As described in Section 2.2 of this EIS, 461.4 acres within the LBA1 tracts have been disturbed as of December 31, 2023. Under the Proposed Action, impacts to the soil resources on the remaining 162.5 acres would continue until 2039 based on the current mine permit. The impacts would be the same as those currently occurring, which include potential changes in soil structure, texture, organic matter content, infiltration rate, permeability, water-holding capacity, soil plant nutrient level, soil microbial composition and activity, and soil fertility. Postmining soils will have a more homogenous mixture compared to premining soils, which would be beneficial to areas that had little topsoil prior to mining but would potentially degrade the soil quality in areas that had a thicker topsoil layer prior to mining. The mining permit requires that the replaced topsoil in the tracts support a stable and productive vegetative cover capable of sustaining planned postmining land uses, which include livestock grazing, cropland, and wildlife habitat. As the vegetation cover becomes reestablished, erosion would not significantly affect productivity.

As stated previously, no “prime” or “unique” farmland exists within the proposed tracts, and therefore none would be disturbed. Drainage features would be reconstructed on the area similar to reclamation techniques used at the SCM.

Overall, the potential impacts to the soil resources would be moderate and long-term.

4.8.1.2 Alternative 2 – Partial Mining

Under the Partial Mining alternative, the SCM would be limited to a 5-year term. Based on the current LOM mining sequence, it is assumed that approximately 78.5 acres would be disturbed over the 5-year term. The types of impacts would be the same as those described for the Proposed Action but would occur over approximately half of the acres impacted by the Proposed Action. As with the Proposed Action, the SCM would adhere to reclamation requirements and vegetation would be restored to minimize erosion. Overall, the potential impacts to the soil resources would be moderate where the mining occurs but the disturbance footprint would be reduced by approximately fifty percent from the Proposed Action.

4.8.1.3 Alternative 3 – Accelerated Mining Rate

The impacts from the Accelerated Mining Rate alternative would be similar to the Proposed Action on soils. Under this alternative the SCM would disturb the remaining 162.5 acres within the LBA1 tracts over 2.2 years. The impacts and reclamation under this alternative would occur sooner than the Proposed Action, but the outcome would be same because the SCM will adhere to reclamation requirements and vegetation would be restored to minimize erosion.

4.8.1.4 Alternative 4 – No Action

Under the No Action Alternative, the SCM would terminate Federal coal recovery operations within the boundaries of the LBA1 tracts. No additional soil would be disturbed within the LBA1 tracts and the SCM would complete reclamation on the currently disturbed areas within the LBA1 tracts. The potential impacts to soil under the No Action alternative would be minor and short-term until vegetation is reestablished on currently disturbed areas to reduce the potential for erosion.

4.8.2 Mitigation Measures

The SCM's approved mining permit requires sediment control structures to trap eroded soil, revegetation to reduce wind erosion, and the special handling of soil or overburden materials containing potentially harmful levels of chemical constituents (such as selenium). These measures are enforceable under state regulations.

4.9 Vegetation

4.9.1 Direct and Indirect Effects

4.9.1.1 Alternative 1 – Proposed Action

Direct effects to the vegetation within the LBA1 tracts would include loss of habitat for some wildlife species, including reduced species diversity on reclaimed lands. Indirect effects to the vegetation would include increased soil erosion and habitat loss for wildlife and livestock. However, grassland-dependent wildlife species and livestock would benefit from the increased grass cover and production. As described in Section 2.2 of this EIS, 461.4 acres within the LBA1 tracts have been disturbed as of December 31, 2023. Under the Proposed Action, impacts to the vegetation on the remaining 162.5 acres would continue until 2039.

Wildfires will continue to occur in Montana. The SCM will adhere to its Contingency Plan which details procedures to be followed during a fire.

Reclamation of disturbed lands with the SCM permit boundary is performed according to MDEQ regulatory standards (ARM 17.24.3). Reclamation would occur contemporaneously with mining on adjacent lands, i.e., reclamation would begin once an area is mined. To approximate premining conditions, the SCM would plan to reestablish vegetation types during the reclamation operation that are similar to the premine types. Reestablished vegetation would be dominated by species mandated in the reclamation seed mixtures approved by MDEQ. The reclamation plan for the SCM includes steps to control invasion by weedy (invasive nonnative) plant species. The direct and indirect effects related to the Proposed Action on vegetation would be moderate and short term.

4.9.1.2 Alternative 2 – Partial Mining

Under the Partial Mining alternative, the SCM would be limited to a 5-year term to mine Federal coal within the LBA1 tracts. Based on the current LOM mining sequence, it is assumed that approximately 78.5 acres would be disturbed over the 5-year term. The impacts would be the same as those described for the Proposed Action but would occur on fewer acres and for a shorter period. The SCM would adhere to reclamation requirements and vegetation would be restored using reclamation seed mixtures approved by MDEQ.

4.9.1.3 Alternative 3 – Accelerated Mining Rate

The impacts on vegetation from the Accelerated Mining Rate alternative would be similar to the Proposed Action. Under this alternative the SCM would disturb the remaining 162.5 acres within the LBA1 tracts over 2.2 years. The impacts and reclamation under this alternative would occur sooner than the Proposed Action, but the outcome would be same because the SCM will adhere to reclamation requirements and vegetation would be restored using reclamation seed mixtures approved by MDEQ.

4.9.1.4 Alternative 4 – No Action

Under the No Action alternative, the SCM would terminate Federal coal recovery operations within the boundaries of the LBA1 tracts. However, approximately 460 acres within the LBA1 tracts have been disturbed. The currently disturbed areas would be reclaimed, and vegetation would be established. The potential impacts to vegetation under the No Action alternative would be negligible.

4.9.2 Mitigation Measures

In accordance with SCM's Reclamation Plan, the SCM will conduct vegetation monitoring to ensure revegetation success. The vegetation monitoring will be based on the phase of bond release status. In addition, the SCM commits to using weed-free seed to control noxious weeds and to using good cultural and management practices to prevent establishment of or to control noxious weeds until Phase IV Bond Release.[2]

4.10 Wildlife

4.10.1 Big Game

4.10.1.1 Direct and Indirect Effects

4.10.1.1.1 Alternative 1 – Proposed Action

Portions of the original LBA1 tracts were designated as high value and moderate winter range for big game (MFWP 2024). Under its approved SMCRA permit, the SCM is required to reclaim disturbed habitats within the area back to wildlife habitat. After mining and reclamation, alterations in the topography and vegetative cover, particularly the reduction in sagebrush density, is anticipated to cause a decrease in carrying capacity and diversity on the tracts. Sagebrush would gradually re-establish on the reclaimed land, but the topographic changes would be permanent.

General reclamation practices for establishing or enhancing post-mining wildlife habitat at the SCM are described in the Reclamation Plan (Section 17.24.313) of SMP C1979012. The SCM also has a separate HRRP for the GRSG, which is a species of particular interest in the region. Because there is overlap between the big game winter range and the GRSG habitat areas, the reclamation of any GRSG habitat outlined the specific HRRP would fulfill the reclamation requirements for mule deer and pronghorn and would provide quality habitat for big game impacted by the Proposed Action. The direct and indirect effects related to the Proposed Action on big game would be moderate and short term.

4.10.1.1.2 Alternative 2 – Partial Mining

The Partial Mining alternative would result in the same types of direct and indirect effects as the Proposed Action but would be reduced in area and duration because the Partial Mining alternative would only allow the disturbance of 78.5 aces over 5 years. The SCM would follow the same reclamation practices described for the Proposed Action and overall impacts to big game from the

Partial Mining alternative would be moderate and short term where mining occurs and overall, less than the Proposed Action.

4.10.1.1.3 Alternative 3 – Accelerated Mining Rate

Under the Accelerated Mining Rate alternative, potential impacts to big game would be the same types of direct and indirect effects as described for the Proposed Action but would occur over a shorter period. The impacts would occur over 2.2 years instead of nearly 16 years, shortening the amount of time that big game species may be disturbed by active mining and allowing reclamation to be started and completed years before the Proposed Action. As a result, overall impacts to big game are likely to be moderate but significantly shorter than the Proposed Action.

4.10.1.1.4 Alternative 4 – No Action

Under the No Action alternative, the SCM would shut down coal recovery within the LBA1 tracts and would begin reclamation. The direct and indirect effects related on big game from the No Action alternative would be minor and short term, until the area is fully reclaimed.

4.10.1.2 Mitigation Measures

No mitigation measures specific to big game are necessary. General reclamation practices for establishing or enhancing post-mining wildlife habitat at the SCM are described in the Reclamation Plan (Section 17.24.313) of SMP C1979012. The SCM also has a separate HRRP for the GRSG, which would provide quality habitat for big game.

4.10.2 Raptors

4.10.2.1 Direct and Indirect Effects

4.10.2.1.1 Alternative 1 – Proposed Action

Potential impacts to raptors include loss of nesting and foraging habitat, collisions with structures and vehicles, nest abandonment and reproductive failure due to increased human activities, reduction in prey populations, and displacement of birds into adjacent areas. The impacts to raptors would be moderate. Approximately 460 acres within the LBA1 tracts have already been disturbed. The Proposed Action will increase the potential for disturbance to nesting and foraging areas by increasing the scale and duration of disturbance.

The SCM has approved plans and procedures in place to minimize impacts to nesting raptors and ensure proper reclamation techniques are implemented to enhance habitat in the postmining landscape for both raptors and their primary prey species. The SCM conducts annual surveys at multiple prairie falcon nest sites throughout the monitoring area and on neighboring lands as part of required and/or voluntary monitoring for this species.

Based on the limited number of nesting raptors within the tracts (in 2022 four pairs of red-tailed hawks were active but only one pair fledged) and the SCM's approved plans and procedures in place to reduce impacts to raptors, the direct and indirect effects related to the Proposed Action on site-specific raptors would be moderate and short term.

4.10.2.1.2 Alternative 2 – Partial Mining

Under the Partial Mining alternative, impacts to raptors would be the same types of impacts as the Proposed Action but would be reduced in duration and acreage. The SCM would adhere to approved plans and procedures to minimize impacts to raptors. Based on this, under the Partial Mining alternative, direct and indirect effects on raptors within the disturbed area would be moderate and short term; however, this alternative would disturb less acreage and the disturbance would be limited to 5 years instead of 15 to 16 years.

4.10.2.1.3 Alternative 3 – Accelerated Mining Rate

The Accelerated Mining Rate alternative would result in the same direct and indirect effects as the Proposed Action but would be reduced in duration but have a higher intensity because mining would occur at a faster rate. The SCM would follow the same approved plans and procedures described for the Proposed Action and overall impacts to raptors would be moderate and short term.

4.10.2.1.4 Alternative 4 – No Action

Under the No Action alternative, the SCM would shut down coal recovery within the LBA1 tracts and would begin reclamation. The No Action alternative would have a negligible effect on raptors.

4.10.2.2 Mitigation Measures

No additional mitigation measures specific to raptors are necessary. General reclamation practices for establishing or enhancing post-mining wildlife habitat at the SCM are described in the Reclamation Plan (Section 17.24.313) of SMP C1979012. The SCM also has plans and procedures to minimize impacts to nesting raptors and ensure proper reclamation techniques are implemented to enhance habitat in the post-mine landscape for raptors and their primary prey species.

4.10.3 Greater Sage-grouse

4.10.3.1 Direct and Indirect Effects

4.10.3.1.1 Alternative 1 – Proposed Action

As stated in Section 3.10.3 of this EIS, the MSGHCP typically manages land uses and activities that may affect key GRSG habitat. However, activities associated with the LBA1 tracts would not be managed according to the MSGHCP because the tracts are entirely within the SCM's currently approved SMP C1979012 permit boundary and are exempt because the permit was received and deemed complete in 2013 before the EO effective date. The current SCM wildlife monitoring area includes two confirmed active lek sites, six confirmed inactive leks, and one confirmed extirpated (mined through) lek (Map 3.10-1). However, no GRSG have been recorded at either of the two confirmed active leks in the last 5 to 6 years, depending on the site.

The Proposed Action would result in the short and long-term loss of approximately 162.5 acres of potential habitat for GRSG. Approximately 460 acres within the four tracts have already been disturbed. Map 3.8-1 shows the proposed disturbance limits from the Proposed Action, as related to GRSG habitats and leks. According to information included in past annual wildlife monitoring reports, the project area provides limited GRSG habitat for breeding, nesting, brood-rearing, summering, and winter use (Great Plains Wildlife Consulting, Inc. 2023). No GRSG broods have ever been observed during annual targeted surveys along drainage routes and no broods have been observed from 2000 to 2021 (Great Plains Wildlife Consulting, Inc. 2023). No GRSG or their sign were encountered during at least 159 individual winter surveys conducted for wintering sage-grouse or other wintering species (e.g., big game, bald eagles) over the last 28 years (Great Plains Wildlife Consulting, Inc. 2023).

In lieu of the management requirements specified in the MSGHCP, the SCM has developed and implemented a detailed HRRP for the management of GRSG at the mine and is voluntarily participating in the TBGPEA to offset potential impacts to GRSG due to mine-related activities. The SCM also voluntarily participates in the CCAA program to help minimize impacts to GRSG in the area.

While project construction would result in long-term direct impacts to GRSG habitat within the monitoring area, monitoring indicates that a population-level effect is not likely for the LBA1 tracts. Impacts to GRSG would be moderate. Due to the sequential nature of disturbance, continued coordination with BLM and MFWP, and implementation of the SCM's HRRP, the potential impacts to GRSG would remain moderate.

4.10.3.1.2 Alternative 2 – Partial Mining

Under the Partial Mining alternative, the SCM would be limited to a 5-year term to mine the remaining coal within the LBA1 tracts. Based on the current LOM mining sequence, it is assumed that approximately 78.5 acres would be disturbed over the 5-year term. The impacts would be the same type of impacts as those described for the Proposed Action but would impact fewer acres and would be shorter in duration.

4.10.3.1.3 Alternative 3 – Accelerated Mining Rate

The impacts from the Accelerated Mining Rate alternative would be the similar to the Proposed Action. Under this alternative, the SCM would disturb the remaining 162.5 acres within the LBA1 tracts over 2.2 years. The impacts and reclamation under this alternative would occur sooner than the Proposed Action, but the outcome would be same as those described for the Proposed Action because the SCM will adhere to the HRRP for the management of GRSG.

4.10.3.1.4 Alternative 4 – No Action

Under the No Action alternative, the SCM would shut down coal recovery within the LBA1 tracts and would begin reclamation. The No Action alternative would have a negligible effect on GRSG.

4.10.3.2 Mitigation Measures

The SCM has developed and implemented a detailed HRRP for sage-grouse at the mine and its voluntary participation in a large-scale conservation strategy highlighting sagebrush-steppe species across the region further offset potential impacts to sage-grouse due to mine-related activities. The plan is included in Section 17.24.312 of SMP C1979012 and is enforceable under its state-issued mining permit. The HRRP consist of the following five parts:

- A habitat analysis of the permit areas.
- A detailed description of the methods selected by the lessee to recover, replace, or mitigate habitat loss, together with a comparative analysis of alternate methods which were considered and rejected by the lessee and the rationale for the decision to select the proposed methods.
- A timetable specifying which will be required to accomplish the habitat recovery or replacement plan and showing how this timetable relates to the overall mining plan.
- An evaluation of the final plan by the BLM, in consultation with the State of Montana.
- In the development of this plan, direct liaison with the State of Montana is essential.

The SCM also is a voluntary participant in the TBGPEA. The focus if the association is to:

- Work in collaboration and cooperation with a variety of government and non-government entities, as well as with experts in academia and members of the private sector.
- Develop and implement a strategy of adaptive management that is informed by and responsive to current conditions and the results of previously implemented conservation efforts.
- Conduct extensive vegetation monitoring and targeted wildlife monitoring to support and enable adaptive management.

- Work with the USFWS to implement incentives-based conservation strategy to protect eight species of concern that inhabit the sagebrush steppe and short-grass prairie of northeastern Wyoming.

4.10.4 Threatened and Endangered Species and Species of Special Interest

4.10.4.1 Direct and Indirect Effects

4.10.4.1.1 Alternative 1 – Proposed Action

No USFWS designated T&E species are known to occur in the project area and the USFWS has not designated critical habitat for any T&E species in the vicinity of the project area currently (USFWS 2024). Because no T&E species or habitats critical to T&E species have been documented within the project area, impacts to T&E species would be negligible.

For the purposes of this discussion, other SOSI include USFWS BCC, BLM Sensitive Species, and MTNHP and MFWP Species of Concern. The MTNHP website was accessed to obtain a comprehensive list of SOSI within the wildlife monitoring area (MTNHP 2024).

As stated in Section 3.10.4 and included in Appendix C of this EIS, 26 vertebrate SOSI have the potential to occur within the wildlife monitoring analysis area. Of the 26 species, five species have never been observed in any field wildlife survey within the wildlife monitoring area. The Proposed Action would result in short-term loss of approximately 162.5 acres of habitat for SOSI within the proposed project area. Activities could displace SOSI to lower quality habitat areas and could result in localized lower reproduction and increased predation. Another direct impact on SOSI is mortality during construction and from collisions with vehicles. Impacts would be moderate; however, the sequential nature of disturbance would reduce impacts to SOSI. Seasonal guidelines for wildlife exclusion periods and applicant committed design features described in Section 4.10.3.2 would reduce impacts to SOSI to minor. The SCM monitors and protects SOSI based on Section 312, 723, and 751 of SMP C1979012. The SOSI comprehensive plan includes migratory birds, which are protected under the Migratory Bird Treaty Act (MBTA). Under the SOSI, the SCM submits a letter annually to USFWS after the initial spring bird nesting monitoring season, documenting the results of the initial spring next surveys. In addition, upon discovery of bird mortality, the SCM notifies MDEQ, USFWS, and MFWP.

4.10.4.1.2 Alternative 2 – Partial Mining

The Partial Mining alternative would result in the same direct and indirect effects as the Proposed Action but would be reduced in area and duration. Because no T&E species or habitats critical to T&E species have been documented within the project area, impacts to T&E species would be negligible. Impacts to SOSI would be moderate and short-term.

4.10.4.1.3 Alternative 3 – Accelerated Mining Rate

Under the Accelerated Mining Rate alternative, potential impacts to T&E species would be negligible and impacts to SOSI would be moderate and short-term. The difference would be that impacts would occur over a shorter duration compared to the Proposed Action.

4.10.4.1.4 Alternative 4 – No Action

Under the No Action Alternative, the SCM would shut down coal recovery within the LBA1 tracts and would begin reclamation within the tracts. The No Action alternative would have a negligible effect on T&E species and SOSI.

4.10.4.2 Mitigation Measures

No mitigation measures specific to T&E species and other SOSI are necessary because there are no T&E species within the LBA1 tracts. General reclamation practices for establishing or enhancing post-mining wildlife habitat at the SCM described in the Reclamation Plan (Section 17.24.313) of SMP C1979012 are in place.

4.11 Ownership and Use of Land

4.11.1 Direct and Indirect Effects

4.11.1.1 Alternative 1 – Proposed Action

Surface ownership in the area includes BLM and private lands and the coal removal area is managed by the BLM and the SCM. Direct and indirect effects of the Proposed Action include reduction of livestock grazing and loss of wildlife habitat. Section 3.3.2.2 of this EIS describes how CBNG development and production in the northern PRB has ceased; therefore, impacts would be negligible.

As of December 31, 2023, disturbance has already taken place on approximately 460 acres within the LBA1 tracts. Wildlife (particularly big game) use would be displaced while the tracts are being mined and reclaimed. Livestock grazing has already been prohibited due to the tracts being inside the permit boundary and adjacent to active mining areas. Hunting on the tracts is currently not allowed because they are within the mine permit boundary and would continue to be disallowed during mining and reclamation. Following reclamation, the land would be suitable for grazing and wildlife, which are the historic land uses. The direct and indirect effects related to the ownership and use of the land would be moderate and short term.

4.11.1.2 Alternative 2 – Partial Mining

Impacts to surface ownership and land use under the Partial Mining alternative would be the same as described for the Proposed Action but would be shortened in duration and would cover fewer acres. As described for the Proposed Action, disturbance has already taken place with the LBA1 tracts which has impacted livestock grazing and hunting. The direct and indirect effects related to the ownership and use of the land would be moderate and short term.

4.11.1.3 Alternative 3 – Accelerated Mining Rate

The Accelerated Mining Rate alternative would have the same types of impacts as the Proposed Action. Under this alternative, the remaining LBA1 tracts area would be disturbed but the disturbance would occur more quickly and, as a result, reclamation may occur earlier than the Proposed Action. The SCM would continue to prohibit livestock grazing and hunting until all reclamation is complete. Based on this, the direct and indirect effects related to the ownership and use of the land would be moderate and short term.

4.11.1.4 Alternative 4 – No Action Alternative

Under the No Action alternative, the SCM would terminate Federal coal recovery operations within the boundaries of the LBA1 tracts. The impacts to ownership and land use under the No Action Alternative would be minor until reclamation is complete and the land is returned to its premining uses wildlife habitat and livestock grazing.

4.11.2 Mitigation Measures

No mitigation measures specific to ownership and use of the land are necessary.

4.12 Cultural Resources

4.12.1 Direct and Indirect Effects

As described in Section 3.12 of this EIS, site 24BH404 was the only site within the LBA1 tract requiring mitigation, which was completed in 2015. Because there are no other sites, the direct and indirect effects on cultural resources from all of the alternatives evaluated in this EIS would be negligible.

4.12.2 Mitigation Measures

The SCM's cultural resources Memorandum of Agreement (MOA) was established between OSMRE, MDEQ and NTEC pursuant to the NHPA and is enforceable as a condition under the SMCRA permit. The MOA is in place to guide mitigation of incidental cultural discoveries that might be encountered during mining.

4.12.2.1 Unanticipated Discoveries

If a previously unidentified cultural resource is discovered in the project area, the SCM would take measures to protect the find locality and provide written notice to the MDEQ and OSMRE within 48 hours of the discovery. A Montana-permitted archaeologist meeting the Secretary of the Interior's Professional Qualification Standards is required to evaluate the discovery, make a recommendation as to the NRHP eligibility of the resource, and provide written notice to the MDEQ and OSMRE within 48 hours. The MDEQ and OSMRE would then consult with the Tribal Historic Preservation Office, SHPO, and the BLM (for federally managed sites) on the NRHP eligibility determination(s) and develop appropriate measures necessary to mitigate any adverse effects through the development of a treatment plan.

Should the discovery involve a burial site or a resource thought to have potential religious or cultural significance to a tribe, the tribe(s) with an interest would be notified and consulted as appropriate. When agreement is reached among all the involved parties, appropriate mitigation, if necessary, would be implemented. The tribes, OSMRE, MDEQ, SHPO, and the surface landowner must agree to any proposed treatment measures.

4.13 Visual Resources

4.13.1 Direct and Indirect Effects

4.13.1.1 Alternative 1 – Proposed Action

No visual resources have been identified on or near the tracts that are unique compared to the surrounding area. The mining operations would continue to affect landscapes classified as VRM Class III by BLM. The objective of this class is to partially retain the existing character of the landscape. Reclaimed terrain would be almost indistinguishable from the surrounding undisturbed terrain. Slopes might appear smoother (less intricately dissected) than the surrounding undisturbed terrain, and sagebrush and trees would not be as abundant for several years; however, within a few years after reclamation, the mined land would not be distinguishable from the surrounding undisturbed terrain except by someone very familiar with landforms and vegetation. The direct and indirect effects related to the visual resources would be moderate and short term.

4.13.1.2 Alternative 2 – Partial Mining

Impacts to visual resources under the Partial Mining alternative would be the same as described for the Proposed Action but would be limited to a 5-year term and approximately 78.5 acres. During mining the direct and indirect effects related to the visual resources would be moderate and short term. Following reclamation, the LBA1 tracts lands would blend with the surrounding area.

4.13.1.3 Alternative 3 – Accelerated Mining Rate

The Accelerated Mining Rate alternative would have the same impacts on visual resources as the Proposed Action, but reclamation would likely occur sooner under this alternative. Overall, this alternative would have a moderate impact on visual resources, but the LBA1 tracts would be reclaimed to blend with surrounding terrain.

4.13.1.4 Alternative 4 – No Action Alternative

Under the No Action alternative, the SCM would terminate Federal coal recovery operations within the boundaries of the LBA1 tracts. Direct and indirect effects related to the visual resources would be minor and short term while reclamation is completed. Following reclamation, the LBA1 tracts lands would blend with the surrounding area.

4.13.2 Mitigation Measures

No mitigation measures specific to visual resources are necessary.

4.14 Noise

4.14.1 Direct and Indirect Effects

4.14.1.1 Alternative 1 – Proposed Action

Direct effects of noise from the Proposed Action would be to the nearest residences. The nearest residence is approximately 3,000 feet from Tract 1 and the nearest recreational opportunity is at the Tongue River Reservoir, approximately 15,000 feet from the proposed tracts. The SCM developed internal criteria on off-site noise acceptable for protection of the local community and established a threshold of 65 dBa. Modeling concluded that this threshold would be exceeded at points less than 4,800 feet from the pit boundary. This threshold would be re-modeled when mining activity encroaches on the 4,800-foot buffer. Overall, direct effects related to noise would be significant in the immediate vicinity but would be reduced as the distance increases. Based on this, direct effects on noise would be moderate and short term.

Indirect effects from the Proposed Action would include noise and vibration associated with rail operation. Both noise and vibration have closely related causal factors with the magnitude of effect relating to the frequency of train passage. According to STB’s environmental review regulations for noise analysis (49 C.F.R. § 1105.7e(6)), the thresholds are (1) an incremental increase in noise levels of 3 dBA or (2) an increase to a noise level above 65 L_{dn} or greater. Changes in a noise level of less than 3 dBA are not typically noticed by the human ear.

The following equation was recently used for two projects involving coal transport by rail to calculate the change in noise levels (STB 2015 and WDOE and Cowlitz County 2017).

$$10 \times \log (N2 \div N1) = \text{dBA change}$$

In this equation, NI equals the existing (baseline) traffic volume along the rail line and N2 equals the maximum estimated traffic additive of the action. The equation assumes that the distribution of the number of trains between daytime and nighttime does not change. Using this equation, traffic must increase 100 percent to increase noise by at least 3 dBA.

Because OSMRE does not regulate rail traffic, for associated environmental impacts, this EIS relies upon STB regulations, which only require analysis of noise where rail traffic increases at least 100 percent (i.e., doubles) or increases by at least 8 trains per day on any segment (49 C.F.R. § 1105.7e(6)). Under the Proposed Action, the rail traffic would not increase over current levels. Therefore, a noise analysis associated with rail traffic is not required. Similarly, based on the lack of noise-related impacts associated with the Proposed Action, no corresponding change or impacts relative to FTA human annoyance vibration criteria guidelines would be expected. Therefore, the indirect impacts from noise and vibration from the Proposed Action would be minor and short-term.

4.14.1.2 Alternative 2 – Partial Mining

Noise impacts under the Partial Mining alternative would be the same as described for the Proposed Action but would be limited to a 5-year term. Under the Partial Mining alternative, the rail traffic would not increase over current levels. Therefore, a noise analysis associated with rail traffic is not required. The indirect impacts from noise and vibration would be minor and short-term.

4.14.1.3 Alternative 3 – Accelerated Mining Rate

The Accelerated Mining Rate alternative would have the same direct and indirect impacts on noise and vibration as the Proposed Action. Although rail traffic would increase under the Accelerated Mining Rate alternative it would not increase by at least 8 trains per day and therefore does not require a noise analysis. Additionally, the increase in rail traffic under the Accelerated Mining Rate alternative would be much shorter in duration compared to the Proposed Action (2.2 years instead of nearly 16 years). This alternative would have a short-term, minor impact on noise and vibration.

4.14.1.4 Alternative 4 – No Action Alternative

Under the No Action alternative, the SCM would terminate federal coal recovery operations within the boundaries of the LBA1 tracts. Impacts on noise and vibration under the No Action alternative would be negligible.

4.14.2 Mitigation Measures

No mitigation measures specific to noise impacts are necessary.

4.15 Transportation Facilities

4.15.1 Direct and Indirect Effects

4.15.1.1 Alternative 1 – Proposed Action

Existing transportation facilities, including roads, railroads, and overhead electrical transmission lines, would continue to be used under the Proposed Action. Most of the coal mined at the SCM is transported by rail with a relatively small amount of retail coal sales transported by truck. U.S. railroad routes used by BNSF to transport SCM coal to various destinations are shown on Map 2.1-1 of this EIS.

The Proposed Action would not increase the current direct impacts on transportation facilities. However, the Proposed Action would result in indirect impacts from coal transport on public health, ecological health, collisions with threatened and endangered species, dust, noise, and vibration. The impacts from rail transportation related to the Proposed Action have been evaluated using 130 coal cars per train and 15,350 short tons of coal per car (NTEC 2021). Under the Proposed Action the LBA1 tract coal would require approximately 50 to 317 coal shipments per year (see Table 2.2-2 for annual coal production). This volume would be less than the current annual rail traffic from SCM coal (2016-2023 average annual rail shipments required approximately 775 coal shipments per year).

Indirect impacts to public health could occur due to inhalation of coal dust or ingestion of soil, sediment, water, agricultural products, fish, or other animals that have ingested soil or water affected by coal deposits.

The existing literature on the emission, dispersion, and deposition of coal dust from rail cars is limited, consisting mainly of industry studies and a few peer-reviewed academic studies. Existing studies have relied on several different analysis methods. Some studies used computer simulations to model the emission and dispersion of fugitive coal dust from rail cars. Others conducted experiments using model trains in wind tunnels or by attaching dust collectors to the outside of train cars. Still others used monitoring equipment to measure the concentration of particulate matter (including coal dust) in the air and/or deposition on the ground near rail lines. These studies vary in their conclusions, especially regarding the quantity of coal dust emitted by moving rail cars. The Draft Tongue River Railroad EIS (STB 2015) and Millennium Bulk Terminals EIS (WDOE and Cowlitz County 2017) provide thorough discussions on human health and ecological impacts that could result from inhalation and ingestion of coal dust emissions from rail transport.

As part of the Draft Tongue River Railroad EIS, STB modeled coal dust deposition and then combined the results with a fate and transport model to estimate coal dust constituents in soil, water, and sediment and the corresponding concentrations in drinking water and fish. Similarly, the Millennium Bulk Terminals EIS provides the results of the AERMOD dispersion model. However, both EISs were for rail line projects encompassing a small portion of rail line. Because the Proposed Action uses over 2 million miles of rail line across the U.S., it is not practical to conduct modeling using AERMOD or a fate and transport model. Instead, the information provided in the Draft Tongue River Railroad EIS is incorporated by reference.

The Draft Tongue River Railroad EIS model indicated that at 26.7 additional coals trains per day the maximum annual increase in PM_{10} from coal dust would be 6.1 $\mu g/m^3$. The report concluded that there would be no exceedance of the PM_{10} NAAQS at 50 meters from the rail line, including exhaust emissions from locomotives and fugitive particulate from wind erosion. Because the additional number of trains resulting from the Proposed Action (an additional 1.2 trains per day) is well below the 26.7 trains per day, indirect impacts resulting from the Proposed Action to public health from coal dust constituents in soil, dust, water, and fish would be minor.

Indirect impacts to ecological health could occur due to ingestion of soil and water and collisions with wildlife. The STB (2015) used the dispersion model to estimate potential ecological impacts. The model indicated that none of the chemical concentrations estimated for soil were above the EPA ecological soil screening levels for plants, soil invertebrates, avian wildlife, or mammalian wildlife. In addition, estimated chemical concentration values for water were below the available EPA freshwater screening benchmark, except for barium, which was likely overestimated because barium precipitates to barium sulfate in water. STB did not expect barium to exceed benchmark or screening levels in water.

Indirect impacts to wildlife, including threatened and endangered species, from coal transport would include collisions. Train collisions with wildlife may occur but are expected to be infrequent and therefore, indirect impacts resulting from the Proposed Action to wildlife would be minor.

The potential for emissions of dust from the large volumes of coal transported to large generating stations can be an environmental concern (Ramboll Environ 2016). In addition to the environmental and human health concerns discussed above, coal dust and fine particles blowing or sifting from moving, loaded rail cars have been linked to railroad track stability problems resulting in train derailments and to rangeland fires caused by spontaneous combustion of accumulated coal dust (BLM 2009). In response to allegations that coal spilled from trains pollutes waterways and creates health and safety concerns, BNSF has agreed to study the use of physical covers on coal trains to reduce the effects of blowing coal particles (Seattle Times 2016). BNSF's Coal Loading Rule, in effect since October 2011, requires all shippers loading coal at any Montana or Wyoming mine to follow specific car loading measures to reduce coal dust losses in transit by at least 85 percent compared to cars with no remedial measures (BNSF 2015).

A derailment analysis was completed using accident data from the FRA. Table 4.15-1 provides the overall national rates, as well as the rates for BNSF on all lines and only the mainline. The table also shows the accident rates for derailments on all lines as well as the mainline for all railroads and the BNSF. Train accident rates were not available for specific cargo, such as coal.

Table 4.15-1 National Annual Train Accident Rates (per million train-miles)

Accident Scenario	2020	2021	2022	2023
All Railroads – All lines	2.92	2.92	3.23	3.20
All Railroads – Derailments on All lines	1.95	1.93	2.09	2.14
All Railroads – Mainline Only	0.97	0.92	0.90	0.92
All Railroads – Derailments on Mainline Only	0.62	0.58	0.56	0.58
BNSF – All lines	2.11	1.78	2.26	2.70
BNSF – Derailments on All lines	1.73	1.48	1.90	2.34
BNSF – Mainline Only	0.59	0.46	0.46	0.53
BNSF – Derailments on Mainline Only	0.41	0.38	0.32	0.41

Source: FRA 2024a

The number of accidents per year for the Proposed Action was calculated by multiplying the annual amount of coal shipped by a factor of 0.16 (calculated by dividing the 2018 and 2020 tonnage of coal shipped by total rail miles) and then multiplying by the four different accident rates. Table 4.15-2 provides the predicted number of train accidents for the Proposed Action.

The table shows that under the Proposed Action up to 1.5 derailment accidents could occur per year. The table shows that there is a higher potential for derailment on all lines (includes main, secondary, yard, and industry) compared to the mainline. It should be noted that not every accident of a loaded mine-related train would result in a coal spill, and any spills that might occur would vary in size. A collision or derailment could involve only a few rail cars or lead to a greater number of rail cars being derailed in certain circumstances. Furthermore, even when rail cars are derailed, not all the derailed cars would end up in a position where some or all of their contents could be spilled, depending on the severity and speed of the accident, as well as the levelness of the surrounding terrain.

Table 4.15-2 Estimated Annual Train Accidents – Proposed Action

Year	LBA1 Coal (Mt)	Rail Miles	All Railroads Derailment on All Lines	All Railroads Derailment on Mainline	BNSF Derailment on All Lines	BNSF Derailment on Mainline
2024	2.20	330,000	0.67	0.19	0.61	0.13
2025	4.51	676,500	1.37	0.40	1.26	0.26
2026	4.14	621,000	1.26	0.36	1.16	0.24
2027	4.87	730,500	1.48	0.43	1.36	0.28
2028	3.59	538,500	1.09	0.32	1.00	0.20
2029	4.21	631,500	1.28	0.37	1.18	0.24
2030	2.51	376,500	0.76	0.22	0.70	0.14
2031	2.51	376,500	0.76	0.22	0.70	0.14
2032	2.51	376,500	0.76	0.22	0.70	0.14
2033	2.51	376,500	0.76	0.22	0.70	0.14
2034	2.51	376,500	0.76	0.22	0.70	0.14
2035	0.78	117,000	0.24	0.07	0.22	0.04
2036	0.78	117,000	0.24	0.07	0.22	0.04
2037	0.78	117,000	0.24	0.07	0.22	0.04
2038	0.78	117,000	0.24	0.07	0.22	0.04
2039	0.78	117,000	0.24	0.07	0.22	0.04

Available data from Liu et al. (2012) indicates that the average number of rail cars derailed on main line track (all classes and speeds) for 2001 through 2010 was 8.4 cars; the number of rail cars on yard, siding, and industry track ranged from 4.3 to 5.7 rail cars. These types of tracks provide a better indication of the consequences of derailments at very low speeds which is consistent with Table 4.15-2.

If an accident caused a significant release of coal, the actual impacts to the environment would depend on the amount of coal released, the length of time that the spilled coal remained in the area before being recovered or cleaned up, the location of the spill relative to areas of environmental concern, and whether the coal ignited, possibly due to the forces involved in the accident. FRA has emergency response teams on call 24/7 (FRA 2024b). FRA has environmental consultants and contractors that work with state environmental agencies to remediate any damage following an incident.

Under the Proposed Action direct impacts from dust would be negligible and indirect impacts would be minor and short-term. Direct and indirect impacts from a train accident, including derailment, would be dependent on the quantity of coal spilled and the location of the spill. Overall, these impacts would be short-term because there are existing rail emergency response and risk management plans in place by FRA and BNSF.

