Water Quality Division
Montana Pollutant Discharge Elimination System (MPDES) ▪ Fact Sheet

Permittee:	Montanore Minerals Corporation
Permit Number:	MT0032158
Receiving Waters:	Ground Water, Libby Creek
Facility Information	
Name:	Libby Exploration Project – Libby Creek Adit
Location:	Section 15 Township 27 Range 31W Lincoln County
Contact:	Martin Stearns, Vice President Montanore Minerals Corporation
Fee Information	
Type of Facility:	Private Major
Number of Outfalls:	Three (For Fee Determination Only)
Type of Outfalls:	001 – Mine Drainage and Storm Water to Groundwater to Libby Creek 003 – Mine Drainage and Storm Water to Libby Creek 004 through 011 – Storm Water

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1. BACKGROUND

This fact sheet identifies the principal facts, and significant factual, legal, methodological, and policy issues considered in preparing a draft permit as required by the Administrative Rules of Montana. A fact sheet is prepared for any draft permit that establishes new or amended effluent limitations or standards, schedules of compliance, variances, nonsignificance determinations, denial or granting of mixing zones, or other significant requirements.

Montanore Minerals Corporation (hereinafter MMC or Permittee) is the owner and operator of the Libby Exploration Project - Libby Creek Adit (hereinafter Libby Exploration Project or Project, and Facility), an underground silver ore and copper ore mineral exploration operation.

Montana has adopted a number of federal regulations by reference which are used in this permit as a basis for permit limits. Reference to "director" or "state director" in these federal regulations means the Department of Environmental Quality (DEQ) when these references are to a delegated or approved NPDES state program, otherwise, it refers to the Regional Administrator.

1.1 PERMIT AND APPLICATION INFORMATION

This permitting action under MT0032158 is for the new Libby Exploration Project that includes mineral exploration including adit and drift development. The discharge of process wastewater is prohibited. The discharge of mine drainage that does not include process wastewater is allowed, and described in further detail in Section 1.2.2.

- Process wastewater: any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, by-product, or waste product (40 CFR 401.11).
- Mine drainage: any water drained, pumped, or siphoned from a mine (40 CFR 440.132).

Because MMC is conducting mineral exploration only and there is no wastewater derived from manufacturing or processing, the mine drainage is not considered process wastewater

This new permit will replace the 2006-issued permit MT0030279, which became effective April 1, 2006. The 2006-issued permit has been the operative MPDES permit for the Libby Creek Adit discharges and reclamation from past activities, since the Montana Supreme Court vacated the 2017-issued permit. MPDES permit MT0030279 will be terminated upon issuance of this new permit.

In 1989, Noranda Mining and Exploration (Noranda) began underground exploration activities at the Libby Creek Adit site. The exploration license required water quality monitoring downstream of the adit in Libby Creek at monitoring site LB-300 (Figure H.2). In December 1989, Noranda filed a petition for Change in Quality of Ambient Water with the Board of Health and Environmental Sciences (BHES). In November 1992, the BHES issued order BHES 93-001-WQB in response to the petition. The order established the Authorization to Degrade and surface water and ground water quality standards for Libby Creek. A consent decree was signed between the Montana Department of Health and Environmental Sciences and Noranda on May 12, 1993. This decree adopted the BHES Order, which established the limit for total inorganic nitrogen at the downstream monitoring site Libby Creek Station LB-300 of 1.0 mg/L. Further control of the discharge was addressed by an agreement that Noranda would apply for an MPDES permit.

MT0030279 and MT0032158 Permitting Activities Summary Timeline

November 1, 1997	First MPDES permit number MT0030279 became effective
September 9, 2002	Noranda sent a letter to DEQ stating that it planned to close the project and fulfill the reclamation requirements
April 1, 2006	Renewed MPDES permit became effective
May 23, 2008	The 2006-issued permit was modified to change owners from Noranda to Montanore Minerals Corporation
February 23, 2011	Renewal application complete and 2006-permit administratively continued
January 17, 2017	Renewed permit was issued to become effective March 1, 2017
February 16, 2017	MMC appealed several provisions of the 2017-issued permit to the Board of Environmental Review (BER)
August 15, 2017	Montana Environmental Information Center (MEIC) filed a Complaint for Declaratory Relief
July 24, 2019	District Court vacated the 2017-issued permit
November 17, 2020	The Montana Supreme Court found that the 1992 Board of Health and Environmental Science Final Decision and Statement of Reasons (BHES Order), which set numeric effluent limits on specific contaminants above ambient conditions, had expired when Noranda abandoned their mining project in 2002. As a result, the Supreme Court vacated the 2017-issued MPDES permit and required that DEQ conduct a degradation review under 75-5-303(3), MCA. This decision left the 2006-issued permit administratively extended.
December 3, 2021	MMC submitted a renewal application
December 30, 2021	DEQ issued first notice of deficiency (NOD) letter with the decision for a new permit number
January 28, 2022	MMC filed a Notice of Appeal and Request for Hearing re: DEQ's Denial of MMC's Permit Renewal Application with the BER
January 31, 2022	MMC responded to the first NOD
March 8, 2022	DEQ issued a second NOD letter
November 22, 2022	MMC and DEQ submitted a Stipulated Motion for Order of Dismissal. The BER dismissed MMC's appeal and a new permit was agreed upon.
February 21, 2023	DEQ received a new permit application from MMC, assigned permit number MT0032158
March 2 - June 8, 2023	DEQ issued NODs and MMC submitted responses to address deficiencies in the permit application for MT0032158
July 6, 2023	DEQ issued a completeness letter to MMC

1.2 DESCRIPTION OF FACILITY AND DISCHARGES

A facility, activity, or outfall is any point source, including land or appurtenances thereto, that are subject to regulation under the MPDES program. The discharge of pollutants to state waters is limited to outfalls authorized in the Facility's discharge permit.

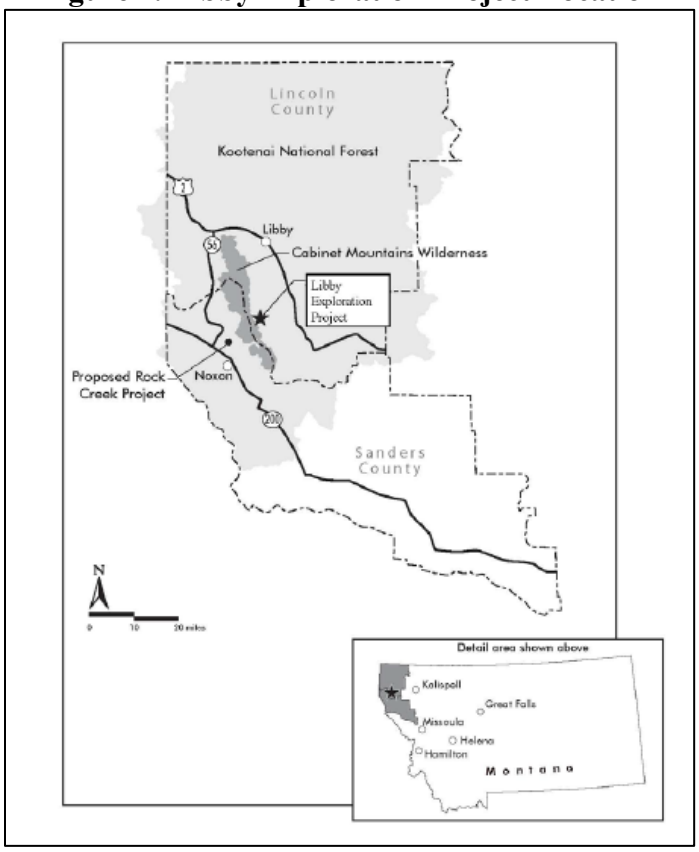
1.2.1 Description and Location of Facility

MMC proposes to conduct mineral (copper and silver) exploration at the Libby Creek Adit Facility. Exploration is characterized as all activities that are conducted on or beneath the surface of lands and that result in material disturbance of the surface for the purpose of determining the presence, location, extent, depth, grade, and economic viability of mineralization in those lands, if any, other than mining for production and economic exploitation (MCA 82.4.303). No mining is planned or permitted during this permit term, as the Libby Creek Exploration Project will occur over a period of about four to five years.

The Facility underwent reclamation while Noranda owned the mine. When MMC bought the Facility, they kept the infrastructure remaining from previous exploration and rebuilt additional infrastructure. MMC will be performing upgrades for future exploration activities (the Libby Exploration Project), including upgrades to the water treatment plant (WTP) and future construction of the outfalls. MMC anticipates any use of Outfall 003 in this permit term would be during an emergency where water must be diverted from Outfall 001. All references to the Facility operations and location in this fact sheet are from the proposed Facility and location as described in the MPDES permit application.

The targeted mineralized resource is underneath the Cabinet Mountains Wilderness located about 20 miles south of Libby, Montana in the Cabinet Mountains of northwestern Montana (Figure 1). Access to the minerals is via an adit under the Cabinet Mountains Wilderness with a portal on private land bordering the wilderness area. The Libby Adit Site is accessible using the existing Forest Service Roads.

Figure 1. Libby Exploration Project Location

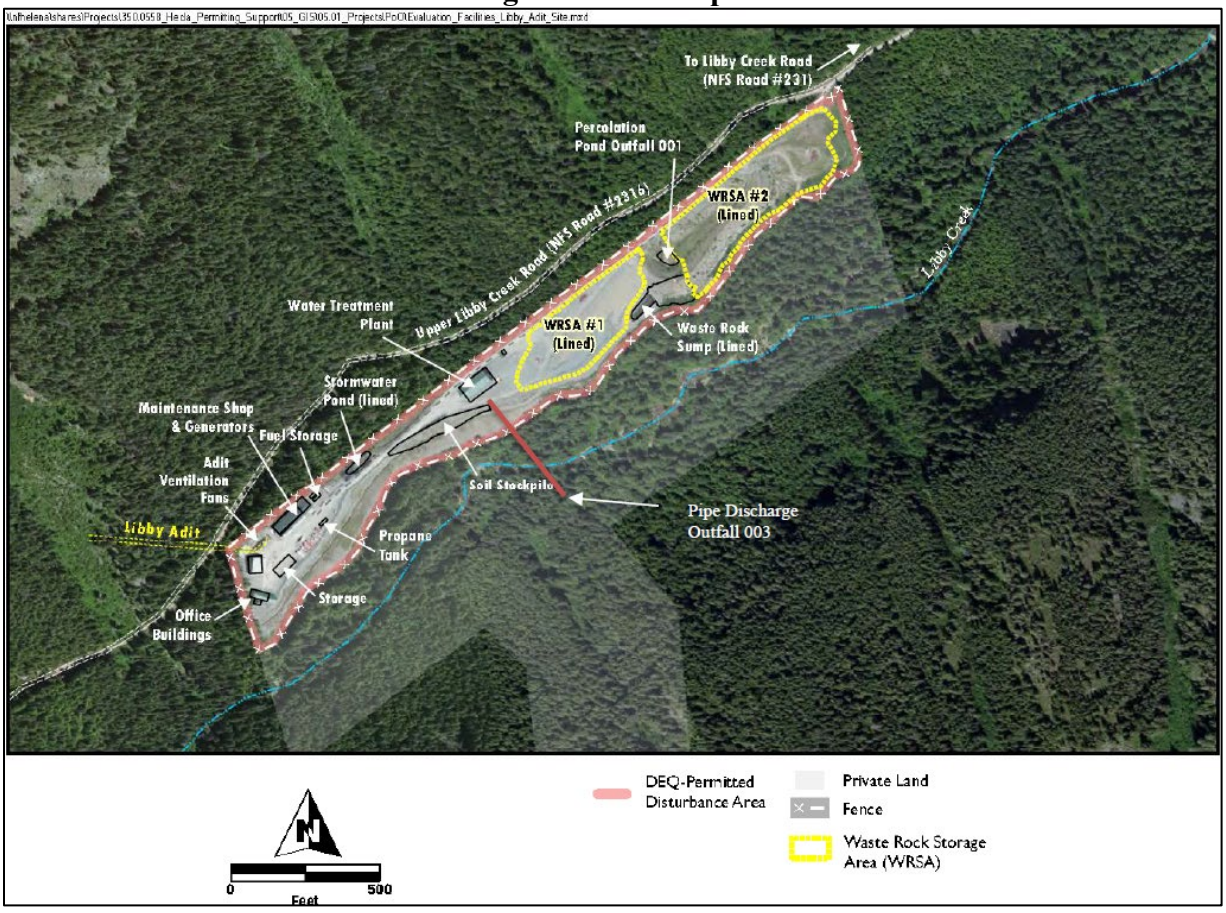


The existing Libby Creek Evaluation Adit is constructed approximately 14,000 feet towards the mineralized resource and currently discharges mine drainage that consists of ground water inflow to the adit tunnel. MMC will dewater and rehabilitate the adit prior to exploration. The proposed future exploration activities will include extending the adit by approximately 4,200 feet, constructing underground lateral drifts (tunnels) of approximately 6,300 feet, and drilling underground boreholes to support exploration drilling activities. This activity will occur beneath Kootenai National Forest-administered land.

In addition to the adit expansion, proposed changes from the existing facility include expansion of the existing lined waste rock storage area (WRSA) #1 to increase storage capacity to about 77,000 cubic yards (yd^3); construction of a new lined WRSA #2 with a storage capacity of about 87,000 yd^3; construction of a new lined 360,000-gallon waste rock sump; and relocation of a soil stockpile to accommodate WRSA #2. Solid wastes, such as generated waste rock, will go to lined WRSAs #1 and #2 (Figure 2 and Appendix H for larger diagrams). Runoff and seepage collected from the repositories will be mixed with ground water drainage from the adit and treated prior to discharge as described in Section 1.2.2.

The other main elements of the Project are underground exploration core drilling, sample collection and transport offsite for analysis, installation of piezometers and other water monitoring wells, and abandonment of exploration holes that are not used for other data collection activities. MMC also plans to continue operation of an equipment storage and maintenance shop, diesel-fueled power generation and associated fuel storage, and office facility.

Figure 2. Site Map



1.2.2 Wastewater Sources, and Treatment or Controls

Ground water inflow into the mine workings is the main source of wastewater. The secondary source is storm water (Section 1.2.2 Storm Water). The maximum daily design flow of the WTP that treats the mine drainage and storm water is 0.72 mgd. The average flow predicted from Outfall 001 and Outfall 003 is 0.38 mgd (0.374 mgd mine drainage and 0.006 mgd of storm water). The average was estimated based on historic adit and storm water flows, frequency and duration of discharges, and estimated future inflows during the adit expansion as described in the Project Plan of Operations by MMC in February 2022.

Discharge is expected to occur intermittently to maintain water at the desired level in the adit, to maintain freeboard in the lined storm water ponds, and to correspond with staff working schedules. Ground water and storm water collected are pumped to the WTP routinely, and discharge is expected to occur seven days a week but could vary to meet dewatering requirements or work schedules.

After treatment by the WTP, wastewater infiltrates into groundwater through a percolation pond, which is identified as Outfall 001. A pressure transducer is installed in the percolation pond to measure standing water elevation. During full plant operation, the water elevation rarely rose more than a few feet with 15-20 feet of remaining freeboard. The alluvium beneath Outfall 001 is very rocky with high transmissivity and easily percolates full plant discharge without risk of overflowing.

The specific sources are:

a. Mine drainage: ground water that came into contact with drilling and blasting areas in the adit and underground mine workings. Grouting of water-bearing faults and fractures and drillholes are done as needed for ground water control. Ground water is pumped up to the surface to be treated before discharge.
b. Storm water:
    - WRSA #1 storm water runoff and infiltration
    - WRSA #2 storm water runoff and infiltration
    - Waste Rock Sump (WRS): The new sump will collect storm water from the WRSA underliners. The storm water will be stored temporarily and then pumped to the WTP to be treated with the adit water. The WRS will be sized to manage runoff from a 100-year, 24-hour storm event
    - Lined storm water pond

<u>Storm Water</u>

The facility has 9.5 acres of impervious surface area within a 14.8-acre area (Figure H.3). Included in this impervious surface area are storm water sources (1.2.2b), building footprints, and compacted soil access road and a parking area. Most of the storm water associated with the project will be treated with mine drainage and be discharged through Outfall 001, and, if constructed, Outfall 003 (Figure 2). See Appendix H for stormwater runoff patterns and outfall locations.

Plant site runoff originating to the south/southwest of the lined storm water pond has potential to either infiltrate the subsurface, flow into the lined storm water pond, or flow to the lowest point in the road. The pond drains by gravity to the WTP by an existing 8-inch overflow pipe. The

lined stormwater pond has, to date, never filled with enough storm water to be routed to the WTP. Given the size of the overflow pipe, it would be able to move 500 gallons per minute (gpm, 0.72 mgd) of storm water from the pond if the storm water were to reach the overflow pipe invert elevation. There is a lined spillway in the northwest corner of the pond in the unlikely case of overflow (Outfall 004) (Figure H.3).

Farther east the road reaches a low point (a saddle) with a cut in the berm for storm water to runoff to the north (Outfall 005)(Figure H.3). This outfall receives storm water from the southern side of the access road, west of the lined storm water pond, as there is no feature clearly directing water to the pond from the south side of the road. Additionally, Outfall 005 receives runoff from the northern and southern sides of the access road east of the lined storm water pond, as well as the WTP building.

Additional runoff from the site may infiltrate the subsurface, flow into either of the lined WRSAs or flowing into the catchment basins/sediment traps along the southern boundary of the site (Outfalls 006 - 011)(Figure H.3).

Storm water that may enter the catchment basins comes from recontoured and revegetated slopes or other minimally disturbed site access features used for site inspection, maintenance, and well sampling. The catchment basins do not currently have discharge points to surface waters, and rarely see any storm water accumulation. MMC will be required to maintain these catchment basins as described in Section 6.6

Precipitation falling on the two WRSAs is routed to a lined waste rock sump. Storm water is then pumped from the sump to the WTP. Storm water will be collected in sumps or ponds, report to the head of the wastewater treatment circuit, and mix in Reaction Tank #1 with adit water prior to treatment. This is shown in Figure 3 as WRS Water.

Storm water run-on will be diverted around the Libby Creek Adit Facility via ditches and culverts along the Upper Libby Creek Road (NFS Road #2316). Minor grading of the Road and the existing ditch will be conducted to ensure run-on is captured. The run-on diversion channel drains toward and enters an existing culvert which then conveys non-contact storm water to a small catchment basin on the southern side of the Libby Adit Site. The existing culvert outlet and catchment basin are located within the footprint of WRSA #2 and an extension to the culvert will be necessary to avoid contact with industrial operations. The new catchment basin will include geotextile and riprap for energy dissipation at the culvert outlet.

Site best management practices (BMPs) include berms, sediment traps, ditches, native materials (brush pile filters, surface revegetation/reclamation), and lined sumps.

Wastewater Treatment

The existing wastewater treatment consists of settling in the underground workings; followed by disc filtration, multi-media filtration and ultrafiltration to remove solids and associated particulate metals. The filter backwash returns to the underground mine workings for settling. Solid residuals are placed in WRSAs #1 and #2. MMC has proposed additional wastewater treatment processes, if necessary, for dissolved metals and nitrogen, including:

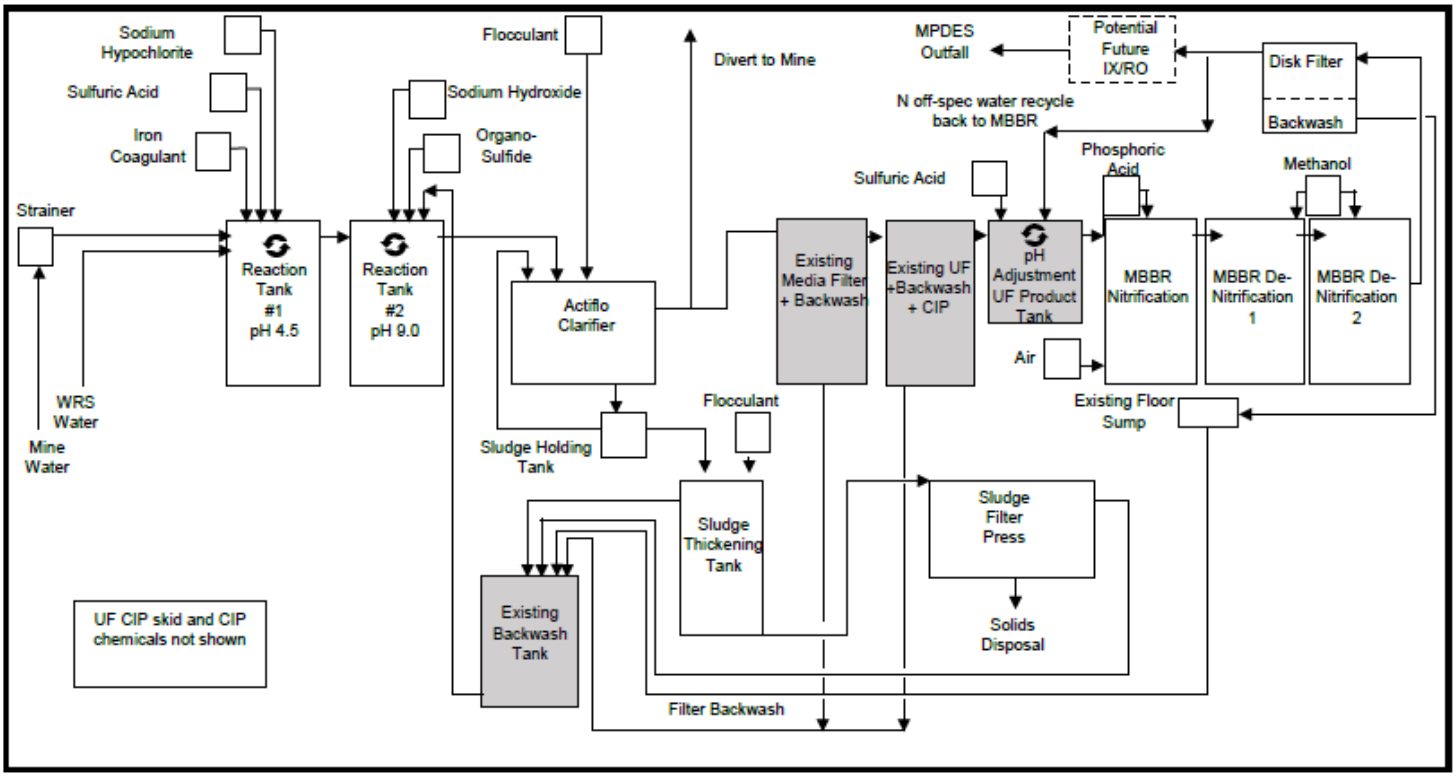
- chemical precipitation of dissolved metals (pH adjustment with sulfuric acid and sodium hydroxide; addition of iron and sulfide reagents);
- clarification and sludge thickening/dewatering to remove precipitated metals from water;
- filtration to further remove precipitated metals from water; and,

- moving bed bioreactor (MBBR) for nitrogen removal.

The design flow will still be 0.72 mgd with any additional upgrades implemented. Upgrades to the existing WTP will be constructed and fully operational before the Project commences. Details of the wastewater treatment processes are described in the October 2017 Memo from Water Engineering Technologies, Inc.

Figure 3 presents the existing (shaded) and proposed (no shading) treatment processes for the Facility WTP.

Figure 3. Water Treatment Flow Diagram



1.2.3 Discharge Points

Outfalls 001 and 003 will discharge to state waters at the locations identified in Table 1. State waters are any surface or underground body of water, irrigation system or drainage system. Ponds, lagoons, or other waste impoundments used solely for treating, impounding, or transporting wastes are not state waters. Discharge to state waters is prohibited unless expressly authorized in the Facility's discharge permit. The beneficial use classifications and applicable water quality standards for the receiving water are identified in Section 3.2.1.

Table 1. Discharge Locations				
Outfall	Latitude	Longitude	Receiving Water	Receiving Water Classification
001	48.102222° N	115.571667° W	Ground Water to Libby Creek	I and B-1
003 (1)	48.101389° N	115.570000° W	Libby Creek	B-1
004	48.100310° N	115.576232° W	Libby Creek	B-1
005	48.100403° N	115.575875° W	Libby Creek	B-1
006	48.09888° N	115.57694° W	Libby Creek	B-1
007	48.09972° N	115.57611° W	Libby Creek	B-1
008	48.10055° N	115.57444° W	Libby Creek	B-1
009	48.10111° N	115.57250° W	Libby Creek	B-1
010	48.10194° N	115.57083° W	Libby Creek	B-1
011	48.10333° N	115.56861° W	Libby Creek	B-1
(1) Outfall 003 is not yet constructed.				

Discharge during the Libby Exploration Project will be through Outfall 001, which is ground water infiltration from the percolation pond. The latitude and longitude are the middle of the percolation pond. The ground water is hydrologically connected to Libby Creek, so wastewater discharged to the ground water enters surface water within a short distance (approximately 450 feet).

Outfall 002 (drainfield) from the MT0030279 permit will not be used during the Project, and authorization for Outfall 002 was not requested. MMC may not discharge from Outfall 002 or any other unpermitted outfall.

Outfall 003 has not been constructed, and no mixing zone is requested for that outfall. Construction of Outfall 003 is not anticipated during the Project and any use of the Outfall 003 would be during an emergency situation where water must be diverted away from Outfall 001. Outfall 003 will direct discharge into Libby Creek, and the latitude and longitude are at end-of-pipe.

Outfalls 004 - 011 are storm water outfalls and their respective latitude and longitude are at the point of discharge.

1.2.4 Permit Fee Determination

Permit fees are based on the type of waste (sewage, process wastewater, storm water, noncontact cooling water, etc.) and receiving water or stream segment. An application and annual fee for multiple outfalls is not required unless the discharges are to different receiving waters or result in multiple or variable effluent limits. Table 2 below identifies, individually or by group, the three fee groups, the type of wastewater and receiving water. Application and annual fees are required for each fee group.

Table 2. Summary Outfall Categories for Fee Purposes			
Fee Group	Effluent Description	Receiving Water	Outfalls
A	Mine Drainage	Groundwater to Libby Creek	001
B	Mine Drainage	Libby Creek	003
C	Storm Water	Libby Creek	004, 005, 006, 007, 008, 009, 010, 011

1.2.5 Effluent Characteristics

Effluent characteristics for Outfalls 001 and 003, reported on the permit application, are summarized in Appendix A. The reported effluent characteristics are estimates based on existing outfall data from MT0030279, the Project predicted quality, similar mines in Montana, and similar treatment systems. In addition to the regular discharge monitoring, the Permittee must complete and submit Sections 7 and 8 of DEQ Form 2C within six months of commencing the discharge from Outfalls 001 and/or 003. Analytical results are required for all parameters listed in Tables A, B, C, D, and E (40 CFR 122.21(k)(5)(vi)) and must be conducted by methods approved under 40 CFR 136, with detection levels capable of achieving the Required Reporting Value (RRV) in Circular DEQ-7.

Storm water quality was determined using analytical results from the lined storm water collection pond. Estimated storm water quality prior to treatment is summarized in Appendix A.

1.2.6 Other Information

MMC is permitted under DEQ Hard Rock Operating Permit #00150. The facility and treatment system evaluated in this MPDES permit is based on the exploration phase proposed by the permittee; any changes to Operating Permit #00150 that alters the basis for the effluent limits found in the MPDES permit or otherwise results in any relevant changes to the MPDES permit may require a modification of this MPDES permit.

The U.S. Department of Agriculture, Kootenai National Forest (KNF), and DEQ were the lead agencies for the Montanore Project Environmental Impact Statement (EIS) and prepared a Joint EIS in 2015 in compliance with the National Environmental Policy Act (NEPA) and the Montana Environmental Policy Act (MEPA). The cooperating agencies were the Bonneville Power Administration, the U.S. Army Corps of Engineers, and Lincoln County, Montana.

2. TECHNOLOGY-BASED EFFLUENT LIMITS

The control of pollutants discharged is established through effluent limitations and other requirements. There are two principal bases for effluent limitations: technology-based effluent limitations (TBELs) that specify the minimum level of treatment or control for conventional, non-conventional, and toxic pollutants and water quality-based effluent limitations (WQBELs) that attain and maintain applicable numeric and narrative water quality standards.

Section 402(a)(1) of the federal Clean Water Act (CWA), the federal regulations at 40 CFR 125.3(a), and Montana regulations at ARM 17.30.1207 require that permits contain TBELs that implement the technology-based treatment requirements specified in the CWA. These technology-based requirements may be national technology standards for existing sources or new sources established by EPA or, in some cases, standards established by the permit writer on a case-by-case basis using best professional judgement (BPJ) (ARM 17.30.1203(5)).

2.1. SCOPE AND AUTHORITY

EPA has promulgated national TBEL and standards of performance for both existing and new sources at 40 CFR Subchapter N. These effluent limitations and standards are more commonly referred to as “effluent limitation guidelines” (ELGs). The Board of Environmental Review (Board) has adopted effluent limitations and standards, toxic effluent standards and new source performance standards in ARM 17.30.1203, 1206 and 1207, respectively, based on the

applicable federal regulation. These regulations state that technology-based treatment requirements specified in the Clean Water Act represent the minimum level of control that must be imposed in MPDES permits.

In developing the ELGs for the ore mining and dressing category, EPA studied ore mining and dressing wastewaters to determine which toxic, conventional, and non-conventional pollutants required TBELs. The method for including or excluding pollutants in the ELGs is described in detail in the *Development Document for Effluent Limitations Guidelines and Standards for the Ore Mining and Dressing Point Source Category* (EPA, 1982)(development document).

For existing sources, EPA developed ELGs representing the degree of effluent treatment currently being attained (in 1982) by existing facilities (best practicable control technology currently available or BPT), the best available technology economically achievable (BAT), and the best conventional pollutant control technology (BCT) for control of conventional pollutants.

For new sources, EPA developed new source performance standards. New source performance standards (NSPS) represent the best available demonstrated control technology standards. The intent of NSPS guidelines is to set limitations that represent state-of-the-art treatment technology for new sources as defined in ARM 17.30.1304 and 1340(1).

The Facility is a new source subject to New Source Performance Standards as defined at ARM 17.30.1304 and 17.30.1340.

Where EPA has not established ELGs that are applicable to a particular class or category of industrial discharger or to a specific discharge, the permit writer establishes applicable technology-based treatment requirements on a case-by-case basis using BPJ.

2.2 ADDITIONAL REQUIREMENTS

All permit effluent limitations, standards or prohibitions for a metal must be expressed as total recoverable metal unless the applicable effluent standard or limitation has been expressed in another form, or the approved method for the metal only measures the dissolved form (e.g. hexavalent chromium).

