DEQ
Montana Department of Environmental Quality

Air, Energy & Mining Division

# Westmoreland Rosebud Mining, LLC

## SURFACE MINING PERMIT C1984003B

## ROSEBUD AREA B

## AMENDMENT 5

## COLSTRIP, MT

**October 16, 2025**
**Draft Supplemental Environmental Assessment**

# TABLE OF CONTENTS

## TABLE OF TABLES



## TABLE OF FIGURES

## ACRONYMS

| | |
|---|---|
| AM5 | Amendment 5, Proposed Lee Coulee Expansion of the Rosebud Mine |
| AR | Assessment Report |
| ARM | Administrative Rules of Montana |
| BLM | Bureau of Land Management |
| DEQ | Montana Department of Environmental Quality |
| EA | Environmental Assessment |
| EIS | Environmental Impact Statement |
| EPA | United States Environmental Protection Agency |
| ESGC | United States Environmental Protection Agency Simplified Greenhouse Gas Calculator |
| FEIS | Final Environmental Impact Statement |
| FLIGHT | Facility Level Information on Greenhouse Gases Tool |
| GHG | Greenhouse Gases |
| IPCC | Intergovernmental Panel on Climate Change |
| LULUCF | Land Use, Land-Use Change, and Forestry |
| MAGICC | Methods for Attributing Climate Impacts of GHG Emissions |
| MCA | Montana Code Annotated |
| MEPA | Montana Environmental Policy Act |
| RCP | Representative Concentration Pathway |
| SIT | State Inventory Tool |

# PROJECT OVERVIEW

| | |
|---|---|
| COMPANY NAME: | Westmoreland Rosebud Mining, LLC |
| Supplemental EA DATE: | October 16, 2025 |
| PROJECT: | Rosebud Area B |
| PERMIT/LICENSE: | C1984003B |
| AMENDMENT #: | AM5 |

## Location

Latitude, Longitude: -106.70436 W; 45.84759 N County: Rosebud

SURFACE OWNERSHIP: FEDERAL ☐ STATE ☒ PRIVATE ☒

MINERAL OWNERSHIP: FEDERAL ☒ STATE ☒ PRIVATE ☒

## Compliance with the Montana Environmental Policy Act

Under the Montana Environmental Policy Act (MEPA), Montana agencies are required to prepare an environmental review for state actions that may have an impact on the Montana environment. The proposed action is considered to be a state action that may have an impact on the Montana environment and, therefore, the Department of Environmental Quality (DEQ) must prepare an environmental review. This Supplemental Environmental Assessment (Supplemental EA) adds to the Final Environmental Impact Statement (FEIS) for Rosebud Mine Area B AM5 issued May 9, 2022, and will examine the proposed action and alternatives to the proposed action and disclose potential impacts that may result from the proposed and alternative actions. DEQ will determine the need for additional environmental review based on consideration of the criteria set forth in Administrative Rules of Montana (ARM) 17.4.608. DEQ may not withhold, deny, or impose conditions on the permit based on the information contained in this Supplemental EA § 75-1-201(4), Montana Code Annotated (MCA).

## Purpose and Need

DEQ's purpose and need in conducting this environmental review is to act upon Westmoreland Rosebud Mining, LLC's application for a permit to conduct coal mining and reclamation in compliance with the Montana Strip and Underground Mine Act.

On September 16, 2025, a voluntary remand without vacatur was granted by the Montana Sixteenth Judicial Court, Rosebud County, MT, ordering DEQ to publish a supplemental climate analysis for the purpose of notifying the public and providing the opportunity for public comment. GHGs are the primary drivers of anthropogenic climate change, and emissions of GHGs are used as an indicator of potential climate change impacts (United States Environmental Protection Agency, 2025c). This Supplemental EA is disclosing the impacts of the potential GHG emissions from the proposed action.

| Date | Event |
|---|---|
| February 17, 2017 | Application for Area B AM5 (C1984003B) is received by DEQ. |
| May 24, 2017 | DEQ determines that Application C1984003B (Permit Area B AM5) is complete and that an EIS is needed. |
| May 9, 2022 | DEQ completes the Final Environmental Impact Statement and makes it available to the public. |
| May 27, 2022 | DEQ approves the Area B AM5. |
| July 26, 2025 | Montana Environmental Information Center and Sierra Club filed a complaint for declaratory relief (case no. DV 22-25) with the Montana Sixteenth Judicial Court, Rosebud County, MT, alleging DEQ violated MEPA and its implementing regulations by failing to rationally evaluate the direct, secondary, and cumulative effects of AM5. |
| September 16, 2025 | Montana Sixteenth Judicial Court, Rosebud County, MT, orders on remand the preparation of a voluntary Supplemental EA assessing greenhouse gas emissions. The Court ordered the following voluntary remand schedule:<br>• 30 days following this Court's remand, DEQ shall publish a draft of its supplemental climate analysis for purposes of notifying the public and providing opportunity for public comment;<br>• 75 days following this Court's remand, the public comment period shall be closed; and<br>• 135 days following the Court's remand, DEQ shall publish its final supplemental climate analysis. |

## Proposed Action

Western Energy, now Westmoreland Rosebud Mining LLC (Westmoreland Rosebud), a subsidiary of Westmoreland Mining, LLC (Westmoreland), submitted an application to the Montana Department of Environmental Quality (DEQ) on February 17, 2017, for a proposed fifth amendment (AM5) to the operating permit (C1984003B) for Area B at the Rosebud Mine, an existing surface coal mine near Colstrip, Montana. DEQ deemed the AM5 Application complete on February 24, 2021, and approved, in part, the AM5 Application in May of 2022. AM5 would increase the Area B permit area by 9,108 acres, making the total Area B acreage 15,153 acres. These 15,153 acres, also known as Area B, are hereafter referred to as the Project area in this document. The Project also includes an updated Area B operations plan and an updated reclamation plan that would add mine passes and areas of reclamation, respectively. In total, the Proposed Action would add 5,478 acres of mineable coal. In the FEIS (Department of Environmental Quality, 2022a), the proposed action is listed as Alternative 3 – Lee Coulee Only in Appendix E (Department of Environmental Quality, 2022b). Alternative 3 is summarized below in **Table 1**. Alternative 3 was the action approved with the issuance of AM5 to the mine permit in 2022.

Under the proposed action for AM5 (Alternative 3), Westmoreland Rosebud would extract an additional 42.9 million tons of coal from the Project Area (Department of Environmental Quality, 2022b). At Westmoreland Rosebud's proposed rate of production, the Project would extend active mining in the Area B permit area by about 6 years and the life of the entire Rosebud Mine complex by 4 years.