4.15.1.2 Alternative 2 – Partial Mining

Direct and indirect impacts from the Partial Mining alternative would be the same as the Proposed Action but would be shorter in duration. Under this alternative, the LBA1 tract coal would require approximately 143 to 317 coal shipments per year for a 5-year period, which is less than the current rail traffic at the SCM. Because the SCM would implement dust control mitigation, direct impacts would be negligible and indirect impacts would be minor and short term. The potential for a derailment would be the same as the Proposed Action but would be limited to the 5-year term. Direct and indirect impacts from a derailment would be dependent on the location and quantity of the spill and would be short term.

4.15.1.3 Alternative 3 – Accelerated Mining Rate

Under the Accelerated Mining Rate alternative, the increased rate of mining (18 Mtpy) would require approximately 1,170 coal trains to transport coal from the LBA1 tracts annually. This would require about 1 additional train per day over current SCM rail traffic. The risk of a derailment would also increase compared to the Proposed Action. Table 4.15-3 shows that there would be potential for over 5 derailments a year under the Accelerated Mining Rate alternative.

Table 4.15-3 Estimated Annual Train Accidents – Accelerated Mining Rate Alternative

Year	LBA1 Coal (Mt)	Rail Miles	All Railroads Derailment on All Lines	All Railroads Derailment on Mainline	BNSF Derailment on All Lines	BNSF Derailment on Mainline
2024	18.0	2,700,000	5.47	1.58	5.03	1.03
2025	18.0	2,700,000	5.47	1.58	5.03	1.03
2026	3.6	540,000	1.09	0.32	1.01	0.21

While this alternative would require more coal shipments and a greater potential for a derailment, the direct and indirect impacts would be the same as the Proposed Action. The direct impacts and indirect impacts would range from negligible to moderate and would be short term.

4.15.1.4 Alternative 4 – No Action

Under the No Action alternative, the SCM would terminate federal coal recovery operations within the boundaries of the LBA1 tracts. Impacts to transportation facilities would be negligible.

4.15.2 Mitigation Measures

Mitigation includes following the Coal Loading Rule.

4.16 Hazardous and Solid Waste

4.16.1 Direct and Indirect Effects

4.16.1.1 Alternative 1 – Proposed Action

Under the Proposed Action, the SCM would continue to generate non-hazardous, hazardous, and universal wastes. Non-hazardous solid waste would continue to be shipped to the municipal landfill in Hardin, Montana. The only wastes disposed of onsite would continue to be wastes such as abandoned mining machinery, non-greasy wood, used tires, concrete, and other items permitted under the mine's existing MDEQ permit to mine. No solid waste disposal on the mine site is allowed to be deposited within 8 feet of any coal outcrop or coal storage area, or at refuse embankments or impoundment sites (Spring Creek Coal Company 2014). Hazardous waste and non-hazardous waste such as used grease and used antifreeze would continue to be incinerated for energy recovery at an off-site EPA-permitted facility. Universal wastes including used batteries, electronic waste, and used light bulbs would continue to be shipped off-site to approved facilities for recycling. No direct or indirect effects from hazardous and solid waste are anticipated as a result of the Proposed Action.

4.16.1.2 Alternative 2 – Partial Mining

As discussed above in section 4.16.1.1, any waste is either sent to a regulated off-site facility or deposited on-site and regulated under the existing MDEQ permit. As a result, no direct or indirect effects from hazardous and solid waste are anticipated under the Partial Mining alternative.

4.16.1.3 Alternative 3 – Accelerated Mining Rate

As discussed above in section 4.16.1.1, any waste is either sent to a regulated off-site facility or deposited on-site and regulated under the existing MDEQ permit. As a result, no direct or indirect effects from hazardous and solid waste are anticipated under the Accelerated Mining Rate alternative.

4.16.1.4 Alternative 4 – No Action

The No Action alternative is not anticipated to create any additional hazardous and/or solid waste and, therefore, no direct or indirect effects.

4.16.2 Mitigation Measures

No mitigation measures specific to hazardous or solid waste would be necessary.

4.17 Socioeconomics

4.17.1 Direct and Indirect Effects

4.17.1.1 Alternative 1 – Proposed Action

Under the Proposed Action, Montana revenues (royalties, severance tax, gross proceeds tax, and resource indemnity trust tax) and federal revenues (royalties, black lung tax, and federal recreation tax) would continue similar to the values provided in Table 3.17-2. It should be noted that the coal from the LBA1 tracts would continue to only be a percentage of these values because the SCM currently blends coal from the LBA1 tracts with other Federal, state, and private coal and has indicated that it intends to continue that practice if the mining plan modification for LBA 1 is approved. Continued mining in the LBA1 tracts would not directly create new jobs and therefore, the availability of housing units would not be impacted. No additional employees are anticipated as a result of the tracts being mined, although the Proposed Action would extend the duration of employment for current employees and extend the substantial economic benefits related to mining the federal coal. No additional changes in the current socioeconomic situation, as described in

Section 3.17.1 of this EIS, are anticipated. Direct and indirect effects of the Proposed Action would be minor and short-term.

4.17.1.2 Alternative 2 – Partial Mining

Socioeconomic impacts under the Partial Mining alternative would be similar to the Proposed Action but would be limited to the 5-year term. Under this alternative, the SCM may not be able to realize the total socioeconomic benefit of the leased Federal coal in the LBA1 tracts because mining may not be completed within the LBA1 tracts by the end of the 5-year term, and mining beyond that term would require another approval. For the 5-year term, the revenues would continue similar to the values provided in Table 3.17-2. It should be noted that the coal from the LBA1 tracts would continue to only be a percentage of these values because the SCM currently, and would continue to, blends coal from the LBA1 tracts with other federal, state, and private coal. After the 5-year term, the revenues would be contingent on approval of a new mining plan modification approval from ASLM. Similarly, employment at the SCM would be the same as the Proposed Action for the 5-year term but would only continue if there is a new mining plan modification approval from ASLM. Based on this, the direct effects would be moderate and short-term, while the indirect effects would be negligible.

4.17.1.3 Alternative 3 – Accelerated Mining Rate

The Accelerated Mining Rate alternative would have the same types of direct and indirect socioeconomic impacts as the Proposed Action. The revenues provided in Table 3.17-2 would increase for the 2.2 years that the coal would be mined at a rate of 18 Mtpy. After this time, the revenues would return to values lower than those provided in Table 3.17-2 because all of the coal in the LBA1 tracts would be recovered. Similarly, because the mining rate would be faster under this alternative, the duration of employment may be less than the Proposed Action although it would likely be similar because the SCM has other federal, state, and private coal available to mine. Overall, the direct and indirect effects would be minor and short-term.

4.17.1.4 Alternative 4 – No Action

Under the No Action alternative, NTEC would terminate federal coal recovery operations within the boundaries of the LBA1 tracts. The SCM would continue to operate as there is approximately 63.4 Mt of permitted Federal, state, and private coal remaining, but the overall LOM would be reduced. The revenues provided in Table 3.17-2 would be reduced because the coal in the LBA1 tracts would not be recovered which would reduce the total coal recovered by the SCM. The reduction in coal recovery and the shortened LOM would have the potential to reduce the employees needed at the SCM. The No Action alternative would result in moderate direct and indirect negative socioeconomic effects.

4.17.2 Mitigation Measures

No mitigation measures specific to socioeconomic impacts are needed.

4.18 Environmental Justice

The CEQ's environmental justice guidance (CEQ 1997) states that the analysis should consider relevant data concerning the potential for multiple or cumulative exposures to human health or environmental hazards in the affected population. This analysis considers multimedia and cumulative impacts and references other sections of the EIS for additional detail. Although the analysis is formally organized by individual resource category, cumulative and multiple impacts (if present) are addressed in the most relevant resource category for those impacts.

Section 3.18 of this EIS discussed environmental justice populations present in the region. This section identifies the potential impacts to environmental justice populations as result of the Proposed Action and No Action Alternative. An environmental justice analysis consists of three steps: (1) Identify whether an alternative has potential adverse social, economic, or health impacts; (2) Determine if potential adverse impacts would disproportionately affect minority or low-income populations based on population and participation in potentially affected activities; (3) Determine if disproportionate adverse impacts are negligible, minor, moderate, or major.

The region of influence for the analysis is Big Horn and Rosebud counties in Montana and Sheridan County, Wyoming. Big Horn and Rosebud counties are characterized by a high population of people of color and low-income residents on Native American tribal trust lands.

The remainder of this section focuses on identifying the presence and significance of adverse social, economic, or health impacts of each alternative, and whether those impacts would have the potential to disproportionately affect identified EJ populations. This analysis is based on the information presented in other resource sections in this EIS. Where other resource sections have identified adverse impacts in comparison to the baseline condition, this section describes the potential associated social, economic, or health impacts and determines whether those impacts would disproportionately affect EJ populations.

4.18.1 Alternative 1 – Proposed Action

4.18.1.1 Cultural Resources

The SCM has been thoroughly surveyed and all potentially eligible resources have been identified and catalogued. If a site cannot be avoided during a surface activity, this site would be mitigated and potentially recovered. The SCM has a cultural resources MOA that is in place to guide mitigation of incidental cultural discoveries that might be encountered during mining. No disproportionate impacts to EJ populations would result from the Proposed Action.

4.18.1.2 Socioeconomics

The SCM is owned by NTEC, whose sole shareholder is the Navajo Nation. NTEC was named the 2020 American Indian Business of the Year and named one of Winds of Change Top 50 Workplaces for Indigenous STEM Professionals (NTEC 2024b). Approximately 9% of the SCM workforce is Native American with relatively high-paying jobs (NTEC 2022). As discussed in section 4.17.1.1, under the Proposed Action, direct and indirect impacts from the Proposed Action to socioeconomics would be minor and short-term. EJ communities in the vicinity of the SCM would realize a continuance of socioeconomic activity from the Proposed Action in the form of the extension of existing high-paying positions, and extension of the indirect/induced economic and fiscal benefits that the SCM currently provides the region. No disproportionate impacts to EJ populations would result from the Proposed Action.

4.18.1.3 Noise and Vibration

Noise and vibration impacts would not be any different than those discussed in Section 4.14.1.1 of this EIS. The impacts would not exceed the significance thresholds or result in major adverse effects to the nearby residences or recreation areas. Therefore, no disproportionate impacts from noise or vibration to the EJ populations in the vicinity of the SCM would occur.

4.18.1.4 Visual Resources

Impacts to visual resources as result of the Proposed Action would be the same as those described in Section 4.13.1.1 of this EIS. These impacts include surface construction impacts (i.e., dust) and observation of existing facilities and mining equipment. Residents and viewers from nearby EJ populations would not experience disproportionate effects from the Proposed Action, as these features would result in minor impacts to the visual resources.

4.18.1.5 Air Quality

Air quality impacts are described in detail in Section 4.4 of this EIS. Modeling and air monitoring indicate that impacts from particulate matter and emissions of NO_x and O_3 to nearby EJ populations would be minor. Similarly, impacts from transportation diesel emissions and coal combustion would not represent a disproportionate impact to the EJ populations living in the vicinity of the SCM. No disproportionate impacts to EJ populations would result from the Proposed Action.

4.18.1.6 Public Health and Safety

Considering that there are no EJ populations present within the SCM, potential public health and safety issues are limited to off-site inhalation of air toxins emitted from construction activities and ingestion through the deposition of air toxins in drinking water supplies and via the food chain. While criteria pollutants may be present in the deposition zone, data collected by the SCM shows that the level of pollution would be below the federally regulated NAAQS, even when added to background concentrations. In addition, the SCM collects routine surface water and groundwater samples and reports the results annually. Analytical data collected during the monitoring period are compared with human health criteria for surface water and groundwater from Circular DEQ-7, Montana Numeric Water Quality Standards (MDEQ 2019). Therefore, potential human health effects in the region from criteria air pollutants would be minor and no disproportionate impacts to EJ populations would result from the Proposed Action.

4.18.2 Alternative 2 – Partial Mining

4.18.2.1 Cultural Resources

The SCM has been thoroughly surveyed and all potentially eligible resources have been identified and catalogued. If a site cannot be avoided during a surface activity, this site would be mitigated and potentially recovered. The SCM has a cultural resources MOA that is in place to guide mitigation of incidental cultural discoveries that might be encountered during mining. No disproportionate impacts to EJ populations would result from the Partial Mining alternative.

4.18.2.2 Socioeconomics

As discussed in section 4.17.1.2, under the Partial Mining alternative, the SCM would be limited to a 5-year term and would need to apply for and be granted approval to continue to mine the LBA1 tracts beyond 5-years. There may be negative impacts to socioeconomics in the region beyond the 5-year term, including limiting the extension of high-paying jobs and revenues from mining the LBA1 tracts. The direct effects of the Partial Mining alternative would be moderate and short-term, while the indirect effects would be negligible. Impacts would not disproportionately effect EJ populations in the vicinity of the SCM.

4.18.2.3 Noise and Vibration

Noise and vibration impacts would not be any different than those discussed in Section 4.14.1.2 of this EIS. The impacts would not exceed the significance thresholds or result in major adverse effects to the nearby residences or recreation areas. Therefore, no disproportionate impacts from noise or vibration to the EJ populations in the vicinity of the SCM would occur.

4.18.2.4 Visual Resources

Impacts to visual resources as result of the Partial Mining alternative would be the same as those described in Section 4.13.1.2 of this EIS. These impacts include surface construction impacts (i.e., dust) and observation of existing facilities and mining equipment which would be limited to a 5-year term. Residents and viewers from nearby EJ populations would not experience disproportionate effects from the Partial Mining alternative, as these features would result in minor impacts to the visual resources.

4.18.2.5 Air Quality

Air quality impacts are described in detail in Section 4.4 of this EIS. Modeling and air monitoring indicate that impacts from particulate matter and emissions of NO_x and O_3 to nearby EJ populations would be minor. Similarly, impacts from transportation diesel emissions and coal combustion would not represent a disproportionate impact to the EJ populations living in the vicinity of the SCM. No disproportionate impacts to EJ populations would result from the Partial Mining alternative.

4.18.2.6 Public Health and Safety

Considering that there are no EJ populations present within the SCM, potential public health and safety issues are limited to off-site inhalation of air toxins emitted from construction activities and ingestion through the deposition of air toxins in drinking water supplies and via the food chain. While criteria pollutants may be present in the deposition zone, the level of pollution would be below the federally regulated NAAQS, even when added to background concentrations. Therefore, potential human health effects in the region from criteria air pollutants would be minor and no disproportionate impacts to EJ populations would result from the Partial Mining alternative.

4.18.3 Alternative 3 – Accelerated Mining Rate

4.18.3.1 Cultural Resources

The SCM has been thoroughly surveyed and all potentially eligible resources have been identified and catalogued. If a site cannot be avoided during a surface activity, this site would be mitigated and potentially recovered. The SCM has a cultural resources MOA that is in place to guide mitigation of incidental cultural discoveries that might be encountered during mining. No disproportionate impacts to EJ populations would result from the Accelerated Mining Rate alternative.

4.18.3.2 Socioeconomics

As discussed in section 4.17.1.3, under the Accelerated Mining Rate alternative, there would be similar impacts to socioeconomics in the region as the Proposed Action and the EJ communities in the vicinity of the SCM would realize a continuance of socioeconomic activity in the form of high-paying positions, although these positions would be for a shorter duration compared to the Proposed Action. The indirect/induced economic and fiscal benefits from this alternative would be the same as the Proposed Action because all of the remaining LBA1 tracts coal would be mined under this alternative. Overall, the direct and indirect effects would be minor and short-term. Impacts would not disproportionately effect EJ populations in the vicinity of the SCM.

4.18.3.3 Noise and Vibration

Noise and vibration impacts would not be any different than those discussed in Section 4.14.1.3 of this EIS. The impacts would not exceed the significance thresholds or result in major adverse effects to the nearby residences or recreation areas. Therefore, no disproportionate impacts from noise or vibration to the EJ populations in the vicinity of the SCM would occur.

4.18.3.4 Visual Resources

Impacts to visual resources as result of the Partial Mining alternative would be the same as those described in Section 4.13.1.3 of this EIS. These impacts include surface construction impacts (i.e., dust) and observation of existing facilities and mining equipment which would be limited to a 5-year term. Residents and viewers from nearby EJ populations would not experience disproportionate effects from the Partial Mining alternative, as these features would result in minor impacts to the visual resources.

4.18.3.5 Air Quality

Air quality impacts are described in detail in Section 4.4 of this EIS. Modeling and air monitoring indicate that impacts from particulate matter and emissions of NO_x and O_3 to nearby EJ populations would be minor. Similarly, impacts from transportation diesel emissions and coal combustion would not represent a disproportionate impact to the EJ populations living in the vicinity of the SCM.

4.18.3.6 Public Health and Safety

Considering that there are no environmental justice populations present within the SCM, potential public health and safety issues are limited to off-site inhalation of air toxins emitted from construction activities and ingestion through the deposition of air toxins in drinking water supplies and via the food chain. While criteria pollutants may be present in the deposition zone, the level of pollution would be below the federally regulated NAAQS, even when added to background concentrations. Therefore, potential human health effects in the region from criteria air pollutants would be minor and would not disproportionately adversely affect EJ populations in the vicinity of the SCM.

4.18.4 Alternative 4 – No Action

As discussed in section 4.17.1.4, under the No Action Alternative, the SCM would terminate Federal coal recovery operations within the boundaries of the LBA1 tracts. The SCM would continue to operate as there is approximately 63.4 Mt of permitted Federal, state, and private coal remaining, but the overall LOM would be reduced, and employment may be impacted. The No Action alternative would result in moderate direct and indirect negative impacts to EJ populations in the vicinity of the SCM because the SCM would have a shorter LOM, fewer employees and revenues to the region would decrease. Impacts would not disproportionately effect EJ populations in the vicinity of the SCM.

5.0 CUMULATIVE EFFECTS

This chapter assesses the cumulative impacts of the Proposed Action (Alternative 1), Partial Mining (Alternative 2), Accelerated Mining Rate (Alternative 3), and No Action (Alternative 4).

The CEQ regulations define cumulative effects as those effects on the environment that result from incremental effects of an action when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-federal) or person undertakes such other actions (40 C.F.R. 1508.1(i)(3)). The past, present, and reasonably foreseeable actions considered in the cumulative effects analysis are described in Section 5.1 of this EIS. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

For purposes of discussion and to enable use of a common scale for all resources, resource specialists considered the following impact levels in qualitative terms.

Significant Impact: Impacts that potentially could cause irretrievable loss of a resource; significant depletion, change, or stress to resources; or stress within the social, cultural, and economic realm.

Moderate Impact: Impacts that could potentially cause some change or stress to an environmental resource, but the impact levels are not considered significant.

Minor Impact: Impacts that potentially could be detectable but slight.

Negligible Impact: Impacts in the lower limit of detection that potentially could cause an insignificant change or stress to an environmental resource or use.

No Impact: No discernible or measurable impacts.

Impacts can be short-term, meaning these impacts generally occur over a short period during a specific point in the mining process and these changes generally revert to pre-disturbance conditions at or within a few years after the disturbance has taken place. Long-term impacts are defined as those that substantially would remain beyond short-term ground-disturbing activities. Long-term impacts would generally last the life of the federal mining plan modification approval and beyond. Permanent impacts are defined as those that would remain indefinitely. Permanent impacts would permanently alter a resource and/or result in permanent loss of a resource.

The cumulative impacts analysis area differs for each resource. Per EPA guidance regarding consideration of cumulative impacts in NEPA documents, the selection of geographic boundaries for the analysis areas were based on natural boundaries and areas that sustain the resources of concern (EPA 1999). For example, the analysis area for topography is limited to existing areas of the Decker and Spring Creek mines, whereas the analysis area for soils is larger, encompassing Big Horn County, Wyoming. For surface water resources, the analysis area is based on watershed boundaries. The analysis area for each resource is described below.

5.1 Past, Present, and Reasonably Foreseeable Future Actions

This section identifies past, present, and reasonably foreseeable future actions. Actions considered in these analyses were identified by the lead agency resource specialists as well as from publicly available information.

5.1.1 Ongoing Operations at the Spring Creek Mine

As discussed in Section 2.1.1, in addition to the LBA1 tracts, the SCM also mines coal from other Federal, state, and private leases within the permit boundary. According to NTEC (2024), there is approximately 63.4 Mt of non-LBA tracts Federal, state, and private coal that cover 970.8 acres. Coal from the various leases is blended due to variability in quality to fulfill contracts.

5.1.2 Agriculture

The project area and surrounding areas have been used and will continue to be used for agricultural purposes, particularly livestock grazing. The source of water for livestock is both surface water and groundwater.

5.1.3 Power Plants

The nearest coal-fired power plants are the Colstrip coal-fired power plant, located about 55 miles north-northeast of the SCM, Rosebud waste coal power plant, located approximately 60 miles north-northeast of the SCM, and the Hardin plant, located about 56 miles northwest of the SCM. The Colstrip power plant consists of 2 generating units (Units 3 and 4) capable of producing 1,480 MW of electricity. The Rosebud power plant is capable of generating 38 MW of electricity from one unit. The Hardin power plant can produce up to 115.7 MW of electricity from one unit. In the larger analysis area, there are a number of other major regional point and area sources including other mines and electric generation facilities.

5.1.4 Other Mining

The Decker Mine is a surface coal mine located approximately 1.5 miles southeast of the project area. Lighthouse Resources, Inc. is the current owner and operator. The permitted mine operations area (approximately 11,718 surface acres) is currently undergoing reclamation. The Absaloka Mine is a surface coal mine located on and adjacent to the Crow Reservation, owned and operated by Westmoreland Resources, Inc. The mine is located approximately 45 miles northwest of the SCM. The permitted mine operations area is approximately 10,427 surface acres. In 2020, the annual coal production was 2.1 Mt. In April 2024, the Absaloka Mine lost its only power plant customer; however, Westmoreland indicated that the Absaloka Mine still has coal reserves and customers (Billings Gazette 2024). The Youngs Creek Mine is owned by NTEC and is located in Wyoming, approximately 7 miles southwest of the SCM. It encompasses approximately 7,822 acres of predominately privately held coal resources and surface rights. Estimated recoverable coal resources are 287 Mt (CPE 2015). The mine is permitted, but there are no current or planned mining operations. The Brook Mine, owned by Ramaco Wyoming Coal, LLC, is permitted by the Wyoming Department of Environmental Quality to mine a maximum of 8 Mtpy of coal using a highwall mining technique. The Brook Mine is located in Wyoming, approximately 15 miles southwest of the SCM and encompasses approximately 4,549 acres of privately held coal resources. Ramaco indicates that initial mine development at the Brook Mine began in the fourth quarter of 2023 and is continuing coal exploration efforts to further define its coal deposits (Ramaco 2024). In May 2023, Ramaco announced the discovery of a rare earth element deposit at the Brook Mine (Ramaco 2023). Ramaco is continuing exploration efforts to further refine the rare earth element deposit. No plans for commercial production have been presented by Ramaco.

5.1.5 Recreation

Recreation in Big Horn County, Montana includes Tongue River Reservoir and hunting and fishing opportunities. No new recreation areas are planned in the reasonably foreseeable future.

5.1.6 Wildfires

Past wildfires can increase runoff and erosion and degrade water quality, can altered habitats, can affects climate change through loss of vegetation and the release of CO_2 and other GHGs into the atmosphere, can result in substantial air pollution, particularly through the release of fine particles. Wildland fires have historically occurred in the vicinity of the SCM and are expected to occur for the reasonably foreseeable future.

5.1.7 Oil and Gas Development

CBNG production in Big Horn County, Montana and Sheridan County, Wyoming has ceased and there is limited oil and gas development.

5.2 Resources

5.2.1 Topography and Physiology

The analysis area for evaluation of the cumulative impacts for topography and physiology includes eastern Big Horn County.

Related past, present, and reasonably foreseeable future actions that would contribute to cumulative impacts to topography and physiology include the following:

- Past, present, and future mining and reclamation at the SCM (outside of the LBA1 tracts - 970.8 disturbance acres currently approved).
- Past, present mining and future reclamation at the Decker Mine (no new disturbance will be added as the Decker Mine is in reclamation phase).

The cumulative effects are related to the amount of physical disturbance occurring within Big Horn County which would alter the topography and physiology. Other than ongoing mining at the SCM and reclamation at the Decker Mine no other past, present, or future surface disturbing actions occur within the county. The cumulative impacts on topography and physiology in the study area resulting from past, present, and reasonably foreseeable future actions is minor.

The amount of additional disturbance associated with each of the alternatives included in this EIS is discussed in Section 2.2. The greatest amount of additional disturbance would occur under Alternatives 1 and 3. There would be no additional disturbance from Alternative 4. Alternatives 2, 3, and 4 would likely reduce the life of the SCM and would shorten the duration of cumulative effects added by the SCM. Alternatives 1, 2, and 3 would have a minor incremental effect on topography and physiology when added to the minor cumulative topography and physiology impacts.

5.2.2 Geology, Mineral Resources, and Paleontology

The analysis area for evaluation of the cumulative impacts for geology, mineral resources, and paleontology includes eastern Big Horn County, Montana and northern Sheridan County, Wyoming.

Related past, present, and reasonably foreseeable future actions that would contribute to cumulative impacts to geology, mineral resources, and paleontology include the following:

- Past, present, and future mining and reclamation at the SCM (outside of the LBA1 tracts - 970.8 disturbance acres currently approved).
- Past, present mining and future reclamation at the Decker Mine (no new disturbance will be added as the Decker Mine is in reclamation phase).
- Past, present mining and future reclamation at the Brook Mine (1,135 acres of proposed disturbance).

Due to the contained nature of impacts to geology, the cumulative impacts on geology in the study area resulting from past, present, and reasonably foreseeable future actions is minor. The cumulative effects to this resource would primarily be associated with past and present mining at the SCM, past mining at the Decker Mine, and future mining at the Brook Mine. The amount of additional disturbance associated with each of the alternatives included in the EIS is discussed in Section 2.2. The greatest amount of additional disturbance would occur under Alternatives 1 and 3. Alternatives 1, 2, and 3 would contribute to moderate and permanent cumulative impacts to the geology of the area. There would be no additional cumulative effects from Alternative 4. All the alternatives would have a minor incremental effect on geology when added to the minor cumulative geology impacts.

As described in Section 3.3.2.2 of this EIS, CBNG production in Big Horn County has ceased and there is limited oil and gas development. Cumulative impacts on mineral resources in the study area are minor based on past activities. When added to the mionr cumulative mineral resource impacts, Alternatives 1,2, 3, and 4 would have a negligible incremental effect on mineral resources.

Due to the contained nature of impacts to paleontology, the cumulative impacts in the study area resulting from past, present, and reasonably foreseeable future actions is negligible. The cumulative effects to this resource would primarily be associated with large surface disturbing actions like mining and reclamation at the SCM, the Decker Mine, and the Brook Mine. No unique or significant paleontological resources have been identified or are suspected to exist in the SCM and the likelihood of encountering significant paleontological resources is very minor. Therefore, Alternatives 1, 2, 3, and 4 would result in negligible incremental effect, but permanent, cumulative impacts to the paleontological resources of the area.

5.2.3 Air Quality

The analysis area for evaluation of the cumulative impacts for air quality includes Big Horn and Rosebud counties, Montana and Sheridan County, Wyoming.

Related past, present, and reasonably foreseeable future actions that would contribute to cumulative impacts to geology, mineral resources, and paleontology include the following:

- Past, present, and future mining and reclamation at the SCM (outside of the LBA1 tracts - 970.8 disturbance acres currently approved).
- Past, present mining and future emissions from the Hardin, Rosebud, and Colstrip power plants.
- Past, present mining and future wildland fires.

5.2.3.1 Cumulative Air Quality Impacts from Mining

The cumulative effects from mining include effects from emissions related to coal excavation and reclamation activities and tailpipe emissions from equipment. As discussed in the Miles City Field Office Supplemental EIS (SEIS), southeast Montana (including Big Horn and Rosebud counties) has met all NAAQS standards for sites within the planning area from 2017 to 2021. Outside of past and present activities within the study area, the only and reasonably foreseeable future action is the Brook Mine. Based on this, the cumulative impacts on air quality from mining in the study area resulting from past, present, and reasonably foreseeable future actions is minor.

Cumulative impacts from air quality could be higher in the short term in the study area due to coal mining and electrical generation activities if surface inversion occurs in the region or if wildland fires occur. These impacts would be temporary, lasting the duration of the inversion or until the fire is extinguished.

The cumulative effects from particulate matter emissions related to Alternatives 1 and 2 would result in a minor incremental effect when added to the minor cumulative impacts to air quality. The cumulative effects from particulate matter emissions related to Alternative 3 would result in a moderate incremental effect because the mining rate would increase at the SCM under this alternative. Alternative 4 would have a negligible incremental effect when added to the minor cumulative air quality impacts from mining.

5.2.3.2 Cumulative Air Quality Impacts from Transportation Diesel Emissions

The cumulative effects from transportation diesel emissions includes equipment, vehicles, and locomotives in the study area. The impacts of diesel emissions vary depending on location, as well as meteorological conditions. Effects would likely be most noticeable near populated areas, where diesel emissions from mining would combine with diesel emissions from other past, present, and reasonably foreseeable transportation modes that use fossil fuel combustion. Based on this, the cumulative impacts on air quality from transportation diesel emissions in the study area resulting from past, present, and reasonably foreseeable future actions is minor.

Diesel emissions related to the alternatives included in the EIS are discussed in Section 4.4.3.1. A comparison of the Alternative 3 (the alternative with the potential to contribute the largest amount of diesel emissions) transportation emissions to the 2020 national transportation emissions shows that this alternative would contribute a small percentage of emissions to each transportation segment. Alternative 1 would allow the SCM to continue mining at or near the current coal production through 2039, which would have a negligible cumulative impact compared to current transportation diesel emissions. Alternative 3 would increase coal production, leading to an associated short-term (2.2 years) increase of cumulative impacts from diesel emissions. Alternatives 2 and 4 would decrease coal production, which would lead to a decrease of cumulative impacts from diesel emissions.

The cumulative effects from diesel transportation emissions related to Alternative 1 is expected to have a minor increment effect when added to the minor cumulative impacts to air quality from transportation diesel emissions. Alternative 3 would have a moderate incremental effect when added to the minor cumulative impacts to air quality from transportation diesel emission. Alternatives 2 and 4 would have a negligible to minor incremental effect when added to the minor cumulative air quality impacts from transportation diesel emissions.

5.2.3.3 Coal Combustion

The cumulative effects from coal combustion within the study area is related to the three power plants located within the study area. Past and present air quality within the study area indicate that NAAQS are being met. Past, present, and reasonably foreseeable future actions would have a minor cumulative impact on air quality due to coal combustion. Alternatives 1 through 4 would have a negligible incremental impact on the minor cumulative impacts within the study area since these alternatives do not contribute to coal combustion in the study area.

Because coal from Alternatives 1, 2, and 3 will be burned at power plants outside of the study area, this analysis also includes a general evaluation of cumulative air quality impacts. The cumulative effects from coal combustion are localized for air/mercury deposition and global for GHGs. Various government agencies continually monitor ambient air quality to ensure maintenance of acceptable conditions and progress toward improvement where conditions are unacceptable. These multiple regulatory restrictions and monitoring programs address and minimize cumulative air quality impacts from coal combustion. Overall, coal combustion can have a moderate to significant cumulative impact depending on the geographic location.

5.2.3.4 Climate Change

Section 4.4.5 includes a detailed discussion on climate change and GHGs for each of the alternatives. There are currently no set specific thresholds for allowable GHG emissions, therefore, it is not possible to determine if any of the alternatives would significantly impact global GHG emissions on their own; however, all anthropogenic GHG emissions may cumulatively have a significant impact on global climate change.

The most recent findings and broad predictions regarding climate change and its effects are presented in the IPCC's *Climate Change 2023: AR6 Synthesis Report*, the USGCRP's *Fifth National*

Climate Assessment (USGCRP 2023), and the *Montana Climate Assessment* (Whitlock et al 2017), which are incorporated by reference into this final EIS. Projected effects of climate change are discussed in each of these documents at varying scales (e.g., global, U.S., and Montana) covering a variety of topics and resources.

Projecting the future cumulative effects of climate change requires modeling many intricate relationships between the land, ocean, and atmosphere. Because of the complexities involved, climate scientists rarely rely on a single model, instead using multiple models to explore the variability of future projections and different scenarios. The IPCC's report uses Shared Socio-economic Pathways (SSPs) to explore future emissions, climate change, related impacts and risks, and possible mitigation and adaptation strategies and are based on a range of assumptions, including socio-economic variables and mitigation options. The high and very high GHG emissions scenarios (SSP3-7.0 and SSP5-8.5) have CO_2 emissions that roughly double from current levels by 2100 and 2050, respectively. The intermediate GHG emissions scenario (SSP2-4.5) has CO_2 emissions remaining around current levels until the middle of the century. To discuss the cumulative impacts of GHG emissions for the project area, regional-scale projected impacts are discussed for the state of Montana. The USGS National Climate Change Viewer (USGS 2024) is one tool that can be used to evaluate potential climate change at the state level. The viewer provides data showing projections of future climate trends for three SSP scenarios (SSP2-4.5, SSP3-7.0, and SSP5-8.5) and three different time intervals (2025-2049, 2050-2074, and 2075-2099 relative to 1981-2010).

Projected changes to the maximum temperature, precipitation, runoff, snow, soil water storage capacity and evaporation for Big Horn County, MT and the entire state of Montana are presented in Table 5.2-1 to assess regional cumulative impacts from GHG emissions. The SSP scenarios forecast similar levels of climate impacts in the region over the next few decades; however, impacts over the next century diverge significantly. Alternative 1 would extend the SCM LOM 16 years (to 2039), Alternative 2 would extend the SCM LOM 5 years beyond the date of the ASLM decision, and Alternative 3 would extend the SCM LOM a little over 2 years (2026). None of these alternatives would contribute to the full extent of these potential climate change impacts. However, for analysis purposes, this EIS assumes that the maximum impacts would be realized during the LOM.

Table 5.2-1 Potential Climate Change Impacts for Montana and Big Horn County

Climate Indicator Variable	SSP	2025- 2049		2050- 2074		2075- 2099	
		Montana	Big Horn County	Montana	Big Horn County	Montana	Big Horn County
Maximum Temperature Departure (°F)	SSP2-4.5	3.53	3.58	5.08	5.02	6.40	6.36
	SSP3-7.0	3.50	3.47	5.98	5.94	8.58	8.61
	SSP5-8.5	4.14	4.15	7.22	7.25	10.84	10.84
Precipitation Departure (inches/month)	SSP2-4.5	0.05	0.02	0.09	0.08	0.11	0.08
	SSP3-7.0	0.03	0.03	0.06	0.05	0.10	0.07
	SSP5-8.5	0.05	0.04	0.07	0.04	0.11	0.09
Runoff Amount Departure (inches/month)	SSP2-4.5	-0.01	-0.02	-0.01	-0.01	0.00	-0.02
	SSP3-7.0	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02
	SSP5-8.5	-0.01	-0.01	-0.02	-0.03	-0.02	-0.02
Snow Water Equivalent Departure (inches)	SSP2-4.5	-0.25	-0.16	-0.37	-0.20	-0.49	-0.26
	SSP3-7.0	-0.25	-0.13	-0.43	-0.24	-0.58	-0.30
	SSP5-8.5	-0.30	-0.17	-0.51	-0.27	-0.72	-0.36
Soil Water Storage Capacity Departure (inches)	SSP2-4.5	-0.16	-0.17	-0.20	-0.17	-0.22	-0.22
	SSP3-7.0	-0.19	-0.18	-0.26	-0.26	-0.30	-0.30
	SSP5-8.5	-0.17	-0.16	-0.29	-0.31	-0.37	-0.39
Evaporation Deficit Departure (inches/month)	SSP2-4.5	0.19	0.21	0.26	0.27	0.32	0.35
	SSP3-7.0	0.20	0.20	0.34	0.35	0.49	0.53
	SSP5-8.5	0.22	0.23	0.42	0.46	0.65	0.68

Source: USGS 2024

5.2.3.4.1 Projected Climate Change Impacts in Montana

The Montana Climate Assessment reports that the state of Montana is projected to continue to warm in all geographic locations, seasons, and under all emission scenarios. By mid-century, Montana temperatures are projected to increase by approximately 4.5-6.0°F (2.5-3.3°C) depending on the emission scenario. By the end-of-century, Montana temperatures are projected to increase 5.6-9.8°F (3.1-5.4°C) depending on the emission scenario. These state-level changes are larger than the average changes projected globally and nationally. The number of days in a year when daily temperature exceeds 90°F (32°C) and the number of frost-free days are expected to increase across the state and in both emission scenarios studied. Increases in the number of days above 90°F (32°C) are expected to be greatest in the eastern part of the state. Across the state, precipitation is projected to increase in winter, spring, and fall; precipitation is projected to decrease in summer. The largest increases are expected to occur during spring in the southern part of the state. The largest decreases are expected to occur during summer in the central and southern parts of the state.

Most of the water that enters Montana comes as rain or snow at higher elevations. Although some of Montana's water originates in Wyoming or adjacent Canadian provinces, over 80% is derived from within state boundaries. Groundwater is another large and important component of the water cycle in Montana, with most groundwater coming from shallow sand or gravel aquifers in river floodplains. Groundwater resources contribute significantly to natural streamflow throughout the year. In Montana, much of the winter snowfall that accumulates in the mountains melts in spring to produce streamflow and recharge groundwater aquifers.