For continuous discharges, all permit effluent limitations, standards, and prohibitions must, unless impracticable, be stated as maximum daily and average monthly discharge limitations for all dischargers other than publicly-owned treatment works (ARM 17.30.1345(6)).

Discharges that are not continuous must be particularly described and limited, considering the following factors, as appropriate: frequency, total mass, maximum rate of discharge of pollutants during the discharge, and prohibition or limitations of specified pollutants by mass, concentration, or other appropriate measure (ARM 17.30.1345(7)).

2.3 APPLICABLE FEDERAL EFFLUENT LIMIT GUIDELINES

EPA has promulgated ELGs in 40 CFR Part 440, Subpart J for facilities in the Ore Mining and Dressing Point Source Category, Copper, Lead, Zinc, Gold, Silver, and Molybdenum Ores Subcategory. The ELGs are found at 40 CFR 440.100 – 440.105 and Subpart L found at 40 CFR 440.130 – 440.132. The guidelines apply to the Facility because it will discharge mine drainage from exploration for copper and silver ores.

The applicable general definitions given in 40 CFR 440.132 are incorporated by reference into this fact sheet and will be included in the permit.

2.4 OUTFALLS 001 AND 003

The Facility is a new source and is subject to the New Source Performance Standards (NSPS) at 40 CFR 440.104, Subpart J, which are discussed below.

40 CFR 440.100 states in pertinent part that "The provisions of this subpart J are applicable to discharges from -- (1) Mines that produce copper, lead, zinc, gold, silver, or molybdenum bearing ores, or any combination of these ores from open-pit or underground operations other than placer deposits; …"

Mine Drainage

Mine drainage means any water drained, pumped, or siphoned from a mine. The concentration of pollutants discharged in mine drainage from mines that produce copper, lead, zinc, gold, silver and molybdenum bearing ores from open-pit or underground operations other than placer deposits shall not exceed:

Table 3. Mine Drainage — 40 CFR 440.104(a)

Effluent Characteristic	Units	Effluent Limitations	
		Maximum for any 1 day	Average of daily values for 30 consecutive days
Copper	mg/L	0.30	0.15
Zinc	mg/L	1.5	0.75
Lead	mg/L	0.6	0.3
Mercury	mg/L	0.002	0.001
Cadmium	mg/L	0.10	0.05
pH	s.u.	Within the range of 6.0 to 9.0	
TSS	mg/L	30.0	20.0

Process Wastewater

Process wastewater is any water which, during manufacturing or processing, comes into direct contact with, or results from the production or use of any raw material, intermediate product, finished product, by-product, or waste product (40 CFR 401.11). By definition, any water introduced into the mill process is considered process wastewater.

Because MMC is conducting mineral exploration only and there is no wastewater derived from manufacturing or processing, the mine drainage is not considered process wastewater. Therefore, the provisions subsequent 40 CFR 440.104(a) are not applicable.

General Provisions Applicable to Outfalls 001 and 003

Combined Waste Streams

The general provision of 40 CFR 440.131(a) allows the discharge of waste streams from various subparts or segments of subparts of Part 440 when they are combined for treatment and discharge (referred to as the commingling provision). The Permittee proposes to commingle mine drainage (Subpart J) with storm water and treat the combined wastewater to

meet the respective outfall limits, There are no ELGs promulgated for storm water. Treated storm water must meet the ELGs described in 40 CFR 440.104(a) and applied as TBELs in this permit.

Storm Exemption

40 CFR 440.131(b) and 40 CFR 440.131(c) describe provisions where the Permittee may discharge an overflow or excess discharge of effluent resulting from precipitation and runoff from a 10-year 24-hour precipitation event, which is not required to meet the TBELs. However, language from 40 CFR 440.131(b) and 40 CFR 440.131(c) will not be included in the permit, as MMC is not producing process wastewater and there is no active mining or mill site for runoff to flow from. The permit will require that the storm water that is treated with the mine drainage wastewater must comply with the final effluent limitations applicable to Outfall 001 and 003.

pH Adjustment

The general provision of 40 CFR 440.131(d) allows the permitting authority to alter pH limitations where necessary for the discharge to achieve the metals limits in the ELGs or to allow for a natural pH in the receiving water less than 6.0. This provision does not apply because the Permittee is proposing a treatment technology that is not addressed by the provision and the natural pH of the receiving water is not less than 6.0.

Ground Water Infiltration

Because MMC is not discharging process wastewater, they are not subject to the no discharge requirement and 40 CFR 440.131(e) is not applicable.

2.5 OUTFALLS 004 - 011

Outfalls 004 - 011 are storm water outfalls for runoff from the Facility haul road, the storm water pond, and any on-site storm water that bypasses the berm constructed of non-waste rock materials and other BMPs to reach the catchment basins. Discharges from these outfalls will not contain process wastewater; ELGs have not been promulgated for these storm water discharges.

The discharge of any process wastewater or any water resulting from mine dewatering activities or mine drainage is prohibited at Outfalls 004 - 011.

Best management practices (BMPs) are used to control sediment in accordance with ARM 17.30.1344 and 40 CFR 122.44(k), where numeric limits are infeasible, such as storm water runoff not subject to federal TBELs. Given that these are storm water discharges from outside the mining areas and should contain uncontaminated sediment easily controlled by BMPs, DEQ is establishing the use of BMPs for the control of pollutants discharged at Outfalls 004 – 011 (ARM 17.30.1345); (see Special Conditions Section 6.7). BMPs are defined as a permit condition and serve as TBELs, determined by BPJ, that represent the minimum level of control that must be implemented in MPDES permits to prevent or control the discharge of pollutants to state waters.

The Permittee must comply with all BMP requirements and must develop, implement, and maintain a Storm Water Pollution Prevention Plan (SWPPP) (see Special Conditions Section 6.7) identifying all BMPs selected for storm water control and submit the SWPPP for DEQ review.

MMC must submit the SWPPP to DEQ no later than 60 days after the effective date of the permit and must be approved by DEQ prior to construction and operation of Outfalls 004 - 011.

2.6 VARIANCE REQUEST

The Permittee has not requested a variance for any of the applicable provisions and DEQ has determined that the discharge does not qualify for a variance.

2.7 FINAL TBELs

Outfalls 001 and 003

Table 4 and the narrative conditions below summarize the TBELs at Outfalls 001 and 003. The concentration of pollutants discharged at Outfalls 001 and 003 shall not exceed:

Table 4. Technology-Based Effluent Limits for Outfalls 001 and 003

Parameter	Units	Maximum Daily Limit	Average Monthly Limit
Copper	mg/L	0.30	0.15
Zinc	mg/L	1.5	0.75
Lead	mg/L	0.6	0.3
Mercury	mg/L	0.002	0.001
Cadmium	mg/L	0.10	0.05
pH	s.u.	Within the range of 6.0 to 9.0	
TSS	mg/L	30.0	20.0

- The discharge of any process wastewater is prohibited.

Outfalls 004 - 011

The Permittee must develop, implement, and maintain a facility-wide storm water pollution prevention plan and associated BMPs to control pollutants associated with storm water for Outfalls 004 - 011. See Special Conditions Section 6.7 *Best Management Practices and Pollution Prevention*.

3. WATER QUALITY-BASED EFFLUENT LIMITS

Permits must include limitations more stringent than applicable federal technology-based requirements where necessary to achieve applicable water quality standards.

3.1 SCOPE AND AUTHORITY

The Montana Water Quality Act at 75-5-401(2), MCA states that a permit may only be issued if DEQ finds that the issuance or continuance of the permit will not result in pollution of any state waters. Montana water quality standards require that no wastes may be discharged such that the waste either alone or in combination with other wastes will violate or can reasonably be expected to violate any standard.

3.2 APPLICABLE WATER QUALITY STANDARDS

The water quality standards include both numeric and narrative standards that protect the beneficial uses set forth in the water use classifications. The specific standards are given in ARM 17.30.621 through 629 and incorporate by reference Circular DEQ-7, entitled "Montana Numeric Water Quality Standards" (June 2019 edition) and Circular DEQ-12A, entitled "Montana Base Numeric Nutrient Standards" (July 2014 edition). Circular DEQ-7 establishes surface water numeric water quality standards for protection of aquatic life and human health, and ground water numeric standards for the protection of human health. Circular DEQ-12A establishes numeric water quality standards for total nitrogen and total phosphorus in surface waters.

ARM 17.30.637(1) requires that state waters must be free from substances which will: (a) settle to form objectionable sludge deposits or emulsions beneath the surface of the water or upon adjoining shorelines; (b) create floating debris, scum, a visible oil film (or be present in concentrations at or in excess of 10 milligrams per liter) or globules of grease or other floating materials; (c) produce odors, colors or other conditions as to which create a nuisance or render undesirable tastes to fish flesh or make fish inedible; (d) create concentrations or combinations of materials which are toxic or harmful to human, animal, plant or aquatic life; and (e) create conditions which produce undesirable aquatic life.

Effluent limitations based on the narrative prohibition of substances that will cause toxicity in state surface water are developed with whole effluent toxicity (WET) tests. WET tests results are expressed as pass or fail. WET methods may also be used to develop a no observed effects levels for pollutants regulated by narrative standards. WET requirements are discussed in Sections 4 and 5.

For new sources, effluent limitations for numeric and narrative standards are modified by the nonsignificance criteria in ARM 17.30.715 which are based on the protection of existing water quality. Appendix C provides a summary of water quality standards and any applicable nondegradation criteria for the affected receiving waters.

3.2.1 Water Use Classification and Standards

Outfall 001 will discharge through a percolation pond to ground water and is projected to reach Libby Creek. The percolation pond is about 450 feet from the nearest point of Libby Creek. Outfall 003 will discharge directly to Libby Creek. The receiving water is located in the Kootenai watershed, USGS Hydrological Unit Code (HUC) 17010101. The designated water-use classification for Libby Creek is B-1 and ground water is Class I. Water use classifications and beneficial uses are summarized in Table 5.

Table 5. Water Use Classification and Beneficial Uses - Libby Creek and Ground Water

Classification	Beneficial Uses
Surface Waters B-1	Drinking, culinary and food processing purposes after conventional treatment; Bathing, swimming, and recreation; Growth and propagation of salmonid fishes and associated aquatic life, waterfowl, and furbearers; and Agricultural and industrial water supply.
Ground Water Class I	The quality of Class I ground water must be maintained so that these waters are suitable for the following uses with little or no treatment: public and private water supplies; culinary and food processing; irrigation; livestock and wildlife; and commercial and industrial purposes.

3.3 IMPAIRED WATERS

The Montana Water Quality Act requires DEQ to monitor state waters and to identify surface water bodies or segments of water bodies whose designated uses are threatened or impaired. DEQ must complete a total maximum daily load (TMDL) for those water bodies that are identified as threatened or impaired.

Upon approval of the TMDL, the wasteload allocation (WLA) developed for a point source must be incorporated into the Facility's discharge permit. A WLA is defined as the portion of the receiving water's loading capacity that is allocated to one of its existing or future point sources.

3.3.1 2020 303(d) List

The reach of Libby Creek from one mile above Howard Creek to Highway 2 Bridge is Montana stream assessment unit MT76D002_061. This segment of Libby Creek is about half a mile downstream of the monitoring station LB-300. This stretch of Libby Creek is listed as impaired on the 2020 303(d) list as not fully supporting aquatic life. Listed causes of impairment are alteration in stream-side or littoral vegetative covers and physical substrate habitat alterations from impacts from abandoned mine lands and placer mining. There is no approved TMDL for this segment of Libby Creek.

The downstream reach of Libby Creek is from the Highway 2 bridge to the mouth of the Kootenai River is MT76D002_062. This segment is listed as impaired on the 2020 303(d) list as not fully supporting aquatic life. Listed causes of impairments are physical substrate habitat alterations from site clearance and sedimentation/siltation from site clearance and streambank modifications/destabilization. There is an approved TMDL for this segment of Libby Creek.

3.3.2 Approved TMDL

The *Kootenai – Fisher Project Area Metals, Nutrients, Sediment, and Temperature TMDLs and Water Quality Improvement Plan* (May 2014) set a TMDL of 4,234 tons/year total allowable sediment for MT76D002_062 and a WLA for Montanore Mine at 24 tons/year of sediment. The intent of the TMDL was not to add load limits to the permits (MT DEQ, 2014). The WLA was intended to be met by adhering to permit requirements based on the 2006-issued MT0030279 permit conditions and storm water BMPs discussed in the 2011 renewal application for the 2017-issued MT0030279 permit. Compared to the renewal application, the storm water outfalls are only discharging to Libby Creek and the drainage area is 14.8 areas, compared to the 20.7 acres discharging to Libby Creek, Ramsey Creek, and Poorman Creek. Storm water requirements are discussed in Sections 4 and 5.

Permit conditions discussed in the TMDL include actual average flow (0.52 mgd), total suspended solids (TSS) concentration (1 mg/L), and TSS load (0.8 tons/year). In this permit, Outfalls 001 and 003 flow rate is estimated by MMC to be an average of 0.38 mgd and a daily maximum of 0.72 mgd. The TSS concentration estimate by MMC is an average of 0.75 mg/L and maximum daily 2.5 mg/L.

- The average daily flow rate of 0.38 mgd and concentration of 0.75 mg/L TSS converts to an average TSS load of 0.43 tons/year.
- The maximum flow rate of 0.72 mgd and the maximum concentration of 2.5 mg/L for converts to a maximum load of 2.7 tons/year

This is much more restrictive than the 24 tons/year WLA associated with the Facility and the 15.8 tons/year estimated Outfall 001 and 003 estimated load. The Facility's discharge described under this permit will be protective and meet the requirements discussed in the TMDL.

3.4 GROUND WATER ASSESSMENT

Outfall 001 discharges to a percolation pond that infiltrates to groundwater. Ground water standards established in ARM 17.30.1006 apply to all ground water outside of a department approved mixing zone. These standards establish the maximum allowable change in ground water quality and provide a basis for limiting discharges to ground water. ARM 17.30.1005. Ground water is also subject to the nondegradation requirements in ARM 17.30.701-717. The water use classification is based on the natural specific conductance (SC) of the water.

The following ground water studies have been conducted:

- March 16, 2021, Revised May 2023 *Libby Creek Mixing Investigation*, Hydrometrics, Inc.
- August 18, 1993, *Aquifer Testing Results and Recommendations for Groundwater Interception Wells at the Montanore Project, Libby, Montana*, Hydrometrics, Inc.

Ground water in the Libby Creek valley is found in the alluvial/colluvial, lacustrine and glaciofluvial deposits and bedrock metasediments. Around Outfall 001 and Libby Creek the subsurface materials consist predominantly of gravel with varying amounts of silt, sand, and cobbles.

MMC has monitored ground water at two sites, MW07-01 and MW07-02, that are located on the southeastern end of the facility (Figure H.4). The wells are downgradient of Outfall 001 and the previously permitted Outfall 002. DEQ used the ambient groundwater data between mine discharge periods from these wells, as there are no wells upgradient of the outfalls. Appendix B Receiving Water Characteristics elaborates on the ground water data used which is then summarized in Table B.2.

3.5 POLLUTANTS OF CONCERN

WQBELs are assessed for pollutants of concern (POC) based on effluent characteristics and the water quality objectives for the affected receiving water(s). DEQ has identified the POCs listed below for purposes of assessing Reasonable Potential and WQBELs. Pollutants and parameters are identified as a POC for the following reasons:

- Listed as TBELs (is subject to a federal ELG)
- Included in a previous permit (see below discussion)
- Identified as present in effluent monitoring or otherwise expected present in the discharge
- Exceeds a water quality standard or nondegradation criterion in the effluent
- Associated with an impairment which may or may not have a wasteload allocation (WLA) in a total maximum daily load (TMDL)

Table 6. Pollutants of Concern for Outfalls 001 and 003	
Parameter	Basis for Identifying as a Pollutant of Concern
Cadmium, Total Recoverable Copper, Total Recoverable Lead, Total Recoverable Mercury, Total Recoverable pH Total Suspended Solids Zinc, Total Recoverable	Applicable ELGs/TBELs
Aluminum, Dissolved Ammonia, as N Antimony, Total Recoverable Arsenic, Total Recoverable Barium, Total Recoverable Beryllium, Total Recoverable Cadmium, Total Recoverable Chromium, Total Recoverable Copper, Total Recoverable Iron, Total Recoverable Lead, Total Recoverable Magnesium, Total Recoverable Manganese, Total Recoverable Mercury, Total Recoverable Nickel, Total Recoverable Nitrate + Nitrite, as N Oil and Grease pH Selenium, Total Recoverable Silver, Total Recoverable Strontium, Total Recoverable Temperature Thallium, Total Recoverable Total Dissolved Solids Total Inorganic Nitrogen Total Nitrogen, as N Total Phosphorus, as P Total Suspended Solids Uranium, Total Recoverable Zinc, Total Recoverable	Permit Application Review, Present in Discharge
Total Suspended Solids	Associated with Impairment

DEQ may identify WQBELs in the previous permit as POCs; in this case the 2006-issued permit and the vacated 2017-issued permit under MT0030279 were examined. Although these permits were not for the exploration phase of the Project, their respective WQBELs were already included as POCs in Table 6.

3.6 NONDEGRADATION ANALYSIS

The Montana Water Quality Act includes a nondegradation policy at 75-5-303, MCA, that applies to any new or increased activity which results in a change in existing water quality. The regulations at ARM 17.30.701-718 implement the state's nondegradation policy. The level of protection provided to the receiving water(s) is specified in ARM 17.30.705(2) and conforms to three "tiers" of the federal antidegradation policy at 40 CFR 131.12. These three levels of protection are as follows:

- *Protection of Existing Uses (Tier 1)***:** Existing and anticipated (designated) uses of state waters and the level of water quality necessary to protect those uses must be maintained and protected (ARM 17.30.705(2)(a)). Tier I protection applies to *all* state waters, including waters not designated as high quality. The effluent limitations applied to outfalls subject to this level of protection are derived from and comply with the state's numeric and narrative water quality standards and, therefore, ensure the level of water quality necessary to attain and maintain existing and anticipated uses are fully protected. Effluent limitations based on this level of protection need to also need to consider protection of any downstream or downgradient receiving waters, which may require a higher level of protection (ARM 17.30.706(3)(d)).
- *Protection of High Quality Waters (Tier 2)*: Unless authorized by DEQ (authorization to degrade) or exempted from review under 75-5-317 MCA, the quality of high-quality waters must be maintained. This rule applies to any activity that may cause degradation of high quality waters, for any parameter, unless the changes in existing water quality are determined to be nonsignificant under ARM 17.30.670, 17.30.715, or 17.30.716. High quality waters include all state surface waters except those not capable of supporting any one of the designated uses for their classification or that have zero flow or surface expression for more than 270 days during most years. Any water body for which the receiving water pollutant concentration is less than the applicable water quality standard is considered high quality. This determination is made on a parameter-by-parameter basis and may include waters listed on the state's 303(d) list.
- *Protection of Outstanding Resource Waters (Tier 3)*: ARM 17.30.705(2)(c) requires that, for outstanding resource waters, no degradation is allowed and no permanent change in the quality of outstanding resources waters resulting from a new or increased point source discharge is allowed.

A discharge that meets the nondegradation criteria is in compliance with Montana's nondegradation policy. New discharges (or sources) that are able to meet WQBELs based on application of nonsignificance criteria are not required to submit an authorization to degrade state waters.

3.6.1 Determination - New or Increased Sources

The Facility is a new source subject to review under the non-degradation rules. DEQ has made the following determinations with respect to the proposed discharges:

Table 7. New or Increased Source Determination			
Outfall(s)	Receiving Water	Source Determination	Nondegradation - Level of Protection Required
001	Ground Water	New	Tier 2 All Parameters
	Libby Creek	New	Tier 2 All Parameters
003	Libby Creek	New	Tier 2 All Parameters

Tier 2 protection applies to all parameters discharging to Libby Creek, as it is not impaired for any parameters in the immediate assessed segments downstream, besides sediment (see Appendix C discussion). Nonsignificance-based limits must be achieved at the point of discharge before mixing with ground water or surface water. Discussion on nonsignificance criteria is in Appendix C.

Effluent limitations (See Section 4 Final Effluent Limits and Conditions) at Outfalls 004 - 011 are based on ensuring BMPs are protective of the nonsignificance criteria.

3.7 MIXING ZONES

A mixing zone is an area where the effluent mixes with the receiving water and certain numeric water quality standards may be exceeded.

Where a mixing zone is requested by a discharger, DEQ will determine whether the requested mixing zone may or may not be granted for a particular parameter and, if a mixing zone is granted, the type of mixing zone. Unless specifically requested, granted, and identified in the permit or permit fact sheet, a mixing zone is not assumed for any parameter.

The discharge must also comply with the general prohibitions of ARM 17.30.637(1), which require that state waters, including mixing zones, be free from certain substances.

When requested and approved, DEQ may provide mixing zones for chronic aquatic life criteria, human health criteria and the nutrients total nitrogen and total phosphorus. In limited circumstances a mixing zone may also be granted for acute aquatic life standards.

The stream flows used for mixing zone analyses are discussed in Section 3.8.1. Generally, dilution is based on the minimum consecutive seven-day average flow which may be expected to occur on the average once in 10 years (7Q10) for aquatic life and human health criteria. For nutrients, mixing zones are based on dilution with the lowest average 14 consecutive day low flow, occurring from July through October, with an average recurrence frequency of once in five years (14Q5).

In addition to sufficient flow, the receiving water must also have assimilative capacity for the parameter(s) under consideration for a mixing zone, i.e. the receiving water quality upstream of the discharge must be less than the water quality standard or nonsignificance criterion. DEQ uses the 75th percentile of the receiving water data for the purpose of determining assimilative capacity and to develop any necessary water quality-based effluent limitations.

Because the proposed discharge is a new source, the mixing zone analysis must be based on achieving the nonsignificance criteria or the Permittee must receive an authorization to degrade water quality under ARM 17.30.707 - 708.

When determining a water quality standard or nonsignificance criterion that is expressed as an incremental change relative to the background receiving water quality, DEQ uses the 25th percentile of the receiving water data as the background receiving water quality.

3.7.1 Mixing Zone Determination

MMC requested source specific ground water and surface water mixing zones for Outfall 001 (shown in Figure 4). The Permittee has requested the mixing zones:

- extend from the point of discharge to ground water (percolation pond) until reaching Libby Creek, and
- from where the effluent mixed with ground water first enters Libby Creek and extending downstream about 3,400 feet to monitoring station LB-300, located at 48.10671° N latitude, 115.55967° W longitude.

MMC describes the requested mixing zones as small as practicable because the size and area of the groundwater portion of the mixing zone includes the area where effluent will be present in groundwater due to natural groundwater dispersion and mixing until the point that the mixed groundwater and effluent discharge into Libby Creek.

MMC requested a dilution allowance of 100 percent of the ground water flux for the ground water mixing zone. MMC also requested a dilution allowance of 100 percent of Libby Creek's low flow (either the 7Q10 or 14Q5). The permittee's rationale is that Outfall 001 discharges to ground water and becomes fully mixed before it subsequently discharges to, and nearly instantaneously mixes with, surface water. The bank-to-bank concentration differences are less than 10 percent as demonstrated by the mixing study conducted in Libby Creek in 2020 (Hydrometrics, 2021). The rapid and complete mixing of discharge within the sources specific mixing zone led to the conclusion that 100 percent dilution is appropriate.

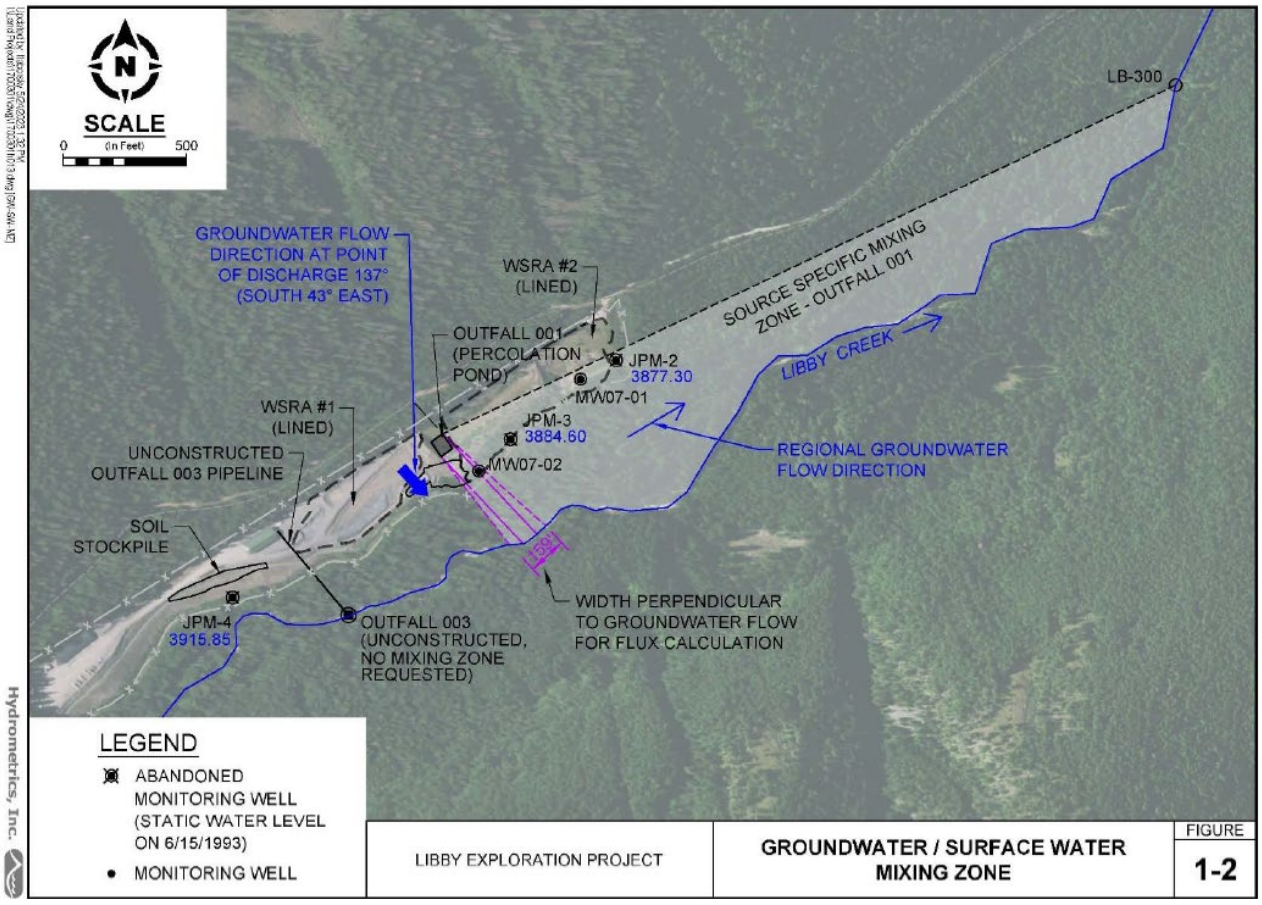
The direction of groundwater flow, shown in Figure H.2, is southeast toward Libby Creek in the immediate vicinity of Outfall 001 and is estimated to be east-northeast in the vicinity of Libby Creek, following the general trend (down valley and parallel) to Libby Creek (Hydrometrics, 1993). Because of the direction change, MMC contends the mixed discharge and groundwater will enter Libby Creek in a diffuse manner, over a distance of 3,400 feet. Generally, ground water flow near streams is parallel to the stream flow direction, or valley bottom, due to higher conductivity materials deposited by the stream being oriented parallel to the axis of the stream or valley and illustrated in Figure H.2 (Hydrometrics, 2021). The most downstream area of the mixed groundwater discharge to the stream occurs in the vicinity of Libby Creek monitoring station LB-300.

Ground water flow is determined as specified in ARM 17.30.517 using Q=KIA. The source specific mixing zone for Outfall 001 is 159 feet wide by 15 feet deep at the downgradient edge, or 2,385 ft^2 (A). Hydraulic conductivity (K) is 558 ft/day, and the gradient (I) is 0.0075. This results in a groundwater flux (Q) of 0.08 mgd (0.12 cubic feet per second, cfs). This volume was estimated based on aquifer parameters determined by aquifer testing from Hydrometrics 1993 report and summarized in Table 8.

Table 8. Estimate of Ground Water Flow Available for Dilution

Parameter	Value	Notes
Groundwater flux (Q, ft^3/day)	9,981	Equal to 0.12 cfs
Hydraulic conductivity (k, ft/day)	558	Average of all aquifer test results in Hydrometrics, 1993; see Appendix C
Gradient (I; ft/ft)	0.0075	Average gradient in adit facility area in Hydrometrics, 1993
Area of aquifer (A, ft^2)	2,385	159 feet wide (see Figure 1-2) by 15 feet of saturated thickness

Figure 4. Mixing Zone Application Map



When assessing a mixing zone request, DEQ must first determine if a mixing zone is feasible (i.e. there is assimilative capacity) by comparing the water quality standards and/or nonsignificance criteria against the 75th percentile concentration of the parameter in the receiving water. DEQ reviewed the ambient data for Libby Creek and compared them with the nonsignificance criteria; summarized in Table 9. A mixing zone will not be granted for total nitrogen, total phosphorus, aluminum, beryllium, copper, lead, mercury, nor selenium as the ambient concentrations exceeded the nonsignificance criterion; therefore, there is no assimilative capacity in Libby Creek, see Appendix B. Additionally, a mixing zone will not be granted for

cadmium, as there is no ground water or surface water ambient data available to determine assimilative capacity.

Table 9. Parameters Mixing Zone Eligibility - Surface Water

Parameters	Eligible	Ambient (75th Percentile) (1)	< or >	Nonsignificance Criteria Outfall 001
Conventional and Nonconventional Pollutants		*(mg/L)*		*(mg/L)*
Ammonia	✓	0.267	<	0.804
Nitrate and Nitrite	✓	0.6	<	1.5
Total Nitrogen (2)		0.233	>	0.11
Total Phosphorus (2)		0.0071	>	0.005
Metals (3)		*(µg/L)*		*(µg/L)*
Aluminum, dissolved		18.53	>	13.05
Antimony	✓	0.61	<	0.84
Arsenic	✓	0.5	=	0.5
Beryllium		0.1	>	0.054
Cadmium		U (4)	-	0.039
Chromium	✓	2.46	<	15
Copper		0.82	>	0.435
Iron	✓	43.03	<	112
Lead		0.09	>	0.075
Mercury		0.0039	>	0.0032
Nickel	✓	1.09	<	2.4
Selenium		0.39	>	0.15
Silver	✓	0.13	<	100 (5)
Thallium	✓	0.08	<	0.3
Zinc	✓	5.17	<	5.55

(1) Ambient data accounts for Outfall 003 discharge.
(2) Seasonal from July 1 - Sept 30.
(3) All metals are total recoverable unless otherwise noted.
(4) Where there is insufficient data for a parameter, the background concentration (C_s) is undetermined and reported as ("U").
(5) Silver's nonsignificance criteria is applied to its acute aquatic life standard, which is not eligible for a mixing zone. The human health standard is eligible for a mixing zone and is compared here.