## No Action Alternative

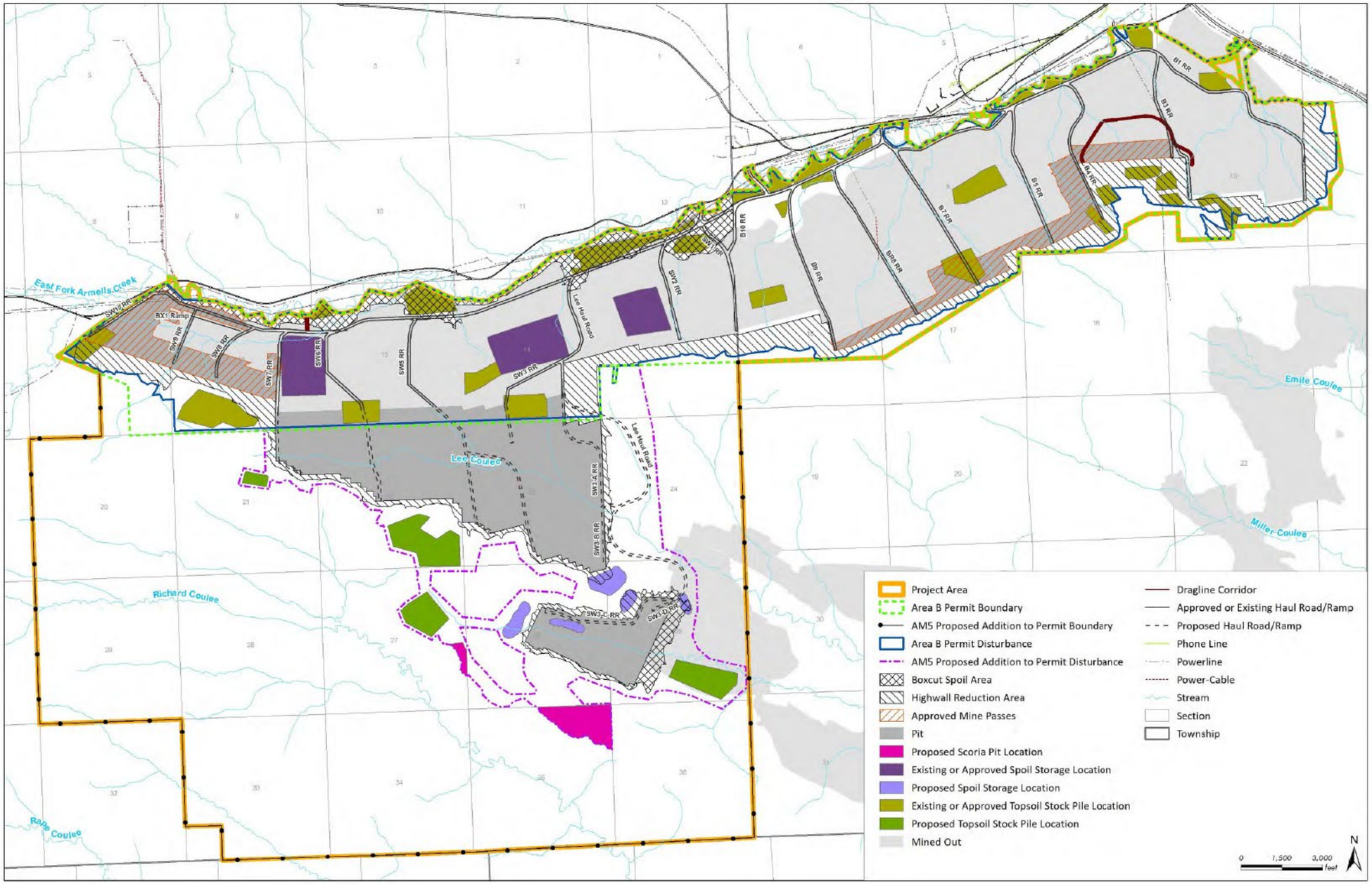
Under the No Action Alternative, AM5 would not be approved, and the mining of the 5,478 acres would not occur. There would be no greenhouse gas emissions from the mining and transportation of coal in the AM5 portion of the Westmoreland Rosebud Mine. If AM5 were not approved, coal from an alternative source would be provided to the Colstrip Power Plant by Westmoreland per their existing contract with the Colstrip Power Plant. The portion of Area B previously permitted, and not part of AM5, would continue to be mined at the Rosebud Mine, which was previously cited as approximately 19.4 million tons of recoverable coal (Department of Environmental Quality, 2022a). The Colstrip Power Plant is projected to operate until 2042 (NorthWestern Energy, 2023). DEQ based the No Action Alternative on the published information stating the Colstrip Power Plant would operate until 2042. Thus, under the No Action Alternative, there would be no change to the greenhouse gas emissions from combustion because coal from alternative sources would still be available at the Colstrip Power Plant for combustion.

**Table 1. Proposed Action as presented in Table E-1 in the Final AM5 EIS (Department of Environmental Quality, 2022b)**

| Component | Proposed Action |
|---|---|
| ***Operations Plan*** | |
| Operational life of Area B1[1] | 20 years from approval of AM5[2]<br>(6 additional years beyond current Area B permit) |
| Operational life of the Rosebud Mine | 4 additional years |
| Area B permit area | 15,153 acres |
| Area B total disturbance area[3] | 8,194 acres |
| Mining area | 5,478 acres |
| AM5 disturbance only | 2,658 acres of new Project-related disturbance within the Alternative 3 8,194-acre disturbance area |
| Coal recovery[4] | 42.9 million tons (AM5) |
| ***Reclamation Plan*** | |
| Reclamation of haul roads | Within 2 years of cessation of mining (estimated to be 2044) |
| Delay of reclamation in existing Area B permit area | Up to 6 years later than currently permitted |
| Delay in reclamation of mine support facilities in other permit areas | Up to 4 years later than currently permitted |

[1] Based on Table 303-2 from Westmoreland Rosebud's October 6, 2021 deficiency response.
[2] Table E-1 in the EIS lists 21 years, but the currently approved coal conservation plan lists 20 years of AM5 mined coal
[3] Based on Table 303-1 from Westmoreland Rosebud's October 6, 2021 deficiency response. Acreages are rounded to the nearest whole number.
[4] Based on Table 322-2 from Westmoreland Rosebud's October 6, 2021 deficiency response.

**Figure 1: AM5 Alternative 3 project area as presented in the Final EIS Figure E-1 (Department of Environmental Quality, 2022b). AM5 pits are shown in dark grey.**



# SUMMARY AND SCOPE OF POTENTIAL IMPACTS

## *Direct, Secondary, and Cumulative Impacts*

The impact analysis will identify and estimate whether the impacts are direct or secondary impacts. Direct impacts occur at the same time and place as the action that causes the impact. Secondary impacts are a further impact to Montana's environment that may be stimulated, or induced by, or otherwise result from a direct impact of the action (ARM 17.4.603(18)). MEPA excludes upstream, downstream, or other indirect actions that occur independently or are caused in part or exclusively by the proposed action per 75-1-220(10)(b)(i), MCA. Where impacts would occur, the impacts will be described.

Cumulative impacts are the collective impacts on Montana's environment within the borders of Montana of the Proposed Action when considered in conjunction with other past and present actions related to the Proposed Action by location and generic type. Related future actions must also be considered when these actions are under concurrent consideration by any state agency through pre-impact statement studies, separate impact statement evaluation, or permit processing procedures.

## *GHG Emission Impacts on Climate Systems*

This Supplemental EA is limited to a GHG assessment and will assess how additional GHGs from AM5 contribute to changes in climate systems. Climate is defined as the long-term weather patterns (typically over a period of 30 years or longer) of a region, and climate change is an identifiable (i.e., statistically significant) and persistent change in long-term climate (IPCC, 2021). Variables such as temperature, precipitation, relative humidity, and sea level are often used to identify climate change trends. In brief, climate change is governed by the relationship between incoming and outgoing heat in the Earth's atmosphere (Denning, June 21, 2017).

The greenhouse effect is the trapping of heat by GHGs, a specific set of gases including carbon dioxide ($CO_2$) that reflect this radiation emitted by the Earth back to the Earth's surface. While the greenhouse effect occurs naturally and is essential for keeping Earth's temperatures habitable, the intensity of this effect increases with the increase of the GHGs in the atmosphere. Higher concentrations of GHGs mean more infrared radiation gets absorbed and re-radiated back to the surface, leading to enhanced warming and higher global- surface temperatures.

The lifetime of carbon dioxide cannot be represented with a single value because the gas is not destroyed over time. The gas instead moves between air, ocean, and land mediums with atmospheric carbon dioxide remaining in the atmosphere for thousands of years, due in part to the very slow process by which carbon is transferred to ocean sediments. Methane gas remains in the atmosphere for approximately 12 years. Nitrous oxide has the potential to remain in the atmosphere for about 109 years (United States Environmental Protection Agency, 2025c). The impacts of climate change throughout the Northern Great Plains include changes in flooding and drought, rising temperatures, and the spread of invasive species (Bureau of Land Management (BLM), 2024).

GHGs are the primary drivers of anthropogenic climate change, and emissions of GHGs are used as an indicator of potential climate change impacts. Climate change can be attributed to both natural and anthropogenic causes but has been largely driven by the significant increase in global GHG emissions from anthropogenic fossil fuel combustion since pre-industrial times. The Intergovernmental Panel on Climate Change's (IPCC) 2021 Sixth Assessment Report reports that human activity led to atmospheric warming of 1.07 ± 0.23°C from 1850 to 2019 (IPCC, 2021).

