Valentine Gold Project: Notification of Change to a Designated Project

Final Report

Calibre Mining Corporation
Valentine Gold Mine
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May 7, 2025

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Acronyms / Abbreviations

AC	assimilative capacity
AET	actual evapotranspiration
ARD	acid rock drainage
ARD/ML	acid rock drainage / metal leaching
Calibre	Calibre Mining Corporation
CCME	Canadian Council of Ministers of the Environment
CORMIX	Cornell Mixing Zone Expert System
CWQG-FAL	Canadian Water Quality Guidelines for the Protection of Aquatic Life
EA	environmental assessment
EA Update	Berry Pit Expansion Environmental Registration / Environmental Assessment (Valentine Gold Project) Update
ECCC	Environment and Climate Change Canada
EIS	Environmental Impact Statement
FDP	final discharge point
GHG	greenhouse gas
ha	hectare
HGO	high-grade ore
HMG	high-medium grade
IAAC	Impact Assessment Agency of Canada
LAA	Local Assessment Area
LGO	low-grade ore
MAF	mean annual flow
Marathon	Marathon Gold Corporation
MDMER	*Metal and Diamond Mining Effluent Regulations*
MG	medium-grade
MMF	mean monthly flow
PAG	potentially acid generating
POPCs	parameters of potential concern
Project	Valentine Gold Project
RAA	Regional Assessment Area
SFE	shake flask extraction
TMF	tailings management facility
VC	valued component
WS	subwatershed

1 Introduction

The Valentine Gold Project (the Project) is an open pit gold mine located in the central region of the Island of Newfoundland, proposed by Calibre Mining Corporation (Calibre), previously Marathon Gold Corporation (Marathon). It was subject to environmental assessment (EA) under the *Canadian Environmental Assessment Act*, 2012 and as part of the EA, Marathon submitted an Environmental Impact Statement (EIS) (Marathon 2020) on September 29, 2020, and responded to a number of Information Requirements provided to Marathon by the Impact Assessment Agency of Canada (IAAC). Following review of the EA information provided by Marathon, the Minister of Environment and Climate Change Canada (ECCC) determined on August 24, 2022, that the Project could proceed subject to a number of conditions.

Following approval to proceed on August 24, 2022, two submissions have been made to advise IAAC of Project changes. On January 13, 2023, Marathon informed IAAC of a proposed change to the Project consisting of construction, operation and eventual decommissioning of a communications tower on the mine site. On August 11, 2023, Marathon provided IAAC with information about additional proposed changes to the Project in a document titled "Berry Pit Expansion Environmental Registration / Environmental Assessment (Valentine Gold Project) Update" (herein after referred to as the EA Update; Marathon 2023) which included the addition of a third open pit and modifications to associated infrastructure. The Government of Newfoundland and Labrador reviewed the Project expansion as a Registration for a new Designated Undertaking and conducted a public comment period under the *Newfoundland and Labrador Environmental Protection Act*. The Project expansion was released from provincial EA, subject to conditions, on October 27, 2023.

As per Condition 2.16 of IAAC's Decision Statement, Calibre is required to notify IAAC in advance of carrying out any proposed changes to the Project as defined in Condition 1.8, as well as consult with Indigenous groups on the proposed changes. Specifically, the following is required in the notification:

> *2.16 If the Proponent is proposing to carry out the Designated Project in a manner other than described in condition 1.8, the Proponent shall notify the Agency in writing in advance of carrying out those proposed activities. As part of the notification, the Proponent shall provide:*
>
> - *2.16.1 a description of the proposed change(s) to the Designated Project and the environmental effects that may result from the change(s);*
> - *2.16.2 any modified or additional measure to mitigate any environmental effect that may result from the change(s) and any modified or additional follow-up requirement; and*
> - *2.16.3 an explanation of how, taking into account any modified or additional mitigation measure referred to in condition 2.16.2, the environmental effects that may result from the change(s) may differ from the environmental effects of the Designated Project identified during the environmental assessment.*

Calibre is currently proposing Project changes to support further engineering refinements and improvements. These refinements are described in Section 2 and include modification and separation of the originally planned high-grade ore (HGO) stockpile, increased fuel storage, an expansion to the camp area, additional laydown areas, and an increase in the size of the process plant pad. Potential environmental effects as a result of these proposed changes, specifically if these Project refinements alter the effects predictions previously provided for the Project, are described in Section 3 and additional mitigation, where applicable, provided in Section 4.

The proposed Project refinements do not constitute a substantive change to the scope of the Project, either individually or in combination. Given the conservative approach to the effects assessment employed in the EIS, the information presented in Section 3 of this document demonstrates that the environmental effects conclusions as presented in the EIS and EA Update have not changed as result of these proposed Project refinements.

2 Description of the Proposed Project Refinements

Project refinements are typical in the evolution of a mining project as it progresses through detailed design and construction. The rationale for the currently proposed Project refinements, along with a description of the changes, are provided in Table 2.1 and shown in Figure 2.1. A few key aspects of these proposed changes are highlighted below:

- The proposed Project refinements described in Table 2.1 occur fully within the Project Area as defined in the EIS and EA Update. The assessments of Project effects on Valued Components (VCs) in the EIS and EA Update conservatively assumed that all habitat within the Project Area would be lost either through direct or indirect disturbance. So, while the Project refinements will result in an increase in cleared area within the mine site of 48.37 hectares (ha) (0.4837 km^2), the effects of this habitat loss were already assessed in the EIS and EA Update. Note that the approved Project results in a cleared footprint within the mine site of 11.5 km^2. The proposed Project refinements would result in an approximately 4% increase in the cleared area within the mine site.
- In relation to the *Physical Activities Regulations*, the previous total area of mining operations was 10.3837 km^2. Therefore, the proposed Project refinements represent an approximately 5% increase in the area of mining operations.
- The proposed Project refinements do not represent new types of activities or infrastructure, but rather an expansion or extension of activities and infrastructure that were already part of the approved Project. The expanded infrastructure will be constructed, operated, maintained, and decommissioned in a manner consistent with that described in the EIS and EA Update, and the mitigation and environmental protection procedures identified in the EIS and EA Update will continue to be applicable and appropriate for these Project refinements. Water management infrastructure required to address the changes to the stockpiles are outlined in Section 2.2. As the proposed changes do not represent new types of activities or infrastructure, the assessment of accidental events as presented in the EIS and EA Update is also considered applicable and valid. For example, while the volume of diesel fuel stored on site is proposed to be increased (Table 2.1), it will still be transported to site and stored on site in a manner consistent with that described in the EIS. Therefore, the assessment of an accidental diesel fuel spill as presented in the EIS is valid and applicable.
- The proposed changes do not result in new permanent infrastructure. The stockpiles, laydown areas, and expanded accommodations camp and fuel storage will be progressively rehabilitated when no longer required and/or will be fully decommissioned and rehabilitated at the end of operations, consistent with the decommissioning, rehabilitation and closure plan described in the EIS and EA Update.
- While the specific rationale for each refinement is provided in Table 2.1, the key reason for these proposed changes is to provide Calibre with improved operational flexibility, including improved efficiency and safety, given evolving external and internal factors, including construction and operation schedules.

Table 2.1 Refinements to the Project Description

Corresponding # on Figure 2.1	Project Refinement	Rationale for Refinement
1.	Calibre proposes the separation of the HGO stockpile into two high-medium grade (HMG) ore stockpiles and two medium-grade (MG) ore stockpiles. Two of these stockpiles are within the footprint of the originally planned HGO stockpile and two additional stockpiles proposed are outside the tailings management facility (TMF) drainage footprint. Additional detail on the stockpile refinements is provided in Section 2.1. This will result in an increase in the stockpile footprints by 22.09 ha. The stockpiles will be developed in a manner consistent with development of other stockpiles for the Project and as outlined in Section 2.3.2.3 of the EIS. Water management infrastructure, including ditches and a sedimentation pond will be required to support this modification. This will result in an increase in the water management footprints by 2.99 ha. Additional detail on the water management refinements is provided in Section 2.2.	The changes to the HGO stockpiles are required due to a combination of factors, including increasing gold price and related decreases in cut-off grade, refinements to the mine plan, improved flexibility to blend and/or separate HGO materials for processing, and the need to maintain space for HGO material after the original HGO stockpile location is needed for tailings storage.
2.	Calibre proposes to increase the approved diesel fuel storage of 450,000 litres (Section 2.3.13 of the EIS) to 950,000 litres. The fuel storage area will be upgraded with full liner system, concrete bases, double contained tanks, and oil water separators to accommodate the additional storage capacity.	The expanded fuel storage capacity will provide Calibre with the ability to store more fuel, thereby increasing operational flexibility in the case fuel trucks are unable to reach the site at certain times of the year due to weather and/or road conditions. The number of annual trucks is not anticipated to increase as a result of the additional storage, but the timing of deliveries would be altered around seasonal restrictions on road access.
3.	The camp expansion is proposed west of the existing camp facility and will result in an increase of 3.74 ha. The expansion is temporary and expected to be required for two to four years. The camp area expansion would include additional parking areas, the addition of up to 250 rooms, as well as a temporary kitchen and upgrades to the existing potable water and sewer treatment plants. The camp expansion will support more workers (contract) and will increase road traffic on the access road (approximately an additional 2-3 busses (return trips) every two weeks, plus equipment mobilization). An additional back-up generator will also be required; currently there are two back-up generators for the current camp setup, a third will be required for this expansion (600KW - 1.1MW (to be determined)).	The camp expansion is required to accommodate additional contracted personnel on site related to changing schedules for continued construction activities, which are now overlapping with operations. Greater overlap of ongoing and future construction personnel with operations personnel will require additional camp-related facilities for the next two, and possibly up to four years.