A ground water mixing zone is appropriate for requested parameters when monitoring data has demonstrated assimilative capacity in the ground water (i.e. the 75th percentile of the ambient condition for that parameter is below the relevant human health standards – including nonsignificance criteria). No parameter can exceed the nonsignificance-based ground water human health standard after the end of the ground water mixing zone. Parameters that weren't eligible for the surface water mixing zone and parameters that didn't have ambient data weren't granted ground water dilution. Parameters that have ground water ambient data demonstrated assimilative capacity (Table 10).

Table 10 – Parameters Mixing Zone Eligibility - Ground Water				
Parameters	Eligible	Ambient (75th percentile) (1)	< or >	Nonsignificance Criterion
Conventional and Nonconventional Pollutants		*(mg/L)*		*(mg/L)*
Ammonia	-	0.052	-	-
Nitrate and Nitrite		U	-	7.5
Total Nitrogen (2)		U	-	-
Total Phosphorus (2)		U	-	-
Metals (3)		*(µg/L)*		*(µg/L)*
Aluminum, dissolved		U	-	-
Antimony		U	-	0.9
Arsenic		U	-	3.0
Beryllium		U	-	1.0
Cadmium		U	-	0.75
Chromium	✓	<1	<	15
Copper	✓	1	<	195
Iron	-	221	-	-
Lead		U	-	2.25
Mercury		U	-	0.2
Nickel		U	-	15
Selenium	✓	<1	<	7.5
Silver		U	-	15
Thallium	✓	<0.2	<	0.3
Zinc		U	-	300

(1) Where there is insufficient data for a parameter, the background concentration (Cs) is undetermined and reported as ("U").
(2) Seasonal from July 1 - Sept 30.
(3) All metals are total recoverable unless otherwise noted.

3.7.2 Water Quality Assessment

Along with the general provisions for designation of a mixing zone in ARM 17.30.505 and the specific requirements in ARM 17.30.507, a mixing zone will not be authorized if it would threaten or impair existing beneficial uses (ARM 17.30.506).

DEQ considered the requirements in ARM 17.30.506 for Outfall 001, as shown in the following table, and determined that the Outfall 001 discharge enters surface water via ground water in an instantaneous manner, which will minimize effects on Libby Creek. The mixing zone cannot be granted if it would threaten or impair existing beneficial uses. Since DEQ determined it does not, the surface water mixing zone for Outfall 001 will be approved for those parameters with assimilative capacity. No mixing zone was requested or granted for Outfall 003.

Water Quality Assessment — ARM 17.30.506 (2)
Biologically Important Area— *(a) Biologically important areas: the presence of fish spawning areas or shallow water nursery areas within the proposed mixing zone or a "shore hugging" effluent plume in an aquatic life segment will support a finding that the mixing zone may be inappropriate during the spawning or nursery periods.* 001: Effluent enters Libby Creek from ground water over 3,700 river-run feet in a diffuse manner resulting in instantaneous and rapid mixing which will preclude shore hugging plume. Bull trout are present in the Libby Creek and are listed as a threatened species.
Drinking Water Intake— *(b) Drinking water or recreational activities: the existence of a drinking water intake, a zone of influence around a drinking water well or a well used for recreational purposes.* 001: Surface water – There are no public drinking water intakes on Libby Creek; no known private intakes. Effluent limits ensure protection and potability of receiving water. 001: Ground water – No drinking water wells are in the designated mixing zone. The nearest drinking water well is located more than 10 miles downstream of the facility. No expected impacts to downstream water supplies or recreational activities since the water quality outside the mixing zones are required to be maintained at nonsignificant levels.
Recreational Area— *(b) Recreational activities or a recreational area within or immediately adjacent to the proposed mixing zone will support a finding that a mixing zone is not appropriate. For purposed of these rules, "recreational" refers to swimming and "recreational area" refers to a public beach or swimming area, including areas adjacent to streams or lakes.* 001: Rapid and complete mixing after dilution in ground water and diffusion over a large area ensures no impairment of use; Recreation use applies to entire surface water. The nearest recreation area, the Libby Creek National Gold Panning area, to the Facility is about 1.4 miles downstream and not within or immediately downstream of the mixing zone.
Attraction to aquatic life— *(c) Attraction of aquatic life to the effluent plume: where currently available data support a conclusion that fish or other aquatic life would be attracted to the effluent plume, resulting in adverse effects such as acute or chronic toxicity, it may be appropriate to adjust a given mixing zone for substances believed to cause the toxic effects.* 001: There are no parameters known to attract aquatic life. Discharges to ground water mitigate any potential elevated temperature, and limit impacts on surface water.
Toxic or Persistent Substances— *(d) Toxicity/persistence of the substance discharged: where a discharge of a parameter is at a concentration that is both toxic and persistent, it may be appropriate to deny a mixing zone. Toxicity and persistence will be given added weight to deny a mixing zone where the parameter is expected to remain biologically available and where a watershed-based solution has not been implemented. For ground water this factor will also be considered in areas where the parameter may remain in the ground water for a period of years after the discharge ceases.*

001: No pollutants are expected to persist in ground water or surface water. The effluent will be completely mixed with ambient ground water prior to reaching Libby Creek.
Passage of aquatic organisms— *(e) Where currently available data indicate that a mixing zone would inhibit migration of fish or other aquatic species, no mixing zone may be allowed for the parameters that inhibit migration. In making this determination, the department will consider whether any parameter in the effluent plume will block migration into tributary segments.* 001: Effluent diffused over a large area after dilution and transport in ground water. Minimal or no migration blockage expected since the permit limits are designed to nonsignificant criteria.
Cumulative effects— *(f) In some cases, the existence of multiple or overlapping mixing zones may threaten or impair the existing uses of the receiving water, so that any additional mixing zone will be limited or denied for the parameter of concern.* 001: There is only one surface water mixing zone requested for this facility and no other discharges or requested mixing zones in the area.
Aquifer Characteristics—*(g) when currently available data indicate that the movement of ground water or pollutants within the subsurface cannot be accurately predicted, such as the movement of ground water through fractures, and also indicate that this unpredictability might result in adverse impacts due to a particular concentration of a parameter in the mixing zone, it may be appropriate to deny the mixing zone for the parameter of concern.* 001: The ground water mixing zone aquifer is composed of predominately gravel (gravel, silt, sand, and cobbles). Flow of ground water through this porous media is predictable and not influenced by fractures (Hydrometrics, 2023).
Ground water discharges to surface water— *(h) In the case of a discharge to ground water which in turn discharges to surface water within a reasonably short time or distance, the mixing zone may extend into the surface water, and the same considerations which apply to setting mixing zones for direct discharges to surface water will apply in determining the allowability and extent of the mixing zone in the surface water.* 001: The requested mixing zone extends through ground water and surface water. Both waters are protected by the most stringent nonsignificance criteria.
Discharges to intermittent and ephemeral streams— *(i) the "natural condition" of these waters during periods of no flow will be the average quality that occurs during periods when flow is present. If a proposed discharge occurs when there is no flow, the quality of the discharge must be at or better than this quality. If variations in seasonal stream flow are known and a mixing zone is limited to use during periods when dilution is available, such a mixing zone may be allowed by the department* 001: The receiving surface water is classified as perennial.

3.8 REASONABLE POTENTIAL ANALYSIS

No wastes may be discharged, either alone or in combination with other wastes, or activities, that will violate or can reasonably be expected to violate any of the standards. Limitations must be established in permits to control all pollutants or pollutant parameters that are or may be discharged at a level that will cause, have the reasonable potential to cause, or contribute to an excursion above any water quality standard. A "reasonable potential analysis" (RPA) is used to determine whether a discharge, alone or in combination with other sources of pollutants already present in the water body could lead to an excursion above a numeric or narrative water quality standard.

When determining the need for WQBELs for individual pollutants regulated by standards expressed in terms of concentration, DEQ primarily uses a mass-balance equation. The mass-balance equation, given below, is a steady-state equation used to determine the concentration of a pollutant after accounting for other sources of pollution in the receiving water and any dilution provided by a mixing zone. It can be rearranged as in Equation 1.A to solve for the resulting stream flow concentration after mixing.

$$Q_rC_r = Q_sC_s + Q_dC_d \qquad \text{(Eq. 1)}$$

$$\mathbf{C_r} = (Q_sC_s + Q_dC_d)/Q_r \qquad \text{(Eq. 1.A)}$$

Where:

Q_s	=	critical stream design flow at point of discharge
C_s	=	critical background pollutant concentration
Q_d	=	critical effluent flow
C_d	=	critical effluent pollutant concentration
Q_r	=	resultant in-stream flow after discharge ($Q_r = Q_s + Q_d$)
$\mathbf{C_r}$	=	**resultant in-stream pollutant concentration (to solve for)**

Where the projected receiving water concentration (C_r), determined from the available effluent data, exceeds a numeric standard or any applicable nondegradation criterion for the parameter of concern, there is reasonable potential and WQBELs must be included in the permit.

In addition to numeric water quality standards, effluent limitations must be included in permits if there is a reasonable potential to exceed narrative standards or TBELs. This includes the general prohibitions ('free from') provision in ARM 17.30.637, including toxicity.

The aggregate toxicity of the whole effluent must also be considered and effluent limitations included where there is a reasonable potential to cause or contribute to toxicity. Appendix D provides additional detail and specific procedures included in the RPA.

3.8.1 Critical Conditions (Variables)

Montana water quality standards state that no wastes may be discharged, either alone or in combination with other wastes, or activities, that will violate or can reasonably be expected to violate any of the standards. In order to establish discharge limitations in permits it is necessary to determine certain characteristics of the receiving water that are critical for the protection of designated uses and existing water quality (new sources).

Critical Effluent Flow (Q_d) – 001 and 003

The critical design flow for the effluent is 0.72 mgd, as that is the maximum design capacity of the water treatment system and there are currently no data representative of the Project's flow.

Critical Effluent Pollutant Concentration (C_d) – 001 and 003

The critical effluent pollutant concentration is based on the maximum estimated concentration multiplied by a factor from Table 3-2, in the EPA's *Technical Support Document for Water Quality Based Toxic Control*, EPA/505/2-90-001, March 1991 (TSD). The critical effluent pollutant concentrations are presented in Appendix A. Where a parameter is subject to a technology-based effluent limitation (TBEL) from the federal ELGs, the TBEL is used as the C_d.

Critical Ambient Flow (Q_s) – 001 Ground Water

This permit will use the available ground water flux of 0.08 mgd (equal to 0.12 cfs) as the critical ambient ground water flow.

Critical Ambient Flow (Q_s) – 001 Surface Water

Where dilution with the receiving water is requested and appropriate, critical stream flow is based on the specific standards of ARM 17.30.620 through 629 which require that discharge permits not cause receiving water concentrations to exceed applicable standards when stream flows equal or exceed the design flows specified in ARM 17.30.635(2). The receiving water design flow for point source discharges is the 7Q10. If there are insufficient data to establish a 7Q10, DEQ must establish an acceptable stream flow. Effluent limitations for controlling nitrogen and phosphorus must be based on the seasonal 14Q5.

MMC's application proposes a 7Q10 of 3.03 cfs that is cited from an analysis conducted in the Joint Final Environmental Impact Statement (Final EIS) by the Kootenai National Forest and DEQ using the regression equations method (Hortnesss, 2006). MMC also proposes a 14Q5 of 3.83 cfs using the drainage-area ratio method (McCarthy et. al., 2016).

DEQ has developed its own methodology for determining receiving water low flow statistics. Using this methodology, DEQ estimated the 7Q10 and 14Q5 using the drainage-area ratio method (McCarthy et. al., 2016) and the USGS Streamstats program (McCarthy, 2016). Appendix G describes the method and rationale used to develop the low flow values for Libby Creek upstream of Outfall 001. This permit will use the estimated low flow statistics of 2.47 cfs 7Q10 and 3.15 cfs 14Q5, using the drainage-area ratio method shown in Table 11.

Table 11. Outfall 001 Low Flow

	Cubic Feet Per Second (cfs)	Million Gallons Per Day (mgd)	Information Source
7Q10	2.47	1.60	McCarthy, et. al. 2016
14Q5	3.15	2.04	McCarthy, et. al. 2016

Critical Ambient Flow (Q_s) – 003 Surface Water

MMC has not requested a mixing zone for Outfall 003. There will be no dilution granted in the receiving water.

Critical Background Receiving Water Pollutant Concentration (C_s) – 001 and 003 Surface Water

The critical pollutant concentration is the average or mean concentration expected in the receiving water during the flow period corresponding to the critical stream flow (7Q10 or 14Q5)

(See *Handbook: Stream Sampling for Waste Load Allocation Applications*, EPA/625/6-86/013, September 1986; *Technical Guidance Manual for Performing Waste Load Allocations, Book VII: Permit Averaging Period*, EPA, September 1984). Since the critical stream flow is an infrequent event, the critical pollutant concentration must be estimated based on existing water quality data that are collected at non-critical conditions.

DEQ uses the interquartile range of the available data for estimating background receiving water pollutant concentrations. The upper bound of the interquartile range (75th percentile) is used when determining assimilative capacity. The lower bound (25th percentile) is used to establish nonsignificance criteria for nondegradation purposes. The sources of background concentrations and associated methodologies are presented in Appendix B.

The magnitude of some numeric standards is dependent on characteristics of the receiving water, such as hardness, pH, and temperature. The hardness used to calculate metal standards in this permit is 25 mg/L based on the 25th percentile of the receiving water data. Temperature and pH are based on the 75th percentile. These values are summarized in Table 12, from ambient data obtained at Libby Creek monitoring site LB-200 between 2017 and 2020. LB-200 is located about 2,000 feet upstream of the facility at 48.09369 º N latitude, 115.58460º W longitude.

Table 12. Basis for Certain Numeric Water Quality Standards

Dependent Parameter(s)	Ambient Parameter	Statistic	Value	Number of Samples
Total Recoverable Metals (Cadmium, Copper, Chromium (III), Lead, Nickel, Silver, and Zinc)	Hardness (as $CaCO_3$)	25th percentile	25 mg/L (1)	16
Total Ammonia	pH	75th percentile	7.21 s.u.	62
	Temperature		8.5 degrees C	64

(1) The 25th percentile hardness is 3.7 mg/L, which is less than 25 mg/L as CaCO3; therefore, 25 mg/L must be used in calculations as described in Circular DEQ-7.

Critical Background Receiving Water Pollutant Concentration (C_s) – 001 Ground Water

The critical background pollutant concentrations in ground water are also calculated using the 75th percentile of the ambient concentration. The development of these data is presented in Appendix B.

3.8.2 RPA Discussion Outfall 001 and Outfall 003

Numeric RPA for Outfalls 001 and 003 is completed and shown in Appendix D. The following discussion describes any narrative RPA DEQ conducted.

Flow

The effluent flow rate may not increase or decrease the mean monthly flow of the surface water (7.57 mgd) by less than 15% or the 7Q10 flow (1.60 mgd) by less than 10% (ARM 17.30.715 (1)(a). The expected maximum discharge of 0.72 mgd leads to an increase in the surface water of 9.5%. Because the increase of 9.5% is less than 15% the mean monthly flow of Libby Creek, there is no RP and the increase in flow is nonsignificant.

Temperature

DEQ did not find RP to exceed the temperature standard because the Outfall 001 discharge is via the percolation pond, and it is assumed the effluent temperature will equilibrate with the ground water temperature before reaching surface water. The permit will require temperature monitoring in the effluent and in Libby Creek upstream and downstream of Outfalls 001 and 003.

Total Suspended Solids

Total suspended solids (TSS) has a TBEL of 20 mg/L average monthly limit. DEQ has determined that this limit and the significant reduction provided by the WTP is protective of the receiving water quality and meets the nonsignificance criteria in ARM 17.30.715(1)(h).

For Outfall 001, DEQ recognizes that the settling in the percolation pond and transportation through ground water will further reduce the TSS. By meeting the TSS TBEL, the discharge won't cause changes that have measurable or significant effect on any existing or anticipated use or cause measurable changes in aquatic life or ecological integrity.

TDS

There are no numeric standards or TBELs for TDS. TDS surface water and ground water limits were set in the BHES Order. Because there are no numeric water quality standards in DEQ-7, numeric RPA was not conducted in this permit. However, numeric RPA was conducted for metals that may contribute to TDS and cause exceedances in water quality standards and nonsignificance criteria. Continued monitoring of the parameters, as well as WET testing, will ensure TDS does not negatively impact receiving waters. TDS monitoring will not be required.

Oil and Grease

ARM 17.30.637(1)(b) requires state waters be free from a visible oil film and substances attributable to municipal discharges that will result in concentrations of oil and grease at or in excess of 10 mg/L. Oil and grease monitoring and observation of presence of sheen will be required in this permit. If visual monitoring indicates the presence of oil and grease, an additional grab sample must be submitted for analysis and discharge must stop if the concentration is found to be greater than the standard of 10 mg/L.

Nutrients

DEQ protects waterbodies from undesirable aquatic life, such as algae, that are stimulated by nutrients like total nitrogen (TN) and total phosphorus (TP). Nitrate and nitrite are toxic components of TN, which is present in MMC's wastewater. There is reasonable potential for nitrate and nitrite, TN, and TP to exceed their respective water quality standards and nonsignificance criterion as demonstrated in Appendix D. Appendix F discusses TN and TP respective to the Libby Exploration Project.

Pollutants of Concern for Monitoring

Total recoverable barium has no effluent data but is known to be present in the discharge. It is listed in Circular DEQ-7 as toxic, with both groundwater and surface water HHS. Effluent and ambient monitoring will be required.

There is no surface water ambient data for magnesium, nor any numeric standard in DEQ-7. Monitoring for magnesium will not be required.

Manganese is present in discharge. Manganese limits were established by the BHES Order in the MT0030279 permit of 50 µg/L for surface water and ground water. However, there are no numeric standards for manganese in DEQ-7. MMC estimates the maximum daily manganese concentration will be 4 µg/L, although the facility had a historical maximum daily concentration of 18 µg/L. DEQ determined wastewater treatment to meet other total recoverable metals and nutrients limits will also prevent discharge from having any measurable impacts on receiving waters. Monitoring in the effluent and receiving waters will be required to ensure the discharge is not impacting receiving water conditions.

No data for strontium and uranium are available, but are described by the Permittee as occurring naturally in most waters. To determine future RP for strontium and uranium, MMC will monitor the effluent and collect ambient data.

Monitoring for metals is required quarterly, unless the metal effluent concentration is close to their nonsignificant criteria. Then weekly monitoring is required.

Whole Effluent Toxicity

The water quality standards prohibit discharges that will create concentrations or combinations of materials which are toxic or harmful to human, animal, plant, or aquatic life. DEQ requires whole effluent toxicity (WET) testing to demonstrate compliance with this narrative standard. Given that the project is exploratory and there will be no process wastewater, the nature of the treatment system and its future upgrades, limits for toxics are set at nonsignificance levels, and the fact the discharge first passes through the ground at Outfall 001, toxicity in the effluent is not expected. However, because the Facility is a major discharger, and to follow Montana and the 1997 U.S. EPA Region 8 policy, the permit will require WET monitoring.

Chronic testing will be used for Outfall 003 because DEQ policy requires chronic testing when the receiving water to discharge flow ratio is less than 10 to 1 and the potential for chronic effects is greater. The dilution ratio of the 7Q10 for Libby Creek (1.60 mgd) to the maximum discharge from the facility (0.72 mgd) is 2.2. Based on this, the appropriate WET monitoring for Outfall 003 is the chronic WET test. Additional acute WET tests are not necessary because the chronic test can be used as an indicator for acute toxicity. For example, significant mortality of the test organisms during the first 24 to 96 hours of the chronic test would result in test failure and would indicate that the effluent is also acutely toxic.

Although the dilution ratio is the same for Outfall 001, acute testing will be used because the outfall first passes through ground water, and is, therefore, granted a ground water and surface water mixing zone. There is no chronic toxicity expected in the effluent.

The WET monitoring and reporting requirements are further discussed in Sections 4 and 5 of this fact sheet.

3.8.3 RPA Discussion Outfall 004 - 011

The narrative water quality standards applicable to B-1 waters requires no increase above naturally occurring concentrations of sediment or suspended sediment and settleable solids which will, or are likely to, create a nuisance or render the waters harmful, detrimental, or injurious to public health, recreation, safety, welfare, livestock, wild animals, birds, fish, or other

wildlife. ARM 17.30.623(2)(d) states the maximum allowable increase above naturally occurring turbidity is five nephelometric turbidity units (NTU).

This permit establishes a requirement for BMPs as BPJ-TBELs for the industrial storm water outfalls (see Section 2 of this Fact Sheet). A discharge of storm water without BMPs in place may exceed water quality standards and/or nondegradation criteria. Additionally, MMC is prohibited from discharging any mine drainage from these storm water outfalls.

BPJ-TBELs require the installation and maintenance of site-specific BMPs that are an effective method for controlling the discharge of storm water and will minimize or eliminate any potential short-term storm water impacts associated with the discharge of storm water. DEQ finds the technology-based BMP requirements in Section 2 will protect the narrative standards for sediment, suspended sediment, turbidity, and settleable solids and for the Table 22 Storm Water Monitoring pollutants.

The permit will require turbidity monitoring of the storm water discharges and the upstream receiving water any time a discharge occurs. Receiving water quality must be measured upstream of all storm water outfalls and as close as possible to the mine operating permit boundary. If the discharge turbidity at any Outfall exceeds the upstream turbidity, the Permittee must re-evaluate the SWPPP and adjust or add to BMPs to improve control of turbidity in the discharge and notify DEQ, in writing, of the amended SWPPP and resulting BMP changes.

In addition to turbidity, DEQ considered total suspended solids (due to impairment on Libby Creek) and the pollutants of concern in storm water discharges for Sector G – Metal Mining in the DEQ *Multi-Sector General Permit for Storm Water Discharges Associated with Industrial Activity*. Storm water discharges from the site are storm water discharges associated with industrial activity as defined at 40 CFR 122.26(b)(14). DEQ finds the technology-based BMP requirements in Section 2 will protect the water quality standards for these parameters.

To ensure storm water discharges cause nonsignificant changes, the permit requires monitoring for the Table 23 pollutants at Outfalls 004 - 011. Up to twice a year during a precipitation event that causes a discharge, the permittee is required to monitor Outfalls 004 - 011. During the same storm events, monitoring must also occur on Libby Creek upstream of all Outfalls. If pollutant concentration exceeds the background concentration for any parameter in Table 23, the Permittee must re-evaluate the SWPPP and adjust or add to BMPs to improve control of the pollutant in the discharge and notify DEQ, in writing, of the amended SWPPP and resulting BMP changes.

3.9 WATER QUALITY-BASED EFFLUENT LIMITS

DEQ must calculate water quality-based effluent limits (WQBELs) must be calculated for both individual pollutants and for the aggregate effect of the discharge as determined by WET when there is a reasonable potential to exceed a numeric or narrative standard. The procedure and basis for these calculations are discussed in Appendix E. WET limits are discussed in Section 3.9.1.

The procedures, model inputs and derived WLAs are described in Appendix E for individual pollutants. These procedures follow EPA's TSD which are based on the requirements of 40 CFR 122.44(d). WQBELs are summarized below.

Table 13. WQBEL - Outfall 001			
Parameter	Units	Proposed Effluent Limits	
		Maximum Daily	Average Monthly
Conventional and Nonconventional Pollutants			
Ammonia	mg/L	4.30	2.14
Nitrate+ Nitrite	mg/L	4.39	4.39
Total Nitrogen	mg/L	-	0.09
	lb/d	-	0.54
Total Phosphorus	mg/L	-	0.0041
	lb/d	-	0.025
Metals (2)			
Aluminum, dissolved	µg/L	21.4	10.7
Antimony	µg/L	1.6	1.6
Arsenic	µg/L	0.50	0.25
Beryllium	µg/L	0.054	0.054
Cadmium	µg/L	0.064	0.032
Copper	µg/L	0.71	0.36
Lead	µg/L	0.133	0.066
Mercury	µg/L	0.0032	0.0016
Selenium	µg/L	1.2	0.61
Silver	µg/L	0.056	0.028
Zinc	µg/L	5.6	2.8
(1) All metals are total recoverable unless otherwise noted.			

Table 14. WQBEL - Outfall 003			
Parameter	Units	Proposed Effluent Limits	
		Maximum Daily	Average Monthly
Conventional and Nonconventional Pollutants			
Ammonia	mg/L	1.32	0.66
Nitrate+ Nitrite	mg/L	1.5	1.5
Total Nitrogen (1)	mg/L	-	0.09
	lb/d	-	0.54
Total Phosphorus (1)	mg/L	-	0.0041
	lb/d	-	0.025
Metals (2)			
Aluminum, dissolved	µg/L	21.4	10.7
Antimony	µg/L	0.84	0.84
Arsenic	µg/L	0.50	0.25
Beryllium	µg/L	0.054	0.054
Cadmium	µg/L	0.064	0.032
Copper	µg/L	0.71	0.36
Iron	µg/L	184	92
Lead	µg/L	0.133	0.066
Mercury	µg/L	0.0032	0.0016
Nickel	µg/L	3.9	2.0

Selenium	µg/L	1.2	0.61
Silver	µg/L	0.056	0.028
Thallium	µg/L	0.036	0.036
Zinc	µg/L	5.6	2.8
(1) Nutrients limits are applicable during the summer months, of July 1st through September 30th. (2) All metals are total recoverable unless otherwise noted.			

3.9.1 Whole Effluent Toxicity Limits

The permit does not contain effluent limitations for WET because the WQBELs set by nondegradation levels for individual parameters should not result in reasonable potential for toxicity. Although at Outfall 001, the discharge will pass through the ground before reaching surface water, the ground water discharge will be in close proximity to Libby Creeks and the Permittee has requested a mixing zone for certain parameters. The permit will require quarterly WET monitoring to assess any potential toxicity in the effluent at Outfall 001 and 003. See Sections 4 and 5 for WET monitoring and reporting requirements.

4. FINAL EFFLUENT LIMITS AND CONDITIONS

The final effluent limitations in the permit are based on the more stringent of the calculated TBELs and WQBELs for each parameter. The more stringent limitations will attain both the technology-based requirements and water quality standards. Stringency of TBEL and WQBEL must be based on a common averaging period and for metals, the total recoverable method of analysis when applicable. The interim and final effluent limits in Tables 15, 16, and 17 will be applied to the discharge at all outfalls beginning on the permit effective date and lasting through the term of the permit.

4.1 STRINGENCY ANALYSIS

The permit contains both TBELs and WQBELs for individual pollutants. This permit's technology-based pollutant restrictions implement the minimum, applicable federal technology-based requirements for Outfall 001 and 003 and additional TBELs for Outfalls 004 – 011. In addition, the permit contains effluent limitations more stringent than the minimum, federal technology-based requirements that are necessary to meet water quality standards for cadmium, copper, lead, mercury, and zinc for Outfall 001 and Outfall 003. To protect against degradation caused by storm water, the permit includes additional BMP and monitoring requirements at Outfalls 004 – 011.

4.2 ANTI-BACKSLIDING ANALYSIS

This is a new permit. Anti-backsliding does not apply.

4.3 EFFLUENT LIMITS

- There shall be no discharge of floating solids or visible foam other than in trace amounts.
- There shall be no discharge which causes visible oil sheen in the receiving stream.
- There shall be no discharge that settles to form objectionable sludge deposits or emulsions beneath the surface of the water or upon adjoining shorelines.
- The discharge of any process wastewater is prohibited.

- All final effluent limits are effective upon issuance of the permit, unless interim limits are given.

Table 15. Final Effluent Limits - Outfall 001

Parameter	Units	Maximum Daily Limit (1)	Average Monthly Limit (1)	Basis
pH	SU	Within the range of 6.0 to 9.0		NSPS - TBEL
TSS	mg/L	30	20	NSPS - TBEL
Oil & Grease	mg/L	10	-	Narrative
Ammonia	mg/L	4.30	2.14	WQBEL
Nitrate+ Nitrite	mg/L	4.39	4.39	WQBEL
Total Nitrogen	mg/L	-	0.09 (2)(3)	WQBEL
	lb/d	-	0.54 (2)	WQBEL
Total Phosphorus	mg/L	-	0.0041 (2)	WQBEL
	lb/d	-	0.025 (2)	WQBEL
Aluminum, Dissolved	µg/L	21.4	10.7	WQBEL
Antimony, Total Recoverable	µg/L	1.6	1.6	WQBEL
Arsenic, Total Recoverable	µg/L	0.50 (3)	0.25 (3)	WQBEL
Beryllium, Total Recoverable	µg/L	0.054 (3)	0.054 (3)	WQBEL
Cadmium, Total Recoverable	µg/L	0.064	0.032	WQBEL
Copper, Total Recoverable	µg/L	0.71 (3)	0.36 (3)	WQBEL
Lead, Total Recoverable	µg/L	0.133 (3)	0.066 (3)	WQBEL
Mercury, Total Recoverable	µg/L	0.0032 (3)	0.0016 (3)	WQBEL
Selenium, Total Recoverable	µg/L	1.2	0.61 (3)	WQBEL
Silver, Total Recoverable	µg/L	0.056 (3)	0.028 (3)	WQBEL
Zinc, Total Recoverable	µg/L	5.6 (3)	2.8 (3)	WQBEL

(1) See Definitions section at the end of the MPDES permit for explanation of terms.
(2) Final nutrient limits will become effective (*4 Years 11 Months from Permit Effective Date*). See Table 16 Interim Limits.
(3) Analysis of effluent with non-detect results less than the RRVs is considered to be in compliance with the limit.

Table 16. Interim Nutrient Effluent Limits - Outfall 001				
Parameter	Units	Average Monthly Limit [1]	Compliance Deadline	Basis
Total Nitrogen	mg/L	0.26 [2]	Effective Immediately	Cap at Current - Outfall 001 Maximum Observed
	lb/d	0.94		
	mg/L	0.21[2]	2 Years from Permit Effective Date	Cap at Current - Outfall 001 Long Term Average Observed
	lb/d	0.73		
Total Phosphorus	mg/L	0.0240	Effective Immediately	Cap at Current - Outfall 001 Maximum Observed
	lb/d	0.080		
	mg/L	0.0078	2 Years from Permit Effective Date	Cap at Current - Outfall 001 Long Term Average Observed
	lb/d	0.026		
(1) See Definitions section at the end of the MPDES permit for explanation of terms. (2) Analysis of effluent with non-detect results less than the RRVs is considered to be in compliance with the limit.				