## *Scope of Supplemental Environmental Assessment*

This Supplemental EA analyzes the direct, secondary and cumulative impacts of GHG emissions from the proposed action. Consideration of GHG emissions and corresponding climate impacts had previously been prohibited in environmental reviews since 2011 by a provision of MEPA (known as the MEPA Limitation). The MEPA Limitation was amended by the state legislature in 2023 to more explicitly prohibit "an evaluation of greenhouse gas emissions and corresponding impacts to the climate in the state or beyond the state's borders."

In December 2024, the Montana Supreme Court in *Held v. State of Montana,* 2024 MT 312, ruled that the prior prohibition violates Montanans' constitutional right to a clean and healthful environment. In January 2025, *MEIC v. DEQ,* 2025 MT 3, further held that in the absence of a prohibition on DEQ considering GHG emissions under MEPA, it would be arbitrary and capricious for the agency to not consider GHG impacts from a generating station expected to emit a large amount of GHG emissions. The 2025 Montana Legislature responded by passing Senate Bill 221 (SB221), signed into law on May 1, 2025, which requires state agencies to evaluate GHG impacts for fossil fuel projects while limiting analysis to proximate impacts (i.e., close in time and place) on Montana's environment. SB221 language embodies the legal standard long governing MEPA, which does not require agencies to analyze remote and speculative impacts that are not closely tied to the state action that is being approved.

Per 75-1-201(2), MCA, agencies are required to conduct a GHG impact analysis for fossil fuel activities. Fossil fuel activities, defined in § 75-1-220, MCA, as amended by SB221, means a proposed action that authorizes the mining of coal, drilling for oil or natural gas, production of oil or natural gas, compression of oil or natural gas, or burning of coal, oil, or natural gas to generate energy for electricity.

Generally, for purposes of DEQ's MEPA review, as recognized in SB221, ARM 17.4.603(18), and Montana and U.S. Supreme Court precedent, *see, e.g., MEIC v. DEQ,* 2025 MT 3, ¶ 51; *Seven County Infrastructure v. Eagle Cnty.*, 145 S. Ct. 1497 (2025), the scope of impacts DEQ must analyze are limited to those that are caused by the specific project or approval, and do not incorporate separate, downstream impacts caused by different projects, even if those projects may be stimulated or induced by the project or approval before the agency. Accordingly, here, impacts from GHG emissions, as with any impact, is appropriately limited to the mining of coal. Important policy considerations underpin the typical scope of an analysis, as these separate upstream or downstream projects may not necessarily fall under the purview of the agency, leading to speculative analyses, particularly when it is unknown if such separate projects have or will be approved. Further, because separate projects may be subject to their own accounting of emissions, it can lead to double counting of GHGs, rendering any analyses of emissions inaccurate or overbroad.

For purposes of this limited voluntary remand, however, DEQ has decided to consider GHG emissions from not only mining of coal, the only project or proposal that's before the agency, but also the transportation and combustion as well. DEQ recognizes that it is evaluating a mine mouth coal plant (i.e., a generating station built adjacent to the coal mine supplying its fuel) and there is public interest in understanding the impacts of coal mining and combustion. Furthermore, because DEQ regulates the air quality permit associated with the combustion of this coal, to adequately capture all of the potential emissions sources from the larger project, DEQ has chosen to go further than what is required under SB221 and current MEPA and National Environmental Policy Act caselaw and evaluate combustion and transportation of coal from AM5 in this Supplemental EA. The scope of this analysis, however, in this

particular, unique instance should not be used as a concession by the agency that DEQ must always broaden the scope of such analysis for any future permitting decisions.

## Greenhouse Gas Assessment

### *Affected Environment, Analysis Area and Methods*

For the purpose of this analysis, DEQ has defined greenhouse gas emissions as the following gas species: carbon dioxide ($CO_2$), methane ($CH_4$), nitrous oxide ($N_2O$), and many species of fluorinated compounds. The range of fluorinated compounds includes numerous chemicals which are used in many household and industrial products. Water vapor is also technically a greenhouse gas, but its properties are controlled by the temperature and pressure within the atmosphere, and it is not considered an anthropogenic species.

The affected environment describes the existing conditions of the GHG emissions in the state of Montana. DEQ has determined the GHG emissions are not a localized impact and have chosen to include an analysis of Montana's GHG emissions. The assessment area for GHG emissions is focused on the activities regulated by the issuance of the coal permit, including construction, operation and reclamation (i.e., mining) of the area encompassed by the request to expand mining operations within and outside of the current Rosebud Area B permit. Also included in the direct impacts are fugitive emissions from exposed coal. DEQ has determined EPA's Scope 1 GHG impacts as defined in the Inventory Guidance for Greenhouse Gas Emissions are appropriate direct impacts under MEPA for this Proposed Action. Scope 1 emissions are defined as direct GHG emissions that occur from sources that are controlled or owned by the organization (United States Environmental Protection Agency, 2025b). Although not regulated by DEQ's permitting authority, as described in the section "Scope of Supplemental Environmental Assessment", the combustion of AM5 coal at the Colstrip Power Plant have been identified as secondary impacts. Cumulative impacts are the direct impacts of AM5 (construction, operation, and reclamation), the combustion of AM5 at the Colstrip Power Plant and the existing GHGs output of the state of Montana in 2022.

DEQ used the EPA Simplified GHG Calculator (ESGC) September 2024 version (Environmental Protection Agency, 2025) for the assessment of GHG emissions. DEQ has calculated GHG emissions using the ESGC September 2024 for the purpose of totaling GHG emissions. This tool totals carbon dioxide ($CO_2$), nitrous oxide ($N_2O$), and methane ($CH_4$) and reports the total as $CO_2$ equivalent ($CO_2e$) in metric tons $CO_2e$. The calculations in this tool are widely accepted to represent reliable calculation approaches.

### *Cumulative Impact Considerations*

Cumulative impacts are defined as collective impacts on Montana environment from the Proposed Action when considered in conjunction with other past and present actions related to the Proposed Action by location or generic type. GHG emissions sources and trends occur at global, national, and state, and regional scales (Office of Surface Mining Reclamation and Enforcement (OSMRE), 2025). The cumulative impact section of this Supplemental EA focuses on the Montana environment. **Table 2** and **Table 3** identify the past and present cumulative activities of this analysis area.

The EPA Facility Level Information on Greenhouse Gases Tool (FLIGHT) provides GHG emissions data from large facilities that emit more than 25,000 metric tons of $CO_2e$ per year (EPA 2024b). This tool includes public information from facilities in nine industry groups that directly emit large quantities of GHGs, as well as suppliers of certain fossil fuels, reported under the EPA's Greenhouse Gas Reporting

Program. FLIGHT can provide baseline facility-level GHG emissions data to identify and quantify emissions from existing and past industrial sources within Montana (**Table 2**) (Department of Environmental Quality, 2025).

