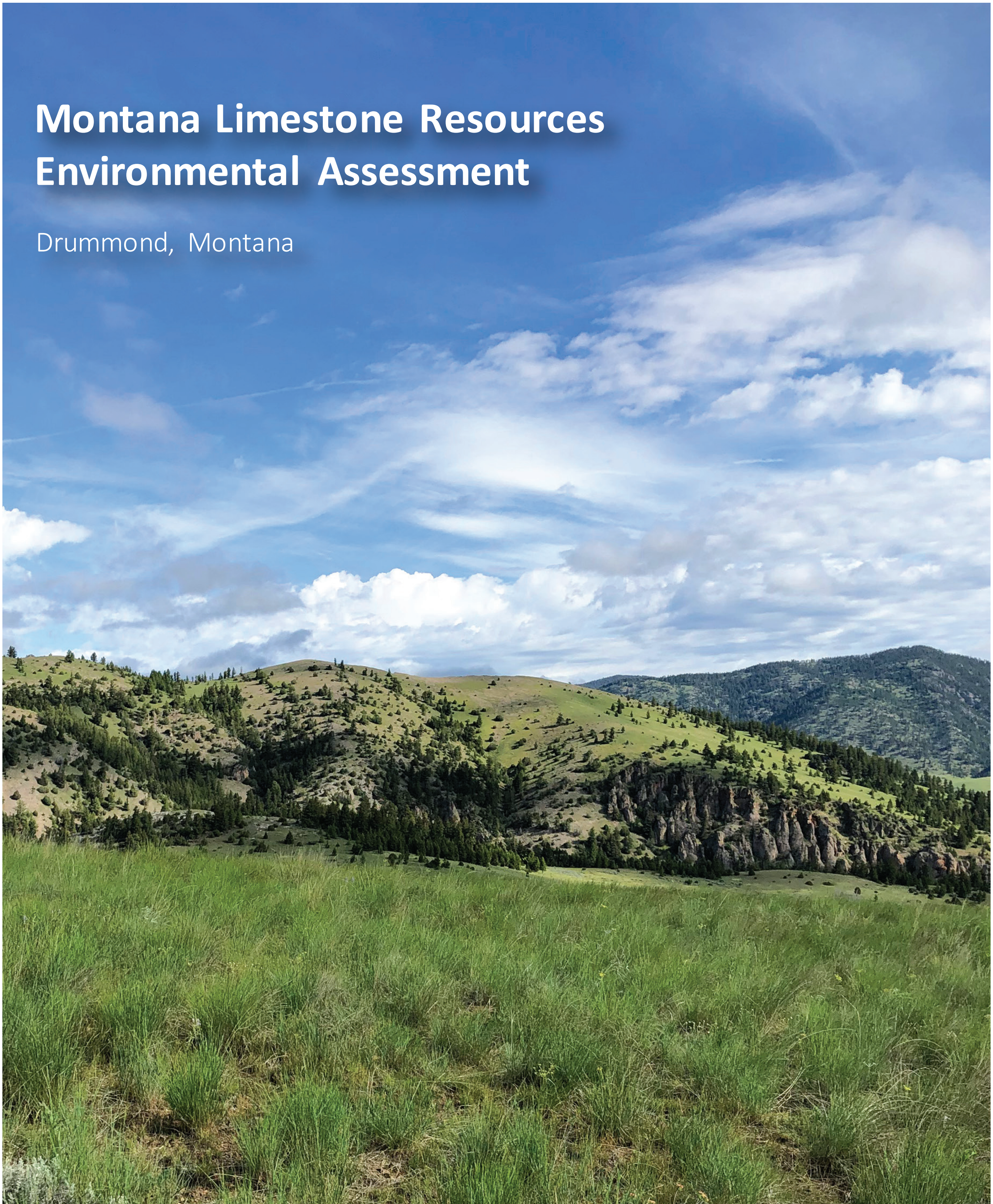
Montana Limestone Resources Environmental Assessment

Drummond, Montana



DEQ
Montana Department of Environmental Quality

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List of Acronyms

°F	Fahrenheit
μg/g	micrograms per gram
$\mu g/m^3$	micrograms per cubic meter
ARM	Administrative Rules of Montana
AS	aquatic standards
bgs	below ground surface
BP	before present
CAA	Clean Air Act
$CaCO_3$	Calcium carbonate; common unit to quantify alkalinity
CF	coarse fragments
CFR	Code of Federal Regulations
cfs	cubic feet per second
CO	carbon monoxide
Corps	United States Army Corps of Engineers
CWA	Clean Water Act
dB	decibels
dBA	A-weighted decibel
dBP	unweighted peak decibels
DEQ	Montana Department of Environmental Quality
EA	Environmental Assessment
EC	electrical conductivity
EIS	Environmental Impact Statement
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act
Forest Service	United States Forest Service
gpm	gallons per minute
HHS	human health standard
hp	horsepower
I-90	Interstate 90
kg	kilogram
kV	kilovolt
L	liter
LOS	level of service
MAAQS	Montana Ambient Air Quality Standards
MCA	Montana Code Annotated
MDT	Montana Department of Transportation
MEPA	Montana Environmental Policy Act
mg	milligram
mg/m^3	milligrams per cubic meter
MLR	Montana Limestone Resources, LLC
MMRA	Metal Mine Reclamation Act
MNHP	Montana Natural Heritage Program

MPDES	Montana Pollutant Discharge Elimination System
mph	miles per hour
MW	megawatts
NA	not applicable
NAAQS	National Ambient Air Quality Standards
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NOx	nitrogen oxides
NRHP	National Register of Historic Places
O_3	ozone
Pb	lead
$PM_{2.5}$ and PM_{10}	particulate matter
ppb	parts per billion
ppm	parts per million
SH	State Highway
SHPO	State Historic Preservation Office
SMS	Scenery Management System
SO_2	sulfur dioxide
T&E	threatened and endangered
TCPs	traditional cultural properties
USBLS	United States Bureau of Labor Statistics
USC	United States Code
USCB	United States Census Bureau
USDA	United States Department of Agriculture
USDI	United States Department of the Interior
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VOC	volatile organic compounds
VP	viewpoint

SECTION 1. PURPOSE AND NEED

1.1 Introduction

On October 3, 2014, Montana Limestone Resources, LLC (MLR) submitted an Operating Permit application (Pending 00186; Application) to the Montana Department of Environmental Quality (DEQ) for the construction and operation of a proposed 546.4-acre limestone quarry (Project) located approximately 2.5 miles west of Drummond, Montana (see **Figure 1.2-1**; Project area). Revised versions of the Application were submitted to DEQ in September 2017, March 2018, and June 2018. A permit issued by DEQ would authorize MLR to develop the MLR Mine Project.

DEQ has prepared this environmental assessment (EA) to meet the requirements of the Montana Environmental Policy Act (MEPA). It analyzes the environmental impacts of two alternatives – the No Action Alternative and the Proposed Action.

A detailed Project description and history of the mine is provided in the Application, which is available online at http://deq.mt.gov/land/hardrock; a summary is provided below in **Section 1.4, Project Location and Overview**.

1.2 Purpose and Need

DEQ's purpose and need in conducting this environmental review is to act upon MLR's Application to authorize the quarrying of limestone in portions of Sections 26, 27, 34, and 35 in Township 11 North, Range 13 West in Granite County. DEQ's action on the Application is governed by the Metal Mine Reclamation Act (MMRA), Section 82-4-301, *et seq,* Montana Code Annotated (MCA).

MLR's purpose and need is to mine and process limestone, to produce lime that would be used for water quality treatment at the Berkeley Pit in Butte, Montana, over a 50-year period. The principal uses of the lime include: (1) pH control of water in flotation cells of the Montana Resources concentrator in Butte, and potentially at other ore processing plants; (2) neutralization of acidic mine water at the Montana Resources Butte operation, and potentially at other mines; and (3) other commercial purposes that may develop for the lime, rejects, or waste rock.

Benefits of the Project include the following:

- Employment of approximately 100 workers during construction of the mine, and employment of approximately 30 workers during operation of the mine;
- An increase in federal and state revenue, including taxes, royalty payments, and disbursements;
- An increase in economic support for local businesses; and
- Continued water quality treatment at the Berkeley Pit.

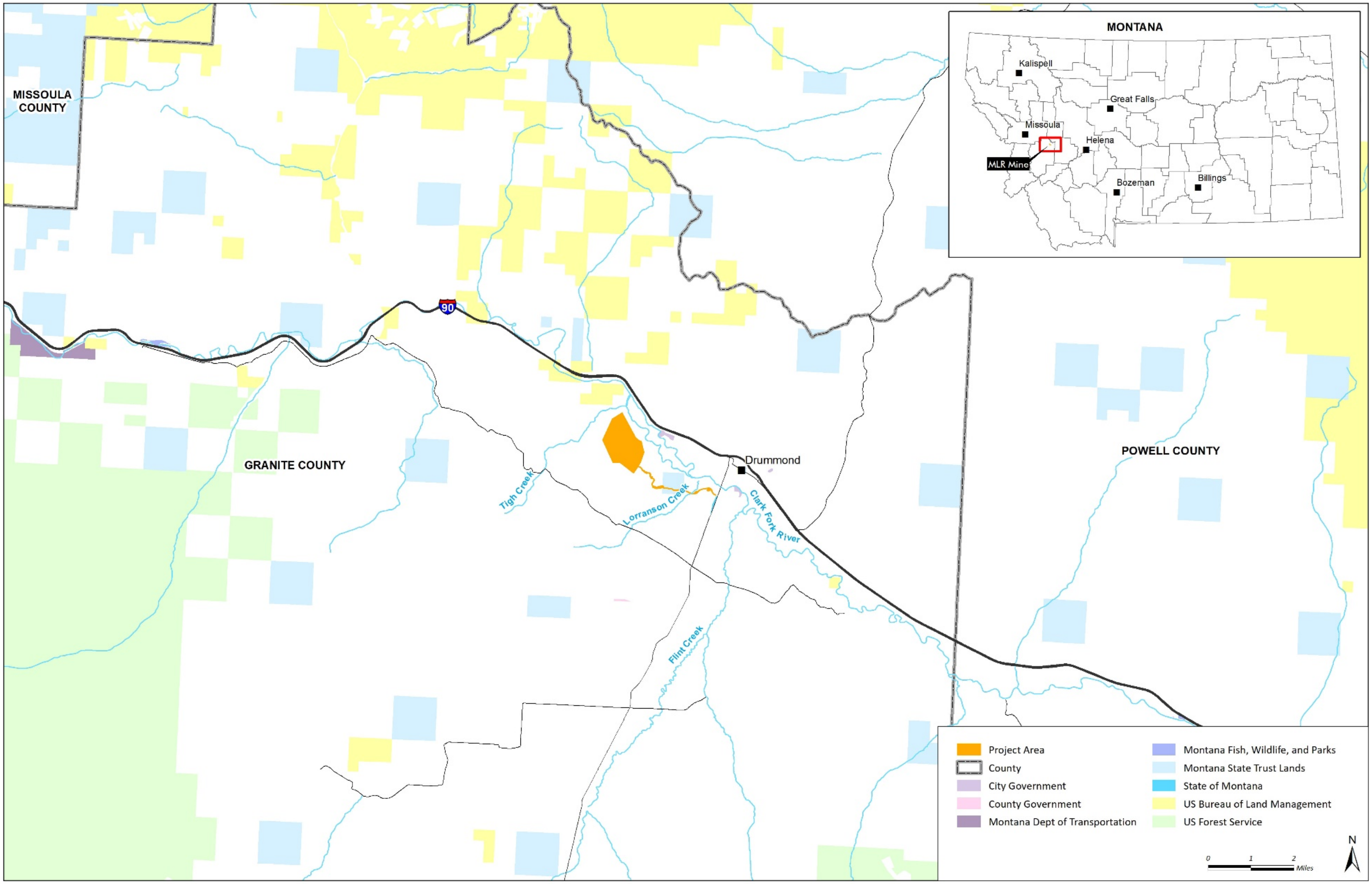

Figure 1.2-1. Project Location Map

1.3 Agency Roles and Authorizing Actions

Agency decision-making is governed by state and federal laws, including statutes, rules, and regulations, which form the legal basis for the conditions the Project must meet to obtain all necessary permits or approvals. The Montana legislature has enacted statutes and the Board of Environmental Review has adopted administrative rules defining the requirements for construction, operation, and reclamation of a mine; discharge of mining waters; discharge of air emissions; and storage of hazardous and solid wastes. DEQ is required to evaluate the Application under the laws and regulations summarized below. The major decisions to be made by DEQ are described below. **Table 1.3-1** provides a summary of state requirements; and **Table 1.3-2** provides a summary of the required federal permits, licenses, and approvals.

1.3.1 Montana Department of Environmental Quality Decisions

1.3.1.1 MMRA (Operating Permit Application Decision)

Section 82-4-337, MCA, requires DEQ to review applications for operating permits, or amendments to operating permits for completeness and compliance. Per Section 82-4-337(1)(a), MCA, DEQ must document how the applications comply with MMRA requirements. DEQ issued a draft approval for MLR's Application (Pending 00186) on May 13, 2019. MLR issued minor revisions to the Application on June 24, 2019.

The final compliance determination is made after completion of the environmental review under MEPA. Per Section 82-4-337(2)(b), MCA, DEQ may add stipulations to the final Application approval either with the MLR's consent or by providing MLR, in writing the reason for the stipulation(s), a citation to the statute or rule that gives DEQ the authority to impose the stipulation(s), and the reason that the stipulations were not contained in the draft Permit.

Per ARM 17.24.101(1), prior to receipt of an operating permit, MLR must deposit a reclamation bond with DEQ.

An application for a permit or an application for an amendment to a permit could be denied for the following reasons (Section 82-4-351, MCA):

- The plan of operation or reclamation conflicts with Section 75-2-101, *et seq*., MCA, as amended; Section 75-5-101, *et seq*., MCA, as amended; Section 75-6-101, *et seq*., MCA, as amended; or rules adopted pursuant to these laws.
- The reclamation plan does not provide an acceptable method for accomplishment of reclamation as required by the MMRA.

A denial of a permit must be in writing, state the reasons for denial, and be based on a preponderance of the evidence.

Table 1.3-1
State Permits, Licenses, and Approvals Required for the Project

Permit, License, or Approval	Relevant Law	Administrative Rule	Purpose and Procedures
Montana DEQ			
Montana Department of Environmental Quality Operating Permit	MMRA (Section 82-4-301, *et seq*., MCA)	ARM 17.24.101, *et seq.*	To regulate mining activity in the state. Proposed activities must comply with state environmental standards and criteria. Approval may include stipulations for final design of facilities and monitoring plans. An applicant must obtain a license or operating permit and deposit a reclamation bond before obtaining an exploration license or operating permit for any exploration, mining, or processing of minerals or ore.
MEPA Analysis of Impacts	Montana Environmental Policy Act (Section 75-1-101, *et seq.*, MCA)	ARM 17.4.607-608	Ensure adequate review of state actions and decisions and the associated impacts on the human environment. An EA is prepared to ensure that natural and social sciences are considered in state decision making, assist in the evaluation of reasonable alternatives, determine the need to prepare an environmental impact statement (EIS), ensure an opportunity for public review and comment, and examine and document the impacts of the proposed action on the human environment.
Montana Air Quality Permit	Clean Air Act of Montana (Section 75-2-101, *et seq.*, MCA)	ARM 17.8.740	To achieve and maintain levels of air quality that will protect human health and safety and, to the greatest degree practicable, prevent injury to plant and animal life and property. A permit is required when the proposed action meets one of the criteria listed in ARM 17.8.743(1).
Montana Title V Operating Permit	Clean Air Act of Montana (Section 75-2-101, *et seq.*, MCA)	ARM 17.8.1201	To regulate all major sources of air pollutants and consolidate all state air quality regulatory requirements. A permit is required when the proposed action meets one of the criteria listed in ARM 17.8.1204(1).
Montana Pollutant Discharge Elimination System (MPDES) Permit	Montana Water Quality Act (Section 75-5-101, *et seq.*, MCA)	ARM 17.30.101	To establish effluent limits, treatment standards, and other requirements for point source discharges, which includes storm water discharges to state waters including ground water. A MPDES permit is required when the proposed action results in a discharge as defined in ARM 17.30.102(4).
401 Certification (33 USC § 1341)	CWA	ARM 17.30.101-109	To ensure that any activity that requires a federal license or permit (such as a Section 404 permit from the Corps) complies with Montana water quality standards.

Table 1.3-1
State Permits, Licenses, and Approvals Required for the Project

Permit, License, or Approval	Relevant Law	Administrative Rule	Purpose and Procedures
Montana State Historic Preservation Office (SHPO)			
Cultural Resource Clearance	National Historic Preservation Act (NHPA) of 1966	ARM 10.121.901	The director of each state agency is responsible for complying with the Montana State Antiquities Act (Section 22-3-414 through 442, MCA), as outlined in ARM 10.121.904.

Table 1.3-2
Federal Permits, Consultations, Licenses, and Approvals Required for the Project

Permit, License, or Approval	Relevant Law	Purpose
U.S. Fish and Wildlife Service (USFWS)		
Section 404 Permit Review (33 USC § 1344)	Federal Water Pollution Control Act (Clean Water Act [CWA])	To comment on the Section 404 permit to prevent loss of or damage to fish or wildlife resources; consult with the U.S. Army Corps of Engineers (Corps)
U.S. Army Corps of Engineers		
Section 404 Permit (33 USC § 1344)	CWA	To allow the discharge of dredged or fill material into wetlands and waters of the U.S., subject to review by the U.S. Environmental Protection Agency (EPA), the Corps, USFWS, and DEQ; permittees must consult with the Montana State Historic Preservation Office (SHPO)

1.3.1.2 MEPA (Determination of Significance of Impacts, ARM 17.4.607 and 608)

DEQ will make a finding on the need for an EIS and, if applicable, an explanation of the reasons for preparing the EA. If an EIS is not required, the EA must describe the reasons the EA is an appropriate level of analysis.

1.3.1.3 Montana Water Quality Act (MPDES Decision)

To comply with Montana water quality regulations and standards, MLR must apply for and obtain a new MPDES permit. There would be no wastewater discharges from the Project, but MLR will seek authorization under the General Permits for Storm Water Discharges for both construction activities and industrial activities.

1.3.1.4 Clean Air Act of Montana (Air Quality Permit Decision)

To comply with the Clean Air Act of Montana, MLR must apply for and obtain a Montana Air Quality Permit and a Title V Operating Permit.

1.4 Project Location and Overview

1.4.1 Project Location

The Project area is in Sections 26, 27, 34, 35, and 36, Township 11 North, Range 13 West; Sections 1, 2, and 3, Township 10 North, Range 13 West; and Section 31, Township 11 North, Range 12 West of the Principal Meridian in Granite County, Montana.

1.4.2 Project Overview

The purpose of this EA is to assess the potential impacts of the Application for construction and operation of the Project. If approved, the Operating Permit would allow MLR to construct and operate a limestone mine on property owned by Washington Limestone, LLC.

The Project would consist of a pit, plant, waste stockpiles, topsoil stockpiles, impoundments, haul roads, and an access road from State Highway (SH) 1 to the mine. The permit area for the Project is 546.4 acres, with the mine and plant permit area consisting of 505.8 acres and the access road permit area consisting of 40.6 acres. The Project would disturb 209 acres within the permit boundary (see **Figure 1.4-1**).

1.4.3 Public Involvement and Issue Identification

1.4.3.1 Scoping

Public scoping provides an opportunity for public and agency involvement during the early planning stages of the environmental review. The intent of the scoping process is to gather comments, concerns, and ideas from those who have an interest in, or who may be affected by, the Proposed Action. Several methods were used to inform the public and solicit comments. These methods included a press release, legal notice, and distribution of a scoping post card.

A detailed account of the scoping processes can be found in the Public Scoping Memorandum (ERO Resources Corporation [ERO] 2019). The memo is available on DEQ's website: http://deq.mt.gov/mining/hardrock/mlr_apppg. During scoping, two comments were received. The commenters raised concerns about potential adverse impacts of the Project on environmental resources including noise, air quality, ground water quantity and quality, and aesthetics.

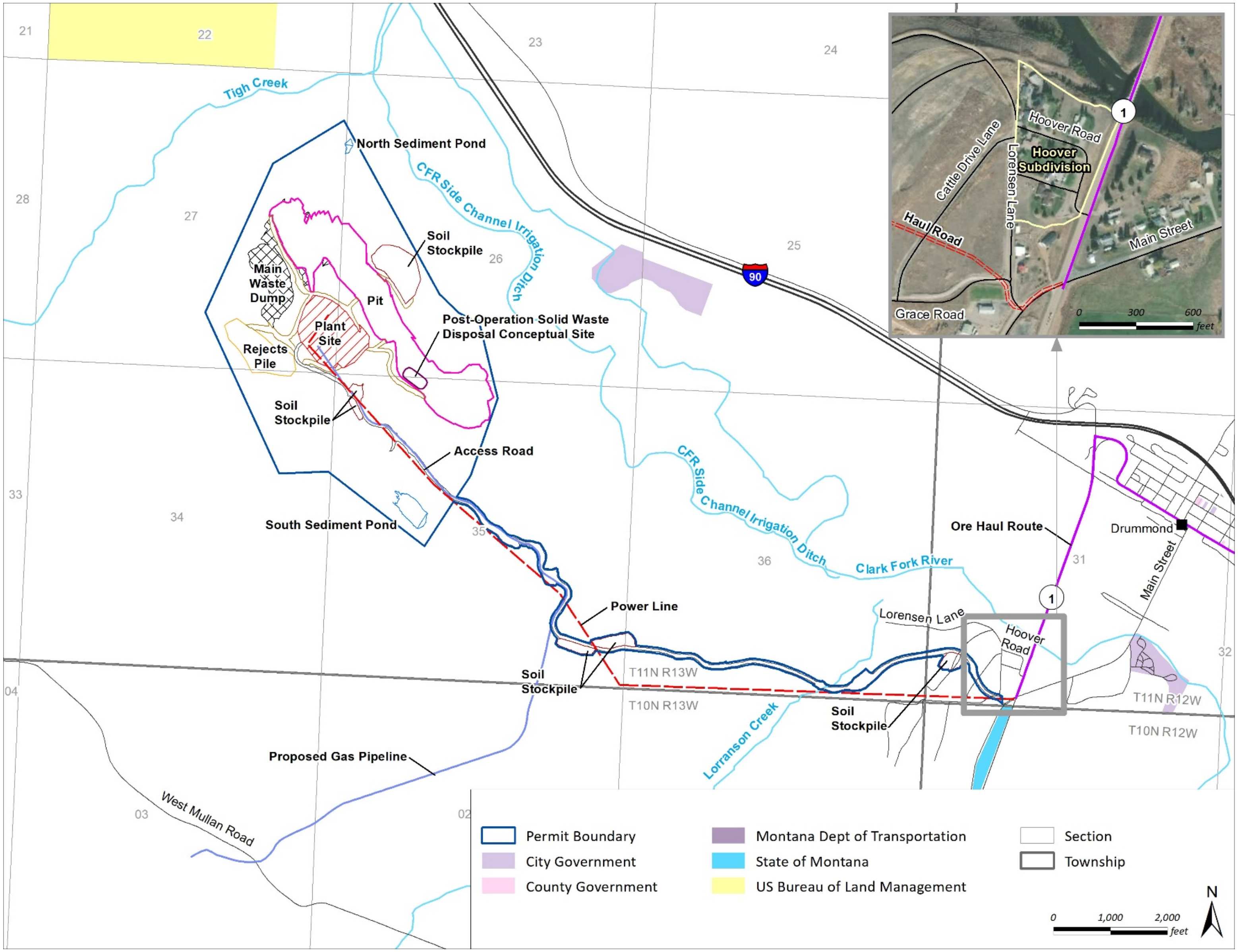

Figure 1.4-1. MLR Mine Plan

SECTION 2. DESCRIPTION OF ALTERNATIVES

2.1 Introduction

This section provides background information about the Project and describes the alternatives considered for the Project by the Montana Department of Environmental Quality (DEQ). This section also describes alternatives that were not carried forward for detailed analysis.

2.2 Alternatives Development

DEQ's alternatives development process is designed to identify a reasonable range of alternatives for detailed analysis in an EA. DEQ developed alternatives in accordance with its authorities (described in **Section 1.3, Agency Roles and Authorizing Actions**). An "alternative" under MEPA means an alternative approach or course of action that would appreciably accomplish the same objectives or results as the proposed action; design parameters, mitigation, or controls other than those incorporated into a proposed action by an applicant or by an agency before preparation of an EA or EIS; or no action or denial per ARM 17.4.603(2).

Alternatives or alternative components considered during the development process included the following: (1) those considered by MLR in the development of the proposed action and permit application; (2) those suggested by the public to DEQ in scoping comments; and (3) those introduced by DEQ and third-party consultant specialists based on professional experience.

To be considered further by DEQ, an alternative had to meet all the following criteria:

- Meets the purpose and need as stated in **Section 1.2, Purpose and Need**;
- Represents a course of action that bears a logical relationship to the proposal being evaluated;
- Is technically feasible (achievable by using current technology);
- Is economically feasible (based on similar projects having similar conditions and physical locations, regardless of the economic strength of the specific Project sponsor); and
- Is environmentally beneficial (environmental impacts must be reduced when compared to the proposed action).

Those alternatives or alternative components considered but not carried forward for detailed analysis are summarized in **Section 2.5, Alternatives Not Carried Forward for Detailed Analysis** below.

2.3 Alternative 1 – No Action Alternative

Under the No Action Alternative, the operating permit for MLR's proposed Project would not be approved by DEQ, no mining within the permit area would occur, and current land uses would continue according to private interests and existing land use plans.

2.4 Alternative 2 – Proposed Action

2.4.1 Introduction to the Alternative

Under the Proposed Action, DEQ would approve MLR's Application for an Operating Permit for a proposed quarry and plant to extract and process limestone to produce lime. If approved, the Operating Permit would allow MLR to construct and operate a limestone mine on property owned by Washington Limestone, LLC, located about 2.5 miles west of Drummond in Granite County, Montana. The operation would consist of a pit, plant, waste stockpiles, topsoil stockpiles, impoundments, haul roads, and an access road from SH 1 to the mine.

2.4.2 Permit and Disturbance Areas

The permit area for the Project is 546.4 acres, with the mine and plant permit area consisting of 505.8 acres and the access road permit area consisting of 40.6 acres. The Project would disturb 209 acres within the permit boundary. **Table 2.4-1** provides details on mine disturbances over the life of the Project. **Figure 1.4-1** shows the planned mine facilities.

Table 2.4-1
MLR Mine Anticipated Disturbed Acres Over the Project Life

Area	Plant Site and Roads	Mine End of Year (EOY)		
		Year 1 (acres)	Year 5 (acres)	Year 50 (acres)
Access Road	25.3	25.3	15.6	15.6
reclaimed[a]	0	0	9.7	9.7
Haul Roads	8.0	10.9	10.9	13.1
Plant Site	24.4	24.4	24.4	24.4
Pit[b]	0	10.2	15.0	83.0
Main Waste Dump	1.7	1.7	4.4	16.7
Soil Stockpiles	8.6	18.9	10.4	12.3
reclaimed[c]	0	0	8.5	8.5
Rejects Pile	0	4.6	7.5	14.6
North & South Sediment Pond Embankments	0.9	0.9	0.9	0.9
N & S Sediment Ponds	4.1	4.1	4.1	4.1
Miscellaneous	1.7	1.7	1.7	6.4
Total	**74.7**	**102.7**	**113.1**	**209.3**

[a]Access road cuts and fills reclaimed by EOY 5 (9.7 acres)
[b]Does not show progressive backfilling/reclamation of pit
[c]Access road cuts and fills and associated topsoil stockpiles reclaimed EOY 5 (8.5 acres)

2.4.3 Mining and Processing Operations

The Project would include an open pit mine accessing a very pure high-calcium limestone ore seam that strikes to the northwest, dips to the southwest, and ranges from 100 to 150 feet thick. Advancement of the mine would be conducted in six phases beginning in the northernmost exposed ore seam and proceeding to the southeast where the waste-to-ore strip ratio would increase from about 0.15 to 0.55. Mine ore production is projected to be about 7,000 tons per week for a 350-ton-per-day lime output.

The ore and overburden would be mined with 20-foot benches and drilled and blasted with roughly 14- by 14-foot blast patterns. Pre-mining pit dewatering is not expected to occur in ground water depths less than mine pit depths. Blasting would be performed by conventional drill/load/blast procedures scheduled biweekly or as needed to sustain production. Excavated material would be sorted between ore and waste, and the ore would be loaded onto 40-ton haul trucks for direct delivery to the primary crusher. Waste would consist of overburden sediments, waste rock, and unsuitable limestone that would be sent to waste dumps. Analysis of the waste rock material indicates it is nonacid-generating material, with much of it having the potential to be sold as aggregate. Ore delivered to the primary crusher would be crushed and stored in a 10,000-ton coarse ore stockpile. From the coarse ore stockpile, the ore would be conveyed to the crushing plant where it would be reduced and screened to a suitable size for processing at the rotary lime kiln. After screening, material in the size range greater than 3/8 inch to less than 1-1/2 inch will be conveyed to kiln feed storage. Kiln feed rock will be stored in a 100 by 200-foot pre-engineered building. The fraction less than 3/8 inch would be segregated and transported by truck for deposit in the reject pile or in the mine pit as backfill. After heating the screened ore in the kiln, the produced lime would be conveyed to storage and shipping facilities. Fugitive dust generated during processing in the rotary kiln would be captured in a fabric filter and conveyed to a bin where it would be emptied and transferred by truck for disposal in the waste rock piles or mine pit.

About 2,000 cubic yards per week of waste rock and dust is expected to be produced. Dust suppression for the Project would occur as described in the Dust Control Plan for Fugitive Particulate Matter (WESTECH 2017a). Two waste piles are planned: a main waste dump sized to hold about 563,500 cubic yards and a rejects pile sized to hold about 895,600 cubic yards. Waste rock and rejects returned to the mine pit are expected to be about 60 percent of the volume of rock extracted.