Table 17. Final Effluent Limits - Outfall 003				
Parameter	Units	Maximum Daily Limit [1]	Average Monthly Limit [1]	Basis
pH	SU	Within the range of 6.0 to 9.0		NSPS - TBEL
TSS	mg/L	30	20	NSPS - TBEL
Oil & Grease	mg/L	10	-	Narrative
Ammonia	mg/L	1.32	0.66	WQBEL
Nitrate+ Nitrite	mg/L	1.5	1.5	WQBEL
Total Nitrogen	mg/L	-	0.09 [2] [3]	WQBEL
	lb/d	-	0.54 [2]	WQBEL
Total Phosphorus	mg/L	-	0.0041 [2]	WQBEL
	lb/d	-	0.025 [2]	WQBEL
Aluminum, Dissolved	µg/L	21.4	10.7	WQBEL
Antimony, Total Recoverable	µg/L	0.84	0.84	WQBEL
Arsenic, Total Recoverable	µg/L	0.5 [3]	0.25 [3]	WQBEL
Beryllium, Total Recoverable	µg/L	0.054 [3]	0.054 [3]	WQBEL
Cadmium, Total Recoverable	µg/L	0.064	0.032	WQBEL
Copper, Total Recoverable	µg/L	0.71 [3]	0.36 [3]	WQBEL
Iron, Total Recoverable	µg/L	184	92	WQBEL
Lead, Total Recoverable	µg/L	0.133 [3]	0.066 [3]	WQBEL
Mercury, Total Recoverable	µg/L	0.0032 [3]	0.0016 [3]	WQBEL
Nickel, Total Recoverable	µg/L	3.9	2.0	WQBEL
Selenium, Total Recoverable	µg/L	1.2	0.61 [3]	WQBEL
Silver, Total Recoverable	µg/L	0.056 [3]	0.028 [3]	WQBEL
Thallium, Total Recoverable	µg/L	0.036 [3]	0.036 [3]	WQBEL
Zinc, Total Recoverable	µg/L	5.6 [3]	2.8 [3]	WQBEL
(1) See Definitions section at the end of the MPDES permit for explanation of terms. (2) Nutrients limits are applicable during the summer months, of July 1st through September 30th. (3) Analysis of effluent with non-detect results less than the RRVs is considered to be in compliance with the limit.				

Final Effluent Limitations Storm Water Outfalls 004 – 011

The discharge of any mine drainage is prohibited at Outfalls 004 – 011.

Outfalls 004 – 011 are subject to the BMP requirements for storm water discharges (See Special Conditions Section 6.7). The Permittee must develop, implement, and maintain a Storm Water Pollution Prevention Plan (SWPPP) identifying all BMPs selected for storm water control and submit the SWPPP for DEQ review.

The Permittee must re-evaluate the SWPPP and adjust or add BMPs when, based on monitoring results, turbidity in the discharge at any Outfall 004 – 011 exceeds the upstream turbidity of the associated receiving water during each discharge event.

Twice a year, during a precipitation event that causes a discharge, the Permittee must conduct additional monitoring for 004 – 011 (Table 23). During the same storm events, monitoring must also occur on Libby Creek upstream of all outfalls.

When any parameter monitored exceeds the upstream parameter concentration, the Permittee must re-evaluate the SWPPP and adjust or add BMPs before the next storm event if possible or within a maximum timeframe of 14 days of receiving the monitoring results. If it is infeasible to adjust or add BMPs within 14 days, the Permittee may request additional time from DEQ. The request must be in writing, outline the reasons why the 14-day timeframe is infeasible, and may not exceed a total of 45 days. The extension request must be approved by DEQ in writing. The Permittee must notify DEQ, in writing, of the amended SWPPP and resulting BMP changes (See Reasonable Potential Analysis Section 3.8, Monitoring and Reporting Requirements Section 5 and Appendix C).

5. MONITORING AND REPORTING REQUIREMENTS

MMC must monitor the following constituents at the frequencies and with the types of measurements indicated; the samples collected and analyzed must be representative of the volume and nature of the discharge. All analytical procedures must comply with the specifications of 40 CFR Part 136, unless otherwise specified by DEQ.

- Monitoring will start with the effective date of the permit and last for the duration of the permit cycle.
- MMC must submit electronic NetDMR results for each month by the 28th of the following month. If no discharge occurs during the entire monitoring period, it must be stated on the electronic Discharge Monitoring Report (NetDMR) that no discharge or overflow occurred.
- Analytical methods must achieve the required reporting value (RRV) specified in the latest version of Department Circular DEQ-7. The RRVs specified in the following monitoring tables are included for convenience and are the RRVs at the time of permit development. RRVs are subject to change during water quality standards triennial review.

5.1 MONITORING LOCATION(S)

The authorization to discharge is limited to the following designated outfalls. The Permittee must monitor the effluent to demonstrate compliance with the effluent limitations and other requirements of this permit at the locations specified in Table 18 below.

Table 18. Outfall Monitoring Locations		
Outfall Designation	Monitoring Location Designation	Monitoring Description
001	001A	At the end of pipe, after all treatment processes, prior to discharge into the percolation pond.
003	003A	At the end of pipe, after all treatment processes, prior to discharge into Libby Creek.
004 - 011	004A – 011A	At the point of discharge from the outfall.

5.2 MONITORING DETERMINATION

Monitoring requirements are given in the following tables specific to each monitoring location as described in Section 5.1.

Outfall 004 – 011

Turbidity monitoring is required at Outfalls 004 – 011 and in Libby Creek upstream of all outfall discharges during any storm event that causes a discharge at any outfall. The upstream monitoring location must be upstream of all outfalls and as near as possible to the mine operating permit boundary. Each instream sampling location must be marked and used during each sampling event.

Semi-annual storm water discharge monitoring is also required at Outfalls 004 – 011, for the parameters associated with copper and silver mines in the 2023 DEQ *General Permit for Storm Water Discharges Associated with Industrial Activity*. Sampling must also occur upstream of all outfalls and as near as possible to the mine operating permit boundary.

For all storm water discharges, sampling data shall be obtained by collecting a grab sample. The grab sample shall be taken during the first thirty minutes of the discharge. If the collection of a grab sample during the first thirty minutes is impracticable, a sample can be taken during the first hour of the discharge and the permittee shall submit, attached to the NetDMR report, a description of why a grab sample during the first thirty minutes was impracticable.

5.3 WHOLE EFFLUENT TOXICITY (WET) TESTING

Whole effluent toxicity has not been assessed for the Facility discharge. No mixing zone for acute or chronic toxicity is authorized by the permit. Quarterly chronic WET testing is required for Outfall 003 and acute WET testing is required for Outfall 001 to characterize the effluent.

Outfall 001

The Permittee must collect samples of treated wastewater and conduct a two-species acute WET test on *Ceriodaphnia dubia* and *Pimephales promelas*. All WET tests must follow the requirements for acute testing based on EPA methods 2002.0 (*Ceriodaphia dubia*) and 2000.0 (*Pimephales promelas*). The permit requires the permittee to report the lethal concentration, 50 percent (LC50) for both species based on a definitive test using a 0.5 dilution series. The Permittee may request a mixing zone that allows for dilution with the upgradient ground water prior to the effluent reaching Libby Creek.

No acute WET effluent limitation is established in the permit. However, the permit does contain an acute WET permit trigger which requires a resample and testing for any test which exhibits

acute toxicity in less than 100 percent effluent. Additional requirements such as toxicity reduction and identification studies are included in the permit.

Outfall 003

The Permittee must collect samples of treated wastewater and conduct a two-species chronic WET test on *Ceriodaphnia dubia* and *Pimephales promelas*. The test must include effluent concentrations of 100, 75, 50, 25, and 12.5 % effluent, plus a control. Moderately hard reconstituted water (see test methods) may be used for effluent dilutions and the control. The test results must show that the inhibition concentration to 25% of the test population (IC_{25}) is greater than the 100% effluent concentration for both species in order to support a conclusion of no toxicity to Libby Creek.

An IC_{25} less than 100% effluent shows the discharge exhibits reasonable potential to cause chronic toxicity and the permit may be reopened to include a WET limit. In the event an IC_{25} greater than 100% effluent cannot be achieved, even after attempts to eliminate the toxicity, the Permittee may request a mixing zone that allows for dilution with the surface water.

Standard WET language addressing any future toxicity as well as potential reduction in monitoring frequency will be included in the permit. All WET tests must follow the requirements for chronic testing based on EPA methods 1002.0 (*Ceriodaphia dubia*) and 1000.0 (*Pimephales promelas*).

5.4 REPORTING REQUIREMENT

All monitoring results for Outfall 001 and Outfall 003, except WET, shall be reported to DEQ monthly. WET testing results shall be reported quarterly. Storm water monitoring shall be reported either quarterly or semi-annually (see below). The Permittee must comply with reporting requirements as specified in ARM 17.30.1342 which are included in the permit.

Table 19. Effluent Monitoring Requirements for Outfall 001 and Outfall 003

Parameter (1)	Units (2)	Sample Type (3)	Minimum Frequency (4)	Reporting Requirement	RRV (5)
Flow Rate	mgd	Instantaneous	Continuous	Daily Maximum Monthly Average	± 10% actual flow
Flow Duration	days	Calculated	Continuous	Number of Days	0.5
Temperature	° C	Instantaneous	1/Week	Daily Maximum Monthly Average	0.1
pH	SU	Instantaneous	1/Week	Daily Minimum Daily Maximum	0.1
Total Suspended Solids (TSS)	mg/L	Composite	1/Week	Daily Maximum Monthly Average	5
Oil & Grease	mg/L	Grab	1/Month	Daily Maximum Monthly Average	1
	Presence	Observation	1/Week (6)	Daily Maximum Monthly Average	-
Ammonia	mg/L	Composite	1/Week	Daily Maximum Monthly Average	0.07
Nitrate+ Nitrite	mg/L	Composite	1/Week	Daily Maximum Monthly Average	0.02

Kjeldahl Nitrogen, as N [7]	mg/L	Composite	1/Week	Daily Maximum Monthly Average	0.225
Total Nitrogen [7][8]	mg/L	Calculated	1/Week	Daily Maximum Monthly Average	0.245
	lb/d	Calculated	1/Week	Daily Maximum Monthly Average	-
Total Phosphorus [7]	mg/L	Composite	1/Week	Daily Maximum Monthly Average	0.003
	lb/d	Calculated	1/Week	Daily Maximum Monthly Average	-
Aluminum, dissolved	µg/L	Composite	1/Week	Daily Maximum Monthly Average	9
Antimony, Total Recoverable	µg/L	Composite	1/Week	Daily Maximum Monthly Average	0.5
Arsenic, Total Recoverable	µg/L	Composite	1/Week	Daily Maximum Monthly Average	1
Barium, Total Recoverable	µg/L	Composite	1/Quarter	Daily Maximum Monthly Average	3
Beryllium, Total Recoverable	µg/L	Composite	1/Week	Daily Maximum Monthly Average	0.8
Cadmium, Total Recoverable	µg/L	Composite	1/Week	Daily Maximum Monthly Average	0.03
Chromium, Total Recoverable	µg/L	Composite	1/Quarter	Daily Maximum Monthly Average	10
Copper, Total Recoverable	µg/L	Composite	1/Week	Daily Maximum Monthly Average	2
Iron, Total Recoverable	µg/L	Composite	1/Month	Daily Maximum Monthly Average	20
Lead, Total Recoverable	µg/L	Composite	1/Week	Daily Maximum Monthly Average	0.3
Manganese, Total Recoverable	µg/L	Composite	1/Quarter	Daily Maximum Monthly Average	-
Mercury, Total Recoverable	µg/L	Composite	1/Week	Daily Maximum Monthly Average	0.005
Nickel, Total Recoverable	µg/L	Composite	1/Quarter	Daily Maximum Monthly Average	2
Selenium, Total Recoverable	µg/L	Composite	1/Week	Daily Maximum Monthly Average	1
Silver, Total Recoverable	µg/L	Composite	1/Week	Daily Maximum Monthly Average	0.2
Strontium, Total Recoverable	µg/L	Composite	1/Quarter	Daily Maximum Monthly Average	20
Thallium, Total Recoverable	µg/L	Composite	1/Week	Daily Maximum Monthly Average	0.2
Uranium, Total Recoverable	µg/L	Composite	1/Quarter	Daily Maximum Monthly Average	0.2
Zinc, Total Recoverable	µg/L	Composite	1/Week	Daily Maximum Monthly Average	8

Whole Effluent Toxicity LC50, Statre 48 Hr Acute, *Ceriodaphnia dubia* (9)	Percent Effluent	Composite	1/Quarter (11)	Pass/Fail	Per Method 2002.0
Whole Effluent Toxicity, LC 50, 96 -Hr Acute – *Pimephales promelas* (9)	Percent Effluent	Composite	1/Quarter (11)	Pass/Fail	Per Method 2000.0
Whole Effluent Toxicity IC_{25}, 3 Brood Chronic, *Ceriodaphnia dubia* (10)	Percent Effluent	Composite	1/Quarter (11)	Pass/Fail	Per Method 1002.0
Whole Effluent Toxicity, IC_{25}, 7-day Chronic – *Pimephales promelas* (10)	Percent Effluent	Composite	1/Quarter (11)	Pass/Fail	Per Method 1000.0

(1) All parameters are effluent unless otherwise noted.
(2) See narrative discussion in Part I.D of the permit for additional details on calculating load and percent removal.
(3) See Definition section at end of permit for explanation of terms.
(4) Monitoring only required during periods of discharge.
(5) Required Reporting Value
(6) A sample must also be taken any time the visual presence of oil is observed.
(7) Monitoring for Nutrients for Outfall 003 required during the summer months, of July 1st through September 30th. Monitoring for Nutrients for Outfall 001 is year-long.
(8) Calculated as the sum of nitrate + nitrite and total Kjeldahl nitrogen concentrations.
(9) Acute WET testing at Outfall 001 only.
(10) Chronic WET testing at Outfall 003 only.
(11) If the results for four consecutive quarters of testing indicate no toxicity, the permittee may request a reduction to semi-annual two-species chronic toxicity testing.

In addition to the monitoring above, the Permittee must complete and submit Parts V and VI of U.S EPA Form 2C within 6 months of commencing the discharge from Outfall 001. Analytical results are required for all parameters listed in Part V-A, B, and C, including all GC/MS fractions in Table 2C-2. Part D must also be completed as required by the Form 2C instructions.

Ambient (upstream and downstream) monitoring for Libby Creek is shown in Tables 20 and 21. The reporting period for this monitoring is monthly or quarterly.

Table 20. Ambient (Upstream) Monitoring Requirements for Libby Creek

Parameter	Units	Sample Type (1)	Minimum Frequency	Reporting Requirement	RRV (2)
Flow Rate	mgd	Instantaneous	1/Month	Value	± 10% actual flow
Temperature	° C	Instantaneous	1/Month	Value	0.1
pH	SU	Instantaneous	1/Month	Value	0.1
Total Suspended Solids (TSS)	mg/L	Grab	1/Quarter	Value	5
Oil & Grease	mg/L	Grab	1/Quarter	Value	1
Ammonia	mg/L	Grab	1/Quarter	Value	0.07
Nitrate+ Nitrite	mg/L	Grab	1/Quarter	Value	0.02
Kjeldahl Nitrogen, as N (3)	mg/L	Grab	1/Quarter	Value	0.225
Total Nitrogen (3) (4)	mg/L	Calculated or Grab	1/Quarter	Value	0.245
Total Phosphorus (3)	mg/L	Grab	1/Quarter	Value	0.003

Total Hardness, as $CaCO_3$	mg/L	Grab	1/Month	Value	2
Aluminum, dissolved	µg/L	Grab	1/Quarter	Value	9
Antimony, Total Recoverable	µg/L	Grab	1/Quarter	Value	0.5
Arsenic, Total Recoverable	µg/L	Grab	1/Quarter	Value	1
Barium, Total Recoverable	µg/L	Grab	1/Quarter	Value	3
Beryllium, Total Recoverable	µg/L	Grab	1/Quarter	Value	0.8
Cadmium, Total Recoverable	µg/L	Grab	1/Quarter	Value	0.03
Chromium, Total Recoverable	µg/L	Grab	1/Quarter	Value	10
Copper, Total Recoverable	µg/L	Grab	1/Quarter	Value	2
Iron, Total Recoverable	µg/L	Grab	1/Quarter	Value	20
Lead, Total Recoverable	µg/L	Grab	1/Quarter	Value	0.3
Manganese, Total Recoverable	µg/L	Grab	1/Quarter	Value	-
Mercury, Total Recoverable	µg/L	Grab	1/Quarter	Value	0.005
Nickel, Total Recoverable	µg/L	Grab	1/Quarter	Value	2
Selenium, Total Recoverable	µg/L	Grab	1/Quarter	Value	1
Silver, Total Recoverable	µg/L	Grab	1/Quarter	Value	0.2
Strontium, Total Recoverable	µg/L	Grab	1/Quarter	Value	20
Thallium, Total Recoverable	µg/L	Grab	1/Quarter	Value	0.2
Uranium, Total Recoverable	µg/L	Grab	1/Quarter	Value	0.2
Zinc, Total Recoverable	µg/L	Grab	1/Quarter	Value	8

(1) See Definition section at end of permit for explanation of terms.
(2) Required Reporting Value. See Circular DEQ-7 for minimum RRVs.
(3) Monitoring for Nutrients required during the summer months, of July 1st through September 30th.
(4) Total nitrogen can be calculated as the sum of nitrate + nitrite and total Kjeldahl nitrogen concentration or using the persulfate method. MMC must report results from the same method for the entire permit duration.

Table 21. Downstream Monitoring Requirements for Libby Creek

Parameter	Units	Sample Type (1)	Minimum Frequency	Reporting Requirement	RRV
Temperature	° C	Instantaneous	1/ Month	Value	0.1
Manganese, Total Recoverable	µg/L	Grab	1/Quarter	Value	-

(1) See Definition section at end of permit for explanation of terms.

The reporting period for storm water monitoring in Table 22 is quarterly, based on calendar quarters. Effluent monitoring must be completed for storm events that result in actual discharge within thirty minutes of initial discharge. Upstream monitoring must occur within the same day of the storm event. If more than one storm event occurs during the monitoring period, report the average of all samples analyzed and the maximum for each parameter. Attach bench sheets for each monitored storm event to the DMR.

Upstream monitoring samples in Tables 22 and 23 must be collected during the same storm event as the corresponding discharge samples.

Table 22. Storm Water Monitoring Requirements for Outfalls 004 – 011 and Upstream in Libby Creek

Parameter	Units	Sample Type (1)	Minimum Frequency	Reporting Requirement	RRV (2)
Flow Rate	mgd	Estimate	1/Discharge	Maximum Daily	-
pH	SU	Instantaneous	1/Discharge	Maximum Daily	0.1
Total Suspended Solids (TSS)	mg/L	Grab	1/Discharge	Maximum Daily	1
Turbidity	NTU	Grab	1/Discharge	Maximum Daily	0.5

(1) See Definition section at end of permit for explanation of terms.
(2) Required Reporting Value. See Circular DEQ-7 for minimum RRVs.

The reporting period for storm water monitoring in Table 23 is semi-annual; January through June and July through December. One storm event must be monitored in each monitoring period. Attach bench sheets for the monitored storm event to the NetDMR.

Table 23. Storm Water Monitoring Requirements for Outfalls 004 - 011 and Upstream in Libby Creek

Parameter	Units	Sample Type (1)	Minimum Frequency	Reporting Requirement	RRV (2)
Flow Rate	mgd	Estimate	Twice/Year	Maximum Daily	-
Nitrate+ Nitrite	mg/L	Grab	Twice/Year	Maximum Daily	0.02
Total Hardness, as $CaCO_3$	mg/L	Grab	Twice/Year	Maximum Daily	2
Chemical Oxygen Demand (COD)	mg/L	Grab	Twice/Year	Maximum Daily	0.07
Antimony, Total Recoverable	µg/L	Grab	Twice/Year	Maximum Daily	0.5
Arsenic, Total Recoverable	µg/L	Grab	Twice/Year	Maximum Daily	1
Beryllium, Total Recoverable	µg/L	Grab	Twice/Year	Maximum Daily	0.8
Cadmium, Total Recoverable	µg/L	Grab	Twice/Year	Maximum Daily	0.03
Copper, Total Recoverable	µg/L	Grab	Twice/Year	Maximum Daily	2
Iron, Total Recoverable	µg/L	Grab	Twice/Year	Maximum Daily	20
Lead, Total Recoverable	µg/L	Grab	Twice/Year	Maximum Daily	0.3
Mercury, Total Recoverable	µg/L	Grab	Twice/Year	Maximum Daily	0.005
Nickel, Total Recoverable	µg/L	Grab	Twice/Year	Maximum Daily	2
Selenium, Total Recoverable	µg/L	Grab	Twice/Year	Maximum Daily	1
Silver, Total Recoverable	µg/L	Grab	Twice/Year	Maximum Daily	0.2
Zinc, Total Recoverable	µg/L	Grab	Twice/Year	Maximum Daily	8

(1) See Definition section at end of permit for explanation of terms.
(2) Required Reporting Value. See Circular DEQ-7 for minimum RRVs.

6. SPECIAL CONDITIONS

Special conditions are included in MPDES permits when necessary to provide for and assure compliance with additional requirements of the Montana Water Quality Act or Federal Clean Water Act and applicable regulations on a case-by-case basis (ARM 17.30.1344). Special conditions include but are not limited to: collection of additional data, studies or supplemental monitoring, preventative measures, best management practices (BMPs), compliance schedules, ground water protection, programmatic conditions such as pretreatment, sewage sludge or sewer overflow, or, toxicity studies. This section provides the rationale for the special conditions included in the permit.

When an annual report is required for multiple special conditions, only one report combing the conditions will be submitted to DEQ. The annual report must be submitted by January 28th of each year. See the Table 24 for a summary of the special conditions compliance schedule.

Table 24. Compliance Schedule

Action	Frequency	Completion Date of Action	Reporting Due Date
Outfall 003 Notification	Single Event	30 days prior to commencement of discharge at Outfall 003	30 days prior to commencement of discharge at Outfall 003
Ground Water Monitoring: Monitoring Well Installation Plan	Single Event	Within six (6) months of the permit effective date	Due on or before the 28th day of the month following completion.
Ground Water Monitoring: Notification of Well Installation	Single Event	Within one (1) year of the permit effective date	Due on or before January 28th of the following year.
Ground Water Monitoring: Sampling and Reporting of New Wells	Quarterly Event	Beginning within fifteen (15) months after the permit effective date	Due on or before the 28th day of the month following the monitoring period
Aquifer Test and Hydrogeologic Investigation: Complete Investigation	Single Event	Prior to the Permittee's next renewal application submittal	With or before the Permittee's next renewal application submittal
Libby Creek Flow Monitoring: Sampling Analysis Plan	Single Event	Within six (6) months after the permit effective date	Within six (6) months of the permit effective date
Libby Creek Flow Monitoring: Visual Flow Assessment	Monthly Event	Beginning within one (1) year after the permit effective date	Due on or before January 28th of the following year
Nutrient Compliance Schedule: Compliance Plan	Yearly Event	Plan complete within two (2) years after the permit effective date. Updates beginning within one (1) year after the permit effective date.	Due on or before January 28th of the following year.
Best Management Practices and Pollution Prevention: SWPPP	Single Event	Within 60 days after the permit effective date	Within 60 days after the permit effective date

6.1 OUTFALLS 001 AND 003

The Permittee must provide written notification to DEQ 30 days prior to commencement of discharge at Outfall 003. Outfall 001 has been discharging under MPDES permit number MT0030279, and no notification is required.

6.2 GROUND WATER MONITORING

The permittee is required to install a minimum of one monitoring well that is representative of the ambient nature of the receiving aquifer. Within six (6) months of the permit effective date, the permittee must create a Monitoring Well Installation Plan. The plan must be approved by DEQ prior to well installation. The installation must take place within one (1) year of the permit effective date.

The monitoring well(s) must be hydraulically upgradient of both Outfall 001 and Outfall 003 and all previous mining discharge locations. Unless otherwise approved by DEQ, the monitoring well(s) is/are to be sufficiently upgradient of all outfalls so that the water quality samples are not influenced by the discharge. The well(s) must be constructed to be representative of the top 20 feet of the shallow water table (first saturated water bearing unit).

Sampling and reporting for the new ambient well(s) will commence fifteen (15) months after the permit effective date. The Facility will conduct quarterly monitoring at the monitoring well(s), at a minimum as required in Table 25. The quarterly monitoring data will be submitted in electronic DMRs, due the 28th of the month following the monitoring period.

Existing downgradient monitoring wells (MW07-01 and MW07-02) will be monitoring locations in this permit. Sampling and reporting for these existing well will commence upon issuance of the permit. The Facility will conduct quarterly monitoring at these two monitoring wells, at a minimum. The quarterly monitoring data will be submitted in electronic DMRs, due the 28th of the month following the monitoring period.

Table 25. Upgradient and Downgradient Ground Water Monitoring Requirements

Parameter	Units	Sample Type (1)	Minimum Frequency	Reporting Requirement	RRV (2)
Static Water Level	ft below ground surface	Grab	1/ Quarter	Daily Maximum	-
pH	SU	Grab	1/ Quarter	Daily Maximum	0.1
Specific Conductance	umhos/cm	Grab	1/ Quarter	Daily Maximum	-
Total Suspended Solids	mg/L	Grab	1/ Quarter	Daily Maximum	5
Oil & Grease	mg/L	Grab	1/ Quarter	Daily Maximum	1
Ammonia	mg/L	Grab	1/ Quarter	Daily Maximum	0.07
Nitrate+ Nitrite	mg/L	Grab	1/ Quarter	Daily Maximum	0.02
Total Nitrogen (3)	mg/L	Grab or Calculated	1/ Quarter	Daily Maximum	0.245
Total Phosphorus (3)	mg/L	Grab	1/ Quarter	Daily Maximum	0.003
Aluminum, dissolved	µg/L	Grab	1/ Quarter	Daily Maximum	9
Antimony, Total Recoverable	µg/L	Grab	1/ Quarter	Daily Maximum	0.5
Arsenic, Total Recoverable	µg/L	Grab	1/ Quarter	Daily Maximum	1
Barium, Total Recoverable	µg/L	Grab	1/ Quarter	Daily Maximum	3
Beryllium, Total Recoverable	µg/L	Grab	1/ Quarter	Daily Maximum	0.8
Cadmium, Total Recoverable	µg/L	Grab	1/ Quarter	Daily Maximum	0.03

Chromium, Total Recoverable	µg/L	Grab	1/ Quarter	Daily Maximum	10
Copper, Total Recoverable	µg/L	Grab	1/ Quarter	Daily Maximum	2
Iron, Total Recoverable	µg/L	Grab	1/ Quarter	Daily Maximum	20
Lead, Total Recoverable	µg/L	Grab	1/ Quarter	Daily Maximum	0.3
Manganese, Total Recoverable	µg/L	Grab	1/ Quarter	Daily Maximum	-
Mercury, Total Recoverable	µg/L	Grab	1/ Quarter	Daily Maximum	0.005
Nickel, Total Recoverable	µg/L	Grab	1/ Quarter	Daily Maximum	2
Selenium, Total Recoverable	µg/L	Grab	1/ Quarter	Daily Maximum	1
Silver, Total Recoverable	µg/L	Grab	1/ Quarter	Daily Maximum	0.2
Strontium, Total Recoverable	µg/L	Grab	1/ Quarter	Daily Maximum	20
Thallium, Total Recoverable	µg/L	Grab	1/ Quarter	Daily Maximum	0.2
Uranium, Total Recoverable	µg/L	Grab	1/ Quarter	Daily Maximum	0.2
Zinc, Total Recoverable	µg/L	Grab	1/ Quarter	Daily Maximum	8

(1) See Definition section at end of permit for explanation of terms.
(2) Required Reporting Value. See Circular DEQ-7 for minimum RRVs.
(3) Total nitrogen can be calculated as the sum of nitrate + nitrite and total Kjeldahl nitrogen concentration or using the persulfate method. MMC must conduct the same method for the entire permit duration.

6.3 AQUIFER TEST AND HYDROGEOLOGIC INVESTIGATION (FATE AND TRANSPORT STUDY)

The current aquifer test for the Libby Creek Exploration Project was prepared for Noranda in 1993. MMC shall complete a new aquifer test that uses new ground water data.

Complete a hydrologic investigation that evaluates fate and transport to know how the pollutants of concern impact surface water. This should be informed by new ground water monitoring data and other up-to-date information. DEQ recommends installing piezometers along Libby Creek and taking repeat measurements during different seasons to get a better understanding of the relationship of ground water and Libby Creek. Submit the study results to DEQ's Water Protection Bureau. Consider mounding, and ground water flow direction (seasonal).

The studies must be submitted with or before the permittee's next renewal application submittal.

6.4 LIBBY CREEK FLOW MONITORING

The permittee will collect in-stream flow data from Libby Creek to determine accurate characterization of perennialization and to gather data for future low flow calculations. MMC must submit a Sampling Analysis Plan for DEQ approval within six (6) months of the permit effective date.

MMC shall complete visual flow assessments between LB-200 and LB-300 at appropriate transects to characterize any dry sections of the stream. The monthly monitoring data will be submitted to DEQ in an annual report by January 28th of each year.

Complete ambient flow monitoring upstream of any discharge or influence of discharge from Outfalls 001 and 003 as described in the Tables 20 and 21.

6.5 TOXICITY IDENTIFICATION EVALUATION/ TOXICITY REDUCTION EVALUATION

The permit has established monitoring requirements for acute and chronic toxicity. The permit also includes a provision to develop and implement a TIE/TRE plan if monitoring indicates effluent toxicity, as defined in the permit.

6.6 NUTRIENT COMPLIANCE SCHEDULE

MMC cannot currently meet the final nonsignificance nutrient limit for TN or TP. DEQ is providing a compliance schedule for ensuring on-going progress towards meeting these limits. See Appendix F for further discussion.

By no later than (*2 years from the effective date of the permit*), MMC will submit a Compliance Plan that evaluates all feasible alternatives for improving water quality for Libby Creek and selects which nutrient reduction option(s) will be pursued. The Compliance Plan will assess:

- Optimization study;
- Additional wastewater treatment;
- Adaptive Management Plant (AMP) (if available);
- Nutrient trading;
- Authorization to Degrade;
- Site-specific standards for Libby Creek;
- Variance and/or,
- Other nutrient reduction options.

MMC will be required to provide a schedule including investigation, design, and implementation. An annual report must be submitted by January 28th of each year, summarizing the progress made the previous year and outlining the steps planned for the year.

If the permittee believes compliance with the total nitrogen limits is not possible at this time, 40 CFR 131.14 and ARM 17.30.662 provide a process for seeking an individual variance from the water quality standard. If the variance is approved under ARM 17.30.662, DEQ will reopen the permit to implement the variance.