**Table 2. FLIGHT GHG emissions (metric tons CO2e) from 2019-2023 for large facilities located in Montana.**

| | Emissions (metric tons of $CO_2e$) | | | | |
|---|---|---|---|---|---|
| **Facility Name** | **2019** | **2020** | **2021** | **2022** | **2023** |
| Colstrip | 14,277,559 | 8,340,434 | 10,035,340 | 10,740,663 | 10,967,111 |
| Phillips 66 Billings Refinery | 966,133 | 940,006 | 976,787 | 834,083 | 967,045 |
| CHS Inc Laurel Refinery | 979,598 | 976,385 | 934,398 | 1,013,794 | 918,021 |
| Yellowstone Energy Limited Partnership | 852,198 | 871,923 | 804,628 | 791,799 | 830,005 |
| Par Montana, LLC Billings Refinery | 726,587 | 661,227 | 712,571 | 621,037 | 719,769 |
| Hardin Generating Station | 212,250 | 73,621 | 692,184 | 730,172 | 663,072 |
| Colstrip Energy Ltd Partnership | 380,050 | 373,440 | 491,021 | 439,647 | 474,565 |
| Calumet Montana Refining, LLC | 311,235 | 299,723 | 283,600 | 260,293 | 427,371 |
| Dave Gates Generating Station | 153,664 | 126,595 | 174,370 | 254,471 | 330,090 |
| Ash Grove Cement Company – Montana City | 301,601 | 320,046 | 316,495 | 342,055 | 323,958 |
| Graymont Western U.S. Inc. Indian Creek | 322,197 | 304,550 | 320,028 | 318,796 | 276,271 |
| Trident | 277,001 | 251,350 | 305,309 | 299,006 | 250,489 |
| Billings City Landfill | 112,979 | 117,906 | 132,607 | 137,524 | 143,249 |
| Culbertson Station | 66,168 | 25,841 | 51,892 | 82,391 | 137,957 |
| Western Sugar Cooperative | 109,378 | 104,364 | 117,000 | 113,595 | 122,996 |
| Montana Waste Systems - Highplains Sanitary Landfill | 73,539 | 78,011 | 80,756 | 83,945 | 85,786 |
| Basin Creek Plant | 76,921 | 28,344 | 59,476 | 69,263 | 55,610 |
| Gallatin County Logan Landfill | 42,027 | 45,078 | 47,120 | 51,204 | 55,531 |
| Weyerhaeuser Nr-Columbia Falls | 35,995 | 33,020 | 35,530 | 36,382 | 40,706 |
| Rec Silicon | 33,499 | 31,006 | 32,620 | 32,753 | 35,245 |
| Lewis & Clark County Landfill | 29,810 | 31,113 | 32,419 | 33,857 | 34,916 |
| Malteurop North America Inc | 31 | 27,301 | 30,481 | 29,063 | 29,063 |
| Cabin Creek Compressor Station | 29,901 | 22,471 | 28,283 | 23,967 | 28,933 |
| Missoula Landfill | 28,316 | 30,692 | 18,347 | 22,770 | 27,790 |
| Northwestern Energy/GTS | 25,356 | 25,210 | 25,524 | 26,051 | 26,289 |

**Table 2. FLIGHT GHG emissions (metric tons CO2e) from 2019-2023 for large facilities located in Montana.**

| | Emissions (metric tons of $CO_2e$) | | | | |
|---|---|---|---|---|---|
| **Facility Name** | **2019** | **2020** | **2021** | **2022** | **2023** |
| Hiland Partners Bakken Gathering Plant | 22,545 | 18,263 | - | 27,967 | 26,275 |
| Crusoe Energy Systems - Kraken CDP | - | - | - | 35,923 | 22,915 |
| Lewis & Clark | 352,646 | 317,241 | 90,127 | 882 | 10,054 |
| Northwestern Energy, SD LDC | 7,164 | 7,155 | 7,191 | 7,211 | 7,329 |
| Northwestern Energy NE LDC | 4,121 | 4,071 | 4,050 | 3,827 | 3,835 |
| Sidney Sugars Incorporated | 96,553 | 126,731 | 109,977 | 110,570 | 2,690 |
| **Total** | **20,907,022** | **14,613,118** | **16,950,131** | **17,539,038** | **18,022,021** |

*Source:* (Department of Environmental Quality, 2025)

DEQ has decided to use the U.S. Environmental Protection Agency State Inventory Tool (SIT) to provide a sector-based statewide GHG emissions inventory. The EPA SIT is an interactive spreadsheet model designed to help states develop and update inventories of GHG emissions and sinks (EPA 2025). The EPA SIT provides default data for each state for the most recent years of available data but allows for state-specific customizations in the modules. It enables users to estimate emissions in 11 industry-level modules (Agriculture; $CO_2$ from Fossil Fuels; Coal; Electricity Consumption; Industrial Processes; Land Use, Land-Use Change, and Forestry (LULUCF); Mobile Combustion; Natural Gas and Oil; Solid Waste; Stationary Combustion; and Wastewater). The methodologies and sectors accounted for in the EPA SIT align with those in the U.S. GHG Inventory and use emission factors from the Inventory of U.S. Greenhouse Gas Emissions and Sinks (EPA 2024a). SIT (updated January 2025) has default emissions data updated through 2022. DEQ updated Montana's statewide GHG emissions using the EPA SIT with updated LULUCF, stationary combustion, and mobile combustion data (Department of Environmental Quality, 2025).

**Table 3. Montana's statewide CO2e from the EPA SIT Tool.**

| Emissions (million metric tons of $CO_2e$) | 2020 | 2021 | 2022 | 2020-2022 Average |
|---|---|---|---|---|
| **Energy** | 28.66 | 30.81 | 31.94 | 30.47 |
| $CO_2$ from Fossil Fuel Combustion | 26.03 | 28.20 | 29.35 | 27.86 |
| Stationary Combustion | 0.17 | 0.19 | 0.22 | 0.19 |
| Mobile Combustion | 0.10 | 0.11 | 0.11 | 0.11 |
| Coal Mining | 0.42 | 0.44 | 0.43 | 0.43 |
| Natural Gas and Oil Systems | 1.93 | 1.87 | 1.83 | 1.88 |
| **Industrial Processes** | 1.41 | 1.42 | 1.42 | 1.42 |
| **Agriculture** | 11.55 | 10.95 | 10.00 | 10.84 |
| **Land Use, Land-Use Change, and Forestry** | 10.03 | 5.00 | 7.00 | 7.34 |
| **Waste** | 0.67 | 0.68 | 0.68 | 0.68 |
| Municipal Solid Waste | 0.57 | 0.58 | 0.58 | 0.58 |
| Wastewater | 0.10 | 0.10 | 0.10 | 0.10 |
| **Indirect $CO_2$ from Electricity Consumption** | 6.37 | 7.47 | 7.68 | 7.18 |
| **Gross Emissions** | **52.32** | **48.87** | **51.04** | **50.74** |

*Note: Emissions from electricity consumption are not included in totals to avoid double counting with Fossil Fuel Combustion estimates.* (Department of Environmental Quality, 2025)

## *Other present cumulative impacts*

Related future actions under cumulative impacts must also be considered when these actions are under concurrent consideration by any state agency through preimpact statement studies, separate impact statement evaluation, or permit processing procedures under MEPA. DEQ would consider projects within the scope of the related future actions that are not part of **Table 2** and **Table 3**, GHG emissions would be the natural gas generating plant proposed by NorthWestern Energy-Laurel Generating Station, now the Yellowstone County Generating Station under the Montana Air Quality Permit Application Number 5261-00 issued on September 8, 2021. The Yellowstone County Generating Station annual GHG emissions total from all engines at the facility would be approximately 695,195 metric tons of $CO_2e$ (MT DEQ, 2025).

## *Direct Impacts:*

The combustion of diesel fuel for the Proposed Action would release GHGs primarily being carbon dioxide ($CO_2$), nitrous oxide ($N_2O$) and much smaller concentrations of non-combusted fuel components including methane ($CH_4$) and other volatile organic compounds. For its analysis of direct impacts from GHGs at AM5, DEQ calculates potential GHG emissions and provides a narrative description of GHG impacts rather than assess GHGs in quantitative economic terms. This approach is consistent with Montana Supreme Court precedent. *See Belk v. Mont. DEQ*, 2022 MT 38, ¶ 29.

The Proposed Action would authorize the use of various equipment and vehicles to mine and process coal and reclaim the site. Surface coal mines typically use large-scale equipment such as draglines, electric or hydraulic shovels, front-end loaders, haul trucks, bulldozers, and drilling and blasting equipment to remove overburden and extract coal efficiently. The expected duration of the project proposed in AM5 is approximately 22 years.

Reclamation timing for the permit area aligns with a 2-year window post mining required in ARM 17.24.501(6)(b) stating, "Backfilling and grading must be completed within two years after coal removal from each pit has been concluded. For the purpose of this provision, 'each pit' means any continuous dragline pass within a particular permit area." Historic annual fuel utilization was assigned entirely to the 2-years after mining has concluded to account for reclamation efforts.