Table 2.1 Refinements to the Project Description

Corresponding # on Figure 2.1	Project Refinement	Rationale for Refinement
4.	Additional laydown areas, as shown on Figure 2.1, are proposed for storing materials, equipment, and/or supplies, resulting in a footprint increase of 12.59 ha. In addition, there is a section of haul road that will be widened. Site preparation and earthworks will be conducted in a manner consistent with other site preparation activities conducted for the Project, and as outlined in Sections 2.4.1 and 2.4.2 of the EIS. The laydown areas will only be used for mobile equipment, construction materials, and bulk project supplies, such as high-density polyethylene piping, rebar, and lumber.	Additional laydown areas are needed to provide flexibility to accommodate changes and fluctuations in storage requirements and materials arriving on site. The location of the new, proposed laydown areas are planned in areas to increase logistical efficiency for better planning of material deliveries and streamlined movement and maintenance of equipment.
5	An addition is proposed to the south and west extent of the process plant pad, and areas adjacent to the crusher and conveyor. The additional areas are expansion of working areas only and no new infrastructure development / construction (i.e., buildings) is required. This will result in a footprint increase of 6.96 ha. Site preparation and earthworks will be conducted in a manner consistent with other site preparation activities conducted for the Project and as outlined in Sections 2.4.1 and 2.4.2 of the EIS.	The additional space adjacent to the crusher and conveyor is required to provide improved access for maintenance and improved efficiency and safety. The expansion to the south and west of the process plant pad is to provide further space for equipment movement and operation (e.g., cranes for Phase 2 construction and operational maintenance), and temporary laydown.

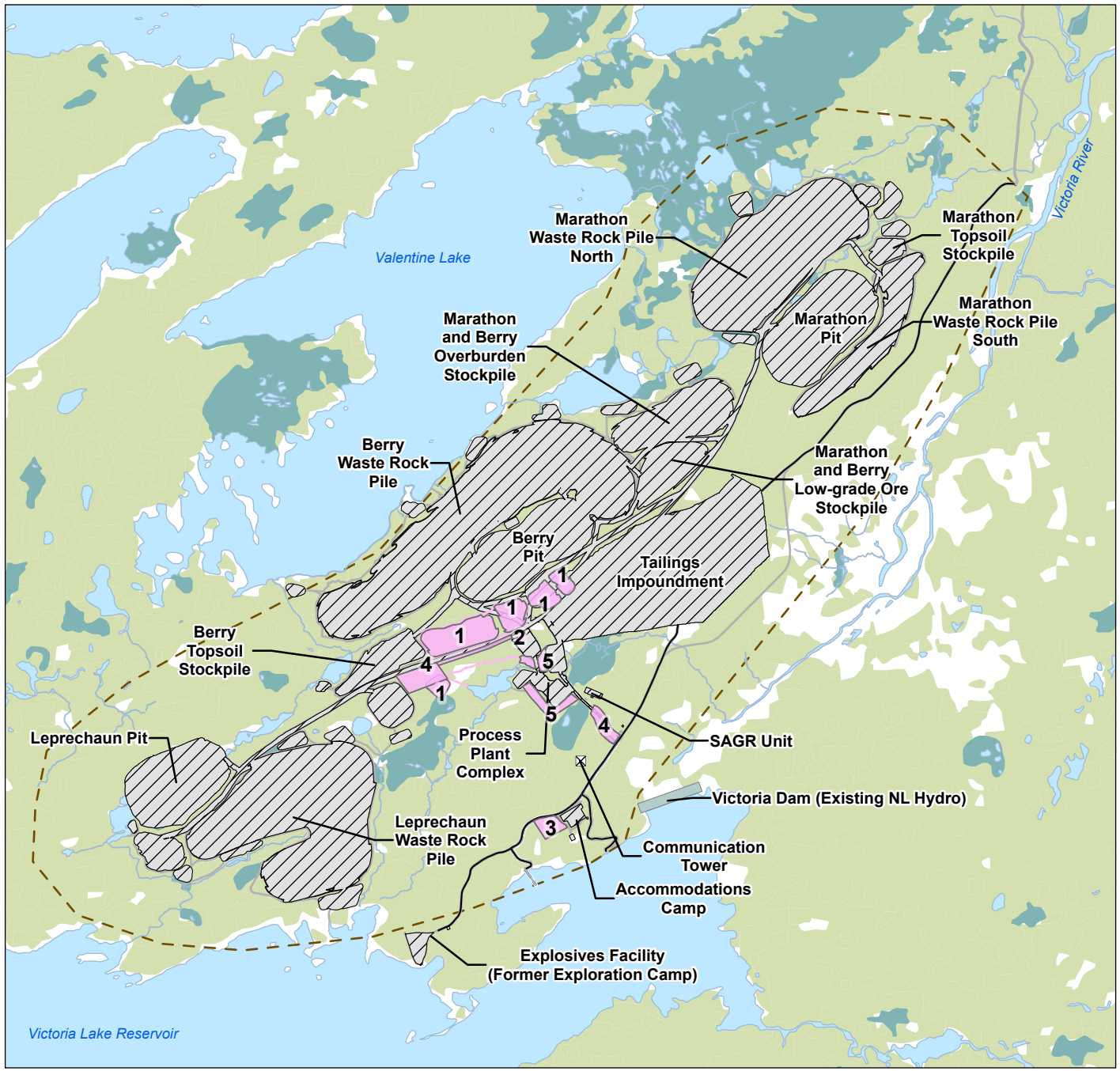

Figure No.
2.1
Title
Project Refinements Layout

Client/Project
Calibre Mining Corporation
Valentine Gold Project
121418425_001

Project Location
Valentine Lake
Central Newfoundland, CA

Prepared by MB on 2025-05-02

N

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Metres
(At original document size of 8.5x11)
1:55,000

- Project Refinement Component
- Approved Project
- Mine Site

Other Features

- Watercourse
- Victoria Dam
- Waterbody
- Wetland
- Forested Area

Notes
1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
2. Data Sources: Cailbre Ming Corporation, Stantec
3. Background: CanVec Natural Resources Canada

Stantec

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2.1 Refinements to the Stockpiles

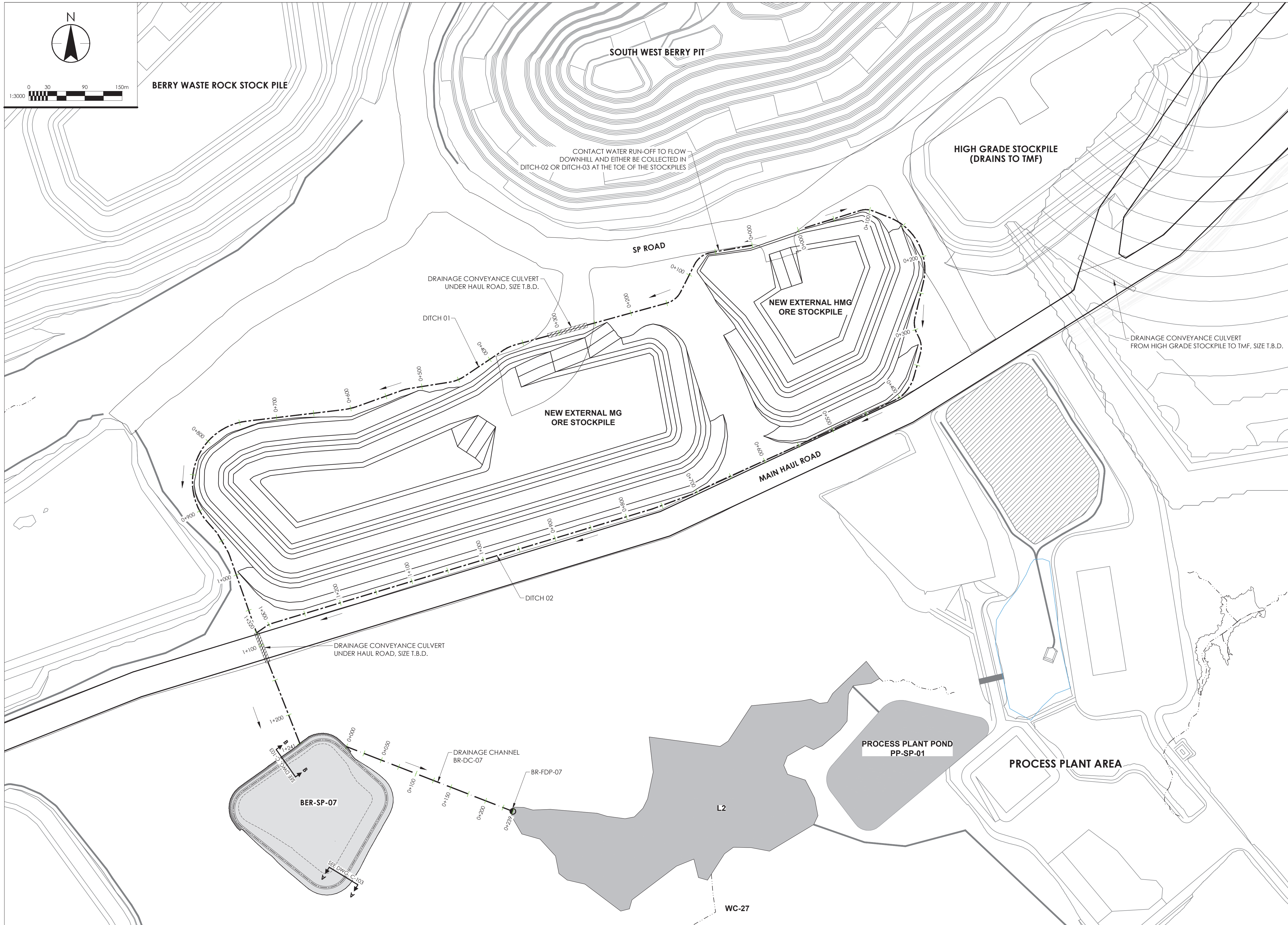
The designated Project was approved with a single HGO stockpile located south of the Berry Pit and within the footprint of the TMF. This original HGO stockpile will be split into two piles (a MG and a HMG stockpile), which will still be located within the footprint of the fully developed TMF. In addition, two new piles will be added to the west of the original pile (a MG and a HMG stockpile), which will be located outside of the TMF footprint.