6.7 BEST MANAGEMENT PRACTICES AND POLLUTION PREVENTION

DEQ is establishing BMPs for the facility as a special condition in this permit.

6.7.1 BMPs

A number of sites and activities found at metal mining facilities require the implementation of BMPs to prevent the contamination of storm water. Implementation of BMPs are required not only for mineral extraction sites and material piles, but for discharges from roads accessing these sites. BMPs must be selected and implemented that address, at a minimum, the following areas:

- Good Housekeeping Practices;
- Minimizing Exposure;
- Erosion and Sediment Control; and
- Management of Runoff and Run-on.

EPA has identified a wide variety of BMPs to mitigate discharges of contaminants at mines. These controls to prevent erosion and control sedimentation are the most effective if they are installed at the inception of operations and maintained throughout active operations and reclamation of the site. These BMPs are described in EPA's *Industrial Stormwater Fact Sheet, Sector G: Metal Mining (Ore Mining and Dressing) Facilities* (EPA-833-F-06-022, February 2021) and must be referenced and incorporated by the permittee into the facility's storm water pollution prevention plan (SWPPP). The following categories describe the BMPs available for reducing pollutants in storm water discharges at metal mining facilities:

- Discharge Diversions
- Drainage/Storm Water Conveyance Systems
- Runoff Dispersion
- Sediment Control and Collection
- Vegetation Practices
- Capping
- Treatment
- Haul Roads and/or Access Roads Maintenance
- Equipment/Vehicle Fueling and Maintenance
- Overburden, Waste Rock, and Raw Material Piles
- Reclamation Activities

A combination of preventive and treatment BMPs will yield the most effective storm water management for minimizing the discharge of pollutants via storm water runoff. BMPs must also address preventive maintenance records or logbooks, regular facility inspections, spill prevention and response, and employee training. All BMPs require regular maintenance to function as intended. Some management measures have simple maintenance requirements, others are quite involved. BMPs must be regularly inspected to ensure they are operating properly, including during runoff events. As soon as a problem is found, action to resolve it should be initiated immediately.

The categories discussed above are not an exhaustive list of BMPs. The permittee may identify and implement any additional BMPs that minimize and/or eliminate the generation of pollutants and the potential discharge of pollutants into state waters through normal operations and ancillary activities. Additional guidance on BMPs is available in EPA's *Guidance Manual for Developing Best Management Practices* (EPA 833-B-93-004, October 1993) and the Forest Service's *National Best Management Practices for Water Quality Management on National Forest System Lands* (USDA, Forest Service, FS-990a, April 2012).

6.7.2 Storm Water Management

The permittee must develop, maintain, and implement a SWPPP that describes the facility, BMPs, control measures, and monitoring procedures that will ensure compliance with the terms and conditions of the MPDES permit. The BMPs implemented at the facility may be structural or non-structural in nature. The SWPPP must be submitted to DEQ no later than 60 days after the effective date of the permit and must be approved by DEQ prior to construction and implementation. SWPPPs are intended to be maintained such that they are updated and adjusted to reflect current conditions, activities, and any storm water issues identified at the facility. The SWPPP and any updates must be maintained onsite. Periodic evaluation of the SWPPP (once per

year minimum) and the ongoing improvements to the facility, as documented in the SWPPP, will serve to improve the quality of storm water runoff.

The SWPPP must contain a narrative evaluation of the appropriateness of storm water management practices that divert, infiltrate, reuse, or otherwise manage storm water runoff such as to reduce the discharge of pollutants. The SWPPP must document, at minimum, the following:

Storm Water Pollution Prevention Team and SWPPP Administrator

The permittee must identify the staff members that comprise the facility's storm water pollution prevention team, as well as their individual responsibilities. This team must include, and the SWPPP specify, a "SWPPP Administrator." The SWPPP Administrator is the lead responsible person for ensuring the development, implementation, and maintenance of the SWPPP. The SWPPP Administrator also serves as the primary contact person regarding the SWPPP. The facility's storm water pollution prevention team is responsible for assisting the facility manager in developing and revising the facility's SWPPP as well as maintaining control measures and taking corrective actions where required. Each member of the storm water pollution prevention team must have ready access to this permit and the SWPPP.

Site Description

The SWPPP must provide a description of the nature of the industrial activities at the facility. The SWPPP must document the mining and associated activities with the potential to impact the storm water discharges covered by this permit.

Site Map

The SWPPP must include a legible map(s) of sufficient scale which clearly shows current conditions including the following:

- Map scale;
- North arrow;
- The site boundaries for the facility or activity;
- Locations of all receiving waters in the immediate vicinity of the facility;
- The location and extent of structures and impervious surfaces;
- Directions of storm water flow (use arrows);
- Locations of all existing structural storm water control measures;
- Locations of all storm water conveyances including ditches, pipes, and swales;
- Locations of all storm water outfall and monitoring points;
- Locations of storm water inlets and outfalls, with a unique identification code for each outfall;
- Locations of potential pollutant sources;
- Locations where spills or leaks have occurred;
- Locations and descriptions of all non-storm water discharges;
- Locations and sources of run-on to the facility from adjacent property that contains pollutants; and
- Locations of the following activities where such activities are exposed to precipitation:
  - Fueling stations;
  - Vehicle and equipment maintenance and/or cleaning areas;
  - Loading/unloading areas;
  - Locations used for the treatment, storage, or disposal of wastes;

- Liquid storage tanks;
- Processing and storage areas;
- Immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility;
- Major permanent facility structures; transfer areas for substances in bulk; and
- Machinery.

In addition to the above items, the SWPPP must document the locations of the following (as appropriate):

- Mining or milling site boundaries;
- Access and haul roads;
- Outline of the drainage areas of each storm water outfall within the facility with indications of the types of discharges from the drainage areas;
- Location(s) of all permitted discharges covered under an individual MPDES permit;
- Outdoor equipment storage, fueling, and maintenance areas;
- Materials handling areas;
- Outdoor manufacturing, outdoor storage, and material disposal areas;
- Outdoor chemicals and explosives storage areas;
- Overburden, materials, soils, or waste storage areas;
- Location of mine drainage (where water leaves the mine) or other process water;
- Tailings piles and ponds (including proposed ones);
- Heap leach pads;
- off-site points of discharge for mine drainage and process water;
- Surface waters;
- Boundary of tributary areas that are subject to effluent limitations guidelines; and
- Location(s) of reclaimed areas.

Summary of any Potential Pollutant Sources

The permittee must document in the SWPPP areas at the facility where industrial materials or activities are exposed to storm water and from which allowable non-storm water discharges are released. Industrial materials or activities include, but are not limited to: material handling equipment or activities; industrial machinery; raw materials; industrial production and processes; and intermediate products, byproducts, final products, and waste products. Material handling activities include, but are not limited to: the storage, loading and unloading, transportation, disposal, or conveyance of any raw material, intermediate product, final product or waste product. For each area identified, the description must include:

- A list of the industrial activities exposed to storm water (e.g., material storage; equipment fueling, maintenance, and cleaning);
- A list of the pollutant(s) or pollutant constituents (e.g. crankcase oil, zinc, sulfuric acid, and/or cleaning solvents) associated with each identified activity. The pollutant list must include materials that have been handled, treated, stored, or disposed, and that have been exposed to storm water in the three years prior to the date of the SWPPP; and
- Documentation of where potential spills and leaks may occur that might contribute pollutants to storm water discharges, and the corresponding outfall(s) potentially affected by such spills and leaks. The permittee must document spills and leaks of oil or toxic or hazardous

pollutants that actually occurred at exposed areas or that drained to a storm water conveyance, in the three years prior to the date of the SWPPP.

Each facility component or system must be examined for its waste minimization opportunities and its potential for discharge to state waters due to equipment failure, improper operation, and natural phenomena. This examination must include, at a minimum, all normal operations and ancillary activities including (as appropriate) material storage areas, plant site runoff, in-plant transfer, process and material handling areas, loading or unloading operations, spillage or leaks, sludge and waste disposal, or drainage from raw material storage.

Description of Control Measures and BMPs

The permittee must document in the SWPPP the location and types of control measures installed and implemented at the facility and describe how the control measure selection and design considerations were addressed. This documentation must describe how the control measures address both the pollutant sources identified and any storm water run-on that commingles with any discharges covered under this permit.

Documentation of control measures must include design and maintenance criteria for permanent and temporary structural control measures (i.e. plans, detail drawings, cross-sections, specifications, narrative description, etc.) and an appropriate maintenance schedule. The selection, design, installation, and implementation of these control measures must be in accordance with good engineering practices and/or manufacturer's specifications, and the SWPPP should reference all source(s) used in BMP design, installation, implementation, and maintenance specifications (i.e. EPA, Montana Department of Transportation, or other BMP manuals). Note that the permittee may deviate from such manufacturer's specifications as long as the permittee provides justification for any deviation and includes documentation of the rationale in the part of the SWPPP that describes control measures.

In addition, any other requirements for other programs or permitting activities which would meet the SWPPP requirements may be incorporated. If the permittee finds that any control measures are not achieving their intended effect of minimizing pollutant discharges, then the permittee must modify these control measures as expeditiously as practicable.

Control measures that must be documented in the SWPPP and implemented by the permittee must, at a minimum, include:

- Good Housekeeping Procedures. Keep clean all exposed areas that are potential sources of pollutants using such measures as sweeping at regular intervals, keeping materials orderly and labeled, and storing materials in appropriate containers.
- Maintenance. Regularly inspect, test, maintain, and repair all industrial equipment and systems to avoid situations that may result in leaks, spills, and other releases of pollutants in storm water discharged to receiving waters. All control measures that are used to achieve the effluent limits required by this permit must be maintained in effective operating condition. Non-structural control measures must also be diligently maintained (e.g., spill response supplies available and personnel appropriately trained). If control measures need to be replaced or repaired, then the permittee must make the necessary repairs or modifications before the next storm event.
- Spill Prevention and Response Procedures. Minimize the potential for leaks, spills and other releases that may be exposed to storm water and develop plans for effective response to such

spills if or when they occur. At a minimum, the SWPPP must document and the permittee must implement the following:

- Procedures for plainly labeling containers (e.g., "Used Oil," "Spent Solvents," "Fertilizers and Pesticides," etc.) that may be susceptible to spillage or leakage to encourage proper handling and facilitate rapid response if spills or leaks occur;
- Preventative measures such as barriers between material storage and traffic areas, secondary containment provisions, and procedures for material storage and handling;
- Procedures for expeditiously stopping, containing, and cleaning up leaks, spills, and other releases. Employees who may cause, detect, or respond to a spill or leak must be trained in these procedures and have necessary spill response equipment available; and
- Procedures for notification of appropriate facility personnel, emergency response agencies, and regulatory agencies.

- Erosion and Sediment Controls. The permittee must stabilize exposed areas and contain runoff using structural and/or non-structural control measures to minimize onsite erosion and sedimentation, and the resulting discharge of pollutants. Among other actions, flow velocity dissipation devices must be placed at discharge locations and within outfall channels where necessary to reduce erosion and/or settle out pollutants. In selecting, designing, installing, and implementing appropriate control measures, the permittee is encouraged to consult with available guidance resources relating to BMPs for erosion and sedimentation, including industrial sector-specific information.
- Management of Runoff. The permittee must divert, infiltrate, reuse, contain, or otherwise reduce storm water runoff, to minimize pollutants in any discharges. In selecting, designing, installing, and implementing appropriate control measures, the permittee is encouraged to consult with available guidance resources relating to storm water BMPs for runoff management, including industrial sector-specific information.

Additionally, the permittee must address and implement the following in their SWPPP:

- The number and quantity of pollutants and the toxicity of effluent generated, discharged, or potentially discharged at the facility must be minimized by the permittee to the extent feasible by managing each influent waste stream in the most appropriate manner;
- Storm water control measures must be designed, operated, and maintained to maximize the chemical and/or physical processes that reduce or eliminate the discharge of any pollutants to state surface waters;
- Sediment ponds must be clearly staked to indicate sediment accumulation;
- The permittee must ensure proper operation and maintenance of any control and/or discharge structures;
- To the maximum extent possible, 100-foot setbacks or 35-foot vegetated buffer strips between roads and/or other impervious surfaces and any downgradient surface waters or other conduits to surface waters will be established and/or maintained;
- Where experience indicates a reasonable potential for equipment failure (e.g., a tank overflow or leakage), natural condition (e.g., precipitation), or other circumstances that may result in significant amounts of pollutants reaching state waters, the SWPPP should include a prediction of the direction, rate of flow and total quantity of pollutants that could be discharged from the facility as a result of each condition or circumstance;
- The permittee must take into account and control sediment from snow plowed or sediment removed from the mine, ancillary facilities, and roads;

- The permittee must avoid the sidecasting of soils or snow. The sidecasting of road material is prohibited on road segments within or abutting Riparian Habitat Conservation Areas in priority watersheds; and
- Discharges to frozen or snow-covered ground must be minimized or eliminated.

Any Schedules and/or Standard Operating Procedures

The SWPPP must document any control measure inspections, routine maintenance, and/or procedures that impact the potential generation and/or discharge of pollutants by the facility. The permittee must conduct a facility inspection once every 30 days and within 24 hours of a significant precipitation event of 0.5 inches or greater. At a minimum, the documentation of each routine facility inspection must include the following:

- The inspection date and time;
- The name(s) and signature(s) of the inspector(s);
- Weather information;
- A description of any discharges occurring at the time of the inspection;
- Any previously unidentified discharges of pollutants from the site;
- Any observations of obvious indicators of storm water pollution;
- Any control measures needing maintenance or repairs;
- Any failed control measures that need replacement;
- Any incidents of noncompliance observed; and
- Any additional control measures needed to comply with the permit requirements.

An inspection for a significant storm event may also be used and credited towards one of the monthly inspections.

Corrective Actions

If any of the following conditions occur, the permittee must review and revise the selection, design, installation, implementation, and maintenance of the facility's control measures to ensure that the condition is eliminated and will not be repeated in the future:

- An unauthorized release or discharge (e.g., spill, leak, or discharge of non-storm water not authorized by this or another MPDES permit) occurs at the facility;
- The permittee become aware, or DEQ determines, that the control measures are not stringent enough for the discharge to meet applicable water quality standards;
- An inspection or evaluation of the facility by a DEQ representative determines that modifications to the control measures are necessary to meet the non-numeric effluent limits in this permit; or
- An inspection finds that the control measures are not being properly operated and maintained.

Corrective Action Deadlines

If an inspection or other observation identifies storm water pollution or control measures needing repair or replacement, the permittee must document these conditions within 24 hours of making such discovery. Subsequently, within 14 days of such discovery, the permittee must document any corrective actions taken or needed, any further investigation of the deficiency, or the basis for determining that no further action is needed. If the permittee determines that any changes are necessary following the review, any modifications to the control measures must be made before

the next storm event if possible, or as soon as practicable following that storm event. The permittee must document the following:

- A summary of any corrective actions taken;
- Notice of whether any SWPPP modifications are required;
- The date any corrective action was initiated; and
- The date that the corrective action was completed.

These time intervals are not grace periods but are schedules considered reasonable for documenting any findings and for making necessary repairs and improvements. They are included in this permit to ensure that the conditions prompting the need for these repairs and improvements are not allowed to persist indefinitely.

Effect of Corrective Action

If the event triggering the corrective action review is a permit violation then correcting it does not remove the original violation. Additionally, failing to take corrective action in accordance with this section is an additional permit violation. DEQ will consider the appropriateness and promptness of corrective action in determining potential enforcement responses to permit violations.

Employee Training

The SWPPP Administrator must ensure all employees receive in-house training, including all members of the pollution prevention team who work in areas where industrial materials or activities are exposed to storm water, or who are responsible for implementing activities necessary to meet the conditions of this permit (e.g., inspectors, maintenance personnel). Training must cover both the specific control measures used to achieve the effluent limits in this permit and the monitoring, inspection, planning, reporting, and documentation requirements in other parts of this permit. Training must be conducted at least annually at a minimum and the date of the training and employees in attendance must be documented.

SWPPP Modifications and Updates

The SWPPP must be maintained and kept up-to-date to reflect current site conditions. If construction or a change in the design, operation, or maintenance at the facility either changes the nature of pollutants discharged in storm water from the facility, or increases the quantity of pollutants discharged, then the permittee must review the selection, design, installation, implementation, and maintenance of the facility's control measures to determine if any modifications to the SWPPP are necessary. Any SWPPP modification or update must be signed by a responsible corporate official as specified in ARM 17.30.1323.

The permittee is required to operate, build, and maintain the facility and storm water practices as identified in their SWPPP. The permittee may adjust or change the control measures used to improve storm water retention and treatment. This flexibility allows the permittee to adjust practices as necessary to ensure continued compliance with the permit. The SWPPP must be kept up-to-date to document any changes in BMPs, control measures, or corrective actions. Any changes to the SWPPP must be submitted to DEQ within 30 days for review. The approved SWPPP must be publicly available on the company's website.

7. STANDARD CONDITIONS

Standard conditions must be included in all MPDES permits and the Permittee must comply with all standard conditions at all times. ARM 17.30.1342. These requirements are expressly incorporated into the permit. In addition to these requirements, ARM 17.30.1343 and 40 CFR 122.42 establishes additional conditions applicable to specific categories of MPDES permits including notification requirements for municipal and non-municipal dischargers.

The additional requirements of ARM 17.30.1343(1)(a) are included in the permit. The requirement establishes additional notification requirements for toxic pollutants that exceed a specified level, exceed the level given in the Facility's permit application or are not regulated in the permit.

8. PUBLIC PARTICIPATION

In accordance with ARM 17.30.1372, DEQ issued Public Notice No. MT-24-11 dated November 4, 2024. The public notice states that a tentative decision has been made to issue an MPDES permit for Montanore Minerals Corporation, and that a draft permit, fact sheet and draft environment assessment (EA) have been prepared. Public comments on the draft MPDES permit and EA related to the permit are invited any time prior to the close of business December 6, 2024. Comments may be directed to:

DEQ Water Quality Division
Water Protection Bureau
PO Box 200901
Helena, MT 59620

or DEQWPBPublicNotices@mt.gov

All comments received or postmarked prior to the close of the public comment period will be considered in the formulation of the final permit. DEQ will respond to all substantive comments and issue a final decision as soon as possible after the close of the public comment period.

All persons, including Permittees, who believe any condition of a draft permit is inappropriate or that DEQ's tentative decision to deny an application, terminate a permit, or prepare a draft permit is inappropriate, shall raise all reasonably ascertainable issues and submit all reasonably available arguments supporting their position by the close of the public comment period (including any public hearing) under ARM 17.30.1372.

8.1 NOTIFICATION OF INTERESTED PARTIES

Copies of the public notice were mailed to the Discharger, state and federal agencies and interested persons who have expressed an interest in being notified of permit actions. A copy of the distribution list is available in the administrative record for this permit. In addition to mailing the public notice, a copy of the notice and applicable draft permit and fact sheet were posted on the DEQ website for 30 days.

Any person interested in being placed on the mailing list for information regarding this MPDES Permit should contact DEQ, reference this Facility, and provide a name, address, and phone number.

8.2 PUBLIC HEARING

During the public comment period provided by the notice, DEQ will accept requests for a public hearing. A request for a public hearing must be in writing and must state the nature of the issue proposed to be raised in the hearing.

8.3 PERMIT APPEAL

After the close of the public comment period DEQ will issue a final permit decision. A final permit decision means a final decision to issue, deny, modify, revoke and reissue, or terminate a permit. A permit decision is effective 30 days after the date of issuance unless a later date is specified in the decision, a stay is granted pursuant to ARM 17.30.1379, or the Permittee files an appeal pursuant to 75-5-403, MCA.

The Permittee may file an appeal within 30 days of DEQ's action to the following address:

Secretary, Board of Environmental Review
Department of Environmental Quality
1520 East Sixth Avenue
PO Box 200901
Helena, Montana 59620-0901

10. INFORMATION SOURCES

Administrative Rules of Montana Title 17 Chapter 30 – Water Quality

- Subchapter 2 – Water Quality Permit and Application Fees
- Subchapter 5 – Mixing Zones in Surface and Ground Water
- Subchapter 6 – Montana Surface Water Quality Standards and Procedures
- Subchapter 7 – Nondegradation of Water Quality
- Subchapter 12 – Montana Pollutant Discharge Elimination (MPDES) Standards
- Subchapter 13 – Montana Pollutant Discharge Elimination (MPDES) Permits

CWAIC: Clean Water Act Information Center, Department of Environmental Quality. Accessed April 2024.

Federal Water Pollution Control Act (Clean Water Act), 33 U.S.C. §§ 1251-1387, October 18, 1972, as amended 1973-1983, 1987, 1988, 1990-1992, 1994, 1995 and 1996.

Hydrometrics, Inc. August 1993. Aquifer Testing Results and Recommendations for Groundwater Interception Wells at the Montanore Project, Libby, Montana.

Hydrometrics, Inc. March 2021. Revised May 2023. Memorandum: Libby Creek Mixing Investigation.

McCarthy, P.M., 2016, Streamflow characteristics based on data through water year 2009 for selected streamflow-gaging stations in or near Montana: U.S. Geological Survey Scientific Investigations Report 2015–5019–E, 10 p.

McCarthy, P.M., Sando, Roy, Sando, S.K., and Dutton, D.M., 2016, Methods for estimating streamflow characteristics at ungaged sites in western Montana based on data through water year 2009: U.S. Geological Survey Scientific Investigations Report 2015–5019–G, 19 p.,

Montana Code Annotated (MCA), Title 75-5-101, et seq., "Montana Water Quality Act."

Montana DEQ. 2020. Integrated 303(d) Water Quality Report for Montana (2020).

Montana DEQ. May 2014. Kootenai – Fisher Project Area Metals, Nutrients, Sediment, and Temperature TMDLs and Water Quality Improvement Plan.

Montana DEQ. Montana Pollutant Discharge Elimination System (MPDES) Permit Number MT0030279 Administrative Record.

Montana DEQ. Montana Pollutant Discharge Elimination System (MPDES) Permit Number MT0032158.

- Administrative Record
- Application Form 1, Form 2D, and Form 2F 2023 and Supplemental Information
- Hydrometrics, Inc. June 2023. Application for Mixing Zone in Groundwater and Surface Water, Montanore Minerals Corporation, Libby Exploration Project, MPDES Permit # MT0032158.

Montanore Minerals Corporation. Plan of Operations, Libby Exploration Project, Lincoln County, Montana. August 2022.

U.S. Department of Agriculture, Forest Service, Kootenai National Forest and Montana Department of Environmental Quality. 2009. Draft Environmental Impact Statement for the Montanore Project. Libby, MT: USDA Forest Service, Kootenai National Forest.

US Code of Federal Regulations, 40 CFR Parts 122-125, 130-133, & 136.

US EPA. EPA Region VIII Mixing Zones and Dilution Policy. December 1994 (Updated September 1995)

US EPA. Industrial Stormwater Fact Sheet, Sector G: Metal Mining (Ore Mining and Dressing) Facilities, EPA-833-F-06-022, February 2021.

US EPA. NPDES Permit Writers' Manual, EPA 833-B-96-003, September 2010.

US EPA. Technical Support Document for Water Quality-Based Toxics Control, EPA/505/2-30-001, March 1991.

USGS, Montana StreamStats, SIR 2015-2019, 2024.

Date: October 2024

APPENDIX A — EFFLUENT CHARACTERISTICS

The Permittee must provide quantitative data on certain pollutants in the effluent (ARM 17.30.1322). This information is used to determine if WQBELs, in addition to TBELs, are necessary. Effluent characterization is based on the daily discharge data for the effluent which is summarized as monthly average and daily maximum values (ARM 17.30.1304). For new facilities, pollutant concentrations must be estimated.

MMC has estimated data based on existing outfall data from MT0030279, the Project predicted quality, similar mines in Montana, and similar treatment systems. Because MMC has been discharging under MPDES permit number MT0030279, actual data was submitted to DEQ and summarized in Table A.1 in comparison to estimated data. The period of record for this data is June 2017 to October 2020 (4.5 years prior to the first application submitted to DEQ, ARM 17.30.1322(7)(g)(x)).

Nutrients were estimated considering upgrades in wastewater treatment processes. Phosphorus concentrations may remain similar to existing outfall data or may increase if phosphorus reagents are needed to enhance nitrogen removal. Therefore, MMC estimated phosphorus concentrations will triple during the Exploration Project. The estimated nitrogen concentrations are based on the future moving bed bioreactor (MBBR) biological treatment system that is to be constructed during the Project.

CRITICAL EFFLUENT POLLUTANT CONCENTRATION (C_d)

When quantitatively determining reasonable potential and assessing the need for a WQBEL, DEQ calculates a reasonable measure of the critical (maximum) effluent pollutant concentration (C_d) accounting for the variability of the effluent as determined by the coefficient of variation (CV) and sample size. This procedure accounts for the variability of the effluent as required in 40 CFR 122.44(d). Due to the non-normal distribution of most effluents and low sample frequency (small sample size), DEQ estimates C_d based on the 95th percentile of the expected effluent concentration following procedure described in Chapter 3 of EPA's *Technical Support Document for Water Quality Based Toxic Control*, EPA/505/2-90-001, March 1991 (TSD). The critical effluent pollutant concentration is based on the estimated 95th percentile value and is calculated as follows:

$$C_d = C_{d(max)} * RPMF$$

Where:

$C_{d(max)}$ = Maximum Daily value, see Tables A.1

RPMF = Reasonable Potential Multiplying Factor, Table 3-2, TSD

Estimating the CV requires that the standard deviation be calculated using the actual measured daily discharge values. Where daily discharge values are not available, as is the case with a new facility where effluent quality is estimated, DEQ assumes a CV of 0.6 and a sample size of 1.

DEQ primarily used the effluent data provided in the permit application as estimates for effluent characterization. These estimates are based on the quality of the ground water (to be pumped from the mine) and the type of treatment system proposed. However, for zinc, DEQ used the applicant's actual data, calculated CV, and number of samples to calculate the RPMF. Zinc's actual maximum daily was higher than estimated by MMC.

Because the permit must require the more stringent of limits based on either TBELs or the water quality standards, the TBELs applicable to Outfall 001 and Outfall 003 are used to estimate the critical effluent concentration for pH and total metals. The projected effluent concentration for mercury was greater than the TBEL, and so the RP and WQBEL analyses used the projected effluent concentration to determine the critical effluent concentration (C_d). Then the WQBEL and TBEL were compared to determine which is most stringent.

CRITICAL EFFLUENT FLOW (Q_d)

Effluent flow is a measure of the average daily flow expected to occur over the next 5-year permit cycle or effective life of the regulated Facility or activity. The critical flow is based on the reported average daily flow or the maximum 30-day (monthly) average flow reported on the permit application. Effluent flow is expressed as gallons per day (gpd) or million gallons per day (mgd). For this new discharge, the projected maximum flow is the critical effluent flow. Future permit renewals, after the facility has actual discharge data, may use the reported maximum 30-day average and daily maximums.

Table A.1. Effluent Characteristics for Outfalls 001 and 003									
Parameter	Units	Estimated for Exploration		Actual Outfall 001 [1]		Coefficient of Variation (CV)	Multiplying Factor 95% Confidence Interval (RPMF)	Critical Effluent Concentration (C_d)	TBEL?
		Maximum Daily	Avg.	Maximum Daily	Avg.				
Conventional and Nonconventional Pollutants									
Flow	mgd	0.72	0.38	-	-	-	-	-	
Temperature, Winter	° C	16.7	14.2	14.4	14.2	-	-	-	
Temperature, Summer	° C	16.8	14.5	16.7	14.2	-	-	-	
Total Suspended Solids	mg/L	<2.5	<0.75	2.2	0.6	-	-	-	Y
Total Dissolved Solids	mg/L	264	264	215	113	-	-	-	
pH	SU	6.5-8.5		7.3-8.4		-	-	-	Y
Oil & Grease	mg/L	5.4	3.4	<5.1	1.4	-	-	-	
Ammonia	mg/L	0.59	0.59	0.21	0.019	0.6	6.2	3.66	
Nitrate+ Nitrite	mg/L	3	3	0.11	0.022	0.6	6.2	18.6	
Total Kjeldahl Nitrogen	mg/L	0.59	0.59	0.21	0.069	-	-	-	
Total Inorganic Nitrogen	mg/L	3.59 [2]	3.59 [2]	0.24	0.038	-	-	-	
Total Nitrogen [4]	mg/L	3.46 [3]	3.46 [3]	0.25	0.2	0.6	6.2	21.5	
Total Phosphorus [4]	mg/L	0.072	0.072	0.024	0.0061	0.6	6.2	0.446	
Metals [5]									
Aluminum, dissolved	µg/L	39	39	24	8.4	0.6	6.2	242	
Antimony	µg/L	3.9	3.9	<0.5	0.15	0.6	6.2	24.2	
Arsenic	µg/L	3.5	3.5	3.5	2.8	0.6	6.2	21.7	
Barium	µg/L	U [6]	U [6]	U [6]	U [6]	0.6	6.2	U	
Beryllium	µg/L	<0.2	<0.2	<0.2	0.061	0.6	6.2	1.24	
Cadmium	µg/L	0.051	0.051	0.03	0.028	0.6	6.2	0.32	Y
Chromium	µg/L	<1	<1	1.1	0.2	0.6	6.2	6.2	
Copper	µg/L	2.5	2.5	1.6	0.39	0.6	6.2	15.5	Y
Iron	µg/L	<50	<50	50	14.6	0.6	6.2	310	
Lead	µg/L	0.62	0.62	0.12	0.04	0.6	6.2	3.84	Y
Magnesium	µg/L	5100	5100	U [6]	U [6]	-	-	-	
Manganese	µg/L	4	4	18	1.1	-	-	-	
Mercury	µg/L	<0.2	<0.2	0.01	0.004	0.6	6.2	1.24	Y
Nickel	µg/L	0.61	<0.5	0.61	0.2	0.6	6.2	3.78	
Selenium	µg/L	<0.5	<0.5	<0.5	0.16	0.6	6.2	3.1	
Silver	µg/L	<0.5	<0.5	<0.17	0.14	0.6	6.2	3.1	

Thallium	µg/L	<0.1	<0.1	<0.1	0.035	0.6	6.2	0.62	
Zinc	µg/L	8	8	72 (7)	12	1.09 (8)	1.17	84	Y

(1) Data from actual Outfall 001 data from June 2017 to October 2020 submitted in the Permit Application Appendix B1 Spreadsheet.
(2) Estimated as sum of nitrate + nitrite and ammonia.
(3) Estimated as sum of total Kjeldahl nitrogen and nitrate + nitrite.
(4) Seasonal data from July 1 to September 30.
(5) All metals are total recoverable unless otherwise noted.
(6) Undetermined: total recoverable data is unavailable.
(7) Using actual Outfall 001 maximum daily to calculate the critical effluent concentration (C_d).
(8) CV calculated from 41 samples.