The amount of diesel fuel utilized at this site may be impacted by several factors including seasonal weather impediments and equipment malfunctions. To ensure a comprehensive assessment, DEQ assumed the maximum amount of diesel combusted at the combined Rosebud mines from 2016 to 2021 to calculate an annual average amount (4,148,797 gallons/year) to assess the amount of greenhouse gas emissions resulting from mobile sources in the proposed AM5. The yearly fuel consumption includes associated transport of coal to transfer facilities for delivery to the Colstrip Power Plant. This methodology allowed for assignment of diesel gallons necessary per ton of coal extracted (0.544 gallons/ton). To account for impacting factors, DEQ has calculated the range of emissions using a factor of +10% of the estimate calculated using the predicted diesel fuel usage for on-site equipment provided by the Applicant. The emissions from workers daily commute between the Rosebud Mine and their residences would be included into the range factor of +10% of the estimate calculated of on-site equipment. By assuming maximum fuel use, any additional GHG emissions from incidental use of gasoline or other vehicles during operation of the mine would be accounted for within the GHG emission assessment.

The exposing of the coal seam produces fugitive methane emissions. Fugitive methane emissions of all AM5 coal mined were included in the analysis utilizing a methane production rate of 33.1 standard cubic feet/ton (U.S. Environmental Protection Agency, 2005) and a methane density of 0.0477 $lb/ft^3$ (0.7168 $kg/m^3$) at standard temperature and pressure (The Engineering Toolbox, 2025). All coal produced in the AM5 permit area was calculated to produce 0.0188 CO2e/short ton.

Blasting emissions were calculated into the overall carbon dioxide equivalent ($CO_2e$) with nitrous oxide ($N_2O$) being the primary fugitive gas impacting calculations. Explosives used in the permit area are assumed to align with products used at neighboring permit sites within Rosebud properties. An EPA publication for explosive emission factors was used in analyzing overall blasting impacts within the permit areas (United States Environmental Protection Agency, 2025a). Powder factors utilized in calculations for coal and overburden were provided by Westmoreland Rosebud Mining, LLC (Westmoreland Rosebud, 2025).

Operation of diesel/gasoline-fueled vehicles throughout the life of the proposed project would produce exhaust fumes containing GHGs. Using data provided by Westmoreland Rosebud Mining, LLC (Westmoreland Rosebud, 2025), DEQ estimates that approximately 0.544 gallons of fuel would be utilized per short ton of coal mined. To account for variability, DEQ has calculated the range of emissions using a factor of +10% of the baseline estimate. Using the ESGC mobile sources, approximately 1.733 metric tons (1,733 kilograms) of $CO_2e$ would be produced per short ton of coal mined.

**Table 4** provides a summary of direct impacts and $CO_2e$ associated with each year of AM5 coal production and reclamation for the entire duration of the Proposed Action. The estimates in **Table 4** are based on Table E-2, Alternative 3 – Estimated Annual Production in Area B (as Modified by AM5) by Year and Acres Disturbed listed in the Final Environmental Impact Statement (Department of Environmental Quality, 2022b). Table E-2 includes production tons for AM5 and the remaining tons in the Area B permit; years 1 through 10 of active mining were adjusted to remove production values not specific to AM5. All

coal produced from Area B after year 10 is identified in Westmoreland's life of mine timetable to be only from the AM5 permit area (Westmoreland Rosebud Mining, 2023).

**Table 4. Summary of direct impacts of CO2e for each year of AM5 coal production and reclamation.**

| Year of Active Mining | Coal Production (short tons/year) | Greenhouse Gas Emissions (metric tons/year) ($CO_2e$) | | | | |
|---|---|---|---|---|---|---|
| | | Mining Production | Reclamation | Exposed Coal | Blasting | Total Emissions (metric tons/year) ($CO_2e$) |
| 1 | 367,928 | 2,310 | 0 | 6,913 | 2,064 | 11,287 |
| 2 | 379,648 | 2,384 | 0 | 7,133 | 2,130 | 11,647 |
| 3 | 818,616 | 5,140 | 0 | 15,380 | 4,593 | 25,113 |
| 4 | 272,872 | 1,713 | 0 | 5,127 | 1,531 | 8,371 |
| 5 | 355,920 | 2,235 | 0 | 6,687 | 1,997 | 10,919 |
| 6 | 272,872 | 1,713 | 0 | 5,127 | 1,531 | 8,371 |
| 7 | 261,008 | 1,639 | 0 | 4,904 | 1,464 | 8,007 |
| 8 | 320,328 | 2,011 | 0 | 6,018 | 1,797 | 9,826 |
| 9 | 605,064 | 3,799 | 0 | 11,368 | 3,394 | 18,561 |
| 10 | 545,744 | 3,427 | 0 | 10,254 | 3,062 | 16,743 |
| 11 | 4,500,000 | 28,256 | 0 | 84,547 | 25,245 | 138,048 |
| 12 | 3,200,000 | 20,093 | 0 | 60,122 | 17,952 | 98,167 |
| 13 | 4,400,000 | 27,628 | 0 | 82,668 | 24,684 | 134,980 |
| 14 | 2,200,000 | 13,814 | 0 | 41,334 | 12,342 | 67,490 |
| 15 | 3,500,000 | 21,977 | 0 | 65,759 | 19,635 | 107,371 |
| 16 | 4,200,000 | 26,372 | 0 | 78,910 | 23,562 | 128,844 |
| 17 | 3,500,000 | 21,977 | 0 | 65,759 | 19,635 | 107,371 |
| 18 | 6,600,000 | 41,441 | 0 | 124,002 | 37,027 | 202,470 |
| 19 | 3,900,000 | 24,488 | 0 | 73,274 | 21,879 | 119,641 |
| 20 | 2,700,000 | 16,953 | 0 | 50,728 | 15,147 | 82,828 |
| 21 | 0 | 0 | 47,863 | 0 | 0 | 47,863 |
| 22 | 0 | 0 | 47,863 | 0 | 0 | 47,863 |

As depicted in **Table 3,** Montana's statewide Coal Mining contributes about 430,000 metric tons of $CO_2e$ year. While the Proposed Action's direct impacts from coal mining would contribute a low of 8,317 metric tons of CO2e to a high of 202,470 metric tons of $CO_2e$ (**Table 4**). Coal production numbers fluctuate and would contribute differently each year.

Because the effects of GHG emissions—warming temperatures and accompanying environmental consequences—are necessarily felt later in time and even, potentially, in location, there are no direct impacts expected with the release of GHG emissions.

### *Secondary and Cumulative Impacts:*

Secondary impacts mean a further impact to the Montana environment that may be stimulated or induced by or otherwise result from a direct impact of the Proposed Action under MEPA. All coal produced each year of active mining is assumed to be combusted at the at the Colstrip Power Plant. As described above, for purposes of this remand, DEQ is including the combustion of the coal from the Proposed Action at the Colstrip Power Plant would as a secondary impact; emissions for each year are quantified by $CO_2e$ metric tons in **Table 5**.

**Table 5. Secondary impacts of the combustion of coal at the Colstrip Power Plant of the Proposed Action mined coal.**

| Year of Active Mining | Coal Production (short tons/year) | Greenhouse Gas Emissions (metric tons/year) (CO2e) |
|---|---|---|
| | | Total Combustion of Proposed Action Coal at Colstrip Power Plant |
| 1 | 367,928 | 625,478 |
| 2 | 379,648 | 645,402 |
| 3 | 818,616 | 1,391,647 |
| 4 | 272,872 | 463,882 |
| 5 | 355,920 | 605,064 |
| 6 | 272,872 | 463,882 |
| 7 | 261,008 | 443,714 |
| 8 | 320,328 | 544,558 |
| 9 | 605,064 | 1,028,609 |
| 10 | 545,744 | 927,765 |
| 11 | 4,500,000 | 7,650,000 |
| 12 | 3,200,000 | 5,440,000 |
| 13 | 4,400,000 | 7,480,000 |
| 14 | 2,200,000 | 3,740,000 |
| 15 | 3,500,000 | 5,950,000 |
| 16 | 4,200,000 | 7,140,000 |
| 17 | 3,500,000 | 5,950,000 |
| 18 | 6,600,000 | 11,220,000 |
| 19 | 3,900,000 | 6,630,000 |
| 20 | 2,700,000 | 4,590,000 |

GHG emissions contribute to changes in atmospheric radiative forcing, resulting in climate change impacts. GHGs act to contain solar energy loss by trapping longer wave radiation emitted from the Earth's surface and act as a positive radiative forcing component (Bureau of Land Management (BLM), 2024).