Water needs for the Project (potable water, equipment cooling circuit makeup water, and road dust suppression) would be sourced from ground water accessed from installed wells (up to three) and storm water. One well would be located near the proposed 150,000-gallon storage tank used to supply potable water to the facilities, makeup water to the equipment cooling water circuit, and fire protection water. The remaining wells would supply water to local storage tanks used for dust suppression. Except for sanitary wastewater treated through an onsite septic system and disposed of by drain field, no process waters requiring treatment are expected to be generated. Storm water runoff captured from the site and mine pit would be collected for reuse as needed. Runoff ditches would control capture of the storm water to two sediment basins (north and south) to control sediment transport and provide additional water for dust suppression.

2.4.4 Blasting Plan

Blasting of overburden and ore would be performed by conventional drill/load/blast procedures using an ammonium nitrate fuel oil and a nonelectric initiation. Ore and overburden blasting would occur as needed to sustain ore and waste production. Blasting operations would be conducted by a qualified contractor. All required permits for the storage of explosives onsite would be attained by the contractor. If stored onsite, a bulk ammonium nitrate and fuel oil truck would transport the materials to an active bench in the mine and load the material into nominal 40- to 50-hole patterns.

To limit the potential for nitrate runoff and infiltration, MLR would require the contractor to implement the following:

- Ammonium nitrate fuel oil would be minimized and cleaned up promptly.
- All blasting is expected to occur in dry weather.
- Waste rock piles would be temporary and eventually used to backfill the pit.
- Concurrent backfilling as well as reclamation and revegetation of the pit would limit infiltration through the waste rock.
- Out of pit rock disposal sites would be reclaimed limiting postoperation infiltration.
- Runoff from the waste rock pile would be diverted to a few locations depending on the phase of the mine, including to the north sediment basin, to a sump near the pit boundary for use in mine operations then back to a sediment basin, or to the reclaimed backfill surface. Storm water would not be diverted to the pit.
- Operational surface water and ground water monitoring would include the same monitoring locations as the baseline program (WESTECH 2018), with modifications as warranted by mine development. As mine development continues and updates to monitoring are warranted, a modified operational water resources sampling and analysis plan would be developed for agency review and approval.

2.4.5 Power Consumption

MLR would require an estimated 1.5 megawatts (MW) of electrical supply. A majority of the electrical power would be used to power induction motors with a total estimated connected horsepower (hp) of 2,100, with the largest single motor being 600 hp. Crushing and conveying would be the major electrical load, followed closely by the blowers and equipment to run the kiln. The remainder of the load would be for lighting and ancillary equipment (e.g., welders, compressors, and office equipment).

Power would be supplied using existing equipment in the Drummond Clark Fork Substation in Drummond and by constructing a new express circuit distribution feeder to MLR's primary metering point at the plant site. The new distribution feeder would require additions to the Drummond Clark Fork Substation, an additional 24.97 kV overhead distribution feeder, a 24.97 kV feeder re-closer, a steel breaker bay structure, foundation work, bus work, relaying, and construction of a feeder get-a-way. The new 24.97 kV distribution feeder would require building a new 9,000-foot single-circuit pole line and rebuilding a 4,400-foot single-circuit line to a double circuit. Northwest Energy would be the owner of the utility infrastructure on MLR's property; therefore, DEQ's Hard Rock Mining Bureau would not issue a bond for removal of the gas and power lines at closure.

2.4.6 Roads and Traffic

The access road for the MLR pit and plant site would traverse upland hills southwest of Drummond. The access road would connect the mine and plant complex to SH 1, which accesses Highway 10A to U.S. Interstate 90 (I-90), immediately east and west of the community (**Figure 1.4-1**).

As designed, the road would be 3.22 miles long, would originate at the junction of Grace Road and Lorensen Lane off of SH 1, and would cross Washington Limestone, LLC property. The termination of the access road is at the plant site. The maximum incidental grade would be 8 percent with an overall average grade of 2 percent. The road would be gravel with a compacted subgrade and crushed gravel top-grade with drainage control structures including scour-lined ditches, culverts, and a sediment pool.

The road would be watered routinely to reduce airborne dust. Other controls for dust control may include speed and traffic controls, hygroscopic treatment (magnesium/calcium chloride), periodic grading, and other engineering controls deemed appropriate by the Dust Control Plan for Fugitive Particulate Matter (WESTECH 2017a).

The posted speed limit for the primary gravel access road would be 45 miles per hour (mph). Haul road widths would be 50 feet (roughly four times the width of a 40-ton articulated truck), with haul grades at 12 percent.

Haul truck traffic would occur 6 days per week, 12 hours per day from 6:00 a.m. to 6:00 p.m. During these days, typical haul routes would include: ore hauls to the crusher, waste hauls to designated waste dumps, and reject loads hauled to designated rejects pile/waste dump. Hauls would vary depending on phase and dump positions.

Product would be shipped in five to twenty 30-ton tractor-trailer loads of lime (average of 14 to 16 loads) dispatched each day over a typical 12-hour period, 6:00 a.m. to 6:00 p.m. Shipping operations would occur on an as-required basis and are expected to continue 6 days per week, 52 weeks per year.

The lime plant kiln would be co-fired typically using a mixture of 80 percent natural gas and 20 percent coal or petroleum coke. Both the coal and coke would be transported to the plant from solid fuel suppliers in Montana, Wyoming, or southern Utah on the MLR access road. The solid fuel would be shipped in six to seven 18- to 20-ton trucks arriving once per week.

2.4.7 Soil Salvage and Protection

Soil within the proposed disturbance areas associated with mine development or operation would be salvaged and stockpiled or directly hauled and replaced on approved reclamation areas.

Topsoil would be salvaged following vegetation removal and prior to major surface-disturbing activities such as grading or excavating. Topsoil would not be salvaged from topsoil storage areas or from small disturbances such as power line construction or small pipeline installations. Topsoil would be salvaged using a multiple-lift approach of various depths to gather mineral soil and nonwoody vegetation materials. Soil salvage techniques and timing would minimize erosion, contamination, degradation, and compaction.

Topsoil salvage depths would range from 0 inches in soil on steep slopes and ridges dominated by bedrock outcrops to 24 inches in depositional areas such as alluvial plains and broad swales.

Salvaged soil would be either directly replaced on graded spoils or transported to one of the soil stockpile areas designated on the Soil Salvage Map (Application, Exhibit 3-7). Excess soil stockpiled along the access road would be moved to soil storage sites near the mine pit or facilities area. Soil stockpiled for 1 year or longer would be seeded with an interim revegetation mixture during the first available seeding period, in accordance with the Reclamation Plan (WESTECH 2018).

2.4.8 Closure and Reclamation

Soil would be salvaged and stored in accordance with methods described above in **Section 2.4.7, Soil Salvage and Protection**. Typically, salvaged topsoil would be transported to an appropriate soil storage area and stored until required for site reclamation. In some cases, soil redistribution would be accomplished using direct-haul handling if areas of graded spoils have been approved for application of soil. The average respread thickness of soil on mine disturbance sites is 14 inches, which approximates the average soil depth of salvaged soils. The mine plan is designed to provide phased pit backfilling. The initial pit area would be backfilled with waste rock generated from the second phase of mining with sequential backfilling such that only the final pit area would remain unbackfilled.

To minimize soil compaction and contamination, soil handling would be timed to avoid periods of wet weather and/or saturated soil, when practicable. In general, soil would be stockpiled and replaced in the general areas from which they were salvaged. Most of the soil salvaged during construction of the mine roads would be immediately replaced and reseeded on roadside cut/fill slopes, reducing the storage time of these soils. Soils associated with development of the mine facilities and mine pit would be stockpiled and replaced onto the backfilled and graded areas of the pit on a rotating basis. These approaches would preserve soil fertility through reduced storage time and mitigate erosion from fewer and/or smaller soil stockpiles.

The cut and fill slopes of the access road up to the mine area and the embankments of the north and south sediment ponds would be permanently reclaimed with the grassland mixture during initial construction and would remain in place for landowner use following mining. The plant facilities area would be minimally graded, ripped, soiled, and seeded in place to provide level areas for landowner use following mining. The sediment pond embankments would also remain in place following mining and would be managed by the landowner for use as potential stockwater ponds.

Grassland and shrubland revegetation mixtures would be used for permanent reseeding. Douglas-fir and juniper would be planted on the east crest of the pit and on the upper pit benches that are visible from I-90 (Figures 3.16-2 and 3.16-3, Application). The location of the permanent postmining revegetation mixtures and plantings are shown on Exhibit 4-2 (Revegetation Map) of the Application. The cut and fill slopes above the plant site would be seeded immediately after construction. The access road surface and pit highwall would remain unvegetated.

Permanent seed mixtures are exclusively native. The mixtures can be expected to provide a diverse, effective, and permanent vegetative cover that can stabilize the postmining soil surface. Seed that is genotypically and phenotypically adapted to the Project area and from within the northern Rocky Mountains or Great Plains would be used when commercially available in sufficient quantity and acceptable quality.

2.5 Alternatives Not Carried Forward for Detailed Analysis

The following alternatives or alternative components were considered but not carried forward for detailed analysis because they did not meet one or more of the criteria described above in **Section 2.2, Alternatives Development**.

2.5.1 Fuel for the Processing Plant

In development of its Proposed Action, MLR considered alternative fuels for the processing plant. MLR chose instead to rely on a mix of petroleum coke and/or coal, as well as natural gas. Fuel rates at the kiln would typically be 80 percent natural gas and 20 percent solid fuels. Solid fuels, as a primary fuel, were not carried forward by MLR for the Proposed Action.

DEQ reviewed MLR's analysis during the alternatives development process and saw no environmental benefit to considering solid fuels as a primary fuel for the processing plant.

2.5.2 Fuel and Ore Transportation

MLR considered transportation alternatives for both fuel and ore. Specifically, MLR considered several rail spur and loadout facility options, which could have been used to transport solid fuels, such as coal and coke, and ore. Under one of these alternatives, a spur would have been constructed from the Montana Rail Link main line (west of the proposed Project area) to an abandoned Milwaukee Railroad grade on the Clark Fork River floodplain (north of the Project area) where a receiving and loadout facility would have been constructed.

Another rail alternative considered by MLR included rehabilitation of the inactive Montana Rail Link Philipsburg spur and construction of a loadout facility in the Flint Creek Valley. A final option included constructing a receiving and loadout facility near Bearmouth along the Montana Rail Link main line. When the decision was made by MLR to use natural gas as the primary fuel source, the diminished tonnage of solid fuels as a secondary fuel source did not warrant the cost of constructing a rail spur and loadout facility. In addition, these transportation alternatives were not carried forward by MLR due to land ownership considerations and a desire by MLR to restrict activities in the Clark Fork River and Flint Creek valleys.

DEQ reviewed MLR's analysis during the alternatives development process, but has no legal authority over rail line or loadout facilities.

2.5.3 Access Road

MLR evaluated two access route options from SH 1, in addition to the route included in the Proposed Action. Under Option 1, MLR would have modified an existing ranch road along the Clark Fork River floodplain. This road would have ascended a steep hill from the Clark Fork River Valley floor to the Project area and was not carried forward because the grade would have been adverse for ascending and descending trucks. MLR also eliminated this option to restrict activities in the Clark Fork River Valley. Under Option 2, MLR would have constructed an access road roughly following the proposed natural gas line from the mine to Mullan Road; from there, Mullan Road would have been used to reach SH 1. This option was not carried forward due to the high number of residences along Mullan Road and the existing condition of Mullan Road. Specifically, MLR was concerned about the narrow width of the road for use by both the public and mine vehicles. Widening the road would have been precluded or difficult due to existing narrow bridges, irrigation ditches, and hilly terrain.

DEQ did not consider any additional alternative access routes because access is limited due to the terrain and existing infrastructure.

2.5.4 Processing Plant Location

MLR considered different locations for the processing plant, including locations within the Project area. MLR determined that an onsite location was preferable due to the presence of high-voltage power lines, high-pressure natural gas lines near the proposed mine, and the proximity to SH 1.

MLR also considered a location onsite, but closer to the mine. This site was not carried forward to avoid placement of the plant on the Renova Formation, which consists of siltstone and mudstone, and is not stable structural foundation material. The location of the plant in the Proposed Action is on limestone, which is a stable foundation material.

DEQ reviewed MLR's analysis during the alternatives development process and concurred with MLR's assessments of the onsite geological conditions and the operational advantage of an onsite plant versus an offsite plant. Furthermore, an offsite alternative was not considered by DEQ because it did not "appreciably accomplish the same objectives or results as the proposed action," per ARM 17.4.603(2). For a project that is not a state-sponsored project, an alternative cannot include an alternative facility or alternative location (Section 75-1-220(1), MCA).

2.5.5 Reduced Disturbance Footprint

DEQ evaluated whether the disturbance footprint could be reduced within the Project area. After review, DEQ determined that the footprint reduction would not be technically feasible or reasonable. Furthermore, a reduced disturbance footprint would not "appreciably accomplish the same objectives or results as the proposed action," per ARM 17.4.603(2).

2.5.6 Alternative Mining Sequence and Other Visual Considerations

DEQ considered an alternative that would sequence mining in a different manner than the Proposed Action and possibly limit visibility of the active mine areas from SH 1 and I-90. This alternative was not carried forward for detailed analysis per ARM 17.4.603(2); changing the mining sequence would present operational limits for MLR that would prevent accomplishment of the same objectives or results as the Proposed Action. The reasons for dismissing this alternative include the following:

- The majority of the Project waste material would be generated from the east side of the pit. If mining were initiated on the east side of the proposed pit, the waste material would have to be stored in dumps and could not be used as pit backfill as the east portion of the mine would be active and the west portion would not have been developed. The west portion of the pit would generate very little waste and would be insufficient to backfill the east portion of the pit. Therefore, mining from west to east would minimize overall mine-related disturbance and maximize pit backfill.
- The pit highwall would not be visible for a long period during the life of the mine. Under the preferred schedule, the area would not be mined for at least 20 years.
- The pit highwall is expected to resemble adjacent undisturbed cliffs in the Clark Fork River Valley.
- Rather than modifying the mining plan to begin mining on the east side of the ore deposit, MLR proposes to comply with the visual mitigation requirement of Section 82-4-336(9)(b)(iii), MCA, by implementing additional mitigation measures on the portion of the final pit wall visible from I-90.

In addition, visual impacts of the proposed mine can be mitigated in other more cost-effective ways that would not impact Project operations, such as planting trees to block views of the mining operation from the highway.

2.6 Other Measures Considered to Reduce Project Impacts

2.6.1 Alternative Seed Mix for Reclamation

DEQ considered an alternative seed mix for reclamation. Heavy metals, such as arsenic, can accumulate in vegetation and within animals, especially ruminants such as cattle and ungulates such as elk, deer, and pronghorn. Arsenic is a nontoxic element at low concentrations. Due to elevated levels of arsenic in Project area soil, there was some concern that arsenic may bioaccumulate in animals that consume forbs and grasses seeded on reclaimed areas after mining. DEQ considered requiring a seed mix that would include species less likely to accumulate arsenic or that would be unappetizing to grazing species.

After further review (see **Section 3.9, Soils and Reclamation**; **Section 3.11, Vegetation**; and **Section 3.12, Wildlife Resources**), DEQ concluded an alternative seed mix would not be warranted as a condition of the permit. This is because the concentrations of arsenic in the Project area are below livestock and human health safety limits and that conditions resulting in elevated levels of arsenic in vegetation and consequent bioaccumulation in animals are unlikely to occur in the Project area.

2.6.2 Noise Reduction Measures

Noise from mine and plant operations was raised as a concern in public scoping comments. DEQ considered if noise reduction measures should be included in an agency alternative. After further review (see **Section 3.8, Noise**), DEQ concluded that additional noise reduction measures are not needed for the following reasons: (1) blasting operations would not occur overnight, (2) mining operations would occur in the pit five days per week, and (3) haul truck traffic would occur six days per week during extended business hours (6:00 a.m. to 6:00 p.m.).

SECTION 3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES BY RESOURCE

3.1 INTRODUCTION

MEPA, described in **Section 1, Purpose and Need**, requires state agencies to examine and disclose the potential impacts on the human environment as a result of proposed projects or activities that require state approval. This section describes the affected environment and the environmental impacts (direct, secondary, and cumulative) that may result from selection and implementation of the Proposed Action and No Action Alternative described in **Section 2, Description of Alternatives**. Resource-specific analysis areas for direct and secondary impacts are also described under each resource.

3.1.1 Terms Used for Impact Analyses

The following terms are used in this EA to describe the nature of impacts associated with each alternative. These definitions were formulated through the review of existing laws (such as MEPA), policies, and guidelines, and with assistance from resource specialists.

Direct, Secondary, and Cumulative Impacts: Under MEPA, impacts can be direct, secondary, or cumulative.

- Direct impacts are caused by an action and occur at the same time and place as the action.
- Secondary impacts are defined in ARM 17.4.603(18) as “a further impact to the human environment that may be stimulated or induced by or otherwise result from a direct impact of the action.”
- Cumulative impacts are defined in ARM 17.4.603(7) as the “collective impacts on the human environment of the proposed action when considered in conjunction with other past and present actions related to the proposed action by location or 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.”

Duration: For this EA, impact duration is described as short-term or long-term; generally, these terms are defined as follows:

- Short-term impact/effect – a change that would no longer be detectable as the resource is returned to its pre-mine condition, appearance, or use. In this EA, a “short-term impact” is defined as the length of the MLR mine operation and until final reclamation activities are complete.
- Long-term impact/effect – a change in a resource or its condition that does not return the resource to pre-mine condition, appearance, or productivity; long-term impacts

would apply to changes in condition that continue beyond the life of the mine and after final reclamation activities are complete.

Type: Impacts can be beneficial or adverse and residual. Beneficial impacts are those that create a positive change in the condition or appearance of the resource or a change that moves the resource toward a desired condition. Adverse impacts are those that move the resource away from a desired condition or detract from its appearance or condition. Residual impacts are those that are not eliminated by mitigation, as defined in ARM 17.4.603(16).

3.1.2 Resources Analyzed

Based on internal agency scoping and public scoping comments, 12 resources were identified for detailed assessment in this EA. Direct, secondary, and cumulative impacts on these resources are disclosed in this section.

3.1.3 Resources Not Carried Forward for Detailed Analysis

The resources chosen for detailed analysis in this EA were identified through internal agency scoping and public scoping comments. Solid and hazardous waste was not carried forward for detailed analysis because the majority of the Project area was used as grazing land, and the potential for existing solid and hazardous wastes occurring within the Project boundary from previous activities is very low. A Spill Plan for oil and hazardous materials is part of the Application and would reduce the potential for solid and hazardous waste impacts.

3.1.4 Location and Description of the Analysis Area

The 546-acre Project area is approximately 50 miles east of Missoula, Montana, and 2.5 miles west of Drummond, Montana, in northwestern Granite County. The area is situated south of the Clark Fork River and west of Flint Creek. The area is characterized by undeveloped, mostly treeless, rolling grassland and shrublands common of the intermontane foothills west of the Continental Divide. Nearby topographic features include Harvey Ridge and the John Long Mountains, part of the Sapphire Range to the southwest; the Philipsburg Valley to the south; the Clark Fork River Valley and Dunkleberg Ridge to the east; and a series of smaller gulches to the north (Lyon Gulch, Spring Gulch, and Garden Gulch). The Project area traverses Lorranson Creek, a tributary of the Clark Fork River. The elevation of the Project area ranges from approximately 4,000 to 5,000 feet above sea level.

The Project area is in the Deer Lodge–Philipsburg–Avon Grassy Intermontane ecoregion (Level IV ecoregion), part of the larger Middle Rocky Mountain ecoregion. The climate is classified as modified continental and is characterized by warm, moderately dry summers and cold winters. See **Section 3.14.2.1, Local and Regional Meteorological Patterns** for more information.

The entire Project area is undeveloped, and past land uses include cattle ranching. No other mining activities occur within, or in the vicinity of, the Project area. See **Section 3.5, Land Use and Recreation** and **Section 3.11, Vegetation** for more information on the existing land uses and vegetation communities in the Project area.

3.1.5 Description of Cumulative Actions

MEPA requires an analysis of cumulative impacts, which are defined as "the collective impacts on the human environment of the Proposed Action when considered in conjunction with other past and present actions related to the Proposed Action by location or generic type. Reasonably foreseeable future actions 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" as set forth in ARM 17.4.603(7).

The sections below identify past, present, and reasonably foreseeable future actions. Actions considered for the analysis were identified by the Montana Department of Environmental Quality (DEQ) and its consulting team as well as from public scoping comments. Past and present actions are accounted for as part of the existing, or "baseline," environmental conditions.

In general, the cumulative impacts analysis area differs for each resource under consideration, but all are based on natural boundaries and areas that sustain the resources of concern. For example, the analysis area for geology and geochemistry is limited to existing and proposed Project areas of the mine, whereas the analysis area for access and transportation is larger and encompasses the local transportation network. For surface water resources, the analysis area is based on watershed boundaries. The cumulative impacts analysis area is described for each resource area.

The type and timing of impacts are key to the cumulative impact analyses. To be considered a cumulative impact, other actions must affect the environment in a similar manner and at a similar time as the Proposed Action and No Action Alternative. The period includes active mining in the Project area through completion of reclamation (final bond release). The types of actions include, but are not limited to, these general categories: agriculture, air pollutant sources and emissions, mining, rail transport, and wildland fire.

3.1.5.1 Related Past and Present Actions

Agriculture

The Project area and surrounding areas have been, and continue to be, used for grazing. The Project area is part of the larger Bar-Four-Bar Ranch, a former 3,520-acre ranch.

Air Pollutant Sources and Emissions

Major regional point source emissions are listed in **Section 3.14.2.2, Existing Regional Air Pollutant Sources and Emissions** and include emissions of any air pollutant greater than 100 tons per year (EPA 2014). The major point source emissions in the region currently come from airports, a plastic and rubber manufacturing plant, lumber sawmills, and a plywood and engineered wood products plant.

Power Plant Operations

Nearby power plants include the Dave Gates Generating Station, owned by NorthWestern Energy, located approximately 50 miles southeast of Drummond, near Anaconda, Montana. The 150-megawatt natural gas-fired plant is a regulating reserve plant that provides increased power reliability to the grid by supplementing power when needed (Rhoads *et al.* 2011).

Mining

Two existing mining operations, both operated by Little Bear Construction, Inc., are located approximately 3 miles north of the Project area, north of I-90 off of Rattler Gulch Road. The Big Horn Calcium/Drummond Quarry (Operating Permit #00022) is a limestone quarry, and the other mine is a Small Miner Exclusion (#46-117C) for open pit aggregate.

Rail Transport

A Montana Rail Link line runs north of the Project area paralleling I-90. The line runs from Billings, Montana, to Sandpoint, Idaho (MDT 2019).

Wildland Fire and Prescribed Burns

Wildland fires have historically occurred in the vicinity of the Project area. Past smaller, nearby wildfires include the 2006 Bearmouth fire approximately 7 miles west of the Project area along I-90, which burned approximately 1,000 acres. The 2012 Elevation Mountain fire burned approximately 1,000 acres and is approximately 12 miles north of the Project area. The 2012 Felan Gulch fire burned approximately 200 acres north and approximately 10 miles northwest of the Project area. Larger fires in the vicinity of the Project area include fires on the Beaverhead-Deerlodge National Forest southwest of the Project area. The 2007 Sawmill Complex fire burned nearly 64,000 acres and is approximately 25 miles southwest of the Project area; and the 2017 Little Hogback fire burned nearly 73,000 acres of the forest (Montana State Library 2019).

3.1.5.2 Reasonably Foreseeable Future Actions

Agriculture

Existing agricultural operations, including grazing, are expected to continue for the reasonably foreseeable future.

Air Pollutant Sources and Emissions

Emissions from sources quantified and discussed in **Section 3.14.2.2, Existing Regional Air Pollutant Sources and Emissions** are expected to continue.

Mining

No future mining activities are planned at this time.

Rail Transport

No future rail transport projects are anticipated at this time. The existing rail transport corridor is expected to continue operations.

Wildland Fire and Prescribed Burns

Wildland fires and prescribed burns have historically occurred in the vicinity of the Project area on federally managed lands and are expected to occur for the reasonably foreseeable future.

3.2 Geology and Geochemistry

3.2.1 Analysis Methods

The geology and geochemistry analysis area is the 546-acre Project area. Geologic impacts were determined from the information contained in the Application.

3.2.2 Affected Environment

The proposed Project is located in the Montana Fold and Thrust Belt along a gently dipping limb of a southeast-plunging asymmetrical anticline of Paleozoic strata. The Montana Fold and Thrust Belt represent an area of complex faulting and folding in western Montana formed by continental plate collisions that began in the late Cretaceous.

Within the Project area, formations ranging from Mississippian-age limestones to Quaternary gravels occur. The anticline fold has resulted in the exposure of the older Mississippian-age limestones at and near the surface with progressively younger rocks encountered outward from the crest of the anticline. The Mississippian Madison Group represents a set of three carbonate formations; from youngest to oldest: McKenzie Canyon, Mission Canyon, and Lodgepole. Within the Mission Canyon Formation, the lower unit represents the ore proposed to be quarried, which consists of a massively bedded dark-gray colored high-calcium limestone. The composition of the ore is calcium carbonate based on drill cores from the ore zone. No traces of asbestiform minerals have been found in the ore. The ore seam strikes to the northwest and dips to the southwest ranging in thickness from 100 to 150 feet. The upper unit of the Mission Canyon Formation is a fine-grained dove-gray colored dolomitic unit overlying the ore zone, which in areas would require removal during mining to expose the lower unit for ore extraction.

Outward from the center of the anticline are the progressively younger Pennsylvanian-age Amsden and Quadrant formations, the Permian-age Phosphoria Formation, undivided Jurassic-age sediments, the Cretaceous-age Kootenai Formation, Tertiary volcanics, the Lower Tertiary-age Renova Formation, and the Upper Tertiary-age Sixmile Creek Formation. The Amsden Formation is a dark-reddish brown calcareous siltstone. The Quadrant Formation is a light-gray to pink quartz sandstone that forms resistant hogbacks and ridges outcropping on both sides of the anticline. Poorly exposed in the Project area is the Phosphoria Formation, which consists of dark brown phosphatic sandstone, chert, and black shale. The undivided Jurassic-age sediments represent poorly exposed sandstone, siltstone, micaceous shale, calcareous shale, shaley limestone, and limestone. The Kootenai Formation is divided into four mappable members: a lower clastic member, a lower calcareous member, an upper clastic member, and an upper calcareous member. Tertiary volcanics consist of rhyolite and andesite/basalt flows and tuff flows. The Renova Formation is a mostly white to light-gray siltstone, arkosic sandstone, tuffaceous sandstone, and volcanic ash deposited in fluvial and lacustrine environments. The Sixmile Creek Formation forms a thin veneer (1 to 2 feet thick) consisting of Tertiary-age conglomerates interbedded with sandstone and siltstone (WESTECH 2018).

Quaternary alluvium deposits consisting of gravel and sands are located within the Clark Fork River basin associated with the current river as well as older deposits associated with terrace deposits.

3.2.3 Environmental Consequences (Direct, Secondary, and Cumulative)

3.2.3.1 Alternative 1 – No Action Alternative

Direct and Secondary Impacts

Under the No Action Alternative, mining of the high-calcium limestone ore would not be permitted. There would be no Project impacts in the geology and geochemistry analysis area because none of the disturbances associated with development of the Project would occur.

3.2.3.2 Alternative 2 – Proposed Action

Direct and Secondary Impacts

Impacts from limestone ore mining under the Proposed Action would result in the disturbance of 209 acres within the 546.4-acre Project area and the direct removal of an estimated 7,000 tons per week of ore rock over a 50-year period. As part of the mining process, following removal of the ore, waste rock would be backfilled in the open pit, altering the geology in the open pit from one consisting of consolidated limestone and dolomite to one of predominantly unconsolidated limestone, dolomite, chert, calcite, and minor siltstone and claystone fragments. The backfill would consist of nonacid-generating overburden rock removed by blasting, and the rejected ore fraction is anticipated to be 2,000 tons per week.

3.2.3.3 Cumulative Impacts

Past, present, and reasonably foreseeable future actions in the geology and geochemistry cumulative impacts analysis area include agricultural operations and nearby mining operations. Two existing mining operations are located approximately 3 miles north of the Project area. The Big Horn Calcium/Drummond Quarry (Operating Permit #00022) is a limestone quarry, and the other mine is a Small Miner Exclusion (#46-117C) for open pit aggregate. Past and ongoing agricultural operations and mining at the nearby mines has resulted in cumulative impacts on the overall geologic formations in the region and the loss of horizontal continuity in geologic beds overlying the minerals; however, from a regional perspective, these effects are cumulatively minimal.

3.3 Ground Water Hydrology and Quality

3.3.1 Analysis Methods

The ground water analysis area used to assess direct, secondary, and cumulative impacts is the 546.4-acre Project area. Impacts on ground water were determined based on the information contained in the Application. The Application provided details concerning ground water related to proposed mining and reclamation actions.

3.3.2 Affected Environment

3.3.2.1 Site Hydrogeology

Project area ground water data have been obtained from monitoring wells, exploration drill holes, and geotechnical boreholes drilled, as well as two homestead wells located in the Project area. Two ground water systems are on the Project area, which include the bedrock ground water beneath the bottom of the proposed open pit mine and a perched ground water zone within the Tertiary-age sedimentary units located along the southern third of the Project area, southeast of the proposed open pit mine. The Clark Fork River floodplain shallow alluvial aquifer is northeast of the property boundary.

Depth to water in the Clark Fork River alluvial aquifer is approximately 10 feet or less below ground surface (bgs) with a ground water flow direction to the northwest. Depth to water in the bedrock ground water zone is about 500 feet bgs, and no ground water flow direction was reported. Ground water was not encountered in the 25 drill holes conducted within the proposed pit boundary. Depth to water in the perched ground water zone varies from about 16 to 38 feet bgs with a flow direction to the southeast. The thickness of the perched ground water zone varies from about 10 to 30 feet with ground water resting on top of a coal seam at the base of the Renova Formation. The perched ground water zone rests about 400 feet above the bedrock ground water zone.