Table A.2. Estimated Storm Water Quality Outfalls 004 - 011					
		Data from Lined Storm Water Pond [1]			
Parameter	Units	Maximum	Average	Number of Samples	Number Below Detect
Conventional and Nonconventional Pollutants					
Temperature	deg C	24.0	11.7	52	-
Total Suspended Solids	mg/L	174.0	25.9	60	2
pH	SU	9.27	7.54	50	-
Oil & Grease	mg/L	10.0	3.3	59	55
Ammonia	mg/L	0.14	0.14	1	0
Nitrite and Nitrate	mg/L	0.46	0.46	1	0
Total Kjeldahl Nitrogen	mg/L	1.07	1.07	2	0
Phosphorus	mg/L	0.01	0.01	2	2
Specific Conductance	uMhos/cm	20.10	13.72	5	-
Metals [2]					
Antimony	µg/L	3.0	3.0	4	4
Arsenic	µg/L	3.0	2.0	4	4
Barium	µg/L	11.0	8.0	4	2
Beryllium	µg/L	1.0	1.0	4	4
Cadmium	µg/L	0.1	0.1	4	4
Chromium	µg/L	4.0	2.5	4	4
Copper	µg/L	2.0	1.3	4	2
Iron	µg/L	152	57	4	1
Lead	µg/L	2.8	2.1	4	0
Magnesium	µg/L	1000	1000	4	4
Manganese	µg/L	20	17	4	2
Mercury	µg/L	0.1	0.1	4	4
Nickel	µg/L	10	10	4	4
Selenium	µg/L	1.0	1.0	4	4
Silver	µg/L	0.5	0.4	4	4
Thallium	µg/L	0.5	0.4	4	4
Zinc	µg/L	18.0	13.5	4	0

(1) Data collected from November 2006 to October 2014.
(2) All metals are total recoverable.

APPENDIX B—RECEIVING WATER CHARACTERISTICS

Where receiving water quality data is available it may be used in the development of water quality-based effluent limitations (WQBEL) when a dilution allowance or mixing zone is approved. In the absence of receiving water quality and quantity, effluent limits are based on meeting the applicable standard at the end-of-pipe, that is, no assimilative capacity is assumed. For new sources subject to nondegradation review, existing water quality, as defined in ARM 17.30.702, is necessary for all pollutants present in the discharge. This Appendix describes the process used to determine the receiving water concentration or value for purposes of developing WQBELs.

Receiving water quality should be based on samples collected at design conditions, this is, the critical stream flow (Q_s), as described in Section 3.8. Because Q_s is an infrequent event and data is not typically available, the background concentration (C_s) must be estimated based on water quality data that is collected outside of this flow condition. To account for the uncertainties in estimating background data, DEQ uses the upper and lower quartiles of the sample data. The upper quartile is defined as the 75th percentile of the measured or observed data and the lower quartile is the 25th percentile of the same data set. To account for the variability of the receiving water, data or measurements should be available and representative of the range of hydrologic conditions in the receiving water. Data used in this analysis is typically collected upstream of the point of discharge for flowing water bodies or outside of the influence of the discharge for non-flowing water bodies.

For most constituents, the critical background concentration is defined to be the upper quartile of the sample data for purposes of a reasonable potential analysis and determining assimilative capacity in calculating wasteload allocations (WLA) (Appendix E). In some cases, including application of the nondegradation criteria in ARM 17.30.715(1), changes in existing water quality or the water quality standard is expressed relative to the background concentration in the receiving water. In these situations, the WLA is based on the lower bound estimate of the interquartile range (25th percentile value) to maintain the existing water quality of the receiving water. Additional details on developing WLAs and WQBELs based on these estimates are given in Appendix E.

Receiving water characteristics for Libby Creek, and alluvial groundwater are described in Tables B.1 and B.2 for the POCs and other descriptive parameters. These data were provided by the Permittee and are from monitoring at the Facility. MMC collected surface water data for Libby Creek were collected at site LB-200 (upstream of the outfalls) and LB-300 (downstream of the outfalls) between 2011 and 2017. Table B.1 shows ambient (upstream of the outfalls) data at LB-200. The POR chosen for ambient data is the same as for actual effluent data described in Appendix A.

Ground water data are from wells MW07-01 and MW07-02 and were collected in 2007. These wells are downgradient of the mine discharge outfalls. As there is no ground water data available from upgradient the outfalls, data was analyzed from between mine discharge periods. Noranda ceased discharge in October 1998. MMC began discharge again February 19, 2008, with well water sample collection beginning the year before. To further ensure that previous mining did not impact ground water, the dataset was examined for abnormally high numbers in mountain hydrogeology. Additionally, the data were compared to data collected at MW07-01 and MW07-02 from 2011 to 2020, actual effluent data from 2011 to 2020, and RRVs. While concentrations of POCs increased slightly in November and December, these numbers aren't a significant increase and may be demonstrating natural fluctuation due to precipitation events. DEQ will take a conservative approach when utilizing this dataset.

Critical Background Concentration (C_s) – Method of Determination

To estimate the value of C_s, the critical background receiving water pollutant concentration as described in Section 3.8 (design conditions), the following procedure is applied.

1. Reported data must use an approved method of analysis (40 CFR 136 or other if specified) and achieve the required reporting value (RRV) in Circular DEQ-7, or achieve the lowest applicable water quality standard.
2. Reject data which has not achieved the applicable level of analysis in Step 1 or other QA/QC objectives.
3. Determine if there is sufficient data to characterize the receiving water. This data should represent the annual range of variation.
4. Determine the 25th percentile value (C_{25}) of the data set
5. Determine the 75th percentile value (C_{75}) of the data set

Where there is insufficient data for a parameter, the background concentration (C_s) is undetermined and reported as ("U"). In this case, RP and WLA/WQBEL are based on meeting the applicable water quality standard or nondegradation criteria at the end-of-pipe (no receiving water dilution). If ambient data is unavailable to determine a nondegradation criteria, the RRV will be used instead.

For pollutants with a numeric water quality standard or non-significance criterion expressed as a *specific value* (e.g. numeric criterion or standard):

1. If C_{75} is a quantified value (i.e. not reported as less than detect), the background concentration (C_s) is estimated by C_{75}
2. If C_{75} is a non-quantified value (NQV), i.e. reported as less than detect, and if the water quality standard < NQV, DEQ will set C_s = WQS (no assimilative capacity).
3. If C_{75} is a NQV and if RRV < water quality standard, DEQ will set C_s = RRV.

For pollutants with a water quality standard or non-significance criterion expressed as a *relative value* (e.g. increase above background) based on background concentration:

1. If C_{25} is a quantified value, then $C_s = C_{25}$
2. If C_{25} is an NQV, then C_s = NQV.

For parameters with nondegradation criterion expressed as a relative value and a numeric water quality standard expressed as an absolute value, this method may only be applied if the value determined by C_{25} is less than the applicable water quality standard.

Table B.1. Receiving Water Characteristics of Libby Creek LB-200 June 2017 to September 2020						
Parameter	Units	RRV [1]	Lower Quartile (C_{25})	Upper Quartile (C_{75})	Number of Samples	Number Below Detect
Conventional and Nonconventional Pollutants						
Flow	cfs	-	3.17	12.6	35	-
Temperature	° C	-	2.3	8.5	64	-
	° F		36.1	47.3	64	-
Total Suspended Solids	mg/L	-	0.49	0.50	49	43
Total Dissolved Solids	mg/L	-	9.7	19.0	49	1
pH	SU	-	6.70	7.21	62	-
Oil & Grease	mg/L	1	1.45	1.7	7	1
Ammonia	mg/L	0.07	0.01	0.025	49	47
Nitrate+ Nitrite	mg/L	0.02	0.1	0.2	49	0
Total Nitrogen [2][3]	mg/L	0.245	0.2	0.233	16	11
Total Phosphorus [3]	mg/L	0.003	0.0025	0.0071	16	7
Hardness, Total as $CaCO_3$ [4]	mg/L	-	3.7	4.6	16	0
Metals [5]						
Aluminum, dissolved	µg/L	9	12	21	21	0
Antimony	µg/L	0.5	<0.5	<0.5	49	49
Arsenic	µg/L	1	<0.5	<0.5	49	49
Barium	µg/L	3	2.1	2.5	49	0
Beryllium	µg/L	0.8	0.054	0.1	49	48
Cadmium	µg/L	0.03	U [6]	U [6]	0	0
Chromium	µg/L	10	0.5	0.5	49	48
Copper	µg/L	2.0	1.0	1.0	48	48
Iron	µg/L	20	6.8	12.0	49	31
Lead	µg/L	0.3	0.1	0.1	49	41
Magnesium	µg/L	-	U [6]	U [6]	-	-
Manganese	µg/L	-	0.5	0.79	49	17
Mercury	µg/L	0.005	0.0032	0.0039	46	44
Nickel	µg/L	2	0.5	0.5	49	48
Selenium	µg/L	1	<0.5	<0.5	49	49
Silver	µg/L	0.2	0.077	0.17	49	50
Thallium	µg/L	0.2	0.1	0.1	49	48
Zinc	µg/L	8	5	5	49	48

(1) Required Reporting Value (RRV) as specified in Department Circular DEQ-7.
(2) Calculated by the sum of total Kjeldahl nitrogen and nitrate + nitrite.
(3) Seasonal data from July 1 to September 30.
(4) Data not available during the POR. Data used from October 2016 to March 2017 to capture seasonality and to achieve DEQ's preferred 10 samples.
(5) All metals are total recoverable unless otherwise noted.
(6) Undetermined: Total recoverable data is not available.

Table B.2. Receiving Water Characteristics of Ground Water from MW07-01 and MW07-02 in 2007						
Parameter	Units	RRV (1)	Lower Quartile (C_{25}) (2)(3)	Upper Quartile (C_{75}) (2)(3)	Number of Samples	Number Below Detect
Conventional and Nonconventional Pollutants						
Temperature	° C	-	U	U	-	-
Total Suspended Solids	mg/L	-	13.2	31.2	2	0
Total Dissolved Solids	mg/L	-	14.8	16.3	2	0
pH	SU	-	6.15	6.19	3	-
Oil & Grease	mg/L	1	U	U	-	-
Ammonia	mg/L	0.07	0.050	0.052	4	3
Nitrate+ Nitrite	mg/L	0.02	U	U	-	-
Total Nitrogen (3)	mg/L	0.245	U	U	-	-
Total Phosphorus (3)	mg/L	0.003	U	U	-	-
Metals (4)						
Aluminum, dissolved	µg/L	-	U	U	-	-
Antimony	µg/L	0.5	U	U	-	-
Arsenic	µg/L	1	U	U	-	-
Barium	µg/L	3	9.5	11	3	0
Beryllium	µg/L	0.8	U	U	-	-
Cadmium	µg/L	0.03	U	U	-	-
Chromium	µg/L	10	<1	<1	6	6
Copper	µg/L	2	1	1	5	4
Iron	µg/L	20	37.5	221	6	0
Lead	µg/L	0.3	U	U	-	-
Magnesium	µg/L	-	628	803	4	0
Manganese	µg/L	-	5	5.75	6	5
Mercury	µg/L	0.005	U	U	-	-
Nickel	µg/L	2	U	U	-	-
Selenium	µg/L	1	<1	<1	6	6
Silver	µg/L	0.2	U	U	-	-
Thallium	µg/L	0.2	<0.2	<0.2	6	6
Zinc	µg/L	8	U	U	-	-

(1) Required Reporting Value (RRV) as specified in Department Circular DEQ-7.
(2) If all results were nondetect, the 25th and 75th quartile are indicated with "<".
(3) "U" means parameter is undetermined.
(4) Seasonal data from July 1 to September 30.
(5) All metals are total recoverable unless otherwise noted.

APPENDIX C—WATER QUALITY STANDARDS AND NONDEGRADATION

Table C.1 summarizes the water quality standards applicable to Libby Creek and ground water at Outfall 001 and Outfall 003, including nonsignificance criteria.

The nondegradation criteria are calculated from the most stringent water quality standard for each parameter. Typically, the most stringent is the chronic aquatic life standard. Where non-degradation criterion are expressed as relative to the background concentration, such as for total nitrogen, or as no increase above background, the lower bound estimate of the interquartile range (lower quartile in Appendix B, Tables B.1 and B.2) is used as the background concentration. Because surface water quality standards are equivalent to or more restrictive than the ground water standards for the POCs, this analysis and any resulting effluent limits will be protective of ground water quality at the end of the ground water mixing zone.

Nonsignificance criteria are based on ARM 17.30.715(1) and depend on the category:

- carcinogenic parameters or parameters with a bioconcentration factor greater than 300 are based on no increase over background,
- toxic parameters are based on exceedance of the trigger value and/or 15% of the lowest applicable standard, and
- harmful parameters and parameters in circular DEQ 12A with existing water quality less than 40% of the standard, and changes outside the mixing zone are less than 10% of the applicable standard.

Table C.1 Water Quality Standards - Libby Creek and Ground Water									
Parameter	Units	Aquatic Life Standards		Human Health Standards		Parameter Category	Nonsignificance Criterion (S_N) [1]		
		Acute (S_A)	Chronic (S_C)	Surface Water	Ground Water (S_H)		Ground Water Outfall 001	Surface Water Outfall 001	Surface Water Outfall 003
Conventional and Nonconventional Pollutants									
Temperature	° F	1° F Increase above natural, not to exceed 67° F. 2° F decrease below natural 55° F to 32° F.			-	Narrative	-	No change [2]	
Total Suspended Solids	mg/L	No increase above natural			-	Narrative	-	No change [2]	
pH, change	SU	0.5 increase or decrease from natural			-	Narrative	-	No change [2]	
pH, range	SU	6.5 to 8.5			-	Narrative	-	No change [2]	
Oil & Grease	mg/L	-	-	-	-	Narrative - 10	-	No change [2]	
Ammonia [3]	mg/L	19.5	5.36	-	-	Toxic	-	0.804	
Nitrate+ Nitrite	mg/L	-	-	10	10	Toxic	7.5	1.5	
Total Nitrogen	mg/L	-	0.275	-	-	Harmful	-	0.11	
Total Phosphorus	mg/L	-	0.025	-	-	Harmful	-	0.005	
Metals [4]									
Aluminum, dissolved	µg/L	750	87	-	-	Toxic	-	13.1	
Antimony	µg/L	-	-	5.6	6	Toxic	0.9	0.84	
Arsenic	µg/L	340	150	10	10	Carcinogen	No increase (3)	No increase (0.5)	
Beryllium	µg/L	-	-	4	4	Carcinogen	No increase (1)	No increase (0.054)	
Cadmium [5]	µg/L	0.49	0.26	5	5	Toxic	0.75	0.039	
Chromium	µg/L	-	-	100	100	Toxic	15	15 [7]	15
Copper [5]	µg/L	3.8	2.9	1,300	1,300	Toxic	195	0.435	
Iron	µg/L	-	1,000	-	-	Harmful	-	112	
Lead [5]	µg/L	14.0	0.54	15	15	Toxic	2.25	0.081	
Mercury	µg/L	1.7	0.91	0.05	2	Toxic w/ BCF > 300	No increase (0.2)	No increase (0.0032)	
Nickel [5]	µg/L	145	16	100	100	Toxic	15	2.4 [7]	2.4
Selenium	µg/L	20	5	50	50	Toxic	7.5	0.75	
Silver [5]	µg/L	0.374	-	100	100	Toxic	15	0.056	
Thallium	µg/L	-	-	0.24	2	Toxic	0.3	0.3 [6]	0.036
Zinc [5]	µg/L	37	37	7,400	2,000	Toxic	300	5.55	

(1) Nonsignificance criteria per ARM 17.30.715(1).
(2) No change allowed if it will have a measurable effect on any existing or anticipated use or cause measurable changes in aquatic life or ecological integrity as described in ARM 17.30.715(1)(h).
(3) Ammonia standard based on Libby Creek 75th percentile pH of 7.21 and temperature of 8.5° C.
(4) All metals are total recoverable unless otherwise noted.
(5) Metals standards based on the 25th percentile hardness of 25 mg/L.
(6) No RP for this parameter as it passes the trigger value test described in ARM 17.30.715(1)(c). The trigger value represents the nonsignificance criteria in this instance.
(7) No RP for this parameter as it passes the 15% of the lowest applicable standard test as described in ARM 17.30.715(1)(c).

NONSIGNIFICANCE DETERMINATION

The Montana Water Quality Act states that it is unlawful to cause degradation of state waters without an authorization issued pursuant to 75-5-303, MCA [75-5-605(1)(d), MCA]. ARM 17.30.706(2) states that DEQ will determine whether a proposed activity may cause degradation for all activities which are permitted, approved, licensed, or otherwise authorized by DEQ, such as issuance of a discharge permit. A nondegradation analysis was conducted in Section 3.6 of this permit fact sheet for the proposed discharges and activities regulated by this permit. Based on this analysis DEQ has made the following determinations:

Outfall 001 and Outfall 003

The discharges from the Facility are a new source. DEQ set the effluent limits and conditions in the permit to comply with the nonsignificance criteria of ARM 17.30.715(1). Discharges in compliance with these conditions are nonsignificant and are not required to undergo review under Montana's Nondegradation Policy (75-5-303, MCA). DEQ reviewed the additional criteria in ARM 17.30.715(2) and at this time finds that cumulative impacts or synergistic effects are unlikely because the effluent limitations are stringent, the permittee has not requested a mixing zone to the unconstructed Outfall 003 (direct discharge to Libby Creek), Outfall 001 flows through ground water prior to reaching Libby Creek, and there are no other known wastewater discharges to upstream or to this section of Libby Creek. The mixing zone allowed for Outfall 001 is as stringent as possible. Changes in flow are addressed in the Joint Final EIS by the Kootenai Forest Service and DEQ and the DEQ MPDES EA.

Outfalls 004 – 011

In accordance with ARM 17.30.715(3), DEQ may determine the significance of changes in water quality using 75-5-301(5)(c), MCA as guidance. Specifically, 75-5-301(5)(c), MCA establishes criteria for determining whether an activity results in nonsignificant changes to water quality based on the following factors:

- Equates significance with the potential for harm to human health, a beneficial use, or the environment;
- Considers both the quantity and the strength of the pollutant;
- Considers the length of time the degradation will occur; and
- Considers the character of the pollutant so that greater significance is associated with carcinogens and toxins that bioaccumulate or biomagnify, and lesser significance is associated with substances that are less harmful or less persistent.

The major pollutant of concern in storm water-driven discharges is sediment. Controlling for sediment will also control for many other pollutants since most of these constituents are attached to or become attached to sediment particles that may be transported by runoff and subsequently captured by BMPs. Pollutants associated with carcinogens and toxins that bioaccumulate or biomagnify are not expected as the discharges are comprised solely of storm water runoff. To minimize the potential impacts from of any storm water driven discharges, DEQ is establishing the use of BMPs for the control of pollutants discharged at Outfalls 004 - 011 (40 CFR 122.44(k); ARM 17.30.1345); see Effluent Limits Section 4.

BMPs are defined as a permit condition and are used in conjunction with other final effluent limits to prevent or control the discharge of pollutants to state surface waters. The MPDES permit for the facility stipulates that BMPs must be implemented prior to the commencement of any regulated

activities at these outfalls. The MPDES permit also includes provisions for the ongoing evaluation of BMPs to ensure the minimization and/or elimination of pollutants contained in storm water runoff as well as the required monitoring of any discharges from Outfalls 004 - 011. DEQ has determined that with the proper selection, installation, and maintenance of BMPs in addition to the other final effluent limits, the discharge of storm water and storm water-driven sediment does not represent a significant change in water quality since the magnitude, duration, and frequency of any storm water discharge events (and their potential short-term impacts) are minimized and/or eliminated.

Based on the discussion above, DEQ finds that, pursuant to ARM 17.30.715(3), the proposed discharge at Outfalls 004 - 011 are a nonsignificant change in existing water quality due to their low potential for harm to human health, beneficial uses, or the environment. This is based on consideration of the quantity and the strength of the expected pollutants; the length of time any degradation may occur; and the expected character of the discharges (see 75-5-301(5)(c), MCA; 75-5-303(3)(c), MCA; 75-5-317(2)(b), MCA).

APPENDIX D — REASONABLE POTENTIAL ANALYSIS

When determining the need for WQBELs, DEQ uses estimated critical effluent concentration and flow (Appendix G) and the design conditions of the receiving water after accounting for any mixing zone. The resulting instream pollutant concentration is compared to the applicable numeric and narrative water quality standard or nondegradation criterion. For purposes of assessing the need for and calculating WQBELs, DEQ primarily uses the mass-balance equation given in Section 3.8.

The mass balance equation assumes steady-state conditions of the discharge and receiving water with rapid and complete mixing. The mass-balance equation is used to determine the concentration of a pollutant after accounting for the dilution provided by a mixing zone. Where there is insufficient ambient data for a parameter, the background concentration (C_s) is undetermined and reported as ("U") and no dilution is provided for that parameter.

The mass-balance equation can be arranged to solve for the resulting instream pollutant concentration (C_r) in the receiving water after accounting for dilution and other sources of pollution.

$$\mathbf{C_r} = (Q_sC_s + Q_dC_d)/Q_r \qquad \text{(Eq. 1.A)}$$

Where:

Q_s	=	critical stream design flow at point of discharge
C_s	=	critical background pollutant concentration
Q_d	=	critical effluent flow
C_d	=	critical effluent pollutant concentration
Q_r	=	resultant in-stream flow after discharge ($Q_r = Q_s + Q_d$)
$\mathbf{C_r}$	**=**	**resultant in-stream pollutant concentration (to solve for)**

To account for Outfall 003 and the ground water mixing, the following equations were derived:

$$C_{s,003} = (Q_sC_s + Q_{003}C_{003})/(Q_{s,\,003}) \qquad \text{(Eq. 1.B)}$$

$$C_{GW,d} = (Q_{GW}C_{GW} + Q_dC_d)/(Q_{GW,d}) \qquad \text{(Eq. 1.C)}$$

$$C_r = (Q_{s,003}C_{s,003} + Q_{GW,d}C_{GW,d})/Q_r \qquad \text{(Eq. 1.D)}$$

Where the resulting pollutant concentration (C_r**)** exceeds the applicable water quality standard or nondegradation criterion, there is reasonable potential and a WQBEL is required for that parameter and must be included in the permit.

DEQ may also perform a narrative reasonable potential analysis based on the stringency of the nonsignificance criteria and/or where effluent concentrations provided by the Permittee are estimates rather than actual effluent monitoring data.

The RP analysis are provided in the following tables:

Table D.1: RP for Outfall 001 to Ground Water to Surface Water
Table D.2: RP for Outfall 003 to Surface Water

Based on the results of these RP analyses, WQBELs will be calculated for any parameter with RP as shown in Table D.1 and Table D.2. In addition, WQBELs will be developed for the five parameters that have TBELs: cadmium, copper, lead, mercury, and zinc.

Table D.1. Reasonable Potential Analysis: Outfall 001 Discharging to Ground Water and Libby Creek												
Parameter	Units	Critical Effluent Concentration (C_d)	Outfall 003 (upstream) Critical Effluent Concentration (C_{003})	Critical Ambient Ground Water Concentration (C_{GW})	Critical Ground Water Flow (mgd) (Q_{GW})	Critical Ambient Libby Creek Concentration (C_s)	Critical Stream Flow Acute (mgd) ($Q_{s/A}$)	Critical Stream Flow Chronic /HH/Nutrients (mgd) ($Q_{s/C}$)	Projected Receiving Water Concentration Acute ($C_{r/A}$)	Projected Receiving Water Concentration (Chronic/HH/ Nutrients) ($C_{r/C}$)	WQS or Nonsignificance Criterion (Acute/Chronic /HH)	WQBEL needed based on Equation 1
Conventional and Nonconventional Pollutants												
Ammonia	mg/L	3.66	0.80	0.052	0.08	0.025	0	1.6	3.66	1.04	19.5 / 0.804	yes
Nitrate+ Nitrite	mg/L	18.6	1.5	U	0	0.2	0	1.6	-	4.87	1.5	yes
Total Nitrogen	mg/L	21.5	0.11	U	0	0.233	0	0	-	21.5	0.11	yes
Total Phosphorus	mg/L	0.446	0.005	U	0	0.0071	0	0	-	0.446	0.005	yes
Metals (1)												
Aluminum, dissolved	µg/L	242	13.05	U	0	21	0	0	242	242	750 / 13.1	yes
Antimony	µg/L	24.2	0.84	U	0	0.5	0	1.6	-	6.19	0.84	yes
Arsenic	µg/L	21.7	0.50	U	0	0.5	0	1.6	21.7	5.52	0.5	yes
Beryllium	µg/L	1.24	0.054	U	0	0.1	0	0	-	1.24	0.054	yes
Cadmium	µg/L	50 (2)	0.04	U	0	U	0	0	50	50 / 50	0.49 / 0.039 / 5	yes
Chromium	µg/L	6.2	6.2	1.0	0.08	0.5	0	1.6	-	3.3	15	no
Copper	µg/L	150 (2)	0.435	1.0	0	1	0	0	150	150 / 150	3.8 / 0.435 / 1300	yes
Iron	µg/L	310	112	221	0.08	12.0	0	1.6	-	109	112	no
Lead	µg/L	300 (2)	0.081	U	0	0.1	0	0	300	300 / 300	14 / 0.081 / 15	yes
Mercury	µg/L	1.24	0.0032	U	0	0.0039	0	0	1.00	1.00 / 1.00	0.0032	yes
Nickel	µg/L	3.78	2.4	U	0	0.5	0	1.6	3.78	1.73 / 1.73	145 / 2.4 / 100	no
Selenium	µg/L	3.1	0.75	1.0	0	0.5	0	1.6	2.89	1.03 / 1.03	20 / 0.75 / 50	yes
Silver	µg/L	3.1	0.0561	U	0	0.17	0	0	3.10	3.10	0.0561 / 100	yes
Thallium	µg/L	0.62	0.036	0.2	0.08	0.1	0	1.6	-	0.21	0.3	no
Zinc	µg/L	750 (2)	5.55	U	0	5	0	1.6	750	182 / 182	5.55 / 5.55 / 7400	yes

(1) All metals are total recoverable unless otherwise noted.
(2) Technology-based effluent limit

Table D.2. Reasonable Potential Analysis: Outfall 003 Discharging to Libby Creek				
Parameter	Units	Projected Receiving Water Concentration (C_r)	WQS/ Nonsignificance Criterion (Acute/Chronic/HH)	WQBEL needed based on Equation 1
Conventional and Nonconventional Pollutants				
Ammonia	mg/L	3.66	19.5 / 0.804	yes
Nitrate+ Nitrite	mg/L	18.6	1.5	yes
Total Nitrogen	mg/L	21.5	0.11	yes
Total Phosphorus	mg/L	0.446	0.005	yes
Metals (1)				
Aluminum, dissolved	µg/L	242	750 / 13.1	yes
Antimony	µg/L	24.2	0.84	yes
Arsenic	µg/L	21.7	0.5	yes
Beryllium	µg/L	1.24	0.054	yes
Cadmium	µg/L	50 (2)	0.49 / 0.039 / 5	yes
Chromium	µg/L	6.2	15	no
Copper	µg/L	150 (2)	3.8 / 0.435 / 1300	yes
Iron	µg/L	310	112	yes
Lead	µg/L	300 (2)	14 / 0.081 / 15	yes
Mercury	µg/L	1.24	0.0032	yes
Nickel	µg/L	3.78	145 / 2.4 / 100	yes
Selenium	µg/L	3.1	20 / 0.75 / 50	yes
Silver	µg/L	3.1	0.0561 / 100	yes
Thallium	µg/L	0.62	0.036	yes
Zinc	µg/L	750 (2)	5.55 / 7400	yes

(1) All metals are total recoverable unless otherwise noted.
(2) Technology-based effluent limit

APPENDIX E — WASTE LOAD ALLOCATIONS (WLA) AND FINAL LIMITS

For pollutants with RP, water quality-based effluent limitations (WQBELs) are based on procedures described in EPA's *Technical Support Document for Water Quality Based Toxic Control*, EPA/505/2-90-001, March 1991 (TSD) with minor modifications to accommodate the specific requirements of Montana's water quality standards. WQBELs must accommodate the magnitude, duration and frequency components of the standards, accounting for any mixing zone, and not allow an exceedance of these standards when stream flows equal or exceed the design flows specified in ARM 17.30.635. DEQ uses the mass balance equation discussed in Section 3.8 for RPA.

The mass-balance equation may be arranged to calculate an acceptable effluent concentration or WLA that does not exceed the water quality standard as follows

$$WLA = C_{d\text{-}WLA} = Q_rC_r - Q_sC_s / Q_d$$

where,

WLA	=	waste load allocation (C_d in the mass-balance equation)
C_r	=	applicable standard or nonsignificance criterion (acute, chronic, nutrient, HH)
Q_r	=	downstream flow after available mixing ($Q_s + Q_d$)
C_s	=	receiving water pollutant concentration (background)
Q_s	=	upstream flow available for dilution
Q_d	=	discharge flow

For those parameters where no mixing zone is considered,

$$WLA = C_{d\text{-}WLA} = C_r$$

The WLA is then translated into an effluent limitation depending on the type of standard. These procedures are described below. All WLAs are expressed in units of concentration, unless the standard is expressed in other units. Values for the applicable standards and background concentrations are given in Appendix C and B, respectively. Mixing zones and dilution flows are given in Section 3.

The background concentration affects the determination of the WLA for both new and existing sources. For existing sources where the background concentration as measured by the 75th percentile ($C_{.75}$) exceeds the applicable water quality standard, the WLA is set at the standard (WLA = Standard) and no mixing zone is granted. For new sources discharging to high quality water, the background concentration may already exceed the nondegradation threshold (S_n). To protect existing water quality, no increase above background concentration is allowed without an authorization to degrade. The process for assigning a WLA is summarized below.