Each of the piles outside the TMF will be constructed in 2026. The stockpiles in the TMF footprint are planned to be removed 6-7 years after the start of construction. The new HMG stockpile (west of the TMF) is planned to be exhausted before the end of mining operations in 2030 (4 years of stockpile operation). The MG stockpile (west of the TMF) will be exhausted by 2036 (10 years of stockpile operation). The processing timing for ore stockpiles could be extended if Calibre realizes more inferred or proven ore bodies than forecasted.

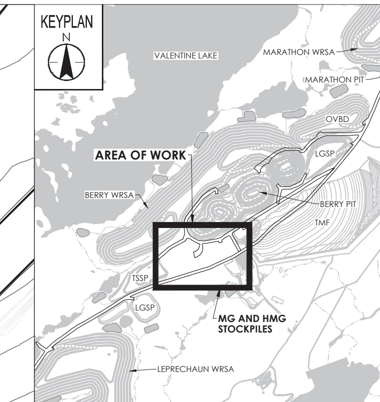
2.2 Water Management

Water management infrastructure, including ditches and a sedimentation pond, will be required to support modifications to the stockpiles (Figure 2.2). The split HMG and MG stockpiles replacing the former HGO stockpile will not require a drainage plan revision as the piles are located within the drainage footprint of the TMF and will continue to be managed as part of TMF water management. The new HMG and MG stockpiles to the west will require perimeter runoff collection ditching and a downstream sedimentation pond (BR-SP-07). The sedimentation pond will be designed to provide adequate residence time for settling and have controlled release discharge via a new final discharge point (FDP), BR-FDP-07, to the nearest natural waterbody, Pond L2, which will meet the *Metal and Diamond Mining Effluent Regulations* (MDMER) limits. Pond L2 drains via unnamed watercourse 27 to Victoria Lake Reservoir. Due to the potential for acid rock drainage (ARD) from the HMG and MG ore, the sedimentation pond will exclusively manage runoff from these piles. ARD potential will be monitored for the MG stockpile where ore may reside in the pile longer than the ARD onset time. If the monitored water quality at the sedimentation pond increases towards MDMER limits, the pond discharge to the environment will be blocked and the water will instead be transferred via pipeline to the mine's Effluent Treatment Plant for treatment prior to discharge to the environment.

The proposed laydown areas will not require new water management infrastructure as they will be managed in the same manner as existing laydown areas at the site with inert materials being stored on aggregate pads and local drainage going to existing roadside ditches or the surrounding environment as surface runoff. The expanded accommodations camp will be designed to drain via an expanded perimeter ditch network to an existing dissipation pool that discharges to a wooded area as overland flow. The dissipation pool sizing will be assessed and resized as required in detailed design to accommodate additional flow from the accommodations camp expansion.



KEYPLAN



LEGEND

- 420 — EXISTING CONTOUR, 5 m
- FLOW ARROW
- POND FOOTPRINT
- FLEXIBLE HOSE PIPELINE
- DITCH CENTERLINE
- DRAINAGE CHANNEL
- CULVERT

NOTES

PRELIMINARY NOT FOR CONSTRUCTION

Not for permits, pricing or other official purposes. This document has not been completed or checked and is for general information or comment only.

PERMIT

SEAL

SEAL

DRAWING No.	REFERENCE DRAWING	Rev	BY	DATE	REVISION DETAILS	CHKD	ENG	APPR	CLNT

DRAWN	
CHECKED	
DESIGNED	
DES. APPR	
PROJ APPR	
CLIENT APPR	

Calibre VALENTINE GOLD MINE

Stantec Consulting Ltd.
141 Kelsey Drive
St. John's NL
Tel. (709) 576-1458
www.stantec.com

Stantec

PROJECT: VALENTINE GOLD MINE

TITLE: NEW HMG AND MG STOCKPILE CONCEPTUAL WATER MANAGEMENT PLAN

PROJECT No	SCALE	SIZE
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C-101	A

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2.2.1 Water Management Plan and Design

The design criteria used in the Water Management Plan Update for the Berry Pit Expansion provides details on the key site-specific mitigation measures to reduce the potential effects as identified in the EIS and EA Update on surface water quantity and quality. The plan will be updated to incorporate the infrastructure and development areas in this proposed Project refinement, including BER-SP-07 and its FDP, prior to construction.

The BER-SP-07 sedimentation pond will provide controlled releases of discharge and is designed to provide adequate residence time for settling. Permanent pools in the pond will be excavated below grade, thus reducing the total dam height and improving dam safety. Effluent will be released slowly to enhance baseflow augmentation and reduce the potential for downstream scour and erosion. MDMER limits will be met at BER-FDP-07 prior to release to the receiver (Pond L2 and watercourse 27).

Sedimentation ponds, including BER-SP-07, are designed based on particle settling characteristics. The minimum target particle size is 5 microns, and the assumed settling velocity of the particles is 2×10^{-5} m/s (conservatively assuming the temperature of the water in the pond is close to freezing). Given a minimum vertical settling zone of 1 m, it will take 14 hours for a particle to reach the trapped sediment zone below the pond outlet invert. Ditches will be constructed along the perimeter of piles to convey the 1:100 AEP surface runoff and toe drainage to sedimentation ponds for water quality and quantity control. Trapezoidal geometry ditch runs will be designed to convey flow through gravity and provide a minimum of 20 cm freeboard under design flows. Ditch excavation materials will be sidecast and berms constructed of the sidecast glacial till material. Ditches will be lined with rip-rap for erosion protection. In areas with ditch gradients steeper than 8%, sediment traps (i.e., check dams) will be installed at a spacing of 200 m per ditch grade % to provide energy dissipation and reduce erosional flow velocities in the ditch. For the same purpose, energy dissipation pools will be installed at the change in ditch gradient from slopes of 10% higher to shallower slopes.

The drainage area to BER-SP-07 is 15.8 ha for the MG stockpile, 6.2 ha for the HMG stockpile and 16.2 ha for disturbed ground around the piles and surrounded by haul roads. The pond will have an approximate active storage capacity of 59,000 m^3 and 17,000 m^3 of dead storage, with a maximum depth of 6 m. The pond has an approximate surface area of 29,880 m^2.

Following removal of the MG and HMG stockpiles, and while vegetation is allowed to establish in the former pile areas, BER-SP-07 and other existing water quality treatment infrastructure will continue to operate. When vegetation has established on the rehabilitated pile areas, the BER-SP-07 pond will be breached to allow drainage to the natural ground and local receivers, and water management features will be removed and restored to natural, pre-development drainage conditions.

2.2.2 Acid Rock Drainage / Metal Leaching Management Plan

In addition to the water management plan update, the Acid Rock Drainage / Metal Leaching (ARD/ML) Management Plan developed for the Project will be revised prior to construction to include maximum storage holding times for the HMG and MG ore in the new stockpiles to align with aging predictions and water quality source terms. Additionally, HMG and MG ores will be preferentially directed to the mill feed to limit exposure of potentially acid generating (PAG) materials to maintain seepage and runoff water quality below MDMER limits.

3 Potential Environmental Effects as a Result of the Change

A review has been conducted to determine if the Project refinements outlined in this notification result in changes to the effects predictions provided in the EIS and EA Update for the various VCs. Note that the geographic boundaries (i.e., Project Area, Local Assessment Areas (LAAs) and Regional Assessment Areas (RAAs)) described in the EIS and EA Update for each VC have not changed as a result of the modification. As indicated above, Project refinements are located within the mine site (i.e., within the assessed Project Area).

3.1 Atmospheric Environment

An assessment for Atmospheric Environment was provided in the EIS (Chapter 5) and EA Update (Chapter 6). The following effects were assessed for this VC:

- Changes in air quality
- Change in greenhouse gas (GHG) emissions
- Change in sound quality
- Change in light levels

The refinements detailed in Table 2.1 do not alter the effects prediction and significance conclusions in the EIS and EA Update with respect to a change in air quality, GHG emissions, sound quality, or light levels within the LAA:

- Minor changes to the releases of fugitive dust from the modified storage piles and additional cleared areas for laydown and the process plant pad are not likely to result in a substantive change in the resulting downwind ambient concentrations. Dust control measures would continue to be in place as described in the EIS and EA Update.
- While there is a proposed increase in fuel storage capacity to provide operation flexibility, Calibre is not proposing to increase the size of its equipment fleet. Therefore, the annual diesel consumption rate is not anticipated to increase.
- The addition of one more back-up generator and incremental road traffic (2-3 busses every 2 weeks) associated with the camp expansion (Table 2.1) could result in a small increase in air contaminant, GHG and noise emissions, but do not result in changes to the characterization of residual adverse effects, proposed mitigation, or overall conclusions described in the EIS.

3.2 Groundwater Resources

3.2.1 Effects Assessed

An assessment for Groundwater Resources was provided in the EIS (Chapter 6) and EA Update (Chapter 7). The following effects were assessed for this VC:

- Change in groundwater quantity
- Change in groundwater quality

The proposed additional fuel storage, expansion of the camp, additional laydown area, and addition to the process plant pad do not alter the effects prediction and significance conclusions in the EIS and EA Update with respect to a change in groundwater quantity or quality:

- Minor changes in water withdrawals from the existing surface water supply for the expansion of the accommodations camp will not substantially affect local or regional groundwater.
- Minor changes in local groundwater recharge rates from additional compacted surfaces related to the additional laydown area and fuel storage tank area, and addition to the process plant will not substantially change infiltration in the Project Area.