Based on the data collected, the three ground water zones appear distinct with limited to potentially no interconnection. The lower elevation of bedrock ground water compared to the Clark Fork River aquifer indicates bedrock ground water does not recharge to the Clark Fork River aquifer and, therefore, there is a potential limited interconnection between the two. The lower elevation of the bedrock ground water compared to the perched ground water indicates the lack of connection between the two as well as the geologically distinct materials comprising the two.

Five seeps have been identified in the vicinity of the Project area with three of the seeps located near the southern boundary of the Project area. The three seeps within the Project area display minimal flow; are estimated to be less than 0.1 gallon per minute, which were dry during the fall 2014 sampling events (WESTECH 2018); were used for livestock watering; and are likely surface expressions of the perched ground water zone.

Seven domestic wells and one unused well were identified within 1 mile of the Project area. Seven of the eight wells are located north of the Clark Fork River and one well is located to the southwest. No wells are located within the Project area.

3.3.2.2 Ground Water Quality

Ground water quality in the three saturated zones display near neutral to alkaline pH, total dissolved solids typically less than 600 milligrams per liter (mg/L), and major ions indicating a calcium-bicarbonate to calcium-sulfate water type. Dissolved metals are low in the three ground water zones with only the bedrock well accessing water with arsenic concentrations about two times greater than the human health state standard of 0.01 mg/L. Dissolved manganese and iron were detected in the bedrock ground water along with low dissolved oxygen and nitrate concentrations, indicating slightly anaerobic conditions in the bedrock ground water relative to the aerobic shallow Clark Fork River and perched ground water zones (WESTECH 2018).

3.3.3 Environmental Consequences (Direct, Secondary, and Cumulative)

3.3.3.1 Alternative 1 – No Action Alternative

Direct and Secondary Impacts

Under the No Action Alternative, the Application for MLR’s proposed Project would not be approved by DEQ, and no mining within the Project area would occur. There would be no Project impacts on the ground water analysis area described above because none of the disturbances associated with the Project would occur.

3.3.3.2 Alternative 2 – Proposed Action

Direct and Secondary Impacts

Ground water impacts from open pit mining of the limestone ore under the Proposed Action would result in minimal to no disturbance of the three ground water zones. Bedrock ground water is located about 200 feet below the bottom of the proposed open pit mine. The perched ground water zone is located outside of the open pit mine in associated geologic materials not being mined. The Clark Fork River alluvium aquifer is also outside the area of the mine, in ground water that does not receive recharge from the underlying bedrock ground water zone.

The open pit backfill would consist of nonacid-generating overburden rock removed by blasting. Nitrate generated during blasting has the potential to increase nitrate concentrations in precipitation interacting with the blast rock and recharging to bedrock ground water. Given the depth to bedrock, as well as the slightly anaerobic conditions, an increase in nitrate in bedrock ground water is not expected beneath the bottom of the proposed open pit mine. Nitrate is one of the parameters that would be monitored in ground water during mining. Best technology currently available would be used to limit the potential runoff and infiltration of nitrates from waste rock piles; nitrate contamination of the perched ground water has the potential to occur but could be managed if detected.

Due to the strong negative water balance, ground water pumping from up to three wells would be conducted to generate the majority of water needed for mining. Production wells would be completed in either bedrock or unconsolidated alluvial/colluvial aquifers. The main production well to be located next to the 150,000-gallon storage tank would likely use the greatest amount of ground water, while the remaining wells and storm water retained in impoundments would be used for dust suppression. Pumping ground water would deplete ground water resources in proportion to the amount used and temporarily alter ground water flow directions toward the wells being pumped. Recovery of ground water flow directions would occur following cessation of pumping. Ground water quality is not anticipated to be affected by pumping activities. Total average annual water demand for the Project, which can be used as an approximate pumping rate, is estimated to be less than about 35 gallons per minute (gpm). Dust suppression is anticipated to be the largest demand, and would be met with storm water. Domestic water wells are not anticipated to be affected by ground water pumping due to their location north of the Clark Fork River, which would act as a hydraulic divide between the wells and the mine.

An operational ground water monitoring program would follow the baseline monitoring program (WESTECH 2018) with additional monitoring sites and frequency added as warranted. As mine development continues and updates to monitoring are warranted, a modified operational water resources sampling and analysis plan would be developed for agency review and approval. Postoperational ground water monitoring would occur until such time as the mine is determined by DEQ to be fully reclaimed and all bonding release milestones are met.

3.3.3.3 Cumulative Impacts

The past, present, and reasonably foreseeable future actions have limited and localized ground water impacts, and Proposed Action impacts are localized to ground water recovery and use. Therefore, no long-term cumulative adverse impacts on ground water are expected. The projects that would affect ground water are too far from the Project area to affect ground water levels in the Project area or to overlap offsite ground water drawdown.

3.4 Surface Water Hydrology and Quality

3.4.1 Analysis Methods

The surface water hydrology and quality analysis area to assess direct, secondary, and cumulative impacts is the 546.4-acre Project area, as well as the downstream watershed, which includes streams and surface water bodies that receive surface drainage from the Project area. The Application provides details concerning surface water related to proposed mining and reclamation actions.

3.4.2 Affected Environment

3.4.2.1 Project Area Climate

The Project area lies within the Middle Rockies Ecoregion of the Rocky Mountains Region with a semiarid climate. Daily precipitation was recorded at a private weather station within the Project area between May 22, 2014 and June 30, 2015 (404 days) (WESTECH 2018). Within the monitoring period, daily precipitation ranged from 0 to 0.63 inches (August 23, 2014) averaging 0.02 inch per day with precipitation observed on 22 percent of monitoring days.

3.4.2.2 Surface Water Hydrology

The Project area lies within the Clark Fork River drainage, a major tributary to the Columbia River, which includes five primary surface water features near the Project area:

- Clark Fork River– approximately 0.5 mile northeast of the Project area flowing northwesterly;
- Tigh Creek – an ephemeral tributary to the Clark Fork River, approximately 0.5 mile northwest of the Project area, that is typically dry and, when flowing in response to high-intensity precipitation or snowmelt, flows northeast to the Clark Fork River;
- Lorranson Creek – a tributary to the Clark Fork River, traverses the southeast portion of the Project area, flowing northeast to the Clark Fork River primarily with waters derived from irrigation return flows;
- Flint Creek – a major tributary to the Clark Fork River, approximately 2.5 miles east of the Project area, flowing northeast to the Clark Fork River; and
- Clark Fork River side channel – between the Clark Fork River and the Project area, flowing northwesterly with waters derived from an irrigation ditch, irrigation return flows, and possibly shallow ground water recharge.

Monitoring data collected by MLR from 2013 through 2015 show (Hydrometrics 2018):

- Decreasing flow rates from upstream to downstream in the Clark Fork River side channel, possibly due to a combination of water diversions from the channel for flood irrigation and channel leakage to the shallow alluvial ground water system;
- Increasing flow rates from upstream to downstream in Lorranson Creek due to increasing irrigation return flows in the downstream direction; and
- No-flow conditions in Tigh Creek during all monitoring events.

Five seeps have been identified within 1 mile beyond the Project area boundary with three of the seeps located within the Project area near the southern boundary (**Figure 3.4-1**). The three seeps within the Project area displayed minimal flow estimated to be less than 0.1 gpm, were dry during the fall 2014 sampling events, were used for livestock watering, and are likely surface expressions of the perched ground water zone (Hydrometrics 2018).

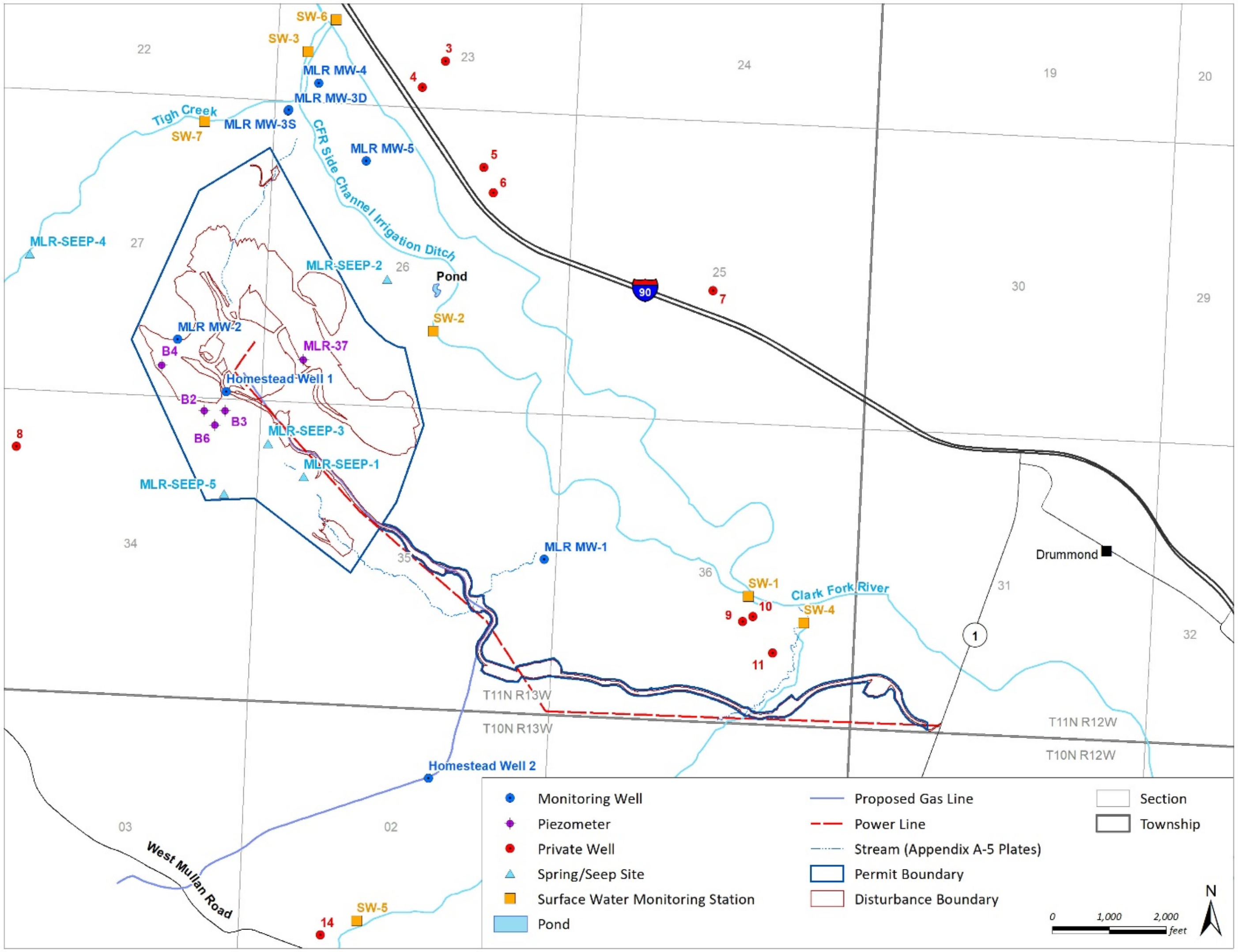

Figure 3.4-1. Well Seeps.

3.4.2.3 Surface Water Quality

Water quality in the nearby surface water system includes a slightly alkaline pH and total alkalinity ranging from 120 to 270 milligrams per liter (mg/L as $CaCO_3$). Major ions indicate a calcium-bicarbonate water type in all of the monitored surface water bodies except Lorranson Creek, which indicates a calcium-sulfate-bicarbonate water type. Total dissolved solids are less than 400 mg/L in the Clark Fork River and side channel, less than 600 mg/L in the pond, and less than 1,000 mg/L in Lorranson Creek. Total nitrogen is relatively consistent throughout the Project area with average concentrations up to 0.25 mg/L. Total phosphorus varies according to water body with average concentrations up to 0.046 mg/L in the Clark Fork River and side channel and up to 0.106 mg/L in Lorranson Creek. Trace metal concentrations were generally low in all surface water samples. Stream bed sediment samples show the highest metal concentrations primarily in the Clark Fork River and side channel, and one metal (strontium) had the highest concentrations in Lorranson Creek. Human Health Standards (HHS) and Aquatic Standards (AS) have been exceeded as follows:

- Arsenic (HHS) – All monitored water bodies except the pond (68 percent exceedance)
- Mercury (HHS) – Clark Fork River (2 percent exceedance)
- Copper (AS) – Clark Fork River and side channel (9 percent exceedance)
- Iron (AS) – Clark Fork River and Lorranson Creek (4 percent exceedance)
- Lead (AS) – Clark Fork River and side channel (4 percent exceedance)

3.4.3 Environmental Consequences (Direct, Secondary, and Cumulative)

3.4.3.1 Alternative 1–- No Action Alternative

Direct and Secondary Impacts

Under the No Action Alternative, the Application for MLR's proposed Project would not be approved by DEQ, and no mining within the Project area would occur. No Project impacts on the surface water hydrology and quality analysis area would occur because none of the disturbances associated with the Project would occur.

3.4.3.2 Alternative 2 – Proposed Action

Direct and Secondary Impacts

Surface water impacts from open pit mining of the limestone ore under the Proposed Action would result in minimal disturbance of the local surface water system due to design and construction of surface water control features, implementation of best technology currently available, and an operational surface water monitoring program.

Storm water surface runoff in the analysis area would be controlled and routed by a series of phased collection and diversion ditches to two earthen embankment sediment basins with emergency spillway outfalls placed in naturally existing drainages. The basins would be designed to capture any runoff and sediment from 578 acres associated with the plant site, primary waste dump, topsoil/fines/rejects stockpiles, primary access road, and pit dewatering, if needed. Storm water collected in the sediment basins would be reused as dust suppression for mine operations. Storm water would also be controlled and routed from access roads by borrow ditches and culverts with inlet and outlet protection. Runoff activities would be covered under General Permits for Storm Water Discharges for both construction activities and industrial activities.

The best technology currently available would be selected and implemented based on site conditions to control sediment transport from disturbed areas for stabilization. Siltation from the Project area and to naturally flowing streams would be prevented with sediment control structures including revegetation of soil stockpiles, access road cut and fill slopes, silt fence, rolled erosion control products, sediment logs, or salvaged subsoil catch berms.

An operational surface water monitoring program would follow the baseline monitoring program (WESTECH 2018) with additional monitoring sites and frequency added as warranted.

With no sources of acid-generating mineralogy, mine runoff is expected to be slightly alkaline and would include suspended solids, to be settled out in the sediment basins. Monthly monitoring activities at the sediment basins would be implemented for turbidity and pH, flocculants would be added to minimize any turbidity issues, and lime would be added to minimize any unanticipated acidity issues.

Reclamation of mine disturbances would include grading, backfilling, sloping, benching, and resoiling for postmine rangeland and to minimize precipitation and run-on infiltration. Reclaimed areas would be seeded with permanent grassland and shrubland mixtures and planted with conifer forest/woodland species to minimize soil erosion and sedimentation and to provide for postmine land uses. Sediment control structures would be removed, graded, and revegetated (ditches); retained and revegetated in place (reject pile ditch); or potentially retained in place for use by the landowner for stock watering (sediment ponds). Postoperational surface water monitoring would occur until such time as the mine is determined by DEQ to be fully reclaimed and all bonding release milestones are met.

3.4.3.3 Cumulative Impacts

The past, present, and reasonably foreseeable future actions would have limited and localized surface water impacts, so no long-term cumulative adverse impacts on surface water would occur from the Proposed Action.

3.5 Land Use and Recreation

3.5.1 Analysis Methods

The land use and recreation analysis area used to assess direct, secondary, and cumulative impacts is the 546.4-acre Project area.

Land use impacts were determined based on the information contained in the Application. Land within the Project area was assigned a land use category based on an analysis of aerial photography and the results of field investigations (WESTECH 2017a). The land use categories are based on the U.S. Geological Survey (USGS) primary land use classification system (Anderson *et al.* 1976).

The Granite County Planning Department and the Granite County Planning Board oversee the development of land, including subdivision regulations, and floodplain and zoning regulations and enforcement. The 2012 Granite County Growth Policy summarizes the county socioeconomic characteristics and establishes goals, objectives, and policies to guide planning and growth (Granite County 2012).

The Granite County Growth Policy establishes two goals regarding recreation (Granite County 2012):

- Provide adequate recreation facilities to serve all segments of the population, including youth, senior, and disabled persons; and
- Encourage quality commercial recreation developments, but protect natural resources and rights of individuals.

3.5.2 Affected Environment

3.5.2.1 Land Ownership and Land Use in the Project Area

Land within the Project area is owned by Washington Limestone, LLC. No other landowners, including public lands, are within the Project area. Land uses within the Project area are summarized in **Table 3.5-1** and shown on **Figure 3.5-1**. The majority (more than 80 percent) of land use within the Project area is grazing land use followed by nonirrigated hay land (11.6 percent) and woodland/grazeable woodland (7.2 percent).

Table 3.5-1
Pre-mine Land Uses within the Project Area

Land Use	Acres in Project Area	Percent of Total Acres in Project Area
Grazing Land	443.1	81.2
Woodland/Grazeable Woodland	39.3	7.2
Irrigated Hay Land	0	0
Nonirrigated Hay Land	63.0	11.5
Transportation Corridor	0.5	<1
Miscellaneous[a]	0.1	<1
Project Area Total	546.0	100

[a] Includes residential, water and gravel bar, rock outcrops, and scree
Percent totals are greater or less than 100% due to rounding.

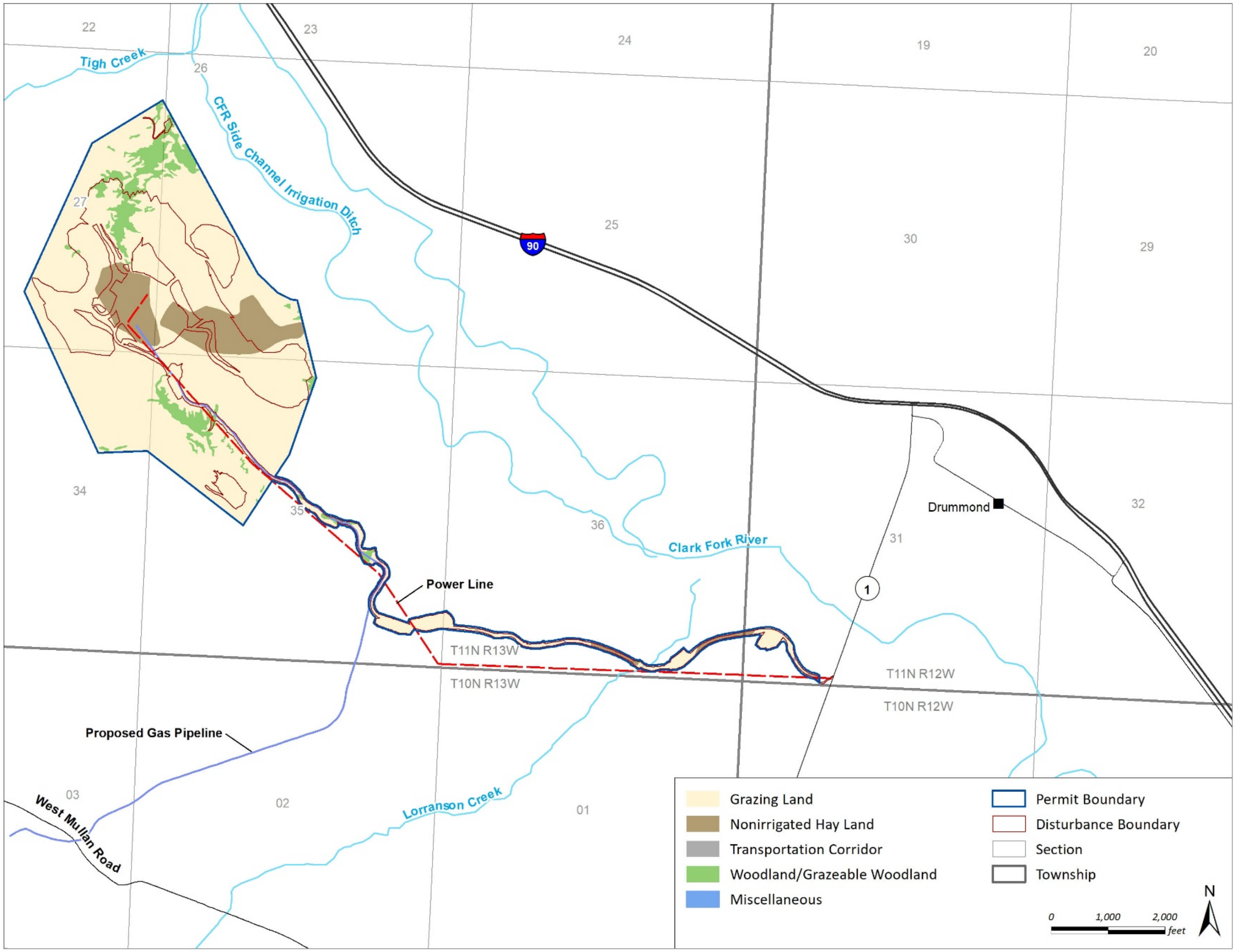

Figure 3.5-1. Pre-mine Land Uses within the Project Area.

3.5.2.2 Access and Recreation in the Project Area

No public recreation is permitted within the analysis area. Private recreation is limited to the family members of the former cattle ranch owners (WESTECH 2017a).

3.5.3 Environmental Consequences (Direct, Secondary, and Cumulative)

The assessment of direct and secondary impacts on land use and recreation resources was based on the type and amount of disturbance to land uses and recreation uses within the land use and recreation analysis area (same as the Project area). The magnitude of impacts on recreation resources was based on the amount and type of loss, with a major impact defined as one that would permanently remove a land use or recreational opportunity.

3.5.3.1 Alternative 1 – No Action Alternative

Direct and Secondary Impacts

Under the No Action Alternative, the operating permit for MLR's proposed Project would not be approved by DEQ, no mining within the Project area would occur, and current land uses would continue. In addition, under the No Action Alternative, no direct or secondary impacts on existing private recreation in the land use and recreation analysis area would occur.

3.5.3.2 Alternative 2 – Proposed Action

Direct and Secondary Impacts

Under the Proposed Action, 209 acres of land within the land use and recreation analysis area would be converted from current land uses to mining and mining operation uses. **Table 3.5-2** provides the proposed pre-mine and postmine land use acreages after closure and full reclamation of the mine. All current land uses within the land use and recreation analysis area would be temporarily disturbed during the life of the mine.

Table 3.5-2
Alternative 2 Land Use Impacts

Land Use	Pre-mine Land Use in Analysis Area (acres)	Postmine Land Use in Analysis Area (acres)	Difference in Land Use in Analysis Area from Pre-mine Land Use (acres)
Grazing Land	443.1	435.1	-8
Woodland/Grazeable Woodland	39.3	57.0	17.7
Irrigated Hay Land	0	0.0	0
Nonirrigated Hay Land	63.0	25.0	-38
Transportation Corridor	0.5	15.1	14.6
Miscellaneous[a]	0.1	13.8	13.7
Project Area Total	546.0	546.0	0.0

[a] Miscellaneous includes pit walls

Postmine land uses in the land use and recreation analysis area would change from pre-mine land uses (**Figure 3.5-2**). The Proposed Action would result in large increases in miscellaneous and transportation corridor land uses compared to pre-mine land uses. Additionally, the Proposed Action would result in a large decrease in nonirrigated hay land use and a large increase in woodland/grazeable woodland land use. Grazing land would decrease slightly, and no change in irrigated hay land use would occur.

Disturbed lands within the land use and recreation analysis area would be reclaimed as described in **Section 2.4.7, Soil Salvage and Protection** and **Section 2.4.8, Closure and Reclamation**. After closure and final reclamation of the mine, the reclaimed areas would be available for grazing as soon as the vegetation is reestablished and a management unit is large enough to support livestock.

The Proposed Action would not create unplanned development or induce new areas for development outside the Project area. The Proposed Action would not reduce development restrictions or substantially induce new development. Therefore, there would be no secondary impacts on land use associated with the Proposed Action. No secondary impacts on recreation in the land use and recreation analysis area would occur.

3.5.3.3 Cumulative Impacts

Past, present, and reasonably foreseeable future actions that may impact land use and recreation in the land use and recreation analysis area include agricultural operations. The Proposed Action would reduce the number of acres available in the Project area for grazing and other agricultural practices in the short term, and in the long term after reclamation. Due to the rural nature and land ownership of the Project area, existing adjacent land uses are unlikely to change. No reasonably foreseeable future actions are anticipated to occur within or in the vicinity of the land use and recreation analysis area that would further reduce agricultural operations.

The Proposed Action is unlikely to contribute to long-term adverse cumulative impacts on recreation in the land use and recreation analysis area. Recreational use in the vicinity is unlikely to change substantially given the existing adjacent land ownership.

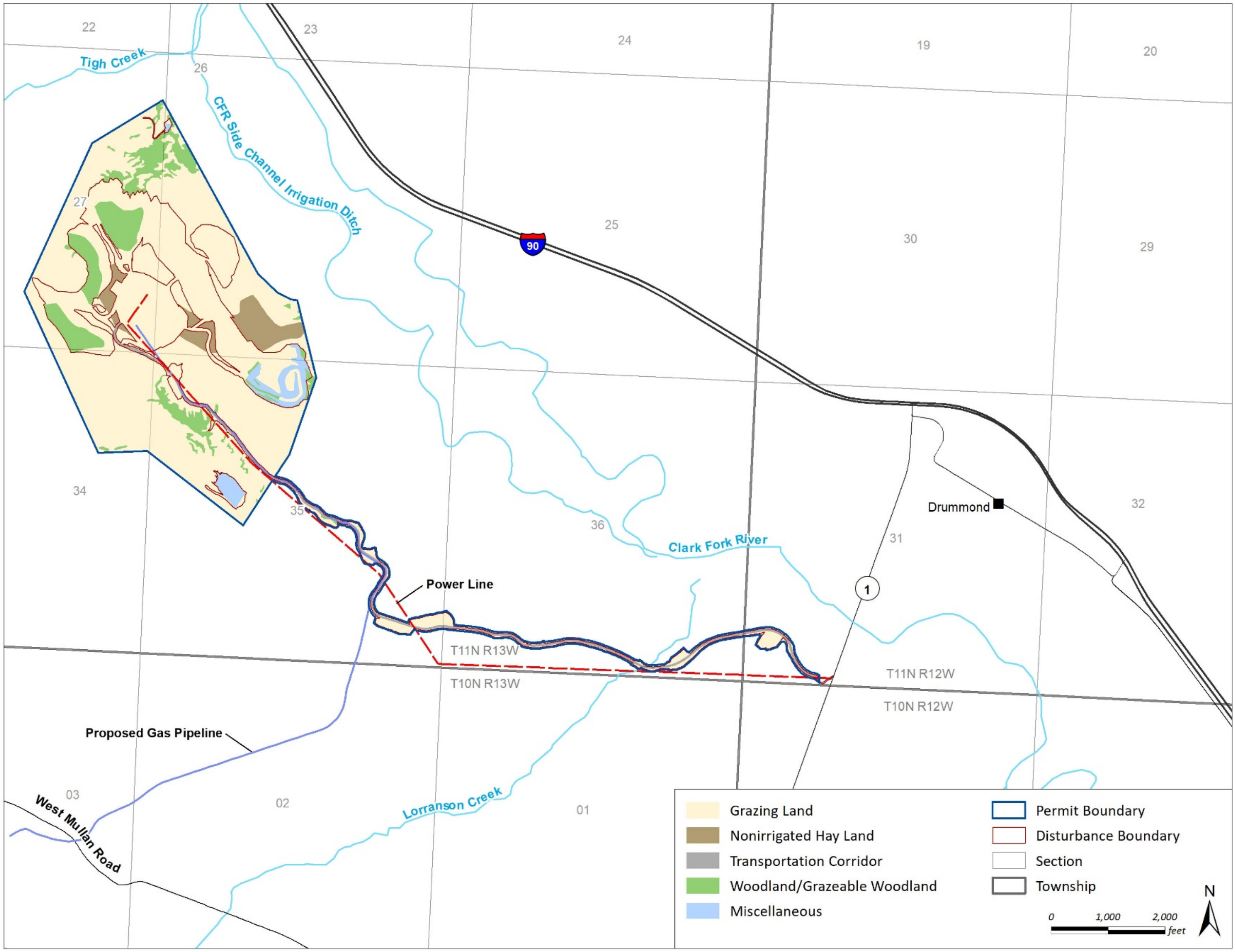

Figure 3.5-2. Postmine Land Uses within the Project Area.

3.6 Socioeconomics

3.6.1 Analysis Methods

To describe the socioeconomic affected environment, data from the following sources were used:

- U.S. Census Bureau (USCB)
- U.S. Bureau of Labor Statistics (USBLS)
- Montana Department of Commerce
- Montana Department of Labor and Industry (MDLI)
- Montana Department of Revenue

The socioeconomic analysis area used to assess the direct and secondary impacts is Granite County. The impact analysis addresses the primary socioeconomic impacts of the Project to include the following:

- An increase in state and local revenue from associated taxes, fees, and licenses
- An increase in employment

3.6.2 Affected Environment

3.6.2.1 General Demographics

The population in Granite County in 2017 was 3,358 (**Table 3.6-1**). Between 2010 and 2017, Granite County's population grew 9 percent, faster than the state growth rate of 6 percent. Granite County is a rural county in southwestern Montana; however, the county has a higher population density than the state. The median age of Granite County residents is 53.7, substantially higher than the state median age of 39.8.