PROCEDURES FOR TRANSLATING WLA INTO PERMIT LIMITATIONS

Aquatic Life Effluent Limitations: In most cases, there are two aquatic life WLAs, namely a WLA based on the acute aquatic life standard (WLA_a) and a WLA based on the chronic aquatic life standard (WLA_c). For each of these WLAs, there is a corresponding long-term average effluent concentration (LTA) calculated by multiplying the WLA by a factor (WLA multiplier). This multiplier is a statistically-based factor derived from the ratio of the WLA, set at a specific percentile value, to the LTA. The value of the multiplier varies depending on the coefficient of variation (CV) of the data set, the percentile value for the WLA (e.g., 99th percentile), and whether the WLA is based on an acute (1-hour average) or chronic (4-day average) water quality standard. DEQ sets the WLA at the 99th percentile of the lognormal distribution. The equations for the WLA multipliers ($WLA\ multiplier_{acute99}$, $WLA\ multiplier_{chronic99}$) and the corresponding LTAs are shown below:

$$WLA\ multiplier_{acute99} = EXP\ (0.5\sigma^2 - z\sigma)$$
$$WLA\ multiplier_{chronic99} = EXP\ (0.5\sigma_4^2 - z\sigma_4)$$

Where
σ = standard deviation
$\sigma = [ln(CV^2 + 1)]^{0.5}$
$\sigma^2 = ln(CV^2 + 1)$
$\sigma_4 = [ln(CV^2/4 + 1)]^{0.5}$
$\sigma_4^2 = ln(CV^2/4 + 1)$

$z = 2.326$ for 99th percentile probability basis

$$LTA_a = WLA_a * WLA\ multiplier_{acute99}$$
$$LTA_c = WLA_c * WLA\ multiplier_{chronic99}$$

Because the calculated LTAs do not have different averaging periods, they can be directly compared to select the most protective aquatic life LTA. This LTA is the basis for calculating effluent limitations that protect aquatic life from both acute and chronic effects. The corresponding CV used in the RPA is used for calculating the aquatic life WLAs. Calculated acute and chronic LTAs are given below.

The two aquatic life LTAs, acute and chronic, represent two performance levels that the Facility would need to maintain. By comparing the two LTAs and selecting the minimum LTA as the basis for the calculated WQBELs, the procedure ensures that the AML and MDL are based on a single performance level that will protect against both acute and chronic effects.

$$LTA_m = \text{Minimum of } LTA_a \text{ and } LTA_c$$

Effluent limitations for protection of aquatic life are calculated by multiplying the most protective aquatic life LTA by multipliers, which are based on the lognormal distribution. Each multiplier is a statistically-based factor reflects the relationship between the LTA and the effluent limitations. The value of the multiplier for each effluent limitation varies depending on:

- the **probability basis** of the effluent limitation (i.e., the percentile value on the lognormal distribution of effluent pollutant concentrations where the limitation will be set, such as 95th percentile or 99th percentile);
- the **CV** of the data set (0.6 where data is estimated); and

- the **number of samples** (for the AML) that will be averaged in order to measure compliance with the effluent limitation. In this permit n = 4 for all parameters because weekly monitoring is required for most parameters.

The AML and MDL multipliers are based on the following:

- setting the AML at a 95th percentile occurrence probability and the MDL at a 99th percentile occurrence probability. These probability bases are consistent with EPA's recommendations in the TSD and consistent with the probability bases EPA uses to derive technology-based requirements in the effluent guidelines;
- the CV used in the reasonable potential determination or a default CV of 0.6 if a CV cannot be calculated); and
- the actual monthly sampling frequency that will be required in the permit, unless the planned sampling frequency is one time per month or less (e.g. quarterly); if the sampling frequency that will be specified in the permit is one time per month or less, DEQ uses a value for sampling frequency (n) in the formula for calculating the AML that is greater than one. This procedure assumes a sampling frequency of two to four times per month in order to ensure that the AML will not exceed any of the calculated WLAs, as recommended in EPA's TSD (pp. 107-108).

The formulae for calculating the AML and the MDL from the most protective aquatic life LTA are shown below:

$MDL_{aquatic\ life} = LTA \times MDL_{multiplier99}$
$AML_{aquatic\ life} = LTA \times AML_{multiplier95}$

$MDL_{multiplier99} = e^{(z\sigma - 0.5\sigma^2)}$
Where:
$\sigma = [ln(CV^2 + 1)]^{0.5}$
$\sigma^2 = ln(CV^2 + 1)$
$z = 2.326$ for 99^{th} percentile probability basis

$AML_{multiplier95} = e^{(z\sigma_n - 0.5\sigma_n^2)}$
Where:
$\sigma_n = [ln(CV^2/n + 1)]^{0.5}$
$\sigma_n^2 = ln(CV^2/n + 1)$
$z = 1.645$ for 95th percentile probability basis
n = number of samples per month that will be required in the permit

Some aquatic life water quality standards are expressed as a single numeric value that defines a single acceptable level of effluent quality; consequently, there will be only a single corresponding WLA. DEQ uses the recommendations in the TSD and applies the following procedure:

- Consider the single WLA to be WLA_c;
- Using the CV determined in the reasonable potential analysis, calculate an LTA that will allow the effluent to meet WLA_c using the equations for the chronic WLA above; and
- Derive an AML and MDL based on the LTA and CV using the equations above.

***Human Health Effluent Limitations**:* Montana's numeric human health numeric standards are expressed as values that may not be exceeded in the receiving water. Because of this requirement, it is necessary to set human health effluent limitations that meet a given WLA on a daily basis. DEQ uses the following approach to establish the effluent limitations for protection of human health:

For parameters where the human health standard is the limiting standard, the AML is set equal to the WLA_h, as stated in TSD Section 5.4.4. However, in accordance with Circular DEQ-7 Footnote 16, receiving water "concentrations may not exceed" any HHS, so the MDL is also set at the WLA_h.

Nonsignificance Criteria Effluent Limitations: Nonsignificance criteria are determined based on the lowest applicable standard for a pollutant, typically the chronic aquatic life standard or the human health standard. Effluent limits are calculated from the most stringent water quality standard or nonsignificance criteria using the procedures for aquatic life standards and human health standards described above. The nonsignificance criterion is substituted for the aquatic life standard and the human health nonsignificance criterion for the human health water quality standard.

Permittees who are unable to comply with a WQBEL based on a nondegradation criterion may submit an authorization to degrade state waters under ARM 17.30.706.

The final WQBELs for a given parameter are determined as follows:

- For **discharges subject to nondegradation criteria** DEQ calculates an aquatic life AML and MDL based on the chronic nondegradation criteria (unless the acute standard is more stringent than the chronic) using the procedures for aquatic life effluent limitations described above. DEQ then compares these values to the AML and MDL calculated from human health nondegradation criterion determined using the procedures for human health effluent limitations. The lowest AML and the lowest MDL are the final calculated WQBELs because the lowest of each of these limitations will assure attainment of all water quality standards and nondegradation criteria.

The calculated WQBELs must be compared to TBELs for the same parameter to determine the final permit effluent limitations that meet the requirements of Section 301 of the federal Clean Water Act (CWA) and protect the designated uses of the receiving water required by Section 302 of the federal CWA. This stringency analysis is discussed in Section 4.1 of the permit fact sheet.

FINAL CALCULATED WQBEL

WQBEL calculations for Outfall 001 and 003 are summarized in the following Tables E.1 and E.2.

WLA for all parameters are based on achieving the lowest applicable water quality standard or nonsignificance criterion of the receiving waters (Libby Creek and ground water).

Table E.1. WQBELs Outfall 001												
Parameter	Units	Chronic Nonsignificance Wasteload Allocation (WLA_c)	Human Health Nonsignificance Wasteload Allocation (WLA_h)	Chronic Long Term Avg (LTA_c)	Aquatic Life		Human Health		TBELs		Proposed WQBELs	
					MDL	AML	MDL	AML	MDL	AML	MDL	AML
Conventional and Nonconventional Pollutants												
Ammonia, total	mg/L	2.62	-	1.38	4.30	2.14	-	-			4.30	2.14
Nitrate + Nitrite	mg/L	-	4.39	-	4.39	4.39					4.39	4.39
Total Nitrogen	mg/L	0.11	-	0.06	-	0.09	-	-			-	0.09
Total Phosphorus	mg/L	0.005	-	0.003	-	0.0041	-	-			-	0.0041
Metals (1)												
Aluminum, dissolved	µg/L	13.05	-	6.88	21.4	10.7	-	-			21.4	10.7
Antimony	µg/L	-	1.6	-	-	-	1.6	1.6			1.6	1.6
Arsenic	µg/L	0.50	0.50	0.16 (2)	0.50	0.25	0.50	0.50			0.50	0.25
Beryllium	µg/L	-	0.054	-	-	-	0.054	0.054			0.054	0.054
Cadmium	µg/L	0.039	5.0	0.021	0.064	0.032	5.0	5.0	100.0	50.0	0.064	0.032
Copper	µg/L	0.435	1300	0.229	0.71	0.36	1300	1300	300	150	0.71	0.36
Lead	µg/L	0.081	15	0.04	0.133	0.066	15	15	600	300	0.133	0.066
Mercury	µg/L	0.0032	0.0032	0.001 (2)	0.0032	0.0016	0.0032	0.0032	2	1	0.003	0.0016
Selenium	µg/L	0.75	50	0.075	1.23	0.61	50	50			1.23	0.61
Silver	µg/L	0.0561 (3)	422	0.018 (3)	0.056	0.028	422	422			0.056	0.028
Zinc	µg/L	5.55 (2)	31228	1.78 (2)	5.6	2.8	31228	31228	1500	750	5.6	2.8

(1) All metals are total recoverable unless otherwise specified.
(2) Acute long term average used (LTA_a), as it was more stringent.
(3) Acute wasteload allocation (WLA_a) and long term average (LTA_a) used since there's only an acute standard for silver.

Table E.2. WQBELs Outfall 003												
Parameter	Units	Chronic Nonsignificance Wasteload Allocation (WLA_c)	Human Health Nonsignificance Wasteload Allocation (WLA_h)	Chronic Long Term Avg (LTA_c)	Aquatic Life		Human Health		TBELs		Proposed WQBELs	
					MDL	AML	MDL	AML	MDL	AML	MDL	AML
Conventional and Nonconventional Pollutants												
Ammonia, total	mg/L	0.804	-	0.42	1.32	0.66	-	-			1.32	0.66
Nitrate + Nitrite	mg/L	-	1.5	-	1.5	1.5					1.5	1.5
Total Nitrogen	mg/L	0.11	-	0.06	-	0.09	-	-			-	0.09
Total Phosphorus	mg/L	0.005	-	0.003	-	0.0041	-	-			-	0.0041
Metals (1)												
Aluminum, dissolved	µg/L	13.1	-	6.88	21.4	10.7	-	-			21.4	10.7
Antimony	µg/L	-	0.84	-	-	-	0.84	0.84			0.84	0.84
Arsenic	µg/L	0.50	0.50	0.16 (2)	0.50	0.25	0.50	0.50			0.50	0.25
Beryllium	µg/L	-	0.054	-	0.054	0.054	-	-			0.054	0.054
Cadmium	µg/L	0.039	5.0	0.021	0.064	0.032	5.0	5.0	100.0	50.0	0.064	0.032
Copper	µg/L	0.435	1300	0.229	0.71	0.36	1300	1300	300	150	0.71	0.36
Iron	µg/L	112	-	59	184	92	-	-			184	92
Lead	µg/L	0.081	15	0.04	0.133	0.066	15	15	600	300	0.133	0.066
Mercury	µg/L	0.0032	0.0032	0.001 (2)	0.0032	0.0016	0.0032	0.0032	2	1	0.003	0.0016
Nickel	µg/L	2.4	100	1.3	3.9	2.0	100	100			3.9	2.0
Selenium	µg/L	0.75	50	0.396	1.23	0.61	50	50			1.23	0.61
Silver	µg/L	0.056 (3)	100	0.018 (3)	0.056	0.028	100	100			0.056	0.028
Thallium	µg/L	-	0.036	-	-	-	0.036	0.036			0.036	0.036
Zinc	µg/L	5.55	7400	1.78 (2)	5.6	2.8	7400	7400	1500	750	5.6	2.8

(1) All metals are total recoverable unless otherwise specified.
(2) Acute long term average used (LTA_a), as it was more stringent.
(3) Acute wasteload allocation (WLA_a) and long term average (LTA_a) used since there's only an acute standard for silver.

APPENDIX F — NUTRIENTS

For the Libby Exploration Project, the nutrients TN and TP are both POCs. The Libby Creek section that MMC discharges is not listed as impaired for nutrients or related parameters; therefore, it is considered a high-quality water for TN and TP. As demonstrated in Appendix C, MMC is subject to nondegradation rules and must meet the nonsignificant criterion for TN and TP based on DEQ's evaluation according to ARM 17.30.715(1)(f).

Total Nitrogen

MMC must meet the TN nonsignificance criteria (0.11 mg/L) at end of pipe because the Libby Creek ambient total nitrogen concentration is greater than 40% of the Circular DEQ-12A water quality standard (Table C.1). The numeric nutrient standard is applied for the Northern Rockies (15) ecoregion from July 1 to September 30.

The nonsignificance criteria is translated to an AML as shown in Appendix C. Although MMC previously monitored total inorganic nitrogen (TIN) in permit MT0030279, Montana does not have any numeric standards for TIN. Total nitrogen encompasses inorganic nitrogen. Total nitrogen will be calculated by the sum of total Kjeldahl nitrogen and nitrate plus nitrite concentrations. The permittee plans to update the WTP to meet the effluent limits, as described in Section 1.2.2.

As shown in Table F.1, MMC cannot meet the TN AMLs of 0.09 mg/L and 0.54 lb/d, as demonstrated by the estimated maximum daily and average 3.46 mg/L. The actual historic maximum daily is 0.44 mg/L and the average is 0.2 mg/L at Outfall 001.

Table F.1. Total Nitrogen Comparison for Outfall 001

	Units	Proposed WQBELs	RRV	GW	Libby Creek	2017 Limits	2006 Limits	Actual Effluent	Estimate
Max Daily	mg/L		0.245	U	$75^{th} = 0.233$	-	-	0.25	3.46
Avg Monthly	mg/L	0.09	0.245	U	$25^{th} = 0.2$	2.5 (1)	2.5 (1)	0.2	3.46
Max Daily	lb/day					-	-		
Avg Monthly	lb/day	0.54				9.3	15 (1) (2)		

(1) Limit for total inorganic nitrogen
(2) Annual average

Total Phosphorus (TP)

As shown in Table F.2, TP must also meet the nonsignificance criteria (0.005 mg/L) at end of pipe, because there is not assimilative capacity in Libby Creek as demonstrated in Table 9. The numeric nutrient standard is applied for the Northern Rockies (15) ecoregion from July 1 to September 30. The nonsignificant criteria is translated to an AML as shown in Appendix C. MMC cannot meet the phosphorus AMLs of 0.0041 mg/L and 0.025 lb/d, even without the potential use of phosphorus reagents in the upgraded WTP to enhance nitrogen removal. The estimated outfall concentration is 0.072 mg/L with the use of phosphorus reagents, and the actual average concentration is 0.0061 mg/L.

Table F.2. Total Phosphorus Comparison for Outfall 001									
	Units	Proposed WQBELs	RRV	GW	Libby Creek	2017 Limits	2006 Limits	Actual Effluent	Estimate
Max Daily	mg/L	-	0.003	U	75th = 0.0071	-	-	0.024	0.072
Avg Monthly	mg/L	0.0041	0.003	U	25th = 0.0025	-	-	0.0061	0.072
Max Daily	lb/day	-				-	-		
Avg Monthly	lb/day	0.025				-	-		

Potential cap at current performance standards were analyzed using Outfall 001 monthly average data from June 2017 to October 2020 (Table F.5). Data was examined annually, not seasonally, because MMC does not have influent or a treatment system that changes seasonally. The cap at current performance standards may serve as interim limits in a short-term compliance schedule.

Proposed Nutrient Permit Limits

Outfall 003 is not yet constructed and will be required to meet the permit limits based on the nonsignificance criteria immediately upon construction.

Outfall 001 will be required to meet the following interim and final limits described in Tables F.3 and F.4. Because the effluent goes through ground water prior to reaching Libby Creek and transport time is unknown, limits will be year-round for Outfall 001.

Table F.3. Proposed Outfall 001 TN Limits w/ Cap at Current			
Compliance Deadlines	Average Daily Concentration Limit (mg/L)	Average Daily Load Limit (lb/d)	Basis
Effective Immediately	0.21 (1)	0.76	Cap at Current - Outfall 001 Maximum Observed
2 Years from Permit Effective Date	0.20 (1)	0.70	Cap at Current - Outfall 001 Long Term Average Observed
4 Years 11 Months from Permit Effective Date	0.09 (1)	0.54	Nonsignificance Criteria
(1) Analysis of effluent with non-detect results < 0.245 mg/L is considered to be in compliance with the TN limit.			

Table F.4. Proposed Outfall 001 TP Limits w/ Cap at Current			
Compliance Deadlines	Average Daily Concentration Limit (mg/L)	Average Daily Load Limit (lb/d)	Basis
Effective Immediately	0.0240	0.080	Cap at Current - Outfall 001 Maximum Observed
2 Years from Permit Effective Date	0.0079	0.026	Cap at Current - Outfall 001 Long Term Average Observed
4 Years 11 Months from Permit Effective Date	0.0041	0.025	Nonsignificance Criteria

Table F.5 presents the TN, TP, and flow data used to develop the maximum observed and long-term average concentrations and load. Note that the majority of TN concentrations were non-detect at a reporting limit of 0.2 mg/L.

Proposed Nutrient Compliance Plan

By no later than (*2 years from the effective date of the permit*), MMC will submit a Compliance Plan that evaluates all feasible alternatives for improving water quality for Libby Creek and selects which nutrient reduction option(s) will be pursued. The Compliance Plan will assess:

- Optimization study;
- Additional wastewater treatment;
- Adaptive Management Plant (AMP) (if available);
- Nutrient trading;
- Authorization to Degrade;
- Site-specific standards for Libby Creek; and/or,
- Other nutrient reduction options.

MMC would be required to provide a schedule including investigation, design, and implementation. An annual report must be submitted by January 28th of each year, summarizing the progress made the previous year and outlining the steps planned for the year.

Table F.5. Cap at Current Performance for Outfall 001					
Dates	TN Monthly Avg *(mg/L)*	TP Monthly Avg *(mg/L)*	Flow Monthly Avg *(mgd)*	TN Monthly Avg *(lb/d)*	TP Monthly Avg *(lb/d)*
6/30/2017	0.2	0.0023	0.42	0.71	0.008
7/31/2017	0.2125	0.005	0.41	0.73	0.017
8/31/2017	0.2	0.0031	0.39	0.65	0.010
9/30/2017	0.2	0.006	0.26	0.44	0.013
10/31/2017	0.2	0.0039	0.37	0.62	0.012
11/30/2017	0.2	0.0044	0.46	0.76	0.017
12/31/2017	0.2	0.00615	0.39	0.66	0.020
1/31/2018	0.2	0.0023	0.37	0.62	0.007
2/28/2018	0.2	0.0037	0.44	0.73	0.014
3/31/2018	0.2	0.0023	0.41	0.68	0.008
4/30/2018	0.2	0.0051	0.41	0.69	0.018
5/31/2018	0.2	0.0047	0.40	0.67	0.016
6/30/2018	0.2	0.0058	0.37	0.62	0.018
7/31/2018	0.2	0.0032	0.40	0.67	0.011
8/31/2018	0.2	0.0092	0.34	0.57	0.026
9/30/2018	0.2	0.024	0.40	0.67	0.080
10/31/2018	0.2	0.0025	0.37	0.62	0.008
11/30/2018	0.2	0.0042	0.41	0.68	0.014
12/31/2018	0.2	0.0025	0.42	0.71	0.009
1/31/2019	0.2	0.0025	0.42	0.70	0.009
2/28/2019	0.2	0.0033	0.40	0.66	0.011
3/31/2019	0.2	0.0027	0.39	0.66	0.009
4/30/2019	0.2	0.005	0.37	0.62	0.016
5/31/2019	0.2	0.0051	0.40	0.67	0.017
6/30/2019	0.2	0.0026	0.38	0.64	0.008
7/31/2019	0.2	0.004	0.39	0.65	0.013
8/31/2019	0.2	0.005	0.39	0.65	0.016
9/30/2019	0.2	0.0025	0.38	0.63	0.008
10/31/2019	0.2	0.0025	0.39	0.64	0.008
11/30/2019	0.2	0.0025	0.39	0.64	0.008
12/31/2019	0.2	0.0025	0.38	0.63	0.008
1/31/2020	0.2	0.0025	0.39	0.66	0.008
4/30/2020	0.2	0.004	0.42	0.70	0.014
7/31/2020	0.2	0.0025	0.36	0.60	0.008
10/31/2020	0.2	0.0045	0.34	0.56	0.013
# Samples	35	35		35	35
Minimum	0.20	0.0023		0.44	0.01
Maximum	**0.21**	**0.0240**		**0.76**	**0.080**
Long Term Average	0.20	0.0044		0.65	0.014
95th percentile	0.20	0.0071		0.73	0.022
Standard Deviation	0.002	0.004		0.055	0.012
Coefficient Variation (CV)	0.010	0.836		0.085	0.855
AML Multiplier, 95th percentile, n=4	1.01	1.79		1.07	1.80
AML (AML Multiplier * Long Term Avg)	**0.20**	**0.0079**		**0.70**	**0.026**

APPENDIX G — LOW FLOW

July 26, 2024

The following methods were used to determine the annual 7-day 10-year (7Q10) and seasonal 14-day 5-year (14Q5) low flow statistics at the Montanore Mine ("facility") for its MPDES permit (MT0032158).

HYDROGEOLOGY

The facility discharges to ground water via a percolation pond (Outfall 001) at 48.102222° N latitude, -115.571667° W longitude. The effluent discharges to groundwater and migrates along the groundwater flow path to Libby Creek. Based on ARM 17.30.507(3) the surface water mixing zone begins at the most upstream point of discharge into the receiving water. Based on Hydrometrics (2023) the groundwater flow (direction South 43º East) reaches the most upstream point of discharge to Libby Creek from Outfall 001 is located at 48.10125º N latitude, -115.57046º W longitude. The Hydrometrics (1993, 2023) report estimates that flow direction at Outfall 001 directly towards Libby Creek eventually becomes nearly parallel to Libby Creek as groundwater flows towards the creek based on groundwater elevations measured in June 1993. Based on that estimated change in groundwater flow direction Hydrometrics (2023) estimates that the Outfall 001 discharge will disperse and enter Libby Creek over a distance of approximately 3,400 feet (or 3,700 river-run feet as measured by DEQ) to the downgradient end of the proposed mixing zone on Libby Creek at "LB-300" located at 48.10671º N latitude, -115.55967º W longitude (see Figure G.1).

Figure G.1 Approximate Location of Mixing Zone in Libby Creek (mixing zone shown as red line).

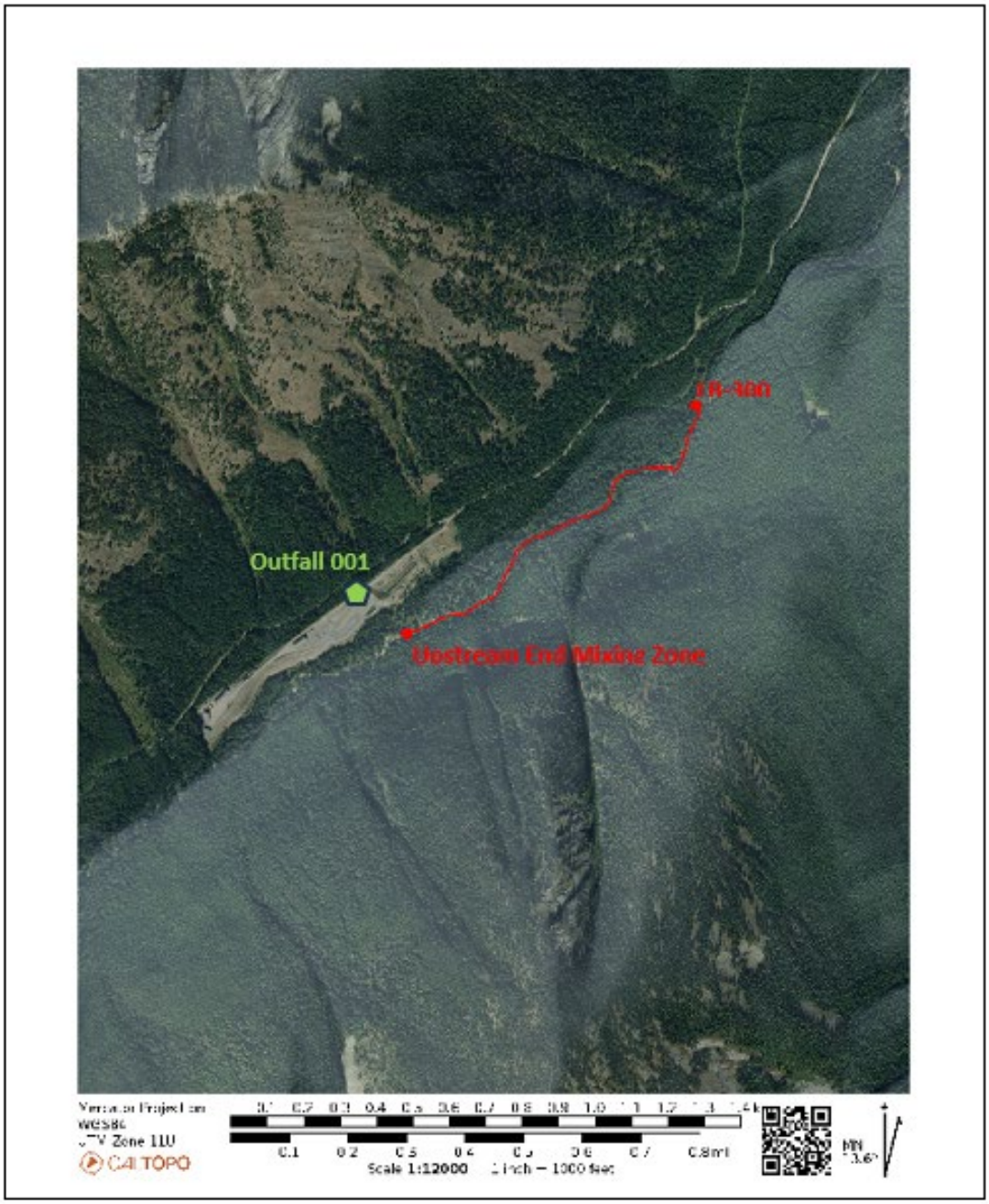
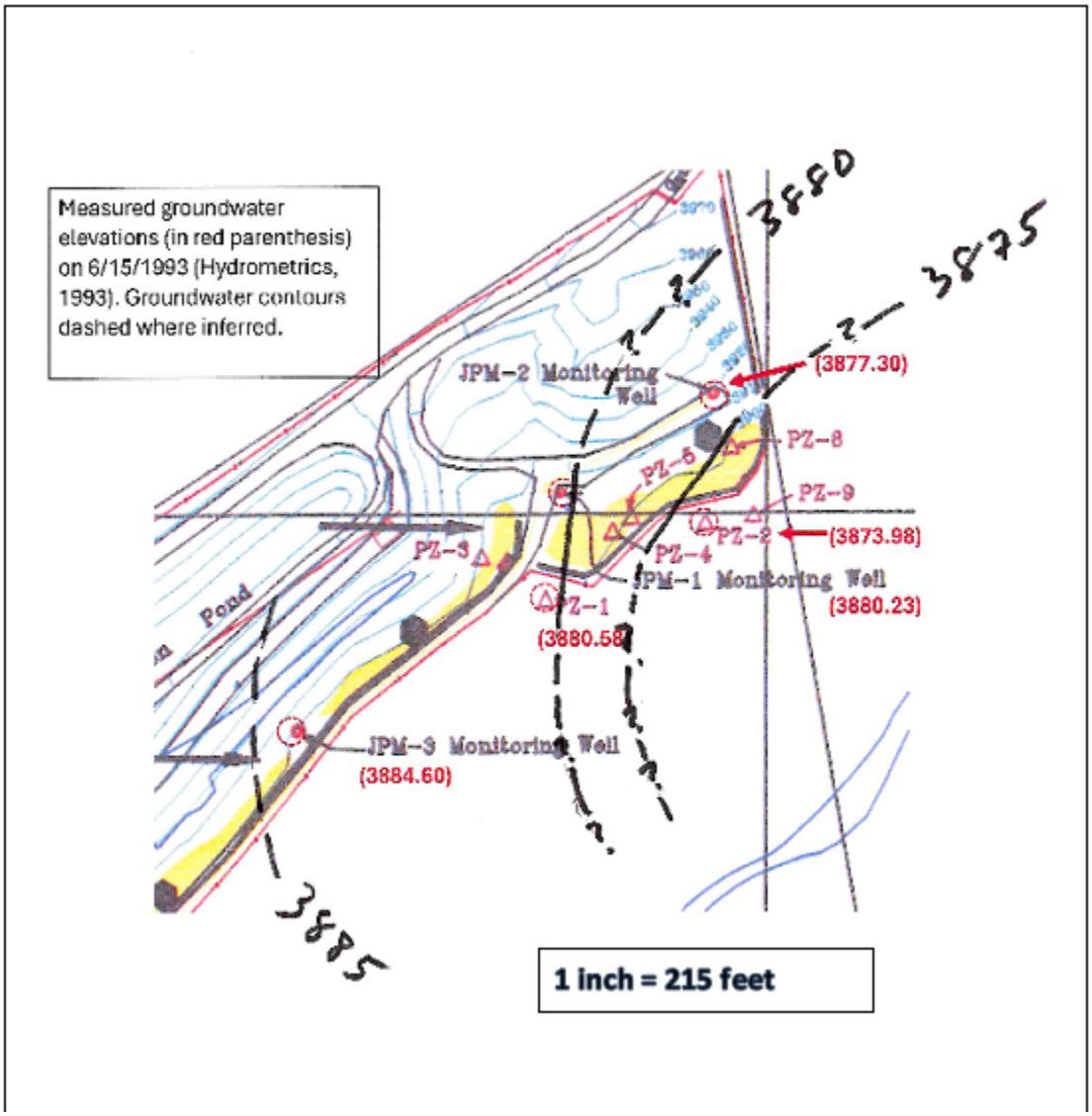


Figure G.2. Groundwater Potentiometric Map June 15, 1993



The June 15, 1993 groundwater elevations were measured in five wells/piezometers (see Figure G.2) on the eastern portion of the property. DEQ used those measurements to prepare a groundwater potentiometric map for that date (Figure G.2). The potentiometric map indicates that groundwater flow likely changes direction from the valley fringes towards the center of Libby Creek. The data is not sufficient to verify the groundwater flow direction submitted by the applicant (Figure 1-2, Hydrometrics 2023) is sub-parallel to Libby Creek (north 60° east). However, the data does indicate that the groundwater flow direction does change as it approaches Libby Creek and it is possible that it does become sub-parallel as estimated by Hydrometrics (2023); additional groundwater monitoring points near Libby creek, in addition to the ones measured in 1993, would be needed to determine the exact groundwater flow directions.