Rising temperatures will reduce snowpack, shift historical patterns of streamflow in Montana, and likely result in additional stress on Montana's water supply, particularly during summer and early fall. Earlier onset of snowmelt and spring runoff will reduce late-summer water availability in snowmelt-dominated watersheds. Groundwater demand will likely increase as elevated temperatures and changing seasonal availability of traditional surface-water sources force water users to seek alternatives. Rising temperatures will exacerbate persistent drought periods that are a natural feature of Montana's climate.

5.2.3.4.2 Climate Change Impacts on the Spring Creek Mine Reclamation

The post-reclamation land use at the SCM is wildlife habitat and grazing, consisting of vegetation cover of grasses and shrubs. For all alternatives, the SCM would be required as part of its approved reclamation plan, and as a condition of eventual bond release, to replace topsoil within disturbed areas and revegetate.

The direct effects of climate change on soils and vegetation include increased temperatures and shifts in precipitation that together alter humidity, soil moisture, and water stress. Reduced soil moisture and water availability could impact revegetation success during reclamation.

To successfully meet the requirements for revegetation success, the SCM may need to adjust the species used for vegetative cover and rely more on drought tolerant and native species, as well as species to prevent increased soil erosion. The timing of revegetation may need to be adjusted based on future climate conditions during reclamation. In some projections, a potentially longer growing season may promote increased vegetative growth but may reduce growth productivity in water-limited areas. Any changes to NTEC's approved reclamation plan would need to be approved by MDEQ.

Any impacts to water resources and vegetation at the SCM may have an impact on wildlife in the area. Lack of available resources may force migration of certain wildlife species.

5.2.4 Hydrology

5.2.4.1 Groundwater

The analysis area for evaluation of the cumulative impacts for groundwater is the Tongue River drainage basin.

Related past, present, and reasonably foreseeable future actions that would contribute to cumulative impacts to groundwater include the following:

- Past, present, and future mining and reclamation at the SCM (outside of the LBA1 tracts).
- Past, present mining and future reclamation at the Decker Mine.
- Past, present, and future mining and reclamation at the Brook Mine.
- Past CBNG production.

The past and present actions within the cumulative groundwater study area have resulted in elevated TDS in some groundwater as a result of recharge to backfilled material. In addition, groundwater pumping from past and present actions (e.g., mining and CBNG) has lowered water levels in the area. Reasonably foreseeable future actions within the cumulative groundwater study area will continue to impact water quality and water levels. The cumulative impacts on groundwater in the study area resulting from past, present, and reasonably foreseeable future actions is minor.

Alternatives 1, 2, and 3 would result in moderate incremental impacts to the cumulative groundwater study area. Alternative 4 would have a negligible incremental impact on the minor cumulative groundwater impacts.

5.2.4.2 Surface Water

The analysis area for evaluation of the cumulative impacts for surface water is the Tongue River drainage basin.

Related past, present, and reasonably foreseeable future actions that would contribute to cumulative impacts to groundwater include the following:

- Past, present, and future mining and reclamation at the SCM (outside of the LBA1 tracts).
- Past, present mining and future reclamation at the Decker Mine.
- Past, present, and future mining and reclamation at the Brook Mine.
- Past, present, and future agricultural activities, primarily livestock grazing.
- Past, present, and future wildland fires.

Past and present actions within the cumulative surface water study area have disturbed surface water channels. In addition, surface disturbing activities, agriculture, and wildland fire have resulted in surface erosion, which has the potential to increase TDS in surface waters downstream. Reasonably foreseeable future actions within the cumulative surface water study area will continue to impact water quality. The cumulative impacts on surface water in the study area resulting from past, present, and reasonably foreseeable future actions is minor.

Alternatives 1, 2, and 3 would result in moderate incremental impacts to the cumulative surface water study area due to the additional disturbance that will occur. Alternative 4 would have a negligible incremental impact on the minor cumulative groundwater impacts.

5.2.4.3 Water Rights

The analysis area for evaluation of the cumulative impacts for water rights is the Tongue River drainage basin.

Related past, present, and reasonably foreseeable future actions that would contribute to cumulative impacts to groundwater include the following:

- Past, present, and future mining and reclamation at the SCM (outside of the LBA1 tracts).
- Past, present mining and future reclamation at the Decker Mine.
- Past, present, and future mining and reclamation at the Brook Mine.
- Past, present, and future agricultural activities, primarily livestock grazing.
- Past CBNG.

Past, present, and reasonably foreseeable future actions have had and will continue to have a moderate cumulative impact on groundwater rights within the study area. Dewatering for CBNG, mining, and agricultural activities have reduced the amount of groundwater that can be pumped from nearby wells in the vicinity of these activities. Reclamation at the mines has and will continue to have the potential to increase concentrations of TDS in groundwater; however, the suitability of groundwater for beneficial use has not and should not change. Overall, cumulative impacts to groundwater rights within the study area are minor and limited to areas near the mines. Alternatives 1 through 4 will have a moderate incremental effect when added to the minor cumulative impacts within the study area.

Surface water rights in Wyoming are controlled by the State Engineers Office and in Montana by the DNRC). Most existing surface water rights within the study area are old and associated with irrigation and livestock watering. Past, present, and reasonably foreseeable future actions have had and will continue to have a negligible cumulative impact to surface water rights within the study area. Similarly, Alternatives 1 through 4 would have a negligible incremental effect on the negligible cumulative impact to surface water rights within the study area.

5.2.5 Soil

The analysis area for evaluation of the cumulative impacts to soils includes eastern Big Horn County, Montana:

- Past, present, and future mining and reclamation at the SCM (outside of the LBA1 tracts - 970.8 disturbance acres currently approved).
- Past, present mining and future reclamation at the Decker Mine (no new disturbance will be added as the Decker Mine is in reclamation phase).

Past and present actions of soil salvage, stockpiling, and replacement of soils associated with mining at the SCM and the Decker Mine have increased erosion rates and reduced soil productivity in comparison to the undisturbed areas of the mines. In accordance with the mine permits, much of the previously disturbed areas within each mine boundary have been reclaimed, which includes filling and grading, replacing topsoil, and revegetating. Reasonably foreseeable future actions will continue to disturb soils and increase erosion and soil productivity at the SCM, while reclamation will continue at the Decker Mine. In addition, past actions including roads, powerlines, rail lines, and other infrastructure have disturbed soils and will likely continue to disturb minor areas. Overall, the cumulative soil impacts within the study area are moderate.

Alternatives 1, 2, 3, and 4 would add a minor incremental impact to the moderate cumulative impacts to soils within the study area. Alternatives 2, 3, and 4 would likely reduce the life of the

SCM and would shorten the duration of cumulative effects added by the SCM. There would be no additional cumulative impacts from Alternative 4.

5.2.6 Vegetation

The analysis area for evaluation of the cumulative impacts to vegetation includes eastern Big Horn County, Montana.

Related past, present, and reasonably foreseeable future actions that would contribute to cumulative impacts to soils include the following:

- Past, present, and future mining and reclamation at the SCM (outside of the LBA1 tracts - 970.8 disturbance acres currently approved).
- Past, present mining and future reclamation at the Decker Mine (no new disturbance will be added as the Decker Mine is in reclamation phase).
- Past, present, and future agricultural practices, including livestock grazing.
- Past, present, and future wildland fires.

Agriculture within Big Horn County, Montana consists mostly of grazing lands. Continued agriculture activities will continue to alter vegetation within the study area and may increase noxious and invasive weeds within the study area. Wildland fires have altered and eliminated vegetation in some areas within the study area. Wildland fires can potentially increase introduced or noxious weed species if a seed source for those invasive species is present. Wildland fires can also remove existing invasive species and allow for an increase in native species or new vegetation communities, such as that of the conifer/sumac complex present in the project area. Fires also can add nutrients to the soil for vegetation and kill insect pests that may be killing native vegetation. Fires are part of the natural ecosystem, and many native plant communities are accustomed to periodic fires. Periodic wildland fires could contribute both beneficial and adverse cumulative impacts on vegetation. Past, present, and future mining at the SCM will continue to have an adverse impact on vegetation until reclamation has reestablished vegetative communities. Based on this, the cumulative vegetation impacts within the study area are minor.

Alternatives 1, 2, and 3 will have a moderate incremental impact to the minor cumulative impacts to the vegetation within the study area. Alternatives 2, 3, and 4 would likely reduce the life of the SCM and would shorten the duration of cumulative effects added by the SCM. There would be no additional cumulative impacts from Alternative 4.

5.2.7 Wildlife

The analysis area for evaluation of the cumulative impacts to wildlife is eastern Big Horn County, Montana.

Related past, present, and reasonably foreseeable future actions that would contribute to cumulative impacts to soils include the following:

- Past, present, and future mining and reclamation at the SCM (outside of the LBA1 tracts).
- Past, present mining and future reclamation at the Decker Mine.
- Past, present, and future agricultural practices, including livestock grazing.
- Past, present, and future recreation.
- Past, present, and future wildland fires.

5.2.7.1 Big Game

Cumulative impacts to big game from past, present, and reasonably foreseeable future actions could include habitat loss, restrictions in seasonal and daily movement caused by railroads, access roads, and mining operations, poaching, urban development, range overuse, possible lack of water sources, and increased road kills. Past, present, and future recreation within the study area has likely deterred wildlife from highly visited areas. Past, present, and future wildland fires have likely changed or eliminated habitat components in the burn areas. General reclamation practices for establishing or enhancing post-mine wildlife habitat are included in the Reclamation Plans for each mine. In addition, the SCM also has developed a separate HRRP for the GRSG, which is a species of particular interest in the region. Because there is overlap between the big game winter range and the GRSG habitat areas, the reclamation of any GRSG habitat outlined the specific HRRP would fulfill the reclamation requirements for mule deer and pronghorn and would provide quality habitat for big game The cumulative impacts to big game within the study area are minor.

Alternatives 1, 2, and 3 would result in a moderate incremental contribution to the minor cumulative impacts to the big game within the study area. There would be no additional cumulative impacts from Alternative 4.

5.2.7.2 Raptors

Potential cumulative impacts to raptors from past, present, and reasonably foreseeable future actions include loss of nesting and foraging habitat, collisions with structures and vehicles, nest abandonment and reproductive failure due to increased human activities, reduction in prey populations, and displacement of birds into adjacent areas. Past, present, and future recreation within the study area has likely deterred raptors from highly visited areas. Past wildland fires likely changed or eliminated habitat components in the burn areas. Approved mine permits include regulations specifying mitigation measures for raptors, including minimization of disturbance, reclamation of habitats, and raptor-safe power line construction. The measures specified in mining permits and enforced by MDEQ ensure compliance with the MBTA, the Bald and Golden Eagle Protection Act, and the ESA, thereby ensuring regional impacts to those protected wildlife species would be minor. Based on this, cumulative impacts to raptors within the study area are minor.

Alternatives 1, 2, and 3 would result in moderate incremental impact to the minor cumulative impacts to the raptors in the study area. There would be no additional cumulative impacts from Alternative 4.

5.2.7.3 Greater Sage-grouse

Cumulative impacts to GRSG from past, present, and reasonably foreseeable future actions could include habitat loss and restrictions in seasonal and daily movement caused mining operations. The cumulative effects to this resource would primarily be linked to the existing SCM and the adjacent Decker Mine. Past wildland fires likely changed or eliminated habitat components in the burn areas.

A wildlife conservation strategy for the SCM was developed in collaboration with the USFWS, other state and federal agencies, and many other stakeholders in the region that would benefit numerous special interest species, including GRSG. The SCM would implement a variety of conservation measures both on and off-property, with special emphasis in habitats identified as Conservation Priority Areas (e.g., GRSG core areas, occupied short-grass prairie habitats, etc.) throughout the coverage area. These voluntary measures include a wide variety of land management actions that are designed to avoid or minimize impacts, and to restore, enhance, and/or maintain habitat benefiting one or more of the targeted species, including GRSG. Alternatives 1, 2, and 3 would result in moderate incremental impact to the minor cumulative impacts to the GRSG of the study area. There would be no additional cumulative impacts from Alternative 4.

5.2.7.4 Threatened and Endangered Species and Species of Special Interest

Because no T&E species or habitats critical to T&E species have been documented within the project area, this project would have negligible and short-term cumulative impacts to T&E species. The cumulative impacts to other SOSI would be minor and result in long-term loss of habitat for SOSI.

5.2.8 Ownership and Use of Land

The analysis area for evaluation of the cumulative impacts to ownership and use of the land includes eastern Big Horn County, Montana.

Related past, present, and reasonably foreseeable future actions that would contribute to cumulative impacts to ownership and use of the land include the following:

- Past, present, and future agricultural activities, primarily livestock grazing.
- Past, present, and future mining and reclamation at the SCM (outside of the LBA1 tracts).
- Past, present mining and future reclamation at the Decker Mine.

The cumulative effects on ownership and use of the land from past, present, and reasonably foreseeable future actions include a reduction of livestock grazing and subsequent revenues, a reduction in habitat for some species of wildlife (particularly pronghorn, GRSG, and mule deer), and loss of recreational access to public lands (particularly for hunters). Mine boundaries within the study area have the biggest impact on use of land since livestock grazing and hunting are restricted within the permit boundaries. Overall, cumulative impacts on ownership and use of land are minor within the study area.

Because the Decker Mine is undergoing reclamation, the amount of additional disturbance contributing to the cumulative effects to these resources will decrease as reclamation is completed and lands become available for alternate uses. Wildlife (particularly big game) use would be displaced while the tracts are being mined and reclaimed. Livestock grazing has already been prohibited due to the tracts being inside permit boundaries and adjacent to active mining areas. Hunting on the tracts is currently not allowed because they are within mine permit boundaries and would continue to be disallowed during mining and reclamation. Following reclamation, the land would be suitable for grazing and wildlife uses, which are the historic land uses. The amount of additional disturbance associated with each of the alternatives included in the EIS is discussed in Section 2.2. The greatest amount of additional disturbance would occur under Alternatives 1 and 3. There would be no additional disturbance from Alternative 4.

Alternatives 1, 2, 3, and 4 would result in moderate incremental impact to the minor cumulative ownership and use of the land impacts within the study area.

5.2.9 Cultural Resources

The analysis area for evaluation of the cumulative impacts to cultural resources includes eastern Big Horn County, Montana.

Related past, present, and reasonably foreseeable future actions that would contribute to cumulative impacts to cultural resources include the following:

- Past, present, and future agricultural activities, primarily livestock grazing.
- Past, present, and future mining and reclamation at the SCM (outside of the LBA1 tracts).
- Past, present mining and future reclamation at the Decker Mine.
- Past, present, and future wildland fires.

Past, present, and reasonably foreseeable agricultural development of surrounding lands has the potential to result in ground disturbances and may affect the integrity of buried archeological sites as well as known and unknown historic properties. Past and future wildland fires in and around the project area have had and will continue to have the potential to destroy historic artifacts and properties, resulting in cumulative impacts on cultural resources. Overall, cumulative impacts to cultural resources within the study area is minor.

Since the SCM is required to evaluate cultural resource sites and avoid or mitigate all unavoidable disturbance to NRHP eligible sites, the cumulative effects to cultural resources have been minor. The cumulative impacts on cultural resources from Alternatives 1, 2, and 3 would have a minor impact when added to the minor cumulative impacts. There would be no additional cumulative impacts from Alternative 4.

5.2.10 Visual Resources

The analysis area for evaluation of the cumulative impacts to visual resources includes eastern Big Horn County, Montana.

Related past, present, and reasonably foreseeable future actions that would contribute to cumulative impacts to cultural resources include the following:

- Past, present, and future agricultural activities, primarily livestock grazing.
- Past, present, and future mining and reclamation at the SCM (outside of the LBA1 tracts).
- Past, present mining and future reclamation at the Decker Mine.
- Past, present, and future wildland fires.

Cumulative resource visual resource impacts from past, present, and reasonably foreseeable future actions include removal of vegetation and exposure of soil, as well as changes to the contour of the landscape. Wildland fire also has impacted visual resources by burning the shrubs, grasses, and trees in the area and leaving large swaths of blackish charred areas with some burned stumps remaining. The visual impacts from wildland fires would continue until the burned areas have become naturally revegetated over the next several years. The greatest visual impact in this area is the visibility of mine pits and facility areas. After mining, the reclaimed slopes might appear somewhat smoother than premining slopes and there would be fewer gullies, bluffs, and rock outcrops than at present. Cumulative impacts on visual resources within the study area is minor.

Alternatives 1, 2, 3, and 4 would result in moderate increment to the minor cumulative visual resource impacts in the study area.

5.2.11 Noise

The analysis area for evaluation of the cumulative impacts to noise includes eastern Big Horn County, Montana.

Related past, present, and reasonably foreseeable future actions that would contribute to cumulative impacts to cultural resources include the following:

- Past, present, and future mining and reclamation at the SCM (outside of the LBA1 tracts).
- Past, present mining and future reclamation at the Decker Mine.
- Past, present, and future recreation.

Past, present, and reasonably foreseeable future actions that have caused and will continue to cause noise within the study area include recreation, transportation, and mining. Recreation and transportation noises are temporary and would dissipate quickly, while mining noises occur for the duration of the mine. Wildlife in the immediate vicinity of the noise may be adversely affected by noise; however, observations at the SCM indicate that wildlife generally adapt to noise conditions associated with activities. While recreational users, local residents, and grazing lessees using lands surrounding active mining areas do hear mining-related noise, this has not been reported to cause a substantial impact. Mining-related noise is generally masked by the wind at short distances, so cumulative overlap of noise impacts would primarily be linked to the existing SCM and the adjacent Decker Mine. Overall, the cumulative noise impact for the study area is minor.

Alternatives 1, 2, and 3 would result in moderate increment to the minor cumulative impacts from noise in the study area. Alternatives 2, 3, and 4 would likely reduce the life of the SCM and would shorten the duration of cumulative effects added by the SCM. Alternative 4 would only generate noise at the mine site during reclamation and therefore would contribute the lease to cumulative noise impacts.

Guideline criteria for evaluating rail-related noise and vibration effects are based on existing rail traffic on rail line segments. As discussed in Section 4.15.1.1 of this EIS, rail transport is forecast to slightly increase. Noise and vibration effects of future actions related to rail operations will be evaluated by FRA, STB, and/or other permitting authorities in the context of existing regulations. Avoidance, minimization, and mitigation measures will be adopted in association with approvals, as needed, to reduce rail-related noise effects to acceptable levels and avoid major impacts related to noise and vibration. Examples include, but are not limited to, wheel treatments to reduce wheel/rail interaction, use of sound barriers, use of wayside horns versus locomotive horns, stringent noise specifications for grade-crossing signals and equipment, operational restrictions lowering speed and reducing nighttime operations) and use of ballast versus concrete for guideways to improve ground absorption of noise (FTA 2006). The cumulative impacts from Alternatives 1, 2, and 3 related to noise from rail transport would be moderate. There would be no additional cumulative impacts from Alternative 4.

5.2.12 Transportation

The analysis area for evaluation of the cumulative impacts on transportation includes eastern Big Horn County, Montana.

Related past, present, and reasonably foreseeable future actions that would contribute to cumulative impacts on transportation include the following:

- Recreation activities in the area.
- Agricultural operations.
- Past, present, and future mining and reclamation at the SCM.
- Past, present mining and future reclamation at the Decker Mine.
- Past, present mining and future reclamation at the Brook Mine.

Past, present, and reasonably foreseeable future actions have contributed to and will continue to wear and tear on existing roads, additional air emissions and fugitive dusts, greater noise, and increased risk of vehicle collisions with livestock, wildlife, and other vehicles. Local, regional, and national transportation facilities are already in place and future coal production levels are not expected to change. Cumulative transportation impacts in the study area are minor.

The annual rail traffic generated by the Alternatives 1, 2, or 3 represents a small fraction of the total U.S. rail freight traffic so the cumulative effects related to transportation would be minor but extended to out to 2039 under these alternatives. There would be no additional cumulative impacts from Alternative 4.

Coal dust would combine with dust generated from other past, present, and reasonably foreseeable future coal haulage. Continued application of BNSF’s Coal Loading Rule (BNSF 2015,

2017) ensures that coal dust emissions are minimized on BNSF-owned and operated rail lines, thereby minimizing the potential for coal-dust related emissions and subsequent deposition to soil and water. Increases to port capacity are not foreseeable, so the future rate of coal transport on the main routes would not change significantly from recent shipping rates. Based on this and the findings of evaluations for other rail transport projects (WDOE and Cowlitz County 2017, STB 2015), project-related coal dust emissions, dispersion, and deposition would result in negligible long-term cumulative effects from coal transport on public health, ecological health, collisions with T&E species, dust, noise, and vibration.

Alternatives 1, 2, and 3 would result in minor and short-term cumulative impacts from coal dust. Alternatives 2, 3, and 4 would likely reduce the life of the SCM and would shorten the duration of cumulative effects added by the SCM. There would be no coal dust generated from Alternative 4.

5.2.13 Hazardous and Solid Waste

The analysis area for evaluation of the cumulative impacts from hazardous and solid wastes includes eastern Big Horn County, Montana.

Related past, present, and reasonably foreseeable future actions that would contribute to cumulative impacts from hazardous and solid wastes include the following:

- Past, present, and future mining and reclamation at the SCM.
- Past, present mining and future reclamation at the Decker Mine.

Past, present, and reasonably foreseeable future actions have generated and will continue to generate hazardous and solid wastes within the study area. Hazardous and solid wastes generated in the study area are disposed of at landfills in Hardin, Montana and Sheridan, Wyoming. It is anticipated that future hazardous and solid waste will continue to be disposed of at these locations. Cumulative hazardous and solid waste impacts within the study area are minor.

Mining activities would generate hazardous, non-hazardous, hazardous, and universal wastes. Non-hazardous solid waste would continue to be shipped to local municipal landfills in Hardin, Montana and Sheridan, Wyoming. The only wastes disposed of onsite would continue to be wastes such as abandoned mining machinery, non-greasy wood, used tires, concrete, and other items permitted under the mines' existing MDEQ or WDEQ permits to mine. Hazardous waste and non-hazardous waste such as used grease and used antifreeze would continue to be incinerated for energy recovery at an off-site EPA-permitted facility. Universal wastes including used batteries, electronic waste, and used light bulbs would continue to be shipped off-site for recycling. No solid waste is deposited within 8 feet of any coal outcrop or coal storage area, or at refuse embankments or impoundment sites (Spring Creek Coal Company 2014).

Alternatives 1, 2, and 3 would result in minor incremental impact to the minor cumulative impacts from hazardous and solid wastes in the study area. There would be no additional hazardous wastes generated from Alternative 4.

5.2.14 Socioeconomics

The analysis area for evaluation of the cumulative impacts on socioeconomics includes eastern Big Horn County, Montana and Sheridan County, Wyoming.

Related past, present, and reasonably foreseeable future actions that would contribute to cumulative impacts on socioeconomics include the following:

- Agricultural operations.
- Past, present, and future mining and reclamation at the SCM.
- Past, present mining and future reclamation at the Decker Mine.

- Past, present mining and future reclamation at the Brook Mine.

The traditional major industries of coal mining and agriculture (ranching and farming) that have been and are the driving forces of the area's economy would likely continue. Past and present mining at the SCM and the Decker Mine have resulted in the loss of potential agricultural lands and economic productivity associated with agriculture. It should be noted that this loss of potential agricultural lands is temporary, as mined areas are reclaimed and returned to post-mine land use. Future mining at the SCM and Brook Mine would continue to have a beneficial impact to employment, the State of Montana revenues (royalties, severance tax, gross proceeds tax, and resource indemnity trust tax) and federal revenues (royalties, black lung tax, and federal recreation tax). The cumulative socioeconomic impact to the study area is moderate.

Alternatives 1, 2, and 3 would result in minor positive incremental impact to the moderate cumulative socioeconomic impacts. Alternative 4 would have a negative incremental impact to the moderate cumulative socioeconomic impacts.

5.2.15 Environmental Justice

The analysis area for evaluation of the cumulative environmental justice impacts includes Big Horn and Rosebud Counties in Montana, and Sheridan County, Wyoming.

Related past, present, and reasonably foreseeable future actions that would contribute to cumulative impacts on socioeconomics include the following:

- Agricultural operations.
- Past, present, and future mining and reclamation at the SCM.
- Past, present mining and future reclamation at the Decker Mine.
- Past, present mining and future reclamation at the Brook Mine.

Agriculture and mining would continue to have impacts similar to those described in Section 4.18 on EJ populations. Future mining at the SCM would continue to have a beneficial impact to the EJ populations near the SCM because it would continue to provide local employment opportunities and generate revenue for the regional economy for the remaining years of operations and reclamation. The cumulative environmental justice impact to the study area is moderate.

Alternatives 1, 2, and 3 would results in minor positive incremental impact to the moderate cumulative environmental justice impacts. Alternative 4 would have a negative incremental impact to the moderate cumulative environmental justice impacts.

6.0 ALTERNATIVES DISCUSSION

6.1 Environmentally Preferable Alternative

In accordance with 40 C.F.R. § 1502.14(f), OSMRE has determined that Alternative 4, the No Action alternative, is the environmentally preferable alternative that will best promote the national environmental policy expressed in Section 101 of NEPA.

As outlined in Section 2.2.4, under the No Action alternative, the Federal mining plan modification for the LBA1 tracts would not be approved and the SCM would no longer be able to mine Federal coal in the LBA1 tracts. The SCM would be required to apply for and receive all appropriate approvals to fully reclaim any disturbed areas according to its current approved mining and reclamation permit, but no additional LBA1 coal removal would be allowed.

Aside from impacts related to reclaiming areas within LBA1 that have already been disturbed by mining, the No Action alternative will not cause additional adverse environmental effects from ground disturbances or coal removal, including effects on topography, geology, mineral resources, paleontology, air quality, hydrology, soil, vegetation, wildlife, cultural resources, visual resources, or noise. Similarly, because additional mining would not be allowed in the LBA1 tracts, the No Action alternative would also be the only alternative that would not contribute to additional global GHG emissions from the removal or combustion of additional LBA1 coal.

The No Action alternative would result in moderate direct and indirect negative socioeconomic effects. The SCM would continue to operate as there is approximately 63.4 Mt of permitted Federal, state, and private coal remaining, but the overall coal recovery and LOM would be reduced.

Alternatives 1, 2, and 3, would all authorize further mining with the related environmental consequences outlined in chapters 4 and 5. For these reasons, OSMRE has determined that the No Action alternative is the environmentally preferable alternative.

6.2 Preferred Alternative

In accordance with 40 C.F.R. § 1502.14(d), OSMRE has identified Alternative 2, the Partial Mining alternative, as the preferred alternative. OSMRE based this determination on the environmental analysis contained in this EIS because the Partial Mining alternative strikes a reasonable balance between the action proposed by the SCM to develop the LBA1 tracts, the environmental impacts outlined in sections 4 and 5 (including socioeconomic effects), and the rapidly changing economic, environmental, and regulatory factors impacting coal markets, including difficulties in forecasting the relevant decision factors 15 to 16 years into the future. This option provides the Department with the discretion to determine, after an initial 5-year term, whether the mining plan modification should be approved again and whether any additional conditions to the approval are warranted to account for changed circumstances.

As outlined in Section 2.2.2, the Partial Mining alternative would limit the mining plan modification approval for the LBA1 tracts to a five-year term starting from the time of ASLM approval. Under this alternative, any mining of the LBA1 tracts after this term would require the operator to request an additional mining plan modification, which would require an updated OSMRE analysis and recommendation. Under this approach, the decision would benefit from a refreshed analysis after 5 years that would take into account any changed circumstances in coal markets, emissions reduction methods and targets, mining practices, or other relevant factors.

7.0 CONSULTATION AND COORDINATION

7.1 Public Comment Process

OSMRE developed a project specific website that provided legal notices, outreach notice letters, mailing address, and an email address for comments to be sent. The website can be accessed at https://www.osmre.gov/laws-and-regulations/nepa/projects.

OSMRE issued a NOI to prepare an EIS in the *Federal Register* and announced the NOI through a news release and on its website on March 17, 2022. The scoping period began on March 17, 2022, and ended April 15, 2022. OSMRE mailed letters to federal agencies, state agencies, tribes, counties, municipalities and conservation districts, non-government organizations, and individuals on March 17, 2022.

During the public scoping period, OSMRE hosted a virtual public scoping meeting on March 31, 2022, via Zoom. The public was provided the opportunity to comment on the project via mail, email, and/or during the virtual meeting.

OSMRE issued a Notice of Availability (NOA) for the draft EIS in the *Federal Register* and announced the NOA through a news release and on its website on September 4, 2024, initiating a 45-day public comment period that ended on October 22, 2024. OSMRE mailed letters to federal agencies, state agencies, tribes, counties, municipalities, and conservation districts, non-government organizations, and individual stakeholders on September 4, 2024.

During the public comment period, OSMRE hosted an in-person public meeting at the Big Horn County Courthouse in Hardin, Montana, on September 24, 2024. The public was provided the opportunity to comment on the project via mail, email, and/or during the public meeting. A summary of comments and OSMRE's responses are in Appendix D.

7.2 Preparers and Contributors

OSMRE personnel that contributed to the development of this EIS are listed in Table 7.2-1 and third-party contractors who contributed to the development of this EIS are identified in Table 7.2-2.

Table 7.2-1 Office of Surface Mining Reclamation and Enforcement

Name	Title	Project Responsibility
Calle, Marcelo	Manager, Program Support Division, Western Region	Project Lead/Project Coordination
Travers, Allison	Lead Natural Resource Specialist, Technical Services Branch, Mid-Continent Region	Project Lead/Project Coordination
Martinez Hernandez, Roberta	Natural Resource Specialist, Program Support Division, Western Region	Air Quality, Climate Change
Trent, Erica	Natural Resource Specialist, Program Support Division, Western Region	Section 7 Coordinator
Christine Allen	NEPA Coordinator, Division of Regulatory Support, Headquarters	NEPA Coordinator

Table 7.2-2 Third Party Contractor

Name	Organization	Project Responsibility	Education/Experience
Wilson, Beth	WWC Engineering	Project Manager, Primary Author	NEPA Specialist
Venton, Kim	WWC Engineering	Hydrology	Hydrogeologist
Christensen, Kyna	WWC Engineering	Hydrology, Ecology	Environmental Scientist
Berry, John	WWC Engineering	QAQC	Wildlife Biologist
Ventling, Rodney	WWC Engineering	AutoCAD	A.S. Engineering

7.3 Distribution of the EIS

This EIS will be distributed to individuals who specifically request a copy of the document. It will also be made available electronically on the OSMRE website at:

https://www.osmre.gov/laws-and-regulations/nepa/projects.

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APPENDIX A

CALCULATIONS OF TRANSPORTATION DIESEL EMISSIONS, COAL COMBUSTION EMISSIONS, AND GREENHOUSE GAS EMISSIONS

APPENDIX A CALCULATIONS OF TRANSPORTATION DIESEL EMISSIONS, COAL COMBUSTION EMISSIONS, AND GREENHOUSE GAS EMISSIONS

A.1 Introduction

This report provides technical support documentation for the existing air quality conditions (Section 3.4) and the air quality impact analysis (Section 4.4), including greenhouse gases (GHGs) and climate change and downstream combustion.

Baseline emissions and emissions for each of the alternatives were calculated using the methodology discussed herein. For the baseline emissions two years were selected based on maximum and minimum production at the SCM over the last eight years. Table A-1 presents the coal shipments from SCM for 2018 and 2020, respectively. The maximum production was 13,768,055 tons in 2018, and the minimum production was 9,513,255 in 2020 (EIA 2024). It should be noted that the baseline emissions use coal from the LBA1 tracts mixed with other Federal, state, and private coal leases. For the alternatives analysis the emissions are only for the LBA1 coal for direct comparison. Under all of the alternatives, except for Alternative 3, SCM would continue to blend coal from the LBA1 tracts with other Federal, state, and private coal leases and overall emissions would be similar to background. For Alternative 3, the EIS assumes that only LBA1 coal will be mined at a rate of 18 Mtpy and therefore all emissions would be from the LBA1 tracts. Table A-2 provides the estimated annual coal production for each of the alternatives.

To allow different GHGs to be compared and added together, GHG emissions were converted into CO_2e emissions using the global warming potential (GWP) concept developed by the Intergovernmental Panel on Climate Change (IPCC). The EPA uses a 100-year time horizon in its Inventory of Greenhouse Gas Emissions and Sinks: 1990-2020 (EPA 2022a) and Mandatory Greenhouse Gas Reporting rule. Therefore, project-related emissions are shown based on the 100-year GWP values for comparison to state and national GHG emissions. Additionally, total CO2e from the project based on a 20-year time horizon is shown for reference. The GWPs used to calculate CO2e emissions are based on the IPCC's Synthesis Report of the Sixth Assessment Report (AR6; IPCC 2021). The 100-year and 20-year GWPs used for this analysis are included in the Conversion Factors and Constants sheet attached to this report.

A.2 Emission Inventory Methodology

The EIS evaluates existing air quality and future project-related air quality impacts by quantifying potential emissions of criteria air pollutants (CAPs), hazardous air pollutants (HAPs) of concern (mercury, lead, and arsenic), and GHGs for the various segments. The criteria air pollutants used in the analysis include PM_{10}, $PM_{2.5}$, NO_x (a surrogate for NO_2), SO_2, CO, and VOCs (as a surrogate for ozone). The following describes the methodology used each of the various segments (mining, locomotives, terminals, vessel shipments, coal combustion, and worker commuters).

A.2.1 Mining

Criteria air pollutant emissions for SCM were obtained from the BLM Miles City Final Supplemental EIS and Proposed RMP Amendment Appendix C, which used the 2019 annual emission inventory reports to develop emissions intensities (tons of emitted pollutant per ton of produced coal) for each criteria air pollutant (CAP) (BLM 2024). The emission inventory for the Spring Creek Mine did not include mobile sources so the Rosebud Mine mobile source emissions were applied. HAP emissions were estimated by applying a 0.1 factor to the total VOC emissions. Table A-3 presents the Spring Creek Mine emission factors used for the analysis. Table A-4 presents the baseline mining emissions for the SCM for baseline years 2018 and 2020. Tables A-5, A-6, and A-7 provide the CAP and emissions for Alternatives 1, 2, and 3, respectively.

GHG emission factors were also obtained from the BLM Miles City Final Supplemental EIS and Proposed RMP Amendment Appendix C (BLM 2024), which account for mine reclamation, coal extraction, overburden removal, and construction. Table A-8 presents the GHG emission factors in kg per ton of coal and ton per ton of coal. Baseline mining GHG emissions for years 2018 and 2020 are provided in Table A-9. The table also includes the 100-year and 20-year GWPs. Tables A-10, A-11, and A-12 provide the GHG mining emissions for each of the alternatives and includes the 100-year and 20-yr GWPs.

A.2.2 Locomotive Emissions

Locomotive emissions were estimated using the methods outlined in the 2020 National Emission Inventory Locomotive Methodology (ERG 2022). The analysis uses the 2020 Class I Line Haul Fleet Weighted emission factors which are presented in Table A-13. These emission factors were converted to tons per gallon using the conversion factors of 453.6 g/lb and 2000 lb/ton.

Train emissions for each pollutant were calculated using the following equation:

$$\text{Emission} = \frac{\text{Distance traveled (mi)} * \text{train gross weight (tons/train)}}{\text{Fuel efficiency (ton-mi/gal)}} * \text{Emission Factor (ton/gal)}$$

Train and transport characteristics are included in the Conversion Factors and Constants sheet attached to this report. Table A-14 provides the baseline locomotive emissions for the SCM for baseline years 2018 and 2020. Baseline locomotive emissions for the CAPs and mercury and arsenic are summarized in Table A-15. Mercury and arsenic emissions were calculated using multiplication factors provided in the 2020 National Emission Inventory Locomotive Methodology report (ERG 2022).

0.0000143 - Multiplication Factor to convert PM2.5 to Mercury

0.0010789 - Multiplication Factor to convert PM2.5 to Arsenic

Locomotive emissions for the alternatives were calculated using the following equation:

Train Shipments = Mt coal x 1,000,000 x 18,590 tons/train

Where:

18,590 tons/train was calculated (Conversion Factors and Constants)

Then emissions were calculated by multiplying the train shipments by the average baseline emissions for each pollutant (Table A-13). The CAP and HAP emissions for Alternatives 1, 2, and 3 are provided in Tables A-16, A-17, and A-18, respectively.

GHG locomotive emissions for baseline and for each alternative were calculated using the same methods as described above. Baseline GHG emissions from locomotives are provided in Table A-19 and includes the 100-year and 20-year GWPs. Tables A-20, A-21, and A-22 provide the GHG locomotive emissions for each of the alternatives, respectively. Each table also includes the 100-year and 20-yr GWPs.