Table 3.6-1
Demographic Information for Granite County and Montana

Demographic Indicator	Granite County	Montana
Population (2017)	3,358	1,050,493
Population (2010)	3,080	990,507
Population change (2010 - 2017) (percent)	9.03	6.06
Land area (square miles)	1,733	147,106
Population density (people/square mile)	0.54	0.14
Median age	53.7	39.8

Source: Montana Department of Commerce, Montana Census & Economic Information Center 2019; Economic Profile Systems (EPS) 2019a; EPS 2019b

3.6.2.2 Employment and Income

Total employment in Granite County in 2017 was estimated at 4,089 (USCB 2017). The top three employment industries in the County account for more than half of the employment in the county and include: educational services, health care, and social assistance (26.4 percent); agriculture, forestry, fishing and hunting, and mining (19.4 percent); transportation and warehousing; and utilities (11.4 percent) (**Table 3.6-2**). According to state data, Granite County has 11 employers in the agriculture, forestry, and fishing and hunting industries, averaging 52 employees with an average wage of $48,737. Four employers in mining, quarrying, and oil and gas extraction industries are located in the county, with an average of five employees and an average wage of $36,491 (MDLI 2019).

Table 3.6-2
Granite County Employment by Industry 2013-2017 (5-Year Estimates)

Industry	Granite County		Montana	
	Number	Percent	Number	Percent
Agriculture, forestry, fishing and hunting, and mining	792	19.4	34,930	7
Construction	291	7.1	40,942	8.2
Manufacturing	35	0.9	23,204	4.7
Wholesale trade	7	0.2	11,932	2.4
Retail trade	236	5.8	59,171	11.9
Transportation and warehousing; utilities	467	11.4	24,692	5
Information	89	2.2	8,468	1.7
Finance and insurance; real estate, rental, and leasing	176	4.3	27,881	5.6
Professional, scientific, management, and administrative	78	1.9	41,195	8.3
Educational services; health care and social assistance	1,078	26.4	116,588	23.4
Arts, entertainment, and recreation; accommodation and food services	447	10.9	54,080	10.9
Other services, except public administration	117	2.9	24,608	4.9
Public administration	276	6.7	30,304	6.1
Total	4,089	100	497,995	100

Source: USCB 2017
Percent totals are greater or less than 100% due to rounding.

The top private employers are listed in **Table 3.6-3**. The largest private employer in the county is the Ranch at Rock Creek, a luxury ranch southwest of Philipsburg that employs 100 to 249 employees (MDLI 2019). Other top employers include Discovery Ski Area, located east of Porters Corner, Montana and employing 50 to 99 employees; and Conney Sapphire Village, Mungas Company, and Sunshine Station, each employing 20 to 49 individuals.

Table 3.6-3
Top Private Employers in Granite County in 2018

Employer Name	Employment Range
The Ranch at Rock Creek	100 to 249
Discovery Ski Area	50 to 99
Conney Sapphire Village	20 to 49
Mungas Company	20 to 49
Sunshine Station	20 to 49

Source: MDLI 2019

The median household income in Granite County from 2013 to 2017 was $49,063, slightly lower than the state median household income of $50,801. However, per capita income in Granite County was slightly higher ($29,144) than the state ($28,706) (USCB 2017).

In 2018, unemployment in Granite County was 5.4 percent, higher than the state unemployment rate of 3.7 percent (MDLI 2019).

3.6.2.3 Tax Revenues

Tax revenues generated in Granite County include property taxes and fees and the Miscellaneous Mines Net Proceeds Tax. In fiscal year (FY) 2018, Montana collected approximately $1.7 billion in property taxes. Of this, 64 percent of all taxes collected were residential, commercial, and industrial land and improvements, otherwise known as Class 4 property. Approximately 4.7 percent of property taxes collected in FY 2018 were agricultural lands (Class 3 property), and less than 1 percent were property taxes related to mines and mining (Class 1 and 2 properties) (Montana Department of Revenue 2019).

In FY 2018, Granite County's total property tax and fees was $7.3 million. Class 4 property accounted for approximately 51 percent of the taxes and fees collected in Granite County in FY 2018, agricultural land accounted for approximately 4 percent, and mines accounted for approximately 2 percent.

Miscellaneous mineral mines, including precious or semiprecious stones or gems; gold; silver; lead; coal; lime rock; granite; marble; travertine; talc; phosphate; and other minerals, rock, or stone extracted from underground mines, quarries, open pits, dumps, or tailings, are subject to the Miscellaneous Mines Net Proceeds Tax (ARM 42.25.1101). The net proceeds for talc, vermiculite, limestone, and industrial garnets are calculated by multiplying the number of tons mined by a statutorily defined value (Montana Department of Revenue 2019). The taxable value of miscellaneous mines' net proceeds is allocated to the local jurisdictions where the mine is located. The mills of the local jurisdiction and the mills for the state are then levied against the taxable value. In FY 2018, the total taxes for the Miscellaneous Mines Net Proceeds Tax was $1.6 million. Of this, $1.2 million, or approximately 75 percent, was allocated to local jurisdictions; and $402,372, or 25 percent, was allocated to the state. Overall, total tax revenue from the Miscellaneous Mines Net Proceeds Tax makes up less than 1 percent of the natural resource tax collections for the state (Montana Department of Revenue 2019).

3.6.3 Environmental Consequences (Direct, Secondary, and Cumulative)

3.6.3.1 Alternative 1 – No Action Alternative

Direct and Secondary Impacts

Under the No Action Alternative, the operating permit for MLR's proposed Project would not be approved by DEQ, and no mining within the Project area would occur. No direct socioeconomic impacts, including additional employment, would occur within the socioeconomic analysis area. Existing employment and trends within the county would continue to occur. Secondary socioeconomic impacts, such as tax revenue, would not change from existing conditions, and the existing agricultural land would generate the same tax revenue for Granite County and the state.

3.6.3.2 Alternative 2 – Proposed Action

Direct and Secondary Impacts

If approved, the Proposed Action would result in short-term beneficial direct socioeconomic impacts. During the one-year construction of the Proposed Action, approximately 100 workers would be employed. Approximately 30 full-time workers would be employed for 50 years during operation of the mine (WESTECH 2017b). It is anticipated that the majority of these workers would reside in the nearby town of Drummond and the surrounding northeastern Granite County. These short-term beneficial impacts would occur until closure of the mine. After closure of the mine, these beneficial direct impacts would no longer occur.

Short-term beneficial secondary impacts, including increased tax revenue, would also occur as a result of the mine and mined limestone. MLR estimates that annual tax revenues from the proposed mine should range from $500,000 to $550,000. Approximately 95 percent of this tax revenue would result from property tax, and the remaining 5 percent would result from production of the ore. Overall, the potential increases in tax revenues would represent approximately 6.8 to 7.5 percent increase in Granite County property tax revenue. Increases in employment could result in minor increases in local spending by employed workers; however, this amount is not quantifiable.

After closure and final reclamation of the mine, the reclaimed areas would be available for grazing as soon as the vegetation is established and a management unit is large enough to support livestock.

3.6.3.3 Cumulative Impacts

Past, present, and reasonably foreseeable future actions that may result in socioeconomic impacts include agricultural operations, mining, and rail transportation. The cumulative impacts of the Proposed Action and past, present, and reasonably foreseeable future actions would result in short-term beneficial direct and secondary socioeconomic impacts. The Proposed Action would provide additional employment opportunities within one of the top three employment industries in Granite County, and potentially increase county and state tax revenues. No changes in long-term cumulative socioeconomic impacts would occur.

3.7 Visual Resources

3.7.1 Analysis Methods

The visual resource analysis area to assess direct, secondary, and cumulative impacts includes the 546.4-acre Project area and the nearest visual-sensitive receptors that could be impacted by the proposed Project, as shown on **Figure 3.7-1** and described in **Table 3.7-1**. Receptors sensitive to visual changes include nearby communities, businesses, and residences; travelers driving on local roads and highways; and people recreating nearby. Although no U.S. Forest Service lands are in the visual resource analysis area, the U.S. Department of Agriculture (USDA), U.S. Forest Service (Forest Service) visual resource analysis method was referenced, *Landscape Aesthetics* and the *Scenery Management System (SMS)* (USDA 1995), when analyzing visual resources. The SMS process serves as a consistent method for visual resource impact analysis. Concepts and terminology borrowed from SMS were used to provide consistent language to describe and understand the visual character of the visual resource analysis area. The visual analysis was conducted by WESTECH (2018).

The landscape character, scenic integrity, landscape visibility and viewer sensitivity, and contrast from proposed activities to the existing landscape were evaluated to describe environmental effects of the Project. Viewer sensitivity level varies based on the type of user, the number of users, public interest, and adjacent land uses. Potential visibility of the proposed mining operation from viewpoints was estimated on the ground by WESTECH (WESTECH 2018). One viewpoint (VP), VP5, was modified for this analysis because the access road was not visible from the original location in the visual simulations. The new VP5 analyzes impacts from Lorensen Lane where the access road would intersect. Also considered in this analysis was the length of viewing time, distance between a viewpoint and the proposed mining, the amount of potential contrast created by Project impacts, and the presence of visual obstructions between a viewpoint and the proposed Project area.

3.7.2 Affected Environment

The proposed Project area includes rolling grassy hills, forested slopes, flat pasturelands and agricultural fields, and forested river valleys. Larger mountain peaks are visible to the northwest depending on the viewer's location. The visual resource analysis area is in the northeastern part of the Sapphire Range of the Rocky Mountains and west of the Continental Divide.

The Project area is southwest of the Clark Fork River corridor, and the river and the surrounding riparian vegetation dominates the view from VP2 and VP3. Two other creeks, Tigh Creek and Flint Creek border the Project area on the northwest and southeast, respectively. The primary land uses in the Project area are livestock grazing and irrigated and nonirrigated hay fields (see **Section 3.5, Land Use and Recreation**). As shown on **Figure 3.7-1**, the visual resource analysis area includes the town of Drummond (east of the Project area), SH 1 (also called Pintler

Veterans' Memorial Scenic Highway), East Front Street and the I-90 Frontage Road, and I-90 paralleling the Project area on the northeast. The Pintler Veterans' Memorial Scenic Highway is advertised as a scenic alternative route to I-90. It is 64 miles long, passing through the historic mining towns of Anaconda, Georgetown Lake, Philipsburg, and Granite Ghost Town, and ending in Drummond (Montana Office of Tourism 2019). The route is notable for the historic sites as well as the visually pleasant vegetated mountains and hills.

3.7.2.1 Landscape Character

The landscape character describes the valued scenic features that make up a landscape, including the vegetation communities, water features, topography, geologic features, cultural and historic built features, agricultural areas, recreation facilities, rural communities, and residential areas. Character may range from predominantly natural to human altered. The Project area consists of treeless rolling hills with rocky outcrops, sparse vegetation, and forested edges rising several hundred feet above the Clark Fork River Valley at elevations up to 4,400 feet. Pasturelands, rural residential developments, and transportation corridors influence the view (WESTECH 2018). The visual resource analysis area has moderate visible human disturbance related to rural life, including livestock grazing, agriculture, roads, utility corridors, railroads, and buildings.

3.7.2.2 Scenic Integrity

Scenic integrity is based on the intactness compared to the valued landscape. The Forest Service designates Scenic Integrity Objectives for landscapes they manage. Because the Project area is private land and not Forest Service land, scenic integrity is used as a reference rather than designated by the Forest Service. The categories are: (Forest Service 1995)

- Very High – Unaltered
- High – Appears unaltered, deviations are not evident
- Moderate – Appears slightly altered, deviations remain visually subordinate
- Low – Appears moderately altered, deviations begin to dominate the valued landscape character but borrow from the valued attributes
- Very Low – Appears heavily altered, but should be shaped and blended with the natural terrain

Based on the five VPs, the landscape appears to have low to moderate scenic integrity due to agricultural modifications, transportation corridors, and residential developments. VP1, VP4, and VP5 have low integrity with many human alterations visible, while VP2 and VP3 have moderate scenic integrity with few alterations to the landscape.

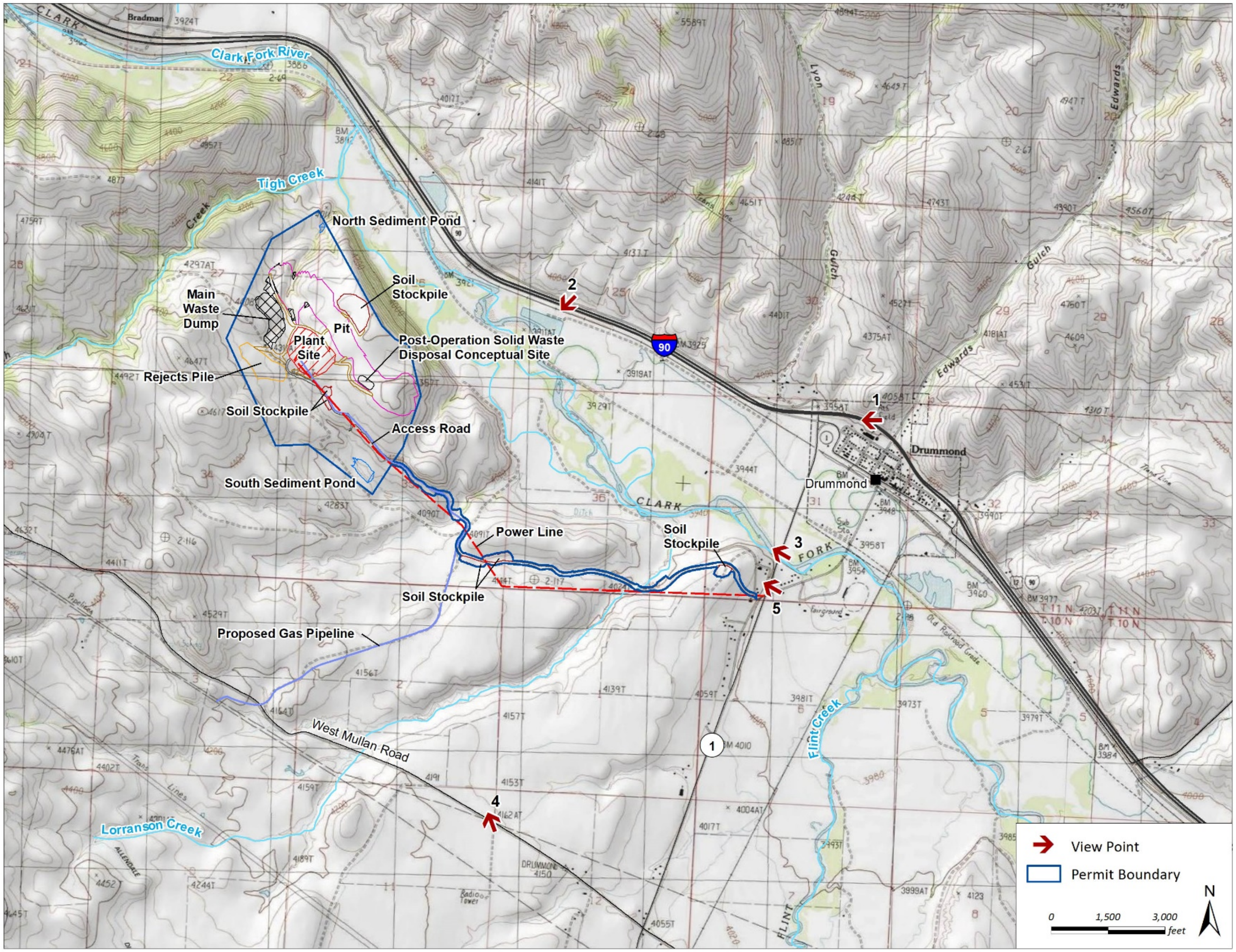

Figure 3.7-1. Visual-Sensitive Receptors in the Visual Resource Analysis Area.

3.7.2.3 Landscape Visibility and Viewer Sensitivity

Landscape visibility combines where the landscape is commonly viewed and the relative value/importance to the viewer. Five VPs were identified by WESTECH (2018) site photos were taken, and visual simulations were created to depict the existing conditions, Year 5 of mining, and 20 years after final reclamation (70 years total – 50 years for the active mine and 20 years postreclamation). **Table 3.7-1** provides the type of viewpoint, the direction of photos, and the visual description from the viewpoints in the visual resource analysis area.

The following definitions for distance zones were used to describe the locations of impacts:

- Foreground – Areas up to 0.5 mile. Fine details are visible, individual trees, rivers, and detail in rock outcrops. Views are more graphic but of shorter duration.
- Middle ground – Areas seen from 0.5 mile to 4 miles. Scenic features combine to be seen as texture and patterns; instead of identifying individual trees, they combine to be seen as forest texture. The viewer has more time to absorb the scenery.
- Background – Areas from 4 miles to the horizon. Views are perceived as large blocks of color and patterns. Distant impacts are less discernible.

Viewing distances for the visual resource analysis area range from 1,000 feet to 2.5 miles, mostly falling in the middle ground classification.

Table 3.7-1
Viewpoints in the Visual Resource Analysis Area

Viewpoints	**Type of Viewer**	**Direction Looking Toward the Analysis Area**	**Description of View (Location of the Project Area within a Distance Zone – in Bold)**
VP1, **I-90**	Car on the highway	West	**Middle ground** – Rolling grassy hills with dark green forested patches and swaths. Foreground – Flat pastures in the valley adjacent to the highway. Manmade features include roads, signs, transmission lines, and scattered residences.
VP2 – **Mile Marker 152, I-90**	Car on the highway	Southwest	**Middle ground** – Rounded hills with mostly conifer dark green forest and patches of grassy meadows. Foreground – Thick deciduous trees along the river valley bottom, power pole, and railroad tracks are visible.
VP3 – **SH 1, Bridge over the Clark Fork River**	Car on the road	Northwest	Background – Distant, dark forested hills. **Middle ground** – Mostly grassy meadows and rolling hills, dark forested patches. Irrigated flat pastures and farm equipment. Foreground – Dense deciduous and conifer forest and shrubland along the river corridor. Open water of the Clark Fork River is visible.

Table 3.7-1
Viewpoints in the Visual Resource Analysis Area

Viewpoints	Type of Viewer	Direction Looking Toward the Analysis Area	Description of View (Location of the Project Area within a Distance Zone – in Bold)
VP4 – **Mullan Road**	Local residents traveling on roads, occasional recreationist	Northwest	Background – Expansive forested mountain peaks. **Middle ground** – Rolling, grassy hills, with red and tan exposed dirt from disturbance and eroded hills. Patchy forest on the slopes. Foreground – Planted crop field and fence line, exposed gray dirt between crops.
VP5 – **Lorensen Lane, Residences Across from New Access Road**	Local residents	Northwest	**Foreground** – Local roads (paved and dirt – white and light-gray surface), street signs, residences, wooden fences, flat grassy areas, power poles, and barren dirt field. A rise in the topography occurs where the proposed access road would be located; therefore, only a small length of the access road would be visible.

3.7.2.4 Contrast

The Project area is located on a hilltop, several hundred feet above the Clark Fork River Valley. This location affects the angle of viewing, the amount of visible Project area, and the length of time the proposed Project would be visible from the VPs. The landscape has only subtle variations in color and texture – when rolling grasslands transition to conifer forests or river valleys transition to rolling hills. The visual resource analysis area has moderate visible human disturbance related to rural life from livestock grazing, agriculture, roads, utility corridors, railroads, and buildings contrasting with the natural landscape.

3.7.3 Environmental Consequences (Direct, Secondary, and Cumulative)

3.7.3.1 Alternative 1 – No Action Alternative

Direct and Secondary Impacts

Under the No Action Alternative, the operating permit for MLR's proposed Project would not be approved by DEQ, and no mining within the Project area would occur. No direct or secondary visual impacts within the visual resource analysis area would occur.

3.7.3.2 Alternative 2 – Proposed Action

Direct and Secondary Impacts

Topography and distance from the town of Drummond are the greatest factors affecting visibility of proposed mining activities. The existing landscape consists of rolling hills and distant mountains. Factors that affect the visual impacts include long distances (1 to 3 miles) between mining operations and the VPs and the steep angle of view from some VPs to the Project area.

Direct visual impacts would occur due to changes in the color and texture of the hillside during active mining. Disturbed soils would increase the contrast between intact vegetation (shades of green) and mining disturbance (tan, red, or gray, depending on the underlying soil color). The visual contrast of exposed soils with intact vegetation would remain as a secondary visual impact until vegetation is reestablished in the disturbed areas.

There would be short-term adverse impacts on visual resources during the life of the mine on vehicles traveling along I-90, SH 1, and Mullan Road. Mining and associated mining activities, such as excavating 20-foot benches and building a new access road, would result in increased visual contrast in the foreground (access road - VP5) to middle ground (mine pit - VPs 1, 2, and 3), including changes in the color of the landscape from removal of vegetation and exposure of soil. However, viewing times would be relatively short (30 seconds to 3 minutes) for drivers traveling adjacent to the Project area.

The approximate distances of VPs to the proposed disturbance and a summary of the proposed impacts are listed in **Table 3.7-2**. The disturbance viewed from VP1 would alter the landscape, contour, color, and texture of the existing view. However, given the distance of almost 3 miles, the disturbance would appear blended into the existing landscape. As the viewer gets closer to the Project area, the disturbance would be more noticeable.

Limited short-term and long-term visual impacts would occur at VP2 and VP5 since existing topography would predominantly screen views of mining operations. As mining progresses in the Project area from northwest to southeast, contrasting exposed soil and rock, as well as mine facilities such as the stack at the mine plant, may be visible in the distance but would constitute a small area visible to residents.

Long-term visual impacts would occur at VP1 and VP3 because reclamation would occur in the direct view of the VPs. Short-term and long-term visual impacts at VP3 and VP4 would be distant and less noticeable. VP4 provides the most complete view of the Project area, including the plant site, but at 2 miles away, details of the Project area are subordinate to the surrounding landscape, and only changes to shape and color may be noticed.

Impacts at VP5 along Lorensen Lane would be short-term and visible to cars driving by for only a short time. For residences along Lorensen Lane, truck traffic on the new access road would be visible for the life of the mine.

Table 3.7-2
Summary of Visual Impacts by Viewpoint

Viewpoint	Viewing Distance (Miles)	Landscape Visibility and Viewer Sensitivity	Contrast	Visual Impacts
VP1	2.3	A high number of travelers along westbound I-90 would have a sustained view of the Project area driving from Drummond west for several miles. Small portions of the Project area would be visible compared to the overall rolling hills of the landscape. The highway corridor has high human alteration.	Low - Most of the Project area would not be visible until the mine progresses southeast.	Short-term visual impacts would occur from exposed soils during mining, toward the end of the life of the mine. Long-term visual impacts would occur due to changes in topography and vegetation after final reclamation.
VP2	0.9	The closest view of the Project area would be from I-90. The view would be short in duration given the speed of traveling vehicles on the highway and the steep angle of the view. The Project area would be partially visible in the middle ground as mining progresses. Short-term visual impacts due to the angle of the view would occur.	Low - Most of the Project area would not be visible until the mine progresses southeast.	Short-term direct visual impacts would occur from soils exposed during mining toward the end of the mine life. Long-term visual changes to topography and vegetation would occur after final reclamation.
VP3	2.0	The view of the Project area would be 10,000 feet away, and the view would be short in duration due to traffic movement and the angle of the view. Exposed dirt from surface disturbance would be visible during mining.	Low – The Project area would be distant.	Short-term direct visible impacts from exposed soils during mining would occur toward the end of the mine life. The large distance from the VP would lessen the impacts. Long-term visual changes to topography and vegetation after final reclamation would occur.

Table 3.7-2
Summary of Visual Impacts by Viewpoint

Viewpoint	Viewing Distance (Miles)	Landscape Visibility and Viewer Sensitivity	Contrast	Visual Impacts
VP4	2.1	The distant view would be more than 10,000 feet away. Soil exposed from disturbance would be visible during mining, but the background mountain view would draw the viewers' attention. A low number of viewers would experience these visual changes.	Low – The Project area is distant. Exposed red soils are currently visible on the hillside caused by erosion.	Short-term direct visual impacts from soil exposed during mining would occur. The large distance from the VP would lessen the impacts and would not result in long-term visual changes.
VP5	<50 feet	This VP is at the intersection of the new MLR Access Road and Lorensen Lane. The view from residences would be of a small segment of the access road because of topography, but would be of high intensity as trucks would be seen on the new access road.	High – The access road is close to stationary residences on Lorensen Lane.	Short-term direct and secondary visual impacts from the new dirt access road and truck traffic would occur. No long-term visual changes would occur.

The direct visual impact from Project activities would be lessened in the visual resource analysis area by the following conditions:

- In accordance with the *Reclamation Plan* (WESTECH 2018) interim reclamation would occur during the life of the mine and consist of revegetating soil stockpiles. Visible exposed tan, gray, and red soil would be covered with vegetation, reducing contrast with intact vegetation.
- Douglas-fir (*Pseudotsuga menziesii*) and juniper (*Juniperus* sp.) trees would be planted on the east crest of the pit and on the upper pit benches that are visible from I-90, VP1, and VP2.
- The area of visible mining disturbance would be relatively small compared to the view from a given VP given existing topography.

3.7.3.3 Cumulative Impacts

Past, present, and reasonably foreseeable future actions that may impact visual resources include agriculture and wildland fires. Wildland fires could result in visual impacts, but would depend on the location, proximity, and size of the wildland fire. When combined with related past, present, and reasonably foreseeable future actions, the No Action Alternative would not result in short-term or long-term cumulative visual impacts. The existing landscape character, scenic integrity, landscape visibility, and contrast within the visual resource analysis area would continue.

3.8 NOISE

3.8.1 Analysis Methods

The noise analysis area includes the 546.4-acre Project area and the nearest noise-sensitive receptors as shown on **Figure 3.8-1** and included in **Table 3.8-1**. Baseline noise levels measurements were conducted in April of 2014 by Big Sky Acoustics at six locations (Connolly 2014a). Ambient daytime and nighttime noise level measurements were completed at the six locations to document existing noise levels. A 24-hour noise level measurement was completed at Location 1, and one 20-minute daytime (7 a.m. to 10 p.m.) and one 20-minute nighttime (10 p.m. to 7 a.m.) noise level measurements were completed at Locations 2 through 6. Noise level measurements were conducted in accordance with the American National Standards Institute (ANSI) S12.18-1994, *Procedures for Outdoor Measurement of Sound Pressure Level* (ANSI 1994).

Table 3.8-1
Noise Level Measurements Locations

Location Number	Location Name
1	Drummond Community Church
2	Mullan Road
3	Drummond Campground
4	East of Drummond, Front Street
5	Campground/I-90 Frontage Road
6	North of Pole Yard

Source: Connolly 2014a

3.8.1.1 Noise Terminology

Noise is typically measured in decibels (dB), a logarithmic (a nonlinear scale used when there is a large range of quantities) that matches the way the human ear interprets sound pressures. The human auditory system is not equally sensitive to all frequencies; therefore, the A-weighted decibel (dBA) is used to measure sound the same way the human ear hears sound (Ver and Beranek 2006). Perceptible sound levels generally range from about 0 dBA (threshold of hearing) to about 140 dBA (painful) with a normal conversation around 60 dBA. Humans can barely perceive a difference in a noise level when it changes by 3 dB. Most can detect a 5-dB change, and a 10-dB change sounds like the noise level has doubled or has been cut in half, depending on the characteristics of the noise source and the atmospheric and topographic conditions over the path the noise travels. A reduction in noise levels can occur if a solid barrier or natural topography is located between the source and receptor (Connolly 2014b).

Noise levels generally fluctuate as noise sources move and environmental factors change. Therefore, noise levels are reported as the accumulation of sound levels over a particular period of time (L_{eq}). The L_{eq} metric uses a single number, similar to an average, to describe the constantly fluctuating ambient noise levels at a receptor location during a period of time.

To help understand the acoustical character of an environment, such as “rural, quiet areas” or “urban noisy areas,” the 90th percentile exceeded noise level (L_{90}) is used. The L_{90} metric denotes the noise level that is exceeded during 90 percent of a measurement period.

The 1st percentile exceeded noise level (L_1) is a metric that indicates the single noise level that is exceeded during 1 percent of a measurement period. For example, over a 60-second measurement period, a fluctuating noise that occurs for at least 0.6 second during that time will determine the L_1. The L_1 is often closer to the high end of the instantaneous noise levels during a measurement period and is typically used to measure impulsive noises of brief durations, such as gunshots, alarms, and impact noises.

The day-night average noise level (L_{dn}) is a single number that represents the varying sound level during a continuous 24-hour period. The L_{dn} can be determined using twenty-four consecutive 1-hour L_{eq} noise measurements (a 24-hour measurement) or estimated using L_{eq} measurements for shorter periods (Connolly 2014a).

The L_{max} metric denotes the maximum instantaneous noise level recorded during a measurement period. The L_{pk} represents the highest instantaneous noise level in unweighted peak decibels (dBP). L_{pk} is often used to assess blast noises since the A-weighting underestimates the human annoyance caused by low-frequency impulsive sounds (Connolly 2014b).

3.8.1.2 Noise Impact Analysis

To assess noise impacts, noise level predictions were generated for the six measurement locations. See Appendix E of the Application for more information on noise level predictions.

ARM 17.24.159(2)(f) regulates all blasting operations covered under the MMRA. Airblasts must not exceed the values shown in **Table 3.8-2**, depending on the lower frequency limit of the measuring system or device. These values must not be exceeded at any dwelling, public building, school, church, or commercial, public, or institutional structure.