The 2023 Hydrometrics report indicated that approximately a 400-foot-long portion of the creek in the proposed 3,700 foot long Libby Creek mixing zone was dry surface. This indicates that the creek is losing water to groundwater upstream of that location at that time of year (September,

2020). That also suggests the creek may be losing to groundwater elsewhere in the mixing zone, but there is insufficient data to confirm that or what sections may be losing. The fact that the creek is losing to groundwater in at least one location provides evidence that due to those complex stream/groundwater interactions a relatively long mixing zone in Libby Creek as proposed by the applicant is appropriate to ensure the mixing zone includes all the discharges from Outfall 001 even if the groundwater flow direction is not known along the entire 3,700-foot-long mixing zone.

Based on the above information using the downstream end of the proposed surface water mixing zone at LB-300 located at 48.10671º N latitude, -115.55967º W longitude is appropriate.

For purposes of determining low flow statistics for the receiving water, Libby Creek, the location immediately upstream of Outfall 001 and the mixing zone (Figure G.1) was chosen. The upstream location used for the StreamStats-based low flow calculations is 48.10089º N latitude, -115.57091º W longitude. The StreamStats location is based on the same location provided by the applicant and verified by DEQ, but because StreamStats discretizes streams into cells for watershed delineation purposes the latitude/longitude provided by StreamStats are not identical to those previously listed at the beginning of this Hydrogeology section for the upstream end of the mixing zone.

LOW FLOW STATISTICS

There are no long-term streamflow gages located on Libby Creek to determine low flow statistics at the discharge location. Therefore, two options to estimate the low flow statistics were evaluated according to department guidance for determining low-flow statistics. The first is using a long-term gage on a nearby stream with similar hydrology, climate, and drainage area. The second is to use the USGS Streamstats program (McCarthy, 2016). Both methods are described below.

For the first method, there is a USGS gage with long-term streamflow records located on Flower Creek near Outfall 001 that has similar hydrology, climate, and drainage area as the discharge location on Libby Creek. The Flower Creek USGS gage (No. 12303100) is approximately 17 miles north of Libby Creek and drains the east side of Cabinet Mountains similar to Libby Creek. The top of each drainage has similar elevations ranging from 6,000 to over 7,000 feet above sea level. The Flower Creek USGS gage drainage area is 11.2 square miles, the drainage area on Libby Creek at Outfall 001 (7.2 square miles), is similar and within the valid 0.5-1.5 drainage area ratio for comparison (McCarthy, 2016). The drainage area, hydrology and climate of Flower Creek is similar to Libby Creek and is therefore applicable to estimate low flow statistics at the discharge location. A comparison of the Flower Creek and Libby Creek watershed characteristics defined by the USGS StreamStats program is provided in Table G.3 and shows the similarity between the two drainages. Of all the basin characteristics in Table G.3, the USGS (McCarthy et al., 2016) found that three basin characteristics provided the best regression: contributing drainage area, percentage of the contributing basin with slopes greater than or equal to 50 percent, and mean annual precipitation.

Libby Creek above the discharge location is unregulated. Flower Creek is regulated by the Flower Creek dam, but the dam is located 200 feet lower in elevation than the USGS gage and does not affect the flow regime at the USGS gage. The low-flow statistics on Libby Creek can be estimated from the Flower Creek measured low-flow statistics using the drainage-area ratio method (McCarthy et. al. 2016), where the ratio of the drainage area of both sites is used to

adjust the streamflow statistics from the measured gage to the unmeasured gage as shown in Equation 1:

$$Q_u = Q_g \left(\frac{A_u}{A_g}\right)^{exp_{Q,R}}$$

where

Q_u is the streamflow characteristic for the ungaged site,

Q_g is the streamflow characteristic for the gaging station (table 1–1),

A_u is the contributing drainage area for the ungaged site,

A_g is the contributing drainage area for the gaging station (table 1–2), and

exp is the coefficient for drainage area adjustment for the streamflow characteristic (Q) and region (R) of the gaging station (table 1–3).

Because this method only provides estimated values the 95% lower confidence interval values from McCarthy (2016) for the 7Q10 and 14Q5 on Flower Creek are used instead of the mean values to account for uncertainty in the estimate. The low-flow statistical values using this method are provided in Table G.1.

Table G.1. Estimated Low Flow Statistics using Drainage-Area Ratio Method

Parameter	Units	Flower Creek near Libby MT USGS gage	Libby Creek – upstream of Outfall 001
Drainage Area	Square miles	11.2	7.2
Drainage Area Ratio	Ratio	N/A	0.64
Measured annual 7Q10 (1)	Cubic ft/sec	3.55	N/A
Measured seasonal 14Q5 (Jul. – Oct.) (1)	Cubic ft/sec	4.44	N/A
Estimated annual 7Q10 (2)	Cubic ft/sec	N/A	**2.47**(3)
Estimated seasonal 14Q5 (Jul. – Oct.) (2)	Cubic ft/sec	N/A	**3.15**(4)

NOTES:

(1) 95% lower confidence interval measured values from Table 1-1 McCarthy (2016) using period of record 1961-1992. The 95% lower confidence interval was used instead of the mean value to account for uncertainty in the drainage-area ratio method.
(2) Drainage-area ratio method (McCarthy, et. al. 2016) used for estimated values.
(3) The "exp" coefficient used in equation 1 to calculate the 7Q10 in the west hydrologic region is 0.823 (Table 1-3; McCarthy, et. al. 2016).
(4) The "exp" coefficient used in equation 1 to calculate the 14Q5 in the west hydrologic region is 0.775 (Table 1-3; McCarthy, et. al. 2016).

For the second method, the USGS Streamstats program was used to estimate the low flow statistics at the discharge location at Libby Creek. Because this method only provides estimated values the lower 90% prediction interval reported by Streamstats is used to account for uncertainty in the estimate. See Table G.2.

Table G.2. Streamstats Low-Flow Statistics for Outfall 001 Location on Libby Creek		
Statistic	Units	Streamstats Value (1)
Drainage Area	Square miles	7.2
Annual 7Q10	cfs	0.826
Seasonal 14Q5 (Jul. – Oct.)	cfs	1.58

NOTES:

(1) The lower 90% prediction interval value from Streamstats.

I recommend that the low flow values from Table G.1 (**2.47** cfs for 7Q10 and **3.15** cfs for 14Q5) should be used for the permit because while both methods only provide estimated values, the drainage-area ratio method is partially based on long-term measured data in a very similar watershed (Flower Creek) 17 miles north of Libby Creek. The Streamstats method is solely a regional regression-based estimate that doesn't account for site-specific characteristics which are more likely accounted for by using the measured low-flow statistics from Flower Creek and the drainage-area ratio method.

Table G.3. Comparison of Flower Creek and Libby Creek Watersheds defined by USGS Streamstats					
Parameter Code	Parameter Description	Flower Creek at USGS gage (12303100) [48.34487,-115.60634]	Libby Creek at Outfall 001 [48.10089,-115.57091]	Unit	Percent Difference
BSLDEM30M	Mean basin slope computed from 30 m DEM	48.9	58.8	percent	16.8%
CHANWD_RS	Channel width determined from remotely sensed data sources, including aerial imagery	0	0	feet	0.0%
CONTDA	Area that contributes flow to a point on a stream	11.2	7.2	square miles	-55.6%
DRNAREA	Area that drains to a point on a stream	11.2	7.2	square miles	-55.6%
EL5000	Percent of area above 5000 ft	68	70	percent	2.9%
EL6000	Percent of area above 6000 ft	41.4	32.5	percent	-27.4%
ELEV	Mean Basin Elevation	5477.9	5548.9	feet	1.3%
ELEVMAX	Maximum basin elevation	7659	7907	feet	3.1%
ET0306MOD	Spring (March-June) mean monthly evapotranspiration (2001-2011), MODIS	1.79	1.68	inches	-6.5%
ET0710MOD	Summer (July-October) mean monthly evapotranspiration (2001-2011), MODIS	1.96	1.97	inches	0.5%
FOREST	Percentage of area covered by forest	83.6	80	percent	-4.5%
IRRIGAT_MT	Percent of basin that is irrigated based on Montana Final Land Unit (FLU) classification	0	0	percent	0.0%

LAKESNHDH	Percent of basin in lakes, ponds, and reservoirs fom high resolution National Hydrography Dataset	1	0	percent	N/A
LC01CRPHAY	Percentage of cultivated crops and hay, classes 81 and 82, from NLCD 2001	0	0	percent	0.0%
LC01DEV	Percentage of land-use from NLCD 2001 classes 21-24	0	0	percent	0.0%
LC01WETLND	Percentage of wetlands, classes 90 and 95, from NLCD 2001	0	0	percent	0.0%
MINBELEV	Minimum basin elevation	2867	3914	feet	26.8%
NFSL30_30M	Percent area with north-facing slopes greater than 30 percent from 30-meter DEM.	30.4	33.6	percent	9.5%
PRECIP	Mean Annual Precipitation	61.43	74.39	inches	17.4%
RELIEF	Maximum - minimum elevation	4792	3993	feet	-20.0%
SLOP30_30M	Percent area with slopes greater than 30 percent from 30-meter DEM.	71.7	89.6	percent	20.0%
SLOP50_30M	Percent area with slopes greater than 50 percent from 30-meter DEM.	44.4	66.3	percent	33.0%
TEMP	Mean Annual Temperature	37.54	37.12	degrees F	-1.1%
WACTCH	Width of active channel	0	0	feet	0.0%
WBANKFULL	Width of channel at bankfull	0	0	feet	0.0%
Application Version: 4.20.1 StreamStats Services Version: 1.2.22 NSS Services Version: 2.2.1					

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Hydrometrics, Inc. 1993. Aquifer Testing Results and Recommendations for Groundwater Interception Wells at the Montanore Project, Libby, MT. Prepared for Noranda Minerals Corp. August 18, 1993.

Hydrometrics, Inc. 2023. Application for Mixing Zone in Groundwater and Surface Water Montanore Minerals Corporation – Libby Exploration Project – MPDES Permit # MT0032158. Prepared for Montanore Minerals Corp. June 2023.

McCarthy, P.M., 2016, Streamflow characteristics based on data through water year 2009 for selected streamflow-gaging stations in or near Montana: U.S. Geological Survey Scientific Investigations Report 2015–5019–E, 10 p. http://dx.doi.org/10.3133/sir20155019E .

McCarthy, P.M., Sando, Roy, Sando, S.K., and Dutton, D.M., 2016, Methods for estimating streamflow characteristics at ungaged sites in western Montana based on data through water year 2009: U.S. Geological Survey Scientific Investigations Report 2015–5019–G, 19 p., http://dx.doi.org/10.3133/sir20155019G

APPENDIX H — FIGURES

Figure H.1. Site Map

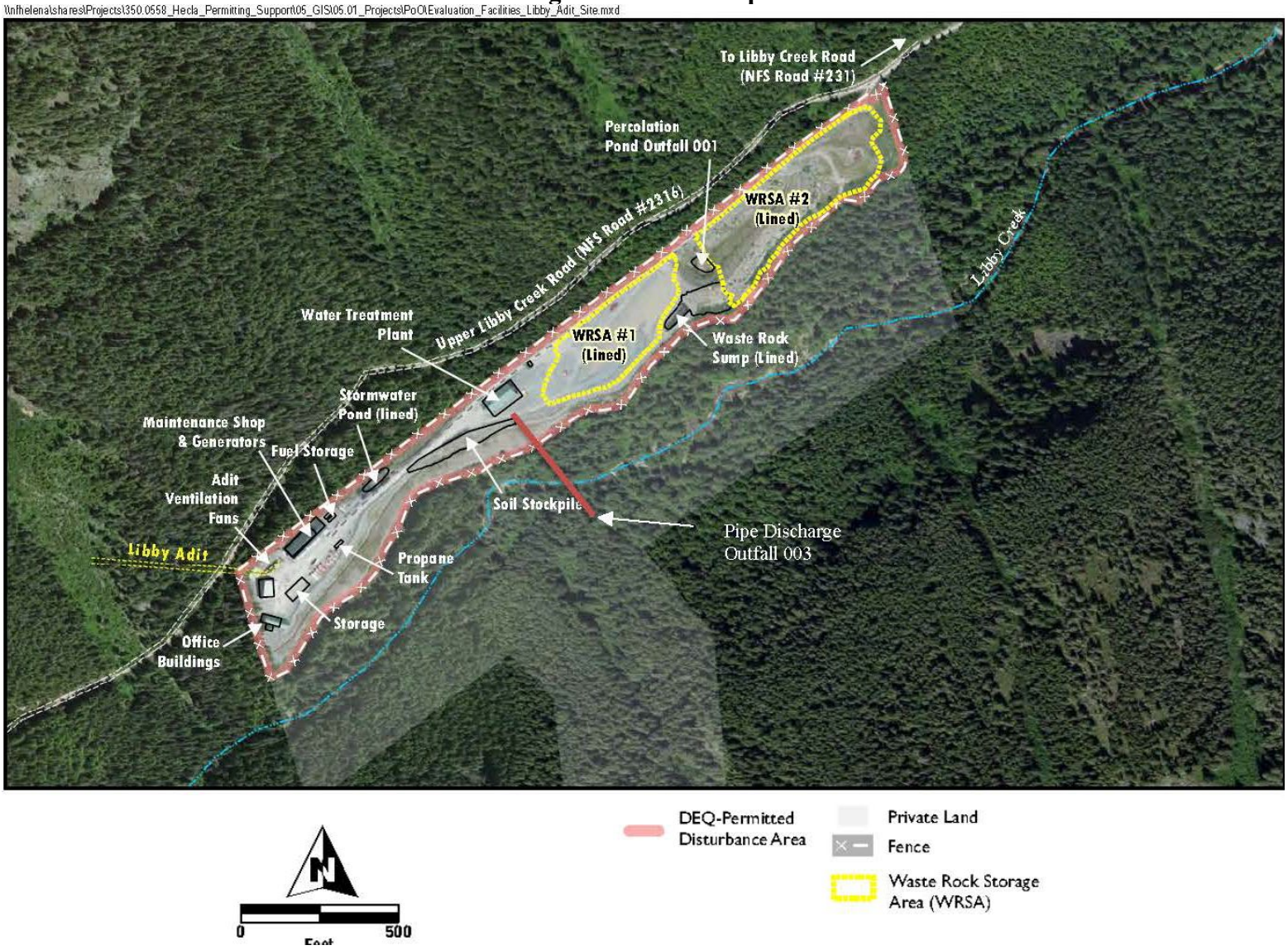


Figure H.2 Map of Mixing Zone

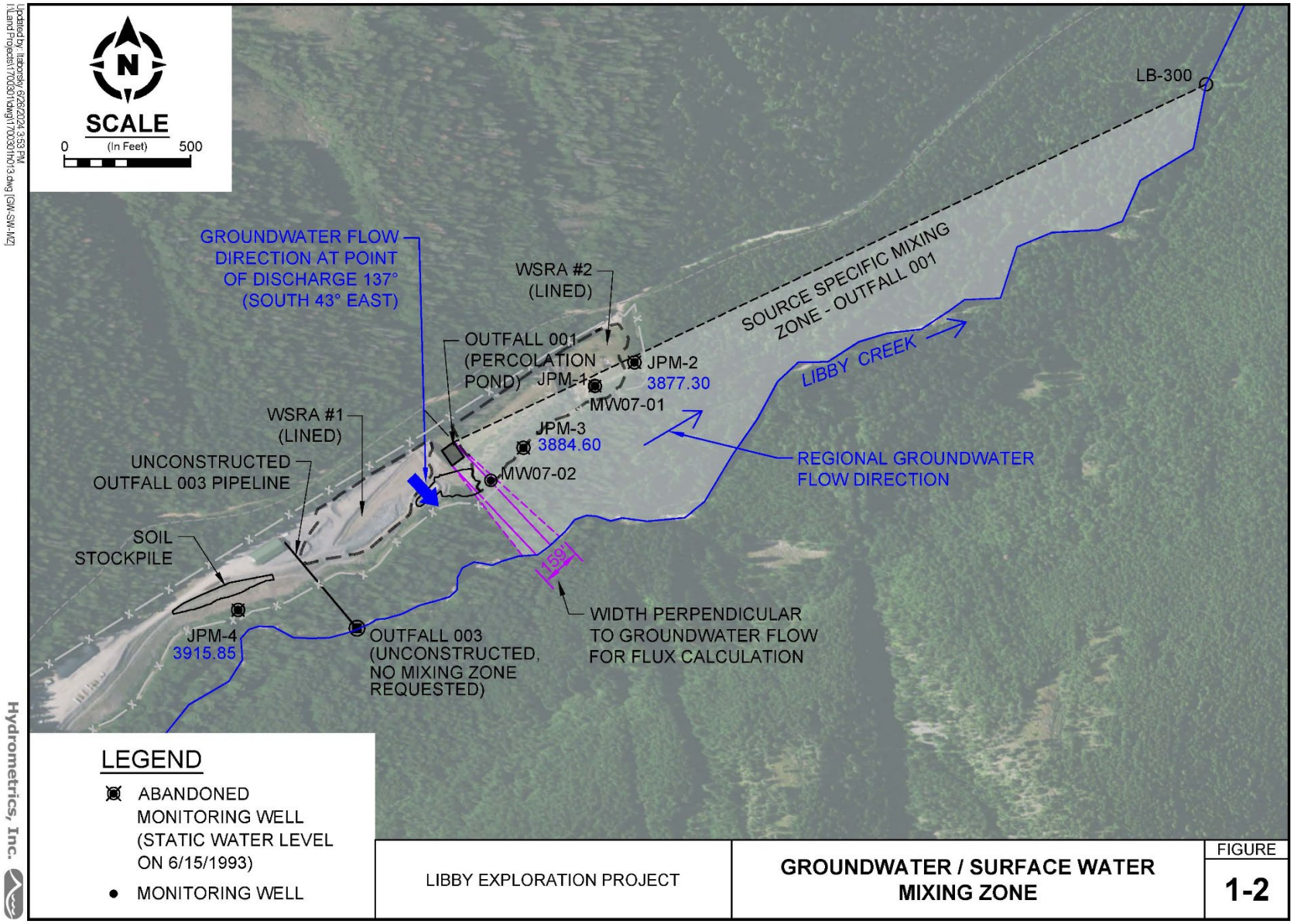
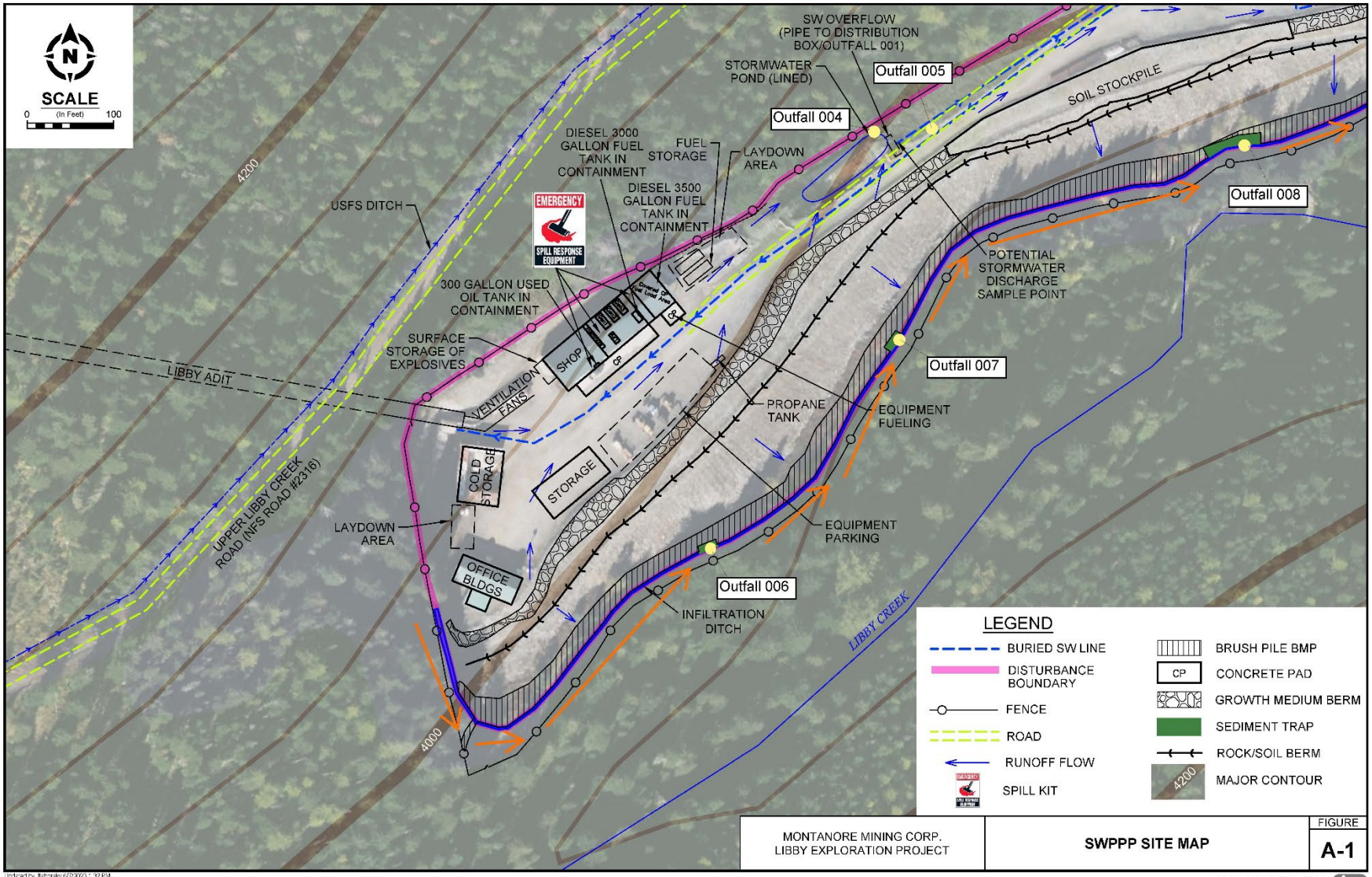
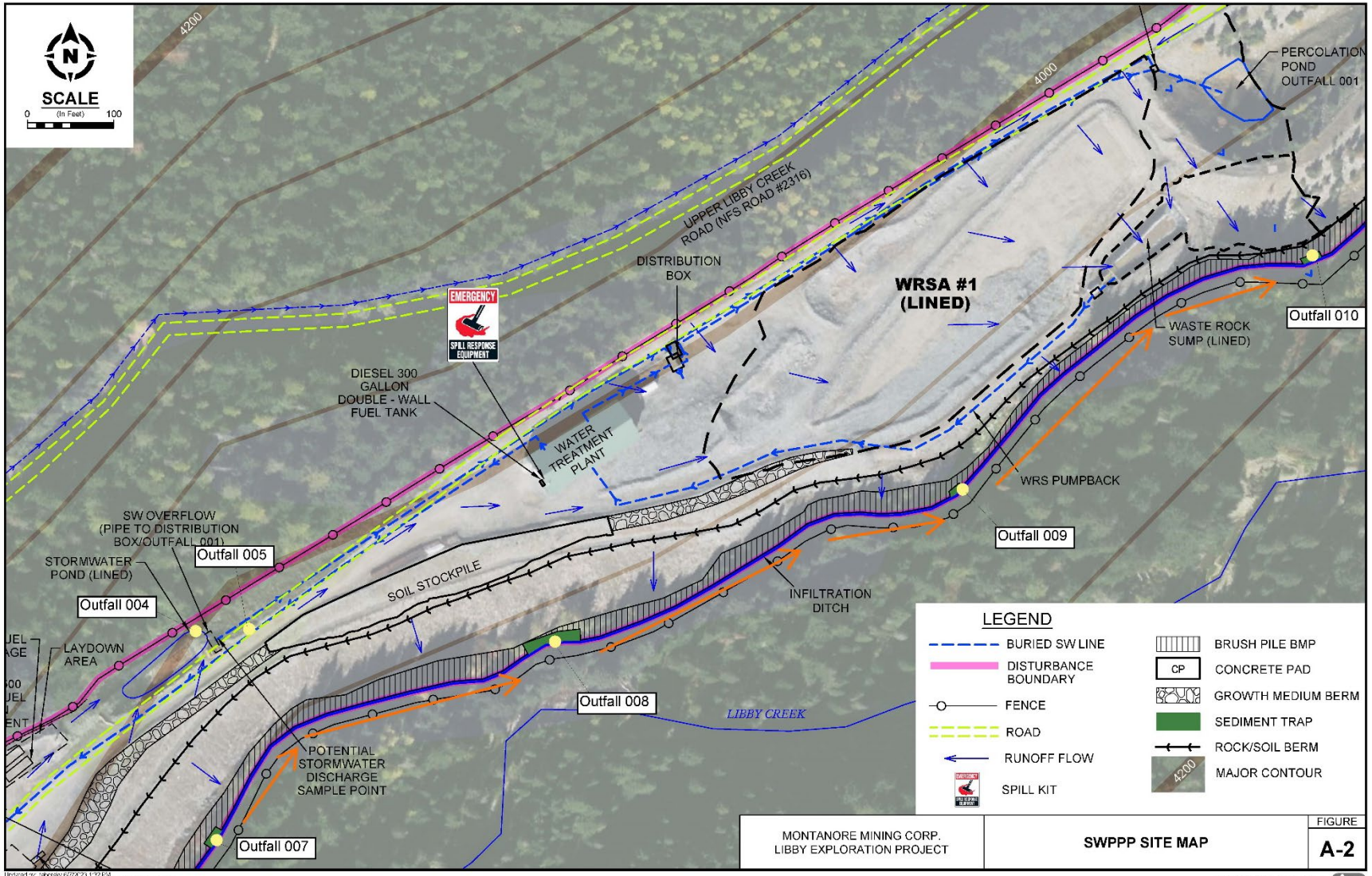


Figure H.3 Map of Impervious Area

Figure H.4 Site Maps of Storm Water Outfalls and BMPs



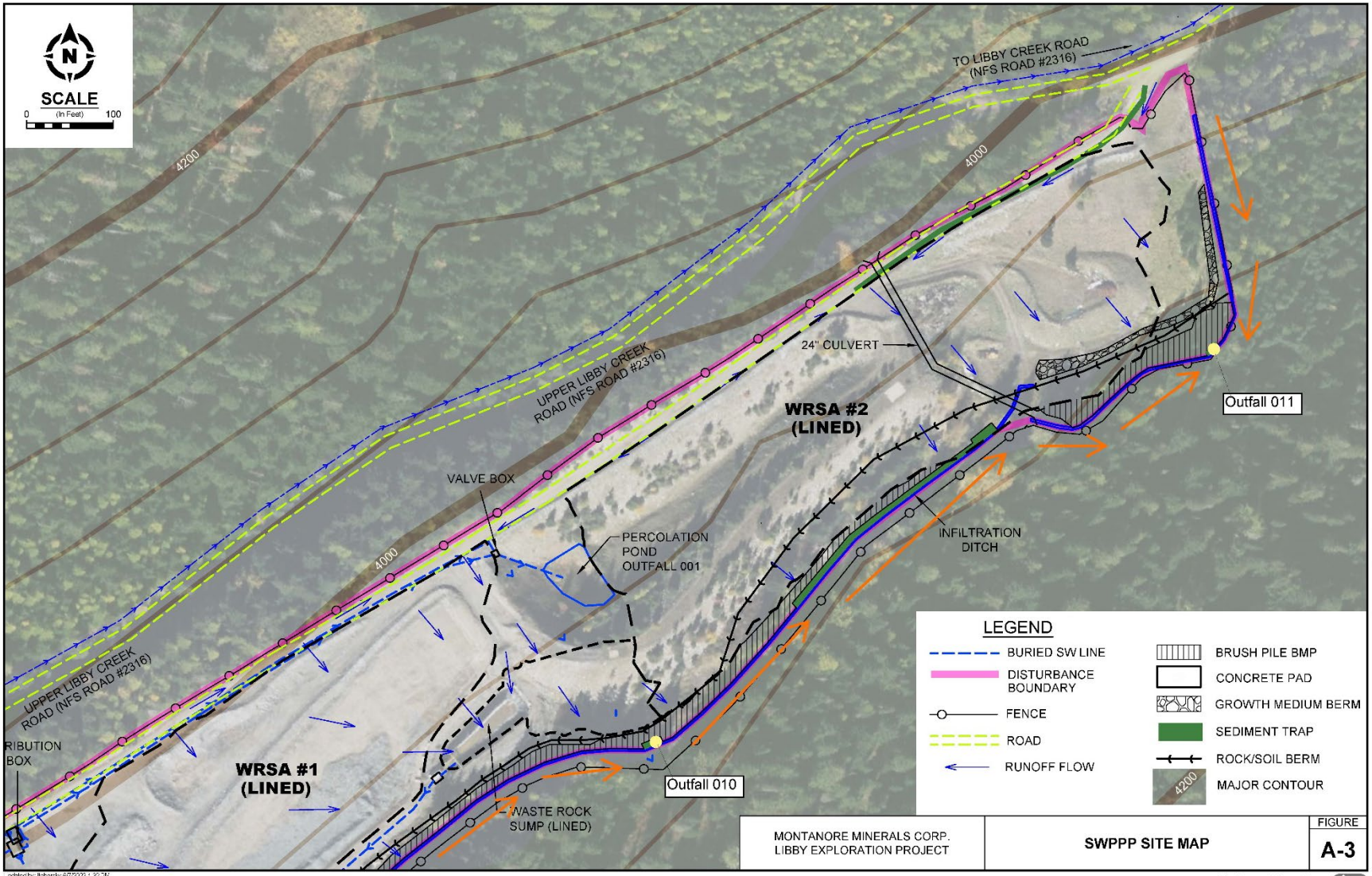


MONTANORE MINING CORP.
LIBBY EXPLORATION PROJECT

SWPPP SITE MAP

FIGURE
A-2

Hydrometrics, Inc.


SCALE
0 (In Feet) 100
TO LIBBY CREEK ROAD (NFS ROAD #2316)
4200
4000
UPPER LIBBY CREEK ROAD (NFS ROAD #2316)
24" CULVERT
WRSA #2 (LINED)
Outfall 011
VALVE BOX
PERCOLATION POND OUTFALL 001
INFILTRATION DITCH
UPPER LIBBY CREEK ROAD (NFS ROAD #2316)
RIBUTION BOX
WRSA #1 (LINED)
Outfall 010
WASTE ROCK SUMP (LINED)
LEGEND
BURIED SW LINE
DISTURBANCE BOUNDARY
FENCE
ROAD
RUNOFF FLOW
BRUSH PILE BMP
CONCRETE PAD
GROWTH MEDIUM BERM
SEDIMENT TRAP
ROCK/SOIL BERM
MAJOR CONTOUR
MONTANORE MINERALS CORP.
LIBBY EXPLORATION PROJECT
SWPPP SITE MAP
FIGURE
A-3
Hydrometrics, Inc.