A.2.3 Terminal Emissions

Terminal emissions were calculated using emissions reported in the Air Emissions Inventory Report prepared for Westshore Terminals Limited Partnership (EnviroChem Services Inc. 2021)). The Air Emissions Inventory Report calculated baseline emissions for marine vessels, rail locomotives, off-road machinery, on-road vehicles, administration buildings, and material handling. Table A-23 provides the estimated annual emissions based on a throughput of 36 Mt. The emissions for each pollutant were divided by the tons shipped to determine the emission per 1 Mt of coal shipped. These emissions were then used for the analysis for both the Westshore and MERC terminals.

The baseline emissions were calculated using the actual quantity of SCM coal that was shipped through each port (Westshore Terminal and MERC). The results are presented in Table A-24. For the alternatives analysis, it was assumed that SCM would ship approximately 32 percent of the LBA1 coal to Westshore Terminal and approximately 24 percent of the LBA1 coal to the MERC Terminal. Emissions for Alternatives 1, 2, and 3 were calculated and are provided in Tables A-25, A-26, and A-27, respectively. It should be noted that Air Emissions Inventory Report only reported CO_2e consistent with the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report Global Warming Potential values of 1, 25, and 298 for CO_2, CH_4, and N_2O, respectively (IPCC 2007). Because of this the individual emissions of CO_2, CH_4, and N_2O could not be calculated and 20-yr GWP could not be calculated for the terminal GHG emissions.

A.2.4 Vessel Emissions

Vessel emissions were calculated using the methods described in the Ports Emissions: Inventory Guidance: Methodologies for Estimating Port-Related and Goods Movement Mobile Source Emissions (EPA 2022). The guidance provides CAP, HAP, and GHG emission factors for ocean-going vessels. For the purpose of the analysis the emission factors were determined using a bulk carrier called Cape Garnet, which is a typical vessel that would be loaded with coal from the SCM (VeselFinder 2024). The following are the details for the Cape Garnet vessel:

Year Built: 2018
Average Speed: 11.6 knots
Maximum Speed: 15.6 knots
Gross Tonnage: 107,829 tons
Deadweight: 208,377 tons
Draught: 18.32 m
Engine: 1 DE: 2 SA 6 CY
Fuel: Marine Diesel
Propeller: 1

Using the information provided above the propulsion engine operating factor and load limit were calculated. The propulsion engine operating factor was calculated using the following equation:

$$Pp = Pref \times (V/Vref)3 \times SM.$$

Where:

Pp	=	propulsion engine operating power (kW)
Pref	=	vessel's total installed propulsion power (kW)
V	=	average speed (kn)
Vref	=	vessel's maximum speed (kn)

SM = sea margin, which accounts for average weather conditions, assumed to be 1.15 for at-sea operations

The load factor was calculated using the following equation:

$LF = Pp/Pref$

The vessel calls and the quantity of coal shipped in the 2013 Environmental Impact Assessment for the Terminal Infrastructure Reinvestment Project at the Westshore Terminal in Vancouver, British Columbia (SNC-Lavalin Environment & Water 2013) were used to calculate the quantity of coal transported on each ship. The round-trip distance between the Westshore Terminal and ports in Japan and the ROK were approximated for 2018 and 2020 as was the round trip miles for shipments out of the MERC terminal. The following summarizes the fleet and terminal attributes:

196 vessel calls per year (SNC-Lavalin 2013)
31.1 Mt of coal shipped in 2016 from the Westshore Terminal (SNC-Lavalin 2013)
0.16 Mt coal per ship from the Westshore Terminal (calculated)
9,946 2018 round trip miles between Westshore Terminal and ports in Japan and ROK
10,010 2020 round trip miles between Westshore Terminal and ports in Japan and ROK
588 round trip miles for MERC terminal shipment in the Great Lakes

Emissions for each pollutant were calculated using the following equation:

$$E = P \times A \times EF \times LLAF$$

Where:

E = per vessel emissions (g)
P = engine operating power (kW)
A = engine operating activity (h)EF = emission factor (g/kWh)
LLAF = low load adjustment factor

Emission factors for arsenic, lead, and mercury used a multiplier based on Appendix D of the Ports Emissions: Inventory Guidance: Methodologies for Estimating Port-Related and Goods Movement Mobile Source Emissions (EPA 2022).

Emissions were calculated for each 1 Mt of coal that was shipped for CAP, HAPs, and GHGs (Table A-31). These values were then used to calculate the baseline emissions (Table A-32).

Similarly, GHG emissions for each 1 Mt of coal were also calculated and presented in Table 2.4-3. Table 2.4-4 provides the baseline vessel shipment GHG emissions. The values in Table A-32 were also used to calculate CAP and HAP emissions for Alternatives 1, 2, and 3 for the ocean vessel shipments from Westshore Terminal and Great Lakes vessel shipments from the MERC Terminal (Tables A-33 throughA-38). The same assumption that SCM would ship approximately 32 percent of the LBA1 coal to the Westshore Terminal and approximately 24 percent of the LBA1 coal to the MERC Terminal was used.

GHG emissions were calculated in the same manner as described above using the emissions for each 1 Mt of coal shipped (Table A-31). Baseline GHG emissions are provided in Table A-39 and GHG emissions for each alternative from the Westshore and MERC terminals are provided in Tables A-40 through A-45.

A.2.5 Coal Combustion

Coal combustion emissions were calculated using SCM coal characteristics and emission factors from AP-42 Chapter 1 (EPA 1998). The emissions were calculated for baseline using a low and high control efficiency. The following lists the SCM coal characteristics (SCC 2021).

9,345 Btu/lb coal, as received
0.33 wt % sulfur, as received
4.16 wt % ash, as received
25.12 wt % moisture, as received
39.25 wt % carbon, as received
0.06 µg/g mercury, dry basis
1.61 µg/g arsenic, dry basis
1.6 µg/g lead, dry basis

The mercury, arsenic, and lead were converted to as received basis using the moisture content of the coal and the following equation. Other emission factors used to calculate coal combustion emissions were as follows.

38	unitless SOx emission factor multiplier; all pulverized coal (PC) firing configurations (EPA 1998, Table 1.1-3)
2.3	unitless filterable PM10 emission factor multiplier; PC dry bottom firing configurations (EPA 1998, Table 1.1-3)
2.6	unitless filterable PM10 emission factor multiplier; PC wet bottom firing configurations (EPA 1998, Table 1.1-3)
0.6	unitless filterable PM2.5 emission factor multiplier; PC dry and dry bottom tangential (EPA 2001)
1.48	unitless filterable PM2.5 emission factor multiplier; PC wet boom (EPA 2001)
95	wt % fuel sulfur emitted as SO2 (EPA 1998, Table 1.1-3)
0.1	unitless total condensable particulate matter factor; PC firing without FGB (EPA 1998, Table 1.1-3)
0.03	unitless total condensable particulate matter term; PC firing without FGB (EPA 1998, Table 1.1-3)

Table A-46 presents the coal combustion emission control efficiency ranges, which were used to calculate the baseline emissions. Emissions for each 1 Mt of coal at the high and low efficiency range are presented in Table A-47. Baseline coal combustion emissions for the low and high efficiency range are presented in Table A-48. Coal combustion emissions for each of the alternatives were calculated using the same methods as described above. CAP and HAP emissions from coal combustion for Alternatives 1, 2, and 3 are provided in Tables A-49, A-50, and A-51, respectively.

GHG emissions were calculated using AP-42 and 40 C.F.R. § 98.33. The following lists the emission factors and sources:

0.99 unitless; carbon-CO_2 conversion factor (AP-42, Table 1.1-20)
44 lb/lb-mol; CO_2 molecular weight
12 lb/lb mol; C molecular weight
11 g CH_4/MMBtu; (40 C.F.R. 98.33, Table C-2)
1.6 g N_2O/MMBtu (40 C.F.R. 98.33, Table C-2)

The emission factors were used to converted to lb of GHG per ton of coal using the energy content of SCM coal (9,345 Btu/lb) and other unit conversions. Baseline GHG emissions from coal combustion are provided in Table A-52, while GHG emissions for each alternative are provided in Tables A-53 through A-55. Each table also includes the 100-year and 20-yr GWPs.

A.2.6 Worker Commute Emissions

Commuter emissions were calculated using emission factors from EPA’s MOVES3 and the employees from SCM that commute to and from the mine. Emissions factors for passenger cars and light duty diesel trucks are provided in Table A-56. The emission factor for carbon dioxide was taken from EPA (2024) and used the average fuel economy for each vehicle from the Department of Energy (DOE 2024). SCM coal production and number of employees for 2023 was used to calculate the emissions per 1 Mt of coal. In addition, the number of workers was estimated by assuming that there was direct correlation between the tons of coal produced and the number of workers. Table A-57 provides the emissions per 1 Mt of coal for each CAP and HAP as well as the baseline emissions. CAP and HAP worker commute emissions for Alternatives 1, 2, and 3 are provided in Tables A-58, A-59, and A-60, respectively.

GHG emissions for workers commute were calculated as described above. The tons of each GHG per 1 Mt of coal was calculated and used to estimate the baseline and alternative emissions. Table A-61 provides the baseline GHG emissions from workers commuting to and from the SCM, while Tables A-62, A-63, and A-64 provide the GHG emissions from workers commuting for each alternative. Each table also includes the estimated number of workers required each year for the LBA1 tract coal as well as the 100-year and 20-year GWPs.

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Table A-1. Baseline Coal Shipments from the Spring Creek Mine

2018	Tons Shipped	Percent of Shipments	Number of Trips	Round-trip Rail Miles	Total Rail Miles
DTE-BRSC Shared Storage	3,756,426	27%	241	2,064	497,004
Transalta Centralia Generation (WA)	2,361,244	17%	151	2,400	363,268
Clay Boswell (MN)	659,895	5%	42	1,954	82,656
Coronado Generating Station (AZ)	563,243	4%	36	2,876	103,839
Hoot Lake (MN)	326,360	2%	21	1,660	34,728
Presque Isle (WI)	260,860	2%	17	2,064	34,514
Sub-total (from EIA)	***7,928,028***	**58%**	**508**	**13,018**	**1,116,009**
Asia	4,503,000	33%	289	3,000	865,962
Additional Shipments (information not publicly available)	1,337,027	10%	86	2,196	188,210
TOTAL	**13,768,055**	**100%**	**883**	**18,214**	**2,170,181**

2020	Tons Shipped	Percent of Shipments	Number of Trips	Round-trip Rail Miles	Total Rail Miles
DTE-BRSC Shared Storage	1,879,560	20%	120	2,064	248,680
Transalta Centralia Generation	1,959,814	21%	126	2,400	301,510
Clay Boswell (MN)	908,001	10%	58	1,954	113,733
Coronado Generating Station (AZ)	313,995	3%	20	2,876	57,888
Sub-total (from EIA)	***5,061,370***	**53%**	**324**	**9,294**	**721,811**
Japan	531,862	6%	34	3,000	102,281
Korea	2,687,618	28%	172	3,000	516,850
Additional Shipments (information not publicly available)	1,232,406	13%	79	2,225	175,756
TOTAL	**9,513,255**	**100%**	**610**	**17,519**	**1,516,697**

Table A-2. Estimated LBA1 Coal Production (tons) for each Alternative

Year	Alternative 1 Proposed Action	Alternative 2 Partial Mining Alternative	Alternative 3 Accelerated Mining Alternative	Alternative 4 No Action
2024	2.20	2.20	18	0
2025	4.51	4.51	18	
2026	4.14	4.14	3.9	
2027	4.87	4.87		
2028	3.59	3.59		
2029	4.21			
2030	2.51			
2031	2.51			
2032	2.51			
2033	2.51			
2034	2.51			
2035	0.78			
2036	0.78			
2037	0.78			
2038	0.78			
2039	0.78			

Conversion Factors and Constants

Value	Units and Notes
453.6	g/lb
137,000	Btu/gal diesel; diesel fuel energy content (EPA 1985)
2,000	lb/ton
1.102	ton/tonne
1.15	mph/knot

100-Yr Global Warming Potentials (unitless) (IPCC AR6 WGI Chapter 7, Table 7.15; IPCC 2021)

1	CO_2
29.8	CH_4
273	N_2O

20-Yr Global Warming Potentials (unitless) (IPCC AR6 WGI Chapter 7, Table 7.15; IPCC 2021)

1	CO_2
82.5	CH_4
273	N_2O

Train and Transport Characteristics

15,350	short tons coal/train (SCM 2021)
130	cars/train (SCM 2021)
286,000	lb/car, loaded (BNSF)
143	tons/car, loaded; calculated
18,590	tons/train; loaded train gross weight (without locomotives), calculated
3,240	tons/train; empty train gross weight (without locomotives), calculated
500	ton-mi/gal diesel, loaded gross weight basis (BNSF 2024)

Mining Emissions

Table A-3. CAP and HAP Mining Emission Factors (tons pollutant per ton of coal)

PM_{10}	$PM_{2.5}$	NO_x	CO	VOC	SO_2	HAP
1.12E-04	2.62E-05	9.26E-05	7.40E-05	5.08E-06	1.70E-06	5.08E-07

Source: BLM 2024

Table A-4. Baseline Mining CAP and HAP Emissions for SCM (tons/year)

Year	Coal Production	PM_{10}	$PM_{2.5}$	NO_x	CO	VOC	SO_2	HAP
2018	13,768,055	1,542	361	1275	1,019	70	23	7.0
2020	9,513,255	1,066	249	881	704	48	16	4.8

Table A-5. Alternative 1 - CAP and HAP Emissions for LBA1 Tract Coal (tons/year)

Year	Mt	PM_{10}	$PM_{2.5}$	NO_x	CO	VOC	SO_2	HAP
2024	2.2	246	58	204	163	11	3.7	1.1
2025	4.51	505	118	418	334	23	7.7	2.3
2026	4.14	464	108	383	306	21	7.0	2.1
2027	4.87	545	128	451	360	25	8.3	2.5
2028	3.59	402	94	332	266	18	6.1	1.8
2029	4.21	472	110	390	312	21	7.2	2.1
2030	2.51	281	66	232	186	13	4.3	1.3
2031	2.51	281	66	232	186	13	4.3	1.3
2032	2.51	281	66	232	186	13	4.3	1.3
2033	2.51	281	66	232	186	13	4.3	1.3
2034	2.51	281	66	232	186	13	4.3	1.3
2035	0.78	87	20	72	58	4	1.3	0.4
2036	0.78	87	20	72	58	4	1.3	0.4
2037	0.78	87	20	72	58	4	1.3	0.4
2038	0.78	87	20	72	58	4	1.3	0.4
2039	0.78	87	20	72	58	4	1.3	0.4
Avg	**2.5**	**280**	**65**	**231**	**185**	**13**	**4.2**	**1.3**
Min	**0.78**	**87**	**20**	**72**	**58**	**4.0**	**1.3**	**0.4**
Max	**4.87**	**545**	**128**	**451**	**360**	**25**	**8.3**	**2.5**

Table A-6. Alternative 2 - CAP and HAP Emissions for LBA1 Tract Coal (tons/year)

Year	Mt	PM_{10}	$PM_{2.5}$	NO_x	CO	VOC	SO_2	HAP
2024	2.2	246	58	204	163	11	3.7	1.1
2025	4.51	505	118	418	334	23	7.7	2.3
2026	4.14	464	108	383	306	21	7.0	2.1
2027	4.87	545	128	451	360	25	8.3	2.5
2028	3.59	402	94	332	266	18	6.1	1.8
Avg	**3.9**	**433**	**101**	**358**	**286**	**20**	**6.6**	**2.0**
Min	**2.2**	**246**	**58**	**204**	**163**	**11.2**	**3.7**	**1.1**
Max	**4.87**	**545**	**128**	**451**	**360**	**25**	**8.3**	**2.5**

Table A-7. Alternative 3 - CAP and HAP Emissions for LBA1 Tract Coal (tons/year)

Year	Mt	PM_{10}	$PM_{2.5}$	NO_x	CO	VOC	SO_2	HAP
2024	18	2,016	472	1,667	1,332	91	30.6	9.1
2025	18	2,016	472	1,667	1,332	91	30.6	9.1
2026	3.9	437	102	361	289	20	6.6	2.0
Avg	**13.3**	**1,490**	**348**	**1,232**	**984**	**68**	**22.6**	**6.8**
Min	**3.9**	**437**	**102**	**361**	**289**	**19.8**	**6.6**	**2.0**
Max	**18**	**2,016**	**472**	**1,667**	**1,332**	**91**	**30.6**	**9.1**

Table A-8. Greenhouse Gas Emission Factors used for Coal Mining

Emission Factor	CO_2	CH_4	N_2O
kg GHG per ton of coal	7.867	0.147	0.006
ton GHG per ton of coal	8.67E-03	1.62E-04	6.61E-06

Source: BLM 2024
**ton GHG calculated using 453.6 g/lb and 2000 lb/ton

Table A-9. Baseline Mining GHG Emissions for SCM (tons/year)

Coal Production	Year	CO_2	CH_4	N_2O	100-Yr GWP CO_2e	20-Yr GWP CO_2e
13,768,055	2018	119,393	2,231	91	210,734	328,304
9,513,255	2020	82,496	1,541	63	145,610	226,847

Table A-10. Alternative 1 - GHG Emissions for LBA1 Tract Coal (tons/year)

Year	Mt	CO_2	CH_4	N_2O	100-Yr GWP CO_2e	20-Yr GWP CO_2e
2024	2.2	19,078	356	15	33,673	52,460
2025	4.51	39,110	731	30	69,030	107,543
2026	4.14	35,901	671	27	63,367	98,720
2027	4.87	42,231	789	32	74,540	116,127
2028	3.59	31,132	582	24	54,949	85,605
2029	4.21	36,508	682	28	64,438	100,389
2030	2.51	21,766	407	17	38,418	59,852
2031	2.51	21,766	407	17	38,418	59,852
2032	2.51	21,766	407	17	38,418	59,852
2033	2.51	21,766	407	17	38,418	59,852
2034	2.51	21,766	407	17	38,418	59,852
2035	0.78	6,764	126	5	11,939	18,599
2036	0.78	6,764	126	5	11,939	18,599
2037	0.78	6,764	126	5	11,939	18,599
2038	0.78	6,764	126	5	11,939	18,599
2039	0.78	6,764	126	5	11,939	18,599
Avg	**2.5**	**21,663**	**405**	**17**	**38,236**	**59,569**
Min	**0.78**	**6,764**	**126**	**5**	**11,939**	**18,599**
Max	**4.87**	**42,231**	**789**	**32**	**74,540**	**116,127**

Table A-11. Alternative 2 - GHG Emissions for LBA1 Tract Coal (tons/year)

Year	Mt	CO_2	CH_4	N_2O	100-Yr GWP CO_2e	20-Yr GWP CO_2e
2024	2.2	19,078	356	15	33,673	52,460
2025	4.51	39,110	731	30	69,030	107,543
2026	4.14	35,901	671	27	63,367	98,720
2027	4.87	42,231	789	32	74,540	116,127
2028	3.59	31,132	582	24	54,949	85,605
Avg	**3.86**	**33,490**	**626**	**26**	**59,112**	**92,091**
Min	**2.2**	**19,078**	**356**	**15**	**33,673**	**52,460**
Max	**4.87**	**42,231**	**789**	**32**	**74,540**	**116,127**

Table A-12. Alternative 3 - GHG Emissions for LBA1 Tract Coal (tons/year)

Year	Mt	CO_2	CH_4	N_2O	100-Yr GWP CO_2e	20-Yr GWP CO_2e
2024	18	156,091	2,917	119	275,508	429,216
2025	18	156,091	2,917	119	275,508	429,216
2026	3.9	33,820	632	26	59,693	92,997
Avg	**13.30**	**115,334**	**2,155**	**88**	**203,570**	**317,143**
Min	**3.9**	**33,820**	**632**	**26**	**59,693**	**92,997**
Max	**18**	**156,091**	**2,917**	**119**	**275,508**	**429,216**

Locomotive Emissions

Table A-13. Baseline Locomotive Emissions per Rail Round-Trip (tons/rail round-trip)

	One-Way Miles (mi)		PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOCs	CO_2	CH_4	N_2O	CO_2e
DTE-BRSC Shared Storage (WI)	1,032	Loaded	0.13	0.12	5.10	0.004	1.13	0.21	429.29	0.03	0.01	NA
		Empty	0.02	0.02	0.89	0.001	0.20	0.04	74.82	0.01	0.00	NA
		Round-Trip	0.15	0.15	5.98	0.005	1.32	0.24	504	0.04	0.01	504
Transalta Centralia Generation (WA)	1,200	Loaded	0.15	0.15	5.93	0.005	1.31	0.24	499.18	0.04	0.01	NA
		Empty	0.03	0.03	1.03	0.001	0.23	0.04	87.0	0.01	0.00	NA
		Round-Trip	0.18	0.17	6.96	0.005	1.54	0.28	586	0.05	0.02	586
Clay Boswell (MN)	977	Loaded	0.12	0.12	4.82	0.004	1.07	0.19	406.41	0.03	0.01	NA
		Empty	0.02	0.02	0.84	0.001	0.19	0.03	70.83	0.01	0.00	NA
		Round-Trip	0.14	0.14	5.67	0.004	1.25	0.23	477	0.04	0.01	477
Coronado Generating Station (AZ)	1,438	Loaded	0.18	0.17	7.10	0.006	1.57	0.29	598.18	0.05	0.02	NA
		Empty	0.03	0.03	1.24	0.001	0.27	0.05	104.26	0.01	0.00	NA
		Round-Trip	0.21	0.20	8.34	0.006	1.84	0.34	702	0.06	0.02	703
Hoot Lake (MN)	830	Loaded	0.10	0.10	4.10	0.003	0.91	0.17	345.26	0.03	0.01	NA
		Empty	0.02	0.02	0.71	0.001	0.16	0.03	60.18	0.00	0.00	NA
		Round-Trip	0.12	0.12	4.81	0.004	1.06	0.19	405	0.03	0.01	405
Presque Isle (WI)	2,064	Loaded	0.15	0.15	5.93	0.005	1.31	0.24	499.18	0.04	0.01	NA
		Empty	0.04	0.04	1.78	0.001	0.39	0.07	149.64	0.01	0.00	NA
		Round-Trip	0.19	0.19	7.70	0.006	1.70	0.31	649	0.05	0.02	649
Additional Shipments (not publicly available)	1,104	Loaded	0.15	0.15	5.93	0.005	1.31	0.24	499.18	0.04	0.01	NA
		Empty	0.02	0.02	0.95	0.001	0.21	0.04	80.04	0.01	0.00	NA
		Round-Trip	0.17	0.17	6.88	0.005	1.52	0.28	579	0.05	0.01	579
Westshore Terminal	1,500	Loaded	0.19	0.18	7.41	0.006	1.64	0.30	623.97	0.05	0.02	NA
		Empty	0.03	0.03	1.29	0.001	0.29	0.05	108.75	0.01	0.00	NA
		Round-Trip	0.22	0.21	8.70	0.007	1.92	0.35	733	0.06	0.02	733
AVERAGE			**0.2**	**0.2**	**6.9**	**0.005**	**1.5**	**0.3**	**580**	**0.046**	**0.015**	**580**

[1] Source: ERG 2022

Table A-14. Baseline Locomotive Emissions for Years 2018 and 2020 (tons/year)

		2018 Mt Shipped	2018 Train Shipments	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOCs	CO_2	CH_4	N_2O	CO_2e
DTE-BRSC Shared Storage (WI)	Loaded	3.8	202	26	25	1,030	0.80	228	41	86,746	6.84	2.22	86,755
	Empty	0	202	5	4	179	0.14	40	7	15,114	1.19	0.39	15,115
	Round-Trip	*3.8*	*202*	*30.5*	*29.6*	*1,209*	*0.94*	*267*	*48.7*	*101,859*	*8.03*	*2.61*	*101,870*
Transalta Centralia Generation (WA)	Loaded	2.4	127	19	18	753	0.59	166	30	63,404	5.00	1.62	63,410
	Empty	0	127	3	3	131	0.10	29	5	11,050	0.87	0.28	11,052
	Round-Trip	*2.4*	*127*	*22.3*	*21.6*	*884*	*0.69*	*195*	*35.6*	*74,454*	*5.87*	*1.91*	*74,462*
Clay Boswell (MN)	Loaded	0.7	35	4	4	171	0.13	38	7	14,427	1.14	0.37	14,428
	Empty	0	35	1	1	30	0.02	7	1	2,514	0.20	0.06	2,515
	Round-Trip	*0.7*	*35*	*5.1*	*4.9*	*201*	*0.16*	*44*	*8.1*	*16,941*	*1.34*	*0.43*	*16,943*
Coronado Generating Station (AZ)	Loaded	0.6	30	5	5	215	0.17	48	9	18,124	1.43	0.46	18,126
	Empty	0	30	1	1	38	0.03	8	2	3,159	0.25	0.08	3,159
	Round-Trip	*0.6*	*30*	*6.4*	*6.2*	*253*	*0.20*	*56*	*10.2*	*21,282*	*1.68*	*0.55*	*21,285*
Hoot Lake (MN)	Loaded	0.3	18	2	2	72	0.06	16	3	6,061	0.48	0.16	6,062
	Empty	0	18	0	0	13	0.01	3	1	1,056	0.08	0.03	1,057
	Round-Trip	*0.3*	*18*	*2.1*	*2.1*	*84.5*	*0.07*	*19*	*3.4*	*7,118*	*0.56*	*0.18*	*7,118*
Presque Isle (WI)	Loaded	0.3	14	2	2	83	0.06	18	3	7,005	0.55	0.18	7,005
	Empty	0	14	1	1	25	0.02	6	1	2,100	0.17	0.05	2,100
	Round-Trip	*0.3*	*14*	*2.7*	*2.6*	*108*	*0.08*	*24*	*4.4*	*9,104*	*0.72*	*0.23*	*9,105*
Additional Shipments (not publicly available)	Loaded	1.3	72	11	10	426	0.33	94	17	35,902	2.83	0.92	35,905
	Empty	0	72	2	2	68	0.05	15	3	5,757	0.45	0.15	5,757
	Round-Trip	*1.3*	*72*	*12.5*	*12.1*	*495*	*0.39*	*109*	*19.9*	*41,658*	*3.28*	*1.07*	*41,663*
Westshore Terminal	Loaded	4.5	242	45	44	1,794	1.40	396	72	151,142	11.91	3.87	151,158
	Empty	0	242	8	8	313	0.24	69	13	26,342	2.08	0.67	26,345
	Round-Trip	*4.5*	*242*	*53.2*	*51.6*	*2,107*	*1.64*	*466*	*84.9*	*177,485*	*13.99*	*4.55*	*177,503*
2018 TOTAL		**13.8**	**NA**	**135**	**131**	**5,341**	**4.16**	**1,180**	**215**	**449,902**	**35.46**	**11.52**	**449,949**

Table A-14. Baseline Locomotive Emissions for Years 2018 and 2020 (tons/year) (continued)

		2020 Mt Shipped	2020 Train Shipments	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOCs	CO_2	CH_4	N_2O	CO_2e
DTE-BRSC Shared Storage (WI)	Loaded	1.9	101	13.01	12.62	515	0.40	114	21	43,404	3.42	1.11	43,408
	Empty	0	101	2.27	2.20	90	0.07	20	4	7,565	0.60	0.19	7,566
	Round-Trip	*1.9*	*101*	*15.28*	*14.82*	*605.1*	*0.47*	*133.7*	*24.4*	*50,969*	*4.02*	*1.31*	*50,974*
Transalta Centralia Generation (WA)	Loaded	2.0	105	15.77	15.30	625	0.49	138	25	52,625	4.15	1.35	52,630
	Empty	0	105	2.75	2.67	109	0.08	24	4	9,172	0.72	0.23	9,173
	Round-Trip	*2.0*	*105*	*18.52*	*17.97*	*733.6*	*0.57*	*162.1*	*29.6*	*61,796*	*4.87*	*1.58*	*61,803*
Clay Boswell (MN)	Loaded	0.9	49	5.95	5.77	236	0.18	52	9	19,851	1.56	0.51	19,853
	Empty	0	49	1.04	1.01	41	0.03	9	2	3,460	0.27	0.09	3,460
	Round-Trip	*0.9*	*49*	*6.99*	*6.78*	*276.7*	*0.22*	*61.1*	*11.1*	*23,310*	*1.84*	*0.60*	*23,313*
Coronado Generating Station (AZ)	Loaded	0.3	17	3.03	2.94	120	0.09	27	5	10,104	0.80	0.26	10,105
	Empty	0	17	0.53	0.51	21	0.02	5	1	1,761	0.14	0.05	1,761
	Round-Trip	*0.3*	*17*	*3.56*	*3.45*	*140.9*	*0.11*	*31.1*	*5.7*	*11,864*	*0.94*	*0.30*	*11,866*
Hoot Lake (MN)	Loaded	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Empty	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Round-Trip	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Presque Isle (WI)	Loaded	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Empty	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Round-Trip	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Additional Shipments (not publicly available)	Loaded	1.2	66	9.92	9.62	393	0.31	87	16	33,092	2.61	0.85	33,096
	Empty	0	66	1.59	1.54	63	0.05	14	3	5,306	0.42	0.14	5,307
	Round-Trip	*1.2*	*66*	*11.51*	*11.16*	*455.9*	*0.36*	*100.7*	*18.4*	*38,399*	*3.03*	*0.98*	*38,403*
Westshore Terminal	Loaded	3.2	173	32.39	31.42	1283	1.00	283	52	108,061	8.52	2.77	108,073
	Empty	0	173	5.64	5.48	224	0.17	49	9	18,834	1.48	0.48	18,836
	Round-Trip	*3.2*	*173*	*38.03*	*36.89*	*1506.5*	*1.17*	*332.9*	*60.7*	*126,895*	*10.00*	*3.25*	*126,908*
2020 TOTAL		**9.5**	**NA**	**93.88**	**91.06**	**3,719**	**2.90**	**822**	**150**	**313,233**	**24.69**	**8.02**	**313,266**

Table A-15. Baseline Locomotive CAP & HAP Emissions for Spring Creek Mine (tons/year)

Year	Coal Production (tons)	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOCs
2018	13,768,055	132	5,397	4	1,180	217	132
2020	9,513,255	92	3,758	3	822	151	92

Train Shipments = Mt coal x 1,000,000 x 18,590 tons/train (see Conversion Factors and Constants)

Emission = Train Shipments x average round trip emission per train shipment

Table A-16 Alternative 1 - Locomotive CAP & HAP Emissions for LBA1 Tract Coal (tons/year)

Year	Mt	Train Shipments	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOCs
2024	2.2	118	20.8	20.1	823	0.6	180	25,677
2025	4.51	243	42.6	41.3	1687	1.3	369	52,639
2026	4.14	223	39.1	37.9	1548	1.2	339	48,320
2027	4.87	262	45.9	44.6	1821	1.4	398	56,841
2028	3.59	193	33.9	32.9	1343	1.0	294	41,901
2029	4.21	226	39.7	38.5	1574	1.2	344	49,137
2030	2.51	135	23.7	23.0	939	0.7	205	29,296
2031	2.51	135	23.7	23.0	939	0.7	205	29,296
2032	2.51	135	23.7	23.0	939	0.7	205	29,296
2033	2.51	135	23.7	23.0	939	0.7	205	29,296
2034	2.51	135	23.7	23.0	939	0.7	205	29,296
2035	0.78	42	7.4	7.1	292	0.2	64	9,104
2036	0.78	42	7.4	7.1	292	0.2	64	9,104
2037	0.78	42	7.4	7.1	292	0.2	64	9,104
2038	0.78	42	7.4	7.1	292	0.2	64	9,104
2039	0.78	42	7.4	7.1	292	0.2	64	9,104
Avg	**2.5**	**134**	**23.6**	**22.9**	**934**	**0.7**	**204.3**	**29,157**
Min	**0.78**	**42**	**7.4**	**7.1**	**292**	**0.2**	**63.8**	**9,104**
Max	**4.87**	**262**	**45.9**	**44.6**	**1,821**	**1.4**	**398**	**56,841**

Table A-17. Alternative 2 – Locomotive CAP & HAP Emissions for LBA1 Tract Coal (tons/year)

Year	Mt	Train Shipments	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOCs
2024	2.2	118	20.8	20.1	823	0.6	180	25,677
2025	4.51	243	42.6	41.3	1687	1.3	369	52,639
2026	4.14	223	39.1	37.9	1548	1.2	339	48,320
2027	4.87	262	45.9	44.6	1821	1.4	398	56,841
2028	3.59	193	33.9	32.9	1343	1.0	294	41,901
Avg	**3.86**	**208**	**36**	**35**	**1,444**	**1**	**316**	**45,076**
Min	**2.20**	**118**	**21**	**20**	**823**	**1**	**180**	**25,677**

Max	**4.87**	**262**	**46**	**45**	**1,821**	**1**	**398**	**56,841**

Table A-18. Alternative 3 – Locomotive CAP & HAP Emissions for LBA1 Tract Coal (tons/year)

Year	Mt	Train Shipments	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOCs
2024	18	968	169.8	164.7	6731	5.2	1472	210,089
2025	18	968	169.8	164.7	6731	5.2	1472	210,089
2026	3.9	210	36.8	35.7	1458	1.1	319	45,519
Avg	**13.3**	**715**	**125**	**122**	**4,974**	**4**	**1,088**	**155,232**
Min	**3.9**	**210**	**37**	**36**	**1,458**	**1**	**319**	**45,519**
Max	**18**	**968**	**170**	**165**	**6,731**	**5**	**1,472**	**210,089**

Table A-19. Baseline Locomotive GHG Emissions for SCM (tons/year)

Coal Production	Year	CO_2	CH_4	N_2O	100-Yr GWP CO_2e	20-Yr GWP CO_2e
13,768,055	2018	449,902	35	12	454,105	455,973
9,513,255	2020	313,233	25	8	316,160	317,461

Table A-20. Alternative 1 - GHG Emissions for LBA1 Tract Coal (tons/year)

Year	Mt	Train Shipments	CO_2	CH_4	N_2O	100-Yr GWP CO_2e	20-Yr GWP CO_2e
2024	2.2	118	68,582	5.4	1.8	69,223	69,508
2025	4.51	243	140,593	11.1	3.6	141,907	142,491
2026	4.14	223	129,059	10.2	3.3	130,265	130,801
2027	4.87	262	151,816	12.0	3.9	153,234	153,865
2028	3.59	193	111,914	8.8	2.9	112,959	113,424
2029	4.21	226	131,241	10.3	3.4	132,467	133,013
2030	2.51	135	78,246	6.2	2.0	78,977	79,302
2031	2.51	135	78,246	6.2	2.0	78,977	79,302
2032	2.51	135	78,246	6.2	2.0	78,977	79,302
2033	2.51	135	78,246	6.2	2.0	78,977	79,302
2034	2.51	135	78,246	6.2	2.0	78,977	79,302
2035	0.78	42	24,316	1.9	0.6	24,543	24,644
2036	0.78	42	24,316	1.9	0.6	24,543	24,644
2037	0.78	42	24,316	1.9	0.6	24,543	24,644
2038	0.78	42	24,316	1.9	0.6	24,543	24,644
2039	0.78	42	24,316	1.9	0.6	24,543	24,644
Avg	**2.5**	**134**	**77,876**	**6.1**	**2.0**	**78,603**	**78,927**
Min	**0.78**	**42**	**24,316**	**1.9**	**0.6**	**24,543**	**24,644**
Max	**4.87**	**262**	**151,816**	**12.0**	**3.9**	**153,234**	**153,865**

Table A-21. Alternative 2 – GHG Emissions for LBA1 Tract Coal (tons/year)

Year	Mt	Train Shipments	CO_2	CH_4	N_2O	100-Yr GWP CO_2e	20-Yr GWP CO_2e
2024	2.2	118	68,582	5.4	1.8	69,223	69,508
2025	4.51	243	140,593	11.1	3.6	141,907	142,491
2026	4.14	223	129,059	10.2	3.3	130,265	130,801
2027	4.87	262	151,816	12.0	3.9	153,234	153,865
2028	3.59	193	111,914	8.8	2.9	112,959	113,424
Avg	**3.86**	**208**	**120,393**	**9**	**3**	**121,518**	**122,018**
Min	**2.2**	**118**	**68,582**	**5**	**2**	**69,223**	**69,508**
Max	**4.87**	**262**	**151,816**	**12**	**4**	**153,234**	**153,865**

Table A-22. Alternative 3 – Emissions for LBA1 Tract Coal (tons/year)

Year	Mt	Train Shipments	CO_2	CH_4	N_2O	100-Yr GWP CO_2e	20-Yr GWP CO_2e
2024	18	968	561,127	44.2	14.4	566,369	568,700
2025	18	968	561,127	44.2	14.4	566,369	568,700
2026	3.9	210	121,578	9.6	3.1	122,713	123,218
Avg	**13.30**	**715**	**414,611**	**33**	**11**	**418,484**	**420,206**
Min	**3.9**	**210**	**121,578**	**10**	**3**	**122,713**	**123,218**
Max	**18**	**968**	**561,127**	**44**	**14**	**566,369**	**568,700**

Terminal Emissions

Table A-23. Westshore Terminal 2021 Baseline Emissions

Source	Mt Coal	PM_{10}	$PM_{2.5}$	NO_x	SO_x	CO	VOC	100-Yr GWP CO_2e*
Marine	36	11.83	10.91	520.55	28.62	61.93	23.99	50,883
Rail	36	1.6	1.55	77.35	0.01	15.65	3.42	6,632
Off-Road	36	0.39	0.38	6.36	0.01	2.58	0.56	1,828
On-Road	36	0.13	0.03	0.47	0.01	3.84	0.17	576
Admin	36	0.01	0.01	0.2	0.01	0.11	0.02	188
Coal Handling	36	68.45	11.7					
Total	**36**	82	25	605	29	84	28	60,107
@ 1 Mt	**1**	2.29	0.68	16.80	0.80	2.34	0.78	1,670

Source: EnviroChem 2021
* CO_2e from EnviroChem 2021, calculated using IPCC Fourth Assessment Report GWP values of 1, 25, and 298 for CO_2, CH_4, and N_2O, respectively.