Table 3.8-2
ARM 17.24.159(2)(f) Maximum Airblast Values

Lower Frequency Limit of Measuring System (Hertz) (+3 dB)	Maximum (Peak) Level in Decibels
0.1 Hz or lower (flat response)	134 (dB)
2 Hz or lower (flat response)	133 (dB)
6 Hz or lower (flat response)	129 (dB)
C-weighted (slow response)	105 (dBC)

Source: ARM 17.24.159(2)(f)

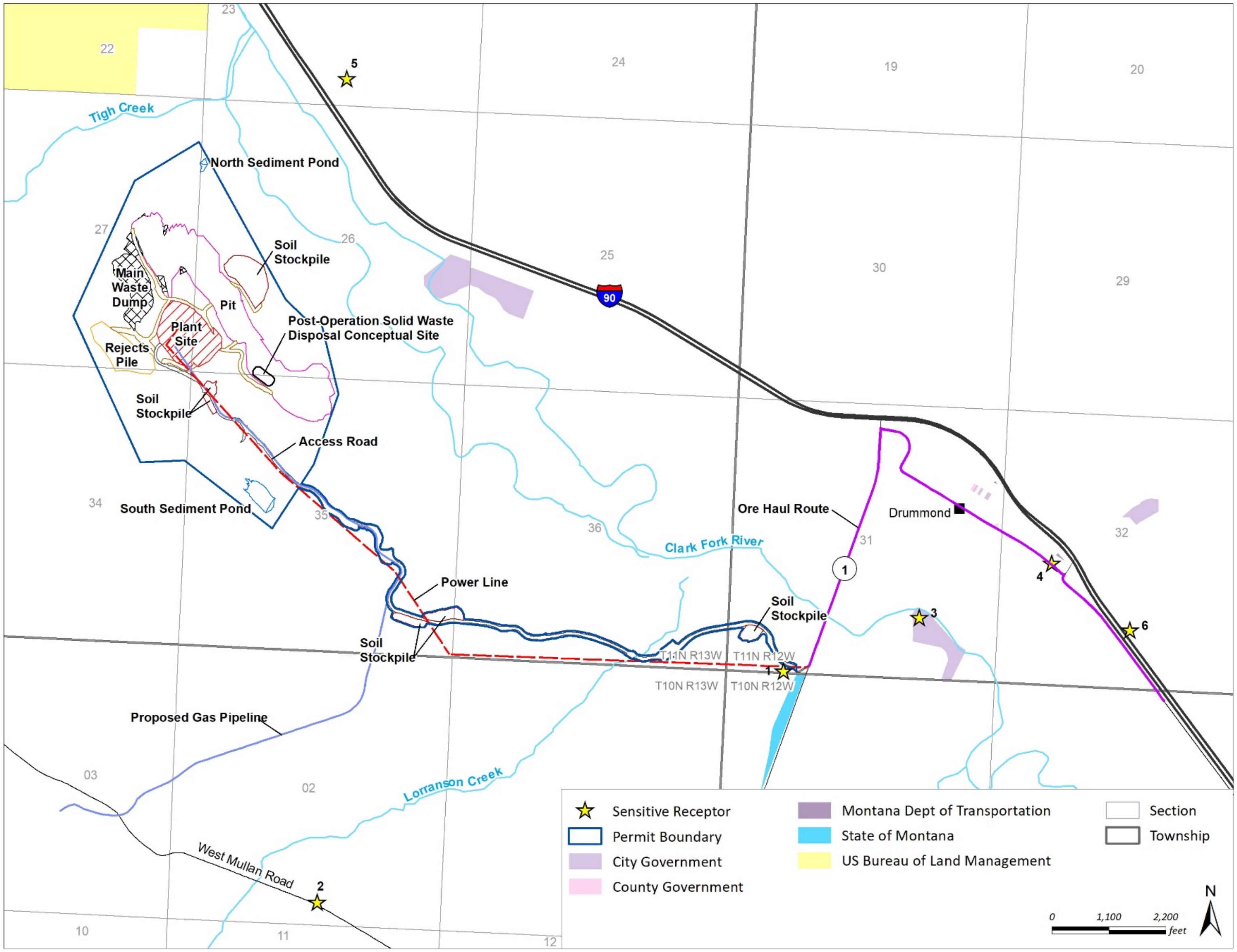

Figure 3.8-1. Location of Sensitive Receptors within the Noise Analysis Area.

In addition, under Section 45-8-111, MCA, noise can be considered a public nuisance.

As a result of the Noise Control Act of 1972 (42 USC § 4901), the EPA established noise level guidelines to protect public health and welfare. While not enforceable, these guidelines are used often for noise studies. Outdoor (L_{dn}) noise levels less than or equal to 55 dBA are considered by the EPA sufficient to protect public health and welfare in residential areas (Connolly 2014b).

The U.S. Department of the Interior (USDI) *Blasting Guidance Manual* establishes a guideline of 120 dB to minimize human annoyance and 134 dB to protect against damage to residential structures (USDI 1987). Additionally, the U.S. Army has established blast noise levels. Generally, measured L_{pk} levels of greater than or equal to 115 dBP are considered an annoyance for receptors.

The Montana Department of Transportation (MDT) has established traffic noise levels. Traffic noise impacts occur when the predicted 1-hour (L_{eq}(h)) traffic noise levels are 66 dBA or higher at a residential property, or when traffic noise levels exceed the measured peak-hour, 1-hour traffic noise level by 13 dBA or more (MDT 2016).

Finally, while the human perception and response to noise is subjective, the typical perceived change in loudness is presented in **Table 3.8-3**. Changes in noise levels of 3 dBA are barely audible for most people. Changes in noise levels of 5 dBA are clearly audible, and changes of 10 dBA or more are substantial perceived changes in loudness (Connolly 2014b).

Table 3.8-3
Change in Noise Level and Perceived Change in Loudness to a Person

Change in Noise Level (dBA)	Perceived Change in Loudness
+- 1	Imperceptible
+- 3	Barely audible
+- 5	Clearly audible
+- 10	Half as loud or twice as loud as the original noise
+- 20	One quarter as loud or four times as loud as the original

Source: Connolly 2014b

3.8.2 Affected Environment

Existing noise levels at each of the six measurement locations are presented in **Table 3.8-4** and summarized below (Connolly 2014a). Additional information including frequency spectra figures are included in Appendix A-11 of the Application (WESTECH 2018).

Table 3.8-4
Existing Noise Level Measurements

Location	Time	L_{eq}	L_{90}	L_{dn}
1	24-hour	35 to 50	26 to 39	52
2	Daytime	27	23	34
	Nighttime	30	22	
3	Daytime	43	37	46
	Nighttime	41	37	
4	Daytime	59	49	58
	Nighttime	52	27	
5	Daytime	52	42	56
	Nighttime	51	32	
6	Daytime	62	49	62
	Nighttime	56	29	

Source: Connolly 2014a

3.8.2.1 Location 1 – Drummond Community Church

Location 1 is along the west fence at the Drummond Community Church on the southwest corner of Lorensen Lane and Main Street less than 1 mile southwest of downtown Drummond. The L_{eq} ranged from 35 to 50 dBA and the L_{90} ranged from 26 to 39 dBA, typical noise levels for sparsely populated rural areas (Harris 1998). The L_{dn} was 52 dBA. Predominant noise sources were SH1 vehicles, and other noises recorded included birds, helicopters, and train horns.

3.8.2.2 Location 2 – Mullan Road

Location 2 is approximately 1.8 miles south of the Washington Limestone property boundary and 5,635 feet from the Project area. The measured noise levels were typical of a rural area. The L_{eq} ranged from 27 to 30 dBA and the L_{90} ranged from 22 to 23 dBA. The L_{dn} was 34. Predominant noise sources were vehicles on I-90 (faint), overhead airplanes (faint), electrical wires, and livestock sounds.

3.8.2.3 Location 3 – Drummond Campground

Location 3 is on the east side of Main Street, south of the Clark Fork River. Predominant noise sources were vehicles on Main Street. Other noises included birds, vehicles on I-90 (faint), a vehicle back-up alarm, a tractor engine (faint), rustling tree leaves, a barking dog, and substation equipment (faint). The L_{eq} ranged from 41 to 43 dBA and the L_{90} was 37 dBA. The L_{dn} was 37 dBA.

3.8.2.4 Location 4 – East of Drummond, Front Street

Location 4 is on the east side of Drummond, approximately 300 feet from the intersection of Front Street and Sorenson Lane and adjacent to a mobile home area. The measured noise levels were typical of a suburban area, not a rural area. Predominant noise sources were vehicles on I-

90 and Front Street. Other noises included a large truck engine idling to the east. The L_{eq} ranged from 52 to 59 dBA, the L_{90} ranged from 27 to 49 dBA, and the L_{dn} was 58 dBA.

3.8.2.5 Location 5 – Campground/I-90 Frontage Road

Location 5, approximately 2.5 miles northwest of Drummond, is north of I-90 along the I-90 Frontage Road. A few residences and a campground are located near the measurement site. The measured noise levels were typical of a suburban area. The L_{eq} ranged from 51 to 52 dBA, the L_{90} ranged from 32 to 42 dBA, and the L_{dn} was 56. Predominant noise sources included vehicles on I-90 and the I-90 Frontage Road. Other noises included birds and a helicopter.

3.8.2.6 Location 6 – North of Pole Yard

Location 6 is approximately 0.5 mile southeast of Drummond, north of I-90 along the I-90 Frontage Road, and east of the intersection of the I-90 Frontage Road and Periman Lane. Several rural residences are located nearby, and a pole yard is located across I-90 from the measurement location. The measured noise levels were typical of a suburban area, not a rural area. Predominant noise sources were vehicles on I-90. Other noises included a construction equipment (loader) engine in the pole yard, a vehicle engine idling, and a train horn (faint). The L_{eq} ranged from 56 to 62 dBA, the L_{90} ranged from 29 to 49 dBA, and the L_{dn} was 62 dBA.

3.8.3 Environmental Consequences (Direct, Secondary, and Cumulative)

3.8.3.1 Alternative 1 – No Action Alternative

Direct and Secondary Impacts

Under the No Action Alternative, the MLR Project would not be permitted. There would be no Project impacts within the noise analysis area described above, and existing baseline noise levels and sources would continue.

3.8.3.2 Alternative 2 – Proposed Action

Direct and Secondary Impacts

The primary sources of noise from the Proposed Action would result from operation of the lime plant equipment, quarry blasting, and haul trucks traveling to and from the site.

The lime plant equipment that would be used include a limestone crushing circuit, mobile diesel-powered equipment, a lime kiln, and a rock drill. The referenced noise levels, estimated duration, and frequency for the lime plant equipment are listed in **Table 3.8-5**. These noise levels were used in the noise prediction analysis (Connolly 2014b).

Table 3.8-5
Lime Plant Equipment Referenced Noise Levels

Noise Source	Noise Level at Distance from Source	Duration and Frequency
Crushing circuit	L_{eq} 66 dBA at 1,050 feet	12 hours per day 4 days per week
Mobile diesel-powered equipment	L_1 85 dBA at 50 feet	12 hours per day 4 days per week
Haul trucks (40-ton) or tandem trailer (60-ton)	L_1 88 dBA at 50 feet	24 hours per day 7 days per week
Rock drill	L_1 98 dBA at 50 feet	8 hours per day 1 to 2 days per week
Kiln fan	L_1 115 dBA at 50 feet	24 hours per day 7 days per week

Source: Connolly 2014b

The crushing circuit includes vibrating screens, crushers, and conveyor systems. This circuit of equipment would run 12 hours per day, 4 days per week. The mobile diesel-powered equipment would also run 12 hours per day, 4 days per week. Haul trucks and lime kiln fans would operate 24 hours per day, 7 days per week. The rock drill, used to drill explosive holes in the quarry, would operate 8 hours per day, 1 to 2 days per week.

The predicted noise levels at the six noise measurement locations is provided in **Table 3.8-6**.

Table 3.8-6
Predicted Noise Levels at Noise Measurement Locations as a Result of Lime Plant Equipment Operation

Measurement Location	Existing L_{dn} (dBA)	Predicted Lime Plant Equipment Noise L_{dn} (dBA)	Difference (dBA)	Noise Level Perception
1	52	31	-21	Imperceptible
2	34	39	+5	Clearly audible increase
3	46	36	-10	Imperceptible
4	58	33	-15	Imperceptible
5	56	41	-15	Imperceptible
6	62	31	-31	Imperceptible

Source: Connolly 2014b

The predicted lime plant equipment noise levels are all below the EPA established guidelines. Noticeable changes in noise levels as a result of the lime plant equipment are only anticipated at Location 2 (along Mullan Road). All other measurement locations would experience an imperceptible change in noise levels.

Noise would also result from blasting to develop the quarry. MLR estimates that the maximum charge per delay is expected to be approximately 310 pounds. At the closest residence, located approximately 4,600 feet northwest of the proposed quarry (near Location 5), the blast noise is predicted to be approximately L_{pk} 111 dBP (Connolly 2014b). While this noise would be audible at this location, the predicted noise level is below the U.S. Army and USDI recommended levels.

Noise from back-up alarms on mobile diesel-powered equipment, such as loaders, and haul trucks would occur at the proposed lime plant and vehicles traveling to and from the lime plant. Sound levels for these alarms can range between a maximum of 90 to 110 dBA at 4 feet away, depending on the volume setting, model, working environment, etc. Use of these alarms would vary throughout the lime plant site as mobile equipment moves around and may be clearly audible at times yet inaudible at others. While these noises are often perceived as an annoyance, generally the sound levels rarely influence measured or predicted noise levels (L_{eq} or L_{dn} values) (Connolly 2014b).

Secondary noise impacts would also occur from haul trucks traveling to and from the lime plant. Lime from the plant would be shipped at an average rate of 14 to 16 trucks, 6 days per week, 12 hours per day. The final truck haul route has not been selected and **Table 3.8-7** provides the predicted traffic noise levels for residences along potential truck haul routes. These locations include the following:

- SH 1 between the intersection of Main Street and I-90
- Front Street in Drummond
- Main Street between SH 1 and Front Street (near Front Street)
- Main Street between SH 1 and Front Street (near SH 1)

Table 3.8-7
Predicted Traffic Noise Levels Along Proposed Truck Haul Routes

Haul Route Option	Distance between Closest Residence and Road Centerline (feet)	Existing Traffic Noise (L_{eq}) (dBA)	Predicted Traffic Noise with Haul Trucks (dBA)	Difference between Existing and Predicted (dBA)	Noise Level Perception
SH 1	85 to 180	55 to 60	56 to 60	0 to +1	Imperceptible
Front Street	40 to 75	55 to 58	56 to 59	+1	Imperceptible
Main Street (near Front Street)	90 to 120	39 to 44	44 to 49	+5	Clearly audible
Main Street (near SH 1)	40 to 185	44 to 52	47 to 55	+3	Barely audible

Source: Connolly 2014b

The predicted noise levels at residences along the proposed truck haul routes are not anticipated to exceed the MDT traffic noise level impact criterion of 66 dBA (L_{eq}(h)) and are predicted to be 0 to +5 dBA above existing traffic noise levels. Perceived noise level changes would be clearly audible to residents along Main Street.

The effect of mining noise on wildlife is described in **Section 3.12.3, Fish and Wildlife Resources**. After the mine operations cease and during and after final reclamation of the mine, the noise impacts would not occur. No long-term noise impacts are anticipated under the Proposed Action.

3.8.3.3 Cumulative Impacts

Past, present, and reasonably foreseeable future actions that could contribute to cumulative impacts from noise sources include agricultural operations, mining, and rail transportation. All of these noise sources create intermittent or distant noises to sensitive receptors. Existing rail operations within the area affect sensitive receptors within and near the town of Drummond; however, noise from passing trains is intermittent. Other noise sources, including agricultural operations and mining, are distant for most sensitive noise receptors.

Noise as a result of the Proposed Action would result in short-term cumulative impacts on sensitive receptors in the noise impact analysis area, especially receptors on West Mullan Road near Location 2, and for residents on Main Street along the proposed haul truck route. No long-term cumulative noise impacts would occur as a result of the Proposed Action.

3.9 Soils and Reclamation

3.9.1 Analysis Methods

The soil analysis area corresponds to the 546-acre Project area, of which about 209 acres are expected to be disturbed by mining operations (**Figure 3.9-1**).

A soil investigation for the Project area was conducted for MLR in 2014 by WESTECH (Baker and Corry 2018). The soil investigation provides descriptions of field, laboratory, and interpretation methods; descriptions of soil map units; and chemical and physical characteristics of the soil types. Soil samples from the soil investigation were tested for particle size; percent saturation; organic matter; pH; electrical conductivity (EC); sodium adsorption ratio; and arsenic, cadmium, copper, lead, and zinc.

An analysis of soil suitability for reclamation and of salvageable depths and volumes is provided and was based on DEQ guidelines and the chemical and physical characteristics of the soil.

3.9.2 Affected Environment

Soils within the soil analysis area are typically developed in colluvium and alluvium derived from sedimentary clays in the southern portion, volcanics along the western boundary, and limestone in the central portion. Generally, soils are very deep (greater than 60 inches) to shallow (less than 20 inches to bedrock), are generally loamy in the surface layers and finer textured below, and typically have few coarse fragments but are abundant in some areas (**Table 3.9-1**).

The elevation of the Project area ranges from 4,000 to 4,600 feet above sea level. The Project area is semiarid with an average annual precipitation of approximately 13.4 inches, and the average annual temperature is 42°F and ranges from 43 to 65°F during the growing season (Baker and Corry 2018).

3.9.2.1 Soil Map Units

Ten soil map units were identified and delineated within the soil analysis area during the soil baseline investigation (Baker and Corry 2018) (**Figure 3.9-1**). Approximately 30 acres are within the soil analysis area along the proposed access road; of that 20 acres are within the proposed disturbance area that were not mapped during the baseline soil investigation. For these 20 acres, existing U.S. Department of Agriculture-Natural Resources Conservation Service soil map units from the Grant County soil survey (USDA-NRCS 2003) were used to determine salvageable soil for reclamation (WESTECH 2018).

Characteristics of the soil map units occurring within the proposed disturbance area are summarized in **Table 3.9-1** and were taken from the baseline soil investigation (Baker and Corry 2018) and from the Application (WESTECH 2018).

3.9.2.2 Suitability for Reclamation

Depths of salvageable soil was based on DEQ recommendations of (1) greater than 1.5 percent organic matter, (2) less than 50 percent coarse fragments, and (3) depth to bedrock (DEQ 2016). In general, the soil contains organic matter levels and physical and chemical properties suitable for reclamation based on DEQ criteria. In some soil, however, arsenic levels exceeded Montana’s background threshold value of 22.5 mg/kg. Within the soil analysis area, a total of 81 soil samples averaged 16 mg/kg of arsenic and ranged from 3 to 121 mg/kg. Of these, 14 samples exceeded the arsenic background threshold. No other metal concentrations (cadmium, copper, lead, and zinc), except for zinc in two deeper soil horizons, exceeded the background thresholds. These threshold concentrations simply represent background levels in the upper 6 inches of soil throughout Montana.

The deep and very deep soil, and some moderately deep soil, has 24 inches of soil suitable for reclamation (Br-To, Co, Da, Ma, and NRCS map units); and the shallow and some moderately deep soil (Lp, Qu, Sh, Wd, and Ws map units) has 12 inches. Map unit WC-RO does not have any suitable soil because of the steep slopes and abundance of rock outcrop (**Table 3.9-1**).

Limiting factors for reclamation are primarily high coarse fragment content, exceeding 50 percent, high clay content, and shallow depth to bedrock. In some areas, steep slopes and rock outcrops also limit soil salvage.

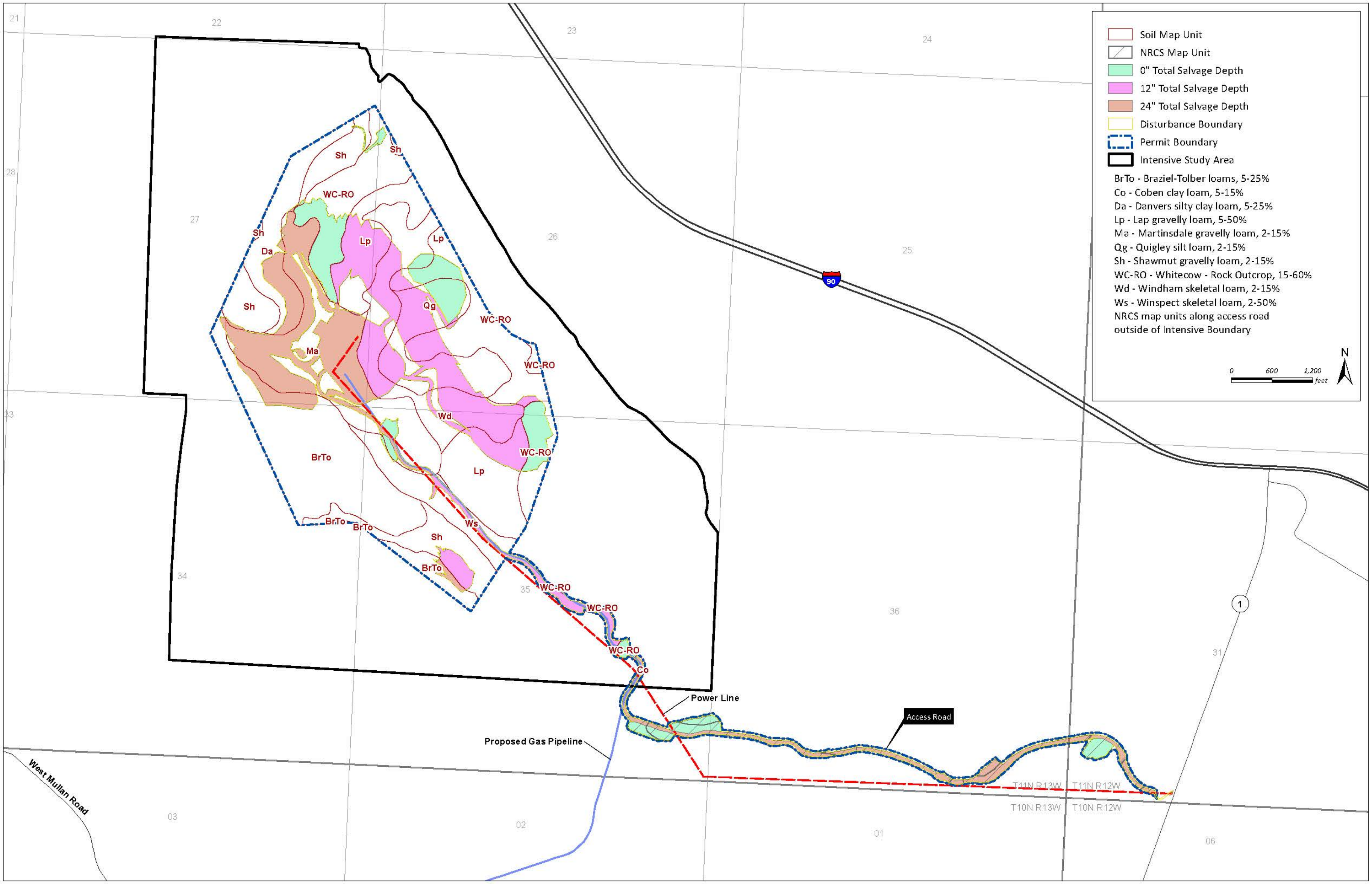

Figure 3.9-1. Soil Map Units and Salvageable Soil.

Table 3.9-1
Soil Characteristics, Acres, and Salvageable Soil

Map Unit Symbol	Soil Map Unit Name	Depth[a]	Dominant Texture	Coarse Fragment Content (CF)	Slope (%)	Analysis Area (Acres)	Proposed Disturbance (Acres)	Proposed Salvage Depth (in)/ Volume (cubic yards)	Potential Salvage Limitation
BrTo	Braziel-Tolbert loams	Variable	Loam, silt loam	Variable	5-25	86.2	7.1	24 22,910	Localized high coarse fragments
Co	Coben clay loam	Deep to very deep	Silty clay loam, clay	Low	5-15	1.2	0.7	24 2,258	Clay content
Da	Danvers silty clay loam	Deep	Silty clay loam, clay	Low	5-25	28.8	8.2	24 26,458	Clay content
Lp	Lap gravelly loam	Shallow	Loam, silt loam	Moderate to high	5-40	100.8	32.7	12 45,657	Shallow soil, high CF, localized steep slopes
Ma	Martinsdale gravelly loam	Moderately deep to deep	Silty loam, silty clay loam	Low to moderate	2-15	80.5	52.0	24 161,979	Localized high CF
Qu	Quigley silt loam	Moderately deep	Loam, silt loam	Low	2-15	40.0	24.6	12 30,492	Localized high CF
Sh	Shawmut gravelly loam	Shallow	Silt loam, silty clay loam, clay	Moderate to high	2-15	46.1	4.2	12 6,776	Shallow soil, high CF
Wc-RO	Whitecow-rock outcrop	Shallow to moderately deep	Silty clay loam	Moderate to high	15-60	51.0	21.4	0 0	Steep slopes, rock outcrop, localized high CF
Wd	Windham skeletal loam	Moderately deep to deep	Silt loam, clay loam, clay	Moderate to high	2-15	52.4	30.7	12 47,432	Localized high CF
Ws	Winspect skeletal loam	Moderately deep	Loam, silt loam	Moderate	2-50	28.6	7.3	12 11,455	Localized steep slopes
NRCS soils	Multiple	Moderately deep to deep	Loam, clay loam, silty clay loam	Low to high	0-35	30.7	20.4	24	Localized high CF
TOTAL						**546.3**	**209.3**	**397,362**	

[a] Shallow <20 inches; moderately deep 20-40 inches; deep 40-60 inches; very deep >60 inches

3.9.2.3 Soil Salvage Protocol

Soil removal would be done in either one or two lifts. For map units Br-To, Co, Da, Ma, and NRCS soil map units, soil salvage would be removed in two lifts – a 12-inch topsoil and upper subsoil (lift 1) and a 12-inch subsoil. Map units Lp, Qu, Sh, Wd, and Ws would be removed in one 12-inch lift (**Table 3.9-1**). If not directly replaced on regraded spoil, lift 1 soil and lift 2 soil would be stockpiled separately and signed accordingly. **Figure 3.9-1** shows the three soil salvage units: (1) double lift consisting of lift 1 (0-12") and lift 2 (12-24"), (2) single lift consisting of lift 1 only (0-12"), and (3) no salvageable soil.

Within the proposed mine disturbance, there is about 269,587 cubic yards of lift 1 soil and 127,775 cubic yards of lift 2 soil for a total of 397,362 cubic yards of soil to be salvaged and used in reclamation (**Table 3.9-1**). These volumes would vary due to the presence of large coarse fragment and intermittent rock outcrops.

3.9.3 Environmental Consequences (Direct, Secondary, and Cumulative)

3.9.3.1 Alternative 1 – No Action Alternative

Direct and Secondary Impacts

Under the No Action Alternative, the proposed Project would not occur. There would be no direct or secondary impacts on soil resources from the proposed Project, and soil erosion initiated by the proposed soil disturbance activities would not occur. Soil losses from erosion due to rainfall, runoff, and wind would continue to occur at existing rates.

3.9.3.2 Alternative 2 – Proposed Action

Direct and Secondary Impacts

Under the Proposed Action, approximately 209 acres would be disturbed by proposed Project activities in the soil analysis area. Impacts on soil would determine, in part, the potential success of reclaiming the land to postmining uses. MLR’s proposed operations plan, reclamation plan, and measures to control onsite erosion and sediment transport would mitigate some disturbance impacts and increase reclamation success; however, some direct impacts, which are typical of any operation where soil is removed, would persist.

Some soil from the disturbance areas would be hauled, and the rest would be stored and later respread. Direct impacts on soil would include:

- Soil erosion in disturbed areas and of salvaged soil through handling
- Changes in chemical, physical, and biological characteristics of soil from salvage, storage, and respreading (leading to reduced soil productivity and decreased soil development)

Soil Erosion

Areas cleared of vegetation would be susceptible to soil erosion from wind and water. Soil erosion would also occur as a result of soil removal and storage and of soil exposure during respreading and stabilization. Soil erosion caused by wind and water likely would occur during all phases of the Project. Soil erosion on disturbed areas would likely occur until vegetation is established and surfaces are protected from erosive forces. It typically takes several years for vegetation on reclaimed sites to provide a sufficient canopy cover to protect the soil from accelerated erosion. Some areas, such as steep slopes (especially south- and west-facing slopes), may require more time for the ground cover to stabilize reclaimed areas.

MLR is required (ARM 17.115) to provide postmine environmental monitoring programs and contingency plans for the postreclamation permit area. Erosion impacts on soil resources would be short-term and adverse and would return to pre-mine erosion rates within several years once vegetation stabilizes the surface.

Changes to Chemical, Physical, and Biological Soil Characteristics

Soil characteristics that would be impacted by the Proposed Action include chemical and physical properties and soil biota. Loss of soil structure through mechanical handling, followed by tillage to relieve compaction, would alter the native soil profile. This soil handling would adversely affect soil/plant interaction due to decreased soil water-holding capacity, loss of aeration and pore space, and increased bulk density (Sharma and Doll 1996). Soil compaction, loss of soil structure, and loss of organic matter due to mixing and storage would likely lower natural fertility and postmining vegetation production, vigor, and diversity for an extended period. Over time, developing root systems, infiltration of biota, climate, and physical processes such as freezing/thawing cycles would restart the soil-forming process and help establish a new natural soil profile.

Degradation of chemical properties may include changes in available nutrients, accumulation of ammonium, and loss of organic carbon through heat and leaching. It would be many years before these soil characteristics return to pre-mine conditions.

Hazardous Waste

A potential secondary impact on soil resources would be from oil and gas spills and releases related to Project operations that could occur within the soil analysis area. Oil and gas releases from seal ruptures on large equipment or from overfilling vehicles at fuel islands would likely occur where the soil had already been stripped and replaced with approved road surfacing material such as rock or spoil. If minor oil and gas releases or spills occur in undisturbed or reclaimed soil, the impact would be short-term and adverse. Depending on the characteristics of the released constituent, a major release on undisturbed land could require removing a significant volume of at least the more productive surface soil layer, which would require decades to return to natural productivity. Accidental releases on undisturbed or reclaimed land would have long-term and adverse impacts on soil resources. The potential for this secondary impact to occur would be unlikely because MLR would operate with an approved Spill Prevention, Control, and Countermeasure plan.

Sediment

Other secondary impacts on soil resources include the potential for sediment to be transported offsite and to impact offsite soil. In general, the larger the disturbance, the greater the potential for soil erosion. This secondary impact would be unlikely because runoff would be directed to sediment-storage structures, but it could occur during heavy storm events where soil disturbances are unprotected.

3.9.3.3 Cumulative Impacts

Past, present, and reasonably foreseeable future actions that have adversely affected or could adversely affect soil in the vicinity of the soil analysis area include quarry operations, wildland fires and prescribed burns, and grazing operations.

Past and present actions of two existing quarry operations in the vicinity of the soil analysis area (**Section 3.1.5.1, Related Past and Present Actions**) have increased erosion rates and reduced soil productivity through soil-handling operations. Soil erosion rates have a short-term adverse cumulative impact on soil and begin to return to natural conditions in a couple of years once vegetation stabilizes reclaimed areas. Reduction of soil productivity is a long-term adverse cumulative impact, likely requiring decades to return to natural conditions. These operations could continue in the foreseeable future and continue to contribute to cumulative impacts on soil.