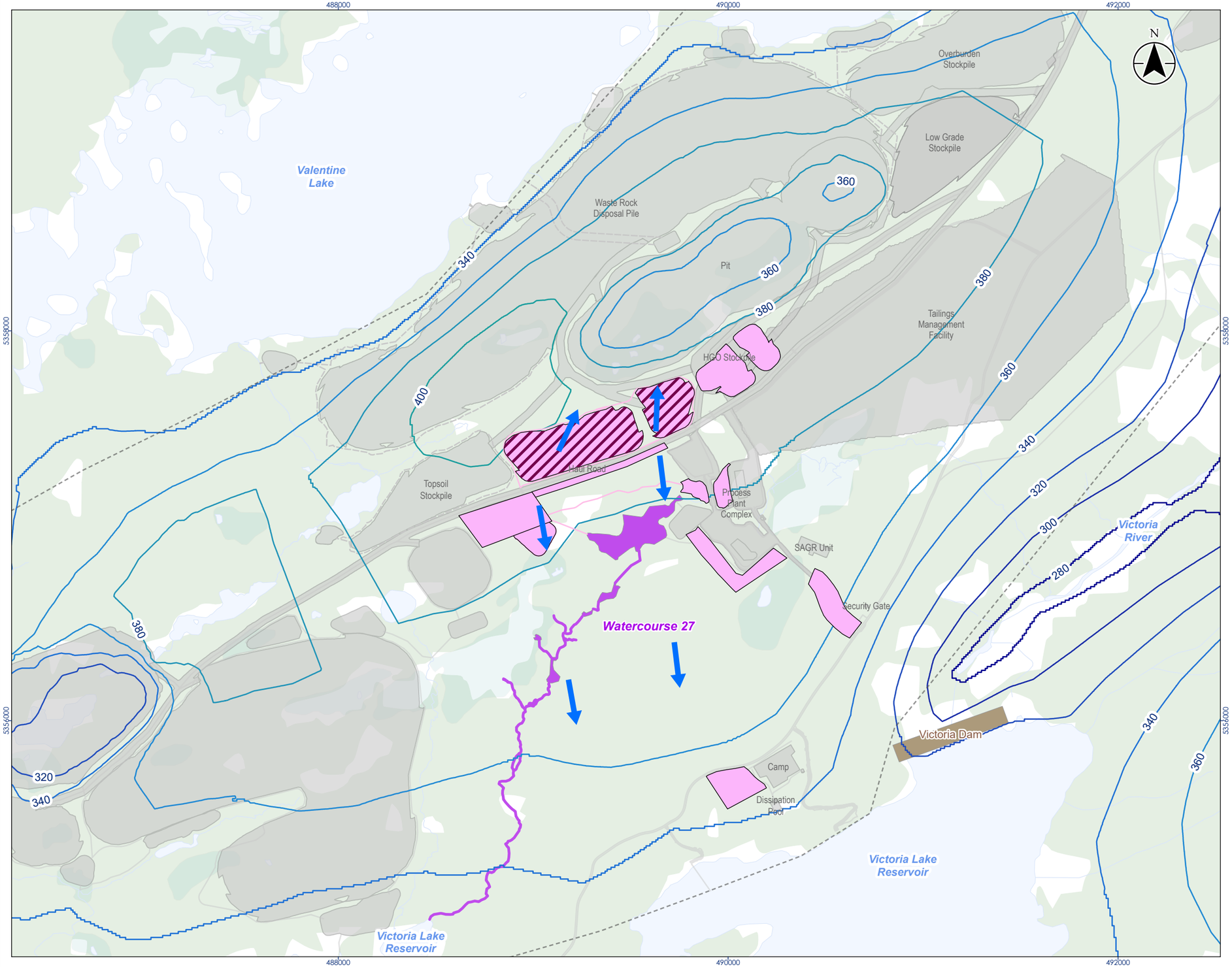
To evaluate whether the relocation and separation of the HGO stockpile would result in changes to these effects as presented in the EIS and EA Update, further analysis was conducted and is described below in Section 3.2.2.

3.2.2 Relocation and Separation of the HGO Stockpile

Based on groundwater modeling completed as part of the EIS and EA Update, seepage from the base of the currently approved location of the HGO stockpile is expected to drain primarily to the pit dewatering system of the Berry Pit and to the TMF during operations. Seepage not captured by the dewatering system of the Berry Pit would flow south-southeast, along with the majority of deeper TMF seepage toward Victoria River.

The proposed separation of the HGO stockpile into HMG and MG stockpiles increases the total footprint of these stockpiles from 9.76 ha to 31.85 ha and shifts the stockpiles away from the groundwater capture zone of the Berry Pit. Therefore, an assessment of groundwater quantity and quality was conducted using semi-quantitative methods by assessing infiltration, stockpile seepage, and the shallow groundwater flow regimes determined for the new location of the stockpiles.

Based on steady state drawdown predicted from groundwater modelling completed as part of the EIS and EA Update, the majority of the footprint of the new stockpiles would remain within the groundwater capture area of the Berry Pit (Figure 3.1). However, it is acknowledged that the results of groundwater modelling are based on steady-state groundwater flow with a fully excavated Berry Pit. Since the stockpiles will be constructed before the pit is fully excavated, the majority of seepage is anticipated to flow south and discharge to Victoria Lake Reservoir and to watercourse 27, which also discharges to Victoria Lake Reservoir, as shown on Figure 3.1.



Stantec

Legend

- HMG and MG Ore Stockpile
- Project Refinement Components

Steady State Operational Water Table Elevation Contours (m amsl)

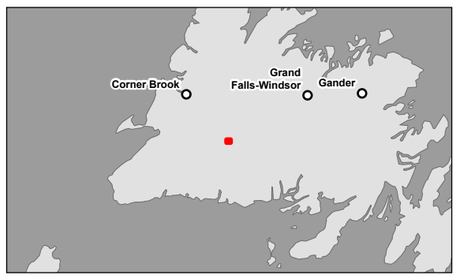
- 260 - 280
- 280 - 300
- 300 - 320
- 320 - 340
- 340 - 360
- 360 - 380
- 380 - 400

- Mine Site
- Approved Project Components
- Victoria Dam
- Inferred Direction of Groundwater Flow

0 0.5 1 km

1:20,000 (At original document size of 11x17)

Notes
1. Coordinate System: NAD 1983 UTM Zone 21N
2. Base Data: CANVEC



Project Location
Valentine Lake
Central Newfoundland, CA

121418425 REVA
Prepared by AW on 2025-04-24
Technical Review by AP on 2025-04-24

Client/Project
CALIBRE MINING CORPORATION
VALENTINE GOLD PROJECT - 2025

Figure No.
3.1

Title
Steady State Operational Water Table Elevation Contours

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3.2.2.1 Changes in Groundwater Quantity

The proposed Project refinement is expected to have little impact on groundwater flow regime, since the majority of groundwater in the proposed locations for the HMG and MG stockpiles were already predicted to discharge to Victoria Lake Reservoir and watercourse 27. The marginal increase in recharge through porous stockpiles will be offset by shallow discharge in collection ditches around the perimeter of the stockpiles. For comparison, the change to baseflow in watercourse 27 predicted by the EIS and EA Update model from operations is a reduction of approximately 8%; the proposed Project refinement is not expected to substantially change this prediction. Although the volume of overall baseflow discharging to the receiving environment isn't expected to change, seepage volumes from the new stockpiles are relevant for the calculation of mass loading of parameters of potential concern (POPCs) to the receiving environment and are therefore estimated using the following information and assumptions:

- Groundwater infiltrates the top of the stockpiles at a rate of 694 mm/year (EA Update)
- The combined aerial footprint of the two new stockpiles is 22.09 ha
- Assume that all seepage through the stockpiles ultimately discharge to Victoria Lake Reservoir

The rate of seepage from the new stockpiles calculated with the information presented above is approximately 420 m^3/d. It is assumed that all seepage will ultimately discharge to Victoria Lake Reservoir, some of which will discharge through watercourse 27. For comparison, the Leprechaun low-grade ore (LGO) stockpile is expected to produce approximately 264 m^3/d of seepage, 163 m^3/d of which is expected to discharge to watercourse 27. The seepage rates from the new stockpiles and the Leprechaun LGO represent approximately 27% and 11% of total baseflow to watercourse 27, respectively. Note that this does not represent a change in the total rate of predicted baseflow, but instead a change in the percentage of the total baseflow that may exhibit water quality characteristics of the stockpile seepage. This number represents a conservative estimate of seepage rates since some of this seepage is expected to be captured within the drawdown induced by the Berry Pit, with a portion of shallow seepage discharging to new ditches and sedimentation ponds being constructed as part of the Project refinement.

3.2.2.2 Changes in Groundwater Quality

Although the rate of total groundwater discharging to surface water features is not expected to change substantially due to the proposed Project refinement, the chemical loading of discharge water will be redistributed based on the new locations of the stockpiles.

As discussed above, seepage from the original location of the HGO stockpile was expected to be captured primarily by the dewatering system of the Berry Pit and TMF. Seepage from the HMG and MG stockpiles that is not collected in water management infrastructure is expected to flow downgradient to Victoria Lake Reservoir. Seepage quality to Victoria Lake Reservoir is expected to improve during downgradient migration as recharge from other sources not affected by the Project mixes with the seepage water. For comparison, seepage from the TMF to the Victoria River assessed as part of the EA Update was estimated to have a 95% dilution ratio. Dilution of seepage from the stockpiles is expected to be similar to or greater than dilution from the TMF for the following reasons:

- The MG stockpile will only be present at the site for a 10-year period, after which the source material that may impact seepage water will be removed.
- The seepage flow path from the HMG and MG stockpiles to Victoria Lake Reservoir is longer, (approximately 2.3 km) than the TMF seepage flow path (approximately 0.9 km) to Victoria River.
- The hydraulic gradient between the stockpiles and Victoria Lake Reservoir is lower than the hydraulic gradient of the TMF seepage flow path to Victoria River which will result in lower expected groundwater velocities towards Victoria Lake Reservoir.
- Victoria River, which receives TMF discharge, is a relatively small receiving waterbody compared to Victoria Lake Reservoir, which will receive stockpile discharge. The larger Victoria Lake Reservoir will therefore provide a larger source of dilution.

The assessment of groundwater quality indicates that seepage affected by the new stockpiles is expected to be temporary with long travel times, relatively low groundwater velocities, and substantial attenuation prior to discharge to Victoria Lake Reservoir.