Table A-24. Baseline Terminal CAP and CO_2e Emissions for SCM (tons/year)

	Mt Coal	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	100-Yr GWP CO_2e*
Westshore	**Terminal**							
2018	4.5	10	3	76	4	11	4	7,518
2020	3.2	7	2	54	3	8	3	5,375
MERC	**Terminal**							
2018	3.8	9	3	63	3	9	3	6,272
2020	1.9	4	1	32	1.5	4	1	3,138

* CO_2e from EnviroChem 2021, calculated using IPCC Fourth Assessment Report GWP values of 1, 25, and 298 for CO_2, CH_4, and N_2O, respectively.

Table A-25. Alternative 1 - Westshore Terminal[1] CAP and CO_2e Emissions for LBA1 Tract Coal (tons/year)

Year	Mt	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	100-Yr GWP CO_2e*
2024	0.70	1.6	1.1	18.5	14.7	34.4	26.9	44,916
2025	1.44	3.3	2.3	37.9	30.2	70.5	55.1	92,078
2026	1.32	3.0	2.1	34.8	27.7	64.7	50.6	84,524
2027	1.56	3.6	2.4	40.9	32.6	76.1	59.6	99,428
2028	1.15	2.6	1.8	30.2	24.0	56.1	43.9	73,295
2029	1.35	3.1	2.1	35.4	28.2	65.8	51.5	85,953
2030	0.80	1.8	1.3	21.1	16.8	39.2	30.7	51,245
2031	0.80	1.8	1.3	21.1	16.8	39.2	30.7	51,245
2032	0.80	1.8	1.3	21.1	16.8	39.2	30.7	51,245
2033	0.80	1.8	1.3	21.1	16.8	39.2	30.7	51,245
2034	0.80	1.8	1.3	21.1	16.8	39.2	30.7	51,245
2035	0.25	0.6	0.4	6.6	5.2	12.2	9.5	15,925
2036	0.25	0.6	0.4	6.6	5.2	12.2	9.5	15,925
2037	0.25	0.6	0.4	6.6	5.2	12.2	9.5	15,925
2038	0.25	0.6	0.4	6.6	5.2	12.2	9.5	15,925
2039	0.25	0.6	0.4	6.6	5.2	12.2	9.5	15,925
Avg	**0.80**	**1.8**	**1.2**	**21.0**	**16.7**	**39.1**	**30.5**	**51,003**
Min	**0.25**	**0.6**	**0.4**	**6.6**	**5.2**	**12.2**	**9.5**	**15,925**
Max	**1.56**	**3.6**	**2.4**	**40.9**	**32.6**	**76.1**	**59.6**	**99,428**

[1] Assumes approximately 32% of the LBA1 coal will be shipped to the Westshore Terminal (overseas)
* CO_2e from EnviroChem 2021, calculated using IPCC Fourth Assessment Report GWP values of 1, 25, and 298 for CO_2, CH_4, and N_2O, respectively.

Table A-26. Alternative 1- MERC Terminal[1] CAP and CO_2e Emissions for LBA1 Tract Coal (tons/year)

Year	Mt	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	100-Yr GWP CO_2e*
2024	0.53	1.2	0.8	13.9	11.0	25.8	20.2	33,687
2025	1.08	2.5	1.7	28.4	22.6	52.9	41.4	69,059
2026	0.99	2.3	1.6	26.1	20.8	48.5	38.0	63,393
2027	1.17	2.7	1.8	30.7	24.4	57.1	44.7	74,571
2028	0.86	2.0	1.3	22.6	18.0	42.1	32.9	54,971
2029	1.01	2.3	1.6	26.5	21.1	49.4	38.6	64,465
2030	0.60	1.4	0.9	15.8	12.6	29.4	23.0	38,434
2031	0.60	1.4	0.9	15.8	12.6	29.4	23.0	38,434
2032	0.60	1.4	0.9	15.8	12.6	29.4	23.0	38,434
2033	0.60	1.4	0.9	15.8	12.6	29.4	23.0	38,434
2034	0.60	1.4	0.9	15.8	12.6	29.4	23.0	38,434
2035	0.19	0.4	0.3	4.9	3.9	9.1	7.2	11,944
2036	0.19	0.4	0.3	4.9	3.9	9.1	7.2	11,944
2037	0.19	0.4	0.3	4.9	3.9	9.1	7.2	11,944
2038	0.19	0.4	0.3	4.9	3.9	9.1	7.2	11,944
2039	0.19	0.4	0.3	4.9	3.9	9.1	7.2	11,944
Avg	**0.60**	**1.4**	**0.9**	**15.7**	**12.5**	**29.3**	**22.9**	**38,252**
Min	**0.19**	**0.4**	**0.3**	**4.9**	**3.9**	**9.1**	**7.2**	**11,944**
Max	**1.17**	**2.7**	**1.8**	**30.7**	**24.4**	**57.1**	**44.7**	**74,571**

[1] Assumes approximately 24% of the LBA1 coal will be shipped to the MERC terminal (Great Lakes)
* CO_2e from EnviroChem 2021, calculated using IPCC Fourth Assessment Report GWP values of 1, 25, and 298 for CO_2, CH_4, and N_2O, respectively.

Table A-27. Alternative 2 - Westshore Terminal[1] CAP and CO_2e Emissions for LBA1 Tract Coal (tons/year)

Year	Mt	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	100-Yr GWP CO_2e*
2024	0.70	1.6	1.1	18.5	14.7	34.4	26.9	44,916
2025	1.44	3.3	2.3	37.9	30.2	70.5	55.1	92,078
2026	1.32	3.0	2.1	34.8	27.7	64.7	50.6	84,524
2027	1.56	3.6	2.4	40.9	32.6	76.1	59.6	99,428
2028	1.15	2.6	1.8	30.2	24.0	56.1	43.9	73,295
Avg	**1.2**	**2.8**	**1.9**	**32.5**	**25.8**	**60.4**	**47.2**	**78,848**
Min	**0.70**	**1.61**	**1.10**	**18.49**	**14.72**	**34.39**	**26.90**	**44,916**
Max	**1.56**	**3.57**	**2.44**	**40.93**	**32.58**	**76.13**	**59.55**	**99,428**

[1] Assumes approximately 32% of the LBA1 coal will be shipped to the Westshore Terminal (overseas)
* CO_2e from EnviroChem 2021, calculated using IPCC Fourth Assessment Report GWP values of 1, 25, and 298 for CO_2, CH_4, and N_2O, respectively.

Table A-28. Alternative 2 - MERC Terminal[1] CAP and CO_2e Emissions for LBA1 Tract Coal (tons/year)

Year	Mt	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	100-Yr GWP CO_2e*
2024	0.53	1.2	0.8	13.9	11.0	25.8	20.2	33,687
2025	1.08	2.5	1.7	28.4	22.6	52.9	41.4	69,059
2026	0.99	2.3	1.6	26.1	20.8	48.5	38.0	63,393
2027	1.17	2.7	1.8	30.7	24.4	57.1	44.7	74,571
2028	0.86	2.0	1.3	22.6	18.0	42.1	32.9	54,971
Avg	**0.9**	**2.1**	**1.4**	**24.3**	**19.4**	**45.3**	**35.4**	**59,136**
Min	**0.53**	**1.21**	**0.83**	**13.87**	**11.04**	**25.79**	**20.18**	**33,687**
Max	**1.17**	**2.68**	**1.83**	**30.70**	**24.44**	**57.10**	**44.66**	**74,571**

[1] Assumes approximately 24% of the LBA1 coal will be shipped to the MERC terminal (Great Lakes)
* CO_2e from EnviroChem 2021, calculated using IPCC Fourth Assessment Report GWP values of 1, 25, and 298 for CO_2, CH_4, and N_2O, respectively.

Table A-29. Alternative 3 - Westshore Terminal[1] CAP and CO_2e Emissions for LBA1 Tract Coal (tons/year)

Year	Mt	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	100-Yr GWP CO_2e*
2024	5.76	13.2	9.0	151.3	120.4	281.4	220.1	367,497
2025	5.76	13.2	9.0	151.3	120.4	281.4	220.1	367,497
2026	1.25	2.9	2.0	32.8	26.1	61.0	47.7	79,624
Avg	**4.3**	**9.7**	**6.7**	**111.8**	**89.0**	**207.9**	**162.6**	**271,539**
Min	**1.25**	**2.86**	**1.95**	**32.78**	**26.09**	**60.97**	**47.69**	**79,624**
Max	**5.76**	**13.19**	**9.00**	**151.28**	**120.44**	**281.38**	**220.11**	**367,497**

[1] Assumes approximately 32% of the LBA1 coal will be shipped to the Westshore Terminal (overseas)

Table A-30. Alternative 3 - MERC Terminal[1] CAP and CO_2e Emissions for LBA1 Tract Coal (tons/year)

Year	Mt	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	100-Yr GWP CO_2e*
2024	4.32	9.9	6.8	113.5	90.3	211.0	165.1	275,623
2025	4.32	9.9	6.8	113.5	90.3	211.0	165.1	275,623
2026	0.94	2.1	1.5	24.6	19.6	45.7	35.8	59,718
Avg	**3.2**	**7.3**	**5.0**	**83.8**	**66.7**	**155.9**	**122.0**	**203,654**
Min	**0.94**	**2.14**	**1.46**	**24.58**	**19.57**	**45.73**	**35.77**	**59,718**
Max	**4.32**	**9.89**	**6.75**	**113.46**	**90.33**	**211.04**	**165.08**	**275,623**

[1] Assumes approximately 24% of the LBA1 coal will be shipped to the MERC terminal (Great Lakes)

Vessel Shipment Emissions

Ship Assumptions

Cape Garnett		
Year of Build	2018	
Avg Speed	11.6	knots
Max Speed	15.6	knots
Gross Tonnage	107,829	lbs
Deadweight	208,377	lbs
Draught	18.32	m
Engine	1 DE: 2 SA 6 CY	
Engine Power	17,300	kW
Fuel	Marine Diesel	
TEU	Not listed	
Propeller	1	

Source: VesselFinder 2024

Fleet & Terminal Assumptions

196 vessel calls/year (SNC-Lavalin 2013)
28.2 million tonnes coal shipped in 2016 from Westshore Terminal (SNC-Lavalin 2013)
31.1 Mt coal shipped in 2016 from Westshore, calculated
0.16 Mt coal/ship, calculated
9,946: 2018 round trip miles; approximate weighted average distance between Westshore Terminal and ports in Japan and ROK
10,010: 2020 round trip miles; approximate weighted average distance between Westshore Terminal and ports in Japan and ROK
588 round trip miles MERC Terminal shipments - Great Lakes (estimated)

Emission Factors from EPA Port Emissions Inventory Guidance (EPA 2022)

NOx	3.4	g/kWh	
BSFC	185	g/kWh	
PM_{10} Calculation	$EFPM_{10} = PMbase + (Sact \times BSFC \times FSC \times MWR)$ PMbase = 0.1545 g/kWh for distillate fuel (MGO and MDO) Sact = 0.027 for all vessel activity outside the ECA before 2020 FSC for PM_{10} = 0.02247 MWR = molecular weight ratio of sulfate PM to sulfur = 224/32 = 7		
PM_{10}	0.80834667	g/kWh	
HC	0.6	g/kWh	
CO	1.4	g/kWh	
CH_4	0.012	g/kWh	CH_4 emission factors should be calculated as 2% of HC emission factors.
N_2O	0.029	g/kWh	
CO_2 Calculation	$EFCO_2 = BSFC \times CCF$ CCF = 3.206 for MGO/MDO		
CO_2	593.11		
SO_2 Calculation	$EFSO2 = BSFC \times Sact \times FSC \times MWR$		

FSC for SO_2 = 0.97753
MWR = molecular weight ratio of SO2 to sulfur = 64/32 = 2

SO_2 9.7655247

Propulsion Engine Operating Power and Load Factor

$Pp = Pref \times (V/Vref)3 \times SM$

Where Pp = propulsion engine operating power (kW)
$Pref$ = vessel's total installed propulsion power (kW)
V = AIS-reported speed before the record interval (kn) - used average speed
$Vref$ = vessel's maximum speed (kn)
SM = sea margin, which accounts for average weather conditions, assumed to be 1.10 for coastal operations and 1.15 for at-sea operations (unitless)

Pp 8179.82695

LF = Pp/Pref

LF 0.47282237

Emissions

$E = P \times A \times EF \times LLAF$

Where E = per vessel emissions (g)
P = engine operating power (kW)
A = engine operating activity (h)
EF = emission factor (g/kWh)
$LLAF$ = low load adjustment factor (unitless)

0.92	$PM_{2.5}/PM_{10}$ ratio
0.0000259	$PM_{2.5}$ to As multiplication factor (EPA Port Emissions Inventory Guidance, Appendix D (EPA 2022))
0.000125	$PM_{2.5}$ to Pb multiplication factor (EPA Port Emissions Inventory Guidance, Appendix D (EPA 2022))
4.18E-08	$PM_{2.5}$ to Hg multiplication factor (EPA Port Emissions Inventory Guidance, Appendix D (EPA 2022))

Table A-31. Estimated CAP, HAP, and GHG Pollutant Emission Rates and Emissions per 1 Mt of Coal

Units	Mt	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	HC	As	Pb	Hg	CO_2	CH_4	N_2O
Emission Rate by Engine Power Output (g/kWh)		0.81	0.74	3.40	9.77	1.4	0.6	1.9E-05	9.3E-05	3.1E-08	593	0.01	0.03
2018 Total Round-trip Ocean Transport Emissions	1	34.3	31.5	144.2	414.1	59.4	25.4	8.2E-04	3.9E-03	1.3E-06	25,147	0.51	1.2
2020 Total Round-trip Ocean Transport Emissions	1	34.5	31.7	145.1	416.7	59.7	25.6	8.2E-04	4.0E-03	1.3E-06	25,309	0.51	1.2
Average Ocean Transport Emissions	1	34.4	31.6	144.6	415.4	59.6	25.5	8.2E-04	4.0E-03	1.3E-06	25,228	0.51	1.2
2019/2020 Total Round-trip Great Lakes Transport Emissions	1	2.0	1.9	8.5	24.5	3.5	1.5	4.8E-05	2.3E-04	7.8E-08	1,487	0.03	0.07

Table A-32. Baseline Vessel Shipment CAP & HAP Emissions for SCM (tons/year)

Units	Mt	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	HC	As	Pb	Hg
2018 Total Round-trip Ocean Transport Emissions	4.5	154.8	142.4	651.2	1870.5	268.2	114.9	3.69E-03	1.78E-02	5.95E-06
2020 Total Round-trip Ocean Transport Emissions	3.2	110.7	101.8	465.6	1337.3	191.7	82.2	2.64E-03	1.27E-02	4.26E-06
2018 Total Round-trip Great Lakes Transport Emissions	3.8	7.6	7.0	32.0	92.0	13.2	5.6	1.81E-04	8.75E-04	2.93E-07
2020 Total Round-trip Great Lakes Transport Emissions	1.9	3.8	3.5	16.0	46.0	6.6	2.8	9.07E-05	4.38E-04	1.46E-07

Table A-33. Alternative 1 - Ocean Vessel Transport CAP & HAP Emissions for LBA1 Tract Coal (tons/year)

Year	Mt Shipped[1]	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	HC	As	Pb	Hg
2024	0.70	24.21	22.27	101.81	292.43	41.92	17.97	5.77E-04	2.78E-03	9.31E-07
2025	1.44	49.62	45.65	208.72	599.48	85.94	36.83	1.18E-03	5.71E-03	1.91E-06
2026	1.32	45.55	41.91	191.59	550.30	78.89	33.81	1.09E-03	5.24E-03	1.75E-06
2027	1.56	53.58	49.30	225.38	647.33	92.80	39.77	1.28E-03	6.16E-03	2.06E-06
2028	1.15	39.50	36.34	166.14	477.19	68.41	29.32	9.41E-04	4.54E-03	1.52E-06
2029	1.35	46.32	42.62	194.83	559.61	80.23	34.38	1.10E-03	5.33E-03	1.78E-06
2030	0.80	27.62	25.41	116.16	333.64	47.83	20.50	6.58E-04	3.18E-03	1.06E-06
2031	0.80	27.62	25.41	116.16	333.64	47.83	20.50	6.58E-04	3.18E-03	1.06E-06
2032	0.80	27.62	25.41	116.16	333.64	47.83	20.50	6.58E-04	3.18E-03	1.06E-06
2033	0.80	27.62	25.41	116.16	333.64	47.83	20.50	6.58E-04	3.18E-03	1.06E-06
2034	0.80	27.62	25.41	116.16	333.64	47.83	20.50	6.58E-04	3.18E-03	1.06E-06
2035	0.25	8.58	7.90	36.10	103.68	14.86	6.37	2.04E-04	9.87E-04	3.30E-07
2036	0.25	8.58	7.90	36.10	103.68	14.86	6.37	2.04E-04	9.87E-04	3.30E-07
2037	0.25	8.58	7.90	36.10	103.68	14.86	6.37	2.04E-04	9.87E-04	3.30E-07
2038	0.25	8.58	7.90	36.10	103.68	14.86	6.37	2.04E-04	9.87E-04	3.30E-07
2039	0.25	8.58	7.90	36.10	103.68	14.86	6.37	2.04E-04	9.87E-04	3.30E-07
Avg	**0.80**	**27.49**	**25.29**	**115.61**	**332.06**	**47.60**	**20.40**	**6.55E-04**	**3.16E-03**	**1.06E-06**
Min	**0.25**	**8.58**	**7.90**	**36.10**	**103.68**	**14.86**	**6.37**	**2.04E-04**	**9.87E-04**	**3.30E-07**
Max	**1.56**	**53.58**	**49.30**	**225.38**	**647.33**	**92.80**	**39.77**	**1.28E-03**	**6.16E-03**	**2.06E-06**

[1] Assumes approximately 32% of the LBA1 coal will be shipped to the Westshore Terminal (overseas)

Table A-34. Alternative 1 - Great Lakes Vessel Transport CAP Emissions for LBA1 Tract Coal (tons/year)

Year	Mt Shipped[1]	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	HC	As	Pb	Hg
2024	0.5	1.1	1.0	4.5	12.9	1.9	0.8	2.55E-05	1.23E-04	4.11E-08
2025	1.1	2.2	2.0	9.2	26.5	3.8	1.6	5.23E-05	2.52E-04	8.43E-08
2026	1.0	2.0	1.9	8.5	24.3	3.5	1.5	4.80E-05	2.32E-04	7.74E-08
2027	1.2	2.4	2.2	10.0	28.6	4.1	1.8	5.64E-05	2.72E-04	9.11E-08
2028	0.9	1.7	1.6	7.3	21.1	3.0	1.3	4.16E-05	2.01E-04	6.71E-08
2029	1.0	2.0	1.9	8.6	24.7	3.5	1.5	4.88E-05	2.35E-04	7.87E-08
2030	0.6	1.2	1.1	5.1	14.7	2.1	0.9	2.91E-05	1.40E-04	4.69E-08
2031	0.6	1.2	1.1	5.1	14.7	2.1	0.9	2.91E-05	1.40E-04	4.69E-08
2032	0.6	1.2	1.1	5.1	14.7	2.1	0.9	2.91E-05	1.40E-04	4.69E-08
2033	0.6	1.2	1.1	5.1	14.7	2.1	0.9	2.91E-05	1.40E-04	4.69E-08
2034	0.6	1.2	1.1	5.1	14.7	2.1	0.9	2.91E-05	1.40E-04	4.69E-08
2035	0.2	0.4	0.3	1.6	4.6	0.7	0.3	9.04E-06	4.36E-05	1.46E-08
2036	0.2	0.4	0.3	1.6	4.6	0.7	0.3	9.04E-06	4.36E-05	1.46E-08
2037	0.2	0.4	0.3	1.6	4.6	0.7	0.3	9.04E-06	4.36E-05	1.46E-08
2038	0.2	0.4	0.3	1.6	4.6	0.7	0.3	9.04E-06	4.36E-05	1.46E-08
2039	0.2	0.4	0.3	1.6	4.6	0.7	0.3	9.04E-06	4.36E-05	1.46E-08
Avg	0.6	1.2	1.1	5.1	14.7	2.1	0.9	2.89E-05	1.40E-04	4.67E-08
Min	0.2	0.4	0.3	1.6	4.6	0.7	0.3	9.04E-06	4.36E-05	1.46E-08
Max	1.2	2.4	2.2	10.0	28.6	4.1	1.8	5.64E-05	2.72E-04	9.11E-08

[1] Assumes approximately 24% of the LBA1 coal will be shipped to the MERC terminal (Great Lakes)

Table A-35. Alternative 2 - Ocean Vessel Transport CAP Emissions for LBA1 Tract Coal (tons/year)

Year	Mt Shipped[1]	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	HC	As	Pb	Hg
2024	0.7	24.2	22.3	101.8	292.4	41.9	18.0	5.77E-04	2.78E-03	9.31E-07
2025	1.4	49.6	45.7	208.7	599.5	85.9	36.8	1.18E-03	5.71E-03	1.91E-06
2026	1.3	45.6	41.9	191.6	550.3	78.9	33.8	1.09E-03	5.24E-03	1.75E-06
2027	1.6	53.6	49.3	225.4	647.3	92.8	39.8	1.28E-03	6.16E-03	2.06E-06
2028	1.1	39.5	36.3	166.1	477.2	68.4	29.3	9.41E-04	4.54E-03	1.52E-06
Avg	**1.2**	**42.5**	**39.1**	**178.7**	**513.3**	**73.6**	**31.5**	**1.01E-03**	**4.89E-03**	**1.63E-06**
Min	**0.7**	**24.2**	**22.3**	**101.8**	**292.4**	**41.9**	**18.0**	**5.77E-04**	**2.78E-03**	**9.31E-07**
Max	**1.6**	**53.6**	**49.3**	**225.4**	**647.3**	**92.8**	**39.8**	**1.28E-03**	**6.16E-03**	**2.06E-06**

[1] Assumes approximately 32% of the LBA1 coal will be shipped to the Westshore Terminal (overseas)

Table A-36. Alternative 2 - Great Lakes Vessel Transport CAP Emissions for LBA1 Tract Coal (tons/year)

Year	Mt Shipped[1]	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	HC	As	Pb	Hg
2024	0.5	1.1	1.0	4.5	12.9	1.9	0.8	2.55E-05	1.23E-04	4.11E-08
2025	1.1	2.2	2.0	9.2	26.5	3.8	1.6	5.23E-05	2.52E-04	8.43E-08
2026	1.0	2.0	1.9	8.5	24.3	3.5	1.5	4.80E-05	2.32E-04	7.74E-08
2027	1.2	2.4	2.2	10.0	28.6	4.1	1.8	5.64E-05	2.72E-04	9.11E-08
2028	0.9	1.7	1.6	7.3	21.1	3.0	1.3	4.16E-05	2.01E-04	6.71E-08
Avg	**0.9**	**1.9**	**1.7**	**7.9**	**22.7**	**3.3**	**1.4**	**4.48E-05**	**2.16E-04**	**7.22E-08**
Min	**0.5**	**1.1**	**1.0**	**4.5**	**12.9**	**1.9**	**0.8**	**2.55E-05**	**1.23E-04**	**4.11E-08**
Max	**1.2**	**2.4**	**2.2**	**10.0**	**28.6**	**4.1**	**1.8**	**5.64E-05**	**2.72E-04**	**9.11E-08**

[1] Assumes approximately 24% of the LBA1 coal will be shipped to the MERC terminal (Great Lakes)

Table A-37. Alternative 3 - Ocean Vessel Transport CAP Emissions for LBA1 Tract Coal (tons/year)

Year	Mt Shipped[1]	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	HC	As	Pb	Hg
2024	5.8	198.0	182.2	833.0	2392.6	343.0	147.0	4.72E-03	2.28E-02	7.62E-06
2025	5.8	198.0	182.2	833.0	2392.6	343.0	147.0	4.72E-03	2.28E-02	7.62E-06
2026	1.2	42.9	39.5	180.5	518.4	74.3	31.9	1.02E-03	4.93E-03	1.65E-06
Avg	4.3	146.3	134.6	615.5	1767.9	253.4	108.6	3.49E-03	1.68E-02	5.63E-06
Min	1.2	42.9	39.5	180.5	518.4	74.3	31.9	1.02E-03	4.93E-03	1.65E-06
Max	5.8	198.0	182.2	833.0	2392.6	343.0	147.0	4.72E-03	2.28E-02	7.62E-06

[1] Assumes approximately 32% of the LBA1 coal will be shipped to the Westshore Terminal (overseas)

Table A-38. Alternative 3 - Great Lakes Vessel Transport CAP Emissions for LBA1 Tract Coal (tons/year)

Year	Mt Shipped[1]	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	HC	As	Pb	Hg
2024	4.3	8.8	8.1	36.8	105.7	15.2	6.5	2.09E-04	1.01E-03	3.37E-07
2025	4.3	8.8	8.1	36.8	105.7	15.2	6.5	2.09E-04	1.01E-03	3.37E-07
2026	0.9	1.9	1.7	8.0	22.9	3.3	1.4	4.52E-05	2.18E-04	7.29E-08
Avg	3.2	6.5	6.0	27.2	78.1	11.2	4.8	1.54E-04	7.44E-04	2.49E-07
Min	0.9	1.9	1.7	8.0	22.9	3.3	1.4	4.52E-05	2.18E-04	7.29E-08
Max	4.3	8.8	8.1	36.8	105.7	15.2	6.5	2.09E-04	1.01E-03	3.37E-07

[1] Assumes approximately 24% of the LBA1 coal will be shipped to the MERC terminal (Great Lakes)

Table A-39. Baseline Ocean Vessel Transport GHG Emissions for SCM (tons/year)

Year	Mt Shipped[1]	CO_2	CH_4	N_2O	100-Yr GWP CO_2e	20-Yr GWP CO_2e
2018 Total Round-trip Ocean Transport Emissions	4.5	113,603	2.3	5.6	115,188	115,309
2020 Total Round-trip Ocean Transport Emissions	3.2	81,222	1.6	4.0	82,355	82,442
2018 Total Round-trip Great Lakes Transport Emissions	3.8	5,585	0.11	0.27	5,663	5,669
2020 Total Round-trip Great Lakes Transport Emissions	1.9	2,794	0.06	0.14	2,833	2,836

Table A-40. Alternative 1 - Ocean Vessel Transport GHG Emissions for LBA1 Tract Coal (tons/year)

Year	Mt Shipped[1]	CO_2	CH_4	N_2O	100-Yr GWP CO_2e	20-Yr GWP CO_2e
2024	0.7	17,761	0.36	0.87	18,009	18,028
2025	1.4	36,410	0.74	1.78	36,918	36,956
2026	1.3	33,423	0.68	1.63	33,889	33,924
2027	1.6	39,316	0.80	1.92	39,864	39,906
2028	1.1	28,982	0.59	1.42	29,387	29,418
2029	1.3	33,988	0.69	1.66	34,462	34,498
2030	0.8	20,263	0.41	0.99	20,546	20,568
2031	0.8	20,263	0.41	0.99	20,546	20,568
2032	0.8	20,263	0.41	0.99	20,546	20,568
2033	0.8	20,263	0.41	0.99	20,546	20,568
2034	0.8	20,263	0.41	0.99	20,546	20,568
2035	0.2	6,297	0.13	0.31	6,385	6,392
2036	0.2	6,297	0.13	0.31	6,385	6,392
2037	0.2	6,297	0.13	0.31	6,385	6,392
2038	0.2	6,297	0.13	0.31	6,385	6,392
2039	0.2	6,297	0.13	0.31	6,385	6,392
Avg	**0.8**	**20,168**	**0.41**	**0.99**	**20,449**	**20,470**
Min	**0.2**	**6,297**	**0.13**	**0.31**	**6,385**	**6,392**
Max	**1.6**	**39,316**	**0.80**	**1.92**	**39,864**	**39,906**

[1] Assumes approximately 32% of the LBA1 coal will be shipped to the Westshore Terminal (overseas)

Table A-41. Alternative 1 - Great Lakes Vessel Transport GHG Emissions for LBA1 Tract Coal (tons/year)

Year	Mt Shipped[1]	CO_2	CH_4	N_2O	100-Yr GWP CO_2e	20-Yr GWP CO_2e
2024	0.5	785	0.02	0.04	796	797
2025	1.1	1,609	0.03	0.08	1,632	1,633
2026	1.0	1,477	0.03	0.07	1,498	1,499
2027	1.2	1,738	0.04	0.08	1,762	1,764
2028	0.9	1,281	0.03	0.06	1,299	1,300
2029	1.0	1,502	0.03	0.07	1,523	1,525
2030	0.6	896	0.02	0.04	908	909
2031	0.6	896	0.02	0.04	908	909
2032	0.6	896	0.02	0.04	908	909
2033	0.6	896	0.02	0.04	908	909
2034	0.6	896	0.02	0.04	908	909
2035	0.2	278	0.01	0.01	282	282
2036	0.2	278	0.01	0.01	282	282
2037	0.2	278	0.01	0.01	282	282
2038	0.2	278	0.01	0.01	282	282
2039	0.2	278	0.01	0.01	282	282
Avg	**0.6**	**891**	**0.02**	**0.04**	**904**	**905**
Min	**0.2**	**278**	**0.01**	**0.01**	**282**	**282**
Max	**1.2**	**1,738**	**0.04**	**0.08**	**1,762**	**1,764**

[1] Assumes approximately 24% of the LBA1 coal will be shipped to the MERC terminal (Great Lakes)

Table A-42. Alternative 2 - Ocean Vessel Transport GHG Emissions for LBA1 Tract Coal (tons/year)

Year	Mt Shipped[1]	CO_2	CH_4	N_2O	100-Yr GWP CO_2e	20-Yr GWP CO_2e
2024	0.7	17,761	0.36	0.87	18,009	18,028
2025	1.4	36,410	0.74	1.78	36,918	36,956
2026	1.3	33,423	0.68	1.63	33,889	33,924
2027	1.6	39,316	0.80	1.92	39,864	39,906
2028	1.1	28,982	0.59	1.42	29,387	29,418
Avg	**1.2**	**31,178**	**0.63**	**1.52**	**31,613**	**31,646**
Min	**0.7**	**17,761**	**0.36**	**0.87**	**18,009**	**18,028**
Max	**1.6**	**39,316**	**0.80**	**1.92**	**39,864**	**39,906**

[1] Assumes approximately 32% of the LBA1 coal will be shipped to the Westshore Terminal (overseas)

Table A-43. Alternative 2 - Great Lakes Vessel Transport GHG Emissions for LBA1 Tract Coal (tons/year)

Year	Mt Shipped[1]	CO_2	CH_4	N_2O	100-Yr GWP CO_2e	20-Yr GWP CO_2e
2024	0.5	785	0.02	0.04	796	797
2025	1.1	1,609	0.03	0.08	1,632	1,633
2026	1.0	1,477	0.03	0.07	1,498	1,499
2027	1.2	1,738	0.04	0.08	1,762	1,764
2028	0.9	1,281	0.03	0.06	1,299	1,300
Avg	**0.9**	**1,378**	**0.03**	**0.07**	**1,397**	**1,399**
Min	**0.5**	**785**	**0.02**	**0.04**	**796**	**797**
Max	**1.2**	**1,738**	**0.04**	**0.08**	**1,762**	**1,764**

[1] Assumes approximately 24% of the LBA1 coal will be shipped to the MERC terminal (Great Lakes)

Table A-44. Alternative 3 - Ocean Vessel Transport GHG Emissions for LBA1 Tract Coal (tons/year)

Year	Mt Shipped[1]	CO_2	CH_4	N_2O	100-Yr GWP CO_2e	20-Yr GWP CO_2e
2024	5.8	145,315	2.94	7.11	147,343	147,498
2025	5.8	145,315	2.94	7.11	147,343	147,498
2026	1.2	31,485	0.64	1.54	31,924	31,958
Avg	**4.3**	**107,372**	**2.17**	**5.25**	**108,870**	**108,984**
Min	**1.2**	**31,485**	**0.64**	**1.54**	**31,924**	**31,958**
Max	**5.8**	**145,315**	**2.94**	**7.11**	**147,343**	**147,498**

[1] Assumes approximately 32% of the LBA1 coal will be shipped to the Westshore Terminal (overseas)

Table A-45. Alternative 3 - Great Lakes Vessel Transport CAP Emissions for LBA1 Tract Coal (tons/year)

Year	Mt Shipped[1]	CO_2	CH_4	N_2O	100-Yr GWP CO_2e	20-Yr GWP CO_2e
2024	4.3	6,423	0.13	0.31	6,512	6,519
2025	4.3	6,423	0.13	0.31	6,512	6,519
2026	0.9	1,392	0.03	0.07	1,411	1,412
Avg	**3.2**	**4,746**	**0.10**	**0.23**	**4,812**	**4,817**
Min	**0.9**	**1,392**	**0.03**	**0.07**	**1,411**	**1,412**
Max	**4.3**	**6,423**	**0.13**	**0.31**	**6,512**	**6,519**

[1] Assumes approximately 24% of the LBA1 coal will be shipped to the MERC terminal (Great Lakes)

Coal Combustion Emissions

Conversion Factors

1000000	*A*	µg/g
2000	*B*	lb/ton
1000000	*C*	Btu/MMBtu

Typical SCM Coal Characteristics

Value	ID	Units and Notes
9345	*D*	Btu/lb coal, as received basis (SCM 2021)
0.33	*E*	wt % sulfur, as received basis (SCM 2021)
4.16	*F*	wt % ash, as received basis (SCM 2021)
25.12	*G*	wt % moisture, as received basis (SCM 2021)
39.25	*H*	wt % carbon, as received basis (SCM 2021)
0.06	*I*	µg/g mercury (Hg), dry basis (SCM 2021)
1.61	*J*	µg/g arsenic (Hg), dry basis (SCM 2021)
1.6	*K*	µg/g lead (Hg), dry basis (SCM 2021)
0.03	*L*	µg/g Hg, as received basis *L=I/(1 + G/100)*
2.2	*M*	µg/g As, as received basis *M=J/(1 + G/100)*
2.5	*N*	µg/g Pb, as received basis *N=K/(1 + G/100)*

CRITERIA POLLUTANT EMISSIONS CALCULATIONS

Input Terms for Calculating Uncontrolled Emission Factors (Pulverized, Bituminous Coal)

38	*O*	unitless SO_x emission factor multiplier; all pulverized coal (PC) firing configurations (EPA 1998, Table 1.1-3)
2.3	*P*	unitless filterable PM_{10} emission factor multiplier; PC dry bottom firing configurations (EPA 1998, Table 1.1-3)
2.6	*Q*	unitless filterable PM_{10} emission factor multiplier; PC wet bottom firing configurations (EPA 1998, Table 1.1-3)
0.6	*R*	unitless filterable $PM_{2.5}$ emission factor multiplier; PC dry and dry bottom tangential (EPA 2001)
1.48	*S*	unitless filterable $PM_{2.5}$ emission factor multiplier; PC wet boom (EPA 2001)
95	*T*	wt % fuel sulfur emitted as SO_2 (EPA 1998, Table 1.1-3)
0.1	*U*	unitless total condensable particulate matter factor; PC firing without FGB (EPA 1998, Table 1.1-3)
0.03	*V*	unitless total condensable particulate matter term; PC firing without FGB (EPA 1998, Table 1.1-3)

Uncontrolled Emission Factors (Pulverized, Bituminous Coal)

11.9	*W*	lb SO2/ton coal; calculated *W = O * E * (T/100)*
9.7	*X*	lb Nox/ton coal; PC dry bottom, tangentially-fired with low NO_x burner

		(EPA 1998, Table 1.1-3)
31	*Y*	lb NO_x /ton coal; PC wet bottom, wall-fired and PC dry bottom, cell burner (EPA 1998, Table 1.1-3)
0.5	*Z*	lb CO/ton coal; all pulverized coal firing configurations (EPA 1998, Table 1.1-3)
9.6	*AA*	lb filterable PM_{10}/ton coal; low end, calculated
		*AA = F * P*
10.8	*BB*	lb filterable PM_{10}/ton coal; high end, calculated
		*BB = F * Q*
2.5	*CC*	lb filterable $PM_{2.5}$/ton coal; low end, calculated
		*CC = F * R*
6.2	*DD*	lb filterable $PM_{2.5}$/ton coal; high end, calculated
		*DD = F * S*
0.003	*EE*	lb total condensable PM/MMBtu; calculated
		*EE = (E * U) - V*
0.06	*FF*	lb total condensable/ton coal; calculated
		*FF = EE * D *B/C*
	G	
0.00006	*G*	lb Hg/ton coal; calculated
		*GG = L * B/A*
0.0044	*HH*	lb As/ton coal; calculated
		*HH = M * B/A*
0.005	*II*	lb Pb/ton coal; calculated
		*II = N * B/A*
0.07	*JJ*	lb VOC /ton coal; PC dry bottom (EPA 1993)