Wildland fires and prescribed burns have historically occurred in the vicinity of the soil analysis area, most of which have occurred on federally managed lands. Large wildfires typically cause severe soil erosion and sedimentation to waterways (Woods and Balfour 2006) and add to the long-term adverse cumulative impacts on soil. Prescribed burns on the other hand help prevent large wildfires. While there would be short-term adverse impacts on soil from prescribed burning, fire management reduces the potential for long-term impacts from wildfires. As such, fire prevention projects benefit soil by reducing wildfire risk. Wildland fires and prescribed burns are expected to occur for the reasonably foreseeable future and would continue to impact soil.

Cumulative impacts from past and present grazing operations in the vicinity and within the soil analysis area have increased erosion rates, especially in livestock concentration areas and at stream crossings. Cumulative impacts on soil from grazing operations are a function of the grazing practices such as the number and type of livestock per acre and duration and timing of grazing. If the amount of soil erosion has been severe and ongoing for many years, the cumulative impacts on soil would be long-term. But with standard grazing practices, such as rotational grazing, which protects the soil surface from erosion, the cumulative impacts on soil would be minimized. Grazing operations are expected to continue for the reasonably foreseeable future, and the cumulative impacts on soil from grazing would continue.

3.10 TRANSPORTATION AND ACCESS

3.10.1 Analysis Methods

The transportation and access analysis area includes the Project area and the following roads and intersections that could be impacted by the Proposed Action:

- Montana SH 1 (proposed mine access road location)
- Front Street and Main Street
- Front Street and Sorensen Lane/I-90 Eastbound On-Ramp/Jens Frontage Road

Impacts on the transportation network were determined based on Morrison-Maierle's 2019 *Traffic Impact Study for the Montana Limestone Resources, LLC Environmental Assessment* (Traffic Impact Study) (Morrison-Maierle 2019). The Traffic Impact Study provides details regarding the methodologies used to assess existing conditions and potential impacts of the proposed mine.

To assess the existing conditions in the transportation and access analysis area, the Traffic Impact Study looked at traffic count data, intersection turning movements, and trip generation estimates. Where available, existing traffic data for the transportation and access analysis area was obtained from MDT. Unavailable data, such as intersection turning movements and trip generation, were modeled and estimated based on the existing traffic data.

To assess potential impacts on the transportation network, the estimated traffic conditions under the Proposed Action were compared to the estimated background existing and future traffic conditions. The estimated vehicular traffic generated from the Proposed Action was calculated by considering the daily truck trip projections, estimated employment data, and estimated volume of material extracted annually from the mine in the Application. Future background traffic volumes were estimated for the year 2021, 2026, and 2071 based on existing traffic data and growth projections.

Transportation system operating conditions are typically described in terms of "level of service." Level of service (LOS) is the performance measure used to evaluate the cumulative impacts of activities such as travel speed, traffic volumes, road and intersection capacity, travel delay, and traffic interruptions. Operating conditions are designated as LOS A through LOS F, which represent the most favorable to the least favorable operating conditions.

3.10.2 Affected Environment

The Project area is primarily undeveloped agricultural land. Two residential buildings and associated outbuildings are located north of the proposed mine access road near Lorensen Lane. Existing roads located within the Project area include a small portion of Grace Road, Lorensen Lane, and Main Street.

Outside of the Project area, but within the transportation and access analysis area, are the following roads and intersections (**Figure 3.10-1**):

- SH 1
- SH 1 and Old Highway 10A
- Front Street and Main Street
- Front Street and Sorensen Lane/I-90 Eastbound On-Ramp/Jens Frontage Road

The intersection of SH 1 and Old Highway 10A is the proposed site of the MLR mine access. The intersection located at SH 1, milepost 63, is currently a two-way, stop sign-controlled intersection. The majority of weekday peak hour morning (7:00 a.m. to 9:00 a.m.) and evening (4:00 p.m. to 6:00 p.m.) traffic travels northbound and southbound along SH 1.

The intersection of Front Street and Main Street is a T-intersection in the town of Drummond. No traffic signals or stop signs are present, and traffic along Main Street must yield to traffic along Front Street. The majority of weekday peak hour morning and evening traffic travels along Front Street.

The last intersection in the transportation and access analysis area includes the intersection of Sorensen Lane and Frontage Road, north of I-90. This intersection is just north of the westbound I-90 off-ramp. The intersection is stop sign controlled for vehicles traveling northbound along the Frontage Road and yield control for vehicles traveling southbound on Sorensen Lane. The majority of weekday peak hour morning and evening traffic travels along Sorensen Lane.

The estimated current daily traffic data is summarized on **Figure 3.10-1**.

3.10.3 Environmental Consequences (Direct, Secondary, and Cumulative)

3.10.3.1 Alternative 1 – No Action Alternative

Direct and Secondary Impacts

Under the No Action Alternative, MLR would not develop a limestone mine in the Project area. No direct or secondary impacts would occur, and the existing transportation and access conditions described above would continue, resulting in no change in existing traffic volumes or transportation operating conditions.

3.10.3.2 Alternative 2 – Proposed Action

Direct and Secondary Impacts

Under the Proposed Action, short-term direct impacts on the existing transportation network and access within the transportation and access analysis area would occur. Direct impacts include increased traffic volumes due to the increased number of vehicles.

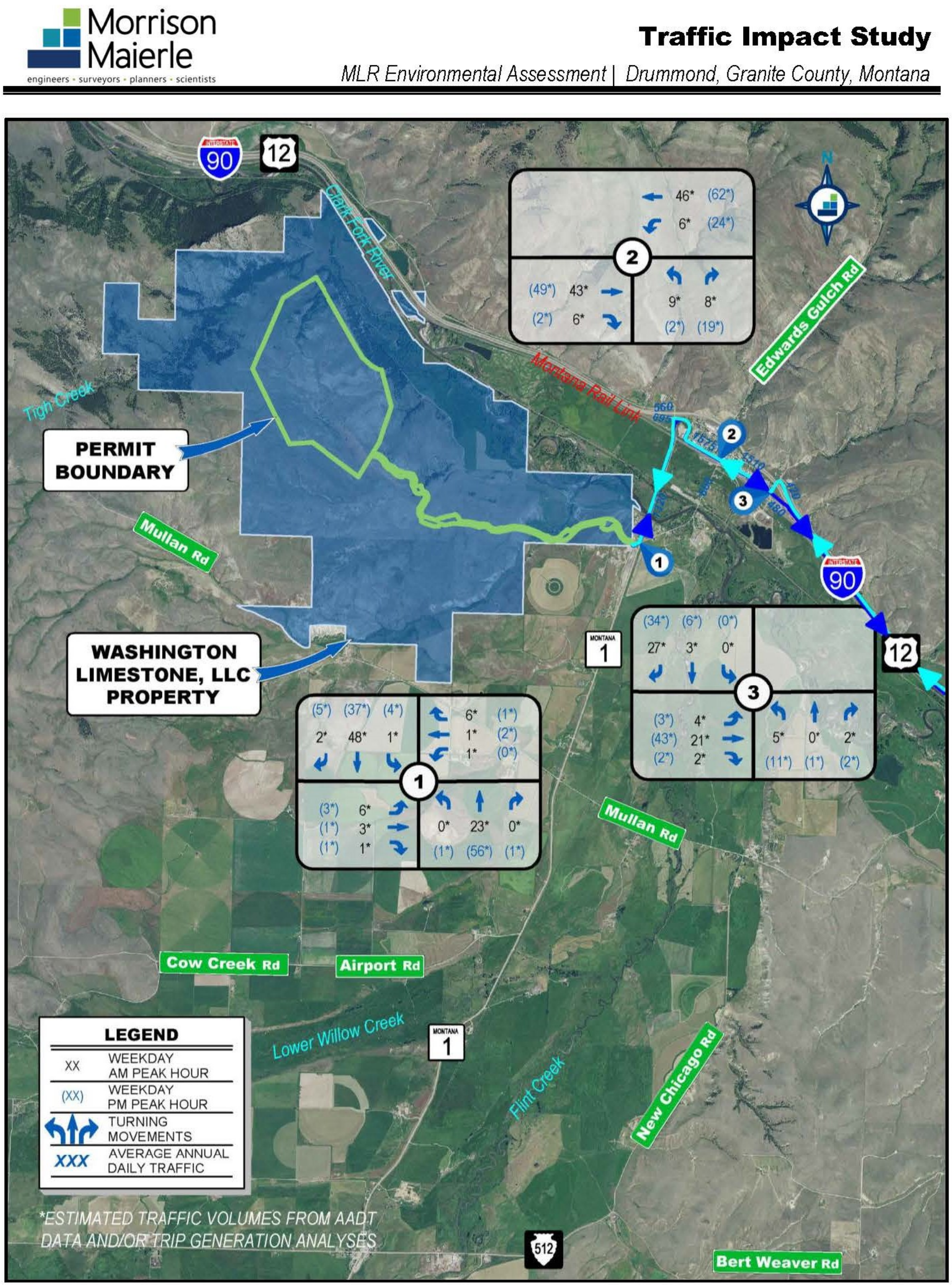

Figure 3.10-1. Existing Daily Traffic in the Transportation and Access Analysis Area.

The increased number of vehicles traveling in the transportation and access analysis area would occur due to employee vehicles and ore distribution truck trips. The Traffic Impact Study assumed that the majority of employee vehicle trips (75 percent) would originate and end in Drummond. The remainder would originate and end outside of Drummond, either south of town along SH 1 or west of town along I-90. As identified in the Application, ore distribution trucks would likely travel from the proposed mine site to Butte, Montana, traveling along SH 1 to eastbound I-90.

Table 3.10-1 includes the estimated trips at the proposed mine access road location, near the intersection of SH 1 and Old Highway 10A. Total average weekday trips are estimated to be 60 under the Proposed Action. Total average weekday morning trips are estimated to be 15, and total average weekday evening trips are estimated to be 12.

Table 3.10-1
Estimated Trip Generation under Alternative 2 – Proposed Action

Trip Generation Time Period	Enter	Exit	Total
Average Weekday	30	30	60
Average Weekday, A.M. Peak Hour (1 hour 7 to 9 a.m.)	10	5	15
Average Weekday, P.M. Peak Hour (1 hour 4 to 6 p.m.)	4	8	12

Source: Morrison-Maierle 2019

Based on the results of the analysis, all intersections included in the transportation and access analysis area would operate at LOS A for all three study years (2021, 2026, and 2071) under the Proposed Action. Additionally, the proposed mine road access location has adequate sight distance and favorable traffic operations. Therefore, no additional auxiliary turn lanes are needed at the proposed access site, and no upgrades are needed at any of the other intersections in the transportation and access analysis area.

No long-term direct or secondary impacts on the transportation network would occur under the Proposed Action.

3.10.3.3 Cumulative Impacts

Past, present, and reasonably foreseeable future actions that may result in transportation impacts include agricultural operations, mining, and rail transportation. When combined with other related past, present, and reasonably foreseeable future actions in the transportation and access analysis area, the short-term direct transportation impacts would result in slightly increased traffic volumes; however, all intersections included in the transportation and access analysis area would operate at LOS A. The Proposed Action would not result in any changes to existing long-term cumulative transportation impacts from other related past, present, and reasonably foreseeable future actions in the transportation and access analysis area.

3.11 Vegetation

3.11.1 Analysis Methods

Information on vegetation, including vegetation types, noxious weeds, wetlands, and waters of the U.S., is based on the *Baseline Vegetation Report* prepared by WESTECH (2014a). Wetlands and waters of the U.S. in the areas that would potentially be disturbed by Project activities were delineated in 2013 using the approach described in the 1987 Corps *Wetland Delineation Manual* (Environmental Laboratory 1987) and the final *Regional Supplement to the Manual: Western Mountains, Valleys and Coast Region* (Corps 2010). Wetlands in portions of the Project area where disturbances were not anticipated were mapped using a combination of aerial photograph interpretation and Montana Natural Heritage Program (MTNHP) wetland mapping. Detailed descriptions of wetlands and waters of the U.S. are provided in the *Baseline Wetlands Report* (WESTECH 2014b).

The vegetation analysis area used to assess direct, secondary, and cumulative impacts is the 546.4-acre Project area. Impacts on vegetation and wetlands from ground-disturbing activities were estimated using the vegetation and wetland mapping from the *Baseline Vegetation Report* and *Baseline Wetlands Report* (WESTECH 2014a; WESTECH 2014b) and the estimates of surface disturbance in the Application.

3.11.2 Affected Environment

3.11.2.1 Vegetation (Including Special Status Species)

The plant community types in the study area are grassland, tame pasture, shrubland, conifer forest and woodland, herbaceous riparian and woodland, woody riparian and wetland, and nonvegetated. Vegetation communities are shown on **Figure 3.11-1**. The diversity of community types in the study area is largely representative of other lower elevation study areas in west-central and southwestern Montana.

Several different native grassland communities were identified, including communities dominated by bluebunch wheatgrass (*Agropyron spicatum*), Idaho fescue (*Festuca idahoensis*), and rough fescue (*Festuca campestris*). Other grass species such as Sandberg bluegrass (*Poa secunda*) and western wheatgrass (*Pascopyrum smithii*) occur in these communities, along with scattered shrubs such as Woods' rose (*Rosa woodsii*) and rabbitbrush (*Ericameria nauseosa*).

The tame pasture plant community consists mostly of areas that are managed for seasonal livestock use or hay production. These pasture areas are mixtures of introduced grasses such as Russian wildrye (*Elymus junceus*), native species such as Sandberg bluegrass, as well as mixtures of smooth brome (*Bromus inermis*), orchardgrass (*Dactylis glomerata*), tall fescue (*Schedonorus arundinaceus*), Kentucky bluegrass (*Poa pratensis*), and meadow foxtail (*Alopecurus pratensis*).

The shrubland vegetation type is dominated by big sagebrush (*Artemisia tridentata*) with various grasses and forbs. Common co-dominant species include Sandberg bluegrass, western wheatgrass, bluebunch wheatgrass, and Idaho fescue. Shrublands dominated by snowberry (*Symphoricarpos occidentalis*) and chokecherry (*Prunus virginiana*) are also present but are infrequent.

Conifer forest and woodlands include areas dominated by Douglas-fir (*Pseudotsuga menziesii*), Rocky Mountain juniper (*Juniperus scopulorum*), and ponderosa pine (*Pinus ponderosa*). Bluebunch wheatgrass (*Pseudoroegneria spicata*), rough fescue (*Festuca altaica*), and mallow ninebark (*Physocarpus malvaceus*) are common understory species in these areas.

The herbaceous riparian and wetland vegetation type is dominated by various associations of Kentucky bluegrass, creeping bentgrass (*Agrostis stolonifera*), smooth brome, cattail (*Typha latifolia*), and various sedges (*Carex nebrascensis, C. pellita*, and *C. utriculata*). The woody riparian and wetland vegetation type includes various combinations of snowberry, sandbar willow (*Salix exigua*), red osier dogwood (*Cornus sericea*), juniper, black cottonwood (*Populus balsamifera*), and aspen (*Populus tremuloides*) habitat types. Wetlands are described in greater detail in **Section 3.11.2.3, Wetlands and Waters of the U.S.**

Miscellaneous nonvegetated areas include roads, railroads, water, gravel bars, and rock outcrops.

The occurrence of each vegetation type in the Project area is summarized in **Table 3.11-1**.

Table 3.11-1
Vegetation in the Project Area

Vegetation Type	Acres	Percent
Native grassland	293.6	53.8
Tame pasture	63.1	11.6
Shrubland	149.3	27.4
Conifer forest and woodland	39.3	7.2
Herbaceous riparian and wetland	0.2	<1
Woody riparian and wetland	0.1	<1
Miscellaneous (nonvegetated)	0.4	<1
Total	546.0	100

Source: WESTECH 2014a
Percent totals are greater or less than 100% due to rounding.

No federally listed threatened or endangered plant species are known to occur near the Project area. The MTNHP lists 62 plant species of concern for Granite, Powell, and Missoula counties (WESTECH 2014a). Field surveys in 2013 identified 367 vascular plant species; however, no plant species of concern were found (WESTECH 2014a).

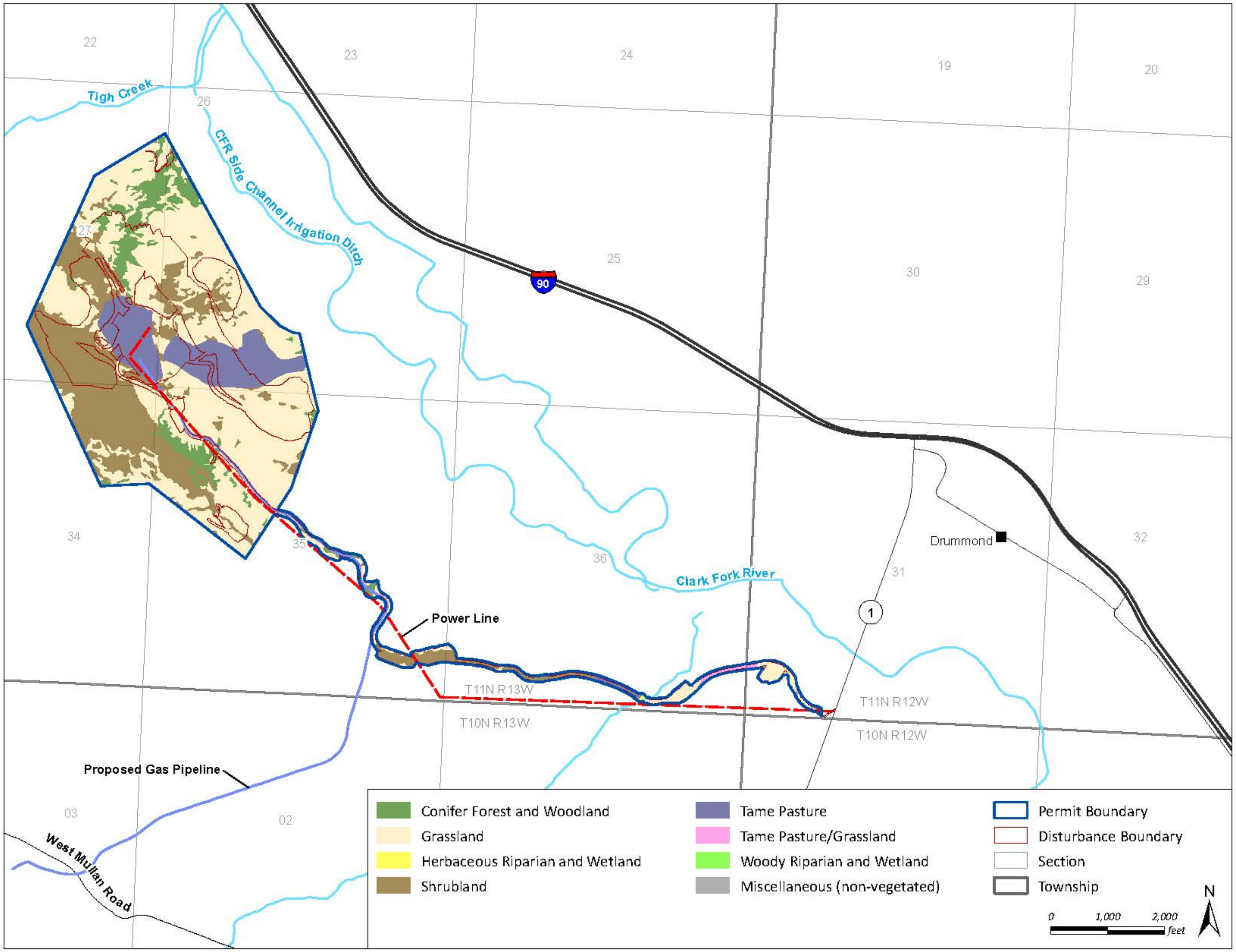

Figure 3.11-1. Vegetation within the Project Area.

3.11.2.2 Noxious Weeds

Ten state-listed weed species (one Priority 2A and nine Priority 2B) and one Priority 3 regulated plant species were encountered in the Project area during the 2013 baseline vegetation inventory (WESTECH 2014a). The one Priority 2A species encountered was perennial pepperweed (*Lepidium latifolium*). The three most common weeds in uplands were spotted knapweed (*Centaurea maculosa*), Dalmatian toadflax (*Linaria dalmatica*), and leafy spurge (*Euphorbia esula*). In drainage bottoms and on the Clark Fork River floodplain, the most common weed species were Canada thistle (*Cirsium arvense*), common houndstongue (*Cynoglossum officinale*), and leafy spurge. Perennial pepperweed and common tansy (*Tanacetum vulgare*) were recorded at limited sites in riparian community types. Russian knapweed (*Acroptilon repens*), field bindweed (*Convolvulus arvensis*), and whitetop (*Lepidium appelianum*) were noted as sporadic occurrences in tame pasture and disturbed roadsides.

3.11.2.3 Wetlands and Waters of the U.S.

Wetlands and streams in the Project area and surrounding area are shown on **Figure 3.11-2**. The *Baseline Wetland Survey* found wetlands and waters of the U.S. along the Clark Fork River and floodplain, two ephemeral tributaries to the Clark Fork River, Lorranson Creek on the eastern edge of the Project area, ditches and seepage areas associated with Lorranson Creek, Flint Creek tributary, and Tigh Creek (WESTECH 2014b). Most wetlands mapped in the *Baseline Wetland Survey* are dominated by herbaceous species such as sedges, cattails, and redtop. Shrub-dominated wetlands are also present and are mostly dominated by sandbar willow and red-osier dogwood.

The wetlands in the Project area are isolated and lack a surface connection to the Clark Fork River, except for Lorranson Creek, which flows to the Clark Fork River. Wetlands and streams found in the Project area are summarized in **Table 3.11-2**.

Table 3.11-2
Wetlands and Streams in the Project Area by Drainage

Location	Wetland Area (Acres)	Nonwetland Stream Length (Feet)
Clark Fork tributaries	0.3	4,939.7
Lorranson Creek	0.2	253.9
Miscellaneous ditches and seepage areas	<1	0
Total	0.5	5,193.6

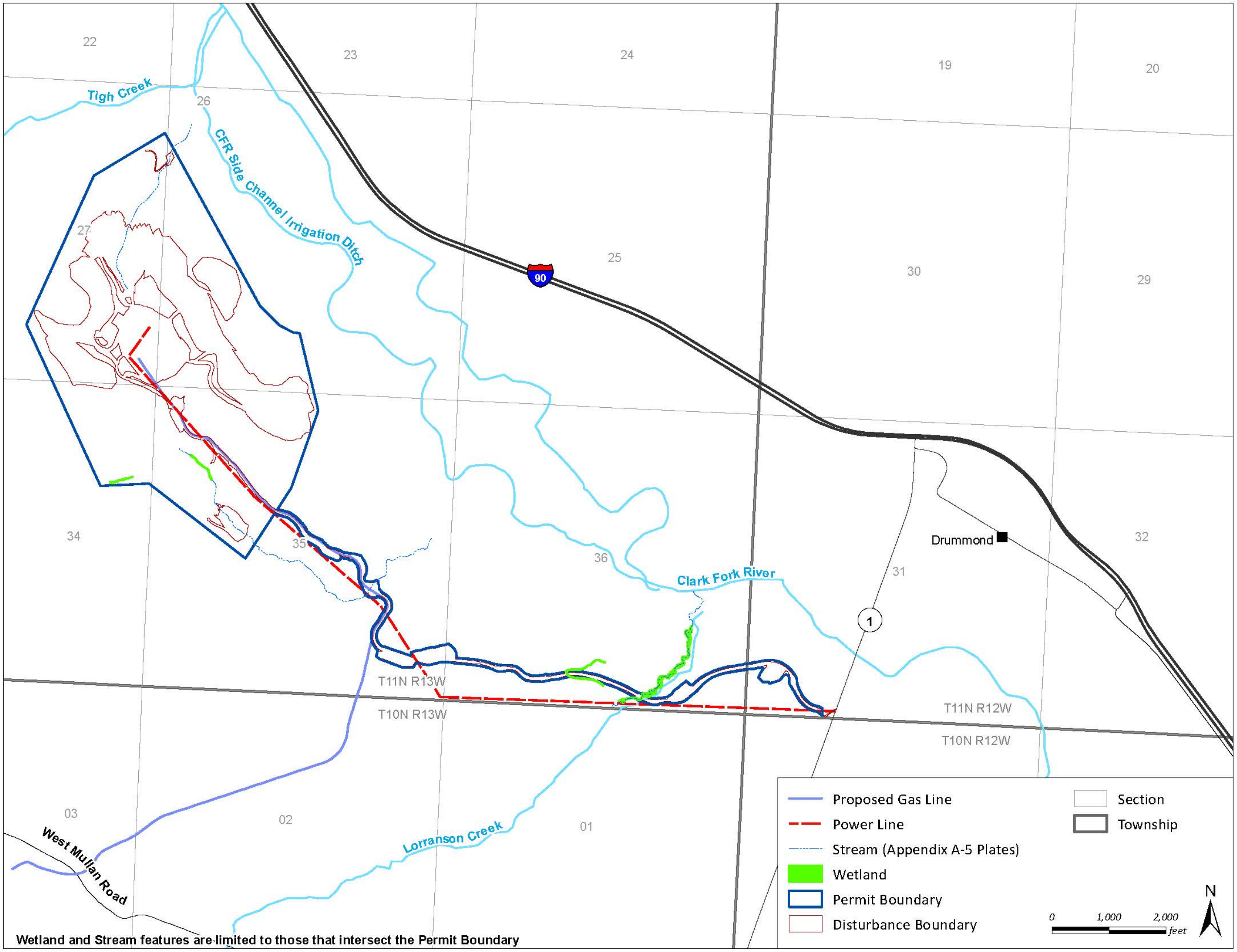

Figure 3.11-2. Wetlands and Streams in the Project Area.

3.11.3 Environmental Consequences (Direct, Secondary, and Cumulative)

3.11.3.1 Alternative 1 – No Action Alternative

Direct and Secondary Impacts

Under the No Action Alternative, the operating permit for MLR's proposed Project would not be approved by DEQ, and no mining within the Project area would occur. No direct impacts on vegetation, noxious weeds, or wetlands would occur from Project activities. Existing conditions and trends in the Project area would continue unchanged.

3.11.3.2 Alternative 2 – Proposed Action

Direct and Secondary Impacts

The Proposed Action would result in the removal and loss of vegetation communities on an estimated 209 acres in the Project area during mining operations, including about 103 acres at the end of Year 1 and about 113 acres at the end of Year 5. Impacts by vegetation type over the life of the Project are shown in **Table 3.11-3**. The grassland community would be the most affected with up to 97.7 acres disturbed, followed by the shrubland community with about 61.46 acres disturbed. Operational disturbances such as soil stockpiles and roadsides within the mine plant during mining would be stabilized using a native seed mix. Areas cleared of vegetation during mining operations would be subject to an overall loss of biodiversity and a loss of productivity during the active mining period. Plant communities would be reestablished through reclamation following mining activities, but the diversity of species would likely be reduced. After reclamation of mine disturbances, shrublands and grasslands can take many years to reestablish a community with a diversity of plants similar to but less than the original plant community.

Table 3.11-3
Vegetation Impacts Over the Project Life

Vegetation Type	Acres in Disturbance Boundary	Percent
Native grassland	97.7	46.8
Tame pasture	38.0	18.2
Shrubland	61.5	29.4
Conifer forest and woodland	11.6	5.5
Herbaceous riparian and wetland	0.1	0.1
Woody riparian and wetland	<0.1	<0.1
Miscellaneous (nonvegetated)	0.3	0.2
Total	209.2	100

Percent totals are greater or less than 100% due to rounding.

Upon completion of mining in the Project area, disturbed areas would be reclaimed and revegetated with native species. Most disturbed areas would be reseeded with grassland and shrubland seed mixes (**Table 3.11-4**). Douglas-fir and juniper would be planted on the east crest of the pit and on upper pit benches that are visible from I-90. The cut and fill slopes above the mine plant would be seeded immediately after construction. The access road surface and pit highwall would remain unvegetated. Revegetation methods and native seed mixes are described in detail in "Section 4.0, Reclamation Plan" of the Application (WESTECH 2018).

Table 3.11-4
Postmining Revegetation

Pre-mining Vegetation Type	Postmining Revegetation (Acres)
Grassland	151.8
Shrubland	26.9
Conifer forest and woodland	1.7
Total	180.4

As described above, no federally listed threatened or endangered plants or plants listed as species of concern occur in the Project area. Therefore, no impacts on special status plants are expected.

Disturbing up to 209 acres of vegetation under the Proposed Action has the potential for the introduction and spread of noxious weeds. Existing weed populations could disperse to newly disturbed areas and other areas via vehicular traffic or soil transport. An increase in abundance and distribution of noxious weeds has the potential to displace native species and reduce vegetation diversity. Noxious weeds would be monitored and controlled during operational and reclamation phases to minimize negative effects on desirable vegetation, both onsite and offsite, as detailed in "Section 4.12" of the Application. The noxious weed control plan would prevent any large populations of noxious weeds from establishing in the Project area.

Wetland impacts are summarized in **Table 3.11-5**. Impacts on Clark Fork tributaries would result in disturbance to 2,608 linear feet of ephemeral upland stream channel. Impacts on 0.08 acre of emergent wetlands and about 127 linear feet of perennial stream channel at Lorranson Creek would result from construction of the access road. An additional 0.01 acre of wetland impacts would result from construction of the access road across an irrigation ditch.

Table 3.11-5
Summary of Wetland and Streams Impacts by Drainage

Location	Wetland Area (acres)	Nonwetland Stream Length (feet)
Clark Fork tributaries	0	2,608.50
Lorranson Creek	0.08	126.87
Miscellaneous ditches and seepage areas	0.01	0
Total	0.09	2,735.37

The Proposed Action would have a short-term moderate adverse effect on vegetation due to the removal of 209 acres of vegetation for mining activities; however, 180 acres of these areas would be reclaimed following mining. Impacts from introducing or spreading noxious weeds would be minimal with implementation of mitigation measures in the noxious weed plan.