3.3 Surface Water Resources

An assessment of Project effects on Surface Water Resources was provided in the EIS (Chapter 7) and EA Update (Chapter 8). The following effects were assessed for this VC:

- Change in surface water quantity
- Change in surface water quality

Refinements to the footprint and location of the stockpiles and water management ponds/ditching, will change local hydrology and water quality in subwatershed (WS) 27, which includes waterbody L2 that discharges into watercourse 27 and eventually empties to the Victoria Lake Reservoir as the ultimate receiver (Figure 3.2). Additionally, there will be changes to local hydrology in WS-35, which includes watercourse 37 that eventually discharges into Valentine Lake (Figure 3.2). Both watersheds had predicted changes in drainage area due to Project activities in the EA Update. Sections 3.3.1 and 3.3.2 assess the changes to surface water resources within these two subwatersheds from the HMG and MG stockpiles and their associated water management infrastructure.

LEGEND:

- EXISTING CONTOUR, m
- SEDIMENTATION POND
- WATERSHEDS
- WATERBODIES

GRID NORTH

VALENTINE LAKE

VAL-P3
FROZEN EAR LAKE

VAL-P2

WS-01
WS-02
WS-19
WS-27
WS-31
WS-32
WS-33
WS-34A
WS-34B
WS-34C
WS-35
WS-36
WS-40
WS-14

106,163 m² NON-CONTACT AREA TO BER-SP-07

2,490 m² FROM WS-14 TO BER-SP-07

76,733 m² FROM WS-35 TO BER-SP-07

60,490 m² FROM WS-27 TO BER-SP-07

158,144 m² FROM WS-27 TO BER-SP-07

BER-SP-07 FOOTPRINT 29,884 m²

0 100 300 500m
1:15 000

Reference Notes:

1. THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND NOT TO BE USED FOR OTHER PURPOSES.
2. LIDAR DERIVED CONTOURS JUNE 6-7, 2019 (AETHON AERIAL SOLUTIONS); VERTICAL DATUM: CGVD28.
3. WATERCOURSES AND WATERBODIES: SURVEYED FISH BEARING OR HAS CONNECTIVITY TO FISH BEARING WATER (STANTEC 2012, 2019 & 2020, 2022), SUPPLEMENTED WITH CANVEC 2011 WATERCOURSES AND WATERBODIES.
4. ALL NON-WATER MANAGEMENT INFRASTRUCTURE DESIGN BY: AUSENCO, GOLDER & MOOSE MOUNTAIN TECHNICAL SERVICES DESIGN.

HMG AND MG STOCKPILE DRAINAGE AREAS

SURFACE WATER MANAGEMENT

Client: CALIBRE MINING CORP

Job No.:	121418425
Scale:	1 : 15 000
Date:	2025-04-08
Dwn. By:	ML
App'd By:	NB

Fig. No.:	Rev. No.:
3.2	00

Stantec

V:\1216\active\121699000\AUTOCAD\1216-NFLD\121623045 - Valentine Lake\6_CAD\sketch_files\01_figures\BR-SP-07-CTCHMENT-AREAS\121417802_SW_FIG_3.2_BER_CTCHMENT_OPR-11x17.dwg

The proposed additional fuel storage, expansion of the camp, additional laydown area, and addition to the process plant pad do not alter the effects prediction and significance conclusions in the EIS and EA Update with respect to a change in surface water quantity or quality due to the following:

- These Project refinements would result in minor changes in surface water runoff flows due to land use changes (i.e., increased imperviousness), while maintaining pre-development catchment areas
- Minor changes in surface water quality from surface water runoff from the additional developed areas will be mitigated through installation of erosion and sediment control measures during construction and appropriate re-sizing of the energy dissipation pool at the outlet of the camp drainage area perimeter ditches

3.3.1 Change in Surface Water Quantity

Project refinement-related changes in surface water quantity were assessed at the watershed scale using the following tiered approach:

- A site-wide water quantity model was developed in the GoldSim™ model to predict the water quantity changes as presented in the EIS and EA Update. The water quantity model includes the open pits, overburden stockpiles, waste rock piles, low grade ore, MG and HMG stockpiles and topsoil piles. With the addition of the MG and HMG stockpiles, the water quantity model was updated to assess outflow from the proposed sedimentation pond, BER-SP-07.
- Changes in mean annual flow (MAF) from pre-development conditions were used as a screening threshold to determine whether further assessment of changes in flow were required. Changes in MAF were calculated for watersheds during each phase of mine development. MAFs were developed using regional relationships used in the EIS. Watersheds with an expected change in MAF of greater than 10% were carried forward to subsequent assessment steps. To support the subsequent assessment, mean monthly flows (MMFs) were calculated for watersheds during each phase of mine development using the regional relationships used in the EIS.
- For watersheds with an expected decrease of over 10% for MAF, the MMFs were compared with baseline environmental flows. The residual effect was considered to not be significant if the predicted MMF was greater than the baseline environmental flows. If the expected MMF was lower than the baseline environmental flows, a locally significant surface water quantity residual effect is expected within the LAA.
- For watersheds with an expected increase in MMF or MAF of over 10%, expected flood flows (Q100) were compared with baseline conditions to assess the potential for flooding and erosion.

3.3.1.1 Water Quantity Model

The surface water quantity and water quality models are constructed using GoldSim™ simulation software (GoldSim™) with the contaminant transport module extension in the EIS and EA Update. These models were updated to simulate flow to BER-SP-07 and its discharge to the environment. The Climate Normal (average condition) and probabilistic scenarios were considered to evaluate the potential effects of the proposed Project refinements on surface water resources. The model was run dynamically on a daily time step for the construction phase (Mine Years -2.25 to -1), operation phase (Years 1-15), closure sub-phase (Years 16 until Pit is Full), and post-closure sub-phase (Pit is full). The stockpiles will be constructed and operated during the operations phase (Year 2-Year 12) and rehabilitated within 5 years of the material being removed (Year 17).

The water quantity model relies on climate and hydrological inputs, drainage areas, and characteristics of mine facilities during different phases of the MG and HMG stockpiles draining via water management infrastructure to BER-SP-07 and its discharge to the environment via BER-FDP-07. The watershed area for BER-SP-07 was delineated based on the proposed changes to the site layout (Figure 2.2) and existing ground surface topography. The watershed areas were delineated where runoff from the stockpiles (MG, HMG) is expected to report to collection ditches and then to BER-SP-07. Seepage (toe) is assumed to drain from the MG and HMG stockpiles to the collection ditches and then the pond. Based on the groundwater assessment for the MG and HMG stockpiles, no additional seepage will be intercepted by the pile perimeter ditches. For conservatism in the model, it is assumed that the catchment area for pile features are at their ultimate stage at the start of construction. However, the build out of the stockpiles within the drainage footprint is estimated as a percentage of the stockpile surface area for each year of operation. The HMG and MG actual evapotranspiration (AET), snowmelt as runoff, rain as runoff and percent of net infiltration as toe seepage adjustment factors are 50%, 50%, 0% and 18%, respectively.

The updated water quantity model shows that pond BER-SP-07 becomes full during freshet of the first year, and overflows to the FDP thereafter (Figure 3.3). Table 3.1 presents the water management pond predicted climate normal average outflows for the phases of development with the highest flows during the latter period of operations (Mine Year 10 to 13) when the stockpiles are at their maximum footprint. The runoff from the stockpiles is substantially reduced when they are removed in Model Year 14 (Mine Year 12) (Figure 3.4). Following the closure sub-phase of five years after the removal of the piles in Model Year 14, the collection ditches are backfilled and the sedimentation pond removed.