Table A-46. Coal Combustion Emissions Control Efficiency Ranges

Control Efficiency Range	Filterable PM_{10} (%)	Filterable $PM_{2.5}$ (%)	NO_x (%)	SO_x (%)	CO (%)	VOC (%)	Pb (%)	Hg (%)	As (%)
Low	98	98	75	75	75	75	98	39	98
High	99.9	99.9	98	95	98	98	99.9	90	99.9

Table A-47. Estimated Controlled Pollutant and HAP Emissions Ranges per 1.0 Mt of Coal Combusted (tons)

Control Efficiency	PM_{10}	$PM_{2.5}$	NO_x	SO_x	CO	VOC	Pb	Hg	As
Low	124	53	1212.5	1489	62.5	8.8	0.05	0.0183	0.044
High	33	31	310	298	5	0.7	0.0025	0.003	0.0022

Table A-48. Baseline Coal Combustion CAP Emissions for SCM (tons/year)

Year	Mt	PM_{10}	$PM_{2.5}$	NO_x	SO_x	CO	VOC	Pb	Hg	As
Low Efficiency										
2018	13.8	1703	730	16694	20502	861	120	0.688	0.252	0.606
2020	9.5	1177	504	11535	14166	595	83	0.476	0.174	0.419
High Efficiency										
2018	13.8	460	428	4268	4100	69	10	0.034	0.041	0.030
2020	9.5	318	296	2949	2833	48	7	0.024	0.029	0.021

Table A-49. Proposed Action Coal Combustion CAP Emissions (tons/year)

Year	Mt	PM_{10}	$PM_{2.5}$	NO_x	SO_x	CO	VOC	Pb	Hg	As
Low	**Efficiency**									
2024	2.2	272	117	2668	3276	138	19	0.110	0.040	0.097
2025	4.5	558	239	5468	6716	282	39	0.226	0.083	0.198
2026	4.1	512	219	5020	6165	259	36	0.207	0.076	0.182
2027	4.9	602	258	5905	7252	304	43	0.244	0.089	0.214
2028	3.6	444	190	4353	5346	224	31	0.180	0.066	0.158
2029	4.2	521	223	5105	6269	263	37	0.211	0.077	0.185
2030	2.5	311	133	3043	3738	157	22	0.126	0.046	0.110
2031	2.5	311	133	3043	3738	157	22	0.126	0.046	0.110
2032	2.5	311	133	3043	3738	157	22	0.126	0.046	0.110
2033	2.5	311	133	3043	3738	157	22	0.126	0.046	0.110
2034	2.5	311	133	3043	3738	157	22	0.126	0.046	0.110
2035	0.8	96	41	946	1162	49	7	0.039	0.014	0.034
2036	0.8	96	41	946	1162	49	7	0.039	0.014	0.034
2037	0.8	96	41	946	1162	49	7	0.039	0.014	0.034
2038	0.8	96	41	946	1162	49	7	0.039	0.014	0.034
2039	0.8	96	41	946	1162	49	7	0.039	0.014	0.034
Avg	**2.5**	**309**	**132**	**3029**	**3720**	**156**	**22**	**0.125**	**0.046**	**0.110**
U.S.	**1.7**	**210**	**90**	**2060**	**2530**	**106**	**15**	**0.085**	**0.031**	**0.075**
Asia	**0.8**	**99**	**42**	**969**	**1190**	**50**	**7**	**0.040**	**0.015**	**0.035**
High	**Efficiency**									
2024	2.2	74	68	682	655	11	2	0.005	0.007	0.005
2025	4.51	151	140	1398	1343	23	3	0.011	0.014	0.010
2026	4.14	138	129	1283	1233	21	3	0.010	0.012	0.009
2027	4.87	163	152	1510	1450	24	3	0.012	0.015	0.011
2028	3.59	120	112	1113	1069	18	3	0.009	0.011	0.008
2029	4.21	141	131	1305	1254	21	3	0.011	0.013	0.009
2030	2.51	84	78	778	748	13	2	0.006	0.008	0.006
2031	2.51	84	78	778	748	13	2	0.006	0.008	0.006
2032	2.51	84	78	778	748	13	2	0.006	0.008	0.006
2033	2.51	84	78	778	748	13	2	0.006	0.008	0.006
2034	2.51	84	78	778	748	13	2	0.006	0.008	0.006
2035	0.78	26	24	242	232	4	1	0.002	0.002	0.002
2036	0.78	26	24	242	232	4	1	0.002	0.002	0.002
2037	0.78	26	24	242	232	4	1	0.002	0.002	0.002
2038	0.78	26	24	242	232	4	1	0.002	0.002	0.002
2039	0.78	26	24	242	232	4	1	0.002	0.002	0.002
Avg	**2.50**	**84**	**78**	**774**	**744**	**12**	**2**	**0.006**	**0.007**	**0.005**
U.S.	**1.70**	**57**	**53**	**527**	**506**	**8**	**1**	**0.004**	**0.005**	**0.004**
Asia	**0.80**	**27**	**25**	**248**	**238**	**4**	**1**	**0.002**	**0.002**	**0.002**

Table A-50. Partial Mining Alternative Coal Combustion CAP Emissions (tons/year)

Year	Mt	PM_{10}	$PM_{2.5}$	NO_x	SO_x	CO	VOC	Pb	Hg	As
Low	**Efficiency**									
2024	2.2	272	117	2668	3276	138	19	0.110	0.040	0.097
2025	4.51	558	239	5468	6716	282	39	0.226	0.083	0.198
2026	4.14	512	219	5020	6165	259	36	0.207	0.076	0.182
2027	4.87	602	258	5905	7252	304	43	0.244	0.089	0.214
2028	3.59	444	190	4353	5346	224	31	0.180	0.066	0.158
Avg	**3.86**	**478**	**205**	**4683**	**5751**	**241**	**34**	**0.193**	**0.071**	**0.170**
U.S.	**2.63**	**325**	**139**	**3184**	**3911**	**164**	**23**	**0.131**	**0.048**	**0.116**
Asia	**1.24**	**153**	**65**	**1498**	**1840**	**77**	**11**	**0.062**	**0.023**	**0.054**
High	**Efficiency**									
2024	2.2	74	68	682	655	11	2	0.005	0.007	0.005
2025	4.51	151	140	1398	1343	23	3	0.011	0.014	0.010
2026	4.14	138	129	1283	1233	21	3	0.010	0.012	0.009
2027	4.87	163	152	1510	1450	24	3	0.012	0.015	0.011
2028	3.59	120	112	1113	1069	18	3	0.009	0.011	0.008
Avg	**3.86**	**129**	**120**	**1197**	**1150**	**19**	**3**	**0.010**	**0.012**	**0.008**
U.S.	**2.63**	**88**	**82**	**814**	**782**	**13**	**2**	**0.007**	**0.008**	**0.006**
Asia	**1.24**	**41**	**38**	**383**	**368**	**6**	**1**	**0.003**	**0.004**	**0.003**

Table A-51. Accelerated Mining Alternative Coal Combustion CAP Emissions (tons/year)

Year	Mt	PM_{10}	$PM_{2.5}$	NO_x	SO_x	CO	VOC	Pb	Hg	As
Low	**Efficiency**									
2024	18	2227	954	21825	26804	1125	158	0.900	0.329	0.792
2025	18	2227	954	21825	26804	1125	158	0.900	0.329	0.792
2026	3.9	482	207	4729	5808	244	34	0.195	0.071	0.172
Avg	**13.3**	**1645**	**705**	**16126**	**19805**	**831**	**116**	**0.665**	**0.243**	**0.585**
U.S.	**9.04**	**1119**	**479**	**10966**	**13468**	**565**	**79**	**0.452**	**0.166**	**0.398**
Asia	**4.26**	**527**	**226**	**5160**	**6338**	**266**	**37**	**0.213**	**0.078**	**0.187**
High	**Efficiency**									
2024	18	602	560	5580	5361	90	13	0.045	0.054	0.040
2025	18	602	560	5580	5361	90	13	0.045	0.054	0.040
2026	3.9	130	121	1209	1162	20	3	0.010	0.012	0.009
Avg	**13.3**	**445**	**414**	**4123**	**3961**	**67**	**9**	**0.033**	**0.040**	**0.029**
U.S.	**9.04**	**302**	**281**	**2804**	**2694**	**45**	**6**	**0.023**	**0.027**	**0.020**
Asia	**4.26**	**142**	**132**	**1319**	**1268**	**21**	**3**	**0.011**	**0.013**	**0.009**

Conversion Factors

453.66	KK	g/lb
0.99	LL	unitless; carbon-CO_2 conversion factor (AP-42, able 1.1-20)
44	MM	lb/lb-mol; CO_2 molecular weight
12	NN	lb/lb-mol; C molecular weight

100-Yr Global Warming Potentials (unitless) (IPCC AR6 WGI Chapter 7, Table 7.15)

1	CO_2
29.8	CH_4
273	N_2O

20-Yr Global Warming Potentials (unitless) (IPCC AR6 WGI Chapter 7, Table 7.15)

1	CO_2
82.5	CH_4
273	N_2O

GHG Emission Factors

11	RR	g CH_4/MMBtu (40 C.F.R. 98.33, Table C-2)
1.6	SS	g N_2O/MMBtu (40 C.F.R. 98.33, Table C-2)

GHG Emissions

2849.55	TT	lb CO_2/ton of coal, calculated *TT = H/100 * LL * MM/NN * E*
0.453	UU	lb CH_4/ton of coal, calculated *UU = RR * DD * B / (KK * C)*
0.066	VV	lb N_2O/ton of coal, calculated VV = SS * DD * B / (KK * C)

Table A-52. Baseline Coal Combustion GHG Emissions for SCM (tons/year)

Year	Mt	CO_2	CH_4	N_2O	100-Yr GWP CO_2e	20-Yr GWP CO_2e
2018	13.8	19,616,381	3,120	454	19,833,229	19,997,637
2020	9.5	13,554,248	2,156	314	13,704,083	13,817,683

Table A-53. Alternative 1 - Proposed Action Mining GHG Emissions (tons/year)

Year	Mt	CO_2	CH_4	N_2O	100-Yr GWP CO_2e	20-Yr GWP CO_2e
2024	2.2	3,134,505	498	73	3,169,155	3,195,426
2025	4.5	6,425,735	1,022	149	6,496,768	6,550,623
2026	4.1	5,898,569	938	136	5,963,774	6,013,211
2027	4.9	6,938,654	1,103	161	7,015,357	7,073,511
2028	3.6	5,114,942	813	118	5,171,485	5,214,354
2029	4.2	5,998,303	954	139	6,064,611	6,114,884
2030	2.5	3,576,185	569	83	3,615,718	3,645,691
2031	2.5	3,576,185	569	83	3,615,718	3,645,691
2032	2.5	3,576,185	569	83	3,615,718	3,645,691
2033	2.5	3,576,185	569	83	3,615,718	3,645,691
2034	2.5	3,576,185	569	83	3,615,718	3,645,691
2035	0.8	1,111,325	177	26	1,123,610	1,132,924
2036	0.8	1,111,325	177	26	1,123,610	1,132,924
2037	0.8	1,111,325	177	26	1,123,610	1,132,924
2038	0.8	1,111,325	177	26	1,123,610	1,132,924
2039	0.8	1,111,325	177	26	1,123,610	1,132,924
Avg	**2.5**	**3,559,266**	**566**	**82**	**3,598,612**	**3,628,443**
Min	**0.8**	**1,111,325**	**177**	**26**	**1,123,610**	**1,132,924**
Max	**4.9**	**6,938,654**	**1,103**	**161**	**7,015,357**	**7,073,511**

Table A-54. Alternative 2 - Partial Mining Alternative Mining GHG Emissions (tons/year)

Year	Mt	CO_2	CH_4	N_2O	100-Yr GWP CO_2e	20-Yr GWP CO_2e
2024	2.2	3,134,505	498	73	3,169,155	3,195,426
2025	4.5	6,425,735	1,022	149	6,496,768	6,550,623
2026	4.1	5,898,569	938	136	5,963,774	6,013,211
2027	4.9	6,938,654	1,103	161	7,015,357	7,073,511
2028	3.6	5,114,942	813	118	5,171,485	5,214,354
Avg	**3.9**	**5,502,481**	**875**	**127**	**5,563,308**	**5,609,425**
Min	**2.2**	**3,134,505**	**498**	**73**	**3,169,155**	**3,195,426**
Max	**4.9**	**6,938,654**	**1,103**	**161**	**7,015,357**	**7,073,511**

Table A-55. Alternative 3 - Accelerated Mining Alternative Mining GHG Emissions (tons/year)

Year	Mt	CO_2	CH_4	N_2O	100-Yr GWP CO_2e	20-Yr GWP CO_2e
2024	18	25,645,950	4,079	593	25,929,452	26,144,395
2025	18	25,645,950	4,079	593	25,929,452	26,144,395
2026	3.9	5,556,623	884	129	5,618,048	5,664,619
Avg	**13.3**	**18,949,508**	**3,014**	**438**	**19,158,984**	**19,317,803**
Min	**3.9**	**5,556,623**	**884**	**129**	**5,618,048**	**5,664,619**
Max	**18.0**	**25,645,950**	**4,079**	**593**	**25,929,452**	**26,144,395**

Worker Commute Emissions

Worker Transportation

Total Employees	256	(SCM 2024)
SCM Coal Production 2023	12.45	tons (EIA 2024)
Total Employees per Day	192	(Assume 75%)
No of One-Way Trips per day	384	(Assumes 2 one-way trips/day)
Passenger Car	192	(Assumes 50% use a passenger car to commute)
Diesel Light Truck	192	(Assumes 50% use a diesel light weight truck to commute)
Distance traveled	32	miles (Assumes all workers travel from Sheridan)
Passenger Car Miles per Year	2,242,560	miles/year
Diesel Light Truck Miles per Year	2,242,560	miles/year

Table A-56. Emission Factors for Passenger Vehicles and Diesel Light Trucks

Passenger Car	VOC exhaust	CO	NO_x	PM_{10} exhaust	$PM_{2.5}$ exhaust	Hg	As	CO_2	CH_4	N_2O
emission factor (g/mi)[1,2,3]	0.04	1.466	0.039	0.004	0.004	1.1E-07	2.3E-06	364	0.008	0.004
emission factor (g/gal)[4]								8,887		
mi/gal[5]								24.4		
Diesel Light Truck	**VOC exhaust**	**CO**	**NO_x**	**PM_{10} exhaust**	**$PM_{2.5}$ exhaust**	**Hg**	**As**	**CO_2**	**CH_4**	**N_2O**
emission factor (g/mi)[1,2,3]	0.141	2.545	0.035	0.003	0.003	6.2E-09	2.3E-06	572	0	0.001
emission factor (g/gal)[4]								10,180		
mi/gal[5]								17.8		

[1] Burnham 2021
[2] Assumed year 2020 from Burnham 2021Table 2 and Table 5
[3] EPA 2020
[4] EPA 2024
[5] DOE 2024

Table A-57. Baseline Worker Commute CAPs & HAPs Emissions for SCM (tons/yr)

Year	Mt	Workers Required	VOC exhaust	CO	NO_x	PM_{10} exhaust	$PM_{2.5}$ exhaust	Hg	As
	1	21	0.04	0.80	0.01	0.001	0.001	2.31E-08	9.13E-07
2018	13.8	283	0.49	10.96	0.20	0.019	0.019	3.18E-07	1.26E-05
2020	9.5	196	0.34	7.57	0.14	0.013	0.013	2.19E-07	8.69E-06

Table A-58. Alternative 1 - Proposed Action Worker Commute CAP & HAP Emissions for LBA1 Tract Coal (tons/year)

Year	Mt	Workers Required	VOC exhaust	CO	NO_x	PM_{10} exhaust	$PM_{2.5}$ exhaust	Hg	As
2024	2.2	45	0.08	1.75	0.03	0.003	0.003	5.07E-08	2.01E-06
2025	4.51	93	0.16	3.59	0.07	0.006	0.006	1.04E-07	4.12E-06
2026	4.14	85	0.15	3.30	0.06	0.006	0.006	9.55E-08	3.78E-06
2027	4.87	100	0.17	3.88	0.07	0.007	0.007	1.12E-07	4.45E-06
2028	3.59	74	0.13	2.86	0.05	0.005	0.005	8.28E-08	3.28E-06
2029	4.21	87	0.15	3.35	0.06	0.006	0.006	9.71E-08	3.84E-06
2030	2.51	52	0.09	2.00	0.04	0.003	0.003	5.79E-08	2.29E-06
2031	2.51	52	0.09	2.00	0.04	0.003	0.003	5.79E-08	2.29E-06
2032	2.51	52	0.09	2.00	0.04	0.003	0.003	5.79E-08	2.29E-06
2033	2.51	52	0.09	2.00	0.04	0.003	0.003	5.79E-08	2.29E-06
2034	2.51	52	0.09	2.00	0.04	0.003	0.003	5.79E-08	2.29E-06
2035	0.78	16	0.03	0.62	0.01	0.001	0.001	1.80E-08	7.12E-07
2036	0.78	16	0.03	0.62	0.01	0.001	0.001	1.80E-08	7.12E-07
2037	0.78	16	0.03	0.62	0.01	0.001	0.001	1.80E-08	7.12E-07
2038	0.78	16	0.03	0.62	0.01	0.001	0.001	1.80E-08	7.12E-07
2039	0.78	16	0.03	0.62	0.01	0.001	0.001	1.80E-08	7.12E-07
Avg	**2.5**	**51**	**0.09**	**1.99**	**0.04**	**0.003**	**0.003**	**5.76E-08**	**2.28E-06**
Min	**0.78**	**16**	**0.03**	**0.62**	**0.01**	**0.001**	**0.001**	**1.80E-08**	**7.12E-07**
Max	**4.87**	**100**	**0.17**	**3.88**	**0.07**	**0.007**	**0.007**	**1.12E-07**	**4.45E-06**

Table A-59. Alternative 2 - Partial Mining Alternative Worker Commute CAP & HAP Emissions for LBA1 Tract Coal (tons/year)

Year	Mt	Workers Required	VOC exhaust	CO	NO_x	PM_{10} exhaust	$PM_{2.5}$ exhaust	Hg	As
2024	2.2	45	0.08	1.75	0.03	0.003	0.003	5.07E-08	2.01E-06
2025	4.51	93	0.16	3.59	0.07	0.006	0.006	1.04E-07	4.12E-06
2026	4.14	85	0.15	3.30	0.06	0.006	0.006	9.55E-08	3.78E-06
2027	4.87	100	0.17	3.88	0.07	0.007	0.007	1.12E-07	4.45E-06
2028	3.59	74	0.13	2.86	0.05	0.005	0.005	8.28E-08	3.28E-06
Avg	**3.86**	**79**	**0.14**	**3.07**	**0.06**	**0.005**	**0.005**	**8.91E-08**	**3.53E-06**
Min	**2.2**	**45**	**0.08**	**1.75**	**0.03**	**0.003**	**0.003**	**5.07E-08**	**2.01E-06**
Max	**4.87**	**100**	**0.17**	**3.88**	**0.07**	**0.007**	**0.007**	**1.12E-07**	**4.45E-06**

Table A-60. Alternative 3 - Accelerated Mining Alternative Worker Commute CAP Emissions for LBA1 Tract Coal (tons/year)

Year	Mt	Workers Required	VOC exhaust	CO	NO_x	PM_{10} exhaust	$PM_{2.5}$ exhaust	Hg	As
2024	18	370	0.65	14.33	0.26	0.025	0.025	4.15E-07	1.64E-05
2025	18	370	0.65	14.33	0.26	0.025	0.025	4.15E-07	1.64E-05
2026	3.9	80	0.14	3.10	0.06	0.005	0.005	8.99E-08	3.56E-06
Avg	**13.3**	**273**	**0.48**	**10.59**	**0.20**	**0.018**	**0.018**	**3.07E-07**	**1.21E-05**
Min	**3.9**	**80**	**0.14**	**3.10**	**0.06**	**0.005**	**0.005**	**8.99E-08**	**3.56E-06**
Max	**18**	**370**	**0.65**	**14.33**	**0.26**	**0.025**	**0.025**	**4.15E-07**	**1.64E-05**

Table A-61. Baseline Worker Commute GHG Emissions for SCM (tons/year)

Year	Mt	Workers Required	CO_2	CH_4	N_2O	100-Yr GWP CO_2e	20-Yr GWP CO_2e
	1	21	186	0.00	0.00	186	186
2018	13.8	283	2,558	0.02	0.01	2,562	2,564
2020	9.5	196	1,768	0.02	0.01	1,771	1,771

Table A-62. Alternative 1 - Proposed Action Worker Commute GHG Emissions for LBA1 Tract Coal (tons/year)

Year	Mt	Workers Required	CO_2	CH_4	N_2O	100-Yr GWP CO_2e	20-Yr GWP CO_2e
2024	2.2	45	409	0.003	0.002	409	410
2025	4.5	93	838	0.007	0.004	839	840
2026	4.1	85	769	0.007	0.004	771	771
2027	4.9	100	905	0.008	0.005	906	907
2028	3.6	74	667	0.006	0.004	668	668
2029	4.2	87	782	0.007	0.004	784	784
2030	2.5	52	466	0.004	0.002	467	467
2031	2.5	52	466	0.004	0.002	467	467
2032	2.5	52	466	0.004	0.002	467	467
2033	2.5	52	466	0.004	0.002	467	467
2034	2.5	52	466	0.004	0.002	467	467
2035	0.8	16	145	0.001	0.001	145	145
2036	0.8	16	145	0.001	0.001	145	145
2037	0.8	16	145	0.001	0.001	145	145
2038	0.8	16	145	0.001	0.001	145	145
2039	0.8	16	145	0.001	0.001	145	145
Avg	**2.5**	**51**	**464**	**0.004**	**0.002**	**465**	**465**
Min	**0.8**	**16**	**145**	**0.001**	**0.001**	**145**	**145**
Max	**4.9**	**100**	**905**	**0.008**	**0.005**	**906**	**907**

Table A-63. Alternative 2 - Partial Mining Alternative Worker Commute GHG Emissions for LBA1 Tract Coal (tons/year)

Year	Mt	Workers Required	CO_2	CH_4	N_2O	100-Yr GWP CO_2e	20-Yr GWP CO_2e
2024	2.2	45	409	0.003	0.002	409	410
2025	4.5	93	838	0.007	0.004	839	840
2026	4.1	85	769	0.007	0.004	771	771
2027	4.9	100	905	0.008	0.005	906	907
2028	3.6	74	667	0.006	0.004	668	668
Avg	**3.9**	**79**	**718**	**0.006**	**0.004**	**719**	**719**
Min	**2.2**	**45**	**409**	**0.003**	**0.002**	**409**	**410**
Max	**4.9**	**100**	**905**	**0.008**	**0.005**	**906**	**907**

Table A-64. Alternative 3 - Accelerated Mining Alternative Worker Commute GHG Emissions for LBA1 Tract Coal (tons/year)

Year	Mt	Workers Required	CO_2	CH_4	N_2O	100-Yr GWP CO_2e	20-Yr GWP CO_2e
2024	18	370	3,344	0.029	0.018	3,350	3,352
2025	18	370	3,344	0.029	0.018	3,350	3,352
2026	3.9	80	725	0.006	0.004	726	726
Avg	**13.3**	**273**	**2,471**	**0.021**	**0.013**	**2,475**	**2,476**
Min	**3.9**	**80**	**725**	**0.006**	**0.004**	**726**	**726**
Max	**18**	**370**	**3,344**	**0.029**	**0.018**	**3,350**	**3,352**

Table A-65. Alternative 1 – Estimated Annual Train Accidents

Year	LBA1 Coal	Rail Miles	All Railroads Derailment on All Lines	All Railroads Derailment on Mainline	BNSF Derailment on All Lines	BNSF Derailment on Mainline
2024	2.20	330,000	0.67	0.19	0.61	0.13
2025	4.51	676,500	1.37	0.40	1.26	0.26
2026	4.14	621,000	1.26	0.36	1.16	0.24
2027	4.87	730,500	1.48	0.43	1.36	0.28
2028	3.59	538,500	1.09	0.32	1.00	0.20
2029	4.21	631,500	1.28	0.37	1.18	0.24
2030	2.51	376,500	0.76	0.22	0.70	0.14
2031	2.51	376,500	0.76	0.22	0.70	0.14
2032	2.51	376,500	0.76	0.22	0.70	0.14
2033	2.51	376,500	0.76	0.22	0.70	0.14
2034	2.51	376,500	0.76	0.22	0.70	0.14
2035	0.78	117,000	0.24	0.07	0.22	0.04
2036	0.78	117,000	0.24	0.07	0.22	0.04
2037	0.78	117,000	0.24	0.07	0.22	0.04
2038	0.78	117,000	0.24	0.07	0.22	0.04
2039	0.78	117,000	0.24	0.07	0.22	0.04

Table A-66. Alternative 2 – Estimated Annual Train Accidents

Year	LBA1 Coal	Rail Miles	All Railroads Derailment on All Lines	All Railroads Derailment on Mainline	BNSF Derailment on All Lines	BNSF Derailment on Mainline
2024	2.20	330,000	0.67	0.19	0.61	0.13
2025	4.51	676,500	1.37	0.40	1.26	0.26
2026	4.14	621,000	1.26	0.36	1.16	0.24
2027	4.87	730,500	1.48	0.43	1.36	0.28
2028	3.59	538,500	1.09	0.32	1.00	0.20

Table A-67. Alternative 3 – Estimated Annual Train Accidents

Year	LBA1 Coal	Rail Miles	All Railroads Derailment on All Lines	All Railroads Derailment on Mainline	BNSF Derailment on All Lines	BNSF Derailment on Mainline
2024	18	2,700,000	5.47	1.58	5.03	1.03
2025	18	2,700,000	5.47	1.58	5.03	1.03
2026	3.6	540,000	1.09	0.32	1.01	0.21

APPENDIX B

SOCIAL COST OF GREENHOUSE GASES ANALYSIS PUBLISHED IN THE DRAFT ENVIRONMENTAL IMPACT STATEMENT

APPENDIX B SOCIAL COST OF GREENHOUSE GASES ANALYSIS PUBLISHED IN THE DRAFT ENVIRONMENTAL IMPACT STATEMENT

B.1 Introduction

The following is the social cost of greenhouse gases discussion published in the September 2024 draft EIS. This discussion has been updated in the final EIS based on the EPA's 2023 methodology and the draft EIS discussion is for reference only.

B.2 Social Cost of Greenhouse Gases

The 2023 GHG guidance provides steps agencies should take when analyzing climate change including disclosing and providing context for the GHG emissions and climate effects. Section IV(B) states that "agencies should disclose and provide context for GHG emissions and climate effects to help decision makers and the public understand proposed actions' potential GHG emissions and climate change effects." This includes provides quantified GHG emissions and best available estimates of SC-GHG for each individual type of GHG emission expected. It also indicates that "the SC-GHG provides an appropriate and valuable metric that gives decision makers and the public useful information and context about a proposed action's climate effects even if no other costs or benefits are monetized, because metric tons of GHGs can be difficult to understand and assess the significance of in the abstract." The SC-GHG can be uses for comparisons to other monetized values and can assist agencies and the public in assessing the significance of climate impacts. In accordance with this direction, this subsection provides estimates of the monetary value of changes in GHG emissions that could result from selecting each alternative. Such analysis should not be construed to mean a cost determination is necessary to address potential impacts of GHGs associated with specific alternatives. These numbers were monetized; however, they neither constitute a complete cost-benefit analysis nor do present a direct comparison with other impacts analyzed in this document. For instance, OSMRE's overall analysis for this action does not monetize most of the major costs or benefits and does not include all revenue streams from the proposed action. SC-GHG is provided only as a useful measure of the benefits of GHG emissions reductions to inform agency decision-making.

For Federal agencies, the best currently available estimates of the SC-GHG are the interim estimates of the social cost of carbon dioxide (SC-CO_2), methane (SC-CH_4), and nitrous oxide (SC-N_2O) developed by the Interagency Working Group (IWG) on the SC-GHG. Select estimates are published in the Technical Support Document (IWG 2021) and the complete set of annual estimates are available on the Office of Management and Budget's website.

The IWG's SC-GHG estimates are based on complex models describing how GHG emissions affect global temperatures, sea level rise, and other biophysical processes; how these changes affect society through, for example, agricultural, health, or other effects; and monetary estimates of the market and nonmarket values of these effects. One key parameter in the models is the discount rate, which is used to estimate the present value of the stream of future damage associated with emissions in a particular year. A higher discount rate assumes that future benefits or costs are more heavily discounted than benefits or costs occurring in the present (i.e., future benefits or costs are a less significant factor in present-day decisions). The current set of interim estimates of SC-GHG have been developed using three different annual discount rates: 2.5%, 3%, and 5% (IWG 2021).

As expected with such a complex model, there are multiple sources of uncertainty inherent in the SC-GHG estimates. Some sources of uncertainty relate to physical effects of GHG emissions, human behavior, future population growth and economic changes, and potential adaptation (IWG 2021). To better understand and communicate the quantifiable uncertainty, the IWG method generates several thousand estimates of the social cost for a specific gas, emitted in a specific year, with a specific discount rate. These estimates create a frequency distribution based on different values for key uncertain climate model parameters. The shape and characteristics of that frequency distribution demonstrate the magnitude of uncertainty relative to the average or expected outcome.

To further address uncertainty, the IWG recommends reporting four SC-GHG estimates in any analysis. Three of the SC-GHG estimates reflect the average damages from the multiple simulations at each of the three discount rates. The fourth value represents higher-than-expected economic impacts from climate change. Specifically, it represents the 95th percentile of damages estimated, applying a 3% annual discount rate for future economic effects. This is a low probability, but high damage scenario, and represents an upper bound of damages within the 3% discount rate model.

The SC-GHG estimates published in the draft EIS followed the IWG's recommendations.

B.2.1 Alternative 1 – Proposed Action

Under the Proposed Action, SCM would mine the remaining 39.9 Mt of mineable Federal coal within the LBA1 tracts through 2039 at an annual rate based on the LOM mining sequence (see Table 2.2-2). The SC-GHGs associated with estimated emissions from future potential development are reported in Table B-1. These estimates represent the present value (from the perspective of future market and nonmarket costs associated with CO_2, CH_4, and N_2O emissions). Estimates presented in Table B-1 were calculated based on IWG estimates of social cost per metric ton of CO_2, CH_4, and N_2O emissions for each year, and were published in the draft EIS. The estimates assume emissions will start in 2024 and end in 2039, based on the current mining plan.

Table B-1. SC-GHGs for the Proposed Action

Social Cost Metric	5% Discount Rate - Average	3% Discount Rate - Average	2.5% Discount Rate - Average	3% Discount Rate – 95th Percentile
SC-CO_2	$781,917,264	$2,876,521,386	$4,325,216,345	$8,685,943,067
SC-CH_4	$5,809,088	$14,210,777	$19,003,396	$37,734,303
SC-N_2O	$8,531,475	$29,268,114	$43,798,633	$77,469,919
Total	**$796,257,828**	**$2,920,000,277**	**$4,388,018,375**	**$8,801,147,288**

B.2.2 Alternative 2 – Partial Mining

Under the Partial Mining alternative, SCM would be limited to mining the Federal coal within the LBA1 tracts to a 5-year term at the annual rate in the current mining plan (see Table 2.2-2). The SC-GHGs associated with estimated emissions from the Partial Mining alternative are reported in Tables 4.4-20a and 4.4-20b. Estimates presented in Table B-2 were calculated based on IWG estimates of social cost per metric ton of CO_2, CH_4, and N_2O emissions for each year, and were published in the draft EIS. The estimates assume emissions will start in 2024 and end in 2028. Any mining of Federal coal within the LBA1 tracts beyond this 5-year term would require reevaluation of the mining operations by OSMRE.

Table B-2 SC-GHGs for the Partial Mining Alternative

Social Cost Metric	5% Discount Rate - Average	3% Discount Rate - Average	2.5% Discount Rate - Average	3% Discount Rate – 95th Percentile
SC-CO_2	$403,295,403	$1,440,848,695	$2,153,903,099	$4,328,319,818
SC-CH_4	$2,954,021	$6,945,612	$9,212,589	$18,388,297
SC-N_2O	$4,388,136	$14,557,759	$21,624,479	$38,429,054
Total	**$410,637,561**	**$1,462,352,066**	**$2,184,740,166**	**$4,385,137,170**

B.2.3 Alternative 3 – Accelerated Mining Rate

Under the Accelerated Mining Rate alternative, SCM would mine the remaining Federal coal within the LBA1 tracts at a rate of 18 Mtpy. Under this alternative, all of the LBA1 tracts coal would be mined in 2.2 years. The SC-GHGs associated with estimated emissions from the Accelerated Mining Rate alternative are reported in Table B-3. Estimates presented in Table B-3 were calculated based on IWG estimates of social cost per metric ton of CO_2, CH_4, and N_2O emissions for each year, and were published in the draft EIS. The estimates assume emissions will start in 2024 and end in 2026.

Table B-3 SC-GHGs for the Accelerated Mining Rate Alternative

Social Cost Metric	5% Discount Rate - Average	3% Discount Rate - Average	2.5% Discount Rate - Average	3% Discount Rate – 95th Percentile
SC-CO_2	$860,721,375	$3,031,163,887	$4,519,276,524	$9,081,578,196
SC-CH_4	$6,092,383	$14,050,601	$18,565,594	$37,148,047
SC-N_2O	$7,876,649	$25,703,362	$38,046,942	$67,750,619
Total	**$874,690,407**	**$3,070,917,850**	**$4,575,889,059**	**$9,186,476,862**

APPENDIX C

SPECIES OF SPECIAL INTEREST

Table C-1. Species of Special Interest Observed During Field Surveys in and Around the Project Area or Included in Agency Databases as Occurring in the Project Area.

Species	Habitat	Historic Occurrence in Analysis Area (1994-2018)	Recent Occurrence and Year Observed (2019-2022)	
			Annual Area	Expanded Area
Amphibians & Reptiles				
Great Plains toad *Anaxyrus cognatus*	Wetlands, floodplain pools	Infrequently	Never	Never
Greater short-horned lizard *Phrynosoma hernandesi*	Rocky outcrops, sparsely vegetated flats with sandy/gravelly soils	Rarely	Never	Never
Plains hog-nosed snake *Heterodon nasicus*	Friable soils	Never	Never	Never
Snapping turtle *Chelydra serpentina*	Prairie rivers and streams	Infrequently	Never	Never
Spiny softshell *Apalone spinifera*	Prairie rivers and larger streams	Never	Never	Never
Western milksnake *Lampropeltis gentilis*	Rock outcrops	Never	Never	Never
Birds				
Bald eagle *Haliaeetus leucocephalus*	Riparian forest	Regularly	2019	Every year from 2019 to 2022
Brewer's sparrow *Spizella breweri*	Sagebrush and shrub-steppe	Regularly	Every year from 2019 to 2022	Every year from 2019 to 2022
Burrowing owl *Athene cunicularia*	Open grasslands where abandoned mammal burrows are available	Occasionally	2021, 2022	2020, 2021
Clark's nutcracker *Nucifraga columbiana*	Conifer forests, including ponderosa pine	Rarely	Never	2021
Golden eagle *Aquila chrysaetos*	Hunt over grasslands, shrublands, and open woodlands; nest on cliffs and large trees	Regularly	Every year from 2019 to 2022	Every year from 2019 to 2022
Great blue heron *Ardea herodias*	Wetlands, and edges of rivers and lakes	Regularly	Every year from 2019 to 2022	Every year from 2019 to 2022
Greater sage grouse *Centrocercus urophasianus*	Sagebrush, riparian meadows	Occasionally	Never	Never
Loggerhead shrike *Lanius ludovicianus*	Grasslands, shrublands, pastures/fields, and other open habitats with short vegetation	Regularly	Every year from 2019 to 2022	Every year from 2019 to 2022

Species	Habitat	Historic Occurrence in Analysis Area (1994-2018)	Recent Occurrence and Year Observed (2019-2022)	
			Annual Area	Expanded Area
Pinyon jay *Gymnorhinus cyanocephalus*	Ponderosa pine and limber pine-juniper woodlands	Occasionally	2020/2021	Never
Sage thrasher *Oreoscoptes montanus*	Sagebrush shrublands	Infrequently	2022	2020, 2021
Yellow-billed cuckoo *Coccyzus americanus*	Deciduous riparian woodland (not known to breed in Montana)	Never	Never	Never
Mammals				
Black-tailed prairie dog *Cynomys ludovicianus*	Flat, open grasslands and shrub-steppe with low, sparse vegetation.	Regularly	Every year from 2019 to 2022	Every year from 2019 to 2022
Eastern red bat *Lasiurus borealis*	Riparian forest	Unknown	Never (not specifically monitored)	Never (not specifically monitored)
Fringed myotis *Myotis thysanodes*	Ponderosa pine and cottonwood riparian; caves, mines, buildings ()	Occasionally	Never (not specifically monitored)	Never (not specifically monitored)
Hoary bat *Lasiurus cinereus*	Forested areas, riparian corridors	Regularly	Never (not specifically monitored)	Never (not specifically monitored)
Long-eared myotis *Myotis evotis*	Forrest areas	Regularly	Never (not specifically monitored)	Never (not specifically monitored)
Long-legged myotis *Myotis volans*	Riparian and dry mixed conifer forest	Unknown	Never (not specifically monitored)	Never (not specifically monitored)
Little brown myotis *Myotis lucifugus*	Generalist, found in a variety of habitats and elevations; buildings, cave/mines (roosting)	Regularly	Never (not specifically monitored)	Never (not specifically monitored)
Townsend's big-eared bat *Corynorhinus townsendii*	Caves/mines (roosting); forest, woodlands, and cottonwood bottomland	Unknown	Never (not specifically monitored)	Never (not specifically monitored)

APPENDIX D

PUBLIC COMMENT RESPONSES

APPENDIX D PUBLIC COMMENT RESPONSES

D.1 Introduction

In compliance with the National Environmental Policy Act of 1969 (NEPA), as amended, the U.S. Department of the Interior (DOI), Office of Surface Mining Reclamation and Enforcement (OSMRE), Regions 5, 7-11 published the Notice of Availability (NOA) of the Draft Environmental Impact Statement (EIS) for the Spring Creek Mine's (SCM) proposed mining plan modification to address a 2021 U.S. District Court of Montana ruling related to Federal Coal Lease MTM 94378. Publication of the NOA began a 45-day public comment period that ended on October 22, 2024. During the public comment period, OMSRE accepted comments from the public on the Draft EIS through email, U.S. Postal Service mail, and by hand delivery at the public meeting held on September 24, 2024, in Hardin, Montana. All comments were given equal consideration, regardless of method of submittal.