A tool used to assist in the analysis of secondary climate impacts from project-level emissions is the Methods for Attributing Climate Impacts of GHG Emissions (MAGICC) (Climate Resource, 2022) model to calculate the secondary impacts of GHGs. The MAGICC model is a peer-reviewed reduced-complexity model created to integrate various climate system interactions, including the carbon cycle, climate feedback loops, and radiative forcing to simulate the effects of changing GHG emissions on atmospheric composition, radiative forcing, and global mean temperature change (Meinshausen, Raper, & Wigley, 2011). MAGICC is particularly advantageous because it emulates the complex and computationally intensive climate models efficiently (Department of Environmental Quality, 2025).

MAGICC uses representative concentration pathways (RCPs) to emulate future scenarios with varying degrees of GHG emission mitigation that result in predicted future changes in radiative forcing in terms of watts per square meter ($W/m^2$). For example, RCP2.6 is representative of a sustainable GHG mitigation scenario that results in a radiative forcing increase of 2.6 $W/m^2$ between the years 1750 and 2100. In contrast, RCP8.5 is representative of a high GHG emission scenario that results in a radiative forcing increase of 8.5 $W/m^2$ between the years 1750 and 2100. For this analysis, DEQ chose to evaluate secondary impacts using both the RCP2.6 and RCP8.5 pathways because these scenarios span a range from high to low GHG emission mitigation, respectively. Importantly, testing two scenarios with significantly different GHG mitigation ensures that the nonlinear nature of induced climate impacts is conservatively estimated. In other words, the variable atmospheric concentration of GHGs over time affects the magnitude of impacts from a new source of emissions, as does the timing of the release of new GHG emissions from the proposed source. For example, the impacts of a GHG emission source are often greater in a sustainable (high mitigation) scenario such as RCP2.6 because the scenario assumes that global GHG emission rates decrease over time to a greater degree than most higher emission scenarios. The proposed source of emissions is therefore more impactful because it may represent an increasingly greater share of global emissions.

To estimate future surface temperature change resulting from the Proposed Action's emissions, DEQ ran the MAGICC model for each RCP using both unmodified (base) emission scenarios and modified emission scenarios with the Proposed Action's emissions subtracted. By comparing the results of the base and modified scenarios, it's possible to estimate the predicted future change in temperature that is attributable to the Proposed Action's emissions.

First, the total $CO_2e$ emissions in **Table 4** and **Table 5** were summed by year and subtracted from the RCP2.6 and RCP8.5 base scenarios. DEQ determined emissions from mining and reclamation (**Table 4**) would be so low relative to emissions from the combustion of the coal (**Table 5**) that it was decided to combine these emission sources rather than evaluate their secondary impacts separately with the MAGICC model. It was assumed that the 20 years of active mining and 2 years of reclamation emissions correspond to the years 2022 to 2043. The emission input files for the online version of MAGICC contain global GHG emissions by GHG species for every decade rather than every year between 2020 and 2100, so the $CO_2e$ emissions in were temporally allocated using a forward-looking 10-year average. For example, the Proposed Action's emissions for 2020 to 2029 were averaged and assumed to be representative of the 2020 emission anchor point in the model.

After the temporally allocated emissions were subtracted from the base scenarios, the model was run using probabilistic mode with the modified RCP2.6 and RCP8.5 emission input files. Running the model in probabilistic mode iterates the model run more than 100 times with slightly different internal parameters, resulting in a distribution of results. The default model output provides the predicted surface temperature increase above the 1850 to 1900 baseline period for every year between 1995 and

2100, and the annual temperature value produced is equal to the median value of the results distribution for that year. The base RCP2.6 and RCP8.5 scenarios (i.e., no emissions subtracted) were also run using probabilistic mode.

For each RCP scenario, the surface temperature results by year in the modified emission scenario were subsequently subtracted from the base emission scenario results, resulting in the increase above baseline future temperature change (ΔT) that can be attributed to the Proposed Action (**Table 6**). The final results for mid-century (2050), end-of-century (2100), and maximum impacts are displayed, indicating that the Proposed Action may result in maximum warming up to 0.00004 °C, or 0.000072 °F. This maximum ΔT value corresponds to the year(s) in each scenario when the difference between the base and modified emission scenarios is expected to be greatest (i.e., when the Proposed Action's emissions have the greatest impact). Due to the extremely marginal differences between base and modified emission scenarios and the probabilistic nature of the results, the maximum ΔT value may occur multiple times over a range of years. Thus, results indicate that the maximum ΔT value may occur as early as 2045 and as late as 2072 (**Table 6**).

**Table 6. MAGICC Model Surface Temperature Results**

| Scenario | ΔT by 2050 (°C) | ΔT by 2100 (°C) | ΔT Maximum (°C) | ΔT Max Year* |
|---|---|---|---|---|
| RCP2.6 | 0.000035 | 0.000030 | 0.000040 | 2045-2072 |
| RCP8.5 | 0.000030 | 0.000030 | 0.000040 | 2065 |

*The year(s) that the Proposed Action's maximum temperature impacts (ΔT °C) occur

Montana recently used the EPA SIT to develop a greenhouse gas inventory in conjunction with preparation of a possible grant application for the Community Planning Reduction Grant program. This tool was developed by EPA to help states develop their own greenhouse gas inventories, and the tool relies upon data collected by the federal government through various agencies. The inventory specifically includes carbon dioxide, methane, and nitrous oxide and reports the total as $CO_2e$. The SIT consists of eleven Excel based modules with pre-populated data that can be used with default settings or, in some cases, allows states to input their own data when the states believe their own data provides a higher level of quality and accuracy. Once each of the eleven modules is completed, the data from each module is exported into a final "synthesis" module which summarizes the data into a single file. Within the synthesis file, several worksheets display output data in various formats such as GHG emissions by sector and GHG emissions by type of greenhouse gas.

DEQ has determined that the use of the default data provides a reasonable representation of the GHG inventory for the various state sectors, and of the estimated total annual GHG inventory. The SIT data from EPA is currently updated through the year 2022, as it takes several years to validate and make new data available within revised modules. DEQ maintains a copy of the output results of the SIT. Presently, Montana emits approximately 51.04 million metric tons of $CO_2$ annually (Department of Environmental Quality, 2025).

The AM5 project is estimated to contribute a low of 47,863 to a high of 7,614,980 metric ton of $CO_2e$ as shown in **Table 7**, which uses the values and assumptions described for **Table 4**. This contribution results from the continued operation of the mine, which supplies coal to keep the Colstrip generating station at a fully utilized level. Coal combustion already accounts for a large portion of the state's total emissions,

contributing approximately 25% (or 12.53 million metric tons) of Montana's annual $CO_2e$ emissions. The emissions associated with AM5 primarily serve to extend the mine life and would maintain the existing level of coal-related $CO_2e$ emissions already factored into the state's inventory, rather than represent a new increase in the coal sector's overall percentage share.