Impacts on wetlands and streams would be minor from filling 0.09 acre of wetlands, 127 linear feet of perennial stream channel, and 2,609 feet of ephemeral stream channel.

3.11.3.3 Cumulative Impacts

Past, present, and reasonably foreseeable future actions within the Project area or nearby, such as past and future wildland fires, agriculture, and mining, would affect vegetation. Wildland fires and agricultural activities would result in changes to the vegetation community, potentially lasting for years until the vegetation community has a chance to return to pre-fire conditions, or creating disturbances that would allow the establishment or spread of noxious weeds and nonnative plants.

The Proposed Action would contribute long-term adverse cumulative impacts on vegetation from removal of vegetation for mining activities. Overall, when combined with other past, present, and reasonably foreseeable future actions, the Proposed Action would have a long-term adverse impact on vegetation.

3.12 Wildlife Resources

3.12.1 Analysis Methods

The wildlife resource analysis area used to assess direct, secondary, and cumulative impacts is the 546.4-acre Project area. While the Project area is the wildlife resource analysis area for most wildlife species, it is broader for several wide-ranging species including pronghorn, mule deer and white-tailed deer, elk, and black bear since these species occur in a larger area. For these species, the cumulative impacts on the wildlife resource analysis area includes the Project area and surrounding adjacent habitat.

Information on terrestrial wildlife occurrence in the Project area is based on the technical report prepared by WESTECH (WESTECH 2014c). Additional detail on wildlife resources can be found in the WESTECH report. Impacts on wildlife and special status species were assessed qualitatively based on known species occurrence data and direct habitat disturbance within the Project area.

3.12.2 Affected Environment

3.12.2.1 Mammals

The Project area contains potential habitat for 63 mammal species. Of these, 20 mammal species were recorded in the Project area in 2013 (WESTECH 2014c). Big game species potentially occurring in the Project area include pronghorn (*Antilocapra americana*), mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), elk (*Cervus elaphus*), moose (*Alces americanus*), black bear (*Ursus americanus*), and mountain lion (*Puma concolor*). Of these, all except pronghorn and mountain lion were documented in the Project area in wildlife surveys conducted in 2013 (WESTECH 2014c). Mule deer and white-tailed deer occur throughout the Project area, with white-tailed deer more common along the riparian areas. The Project area is within elk winter range, and elk are reported to use the hay fields along the Clark Fork River to feed in the summer. Moose are also present in the Clark Fork River Valley year-round and were documented near or adjacent to the Project area in 2013. A black bear was also documented northwest of the Project area near Tigh Creek during wildlife surveys in 2013, but there were no further sightings or evidence of black bears, suggesting that black bear use of the Project area was occasional rather than consistent.

Medium-sized mammals observed or documented by evidence in or near the Project area during surveys in 2013 included badger (*Taxidea taxus*), coyote (*Canis latrans*), bobcat (*Lynx rufus*), mountain cottontail (*Sylvilagus nuttallii*), snowshoe hare (*Lepus americanus*), Columbian ground squirrel (*Urocitellus columbianus*), yellow-bellied marmot (*Marmota flaviventris*), beaver (*Castor canadensis*), raccoon (*Procyon lotor*), and mink (*Mustela vison*) (WESTECH 2014c). Based on observations and evidence, such as badger diggings and scats and tracks of coyotes, these two species are probably common in the Project area.

Although small terrestrial mammals were not quantitatively sampled during wildlife surveys in 2013, several species were documented (WESTECH 2014c). These species included least chipmunk (*Tamias minimus*), yellow-pine chipmunk (*Tamias amoenus*), red squirrel (*Tamiasciurus hudsonicus*), eastern fox squirrel (*Sciurus niger*), and northern pocket gopher (*Thomomys talpoides*) (WESTECH 2014c). Most of these species are common in the Project area, with the exception of the eastern fox squirrel, which was observed once near the Clark Fork River and is likely rare in the Project area.

Twelve bat species potentially occur in the Project area. No bat sampling was conducted in the Project area, but long-term acoustic bat sampling conducted by MTNHP near Bearmouth, about 10 miles from the Project area, has documented ten bat species, all of which could potentially occur in the Project area (WESTECH 2014c). These species are Townsend's big-eared bat (*Corynorhinus townsendii*), big brown bat (*Eptesicus fuscus*), silver-haired bat (*Lasionycteris noctivagans*), hoary bat (*Lasiurus cinereus*), California myotis (*Myotis californicus*), western small-footed myotis (*Myotis ciliolabrum*), long-eared myotis (*Myotis evotis*), little brown myotis (*Myotis lucifugus*), fringed myotis (*Myotis thysanodes*), and long-legged myotis (*Myotis volans*).

3.12.2.2 Birds

The Project area contains preferred or breeding habitat for 214 bird species. Of these, 93 species were recorded during surveys in 2013 (WESTECH 2014c). Recorded upland game species were dusky grouse (*Dendragapus obscurus*) and ruffed grouse (*Bonasa umbellus*). Raptors observed included turkey vulture (*Cathartes aura*), osprey (*Pandion haliaetus*), bald eagle (*Haliaeetus leucocephalus*), golden eagle (*Aquila chrysaetos*), rough-legged hawk (*Buteo lagopus*), red-tailed hawk (*Buteo jamaicensis*), Cooper’s hawk (*Accipiter cooperii*), prairie falcon (*Falco mexicanus*), American kestrel (*Falco sparverius*), and great horned owl (*Bubo virginianus*). Red-tailed hawks and American kestrels were the most commonly observed raptors, with most other species observed only once or a few times.

Seven waterfowl species were recorded during 2013 fieldwork (WESTECH 2014c). Of these, nesting was verified along the Clark Fork River near the Project area for four species: Canada goose (*Branta canadensis*), wood duck (*Aix sponsa*), hooded merganser (*Lophodytes cucullatus*), and common merganser (*Mergus merganser*) (WESTECH 2014c). Nesting was also suspected for killdeer (*Charadrius vociferous*) and Wilson's snipe (*Gallinago delicata*). Great blue herons (*Ardea herodias*) were regularly seen along the Clark Fork River and at some of the ponds near the Project area.

Bald eagles were observed only twice in riparian habitat along the Clark Fork River in 2013. Only one sighting of a golden eagle was recorded, likely of a transient individual. Two active osprey nests occurred on artificial platforms along the Clark Fork River near Drummond, outside the Project area in 2013. Ospreys have not been observed along the Clark Fork River in or near the Project area, although the presence of two nests nearby suggests that ospreys must have foraged in the Project area at times. An active red-tailed hawk nest was also documented in a tree in riparian habitat along the Clark Fork River (WESTECH 2014c). No other nests were observed, although there are records of bald eagle nests within 10 miles of the Project area along the Clark Fork River.

Other birds (species other than upland game species, raptors, waterfowl, and shorebirds) were recorded mostly within riparian tree habitat along the Clark Fork River. Birds were inventoried at four upland sites in areas of potential mine disturbance in Douglas-fir (*Pseudotsuga menziesii*), big sagebrush (*Artemisia tridentate*), bunchgrass (*Andropogon sp.*), and pasture habitats in 2013. Twenty-one species were recorded in these habitats, many of which likely breed in the Project area. Detailed information on bird species and their habitat in the Project area is found in the WESTECH report (WESTECH 2014c).

3.12.2.3 Amphibians and Reptiles

The Project area contains preferred or breeding habitat for four species of amphibians and nine reptile species (WESTECH 2014c). Only one reptile species, the prairie rattlesnake (*Crotalus viridis*), was observed in the Project area in 2013. No amphibians or their eggs or larvae were recorded in the Project area, although potential habitat is present in several ponds near the Clark Fork River.

3.12.2.4 Species of Concern

The United States Fish and Wildlife Service (USFWS) (2018) has identified three terrestrial wildlife species that are listed, proposed, or candidates for listing under the Endangered Species Act of 1973, as amended (ESA), and potentially occur in Granite County: Canada lynx (*Lynx canadensis*), grizzly bear (*Ursus arctos*), and wolverine (*Gulo gulo*). The yellow-billed cuckoo (*Coccyzus americanus*) is also listed as a threatened species and could potentially occur in the Project area. These species were not observed in the Project area during wildlife surveys in 2013 (WESTECH 2014c).

In the Rocky Mountains, lynx habitat is subalpine fir (*Abies lasiocarpa*), Engelmann spruce (*Picea engelmannii*), and lodgepole pine (*Pinus contorta*). Dry forest of ponderosa pine (*Pinus ponderosa*) and Douglas-fir, such as the forest habitat found in the Project area, is not lynx habitat (USFWS 2013). In addition, although lynx critical habitat has been designated in portions of Granite County, the Project area is near the southern boundary of critical habitat, but not within critical habitat. Therefore, the probability of a lynx occurring in the Project area is extremely low, and any occurrence of this species would likely be a transient individual.

There is a 2005 record of a grizzly bear sighting within about 15 miles of the Project area (MTNHP 2014). Grizzly bears may use a wide variety of habitats and, therefore, it is possible that a transient grizzly bear could travel through the Project area. However, given the proximity of human activity (e.g., I-90, town of Drummond, and human development), it is unlikely that grizzly bears would be endemic in the area (WESTECH 2014c).

Wolverines prefer mountainous areas with little development and few roads, generally at or above timberline; thus, the Project area is not preferred wolverine habitat. The probability of a wolverine occurring in the Project area is extremely low, and any occurrence of this species would likely be a transient individual.

Yellow-billed cuckoos occur in riparian woodland habitat with dense shrubby understory. The wildlife survey in 2013 noted that habitat for this species is present along the Clark Fork River, but no cuckoos were observed during field surveys (WESTECH 2014c).

Eight species of concern, as identified by MTNHP, were recorded in the Project area during the 2013 wildlife surveys (WESTECH 2014c). The species of concern observed were hooded merganser, great blue heron, bald eagle, golden eagle, rufous hummingbird (*Selasphorus rufus*), pileated woodpecker (*Dryocopus pileatus*), Clark's nutcracker (*Nucifraga columbiana*), and Brewer's sparrow (*Spizella breweri*). The occurrences of hooded merganser, great blue heron, bald eagle, and golden eagle are described above under in **Section 3.12.2.2, Birds**. Rufous hummingbirds were observed in riparian areas and near buildings outside the breeding season outside the Project area and were likely transient individuals. Pileated woodpeckers were not directly observed in the Project area during the 2013 wildlife surveys, but their characteristic excavations were found in riparian trees near the Project area (WESTECH 2014c). Clark's nutcrackers are common in the Douglas-fir habitats in the Project area. Brewer's sparrows are typically associated with sagebrush habitat and were observed in big sagebrush areas in the Project area in 2013.

3.12.3 Environmental Consequences (Direct, Secondary, and Cumulative)

3.12.3.1 Alternative 1 – No Action Alternative

Direct and Secondary Impacts

Under the No Action Alternative, the operating permit for MLR's proposed Project would not be approved by DEQ, and no mining within the Project area would occur. Therefore, no direct impacts on wildlife would occur from Project activities. Existing conditions and trends within the Project area would continue unchanged.

3.12.3.2 Alternative 2 – Proposed Action

Direct and Secondary Impacts

Potential adverse direct impacts from the Proposed Action include loss of habitat due to surface disturbances that result in vegetation removal, direct mortality of or injury to wildlife, and behavioral shifts such as a change in movement or displacement to other areas due to increased human activity and noise from blasting and mining operations.

Wildlife species are dependent on habitats and the plant communities that support specific habitats. Removal of up to 209 acres of mostly grassland and shrubland vegetation would reduce available shelter and burrowing habitat for small mammals; nesting, foraging, and roosting habitat for birds; and foraging habitat for many other species such as bats, deer, and elk over the life of the mine. Mining activities could cause abandonment or direct removal of bird nests if land-clearing activities occur during the breeding season. Effects on riparian species such as waterfowl and osprey are expected to be minimal because direct impacts are not expected on riparian areas. Similarly, raptors such as red-tailed hawks mostly nest along the Clark Fork River but could be affected by loss of foraging habitat during mining. Some small mammals and songbirds may be displaced to adjacent land, which could lead to increased competition.

As described in **Section 3.11, Vegetation**, disturbed areas would be reclaimed and revegetated with native species upon completion of mining. Most disturbed areas would be reseeded with grassland and shrubland seed mixes. Wildlife species are expected to return to disturbed areas after reclamation. Long-term impacts would depend on how quickly different habitat types reestablish following reclamation. Grasslands would mature more quickly than shrubland habitat. Reclaimed areas would first be revegetated with early successional species, which would provide habitat for grassland species. Reclamation would incorporate features to benefit wildlife habitat such as shrub seedings, slash piles, and rock piles. The portion of the pit that is not backfilled would have bluffs and exposed outcrops that could be used by wildlife, such as potentially providing roosting sites for bats.

Direct mortality is most likely for small mammals, and possibly prairie rattlesnakes, because mobility of these species is limited and many use burrows for shelter. Most other wildlife species such as deer and elk, bats, birds, and most mammals are mobile and would likely avoid direct mortality by moving to unaffected areas. Animals that are displaced may move to less suitable habitat or suitable habitat occupied by predators or competitors, which could result in lower survival and reproduction rates. Direct mortality of wildlife could also result from increased traffic associated with mining activities, leading to collisions with mine-related vehicles.

Foraging behavior of many species could be affected by increased human presence and mine-related noise from machinery and blasting because these effects may cause wildlife to avoid suitable foraging habitat. Displacement could result in lower production or survival of local populations in the wildlife resource analysis area depending on the level of competition in other nearby habitats and abundance of food sources. Large animals such as deer, elk, and larger carnivores may be affected as individuals, but mining activities would not likely affect regional populations of these species because they are highly mobile and abundant suitable habitat is available in the surrounding area.

Of the species of concern listed above, most are wide ranging and unlikely to occur in the Project area, or are generally associated with riparian, aquatic, or forested habitats that would not be affected by mining activities. Brewer's sparrow is typically associated with sagebrush habitat and would be affected by removal of 61 acres of shrubland vegetation, resulting in reduced habitat for nesting, foraging, and roosting. Because of increased noise and human activity, Brewer's sparrows could move to less suitable habitat or suitable habitat occupied by predators or competitors, which could result in lower survival and reproduction rates.

The Proposed Action includes mitigation measures that would reduce impacts on wildlife. Sites containing potentially toxic materials would be fenced or access to such materials by wildlife would be otherwise blocked. Garbage or other waste materials that may attract wildlife would be stored in appropriate containers. Feeding or attracting wildlife in such a manner that poses undue risk to either human or wildlife safety would be prohibited. Speed limits for vehicles on access or haul roads would be established at safe levels that would avoid or minimize impacts on wildlife. Firearms would be prohibited in mine vehicles. Warning signs would be posted, or employees and visitors would otherwise be notified, of any persistent livestock- or wildlife-related hazards in the Project area.

3.12.3.3 Cumulative Impacts

Past, present, and reasonably foreseeable future actions such as past and future wildland fires, agricultural activities, and nearby mining could affect wildlife species. Past and ongoing agricultural use of the Project area has increased the human presence compared with similar areas, thereby likely resulting in avoidance of the Project area by some wildlife species. However, when combined with the effects of past, present, and reasonably foreseeable future actions, such as agricultural use, wildlife fires, and mining, the cumulative impacts of the Proposed Action on wildlife would be minor.

3.13 Cultural and Historic Resources

3.13.1 Analysis Methods

The cultural resource analysis area is the 546-acre Project area. Impacts on cultural resources were determined based on the information contained in the Application and the MLR *Cultural Resource Inventory Report* (Hufstetler and Dickerson 2014). Renewable Technologies, Inc. surveyed the entire Project area for cultural resources in 2013 and 2014. The Application and report provided details concerning cultural resources relative to proposed mining and reclamation actions.

3.13.2 Affected Environment

Cultural resources are aspects of the human environment that include buildings, structures, objects, historic and prehistoric archaeological sites, landscapes, and districts. Districts are groups of buildings, structures, or sites that are associated by shared cultural significance such as mining or homesteading and are further related in both time and space. Cultural landscapes have been affected, influenced, or shaped by human involvement and can be associated with persons or events. Sites are typically meant to include historic or prehistoric archaeological sites. Traditional cultural properties (TCPs) include “traditions, beliefs, practices, lifeways, arts, crafts, and social institutions of any community, be it an Indian tribe, a local ethnic group, or the people of the nation as a whole” (National Park Service 1998). Cultural resources with archaeological or cultural significance are collectively referred to as historic properties, and impacts on historic properties must be considered by the Proposed Action.

3.13.2.1 Cultural Context

The cultural context that follows is provided for a better understanding of the cultural and historical context of the cultural resource analysis area. The cultural history of the region is divided into five periods: the Early Prehistoric (or Paleo-Indian) period (11,500 to 7750 before present [BP]), the Middle Prehistoric (Archaic) period (7750 to 1600 BP), the Late Prehistoric period (1600 to 200 BP), the Protohistoric period (ca. 300 to 200 BP), and the Historic Period (200 to 50 BP). A summary of the individual periods is provided in the Cultural Inventory Report (Hufstetler and Dickerson 2014).

3.13.2.2 Documented Cultural Resources

Three cultural resources were documented during the 2013 and 2014 survey: one prehistoric lithic scatter, one historic farmstead, and one historic homestead (Hufstetler and Dickerson 2014). All three of these sites were recommended not eligible for listing in the National Register of Historic Places (NRHP). DEQ agrees with the recommendations of Not Eligible for all three sites and requested concurrence from the SHPO. In a letter dated January 21, 2020, the SHPO concurred that the Project would have no effect on historic properties.

3.13.3 Environmental Consequences (Direct, Secondary, and Cumulative)

3.13.3.1 Alternative 1 – No Action Alternative

Direct and Secondary Impacts

Under the No Action Alternative, mining of the high-calcium limestone ore would not be permitted. There would be no Project impacts on the historic properties described above because none of the disturbances associated with development of the Project would occur.

3.13.3.2 Alternative 2 – Proposed Action

Direct and Secondary Impacts

If approved, the Proposed Action would not result in any impacts on historic properties. As all cultural resources within the Project area are not eligible for listing in the NRHP, there would be no direct or secondary impacts on historic properties under the Proposed Action.

3.13.3.3 Cumulative Impacts

Past, present, and reasonably foreseeable future actions that may result in cultural resource impacts include agricultural operations and mining. Agricultural and mining operations within the region may have cumulative impacts on undiscovered cultural resources, but the Proposed Action would not contribute to cumulative impacts on cultural resources within the region.

3.14 Air Quality

3.14.1 Analysis Methods

The air quality analysis area includes the 546-acre Project area, and the larger region, which is defined as Granite, Powell, and Missoula counties, where potential effects on air quality could occur. Maximum ambient impacts are expected to occur in the immediate area around the Project area as air quality impacts typically decrease rapidly with distance from the source.

If approved, the Proposed Action would require a Montana Air Quality Permit and a Montana Title V Operating Permit (see **Section 1.3, Agency Roles and Authorizing Actions**). A detailed quantitative air quality analysis, including air quality monitoring, is part of the DEQ review and approval process for both permits. This air quality analysis focuses on the existing air quality of the proposed mine site, and a qualitative discussion of the anticipated air quality impacts in the analysis area. Air quality impacts were determined based on the information contained in the Application and other online sources. The Application provides details concerning existing air quality at the proposed mine site and anticipated air quality impacts as a result of the proposed mining activities.

3.14.2 Affected Environment

3.14.2.1 Local and Regional Meteorological Patterns

The area is characterized by undeveloped, mostly treeless, rolling grassland and shrublands common of the intermontane foothills west of the Continental Divide. Nearby topographic features include Harvey Ridge and John Long Mountains, part of the Sapphire Range to the southwest, the Philipsburg Valley to the south, the Clark Fork River Valley and Dunkleberg Ridge to the east, and a series of smaller gulches to the north (Lyon Gulch, Spring Gulch, and Garden Gulch). The Project area traverses Lorranson Creek, a tributary of the Clark Fork River. The elevation of the Project area ranges from approximately 4,000 to 4,600 feet above sea level.

The climate is classified as modified continental and is characterized by warm, moderately dry summers and cold winters. The average annual temperature is 43 degrees Fahrenheit (°F) with temperatures ranging from an average minimum of 11°F in January to an average maximum of 84°F in July. Precipitation averages 12.6 inches annually, ranging from 0.6 inch in February to 2.0 inches in May, with the greatest precipitation occurring in May and June. Prevailing winds in the analysis area tend to be from the west and northwest throughout the year, more than half of the year. Average wind speeds range from 6.5 to 10.8 miles per hour (WESTECH 2018).

3.14.2.2 Existing Regional Air Pollutant Sources and Emissions

The Project area is in attainment for all six National Ambient Air Quality Standards (NAAQS) regulated pollutants, commonly referred to as criteria pollutants, which are carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter ($PM_{2.5}$ and PM_{10}), lead (Pb), and sulfur dioxide (SO_2). The NAAQS were created to protect public health and regulate the emissions of hazardous air pollutants as part of the Clean Air Act of 1970 (CAA) (42 USC § 7401). Areas that meet the NAAQS and state standard are classified as attainment, while areas that exceed the NAAQS or state standard are classified as nonattainment. Areas can be attainment or nonattainment for one or more of the six criteria pollutants (EPA 2017). The NAAQS, which are listed in **Table 3.14-1**, include both primary standards to protect public health, including the health of sensitive populations, and secondary standards to protect public welfare, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

The EPA has delegated authority to DEQ to administer and enforce the rules set forth under the CAA in the State of Montana, including the NAAQS. In addition to the NAAQS, individual states have the option to adopt more stringent standards and to include other pollution sources. Under Montana's implementation of the CAA, DEQ established air quality rules under ARM 17.8.101, *et seq.* The Montana Ambient Air Quality Standards (MAAQS) are promulgated under ARM 17.8.201-230.

Table 3.14-1
National and Montana Ambient Air Quality Standards

Pollutant	Averaging Time	NAAQS		MAAQS
		Primary	Secondary	
Carbon monoxide (CO)	8-hour	9 ppm [a]	NA	9 ppm [b]
	1-hour	35 ppm [a]	NA	23 ppm [b]
Lead (Pb)	Rolling 3-month	0.15 µg/m^3 [c]	0.15 µg/m^3 [c]	NA
	Quarterly	1.5 µg/m^3 [c, o]	1.5 µg/m^3 [c, o]	1.5 µg/m^3 [c]
Nitrogen dioxide (NO_2)	1-hour	100 ppb [d]	NA	0.30 ppm [b]
	Annual	53 ppb [e]	53 ppb [e]	0.05 ppm [f]
Ozone (O_3)	1-hour	NA	NA	0.10 ppm [b]
	8-hour	0.070 ppm [g]	0.070 ppm [g]	NA
Particulate matter ≤ 2.5 µm diameter ($PM_{2.5}$)	Annual	12.0 µg/m^3 [h]	15.0 µg/m^3 [h]	NA
	24-hour	35 µg/m^3 [i]	35 µg/m^3 [i]	NA
Particulate matter ≤ 10 µm diameter (PM_{10})	Annual	NA	NA	50 µg/m^3 [j]
	24-hour	150 µg/m^3 [k]	150 µg/m^3 [k]	150 µg/m^3 [k]

Table 3.14-1
National and Montana Ambient Air Quality Standards

Pollutant	Averaging Time	NAAQS		MAAQS
		Primary	Secondary	
Sulfur dioxide (SO_2)	1-hour	75 ppb [l]	NA	0.50 ppm [m]
	3-hour	NA	0.5 ppm [a]	NA
	24-hour	0.14 ppm [a, n]	NA	0.10 ppm [b]
	Annual	0.030 ppm [e, n]	NA	0.02 ppm [f]
Fluoride in Forage	Monthly	NA	NA	50 µg/g [c]
	Grazing Season	NA	NA	35 µg/g [c]
Hydrogen Sulfide (H_2S)	1 hour	NA	NA	0.05 ppm [b]
Settleable PM	30 days	NA	NA	10 g/m^2 [c]
Visibility	Annual	NA	NA	3×10^{-5}/m [f, p]

Source: DEQ 2019.
a Not to be exceeded more than once per year
b Not to be exceeded more than once over any 12 consecutive months
c Not to be exceeded
d Not to be exceeded by the 98th percentile of 1-hour daily maximum concentrations averaged over 3 years
e Not to be exceeded by the annual mean
f Not to be exceeded by the arithmetic average over any four consecutive quarters
g Not to be exceeded by the annual fourth-highest daily maximum 8-hour concentration averaged over 3 years
h Not to be exceeded by the annual mean averaged over 3 years
i Not to be exceeded by the 98th percentile of 24-hour concentrations averaged over 3 years
j Not to be exceeded by 3-year average of annual means
k Not to be exceeded more than once per year on average over 3 years
l Not to be exceeded by the 99th percentile of 1-hour daily maximum concentrations averaged over 3 years
m Not to be exceeded more than 18 times in any 12 consecutive months
n The 1971 SO_2 NAAQS are retained in Laurel, MT and East Helena, MT until the EPA approves attainment and/or maintenance demonstrations for the revised SO_2 NAAQS.
o The 1978 Pb NAAQS is retained in East Helena, Montana until the EPA approves attainment and/or maintenance demonstrations for the revised Pb NAAQS.
p This standard only applies to Class I areas designated under ARM 17.8.801-828.
µg/g = micrograms per gram
µg/m^3 = micrograms per cubic meter
mg/m^3 = milligrams per cubic meter
ppb = parts per billion
ppm = parts per million
NA = Not applicable

The EPA releases estimates of air emissions for criteria and hazardous pollutants every three years (EPA 2014). According to the 2014 estimates, Granite County emissions were 33.08 tons per year. More than half (55.6 percent) of estimated emissions in Granite County were volatile organic compounds (VOC), followed by CO (29.6 percent), PM_{10} (6.6 percent), and nitrogen oxides (NOx) (3.5 percent). The majority of VOC emissions were from natural sources. CO emissions were primarily from fires and natural sources. Mobile sources, including vehicles, were the primarily source of NOx in Granite County.

Missoula County estimated emissions were 98 tons per year in 2014. CO made up nearly 40 percent of the estimated emissions, while VOC made up 37.6 percent, and PM_{10} made up 12.1 percent. The primary sources of CO were mobile source and fires, while nearly 80 percent of all VOC emissions were from natural sources, and 90 percent of PM_{10} emissions were stationary sources (EPA 2014).

Powell County had an estimated 42.3 tons per year of emissions, with 54.8 percent of emissions from VOC, 28.4 percent CO, and 7.5 percent PM_{10}. VOC emissions were primarily from natural sources (93 percent), and CO emissions were primarily from natural sources and fires (34 percent each). The primary source (84.8 percent) of PM_{10} emissions was stationary sources (EPA 2014).

Table 3.14-2 presents the major regional point source emissions in the analysis area, according to the 2014 National Emissions Inventory Report by the EPA. Major point sources include emissions of any air pollutant greater than 100 tons per year (EPA 2014).

Table 3.14-2
Major Regional Point Source Emissions in the Analysis Area

Facility	Facility Type	County	Pollutant	Emissions Rate (tons/year)
Riddick Field	Airport	Granite	CO	5.74
Hexion Inc	Plastic, Resin, Syn Fiber, or Rubber Products Plant	Missoula	Formaldehyde	4.4759
			VOC	31
			CO	22.48
			PM_{10}	38.52
			$PM_{2.5}$	38.39
Missoula International	Airport	Missoula	Acrolein	0.34002
			Benzene	0.28484
			CO	160.66
			Formaldehyde	1.83047
			Pb	0.06
			NOx	30.33
			VOC	16.24
Phillips 66 Company	Other	Missoula	CO	10.29
			NOx	5.21
			Benzene	0.2805
			VOC	71.68
Pyramid Mountain Lumber	Lumber/Sawmill	Missoula	$PM_{2.5}$	44.88
			Benzene	0.27635
			Acrolein	0.26319
			PM_{10}	85.77
			VOC	53.89
			CO	21.06
Roseburg Forest Products	Plywood and Engineered Wood Products	Missoula	VOC	12.55
			Black Carbon	13.33
			Formaldehyde	29.586
			CO	83.71
			PM_{10}	304.36
			$PM_{2.5}$	273.69
			NOx	276.11
Deer Lodge Airport	Airport	Powell	Acrolein	0.02642
			Benzene	0.02279
			CO	12.27
Seeley Lake	Airport	Powell	CO	5.99
Sun Mountain Lumber	Lumber/Sawmill	Powell	NOx	23.49
			CO	64.08
			$PM_{2.5}$	41.79
			VOC	26.86
			PM_{10}	62.93

Source: EPA 2014

Riddick Field, a small airport located approximately 1.5 miles south of Phillipsburg, Montana, is the only existing point source of air pollutants in Granite County. According to data from the EPA, the airport is a source of CO and emits an estimated 5.7 tons of CO per year. Five major point sources are located in Missoula County and three are located in Powell County. The largest point source was Roseburg Forest Products in Missoula County, which produces plywood and other engineered wood products. The highest emitted pollutants from this point source were PM_{10}, NOx, and $PM_{2.5}$ (EPA 2014).

No Federal Class I Areas, as defined in 40 Code of Federal Regulations (CFR) § 51.308, are located within the air quality analysis area.

3.14.2.3 Existing Air Quality Monitoring at Proposed MLR Mine

Baseline air quality monitoring was conducted by Bison Engineering in the vicinity of the Project area boundary. SO_2 monitoring began in January 2014 and ended in January 2015, and monitoring for $PM_{2.5}$ and PM_{10} began in August 2013 and ended in August 2014. The results of this monitoring along with the applicable federal and state standards are provided in **Table 3.14-3**.