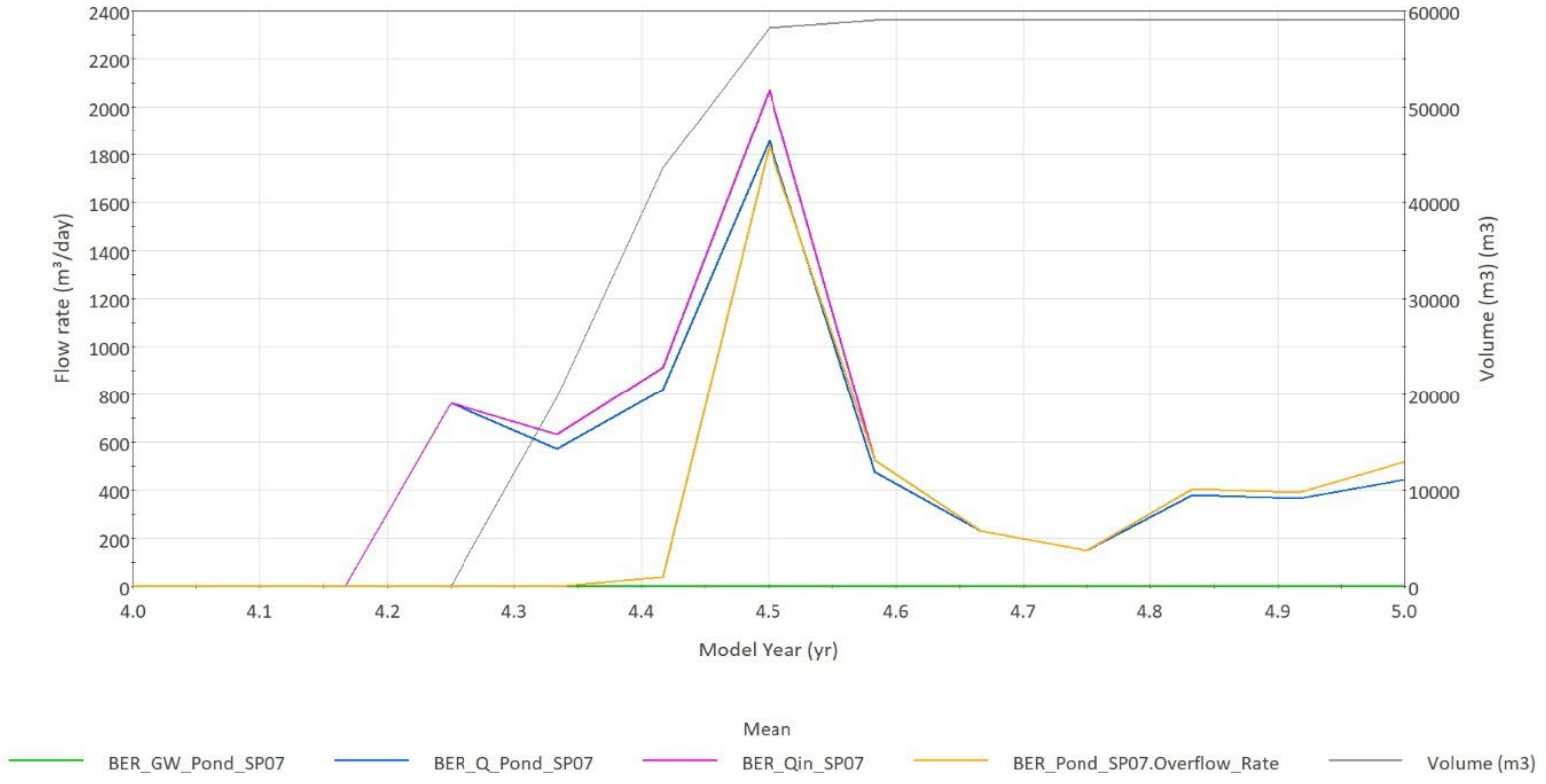

Figure 3.3 Average Condition Volume, Inflows and Outflow of BER-SP-07

Table 3.1 Monthly Average Condition Outflows from SP-07

Period	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
	Average Flow (m^3/day)												
Construction (Year -2.25 to-1: Model Year 0 to 2.25)	0	0	0	0	0	0	0	0	0	0	0	0	0
Operation (Year 1 to 9; Model Year 2.25 to 11.25)	489	349	559	1508	404	201	145	372	426	493	538	547	498
Operation (Year 10 to 13; Model Year 12.25 to 15.25)	597	499	736	1735	500	255	174	486	535	658	665	706	629
Closure (Year 14 to 18; Model Year 16.25 to 20.25)	72	49	74	168	39	0	0	21	29	60	66	68	54
Post Closure (from year 19; Model Year 21.25)	-	-	-	-	-	-	-	-	-	-	-	-	-

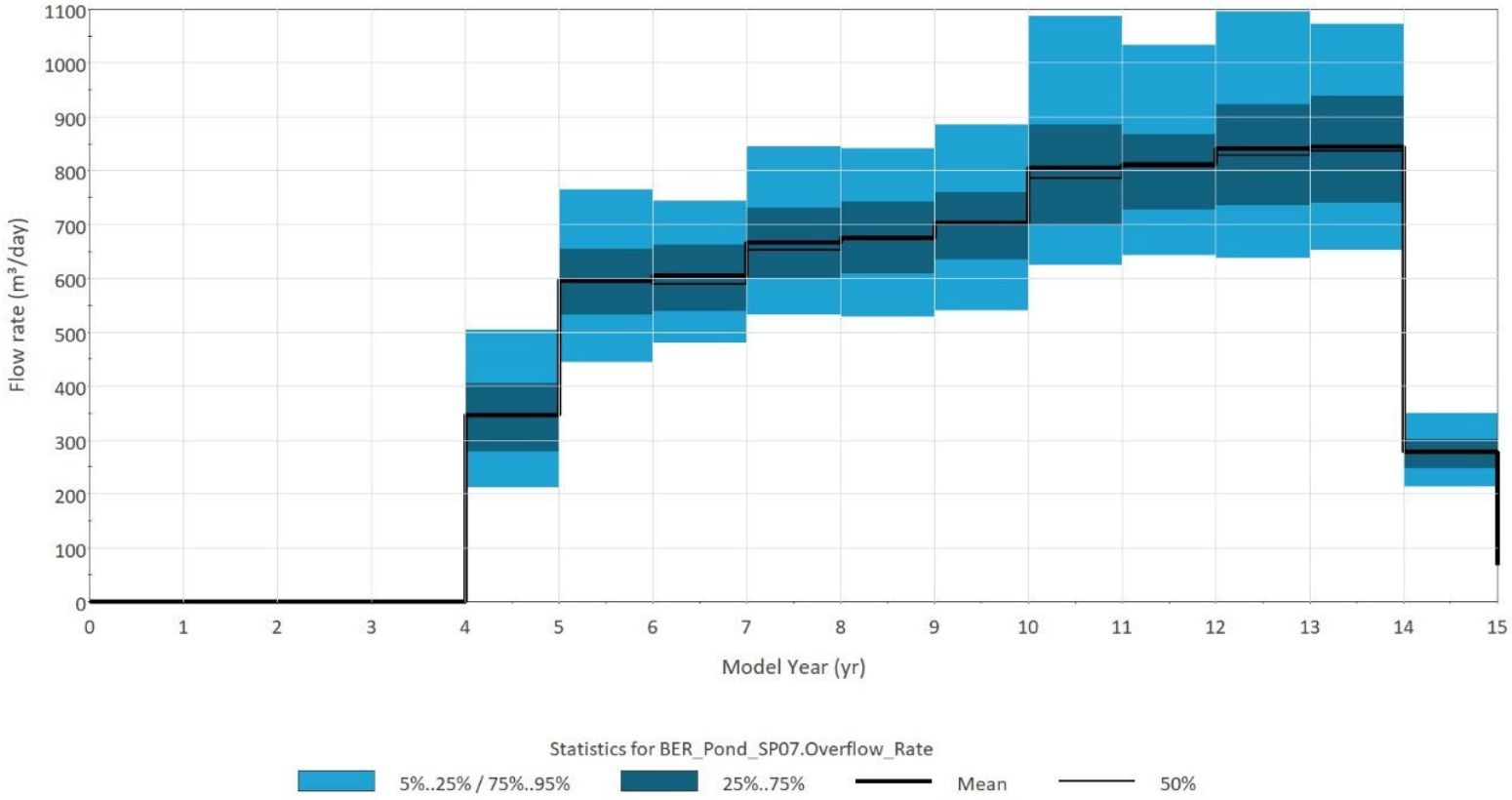

Figure 3.4 **BER-SP-07 Annual Outflow Probabilistic Analysis**

3.3.1.2 Change in Surface Water Quantity Residual Effects

Changes in watershed area and estimated changes in MAFs through the mine life phases, which are the same values, are shown in Table 3.2 and Figure 3.2. Estimated changes in MMFs are shown in Table 3.3. Where changes in MAF were projected to be less than 10%, no residual effect is anticipated. Where an increase of over 10% in MAF is predicted, increased flows during high flow events were considered a potential residual effect. Where a decrease of over 10% in MAF is predicted, decreased flows during low flow events (environmental flows) were considered a potential residual effect. Environmental flows for the province of Newfoundland and Labrador are calculated as 50% MAF for summer months (April to September), and 30% MAF for winter months (October to March) (Zadeh 2012). Table 3.3 presents the MMF changes for the watersheds altered by the proposed Project refinements.

The following predicted decreases in MAF flow for the two watersheds affected by the proposed Project change are similar to those expected in the EIS and EA Update:

- **WS-35 (watercourse 37)** - WS-35 in the EA Update was expected to have a decrease in MAF of greater than 10% (-53%), with baseline environmental flows not being maintained within watercourse 37. The proposed Project change is 8% lower in value from the EA Update predicted value (-61%). WS-35 will continue to not maintain baseline environmental flows due to the Project with monthly flows below the environmental flow value for 6 of 12 months per year with August having baseline MMF values below the environmental flow threshold.
- **WS-27 (watercourse 27)** – WS-27 in the EA Update was expected to have a decrease in MAF of greater than 10% (-32%), with baseline environmental flow being maintained in watercourse 27. WS-27, with the addition of flow from BER-FDP-07, is expected to see a lower reduction in MAF for the proposed Project changes from -32% to -27% for the operations and closure/post-closure phases. The WS-27 MMFs are predicted to be below the environmental flow threshold for July and August with the baseline flow in August also being below the environmental flow value, which is the same as predicted in the EA Update. The predicted 7Q10 low flow for WS-27 is 0.0024 m^3/s.

With the implementation of mitigation measures as described in the EIS and EA Update for Surface Water Resources, residual effects on surface water quantity from the proposed Project refinements are anticipated to be adverse in direction, but of similar magnitude to the predicted reductions in surface water quantity in watersheds WS-35 and WS-27 within the LAA during all phases of mine life as predicted in the EIS and EA Update.

Table 3.2 Summary of Watershed Area and Mean Annual Flow Changes from Proposed Project Changes

Watershed ID	EA Update Largest change in MAF (%)	Watershed Area (km²)				MAF (m3/s)				Largest change in MAF (%)
		Baseline	Construction / Operations 1-9	Operations 10-15	Closure / Post-Closure	Baseline	Construction / Operations 1-9	Operations 10-15	Closure / Post-Closure	
35	-53 (All)	0.494	0.1960	0.1960	0.1960	0.0123	0.0048	0.0048	0.0048	-61 (All)
27	-32 (All)	3.141	1.933	1.933	1.933	0.0810	0.0588	0.0588	0.0588	-27 (All)

Notes:
1. Largest changes in mean annual flows (MAF) compared to the baseline conditions and the proposed Project changes phase that this change will be experienced in
2. Changes in % of the MAF refer to the conservative scenarios
3. CO = Construction & Operations (Year 1-9), Op = Operations (Year 10-15), Cl = Closure, PCl = Post Closure, All = All phases
4. BER-SP-07 is assumed as a worst-case scenario to remain in place as water management infrastructure into the closure and post-closure phases of the mine site.