**Table 7. Cumulative AM5 Greenhouse Gas Impact Summary.**

| Year of Active Mining | Coal Production (short tons/year) | Greenhouse Gas Emissions (metric tons/year) ($CO_2e$) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Mining Production | Reclamation | Exposed Coal | Blasting | Combustion | Total Emissions (metric tons/year) ($CO_2e$) |
| 1 | 367,928 | 2,310 | 0 | 6,913 | 2,064 | 625,478 | 636,765 |
| 2 | 379,648 | 2,384 | 0 | 7,133 | 2,130 | 645,402 | 657,048 |
| 3 | 818,616 | 5,140 | 0 | 15,380 | 4,593 | 1,391,647 | 1,416,760 |
| 4 | 272,872 | 1,713 | 0 | 5,127 | 1,531 | 463,882 | 472,253 |
| 5 | 355,920 | 2,235 | 0 | 6,687 | 1,997 | 605,064 | 615,983 |
| 6 | 272,872 | 1,713 | 0 | 5,127 | 1,531 | 463,882 | 472,253 |
| 7 | 261,008 | 1,639 | 0 | 4,904 | 1,464 | 443,714 | 451,721 |
| 8 | 320,328 | 2,011 | 0 | 6,018 | 1,797 | 544,558 | 554,384 |
| 9 | 605,064 | 3,799 | 0 | 11,368 | 3,394 | 1,028,609 | 1,047,171 |
| 10 | 545,744 | 3,427 | 0 | 10,254 | 3,062 | 927,765 | 944,507 |
| 11 | 4,500,000 | 28,256 | 0 | 84,547 | 25,245 | 7,650,000 | 7,788,048 |
| 12 | 3,200,000 | 20,093 | 0 | 60,122 | 17,952 | 5,440,000 | 5,538,167 |
| 13 | 4,400,000 | 27,628 | 0 | 82,668 | 24,684 | 7,480,000 | 7,614,980 |
| 14 | 2,200,000 | 13,814 | 0 | 41,334 | 12,342 | 3,740,000 | 3,807,490 |
| 15 | 3,500,000 | 21,977 | 0 | 65,759 | 19,635 | 5,950,000 | 6,057,371 |
| 16 | 4,200,000 | 26,372 | 0 | 78,910 | 23,562 | 7,140,000 | 7,268,845 |
| 17 | 3,500,000 | 21,977 | 0 | 65,759 | 19,635 | 5,950,000 | 6,057,371 |
| 18 | 6,600,000 | 41,441 | 0 | 124,002 | 37,027 | 11,220,000 | 11,422,470 |
| 19 | 3,900,000 | 24,488 | 0 | 73,274 | 21,879 | 6,630,000 | 6,749,641 |
| 20 | 2,700,000 | 16,953 | 0 | 50,728 | 15,147 | 4,590,000 | 4,672,829 |
| 21 | 0 | 0 | 47,863 | 0 | 0 | 0 | 47,863 |
| 22 | 0 | 0 | 47,863 | 0 | 0 | 0 | 47,863 |
| ***Total*** | **42,900,000** | **269,370** | **95,726** | **806,013** | **240,673** | **72,930,000** | **74,341,782** |

As identified previously in this section, the MAGGIC model results indicate that the proposed action may result in warming up to 0.00004°C or 0.000072°F by 2045, or approximately 0.00002°C per decade. Montana's temperature has risen by approximately 2.5°F (1.4°C) from 1900 to 2020 (NOAA, 2022), and it's expected to increase approximately another 2.5°F (1.4°C) between 2020 and 2050 (Alder & Hostetler, 2013). This equates to roughly 0.46 °C of warming per decade over this future period in Montana. Therefore, the Proposed Action would account for 0.004% of Montana's warming over the next decade.

In Montana, the BLM Specialist Report states that higher global surface temperatures may result in hotter temperatures, longer growing seasons, decreases in snowpack, and drier forests resulting in increased likelihood of forest fires and insect outbreaks (Bureau of Land Management (BLM), 2024). The Fifth National Climate Assessment, which encompasses Montana, Wyoming, North Dakota, South Dakota, and Nebraska states that the Great-Plains states are already experiencing climate impacts such as reduced peak streamflow, more intense spring storms, and increased localized drought. (Knapp, 2023) The Montana Climate Assessment (Whitlock, 2017) discussed similar climate impacts, and includes a special report, 2021 Climate Change and Human Health in Montana, that provides comprehensive data on Montana's current health profile, including how populations' health may be impacted (Adams, 2021). Those health-related impacts on Montanans may include increased risk of heat exhaustion, heat stroke, and worsening of chronic conditions such as respiratory diseases, cardiovascular issues, and kidney disease (Adams, 2021). Poor air quality may result from increased wildfires, creating harmful breathing conditions (Adams, 2021). Additionally, water quality may be impacted due to increased risk of flood that could contaminate water sources, contributing to water-borne illness and decrease in species that communities rely on for subsidence.

Due to the inherent cumulative and global nature of climate change, it is difficult to link one source of GHG emissions to a specific environmental impact. Carbon dioxide ($CO_2$) and other GHGs become well mixed in the atmosphere within a year due to atmospheric circulation, meaning that GHG emissions from one region are incorporated worldwide within that timeframe (NOAA, 2025; United States Environmental Protection Agency, 2025b; United States Environmental Protection Agency, 2025c). This global mixing blurs regional signals, making it very difficult to trace atmospheric concentrations back to specific emissions sources and is the reason GHGs cause widespread global climate effects independent of where they are emitted. Therefore, tracing specific local outcomes (e.g., a Montana heatwave) back to any single project is not possible with available technology. Nevertheless, every project's GHG emissions incrementally add to global GHGs and, thus, to cumulative climate impacts. Due to the inherent cumulative and global nature of climate change, it is difficult to link one source of GHG emissions to a specific environmental impact.

## SIGNIFICANCE OF POTENTIAL IMPACTS

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

*1. The severity, duration, geographic extent, and frequency of the occurrence of the impact.*

The Proposed Action's individual contribution to climate change is determined to be not significant. As detailed in the cumulative impacts section, the action would account for a negligible fraction of the total warming in Montana over the next decade (roughly 0.46 °C), contributing only 0.004% (or approximately 0.00002°C). This is not to downplay the effects of GHG emissions. Rather, given the wide dispersion of greenhouse gas effects, the resulting climate impacts are globally indistinguishable and non-differentiable. Consequently, the Proposed Action's individual emissions are insufficient to cause a significant impact on climate systems. The severity, duration, geographic extent and frequency of the occurrence of the impacts are addressed in turn:

- Severity: The project's contribution of GHG emissions would not be distinguishable on a global or local scale. The estimate of global warming that would result from AM5 is approximately 0.00002°C per decade, or 0.004% of Montana's projected warming over the next decade. GHG

emissions incrementally add to global GHGs and, thus, to cumulative climate impacts. However, the Proposed Action would not induce attributable climate impacts.

- Duration: While the GHG impacts are long-term (over decades and centuries), the Proposed Action's duration of 22 years is finite. The impact would not be permanent on the global climate system because global emission impacts are continuous and cumulative, and the Proposed Action's commencement or cessation would not meaningfully alter the long-term trend.

- Geographic Extent: The emissions would originate in Montana, but their ultimate impact (change in climate systems) is global in nature. Because the impacts are not concentrated in the immediate AM5 area in Montana, the project's contribution of GHGs would be indistinguishable from the background of statewide and global GHG emissions, and the contribution would not alter the frequency or intensity of climate events in the AM5 area or Montana.

- Frequency of Occurrence: The emission of GHGs would occur continuously for the life of the mine (22 years), as long as coal is mined, transported, and combusted. While the activity is frequent, the resulting impact on climate systems would not be significantly increased by the Proposed Action because the project would not alter the frequency or intensity of climate events.

2. *The probability that the impact will occur if the proposed action occurs; or conversely, reasonable assurance in keeping with the potential severity of an impact that the impact will not occur.*

The probability that the proposed project would contribute to GHGs is certain. However, as discussed in the Cumulative Impacts section, the severity of the additional greenhouse gas contributions is low to the overall warming of Montana. The yearly addition of $CO_2e$ from mining, combustion and transportation would result in an increase of Montana temperatures by approximately 0.00004°C over the lifespan (22 years) of the Proposed Action.