Table 3.14-3
MLR Air Quality Monitoring Results

Pollutant	Averaging Period	Measured Concentration	NAAQS	MAAQS	Units
SO_2	1-hour	1[a]	75[a]	---	ppb
		0.028	---	0.5[b]	ppm
	3-hour	0.009	0.5[c]	---	
	24-hour	0.002	---	0.1[c]	ppm
	Annual	0.000	---	0.02	ppm
PM_{10}	24-hour	67[d]/31	150[e]	150[f]	μg/m³
	Annual	8	---	50[g]	μg/m³
$PM_{2.5}$	24-hour	53[d]/20	35[h]	---	μg/m³
	Annual	5	12	---	μg/m³

[a] Based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations; reported background value is 2nd highest daily 1-hour maximum
[b] Not more than 18 exceedances in 12 months
[c] Not more than one exceedance per year
[d] The first maximum value was recorded when wildfires were reported in the area. The second value represents the next highest value excluding wildfires.
[e] Not to be exceeded more than once per year on average over 3 years
[f] Not to be exceeded more than once per year, as determined in accordance with 40 CFR § 50 Appendix K
[g] Not to be exceeded in a calendar year, as determined in accordance with 40 CFR § 50 Appendix K
[h] To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 $\mu g/m^3$ (effective December 17, 2006).

All measured values, aside from those measured during the wildfire are well below NAAQS and MAAQS levels. The average PM_{10} concentration was 8 $\mu g/m^3$, and the maximum 24-hour concentration was 67 $\mu g/m^3$ during a nearby wildfire. The next highest maximum was 31 $\mu g/m^3$. The average $PM_{2.5}$ concentration was 5.0 $\mu g/m^3$, and the maximum 24-hour concentration was 53 $\mu g/m^3$, during a nearby wildland fire. The next highest maximum 24-hour concentration was 20 $\mu g/m^3$.

3.14.3 Environmental Consequences (Direct, Secondary, and Cumulative)

3.14.3.1 Alternative 1 – No Action Alternative

Direct and Secondary Impacts

Under the No Action Alternative, MLR would not develop a limestone mine in the Project area. The existing air quality conditions described above would continue, resulting in no change to current ambient air quality.

3.14.3.2 Alternative 2 – Proposed Action

Direct and Secondary Impacts

The direct air quality impacts of the Proposed Action would result from the emissions of mining, handling, and processing of Project area ore as well as reclamation of disturbed areas. The sources of air pollution include fugitive dust sources (e.g., topsoil removal and unloading; overburden drilling, blasting, and removal; ore drilling, blasting, removal, loading, dumping, crushing, production, and conveying; haul and access roads; and wind erosion of disturbed areas); mobile sources (e.g., haul/water trucks, graders, and dozers); portable/stationary engines; and explosives use for overburden and blasting. These emissions would result in short-term impacts on air quality in the analysis area. After mining operations cease, the fugitive dust and mobile sources would decrease. After reclamation, these sources would decrease even further.

The Proposed Action would require a Montana Air Quality Permit and a Montana Title V Operating Permit. Details regarding anticipated criteria and hazardous emissions, as well as a finalized Dust Control Plan and other monitoring and reporting requirements, would be included as part of these permits. At that time, DEQ would conduct a separate MEPA analysis to evaluate specific impacts on air quality based on the information in the permit application.

3.14.3.3 Cumulative Impacts

The analysis area for cumulative impacts is the same as the direct and secondary impacts analysis area. Actions in the cumulative impacts analysis area that have directly or indirectly affected, or will affect, air quality in the future include a variety of air pollutant sources and emissions including, but not limited to, airports, power plants, mines and mining activities, and wildland fires. When combined with related past, present, and reasonably foreseeable future actions, the Proposed Action would result in short-term adverse impacts on air quality during construction and operation of the mine due to the increase in fugitive dust and mobile sources. These impacts would decrease after reclamation of the mine.

3.15 Regulatory Restrictions

MEPA requires state agencies to evaluate regulatory restrictions proposed to be imposed on private property rights as a result of actions of state agencies, including an analysis of alternatives that reduce, minimize, or eliminate the regulation of private property (Section 75-1-201(1)(b)(iii), MCA). Alternatives and mitigation measures required by federal or state laws and regulations to meet minimum environmental standards, as well as actions proposed by or consented to by the applicant, are not subject to a regulatory restrictions analysis.

No aspect of the alternatives under consideration would restrict the use of private lands or regulate their use beyond the permitting process prescribed by the MMRA. The conditions that would be imposed by the Montana Department of Environmental Quality (DEQ) in issuing the permit would be designed to make the Project meet minimum environmental standards or have been proposed and/or agreed to by MLR. Thus, no further analysis is required.

SECTION 4. CONSULTATION AND COORDINATION

Formal and informal consultation was conducted by the Montana Department of Environmental Quality (DEQ) with various federal and state agencies, local governments, tribes, and members of the public to ensure that agency and public interests were considered by DEQ. **Section 1, Purpose and Need** provides a summary of the public scoping process, which provides an opportunity for public and agency involvement to gather comments, concerns, and ideas from those who have an interest in, or who may be affected by, the Proposed Action (**Section 1.4.3.1, Scoping**).

DEQ also consulted with the following agencies during development of this EA:

- Granite County
- Town of Drummond
- Bureau of Land Management, Missoula Field Office
- Beaverhead-Deerlodge National Forest, Pintler Ranger District
- Montana State Legislature
- U.S. Fish and Wildlife Service, Helena Ecological Services Office
- U.S. Army Corps of Engineers, Omaha District
- State of Montana, Department of Fish, Wildlife and Parks
- State of Montana, Department of Natural Resources, Missoula Regional Office
- Montana Association of Conservation Districts, Granite Conservation District

DEQ initiated tribal consultation with the Blackfeet Nation Tribe, Chippewa Cree Tribe, Confederated Salish & Kootenai Tribes of the Flathead Reservation, Crow Nation, Fort Peck Assiniboine & Sioux Tribes, Little Shell Chippewa Tribe, Nakoda and Aaniiih Nations, and Northern Cheyenne Tribe regarding the identification and effects on traditional cultural properties (TCPs) and archaeological sites of significance to the tribes.

TCPs are protected under Section 106 of the NHPA as historic properties and, when applicable, they have additional protections under the American Indian Religious Freedom Act of 1978 and the Native American Graves Protection and Repatriation Act of 1990. A TCP may be eligible for listing in the NRHP because of its association with cultural practices or beliefs of a living community that are (1) rooted in the history of the community or tribe and (2) important in maintaining the continuing cultural identity of the community or tribe. Examples of TCPs include, but are not limited to, locations where Native Americans have performed ceremonies, traditional locations for resource gathering, and rural community land use patterns such as farming and ranching.

No TCPs have been identified to date; however, continued tribal consultation may identify such properties.

Copies of the EA will be available on DEQ's website at http://deq.mt.gov/mining/hardrock/mlr_apppg. Hard copies will be available upon request.

SECTION 5. LIST OF PREPARERS

5.1 Montana Department of Environmental Quality (DEQ)

Name	Project Responsibility	Education
Blend, Jeff	Socioeconomics	Ph.D., Agricultural Economics M.S., Economics B.S., Economics
Lane, Jen	MEPA Coordinator	B.A., Environmental and Social Justice
Freshman, Charles	Mining Engineer	M.S., Geological Engineering B.S., Civil and Environmental Engineering
Hayes, Ed	Program Attorney, Hard Rock Program	J.D., Attorney
Hovda, Betsy	Hard Rock Project Lead	B.A., Geology
Jepson, Wayne	Hydrologist	M.S., Geology B.S., Earth Sciences
Olsen, Millie	Vegetation and Soils	M.S., Land Resources and Environmental Sciences B.S., Chemistry
Rolfes, Herb	Hard Rock Section Supervisor	M.S., Land Rehabilitation B.A., Earth Space Science A.S., Chemical Engineering
Smith, Garrett	Geochemist	M.S., Geoscience/Geochemistry B.S., Chemistry
Walsh, Dan	Hard Rock Mining Bureau Chief	B.S., Environmental Engineering
Whitaker, Nicholas	Staff Attorney	J.D., Attorney

5.2 Consultant Team

Name	Project Responsibility	Education
Bauman, Nicole ERO Resources Corporation	Project Manager	M.S., Environmental Policy and Management B.S., Communication
Butler, Steve ERO Resources Corporation	Biological Resources	M.E.M., Water and Air Resources B.S., Biology
Corsi, Emily ERO Resources Corporation	Public Participation	M.S., Natural Resources Conservation B.A., Politics
Croll, Kathy ERO Resources Corporation	Cultural Resources	Ph.D., Anthropology M.A., Anthropology B.S., Social Science
Fowler, Aliina ERO Resources Corporation	Transportation, Land Use, Noise, Socioeconomics, and Air Quality	Masters of Urban and Regional Planning B.A., Political Science B.S., Community Development and Applied Economics
Hesker, David ERO Resources Corporation	Graphics Specialist	B.F.A., Graphic Design
Hodges, Wendy ERO Resources Corporation	GIS Specialist	M.S., Environmental Policy and Management B.S., Natural Science

Name	Project Responsibility	Education
Olmsted, Brian ERO Resources Corporation	Geological and Hydrogeological Resources	M.S., Geochemistry B.S., Geology
Wall, Kay ERO Resources Corporation	Technical Editor	B.A., Behavioral Science
Way, Aimee ERO Resources Corporation	Visual Resources	M.S., Environmental Science B.S., Genetics
Buscher, Dave Buscher Soil and Environmental	Soil and Reclamation	M.S., Ecological Engineering B.S., Geological Engineering B.S., Wildlife Biology
Brown, Matt Confluence Water	Surface Water Hydrology and Water Quality	M.S., Civil Engineering B.S., Civil Engineering
Eastwood, Tom Morrison-Maierle	Traffic Engineering	B.S., Civil Engineering

SECTION 6. NEED FOR FURTHER ANALYSIS AND SIGNIFICANCE OF POTENTIAL IMPACTS

The Montana Department of Environmental Quality (DEQ) is required to determine the significance of the impacts of the Proposed Action to determine whether preparation of an EIS is necessary. The seven criteria that DEQ is required to consider in making this determination are set forth in Administrative Rules of Montana (ARM) 17.4.608, as follows:

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

The application submitted by MLR proposes to construct and operate a limestone mine, disturbing 209 acres. Disturbed areas would be reclaimed following mining.

The impacts of the Proposed Action are limited to the areas within and adjacent to the proposed permit boundary. DEQ has not identified any significant impacts on the resources evaluated. Identified impacts range from no impact to moderate impacts, and there would be no undue or unnecessary degradation of resources.

DEQ has not identified any significant impacts on ground water or surface water hydrology. Ground water impacts from open pit mining of the limestone ore under the Proposed Action would result in minimal to no disturbance of the three ground water zones located in the Project area, as bedrock ground water is located about 200 feet below the bottom of the proposed open pit mine, and the perched ground water zone and Clark Fork River alluvium aquifer are each outside the area of the mine. Surface water impacts would result in minimal disturbance of the local surface water system due to design and construction of surface water control features, implementation of best technology currently available, and an operational surface water monitoring program.

The removal of up to 209 acres of mostly grassland and shrubland vegetation would have minor impacts on wildlife habitat; however, there is sufficient suitable habitat available adjacent to the Project area, and impacts would end upon reclamation of the site. Of the species of concern identified in the EA, most are wide ranging and unlikely to occur in the Project area, or are generally associated with riparian, aquatic, or forested habitats that would not be affected by mining activities.

The Proposed Action would have a short-term moderate adverse effect on vegetation due to the removal of 209 acres of vegetation for mining activities; however, 180 acres of these areas would be reclaimed following mining. Impacts from introducing or spreading noxious weeds would be minimal with implementation of mitigation measures in the noxious weed plan. Additionally, impacts on wetlands and streams would be minor from filling 0.09 acre of wetlands, 127 linear feet of perennial stream channel, and 2,609 feet of ephemeral stream channel.

Direct air quality impacts from the Proposed Action would result from the emissions of mining, handling, and processing of Project area ore as well as reclamation of the disturbed areas. Sources of air pollution include fugitive dust sources, mobile sources, portable/stationary engines, and explosives used for overburden and blasting. These emissions would result in short-term impacts on air quality. After mining operations cease, the fugitive dust and mobile sources would decrease. After reclamation, these sources would decrease even further.

Direct visual impacts would occur due to changes in the color and texture of the hillside during active mining, and there would be short-term adverse impacts on visual resources during the life of the mine on vehicles traveling along I-90, SH1, and Mullan Road. However, given existing topography, the area of visible mining disturbance would be relatively small. Tree planting and implementation of the reclamation plan, including interim reclamation, would also lessen direct visual impacts by reducing contrast with intact vegetation.

Noise impacts would result from the Proposed Action, primarily from operation of the lime plant equipment, quarry blasting, and haul trucks traveling to and from the site. However, the predicted lime plant equipment noise levels are all below EPA established guidelines, and predicted noise levels from blasting are below the U.S. Army and USDI recommended levels. In addition, while there is the potential for a secondary noise impact occurring from haul trucks traveling to and from the lime plant, the predicted noise levels at residences along the proposed truck haul routes are not anticipated to exceed the MDT traffic noise level impact criterion. No long-term noise impacts are anticipated under the Proposed Action.

There would be no anticipated direct or secondary impacts on historic properties under the Proposed Action, as all cultural resources within the Project area are not eligible for listing in the National Register of Historic Places.

DEQ has not identified any growth-inducing or growth-inhibiting aspects due to the Proposed Action. Issuance of an operating permit to MLR does not set any precedent and would not commit DEQ to any future action with significant impacts, nor is it a decision in principle about any future actions that DEQ may act on. Finally, the Proposed Action does not conflict with any local, state, or federal laws, requirements, or formal plans.

DEQ has identified the Proposed Action as the preferred alternative. Based on a consideration of the criteria set forth in ARM 17.4.608, DEQ has determined that MLR's proposal to construct and operate a 546.4-acre limestone mine, disturbing 209 acres, is not predicted to significantly impact the quality of the human environment. Therefore, preparation of an environmental assessment is the appropriate level of review under MEPA.

SECTION 7. RESPONSE TO COMMENTS

7.1 INTRODUCTION

The draft EA was published on November 18, 2019 for a 30-day comment period. The comment period closed on December 18, 2019. Two private individuals living in Drummond, Montana, and one business, Montana Limestone Resources (MLR), provided comments on the draft EA (four correspondences total). Table 7.1-1 below includes the comments and responses to substantive comments . The full MLR EA Comment Summary Report is available on DEQ's website at http://deq.mt.gov/mining/hardrock/mlr_apppg.

Table 7.1-1
Substantive Comments and Responses

Comment Number	Comment	Issue Code	Response
01	The broken red line on 1.4.1 wouldn't be Lorensen Lane. The enclosed map might help.	350	Thank you for the enclosed map. The broken red line on Figure 1.4-1 is a power line, not the proposed access road for the MLR pit and plant site.
02-01	I am opposed to Lorensen Lane being the haul route of limestone from the mine to Highway #1. I live in Hoover Subdivision, which is adjacent to Lorensen Lane. There are two private roads that intersect with Lorensen Lane and run through the Hoover subdivision and intersect with Montana #1. The two roads are narrow, 30 feet wide and there is no maintenance on the roads. If people traveling to and from the mine started driving through Hoover Subdivision it would destroy these roads and the way of life of the residence of the subdivision.	350	The portion of Lorensen Lane used for proposed haul trucks would be south of the Hoover Subdivision as shown in the map you provided. The proposed route would limit the use of Lorensen Lane to the segment between the intersection with Grace Road and the Highway 1 intersection (approximately 200 ft).
02-02	The 45 MPH speed limit on Lorensen Lane for any type of vehicle traveling past Hoover Subdivision would be too high.	350	As mentioned above, the portion of Lorensen Lane in the proposed route is approximately 200 feet. As shown in MLR's application Figure 3.16-6 (Viewpoint #5), a stop sign is located on the east side of State Highway 1 and a stop sign at the intersection of Lorensen Lane and the Old Highway/Main Street. Within Google Street View, a stop sign is visible at the intersection of Old Highway/Main Street and State Highway 1, at the intersection of Lorensen Lane and Old Highway/Main Street, and at the intersection of Grace Road and Lorensen Lane. Assuming all vehicles obey posted stop signs, vehicles leaving the proposed mine access road would not likely be traveling 45 MPH. Vehicles entering the proposed mine access road would also likely not be traveling 45 MPH in order to navigate the corners at those intersections.
03	Get the Permit sent already. We need jobs in Montana.	221/330	Thank you for your comment.
04-01	Paragraph 2: First sentence might more accurately state "MLR's purpose and need is to mine and process limestone, to produce lime which would be used…"	430	Edit incorporated into the document.
04-02	Project Location Map (Figure 1.2-1) shows former state ¼ ¼ Section, which was transferred to Washington Limestone, LLC.	430	Error corrected in the document.

Table 7.1-1
Substantive Comments and Responses

Comment Number	Comment	Issue Code	Response
04-03	Specify that the MPDES permit will be limited to a General Permit for Storm Water Discharges to clarify that there will not be a wastewater discharge from the project.	430	Edit incorporated into the document.
04-04	Sections 25 and 28 are not in the project area (as shown on Figure 1.4.4). Also, the second Section 34 should be 35.	430	Error corrected in the document.
04-05	Bullet No. 6 says runoff from the waste rock pile will be diverted to the pit. Actually, dump runoff will be diverted to the north sediment basin for the first mining phase (5+ years), then to a sump near the pit boundary for use in mine operations or allowed to evaporate/infiltrate, and then back to the north sediment basin or the reclaimed backfill surface after Phase 1 backfilling and revegetation. Storm water will not be diverted to the pit.	430/220	Error corrected in the document.
04-06	To our knowledge, no one at MLR considered locating a lime processing plant in Butte.	430/220	Error corrected in the document.
04-07	In paragraph 1, the area is actually situated **west** of Flint Creek. Also, there are a few references to Antelope Creek in the draft EA, which is not located in the project area. Lorranson Creek, however is – see EA Section 3.4.4.2 Paragraph 2, last sentence: “Metrological” is assumed to be “**Meteorological**”.	430	Error corrected in the document.

Table 7.1-1
Substantive Comments and Responses

Comment Number	Comment	Issue Code	Response
04-08	The first paragraph says that three GW systems occur in the Project Area; the bedrock GW system, perched system and CFR floodplain GW system. The CFR floodplain system is not located within the Project Area as defined in the EA (i.e., the Permit Area). Recommend changing to say that there are two GW systems in the Project Area, the bedrock and perched systems, and a third system, CFR floodplain system, nearby.	430/315	Error corrected in the document.
04-09	The first full paragraph of the page says “Total average annual water demand for the Project, which can be used as an approximate pumping rate, is estimated to be approximately 35 gpm…”. The plan is actually for a significant portion of the dust suppression water demand to come from storm water. With a combined storage capacity of about 21 acre-feet, the two basins will provide a significant portion of the dust suppression water demand. The text should be revised to note that a portion of the water demand will come from storm water, meaning the average annual ground water pumping rate will be less than 35 gpm.	430/315	Error corrected in the document.
04-10	In second line from top, should add “if necessary” after pit dewatering.	430/320	Error corrected in the document.
04-11	This heading missing “**No Action Alternative**”. Paragraph 1: There is no discussion on the potential loss of new tax revenue for the No Action Alternative.	430/330	Error corrected in the document.
04-12	Fourth full paragraph: It is incorrect to combine Lmax and Lpk definitions. Suggest using separate sentences, and deleting references to *Lmax* in last sentence.	430/340	Error corrected in the document.

Table 7.1-1
Substantive Comments and Responses

Comment Number	Comment	Issue Code	Response
04-13	Table 3.8-4. Incorrect to separate Location 1 data into daytime/nighttime. Should change to Time: **24-hour, Leq: 35-50, L90: 26-39**.	430/340	Error corrected in the document.
04-14	First paragraph is inaccurate interpretation of report info. Consider correcting or removing paragraph.	430/340	Error corrected in the document.
04-15	Second to last paragraph: for clarification, add to end of first sentence: "**above existing traffic noise levels**."	430/340	Error corrected in the document.
04-16	Paragraph 1, page 82: the next-to-last sentence references "Antelope Creek". This should be changed to "**Lorranson Creek**".	430/370	Error corrected in the document.
04-17	Day-night average noise level or Ldn: Second sentence is incorrect; consider deleting.	430/340	Error corrected in the document.
04-18	dBA: for accuracy, end of sentence should be changed to: **"which approximates the frequencies heard by the human ear."**	430/340	Error corrected in the document.
04-19	Leq: Definition is incorrect. Should change to: "**A-weighted equivalent sound level**".	430/340	Error corrected in the document.

SECTION 8. GLOSSARY

air pollutant	Any substance in air that could, in high enough concentration, harm animals, humans, vegetation, or materials. Such pollutants may be present as solid particles, liquid droplets, or gases. Air pollutants fall into two main groups: (1) those emitted from identifiable sources, and (2) those formed in the air by interaction between other pollutants.
air quality	A measure of the health-related and visual characteristics of the air, often derived from quantitative measurements of the concentrations of specific injurious or contaminating substances.
alkalinity	The capacity of water to resist changes in pH that would make the water more acidic.
alluvium	Unconsolidated material that is deposited by flowing water.
alternative	A MEPA term defined in ARM 17.4.603(2)(a): (i) an alternate approach or course of action that would appreciably accomplish the same objectives or results as the proposed action; (ii) design parameters, mitigation, or controls other than those incorporated into a proposed action by an applicant or by an agency prior to preparation of an EA or draft EIS; (iii) no action or denial; and (iv) for agency-initiated actions, a different program or series of activities that would accomplish other objectives or a different use of resources than the proposed program or series of activities. The agency is required to consider only alternatives that are realistic, technologically available, and that represent a course of action that bears a logical relationship to the proposal being evaluated [ARM 17.4.603(2)(b)].
ambient	Surrounding, existing. Of the environment surrounding a body, encompassing on all sides. Most commonly applied to air quality and noise.
analysis area	The geographical area being targeted in the analysis as related to the area of the proposed Project.
attainment area	An area that the EPA has designated as being in compliance with one or more of the NAAQS for sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead, and particulate matter. An area may be in attainment for some pollutants but not for others.
backfilling and grading	The operation of refilling an excavation and finishing the surface.
biodiversity	A term that describes the variety of life forms, the ecological role they perform, and the genetic diversity they contain.
blasting	The act of removing, opening, or forming by, or as if by, an explosive.
climate	The average weather conditions over lengthy periods. Typically quantified using mean and variability of temperature, precipitation, and wind over a 30-year period.
colluvium	A general term applied to deposits on a slope or at the foot of a slope that were moved there chiefly by gravity.
Cretaceous	The third and latest of the periods included in the Mesozoic Era. Also, the system of strata deposited in the Cretaceous period and related most commonly to the age of dinosaurs.

criteria pollutant	An air pollutant that is regulated by the NAAQS. Criteria pollutants include sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead, and two size classes of particulate matter, less than 10 micrometers (0.0004 inch) in aerodynamic diameter, and less than 2.5 micrometers (0.0001 inch) in aerodynamic diameter. Pollutants may be added to, or removed from, the list of criteria pollutants as more information becomes available. Note: Sometimes pollutants regulated by state laws also are called criteria pollutants.
cumulative impact	A MEPA term defined in ARM 17.4.603(7): the collective impacts on the human environment of the proposed action when considered in conjunction with other past and present actions related to the proposed action by location or generic type. Reasonably foreseeable future actions 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.
day-night average noise level or L_{dn}	A noise metric that reflects a 24-hour A-weighted noise.
dBA or decibels A scale	A logarithmic unit for measuring sound intensity, using the decibel A-weighted scale, which approximates the frequencies heard by the human ear.
direct impact	An impact caused by an action and that occurs at the same time and place as the action.
disturbed area/disturbance	An area where vegetation, topsoil, or overburden is removed or upon which topsoil, spoil, and processed waste is placed as a result of mining.
downgradient	The direction that ground water flows, which is from areas of high ground water levels to areas of low ground water levels.
electrical conductivity (EC)	A measure of soluble salts in soil (salinity of a soil).
emission	Effluent discharged into the atmosphere, usually specified by mass per unit time, and considered when analyzing air quality.
emissions inventory	An emission inventory is an accounting of the amount of pollutants discharged into the atmosphere.
endangered species	Any species of plant or animal that is in danger of extinction throughout all or a significant portion of its range. Endangered species are identified by the Secretary of the Interior in accordance with the 1973 ESA.
Endangered Species Act	An act of Congress, enacted in 1973, to protect and recover threatened or endangered plant or animal species and their habitats. The Secretary of the Interior, in accordance with the act, identifies or lists the species as “threatened” or “endangered.”
environmental consequences	Environmental impacts of Project alternatives, including the Proposed Action, which cannot be avoided; the relationship between short-term uses of the human environment and any irreversible or irretrievable commitments of resources that would be involved if the Proposed Action should be implemented.
forb	Any herbaceous plant, usually broadleaved, that is not a grass or grass-like plant.

hazardous air pollutants (HAPs)	Air pollutants not covered by the NAAQS, but which may present a threat of adverse human health effects or adverse environmental effects. Those HAPs specifically listed in 40 CFR § 61.01 are asbestos, benzene, beryllium, coke oven emissions, inorganic arsenic, mercury, radionuclides, and vinyl chloride. More broadly, HAPs are any of the 189 pollutants listed in or pursuant to Section 112(b) of the CAA. Very generally, HAPs are any air pollutants that may realistically be expected to pose a threat to human health or welfare.
highwall	The face of exposed overburden and mineral in surface mining operations or for entry to underground mining operations.
historic properties	Cultural resources that are listed in or are eligible for listing in the NRHP.
indirect impact	See the definition for secondary impact.
L_{eq}	A-weighted equivalent sound level.
life-of-mine	Length of time after permitting during which limestone is extracted and mine-related activities can occur.
long-term effect	A change in a resource or its condition that does not return the resource to pre-mine condition, appearance, or productivity; long-term impacts would apply to changes in condition that continue beyond the life of the mine and after final reclamation activities are complete.
Migratory Bird Treaty Act	Enacted in 1918 between the United States and several other countries. The act forbids any person without a permit to "pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, included in the terms of this Convention…for the protection of migratory birds…or any part, nest, or egg of any such bird."
mitigation	An action to avoid, minimize, reduce, eliminate, replace, or rectify the impact of a management practice.
Montana Natural Heritage Program	The Montana Natural Heritage Program provides information on Montana's species and habitats, emphasizing those of conservation concern.
mycorrhizae	Important structures that develop when certain fungi and plant roots form a mutually beneficial relationship where energy moves primarily from plant to fungus and inorganic resources (principally phosphate) move from fungus to plant.
National Ambient Air Quality Standards (NAAQS)	The allowable concentrations of air pollutants in the ambient (public outdoor) air. NAAQS are based on the air quality.
No Action Alternative	An alternative in which the proposed action is not taken. The no action alternative represents a scenario in which current conditions and trends are projected into the future in which the proposed action does not take place and the Project is not implemented.
nonattainment area	An area that the EPA has designated as not meeting (i.e., not being in attainment of) one or more of the NAAQS for sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead, and particulate matter. An area may be in attainment for some pollutants, but not for others.

noncriteria pollutants	The entire range of contaminants other than criteria air contaminants (see the "criteria air contaminants" definition), including other toxic and hazardous pollutants.
noxious weed	Any exotic plant species established or that may be introduced in the state that may render land unfit for agriculture, forestry, livestock, wildlife, or other beneficial uses, or that may harm native plant communities.
particulate matter (pm)	A complex mixture of extremely small particles and liquid droplets that get into the air. Once inhaled, these particles can affect the heart and lungs and cause serious health effects. PM10 includes only those particles equal to or less than 10 micrometers (0.0004 inch) in aerodynamic diameter; PM2.5 includes only those particles equal to or less than 2.5 aerodynamic micrometers (0.0001 inch) in diameter.
postmining land use	The specific use or management-related activity to which a disturbed area is restored after completion of mining and reclamation.
proposed action	A MEPA term used for the action put forth by an applicant to be analyzed. An action is defined in ARM 17.4.603(1) and includes "a Project or activity involving the issuance of a lease, permit, license, certificate, or other entitlement for use or permission to act by the agency, either singly or in combination with other state agencies."
raptors	Birds of prey (e.g., hawks, owls, vultures, and eagles).
revegetation	Plant growth that replaces original ground cover following land disturbance.
riparian areas	Areas with distinct resource values and characteristics that comprise an aquatic ecosystem, and adjacent upland areas that have direct relationships with the aquatic system. This includes floodplains, wetlands, and lake shores.
ripped	Mechanically breaking up compacted soil layers using heavy machinery with tines working at depth.
secondary impact	A MEPA term defined in ARM 17.4.603(18): "a further impact to the human environment that may be stimulated or induced by or otherwise result from a direct impact of the action."
seep	A place where ground water flows slowly out of the ground.
species of concern	Those species, plant and animal, identified by the MTNHP and are considered rare, threatened, and/or have declining populations and, as a result, are at risk or potentially at risk of extirpation in Montana.
short-term effect	A change that within a short period would no longer be detectable as the resource is returned to its pre-mine condition, appearance, or use. Short-term effect is defined as the length of the MLR mine operation and until final reclamation activities are complete.
soil texture	Soil textural units are based on the relative proportions of sand, silt, and clay.
spoil	Overburden that has been removed during surface or underground mining operations.
threatened species	Any species likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range, as identified by the Secretary of the Interior in accordance with the 1973 ESA.
total dissolved solids	A measure of the amount of material dissolved in water (mostly inorganic salts).

upgradient	The direction from which ground water flows.
visibility	The distance to which an observer can distinguish objects from their background. The determinants of visibility include the characteristics of the target object (shape, size, color, and pattern); the angle and intensity of sunlight; the observer's eyesight; and any screening present between the viewer and the object (i.e., vegetation, landform, and pollution such as regional haze).
waters of the U.S.	Waters that include the following: all interstate waters, intrastate waters used in interstate and/or foreign commerce, tributaries of the above, territorial seas at the cyclical high-tide mark, and wetlands adjacent to all the above.
wetlands	Areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated-soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

SECTION 9. REFERENCES

9.1 SECTION 1

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9.2 SECTION 2

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SECTION 10. APPENDICES

10.1 Appendix A – Technical Memo: Traffic Study

Appendix A is available with this EA on the DEQ website at: http://deq.mt.gov/land/hardrock.