Table 3.3 Summary of Mean Monthly Flow Changes from Proposed Project Changes and Comparison to Low Flows

Watershed ID	Phase	MMF (m^3/s)											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
35	Baseline	0.0053	0.0054	0.0103	0.0366	0.0377	0.0150	0.0073	**0.0055**	0.0091	0.0135	0.0138	0.0089
	CO	**0.0019**	**0.0019**	0.0039	0.0147	0.0161	0.0064	**0.0030**	**0.0022**	**0.0036**	0.0054	0.0053	**0.0033**
	%Change	-64%	-64%	-62%	-60%	-57%	-58%	-59%	-60%	-60%	-60%	-62%	-63%
27	Baseline	0.0416	0.0427	0.0722	0.2258	0.2063	0.0843	0.0442	**0.0349**	0.0571	0.0848	0.0934	0.0656
	CO	0.0336	0.0342	0.0527	0.1494	0.1415	0.0630	**0.0369**	**0.0309**	0.0446	0.0617	0.0659	0.0482
	%Change	-19%	-20%	-27%	-34%	-31%	-25%	-16%	-12%	-22%	-27%	-29%	-27%

Notes:
Note: CO – Construction/Operation
Bold = MMF is below the Summer Environmental Flow rate - 0.0061 m^3/s for WS-35 or 0.0405 m^3/s for WS-27 or MMF is below the Winter Environmental Flow rate - 0.0037 m^3/s for WS-35 or 0.0243 m^3/s for WS-27

The predicted magnitude of residual adverse effects is low. Predicted changes in water quantity at the LAA boundary during construction and operation (Years 1-9), operations (Year 10-15), closure, and post-closure phases are considered to be within the range of natural variability, similar to those predicted in the EIS and EA Update and are not substantially changed by the proposed Project refinements. The change in surface water quantity is predicted to extend to the boundary of the LAA and be continuous and long-term in duration. The natural seasonal variations including precipitation, surface runoff, and groundwater flows could affect the surface water quantity within the LAA; however, these variations would not be considered a proposed Project change related effect. Changes to some watersheds within the LAA will be realized post-closure and therefore, these are considered long-term effects. Effects on water quantity for most of the watercourses/waterbodies assessed are considered reversible as conditions will return to predevelopment flow patterns for the majority of the site post-closure. The ecological context is disturbed, with the ecological function considered typical compared to other lake systems in the region and predevelopment conditions.

3.3.2 Change in Surface Water Quality

To assess the effects of the proposed Project refinements on water quality, the water quality model used to assess Project effects in the EIS and EA Update was updated to consider the effects of the new sedimentation pond and new FDP. Section 3.3.2.1 presents the methods used for the water quality model update and results. A full description of the water quality model can be found in Appendix 8A of the EA Update. The assimilative capacity (AC) study was also updated to assess the effects of the new FDP discharge into Pond L2 and watercourse 27, and eventually to the ultimate receiver, Victoria Lake Reservoir. Section 3.3.2.2 presents the methods used for the AC study update and the results. A full description of the AC study can be found in Appendix 7C of the EIS.

Baseline surface water quality was used as the baseline against which changes to surface water quality as a result of proposed Project refinements were assessed. A design objective for water management infrastructure is to keep noncontact water and contact water separated. Contact water is directed to sedimentation ponds prior to discharge to the environment at the proposed BER-FDP-07 location (Figure 2.2). Non-contact water directed to the environment has been assumed to be represented by baseline water quality. Contact water quality was predicted by integrating geochemical contact water predictions into the water quality model (Section 3.3.2.1).

A list of POPCs was established and changes in these parameters were assessed to determine the effects of the proposed Project refinements on surface water quality. Selection of the POPCs is discussed in detail in the Water Quantity and Water Quality Model Update Report (Appendix 8A of the EA Update) and the selection criteria are listed below:

- Parameters found to exceed Canadian Council of Ministers of the Environment (CCME) Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (CWQG-FAL) in baseline monitoring (aluminum (Al), cadmium (Cd), iron (Fe), arsenic (As), copper (Cu), lead (Pb), zinc (Zn), and nitrite ($N\text{-}NO_2$))

- Parameters listed in the MDMER considered to be at risk of being elevated (copper, unionized ammonia, and total cyanide)
- Parameters considered potentially present in mine effluent as a result of mining activities (Al, As, Cd, chromium (Cr), Cu, Fe, Pb, manganese (Mn), mercury (Hg), molybdenum (Mo), phosphorus (P), selenium (Se), silver (Ag), uranium (U), Zn, N-NO_2, nitrate (N-NO_3), total ammonia (N-NH_3 T), unionized ammonia (N-NH_3 UN), and fluoride (F))

Expected surface water quality for these POPCs were assessed at the FDP location, within watercourse 27 and up to 300 m at the ultimate surface water receiver (Victoria Lake Reservoir) (Section 3.3.2.2).

3.3.2.1 Water Quality Model

The water quality model was developed using the GoldSim™ software package with the contaminant transport module to predict water quality associated with the sitewide water quantity model (water balance). More detail can be found in the Water Quantity and Water Quality Model Update Report (Appendix 8A of the EA Update). The water quality predictions are calculated at the model nodes by integrating source term development (loading sources) into the water balance. The HMG and MG source terms for the water quality model used the shake flask extraction (SFE) and kinetic test results previously used for the EIS and EA Update GoldSim models.

The water quality model is run in a probabilistic mode with 100 realizations. Each realization is run for 100 years in a daily timestep. The mean and 95th percentile concentration statistics at BER-FDP-07 were predicted during the Project construction, operation, and decommissioning, rehabilitation and closure phases, and are summarized as follows:

- Water quality parameters (both monthly mean and 95th percentiles) are expected to comply with the MDMER discharge limits at BER-FDP-07 during all mine phases.
- CWQG-FAL are predicted to be exceeded for some parameters, including total Al, total Cr (assessed with chromium VI guideline value), total Cu, total Fe, total Pb, total Mn, total P, total Zn, N-NO_2, N-NO_3, N-NH_3 T and F at BER-FDP-07 which are associated with seepage from HMG and MG ore. These parameters are predicted to decline during closure when the stockpiles are removed (Table 3.4). Appendix A presents time series figures of water quality predictions results for select parameters, including those that exceeded CWQG-FAL.

Table 3.4 Highest Value of the Monthly Mean and 95th Percentile Concentrations for Each Project Phase at BER-FDP-07 Discharge Point

Parameter	Units	MDMER	CWQG-FAL	CWQG-FAL	Baseline	Baseline	BER-FDP-07	BER-FDP-07	BER-FDP-07	BER-FDP-07	BER-FDP-07	BER-FDP-07	BER-FDP-07	BER-FDP-07	BER-FDP-07	BER-FDP-07
Project Phase							**1-Construction**	**1-Construction**	**2-Operation**	**2-Operation**	**3-Closure**	**3-Closure**	**4-Post-closure**	**4-Post-closure**	**5-Closure and Post-closure**	**5-Closure and Post-closure**
Statistics			**Short-term**	**Long-term**	**Max of 95th**	**Max of mean**	**Max of 95th**	**Max of mean**	**Max of 95th**	**Max of mean**	**Max of 95th**	**Max of mean**	**Max of 95th**	**Max of mean**	**Max of 95th**	**Max of mean**
Aluminum	µg/L	-	-	100	**233**	**133**	na	na	**324**	**288**	**223**	**143**	na	na	**223**	**143**
Antimony	µg/L	-	-	-	0.5	0.5	na	na	1.8	1.6	0.5	0.5	na	na	0.5	0.5
Arsenic	µg/L	100	-	5	2.0	1.1	na	na	2.1	1.8	1.8	1.2	na	na	1.8	1.2
Barium	µg/L	-	-	-	7.3	3.9	na	na	7.3	4.5	7.2	4.3	na	na	7.2	4.3
Boron	µg/L	-	29000	1500	25	25	na	na	55	50	25	25	na	na	25	25
Cadmium	µg/L	-	0.13	0.04	0.02	0.01	na	na	0.02	0.02	0.02	0.01	na	na	0.0	0.0
Calcium	µg/L	-	-	-	19,620	9,767	na	na	25,953	22,426	17,548	10,644	na	na	17,548	10,644
Chromium	µg/L	-	-	1	**5.1**	**2.4**	na	na	**5**	**2.7**	**5**	**2.7**	na	na	**4.7**	**2.7**
Copper	µg/L	100	-	2	1.9	1.1	na	na	**6.1**	**5.1**	1.7	1.2	na	na	1.7	1.2
Iron	µg/L	-	-	300	**556**	286	na	na	**520**	**317**	**549**	**321**	na	na	**549**	**321**
Lead	µg/L	80	-	1	0.36	0.29	na	na	0.42	0.38	0.35	0.30	na	na	0.35	0.30
Magnesium	µg/L	-	-	-	2,217	1,264	na	na	2,259	1,921	2,097	1,330	na	na	2,097	1,330
Manganese	µg/L	-	596	210	**448**	194	na	na	**443**	**248**	**398**	**221**	na	na	**398**	**221**
Mercury	µg/L	-	-	0.026	0.017	0.011	na	na	0.024	0.021	0.017	0.011	na	na	0.02	0.01
Molybdenum	µg/L	-	-	73	1.5	1.2	na	na	16	13.6	1	1.2	na	na	1.5	1.2
Nickel	µg/L	250	-	25	1.0	1.0	na	na	2	1.5	1	1.0	na	na	1.0	1.0
Phosphorus	µg/L	-	-	4	**50**	**50**	na	na	**50**	**50**	**50**	**50**	na	na	**50**	**50**
Potassium	µg/L	-	-	-	761	353	na	na	3046	2589	608	388	na	na	608	388
Selenium	µg/L	-	-	1	0.5	0.5	na	na	0.6	0.6	0.5	0.5	na	na	0.5	0.5
Silver	µg/L	-	-	0.25	0.05	0.05	na	na	0.12	0.10	0.05	0.05	na	na	0.05	0.05
Sodium	µg/L	-	-	-	3306	2260	na	na	13,598	11,452	3,212	2,354	na	na	3,212	2,354
Thallium	µg/L	-	-	0.8	0.05	0.05	na	na	0.05	0.05	0.05	0.05	na	na	0.05	0.05
Uranium	µg/L	-	33	15	0.14	0.09	na	na	7.87	5.95	0.13	0.09	na	na	0.13	0.09
Zinc	µg/L	400	11.3	2.2	**7.9**	**4.8**	na	na	**7.6**	**6.1**	**7.2**	**5.1**	na	na	**7.2**	**5.1**
Chloride	µg/L	-	640000	120000	4752	3080	na	na	4,621	3,281	4,689	3,280	na	na	4,689	3,280
Nitrate + Nitrite (as Nitrogen)	µg/L	-	-	-	104	58	na	na	46456	28133	97	63	na	na	97	63
Nitrite (as Nitrogen)	µg/L	-	-	60	12	8	na	na	**1,050**	**638**	12	8	na	na	12	8
Nitrate (as Nitrogen)	µg/L	-	550000	13000	102	57	na	na	**45,408**	**27,502**	102	63	na	na	102	63
Total Ammonia (as Nitrogen)	µg/L	-	-	689	135	61	na	na	**5,796**	**3,523**	121	68	na	na	121	68