3. *Growth-inducing or growth-inhibiting aspects of the impact, including the relationship or contribution of the impact to cumulative impacts.*

The proposed mining activities by the applicant would not have any growth-inducing or growth-inhibiting aspects, or significant contribution to cumulative impacts. The Proposed Action's GHG emissions, which are primarily associated with the continued, full-capacity operation of an existing power plant (Colstrip) would not induce new regional or national growth. The Proposed Action maintains the current power generation output and existing economic activity tied to the facility. The Proposed Action's contribution to global GHG concentrations does not meaningfully alter the probability or severity of climate-related events at a scale that would inhibit economic growth either locally or globally.

4. *The quantity and quality of each environmental resource or value that would be affected, including the uniqueness and fragility of those resources and values.*

The Proposed Action does not impact any resources that are considered unique or fragile within the context of the project area. The area where mining activities occur is part of an existing, long-term operational mine complex and is already subject to current disturbance and reclamation requirements. Regarding climate, the project's contribution to global climate change is marginal (0.00004°C of warming over the lifespan of the Proposed Action). This minimal fraction does not constitute a measurable effect

on the quantity and quality of the stable global climate system, nor does it impact the integrity of any localized environmental resource.

5. *The importance to the state and to society of each environmental resource or value that would be affected.*

Although environmental resources and the value of a stable climate system are of the highest importance to the state and society, the Proposed Action, by maintaining the existing coal combustion baseline at the Colstrip Power Plant, has a marginal impact global GHG emissions.

6. *Any precedent that would be set as a result of an impact of the proposed action that would commit the department to future actions with significant impacts or a decision in principle about such future actions.*

Issuance of an operating permit to the applicant does not set any precedent that commits DEQ to future actions with significant impacts or a decision in principle about such future actions. This supplemental EA conducted for this specific permitting action, including an analysis of coal combustion and transportation emissions, is performed pursuant to a voluntary remand. This voluntary analysis does not constitute a decision in principle or set a binding precedent requiring DEQ to analyze coal combustion or transportation emissions in its review of operating permit applications under the Montana Strip and Underground Mine Reclamation Act (MSUMRA). Specifically, DEQ is not currently required to analyze end-use coal combustion for MSUMRA operating permits, and this action does not commit or require DEQ to conduct such an analysis for other or future permit applications. If the applicant submits another operating permit, amendment, or revision application to conduct additional mining, DEQ is not committed to issuing those authorizations. Pursuant to MEPA, DEQ would conduct an environmental review for any subsequent authorizations sought by the applicant that require environmental review. DEQ would make a permitting decision based on the criteria set forth in the MSUMRA.

7. *Potential conflict with local, state, or federal laws, requirements, or formal plans.*

The Proposed Action would not have any growth-inducing or growth-inhibiting aspects that would conflict with any local, state, or federal laws, requirements, or formal plans. The Proposed Action is an addition to an operational mine, the scope of the regulatory review focuses primarily on the expansion area, which adheres to the same legally-mandated operational standards as the existing mine.

## PREPARATION

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## REFERENCES

Adams, A. B. (2021). *Climate change and human health in Montana: a special report of the Montana Climate Assessment.* Bozeman MT: Montana State University, Institute on Ecosystems, Center for American Indian and Rural Health Equity.

Alder, J., & Hostetler, S. (2013). *USGS National Climate Change Viewer. US Geological Survey*. doi:10.5066/F7W9575T

Bureau of Land Management (BLM). (2024). *2023 BLM Specialist Report on Annual Greenhouse Gas Emissions and Climate Trends from Coal, Oil, and Gas Exploration and Development on the Federal Mineral Estate.*

Climate Resource. (2022). *MAGICC*. Retrieved from https://magicc.org/.

Denning, A. (June 21, 2017). Simple, Serious, and Solvable: Climate Change Communication for Public Audiences. *American Meteorological Society 45th Conference on Broadcast Meteorology.* Kansas City, MO.

Department of Environmental Quality. (2022a). *Rosebud Mine Area B AM5 Final Environmental Impact Statement.*

Department of Environmental Quality. (2022b). *Rosebud Mine Area B AM5 Final Environmental Impact Statement Appendix E.*

Department of Environmental Quality. (2025). *Draft Guidance for Greenhouse Gas Impact Assessments Under the Montana Environmental Policy Act: Appendix 4 Cumulative Impacts of GHG.* Helena: Department of Environmental Quality.

Environmental Protection Agency. (2025). *EPA Simplified GHG Emissions Calculator*. Retrieved from https://www.epa.gov/climateleadership/simplified-ghg-emissions-calculator

IPCC. (2014). *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.*

IPCC. (2021). *Climate change 2021: the physical science basis. Contribution of Working Group I to the SIxth Assessment Report of the Intergovernmental Panel on Climate Change.* doi:10.1017/9781009157896.

Knapp, C. e. (2023). *Northern Great Plains. In: Fifth National Climate Assessment.* Washington, DC, USA: U.S. Global Change Research Program.

Meinshausen, M., Raper, S., & Wigley, T. (2011). Emulating coupled atmosphere-ocean and carbon cycle models with a simpler model, MAGICC6 - Part 1. *Atmospheric Chemistry and Physics*.

MT DEQ. (2025, August 1). *Final Supplemental EA.* Retrieved 10 13, 2025, from MT DEQ: https://deq.mt.gov/files/Air/AirQuality/Documents/ARMpermits/5261-00_Final_EA.pdf

NOAA. (2022). *State Climate Summaries 2022 150-MT.* Retrieved from NOAA National Centers for Environmental Information: https://statesummaries.ncics.org/downloads/Montana-StateClimateSummary2022.pdf

NOAA. (2025). *What is the Global Greenhouse Gas Reference Network?* . Retrieved from https://gml.noaa.gov/ccgg/about.html

NorthWestern Energy. (2023). *NorthWestern Energy's Montana Integrated Resource Plan.* Retrieved October 15, 2025, from NorthWestern Energy: https://northwesternenergy.com/docs/default-source/default-document-library/about-us/erp-irp/2023_montana_irp_final.pdf?Status=Master/2023_Montana_IRP_Final.pdf

Office of Surface Mining Reclamation and Enforcement (OSMRE). (2025, August 4). *Rosebud Mine Area F Final Supplemental Environmental Impact Statement.* Retrieved October 13, 2025, from OSMRE.Gov: https://www.osmre.gov/sites/default/files/inline-files/FSEIS_RosebudMineAreaF_2024_08_04.pdf

The Engineering Toolbox. (2025, October 8). *Density of Gases*. Retrieved from The Engineering Toolbox: https://www.engineeringtoolbox.com/gas-density-d_158.html

U.S. Environmental Protection Agency. (2005). *U.S. Surface Mines Emissions Assessment.* U.S. EPA Coalbed Methane Outreach Program.

United States Environmental Protection Agency. (2025a, October 8). *AP 42, Fifth Edition, Volume I Chapter 13: Miscellaneous Sources*. Retrieved from Environmental Protection Agency: https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-fifth-edition-volume-i-chapter-13-miscellaneous-0

United States Environmental Protection Agency. (2025b, October 8). *Scopes 1, 2 and 3 Emissions Inventorying and Guidance*. Retrieved from United States Environmental Protection Agency: https://www.epa.gov/climateleadership/scopes-1-2-and-3-emissions-inventorying-and-guidance#:~:text=EPA%27s%20scope%201%20and%20scope,boilers%2C%20furnaces%2C%20vehicles).

United States Environmental Protection Agency. (2025c, October 8). *Climate Change Indicators*. Retrieved from United States Environmental Protection Agency: https://www.epa.gov/climate-indicators/greenhouse-gases

Westmoreland Rosebud. (2025, September 29). personal communication.

Westmoreland Rosebud Mining. (2023). *17.24.303(1)(s) Life of Mine - Estimated Mining Table MR106.*

Whitlock, C. C. (2017). *2017 Montana Climate Assessment.* Bozeman and Missoula MT: Montana State University and University of Montana, Montana Institute on Ecosystems. .