OSMRE is required to assess and consider comments on the Draft EIS both individually and collectively (40 C.F.R. § 1503.4(a)). This appendix provides the comments received regarding the Draft EIS and the responses to those comments. Where appropriate, revisions were made to the Draft EIS in the Final EIS.

D.2 COMMENT COLLECTION AND ANALYSIS

D.2.1 Overview

OSMRE received 450 comment letters/emails: 16 from Federal, state/county/municipal and tribes, 12 from non-governmental organizations (NGOs), five from private companies, and 417 from members of the public.

D.2.2 Substantive Comments

This appendix focuses on substantive comments on the Draft EIS. Non-substantive comments are briefly summarized in Section D.3.2 but do not merit a response. All substantive comments are addressed in Table D-3.

D.2.3 Comment Processing

Comment letters/emails received were binned and the contents of each letter/email was reviewed. Discrete comments were individually identified. Of the 450 letters/emails received, 12 comment letters were identified as containing one or more substantive comments and the remaining 441 comment letters/emails were identified as containing non-substantive comments.

D.3 COMMENTS AND RESPONSES TO COMMENTS

D.3.1 Overview

Binning and reviewing identified 96 individual substantive comments. To summarize the nature and volume of comments received, the comments were categorized by content (Table D-1).

Table D-1. Comment Category and Frequency

Comment Category	Number of Comments
Air Quality	3
Alternatives	2
Climate Change	6
Cumulative Impacts	5
Environmental Justice	9
GHG	10
Mine Decommissioning, Reclamation, and Financial Assurance	3
Noise	1
SC-GHG	3
Socioeconomics	17
Soils	1
Technical	20
Topography	1
Transportation	1
Water Resources	11
Wetlands	1
Wildland Fires	1
Wildlife	1

D.3.2 Responses to Non-Substantive Comments

Comment letters containing non-substantive comments were summarized and evaluated by OSMRE. The main topics presented in non-substantive comments included:

- Support for the Project or a given alternative with no reason or overly general reasoning.
- Opposition to the Project or a given alternative with no reason or overly general reasoning.
- General concern for possible impacts to a given resource with no reason or overly general reasoning.

D.3.3 Responses to Substantive Comments

Table D-2 provides a submission ID, name, and organization for each submission containing substantive comments. D-3 provides OSMRE's responses to each substantive comment submitted on the Draft EIS.

Table D-2 Substantive Comment Submissions

Submission ID	Name	Organization
A	Asia Patterson	
B	David Schwend	Navajo Transitional Energy Company (NTEC)
C	Thomas Clarke	Interstate Mining Compact Commission (IMCC)
D	Carolyn Gleason	U.S. Environmental Protection Agency (EPA)
E	Todd Parfitt	Wyoming Department of Environmental Quality (WDEQ)
F	Dan Walsh	Montana Department of Environmental Quality (MDEQ)
G	Greg Gianforte	Montana Governor
H	Katie Mills	National Mining Association (NMA)
I	Brad Schmitz	Montana Fish, Wildlife & Parks (MT FWP)
J	Travis Deti	Wyoming Mining Association
K	George Harris	Montana Coal Council
L	Representative Gary Parry	Montana House of Representatives

Table D-3 Substantive Comments and Responses

Comment No.	Submission ID	Comment Category	Comment (Verbatim)	Comment Response
1	A	Environmental Justice	Section 4.18.2.2 of the DEIS details that, “Under the Proposed Action, there would be no impact to socioeconomics in the region and key environmental justice community would realize a continuance of socioeconomic activity from the proposed action in the form of high paying positions, and the indirect/induced economic and fiscal benefits that SCM provides the region.” While including social and economic cost analysis in the DEIS is significant– especially concerning the Indigenous Peoples identified in the DEIS as the ‘key environmental justice community’– I urge OSMRE to consider a wider range of scenarios that reflect varying future coal market conditions.	Section 3.18 and 4.18 have been revised based on this comment to include additional detail on the environmental justice populations within a 50-mile radius of the SCM. OSMRE acknowledges that coal market conditions could vary considerably in the future in its analysis of Alternative 2, the Partial Mining Alternative.
2	A	Cumulative Impacts	Given the challenges and the trends highlighted in 3.17-1, how does OSMRE anticipate the Proposed Action will affect future employment at SCM after the completion of MLA 1? Currently, Chapter 5 (Cumulative Effects) of the DEIS does not contain an analysis of past, present, and future actions’ effects on socioeconomics in the region. Are there predictions based on past and current SCM employment statistics that can provide clarity on long-term socioeconomic interests as dependence on coal declines?	Sections 4.17 and 5.2.14 have been revised based on this comment to include the employment impacts for each alternative, and cumulative impacts. The EIS analyzes the socioeconomic impacts of the proposed project alternatives, not projections of overall market conditions. The EIS acknowledges the volatility of the coal market in its analysis of Alternative 2, the Partial Mining Alternative.
3	A	Water Resources	Section 4.4.3.1.1 of the DEIS details that “reclamation will increase concentrations of TDS in groundwater but is not anticipated to change the suitability of groundwater for beneficial use. Water levels and water quality will eventually stabilize near pre-mining levels.” More data is needed in the DEIS to support this claim.	Section 4.5.1.1.1 has been revised based on this comment to add additional detail on the TDS concentrations in the spoil wells from the Annual Hydrology Report.
4	A	Water Resources	Section 3.5.1 says, “until flushing, absorption/desorption, precipitation/dissolution and other complex geochemical processes reduce TDS in spoils, groundwater reconnected through the spoils will deliver higher TDS to downstream receiving waterways (namely Tongue River Reservoir).” However, no data is provided as to how long this natural	Section 3.5.1 has been revised based on this comment to include more detailed information from the 2020 CHIA for the TR1 Tract.

Comment No.	Submission ID	Comment Category	Comment (Verbatim)	Comment Response
			stabilization will take. Are there former mining areas in Montana in which water has stabilized itself to "near pre-mining levels?" Additionally, how does OSMRE define near?	
5	A	Environmental Justice	Section 4.18.2.6 of the DEIS explains that "potential health and public safety issues are limited to off-site inhalation of air toxins emitted from construction activities and ingestion through the deposition of air toxins and drinking water supplies and via the food chain" signifying that MLA1 may adversely affect air and water quality. I am particularly interested in how this might affect the food chain. If the effect is not statistically significant or well below federal regulations (as the potential health and safety issues are in regard to air and water emissions), the report would benefit from a section explicitly stating this.	Section 4.18.2.6 has been revised based on this comment to include additional information on surface water and groundwater monitoring at SCM in compliance with state public health and safety standards.
6	A	Water Resources	Overall, providing more localized data on potential impacts would enhance transparency and community understanding. Additional data will be beneficial to future generations that may need to use groundwater for different purposes than it is currently used for.	Sections 3.5 and 4.5 have been revised based on this comment to include additional information from the Annual Hydrology Report.
7	A	Wildland Fires	According to the Environmental Protection Agency (EPA), Montana is expected to be heavily impacted by climate change, with decreasing snowpack and water levels and an increase in wildfires (What climate change means for Montana). While wildland fires are briefly discussed in section 5.1.5, it may be helpful to include more explanation about how mining practices can increase the risk of these fires. In my sources, I have attached a link to the OSMRE website that better explains mining's direct relation to wildland fires (Coal mine fires and burning refuse).	Sections 3.9 and 4.9 have been revised based on this comment to include discussions on wildfires. Section 4.4.5.1.3 has been added to discuss coal seam fires and climate change impacts.
8	B	Alternatives	The DEIS underestimates the surface disturbance that will be caused by the Partial Mining alternative and the No Action alternative. The DEIS severely under-accounts for the surface disturbance that will occur under the Partial Mining alternative and the No Action alternative, because the DEIS fails to acknowledge that surface disturbance will	The EIS accounts for the disturbance from reclamation in all alternatives, including the Partial Mining and No Action alternatives. The EIS assumes that reclamation will occur under all alternatives, as required by SMCRA and SCM's approved permits and accounts for the fact that the mining plan may have to be revised under the Partial

Comment No.	Submission ID	Comment Category	Comment (Verbatim)	Comment Response
			be necessary to satisfy the Spring Creek Mine's reclamation requirements.	Mining and No Action alternatives. Section 2.1.1 has been revised based on this comment to include additional reclamation information.
9	B	Air Quality	The DEIS underestimates the air-quality impacts of the Partial Mining alternative, because it entirely fails to account for increased emissions that will result from operational changes the Mine would have to undertake to recover coal under the Partial Mining alternative—changes that would not transpire under the Proposed Action alternative.	The Partial Mining Alternative would not require operators to alter mining sequences. In fact, the Partial Mining Alternative assumes that the operation would proceed under the currently approved mining plan, at the same estimated mining rate, but for only 5-years.
10	B	Social Cost of GHGs	The SCGHG estimates for the No Action alternative are inaccurate, because it is not clear they account for GHG emissions that will result from reclamation. (Section 4.4.5.6). Additionally, the SC-GHG analysis is fundamentally flawed because it does not assume replacement energy sources for the Spring Creek Mine coal that would not be burned at power plants.	Section 4.4.5 has been revised based on this comment to clarify that the GHG emissions from reclamation were not included in the emission inventory, as the effects would be similar across all alternatives. The analysis in this EIS is focused on the effects of mining and burning coal from this proposed mine and does not consider the emissions from other replacement energy sources, which could vary depending on the type of replacement energy used. The "perfect substitution assumption" (that is, the assumption that if the Department declined to approve the proposed action, the same amount of coal would be mined elsewhere through private development) has been previously ruled as an arbitrary and capricious basis for analysis (*WildEarth Guardians v. Bureau of Land Management*, Docket No. 15-8109).
11	B	Technical	Under the Partial Mining alternative, the Spring Creek Mine will be forced to reconfigure its mining plan to access the coal reserves in the Scrutchfield lease without mining in from the MTM 94378 lease area. The DEIS fails to recognize that boundary issues will render additional tons of coal in other leases adjacent to MTM 94378 unrecoverable due to how the coal must be accessed and recovered.	The goal of the Partial Mining Alternative is not to require operators to alter mining sequences. The goal is to provide an alternative that takes into account the volatility of the coal market. If the operator would like to continue mining after 5-year term, OSMRE will review and make a recommendation on an additional mining plan modification, which, if approved, would mean that there is no break in operations.
12	B	Topography	First, the impacts under the Proposed Action alternative resulting from topographic moderation are overstated. The DEIS states there will be a reduction in habitat diversity for	Section 4.2.1.1 has been revised based on this comment to remove this statement.

Comment No.	Submission ID	Comment Category	Comment (Verbatim)	Comment Response
			some species and possible “long-term reduction in big game carrying capacity.” (Section 4.2.1.1). This is inaccurate. Montana DEQ has approved the Spring Creek Mine’s reclamation plan and it requires that reclamation provide for the habitat needs of various wildlife species. (ARM 17.24.751(2)(e) (“the operator shall . . . ensure that reclamation will provide for habitat needs of various wildlife species in accordance with the approved postmining land use.”)) The DEIS cannot include this type of assumption that implies unlawful reclamation.	
13	B	Transportation	Second, the DEIS includes a speculative estimate of train accidents that may occur for the Proposed Action alternative (Section 4.15.1.1). The DEIS estimates that up to 1.5 derailment accidents might occur per year under the Proposed Action alternative, which is speculative and unfounded. Over the past 15 years, cargo transported from the Spring Creek Mine has experienced three or fewer derailments. Further, train derailments are not reasonably foreseeable as a result of OSMRE’s approval of the Proposed Action alternative. Moreover, OSMRE’s evaluation of train derailments as part of this analysis reaches beyond the lawful bounds of NEPA.	The U.S. District Court of Montana directed OSMRE to analyze train derailments in the EIS. The derailment analysis is based on rates reported by the Federal Railroad Association, and the methodology is described in detail in Section 4.15.1.1. Section 3.15.1 acknowledges that there have been no train derailments recorded involving coal transported from SCM since 2016. No change has been made to the EIS based on this comment.
14	B	Technical	NTEC identified certain typographical errors in the DEIS. Although NTEC anticipates OSMRE will correct such errors in the Final EIS, NTEC identifies the following errors with deletions in strikethrough and additions in red: Page 1-1: “The SCM recovers coal under ~~eight~~ ten distinct coal leases, as shown on Map 1.2-2.” Page 1-4: The text box should read “corrective NEPA analysis” rather than “EIS,” since the court did not order completion of an EIS. Page 1-5: “The 2011 amendment to SMP C1979012 reduced the disturbance amount for MTM 94378 to 627.9 acres from the BLM previously approved 799 acres in the 2006 LBA EA. This total was recently reduced to 623.9 acres through the minor revision process.”	The typographical errors identified in this comment were corrected in the final EIS based on this comment, except for the final comment regarding Brook Mine. Section 5.1.4 clearly states that Brook Mine is located in Wyoming. The resource areas with an area of analysis that includes northern Sheriden County, Wyoming (where Brook Mine is located) are also identified in the Cumulative Impacts chapter.

Comment No.	Submission ID	Comment Category	Comment (Verbatim)	Comment Response
			Page 1-5: "The ASLM approved the Federal mining plan modification on June 27, 2012, to add approximately 1,117.7 acres of federal coal ~~and approximately 1,224.0 acres of disturbance~~ to the previously approved Federal mining plan, which also included all of leases MTM 069782 and MTM 088405." Page 3-1: "Tract 2 is incised by several small drainages that flow into ~~the North Fork of~~ Spring Creek." Page 3-4: "SCM to sample for PM10 in September 2009, based on SCM's history of relatively low ~~ambient~~ downwind monitoring readings" Page 3-14: "U.S counties with power plants that burn coal from the SCM and other sources." (The proposed language is a necessary addition because Table 3.4-17 shows national emissions totals that are not merely from burning coal from SCM.) Page 3-15: "Table 3.4-18 provides the annual air emissions from the power plants that burn coal mined from the SCM and other sources." Page 3-20: "Pearson Creek flow is ~~not~~ currently detained by the mine, . . ." Page 3-23: "Streamflow and surface-water quality associated with the SCM are currently being monitored at eight monitoring sites (Map 3.5-3) on Spring Creek, South Fork Spring Creek, South Fork Pearson Creek, and Pearson Creek." Page 3-33: Spring Creek is only permitted to dispose of used tires, concrete with rebar cut off, and non-greasy wood/steel/aluminum products~~ in the onsite landfill ~~at SCM, as described in its mining permit from Montana DEQ. The first sentence in Section 3.16 currently overstates what can be disposed of ~~in the landfill~~ at SCM. All other non-hazardous waste is shipped offsite to a permitted landfill. Page 4-24: "Water impounded in the reservoirs is periodically discharged and ultimately flows into Tongue River and Tongue River Reservoir." This sentence is	

Comment No.	Submission ID	Comment Category	Comment (Verbatim)	Comment Response
			inaccurate. Water impounded by reservoirs at the Spring Creek Mine do not discharge. Rather, the water is collected and used on site. There are statements throughout the DEIS that the coal from the Spring Creek Mine is sent exclusively to power plants. That is inaccurate. Approximately 10-15% of the coal is sent to industrial customers, although those customers do still combust the coal for heat. There are statements throughout the DEIS that refer to the Brook Mine as being in Montana. These references are all in error. The Brook Mine is in Wyoming and has no import on this DEIS involving the Spring Creek Mine in Montana.	
15	C	Technical	The draft EIS should identify DOI's preferred alternative. Without identification of a preferred alternative, DOI's true intentions are being hidden from public scrutiny and the process lacks the transparency NEPA is intended to provide. The public and other commenters are being denied the opportunity to effectively comment on the government's true plans.	An agency is encouraged, but not required, to identify its preferred alternative in a draft EIS if there is a preferred alternative. 40 C.F.R. § 1502.14(d). Here, where OSMRE did not have a preferred alternative at the time of publication of the DEIS, it was not required to identify its preferred alternative. The DEIS identified the environmentally preferred alternative as required by 40 C.F.R. § 1502.14(f). The Final EIS identifies the OSMRE preferred alternative for the project.
16	C	Technical	A final EIS should analyze and explain why mining operations on the tracts at issue have now been deemed to be environmentally unacceptable, particularly in light of: (1)at least two previous findings by the Department of the Interior (DOI) in previous NEPA analyses that mining operations on these tracts will have no significant impact (FONSIs were issued) and, (2)the Spring Creek Mine's demonstrated history of environmental compliance that supports the previous DOI FONSIs.	Section 1.1 explains the need for the EIS and the elements of prior NEPA analyses for SCM that have been identified by the U.S. District Court of Montana as being inadequate. Section 1.3 includes the background of the previously completed NEPA analyses. No changes to the EIS were made based on this comment. We recognize SCM's history of environmental compliance and expect such compliance to continue; however, the prior FONSIs were not based on past environmental compliance. Instead, they were based on the analysis of environmental impacts from assumed compliance with the future proposed action. NEPA is intended to provide decision makers and the public with an assessment of the environmental consequences of the proposed action and an analysis of a reasonable range of alternatives. Although the DEIS identifies the No Action

Comment No.	Submission ID	Comment Category	Comment (Verbatim)	Comment Response
				Alternative as the environmentally preferred alternative based on this impacts analysis, nothing in the DEIS concludes that the operations are "environmentally unacceptable". The Record of Decision will include the decisionmaker's conclusion on what alternative, if any, is acceptable.
17	C	Technical	A final EIS should provide an analysis of the impact of rejection of the mine plan on the feasibility of reclamation of the portions of the tracts of land at issue that have already been mined.	The EIS assumes that reclamation will occur under all alternatives, as required by law. Section 2.1.1 has been revised based on this comment to include additional reclamation information.
18	C	Technical	A final EIS should provide an analysis of the impact of rejection of the mine plan on the feasibility of reclamation on the Spring Creek Mine as a whole.	The EIS assumes that reclamation will occur under all alternatives, as required by law. Section 2.1.1 has been revised based on this comment to include additional reclamation information.
19	C	Technical	A final EIS should more clearly explain how/why DOI chose the no action alternative as the environmentally preferable alternative. There is no analysis justifying this conclusion. Such an analysis should identify any legally enforceable standards upon which it is based.	The DEIS Chapter 6 identified the environmentally preferred alternative as required by 40 C.F.R. 1502.14(f). The environmentally preferable alternative is defined as the alternative that "will best promote the national environmental policy expressed in section 101 of NEPA by maximizing environmental benefits, such as addressing climate change-related effects or disproportionate and adverse effects on communities with environmental justice concerns; protecting, preserving, or enhancing historic, cultural, Tribal, and natural resources, including rights of Tribal Nations that have been reserved through treaties, statutes, or Executive Orders; or causing the least damage to the biological and physical environment." The environmental analysis of the No Action Alternative is found throughout Chapter 4 of the EIS and is the basis of this determination. No changes to the EIS were made based on this comment.
20	C	Technical	If the environmentally preferable alternative is the preferred alternative, the only legal basis for rejecting the Spring Creek Mine plan revision cited in the draft EIS is Section 101 of NEPA. This is not a proper use of NEPA.	Recent updates to the NEPA regulations require an agency to identify the environmentally preferable alternative. The environmentally preferable alternative, as identified in Chapter 6, is not an indication of OSMRE's preferred alternative. OSMRE did not identify a preferred alternative

Comment No.	Submission ID	Comment Category	Comment (Verbatim)	Comment Response
			NEPA is only a procedural statute. NEPA does not provide a legal basis for rejecting a mine plan.	in the DEIS because the agency did not have a preferred alternative at the time of publication of the DEIS. For the Final EIS, OSMRE did identify Alternative 2, not the No Action alternative, as the preferred alternative. The DOI Assistant Secretary for Land and Minerals Management (as delegated by the Secretary), not OSMRE, has the authority to approve, approve with conditions, or disapprove the proposed mining plan modification. No changes to the EIS were made based on this comment.
21	C	Technical	A final EIS should more clearly identify and discuss which impacts of the proposed action cause it to be unacceptable under Section 101 of NEPA.	The environmentally preferable alternative is defined as the alternative that “will best promote the national environmental policy expressed in section 101 of NEPA.” An alternative not being chosen as the environmentally preferable alternative does not indicate that it is “unacceptable” under section 101 of NEPA. No changes to the EIS were made based on this comment.
22	C	Technical	If the environmentally preferable alternative is the preferred alternative, the only environmental impacts discussed in the draft EIS upon which such a conclusion might be based, especially in light of the demonstrated compliance history of the mine, are greenhouse gas (GHG) emissions that will result from mining operations on the tracts at issue.	The environmentally preferable alternative, as identified in Chapter 6, is not an indication of OSMRE’s preferred alternative. OSMRE did not identify a preferred alternative in the DEIS because the agency did not have a preferred alternative at the time of publication of the DEIS. For the Final EIS, OSMRE identified Alternative 2, not the No Action alternative, as the preferred alternative. No changes to the EIS were made based on this comment.
23	C	GHG	GHG emissions are ubiquitous. The draft EIS appears to acknowledge that there are no legal standards that identify levels at which GHG emissions are acceptable or unacceptable on either a source by source or global basis. The draft EIS’s statement that “all anthropogenic GHG emissions may cumulatively have a significant impact on global climate change”, is the only basis the draft EIS provides for choosing the no action alternative as the preferred alternative. In view of the pervasiveness of GHG emissions and the lack of enforceable legal standards, an “all GHG emissions are bad” approach appears to be	OSMRE did not identify a preferred alternative in the DEIS because the agency did not have a preferred alternative at the time of publication of the DEIS. Instead, OSMRE identified the No Action alternative as the environmentally preferable alternative. OSMRE outlined its rationale for choosing the No Action alternative as the environmentally preferred alternative in Section 6.0 of the DEIS. While OSMRE noted that the No Action alternative would be the only alternative that would not contribute to additional greenhouse gas emissions, OSMRE also noted that the No Action alternative “will not cause additional adverse environmental effects from ground disturbances or coal

Comment No.	Submission ID	Comment Category	Comment (Verbatim)	Comment Response
			insupportably arbitrary. A final EIS should fully explain the bases for DOI's conclusions on this point.	removal, including effects on topography, geology, mineral resources, paleontology, air quality, hydrology, soil, vegetation, wildlife, cultural resources, visual resources, or noise." The Final EIS has been updated to explain OSMRE's rationale for selecting the environmentally preferable alternative. Subsequent to the publication of the DEIS, OSMRE identified Alternative 2 (the Partial Mining alternative), not Alternative 4 (the No Action alternative), as the preferred alternative. The basis for this selection is also explained in the Final EIS.
24	D	Water Resources	We recommend identifying any potential underground sources of drinking water (USDW) that may be impacted by the project. The EPA therefore recommends the NEPA analysis identify and discuss how these USDWs may or may not be protected or impacted by the ongoing mining at SCM. Special consideration should be given to the LBA1 areas that have yet to be developed because these areas may have impacts to USDWs that are not currently reflected in the water quality data available for SCM monitoring wells and these USDWs. If the project will impact USDWs, we recommend that OSMRE stipulate mitigation measures that: 1. Avoid impacts to relevant aquifers; 2. Limit the degree or magnitude of impacts to those aquifers; 3. Repair or restore those aquifers; and/or 4. Compensate for those groundwater impacts through replacement or substitution	Sections 3.5.1 and 4.5.1.1 have been revised based on this comment to include information on Public Water Systems, monitoring, and potential impacts from each alternative.
25	D	Water Resources	We recommend further differentiating the resource impacts associated with Alternative 3 relative to the Proposed Action to account for any additional impacts to USDWs or sensitive aquatic resources associated with potentially larger, flashier, episodic TDS loading. (Section 4.5.2.1.3)	Section 4.5.2.1.1 has been corrected based on other comments to indicate that all surface water flow is stored in impoundments at SCM. Surface water runoff is diverted to sedimentation ponds, so an increase in TDS loading under the Accelerated Mining alternative is not anticipated. That statement has been removed from Section 4.5.2.1.3.

Comment No.	Submission ID	Comment Category	Comment (Verbatim)	Comment Response
26	D	Wetlands	The Draft EIS does not identify any wetlands in the area and therefore, did not identify impacts to wetlands that may result from project activities, yet it seems there may be some emergent wetlands near the mine boundary. We recommend reexamining the wetlands within and proximal to the mine, including those downstream or supported by groundwater that may be impacted by the mine. If impacts are anticipated on federal lands, we also recommend the EIS describe how the OSMRE intends "to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands," as described in Executive Order (EO) 11990, Protection of Wetlands, including how wetlands will be identified and avoided, and how unavoidable impacts would be minimized and mitigated.	As noted in Section 3.7, no potential jurisdictional wetlands that may be impacted by the proposed Project were identified during field surveys of the LBA1 tracts. Section 4.5.2.1.1 of the EIS has also been corrected based on other comments to indicate that all surface water flow is stored in impoundments at SCM and used onsite. No changes to the EIS were made based on this comment.
27	D	Water Resources and Climate Change	The EPA recommends the OSMRE consider the impacts of climate change on precipitation patterns on the project as part of its analysis of impacts to water resources, and commit to stipulating that any erosion control, bypass, and diversion features be designed to withstand longer precipitation frequency/duration models. In the EIS, we recommend identifying the water quality protection measures that are currently in place under the existing mine plan and those which may be needed to accommodate future anticipated effects from storms of increased intensity and severity and consider upsizing the stormwater management channels, diversion structures, and retention systems beyond the 100-year, 24-hour stormwater event.	Section 5.2.3.4 was added based on this comment and provides information on climate change using the USGS Climate Change Viewer. Sections 4.5.2.1 and 4.5.2.2 were added to discuss mitigation measures for groundwater and surface water, respectively.
28	D	Air Quality	We also encourage OSMRE to include additional narrative analyses in Chapter 4 that discuss the effects of the project's air quality impacts on any potential sensitive receptors around the SCM and in the communities that may be indirectly affected by the project, especially considering any ongoing effects experienced by the	Section 3.4.2 describes SCM's existing air quality and indicates that based on SCM's history of relatively low downwind monitoring readings, SCM is not required by MDEQ to monitor particulate matter emissions. However, SCM has voluntarily chosen to continue the PM_{10} sampling program. Section 4.4.1 describes potential impacts to nearby receptors, including the nearest residence and

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			receptors as well as the cumulative effects of the action alternatives.	nearest recreation area. Section 5.2.3.4 has been added using the USGS Climate Change Viewer.
29	D	Cumulative Impacts	The analysis of cumulative effects should consider the effect of the alternatives when added to the rest of the mine. For example, the Final EIS should consider whether mining LBA1 would require a longer mine life and so a longer duration of effects, or if, instead, the mine life would be the same while the intensity of effects would be greater.	Chapter 5 of the EIS discusses the cumulative impacts of each alternative when added to the impacts from ongoing SCM operations involving the extraction of Federal, State, or private coal. No changes to the EIS were made based on this comment.
30	D	GHG	Overall, we recommend defining what units (e.g., tons or tons/year) are presented in each table in Appendix A.	Appendix A has been revised based on this comment to define these units.
31	D	GHG	For all emissions categories evaluated (e.g., vessel, locomotive, terminal, etc.) there are significant differences between baseline emissions for 2018 and 2020 on the one hand, and the emissions from the action alternatives on the other. The baseline appears to calculate emissions from all coal produced by the entire mine, while the action alternatives appear to estimate emissions from only the federal lease portions of the mine. This approach makes it difficult to understand the difference between baseline emissions and the total emissions that would be expected under each alternative, and therefore to understand the effects, including the cumulative effects, of the alternatives. To understand how the approval of LBA1 would affect pollutant emissions we recommend including the emissions from the No Action Alternative and specifying what the total mine emissions, inclusive of LBA1, would be under each alternative. While this latter value may be similar to the baseline emissions for the mine, these two additional datasets would show what proportion of the total emissions under each alternative would be attributable to the extraction of federal coal as a result of OSMRE's decision.	The EIS and Appendix A have been revised based on this comment to clarify the baseline emissions for the other Federal, State, or private coal mined at SCM, while the emissions analyzed for each alternative are specific to only the LBA1 coal tracts.
32	D	GHG	Page A-2 includes two tables documenting tons of coal shipped by rail to different destinations in 2018 and 2020. There are two footnotes which are missing. We	Appendix A has been revised based on this comment and the footnotes have been removed.

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			recommend including the footnotes or deleting the references if they are not needed.	
33	D	GHG	Page A-3 includes conversion factors and constants. A brake specific fuel consumption (BSFC) value of 2,544 Btu/hp-hr is listed. This value is quite different from the standard assumption of 7,000 Btu/hp-hr used by EPA in its compilation of emission factors (AP-42). We recommend verifying that this value is correct and providing a citation to the source of the information. In addition, the fraction of usable power (i.e., engine load) is listed as being 0.39 (or 39%) and is "calculated." We recommend that the calculation be included, rather than simply listing the calculated load factor.	The EIS and Appendix A have been revised to update the methodology to calculate locomotive emissions to follow the ERG 2020 National Emissions Inventory Locomotive Methodology (https://www.epa.gov/system/files/documents/2023-01/2020_NEI_Rail_062722.pdf). The emission factors referenced in this comment have been removed.
34	D	GHG	Page A-4 includes calculations of worker transport emissions from passenger cars and light diesel trucks. It is unclear what method of calculation was used to generate the tons per year (tpy) emissions. There are assumptions included such as average speed, emissions in grams/hp-hr, and fuel consumption that are not needed to calculate emissions based on the grams/mile emission factors. We also note that the gal/mile values do not appear to be correct. It appears that these values should be miles/gal. We recommend correcting the gal/mile values or correcting the heading to be "miles/gal." We have attempted to reproduce the emission estimates for these sources by using the emission factors (in grams/mile) as well as the trips and mileage documented on this page of Appendix A. In doing so we were not able to match the emissions presented. We recommend that Appendix A include narrative descriptions necessary to understand the methods of calculations and to the extent possible use the simplest methods to avoid unnecessary complication. Finally, we note that the cited version of Motor Vehicle Emissions Simulator (MOVES) is from September 2013 and is no longer the current version of MOVES. We recommend using MOVES4 for all future OSMRE NEPA documents.	The EIS and Appendix A have been revised based on this comment. The worker transport emissions have been revised to use EPA's MOVES3 (2021) emission factors and the fuel economy has been revised. OSMRE did not use MOVES4 because the modeling software was difficult to use in the manner required for this analysis and the EPA website indicated that MOVES3 is still acceptable for use. Additional information on how terminal emissions were calculated has been added to Appendix A.

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35	D	GHG	Pages A-5 through A-7 include estimated emissions from locomotives. However, the source for the emission factors is not listed and we recommend including this information.	The EIS and Appendix A have been revised based on this comment. The methodology to calculate locomotive emissions was revised to follow the ERG 2020 National Emissions Inventory Locomotive Methodology (https://www.epa.gov/system/files/documents/2023-01/2020_NEI_Rail_062722.pdf).
36	D	GHG	Page A-8 and A-9 include estimates of shipping terminal emissions organized into tables. These tables do not appear to include equations, emission factors, or other information that would allow the reader to understand the calculation methods that were used. Rather than only including the final summary values, we recommend including a narrative discussion that explains how these estimates were produced.	Appendix A was revised based on this comment. Additional information on how terminal emissions were calculated has been added to Appendix A.
37	D	GHG	Page A-10 includes a table that depicts the number of ships within each age bracket, with the age bracket defining the standards for NOx, SO2, and PM. However, the number of pre-2012 ships does not match between the NOx brackets and the SO2/PM bracket. Specifically, for NOx, 84 ships are listed as being 2011 model year or older, whereas for the SO2/PM bracket, there are 113 ships listed as being older than 2012 (2011 or older). We recommend reconciling these differences in the Final EIS. In addition, pages A-12 and A-13 include two tables titled, "Proposed Action Ocean Vessel Transport Emissions (tons);" however, each table has different values so it appears as though they are representative of different emissions sources and, therefore, should have different titles. We recommend correcting the titles of these tables as needed.	Appendix A was revised based on this comment. The vessel shipment emissions have been revised.
38	D	GHG	Greenhouse gas (GHG) emissions calculations are provided in Appendix A but it does not clearly demonstrate how all calculations were completed. As an example of how this impedes understanding, the first table on Page A-27 reports "CO2e Emissions (tons)" values for the Proposed Action but the values in this table do not match the values in either the "100-Yr GWP CO2e Emissions (tons)" table on	Appendix A has been revised based on this comment and a technical support document has been prepared. Additional information on how the GHG emissions were calculated has been added to Appendix A.

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			page A-28 or the "20-Yr GWP Emissions (tons)" table on page A-29. To facilitate understanding, beneath each table in Appendix A, we recommend providing an explanation of what each table represents. A narrative explanation of the calculation methods used for each table in Appendix A is also recommended.	
39	D	Climate Change	The EPA recommends that the EIS analyze the "climate change-related effects, including, where feasible, quantification of greenhouse gas emissions, from the proposed action and alternatives and the effects of climate change on the proposed action and alternatives."7 Consistent with CEQ's National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change (CEQ's 2023 Climate Change Guidance), we recommend the EIS analysis examine how the effects of the proposed action and alternatives on each resource could be exacerbated by climate change in addition to analyzing the impacts that the project may have on global climate change (as shown in Section 4.4.5.1.1).	Section 5.2.3.4 was added based on this comment and provides information on climate change impacts to the different resource areas using the USGS Climate Change Viewer.
40	D	Climate Change	Consistent with the CEQ's 2023 Climate Change Guidance, the EPA recommends that the OSMRE report relevant GHG emissions in carbon dioxide (CO2)-equivalent terms and translate the emissions into equivalencies that are more easily understood by the public (e.g., annual GHG emissions from x number of motor vehicles). The EPA also recommends that the OSMRE avoid relying on percentage comparisons between planning-level and regional, national, or global GHG emissions in the EIS, as such comparisons can inappropriately minimize the significance of planning-level GHG emissions. As the CEQ's 2023 Climate Change Guidance explained, representing the project's GHG emissions in this manner does not provide useful information regarding the significance of the climate change impacts caused by the project's emissions and "does not reveal anything beyond the nature of the climate	Section 4.4.5 has been revised based on this comment to provide equivalencies for each alternative. However, the Final EIS retains the percentage comparisons as this information was provided in other NEPA documents analyzing other mining plans and mining plan modifications and provides an opportunity to compare data across multiple projects.

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			change challenge itself—the fact that diverse individual sources of emissions each make a relatively small addition to global atmospheric greenhouse gas concentrations that collectively have a large effect." All GHG emissions have incremental impacts that are important to disclose, discuss, and mitigate or avoid.	
41	D	Climate Change	we recommend that the EIS connect the GHG impacts analysis included in Section 4.4.5.1.1 for each alternative to the GHG emission reduction goals referenced in Section 4.4.5.1.2, including the U.S. long-term strategy to achieve net-zero GHG emissions by 2050. The Final EIS analysis should also be expanded to discuss consistency with the state's goals set forth in the August 2020 Montana Climate Solutions Plan.	Section 4.4.5.1.2. has been revised based on this comment to include additional discussion on Montana's 2024 Climate Pollution Reduction Priorities and 2024 EPA grant award.
42	D	Climate Change	EPA recommends the Final EIS identify, discuss, and commit to mitigation measures that avoid, minimize, or compensate for GHG emissions and climate change effects, such as any options to implement high-integrity GHG emissions offsets or climate change impact fees which may be charged by Department of the Interior lead agencies and serve as an effective form of compensatory mitigation for any unavoidable direct and indirect emissions.	The purpose of the EIS is to disclose the impacts of the proposed Project and to inform OSMRE decisionmakers to make a recommendation to the Assistant Secretary for Land and Minerals Management to approve, disapprove, or conditionally approve the proposed mining plan modification. No changes to the EIS were made based on this comment.
43	D	Climate Change	Although Table 4.4-16 presents a summary of annual GHG emissions for each alternative, they are presented in CO2e instead of by individual GHG (CO2, CH4, N2O). Direct and indirect emissions for each individual GHG under the alternatives are presented in Appendix A. These should be presented in Chapter 4 of the EIS to better illustrate the total emissions under the alternatives. EPA recommends including a separate table for each alternative, similar to Table 4.4-16, that shows total annual individual GHG emissions (both direct and indirect emissions, and total emissions), with references to the source tables in the appendix.	Section 4.4.5 was revised based on this comment to present the GHGs for each alternative in separate tables.
44	D	Climate Change	In Appendix A, individual GHGs (CO2, CH4 and N2O, presumably in units of tons) as well as CO2e are reported	Appendix A has been revised based on this comment and the total calculations have been corrected.

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			for coal transportation (i.e., locomotives, great lakes vessels, oceanic vessels, etc.). Emissions of individual GHGs are converted to CO2e using 20-year and 100-year global warming potential (GWP) and then summed to get total CO2e. However, it appears that the raw individual GHG emission estimates are incorrectly summed to get total CO2e. For example, page A-17 contains emissions associated with Ocean Vessel Transport. The first three columns contain emissions for each GHG, while the fourth column contains "total CO2e." However, that fourth column is just the addition of the previous three columns, unweighted by GWP factors, and hence does not represent total CO2e, rather it represents the total tons of pollutants. This error is made in multiple tables throughout Appendix A. We recommend making necessary corrections to the GHG analysis in the Final EIS. The EPA is available to answer any follow up questions regarding these concerns.	
45	D	Social Cost of GHGs	EPA recommends that the analysis of SC-GHG throughout the EIS follow the recommendation from CEQ's 2023 Interim Guidance to use the best available social cost of GHG estimates. In November 2023, the EPA published the Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances. This report provides updated estimates of the SC-GHGs that reflect advancements in the scientific literature on climate change and its economic impacts and incorporates recommendations made by the National Academies of Science, Engineering, and Medicine (National Academies 2017). In this update, the methodology underlying each of the four components, or modules, of the SC-GHG estimation process – socioeconomics and emissions, climate, damages, and discounting – is developed by drawing on the latest research and expertise from the scientific disciplines relevant to that component. Regarding discounting, the EPA's report presents updated estimates of the SC-GHG at multiple discount rates. Considering the	The Department was still evaluating EPA's 2023 SC-GHG methodology when OSMRE published this DEIS using the IWG's SC-GHG methodology. In October 2024, the Department issued a memorandum notifying bureaus that it had completed its analysis of EPA's 2023 SC-GHG methodology and determined that it was the best available science for calculating SC-GHG. Therefore, OSMRE revised Section 4.4.5 to use the EPA's 2023 SC-GHG methodology.

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			multiple lines of evidence on the appropriate certainty-equivalent near-term rate, the modeling results presented in this report consider a range of near-term target rates of 1.5%, 2.0%, and 2.5%. This range of rates allows for a symmetric one point spread around 2.0%. The updated SC-GHG estimates have also undergone an expert peer review and a public comment process.	
46	D	Social Cost of GHGs	Additionally, Section 4.4.5.2 should provide sufficient descriptions of data and methods used to compute the monetized climate damages to allow them to be reproduced by a qualified individual. We recommend creating including a more comprehensive narrative explaining the methods used in the Final EIS. For example, we recommend providing the dollar year used for the SC-GHG calculations, and indicating whether the present value year is assumed to be the first year of the project (e.g., 2024).	Section 4.4.5.2 has been revised based on this comment to provide additional narrative on the SC-GHG methodology. Appendix A has been revised and a technical support document prepared.
47	D	Environmental Justice	While minorities and low-income residents in the region reside in places other than tribal trust lands, this analysis focuses on Native American populations." Therefore, low-income communities and populations with communities of color were not analyzed in the EJ analysis. In accordance with the CEQ Environmental Justice Guidance, EPA recommends the EJ analysis in Section 4.18 analyze whether there are potential disproportionate impacts to low-income communities and communities of color in the region of influence in addition to the Native American populations or provide a justification for the exclusion of all block groups except Native Americans. EPA's EJScreen indicates that within Big Horn and Rosebud counties there are several block groups in the 90th to 100th state percentile for People of Color and low-income populations. When assessing large geographic areas, it is recommended to consider individual block groups within the area of effect. This can help identify individual areas adjacent to the project area that may warrant further consideration,	Section 3.18 has been revised based on this comment to present the individual block groups for Rosebud, Big Horn, and Sheridan counties. Section 3.18 has been revised to describe the low income and people of color EJ populations.

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			analysis, or outreach. The EPA recommends identifying block groups and using those to inform a re-evaluation of the EJ analysis.	
48	D	Environmental Justice	The EPA recommends expanding the region of influence for the EJ analysis to include areas along the railroad routes, shipping routes, and the destination ports outside of the three counties. The Final EIS should identify and address potential disproportionate and adverse effects related to the transport of coal on communities with EJ concerns.	The EIS analyzes the direct effects to EJ populations within 50 miles of SCM. Indirect impacts to EJ populations along railroad and shipping routes are not evaluated because under any of the alternatives, the coal extracted from the LBA1 tracts would account for only a small fraction of the material shipped along such routes. Section 4.15.1 discusses potential indirect impacts along rail lines, including an analysis of potential rail accidents. No changes to the EIS were made based on this comment.
49	D	Environmental Justice	EPA further notes that Rosebud, MT has a higher population with disabilities (17.9%) relative to the state average (14.8%). EPA recommends that OSMRE conduct enhanced outreach to communities, including appropriate accommodations for persons with disabilities, limited English proficiency, and/or limited internet access.	During the development of this EIS, OSMRE conducted a virtual public scoping meeting and an in-person public meeting in Hardin, MT near Rosebud County. OSMRE also mailed out public scoping and NOA letters to stakeholders within Rosebud County, including tribal members. The DEIS was made publicly available for review both locally, and on OSMRE’s public website as a 508 accessible document. No changes to the EIS were made based on this comment.
50	D	Noise	Please clarify if any residences are within 4,800 feet of the pit boundary and if any are in a block group that is a community with EJ concerns. EPA recommends including a map detailing the location of residences within communities with EJ concerns in relation to the area of impact to illustrate which areas may be exposed to exceedances of the noise threshold of 65 dBA. If exceedances of the noise threshold could be experienced by residences within communities with EJ concerns, the EPA recommends including the analysis of noise effects on these residences in Section 4.18 and discussing cumulative EJ effects related to these impacts in Section 5.2.15. If any disproportionate impacts to EJ communities are identified, we recommend implementing appropriate mitigation	Section 3.14 has been revised based on this comment to reference Map 3.4-1, which depicts the nearest residences to SCM. All the residences that could potentially be impacted by exceedances of the noise threshold are associated with local ranches and are not EJ communities.

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			measures to offset these impacts. These measures should also be informed by these communities.	
51	D	Cumulative Impacts	The Draft EIS does not sufficiently consider cumulative impacts as they pertain to communities with EJ concerns in the determination of disproportionate and adverse effects (Section 5.2.15).	Section 5.2.15 has been revised based on this comment to include a more detailed discussion on the cumulative impacts to EJ communities.
52	D	Cumulative Impacts	The area of analysis in the cumulative impacts section (Section 5.2.15) excluded Rosebud County, which was included in the environmental consequences section (Section 4.18). Please include Rosebud County in this analysis or provide reasoning for its exclusion.	Section 5.2.15 has been revised based on this comment to include Rosebud County.
53	D	Meaningful Engagement	The EPA recommends conducting further outreach and engagement with the communities with EJ concerns to ensure that the concerns of the community have been fully considered and that their input has been included in the decision-making process.	As mentioned above, OSMRE conducted a virtual public scoping meeting and an in person public comment meeting in addition to soliciting comments in person and online. Additional outreach and engagement with communities is not warranted at this time. OSMRE will publish the Final EIS on its website as a 508 accessible document, which includes contact information the public may use to contact project staff. OSMRE will also publish its subsequent Record of Decision, and the ASLM's final decision whether to approve, disapprove, or conditionally approve the proposed mining plan modification. No changes to the EIS were made based on this comment.
54	D	Technical	The Draft EIS incorrectly refers to Section 3.17.5 and Table 3.17-3 throughout the document when discussing the EJ analysis. However, Section 3.17.5 and Table 3.17-3 do not exist in the Draft EIS. The EPA recommends the Final EIS correct the references to sections and tables in the EJ section of the report.	References to Section 3.17.5 and Table 3.17-3 have been corrected based on this comment.
55	D	Mine Decommissioning, Reclamation, and Financial Assurance	The EPA recommends the EIS fully describe the decommissioning and reclamation management actions required under the current mine plan and the project. Generally, mine reclamation and closure plans include strong monitoring components for soils, groundwater, and surface water around the mining and processing area and other facilities. Specifically, we recommend the following:	Section 2.1.1 has been revised based on this comment to include additional information on the SCM Reclamation Plan.

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			• List the actions and measures that would be taken to decommission mine operations and stabilize and revegetate slopes, roads, and other disturbed areas. The Draft EIS mentions that these actions would be based on Montana Department of Environmental Quality requirements. We also recommend listing these requirements. • Consider any necessary mitigation for changes to regional water quality and hydrology at the end of mine life, during mine decommissioning and after closure and incorporate these measures, including financial assurances, into all relevant mine plans. • Identify the areas (acres) targeted for reclamation and describe the intended degree of treatment in each area. • Specify the required timing of reclamation measures relative to mining operations, the procedures for concurrent reclamation activities, and the duration of reclamation treatments. • Include monitoring methods, frequency, and standards for determining reclamation success and benchmarks for ceasing monitoring, and contingency measures if standards are not achieved. • Include means of assuring that all maintenance required for reclaimed areas would continue after operations cease or while operations are suspended. • Consider the maximum probable flood that could be expected over the life of the project and post-reclamation activities and discuss water management design requirements, beyond design for the 100-year, 24-hour storm event, that may be necessary to avoid unpermitted discharges.	
56	D	Revegetation	We also recommend the OSMRE consider the effects rising temperatures and drier conditions may have on seeds/seedlings growth and the vulnerability of specific species under projected climate conditions in the short and longer term and evaluate the use of climate resilient native	Section 2.1.1 has been revised based on this comment to include additional information on seeding, in conformance with 82-4-233 MCA. Revegetation general requirements and standards for success will adhere to the federal requirements set forth in 30 C.F.R. §§ 816.111 -- 816.116.

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			species for replanting during reclamation. The EPA also recommends that revegetation success be monitored and enforced for at least five years following revegetation efforts post-reclamation.	For areas of 26.0 inches or less average annual precipitation, such as SCM, the period of responsibility for revegetation success is defined in 30 C.F.R. § 816.116(c)(3).
57	D	Financial Assurance	The amount and viability of financial assurance are critical factors in determining the effectiveness of reclamation and closure activities. Therefore, in addition to the bonding information provided in Section 2.1.2, the EPA recommends that the EIS: • Disclose the estimated cost to reclaim and close the site in a manner that achieves reclamation goals and post-mining land use objectives, including costs for long-term obligations such as potential water treatment or supplementation for drinking water sources. • Identify how the current reclamation bonding process has accounted for the costs associated with implementing the mine reclamation and closure plan. This should include the costs to close the site in a manner that achieves reclamation goals and post-mining land and water use objectives, the costs for long-term obligations such as monitoring and maintenance, and costs associated with reasonably foreseeable, but not specifically predicted outcomes. This disclosure informs the public and decision-makers of the financial risk to the public posed by conditions at the site, and this is important information to disclose to the public during the NEPA process. • Confirm that financial assurances are protective of the public interest if NTEC is unable to implement contingency measures or perform long-term operation, maintenance, monitoring, and compliance activities at a closed mine site; and • Confirm that current financial plans require that active or passive methods for reclamation, treatments, or maintenance would continue post-closure or while active operations are suspended.	Section 2.1.2 has been revised based on this comment to include additional information on the performance bond requirements for SCM.

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58	E	Socioeconomics	The Draft EIS released by OSMRE did not adequately address the full scope of economic impacts of the SCM on the Montana and Wyoming economies. In the final EIS, OSMRE must recognize the extent of the economic impact of the mine on the Montana and Wyoming economies.	Section 4.17 has been revised based on this comment to add additional information on socioeconomic impacts.
59	E	Socioeconomics	The DEIS is silent on the Bonus Bid and royalties paid to the state and federal governments. OSMRE's FEIS and ROD must, therefore, appropriately recognize the applicable federal acts and requirements, address the fact that this coal has already been previously approved, properly paid for, and permitted for mining under state and federal law.	Section 1.3 describes the project background, including the Mineral Leasing Act, the leasing history of the MTM 94378 lease tract, and the history of both BLM and OSMRE's previous NEPA documents. Table 3.17-2 shows the Federal, State, private, and total royalty payments from coal production at SCM for 2016 to 2022. Sections 1.3 and 3.17 of the EIS have been revised in response to this comment to add information on SCM's bid.
60	F	Technical	The EIS should be clarified to specifically indicate whether it is tiered from the 2016 LBA1 EA or intended to be a complete analysis independent of the prior analyses.	Section 1.3 describes the project background and the previous NEPA analyses and explains that this EIS does not tier to the previous NEPA analyses. No changes to the EIS were made based on this comment.
61	F	Technical	In general, the analysis of the Alternative 4 – No Action does not adequately consider the potential impacts of denying mining of the LBA1 tracts. Analysis of potential impacts from the Alternative 4 – No Action is needed as a baseline to compare the effects other alternatives may have on the human environment. Typically, a No Action alternative provides a benchmark. However, in the context of this DEIS, Alternative 4 is not just a benchmark, but is itself an alternative that may cause unique impacts to the human environment. Thus, the EIS should more thoroughly consider the potential impacts to the human environment of Alternative 4- No Action.	The No Action alternative was developed to reflect the direct and indirect effects from SCM not continuing to mine the leased Federal coal from the LBA1 tract. The cumulative impacts from ongoing SCM operations involving the extraction of Federal, State, or private coal are analyzed in Chapter 5. No changes to the EIS were made based on this comment.
62	F	Technical	The EIS would benefit from additional analyses to address potential impacts related to disturbance of the LBA1 tracts caused by mining non-Federal coal in adjacent tracts. In particular, Alternative 1, Alternative 2 and Alternative 3 contemplate a mining disturbance that is fully reclaimed per an approved reclamation plan that covers the LBA1 tracts and adjacent tracts. However, Alternative 4 – No	The No Action alternative was developed to reflect the unique circumstances at this mine where a court found OSMRE’s earlier NEPA analysis inadequate but deferred vacatur of the mining plan modification approval so that OSMRE could complete its corrective NEPA analysis while the mine continued to operate. Under these circumstances, mining was allowed to continue, requiring

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			Action ignores the cohesive plan approved under the Montana Strip and Underground Mining Act. As a result, Alternative 4 – No Action has potential additional direct and indirect effects that are not considered in Section 4.2.1.4. For example, while Federal coal may not be mined without approval by the Assistant Secretary for Lands and Minerals Management (ASLM), non-Federal coal mining has already been approved. Thus, in areas that contain Federal coal, but private surface rights, non-mining layback of the surface would be allowed for access to adjacent non-Federal coal. Thus, Alternative 4 – No Action alternative will have impacts that should be included in the EIS.	OSMRE to analyze the effects of the ongoing mining as part of the baseline. OSMRE analyzed the direct and indirect effects from SCM not continuing to mine the leased Federal coal from the LBA1 tract. The cumulative impacts from ongoing SCM operations involving the extraction of Federal, State, or private coal are analyzed in Chapter 5. No changes to the EIS were made based on this comment.
63	F	Socioeconomics	Section 4.17.1.4 (p. 4-41) The direct and indirect effects section for Alternative 4 – No action section as related to socioeconomics does not appear to correctly categorize the severity of the alternative. As shown in Table 3.17-2 of the DEIS on page 3-34, royalty payments at Spring Creek Mine would be expected to decrease by $29.6 million for a county where over 50% of the population is considered low income (Table 3.18-1, p. 3-35). The EIS should include an analysis that describes lost tax revenue, increased unemployment, loss of government services and secondary economic impacts. Without the additional analysis, classification of the impact levels deviates from the 2016 LBA1 EA, which concluded, “The No Action Alternative would result in significant direct and indirect negative socioeconomic effects” (2016 LBA1 EA, p. 4-44). The EIS should explain this discrepancy.	Section 4.17.1.4 has been revised based on this comment to include additional discussion on the loss of revenue and reduction in employees.
64	F	Environmental Justice	Section 4.18.5 (p. 4-44) Similar to the socioeconomic impact, additional analysis related to the environmental justice are warranted. Section 4.18.5 examines the Alternative 4 – No Action alternative in the context of completed reclamation, not based on the proposed action which is to mine coal. A meaningful	Section 4.18.5 has been revised based on this comment to discuss the environmental justice impacts related to loss of employment and revenue from the No Action alternative.

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			analysis of both the direct and indirect environmental justice impacts should be included if mining is not approved rather than "after reclamation."	
65	F	Water Resources	Section 3.5.2 (p. 3-20) The third paragraph indicates Pearson Creek is not currently detained by the mine. However, flood control reservoirs have been constructed on Pearson Creek by the Spring Creek Mine.	Section 3.5.2 has been corrected based on this comment to indicate that Pearson Creek flow is detained by SCM.
66	F	Water Resources	Section 3.5.2 (p. 3-23) The comparison of Pearson Creek water quality data to the dissolved aluminum DEQ-7 criteria is inappropriate. Ephemeral drainages are not subject to DEQ-7 numeric criteria pursuant to the Administrative Rules of Montana (ARM) 17.30.637(4).	Section 3.5.2 has been corrected based on this comment to remove the statement comparing the Pearson Creek dissolved aluminum to the MDEQ DEQ 7 criteria.
67	F	Soils	Section 3.8 (p. 3-24) The first sentence should state "Soils in the LBA1 tracts areas have not been designated as "unique" farmland and have not been specified as land of "statewide importance.""	Section 3.8 has been corrected based on this comment to indicate that soils in the LBA1 tracts have not been designated as unique farmland.
68	F	Water Resources	Section 4.5.2.1.1 (p. 4-24) The following statement "Water impounded in the reservoirs is periodically discharged and ultimately flows into the Tongue River and Tongue Rivers Reservoir," is incorrect. There has been no recorded or reported flows coming from the Spring Creek Mine down the drainages. These discharges would be recorded as Montana Pollutant Discharge Elimination System (MPDES) discharges. Captured surface water is either used on the mine site, evaporates, or infiltrates into the ground.	Section 4.5.2.1.1 has been revised based on this comment to indicate that all surface water within the SCM boundary is stored in impoundments and used onsite.
69	F	Water Resources	Section 4.5.2.1.1 (p. 4-24) The following statement "Evaporation and infiltration that occur during impoundment could potentially reduce the volume of surface water that leaves the site; however, mining operations in the Tongue River watershed have not resulted in decreased flow in the Tongue River (MDEQ 2020b)," appears to be a misstatement from the	Section 4.5.2.1.1 has been revised based on this comment to indicate that mining operations in the Tongue River watershed have not resulted in decreased flow in the Tongue River.

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			Cumulative Hydrologic Impact Analysis (CHIA). The CHIA described the impacts as not predicted to measurably impact flows in the Tongue River due to the proportional size and ephemeral nature of the drainages intercepted by the Spring Creek Mine.	
70	F	Water Resources	Section 4.5.2.1.1 (p. 4-24) Please provide a reference for the statement, "reclaimed soils may initially have lower infiltration rates and more runoff than the premining land surface."	4.5.2.1.1 has been revised based on this comment to add a reference for the statement regarding infiltration rates.
71	F	Water Resources	Section 4.5.2.1.1 (p. 4-24) The statement about impacts to Total Dissolved Solids (TDS) and Total Suspended Solids (TSS) in the Tongue River citing the TR1 CHIA appears to be a misstatement. The CHIA said, "TDS downstream of mining and downstream of the reservoir is generally similar or of lower concentration when compared to TDS upstream of mining and the reservoir (Figure 9-7). TSS is generally much lower downstream of mining (Figure 9-7). This is a result of reservoir operations." The CHIA statements make no inference on the source of TDS or TSS nor does it discuss discharge from MPDES regulated outfalls in particular. Changes in TDS or TSS from mining in the Tongue River were not discussed except in a theoretical manner, and no definitive statement about attribution to mining was made in the CHIA.	Section 4.5.2.1.1 has been revised to better reflect the 2020 CHIA.
72	F	Technical	However, MDEQ recommends the potential impacts from mining the LBA 1 tracts and the adjacent areas as they currently exist also be considered as part of the assessment of the environmentally preferable alternative. The potential socioeconomic impacts that may disproportionately affect an area with environmental justice concerns should also be considered in the context that Alternative 4 – No Action may also have significant impacts. MDEQ believes it is important to note in the context of the environmentally preferable alternative that the mine plan	The No Action alternative was developed to reflect the direct and indirect effects from SCM not continuing to mine the leased Federal coal from the LBA1 Tract. The cumulative impacts from ongoing, permitted operations at SCM involving the extraction of other Federal, State, and private coal leases are analyzed in Chapter 5. Section 6.1 has been revised to disclose the No Action alternative would result in moderate direct and indirect negative socioeconomic effects.

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			was previously analyzed by MDEQ and found to be incompliance with the Montana Strip and Underground Reclamation Act, Clean Water Act, and the Clean Air Act.	
73	G	Technical	The beneficial downstream energy supply impacts of a fully operational Spring Creek Mine must be considered in the FEIS. As the nation attempts to transition toward other forms of energy, the need for affordable and reliable energy provided by coal is still necessary. The ever-growing demand for electricity from data centers, electric vehicles, and many other new uses will not be met from wind and solar alone. A true "all-of-the-above" energy strategy that includes coal generated power is the only strategy that will provide sufficient capacity to fuel a prosperous future. The importance of coal must be recognized in the FEIS.	The purpose of the EIS is to disclose the impacts of the proposed Project and to inform OSMRE decisionmakers to make a recommendation to the Assistant Secretary for Land and Minerals Management to approve, disapprove, or conditionally approve the proposed mining plan modification. The purpose and need for this EIS is not to evaluate energy market strategies in the U.S. No changes to the EIS were made based on this comment.
74	G	Socioeconomics	The DEIS fails to recognize the requirements of other Federal Acts such as the Mineral Leasing Act of 1920 (MLA) and the National Environmental Policy Act (NEPA). Pursuant to the MLA, bonus bids revenues have been paid to states and the federal government from this coal. There have been two previous findings of no significant impact pursuant to NEPA. The coal under consideration is already leased, the impacts of mining have been reviewed twice, and related fees and royalties have been paid. These actions should be appropriately recognized in the FEIS.	Section 1.3 of the EIS describes the project background, including the Mineral Leasing Act, the leasing history of the MTM 94378 lease tract, and the history of both BLM and OSMRE's previous NEPA documents. In addition, two previous FONSIs were based on environmental analyses that the court subsequently found to be in adequate. Table 3.17-2 shows the Federal, State, private, and total royalty payments from coal production at SCM for 2016 to 2022. Sections 1.3 and 3.17 have been revised based on this comment to add information on SCM's bid.
75	G	Technical	The environmentally preferable alternative in the DEIS did not consider the other environmental impacts of the "no action alternative," but only considered the potential impacts of the combustion of the coal that would be mined. Selecting the no action alternative would have other environmental impacts, such as negative impacts on final reclamation, that should be disclosed in the FEIS and Record of Decision (ROD). In the FEIS and ROD, the consideration of those other environmental impacts on the environmentally preferrable alternative must be disclosed.	The EIS assumes that reclamation will occur under all alternatives, as required by law. Section 2.1.1 has been revised based on this comment to include additional reclamation information.
76	G	Technical	The FEIS and ROD should appropriately reference and/or tier to the environmental reviews that have been	Section 1.3 describes the project background including the previous NEPA analyses. The EIS does not tier to the

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			conducted on this project to date to ensure that all impacts are considered and are part of the administrative record.	previous NEPA analyses but instead incorporates the information and analysis in the earlier EA, as appropriate. No changes to the EIS were made based on this comment.
77	G	Socioeconomics	The FEIS for this project must consider all impacts of these alternatives, including the many socioeconomic benefits of approval of the project to inform a legally defensible ROD that ensures a future for the Spring Creek Mine and for the people of Bighorn County.	Section 4.17 has been revised based on this comment to include additional information on the socioeconomic impacts of each alternative.
78	H	Socioeconomics	The NMA urges OSMRE to provide an accurate accounting of the socioeconomic impacts of alternative 2.	Section 4.17.1 has been revised based on this comment to include additional information on the socioeconomic impacts of each alternative.
79	H	Socioeconomics	The NMA urges OSMRE to provide an accurate accounting of the socioeconomic impacts of alternative 3.	Section 4.17.1 has been revised based on this comment to include additional detail on the socioeconomic impacts of each alternative.
80	H	Socioeconomics	The NMA urges OSMRE to provide an accurate accounting of the socioeconomic impacts of alternative 4.	Section 4.17.1 has been revised based on this comment to include additional information on the socioeconomic impacts of each alternative.
81	H	Socioeconomics	The NMA urges that several additional details be included in the final EIS to provide a more accurate picture of the socioeconomic impacts to the communities the SCM impacts, as described below and extensively discussed in NTEC's comments to the DEIS.	Section 4.17.1 has been revised based on this comment to include additional information on the socioeconomic impacts of each alternative.
82	I	Wildlife	Within an approximate 3-mile diameter of the current Spring Creek Mine, there are twenty-three (23) occurring terrestrial vertebrate Species of Concern. For the Navajo Transitional Energy Company, LLC to continue with their proposed action at the Spring Creek Mine, each of the occurring species, as well as game and upland bird species, will be negatively impacted by further mining activity, both directly through the direct degradation and removal of habitat but also through noise pollution in the areas surrounding the mining area.	Sections 3.10.4 and 4.10.4 discuss Other Species of Special Interest (which include USFWS Birds of Conservation Concern, BLM Sensitive Species, and Montana Natural Heritage Program and Montana Fish, Wildlife, and Parks Species of Concern) within the SCM wildlife monitoring analysis area. Table 3.10-1, "Other Species of Special Interest within SCM Wildlife Monitoring Analysis Area," has been added to the EIS in response to this comment.
83	J	Technical	The draft EIS is wrong in estimating that the Partial Mining Alternative will only cause half the surface area disturbance. In fact, the surface area disturbed under the Proposed Alternative or the Partial Mining Alternative will	For the Final EIS, the Department selected the Partial Mining alternative (Alternative 2) as the preferred alternative because it is the alternative that best accounts for the volatility of the coal market and allows the

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			be the same acreage. Selecting the Partial Mining Alternative will, in reality, merely force the Spring Creek Mine to seek OSMRE's and the Montana Department of Environmental Quality's approvals every couple of years. As is evident from the delay regarding the Spring Creek Mine's mine plan modification, requiring state and regulatory approval ever couple of years will inevitably delay reclamation. This type of regulatory uncertainty makes it prohibitively difficult to operate, it increases the costs of mining (thereby potentially rendering mining uneconomic), and it will cause more severe impacts to air quality and surface disturbance than OSMRE's draft EIS accounts for under the Partial Mining Alternative.	Secretary to reevaluate the mining plan at an interval that reflects a rapidly changing regulatory, scientific, and economic landscape. If the Assistant Secretary for Land and Minerals Management selects this alternative in the ROD, Alternative 2 would limit the term of the mining plan modification approval to 5-years, which is consistent with the 5-year permit approval term under federal surface mining regulations. Selection of Alternative 2 would not necessarily limit the mining operation to 5-years. If the operator would like to continue mining after 5-year term, OSMRE will review the circumstances that exist in the future and make a recommendation on an additional mining plan modification, which, if approved, would mean that there is no break in operations.
84	K	Socioeconomics	Any loss of jobs at the Spring Creek Mine would worsen the unemployment rate in Big Hom County, which is already staggeringly high. If OSMRE does not authorize the Spring Creek Mine to mine all the coal it has lawful leases to mine, quality jobs in the region will be lost. This would be unfortunate for a rural economy that needs such high paying jobs so badly.	Section 4.17 has been revised based on this comment to include additional information on the socioeconomic impacts of each alternative.
85	K	Environmental Justice	Additionally, the Spring Creek Mine is near both the Crow Indian Reservation and the Northern Cheyenne Reservation, and as such the Mine provides employment opportunities that allow tribal members to work close to their reservations.	Section 4.18 has been revised based on this comment to include additional information on the environmental justice impacts of each alternative including jobs for Tribal members.
86	K	Socioeconomics	Mining also boosts local and state economies. The Spring Creek Mine provides critical funding to its local government and is an impo1tant source of state revenue. The Spring Creek Mine supports the local Big Horn County economy not only by contributing substantial amounts to the local tax base, but also by purchasing services and goods in the community and supp01ting local causes. The revenue provided by mining supports essential public services like schools and law enforcement. For example, MCC understands that in 2023 alone, the Spring Creek	Section 4.17 has been revised based on this comment to include additional information on the socioeconomic impacts of each alternative. Additionally, annual royalty collections information from coal production at SCM for the years 2016 through 2022 is provided in Table 3.17-2.

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			Mine purchased $106 million of goods and services locally, and $47.8 million in taxes and royalties were allocated to the State of Montana. MCC also understands that Big Horn County will lose $500,000 to $600,000 per month in revenue if the Spring Creek Mine shuts down. Historically, nearly 70% of Big Horn County's revenue came from coal, and the Spring Creek Mine is the only remaining active coal mine in the county. Reducing, slowing or shutting down the Spring Creek Mine would be devastating to Big Hom County. Any alternative in the draft EIS other than the Proposed Action alternative threatens to make mining uneconomic and infeasible such that the Spring Creek Mine will shut down.	
87	K	Socioeconomics	Another component of the Spring Creek Mine's economic contribution is paying royalties to the Federal Government, including paying upfront royalties for the federal coal lease, the mining of which is being evaluated in the draft EIS.	Section 4.17 has been revised based on this comment to include additional information on the socioeconomic impacts of each alternative. Additionally, annual royalty collections information from coal production at SCM for the years 2016 through 2022 is provided in Table 3.17-2.
88	K	Alternatives	One alternative examined in the draft EIS, is a Partial Mining Alternative, which would force the Spring Creek Mine to only mine a portion of its previously leased federal coal. This is contrary to several Congressional acts, and hurts not only America, but the American people. MCC is deeply concerned about the untenable position that the Spring Creek Mine would be put in if OSMRE chooses the Partial Mining Alternative.	The Partial Mining alternative is premised upon the life of mine mining sequence outlined in the approved SMP C1979012 (NTEC 2023a) and would not require operators to alter mining sequences. Selection of Alternative 2 Partial Mining alternative would in not necessarily limit the mining operation to 5-years. If the operator would like to continue mining after 5-year term, OSMRE will review the circumstances that exist in the future and make a recommendation on an additional mining plan modification, which, if approved, would mean that there is no break in operations.
89	K	Air Quality	MCC noted that the draft EIS fails to appropriately account for the harm to the environment of the Partial Mining Alternative. The draft EIS portrays the Partial Mining Alternative as having moderate air quality impacts-the same level of impacts as the Proposed Action Alternative-when in fact the impacts of the Partial Mining Alternative should be more severe. In reality, if the Spring Creek Mine	The Partial Mining alternative is premised upon the life of mine mining sequence outlined in the approved SMP C1979012 (NTEC 2023a) and would not require operators to alter mining sequences. Therefore, a change in mining methods from using an electric drag line to a diesel-powered truck and shovel operation was not contemplated.

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			can only mine a portion of its leased coal, MCC understands that the Mine may have to switch from using an electric drag line to a diesel-powered truck and shovel operation. This is a less efficient way to remove the coal, and it will cause more air quality impacts.	Selection of Alternative 2 Partial Mining alternative would in not necessarily limit the mining operation to 5-years. If the operator would like to continue mining after 5-year term, OSMRE will review the circumstances that exist in the future and make a recommendation on an additional mining plan modification, which, if approved, would mean that there is no break in operations.
90	K	Technical	As another example. the draft EIS is wrong in estimating that the Partial Mining Alternative will only cause half the surface area disturbance. In fact. the surface area disturbed under the Proposed Alternative or the Partial Mining Alternative will be the same acreage. Selecting the Partial Mining Alternative will, in reality, merely force the Spring Creek Mine to seek OSMRE's and the Montana Department of Environmental Quality's approvals every couple of years. As is evident from the delay regarding the Spring Creek Mine's mine plan modification, requiring state and regulatory approval every couple of years will inevitably delay reclamation. This type of regulatory uncertainty makes it prohibitively difficult to operate, it increases the costs of mining (thereby potentially rendering mining uneconomic). and it will cause more severe impacts to air quality and surface disturbance than OSMRE's draft EIS accounts for under the Partial Mining Alternative.	See Response 83. In addition, the Partial Mining alternative is set at a 5-year interval, which, among other things, is the same duration that Congress set for the life of a permit for a surface coal mining operation under SMCRA and time that CEQ has identified as a "rule of thumb" for NEPA supplementation. *See, e.g.*, 30 U.S.C. § 1256(b); 46 Fed. Reg. 18,026 (Mar. 23, 1981) ("Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations"). While we recognize that SMCRA permits carry a qualified right of renewal, that right of renewal requires, among other necessities, that certain criteria be met before the renewal can be approved, which includes the operator providing updated information. 30 U.S.C. § 1256(d). If the Partial Mining alternative is selected, it would simply require an updated analysis to determine whether circumstances changed. At that time, OSMRE would make a recommendation to ASLM on whether to approve, approve with condition, or deny the future mining plan modification, which, if approved, would mean that there should be no break in operations.
91	K	Socioeconomics	MCC is concerned that any alternative other than the Proposed Action alternative in the draft EIS would greatly curtail the Spring Creek Mine's operations. A curtailment of the Spring Creek Mine's operations would have extensive economic and employment ripple effects both locally and statewide.	Section 4.17 has been revised based on this comment to include additional information on the socioeconomic impacts of each alternative.

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92	L	Socioeconomics	I'm writing to express my support for the Spring Creek Mine and the Proposed Alternative in the draft EIS. The Spring Creek Mine has been a vital part of Hardin and Sheridan, Wyoming communities for many years. This mine plays a crucial role in providing jobs, supporting local businesses, and generating much-needed tax revenue for the schools and for the essential public services in these communities.	Section 4.17 has been revised based on this comment to include additional information on the socioeconomic impacts of each alternative.
93	L	Environmental Justice	Mining is a vital part of our economy, especially in rural areas like Big Horn County. The jobs created by the Spring Creek Mine aren't just any jobs-they're good-paying jobs that support families and communities throughout our region. This is particularly important in Big Horn County, which has one of the highest unemployment rates in Montana. Additionally, the mine provides job opportunities for members of the Crow and Northern Cheyenne Tribes, which is critical for these communities and these rural families in Eastern Montana.	Section 4.18 has been revised based on this comment to include additional information on the environmental justice impacts of each alternative.
94	L	Socioeconomics	If the mine's operations are reduced or restricted, the impact on our local economy would be devastating. Not only would we lose jobs, but the county would also lose essential revenue that funds services like schools, law enforcement, and infrastructure. In fact, if the mine shuts down due to these delays and prohibitive revisions, Big Horn County stands to lose $500,000 to $600,000 in revenue every month, a loss we simply cannot afford.	Section 4.17 has been revised based on this comment to include additional information on the socioeconomic impacts of each alternative.
95	L	Socioeconomics	The mine also contributes to both the state and federal economics by property taxes, severance taxes, income taxes and significant private and Federal royalties. These delay and targeted aggressive actions are denying the citizens of our country the production royalties due to them. In 2023 alone, this mine contributed $47.8 million to the state of Montana and purchased $106 million worth of goods and services locally. It's clear that the Spring Creek Mine is a critical part of the economic fabric of our state and local communities.	Section 4.17 has been revised based on this comment to include additional information on the socioeconomic impacts of each alternative.

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96	L	Socioeconomics	The alternative option of reducing mining operations, as proposed in the draft EIS would undermine not only the local economy but also the broader goals of responsibly managing our public lands and energy resources. We need to make sure that the Federal Lands are used in ways that benefit both our nation and our local communities. Limiting the mine's ability to operate would go against decades of policy that encourage the responsible use of these resources.	Section 4.17 has been revised based on this comment to include additional information on the socioeconomic impacts of each alternative. Selection of Alternative 2 Partial Mining alternative would not necessarily limit the mining operation to 5-years. If the operator would like to continue mining after 5-year term, OSMRE will review the circumstances that exist in the future and make a recommendation on an additional mining plan modification.