Table 3.4 Highest Value of the Monthly Mean and 95th Percentile Concentrations for Each Project Phase at BER-FDP-07 Discharge Point

Parameter	Units	MDMER	CWQG-FAL	CWQG-FAL	Baseline	Baseline	BER-FDP-07	BER-FDP-07	BER-FDP-07	BER-FDP-07	BER-FDP-07	BER-FDP-07	BER-FDP-07	BER-FDP-07	BER-FDP-07	BER-FDP-07
Project Phase							1-Construction	1-Construction	2-Operation	2-Operation	3-Closure	3-Closure	4-Post-closure	4-Post-closure	5-Closure and Post-closure	5-Closure and Post-closure
Statistics			Short-term	Long-term	Max of 95th	Max of mean	Max of 95th	Max of mean	Max of 95th	Max of mean	Max of 95th	Max of mean	Max of 95th	Max of mean	Max of 95th	Max of mean
Un-ionized Ammonia (as Nitrogen)	µg/L	500	16	16	5.1	2.34	na	na	2.84	2.47	0.28	0.17	na	na	0.28	0.17
Cyanide, Total	µg/L	500	-	-	10	10	na	na	10	10	10	10	na	na	10	10
Cyanide, WAD	µg/L	-	-	5	1	1	na	na	1	1	1	1	na	na	1.01	1.00
Sulphate	µg/L	-	-	-	3,082	1,774	na	na	27,172	23,226	2,822	1,868	na	na	2,822	1,868
Fluoride	µg/L	-	-	120	60	60	na	na	**143**	**128**	60	60	na	na	60	60
Radium-226	Bg/L	0.37	-	-	0.005	0.005	na	na	0.016	0.015	0.005	0.005	na	na	0.005	0.005

Notes: See Table C-1 notes for details on the parameters and guidelines.
1-Construction = Model Year 0 - 2.25
2-Operation = Model Year 2.25 - 17.25
3-Closure = Model Year 17.25 - 22.25
4-Post-closure = Model Year 22.25 - 100
5-Closure and Post-closure = Model Year 17.25 - 100
na = Predicted concentrations are not available because there is no water in the Project Expansion facility during the project phase

3.3.2.2 Assimilative Capacity Study

The AC study conducted to support the effects assessment in the EIS was updated in 2023 as part of the EA Update. The ultimate receiver, Victoria Lake Reservoir, was not assessed in the EA Update as there was no change in FDP discharges to this waterbody. The effects of discharging treated effluent at the BER-FDP-07 from sedimentation pond BER-SP-07 are assessed by updating mixing zones (at the ultimate receiver point in Victoria Lake Reservoir) in comparison to those assessed in the EIS and regulatory criteria. The ultimate receiver point also receives treated effluent discharge from an existing sedimentation pond from the process plant area, PP-FDP-02. Figure 3.5 presents the two FDPs that affect the ultimate receiver point in Victoria Lake Reservoir, as well as the drainage area upstream of the ultimate receiver point (WS-27).

The AC study is conducted for the operation phase of the Project, as this phase is anticipated to represent the worst-case conditions with respect to effluent quality. Water quality is assessed using a mass balance approach and near-field mixing modelling (Cornell Mixing Zone Expert System, CORMIX) under two discharge conditions: regulatory and normal scenarios. The regulatory operating conditions are considered worst case and conservative, while normal operating conditions are considered representative of the expected average discharge conditions during Project operation. Input parameters for these two operating conditions from the EIS, EA Update and updated water balance and water quality model are:

- Regulatory Operating Conditions Scenario:
  - limits for POPCs as listed in MDMER for effluent
  - 95th percentile water quality for POPCs not listed in MDMER from water quality model
  - 75th percentile baseline water quality in the receiving watercourses
  - 7Q10 flow conditions (7-day low flow, 10-year return period) in the receiving watercourses based on regression analysis
  - Seepage (toe and basal) flow out of the sedimentation ponds from water balance model, which contribute to the discharge at the FDP receiver point. This seepage represents effluent discharge during dry conditions
- Normal Operating Conditions Scenario:
  - Mean monthly water quality concentrations for POPCs predicted in water quality model
  - Mean concentrations for baseline water quality in the receiving watercourses
  - MAF conditions in the receiving watercourses based on regional regression analysis
  - Predicted mean effluent flow modelled using the water balance model

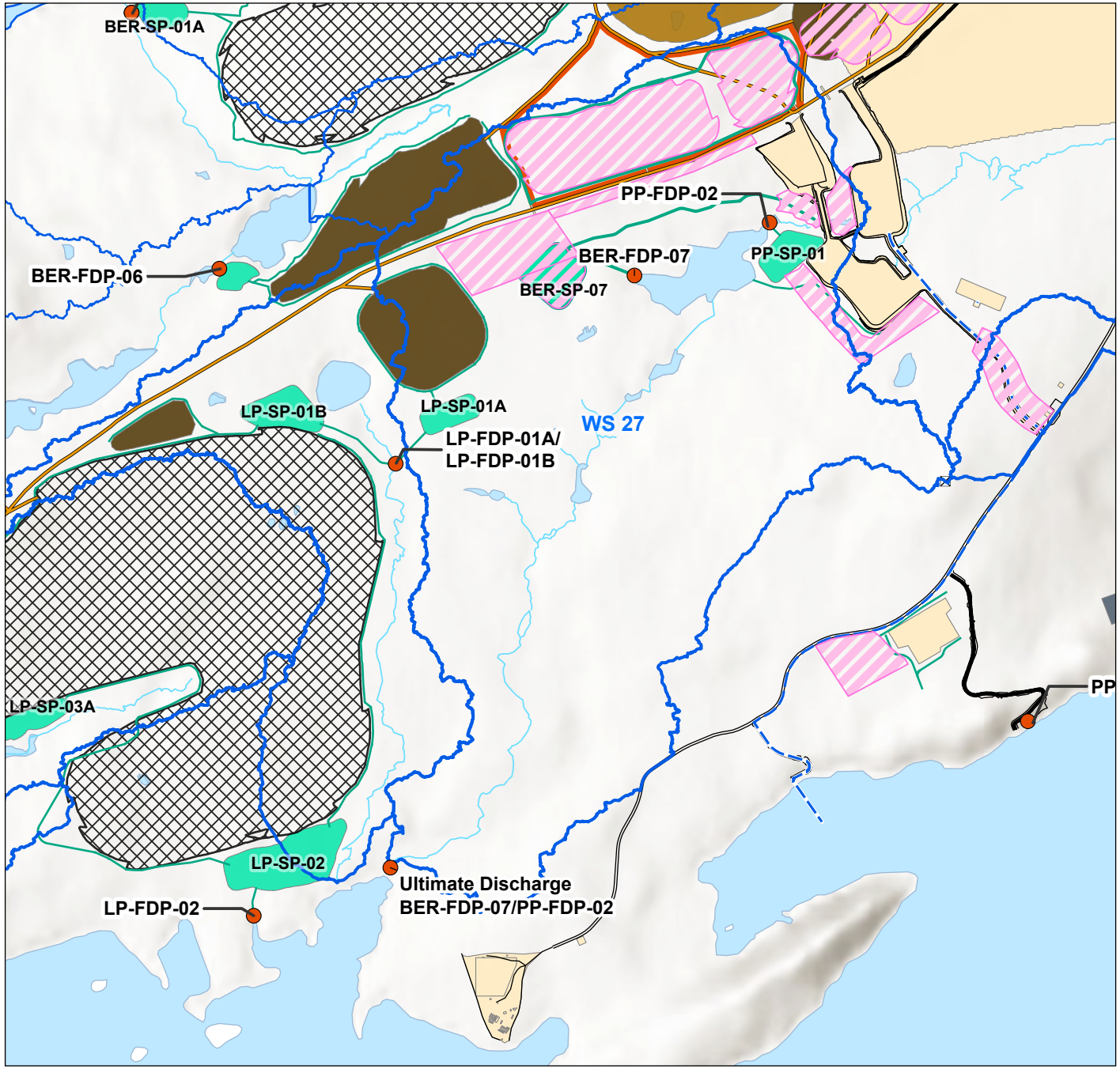

Figure No.
3.5

Title
Assimilative Capacity Assessment
FDPs and the Ultimate Receiver

Client/Project 121418425_002
Calibre Mining Corporation
Valentine Gold Project

Project Location Prepared by MB on 2025-05-06
Valentine Lake
Central Newfoundland, CA

N

0 200 400 Metres
(At original document size of 8.5x11)
1:20,000

- Final Discharge Point (FDP)
- Ditch / Drainage Channel
- BER-SP-07 Drainage Area
- Project Refinement
- Sedimentation Pond
- Open Pit
- Stockpile
- Waste Rock Pile
- Other Mine Infrastructure

Other Features

- Watercourse
- Watershed
- Victoria Dam
- Waterbody

Notes
1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
2. Data Sources: Cailbre Ming Corporation, Stantec
3. Background: CanVec Natural Resources Canada

Stantec

V:\1214\active\121418425\03_data\gis_cad\gis_data\mapping\aprx\121418425_Valentine_Change_2025\121418425_Valentine_Change_2025.aprx Revised: 2025-05-06 By: mblackwood

The AC study for BER-FDP-07 aims to determine the extent of mixing zone and model concentrations of POPCs at the end of the mixing zone in Victoria Lake Reservoir. The CCME defines the mixing zone as "an area contiguous with a point source (effluent) where the effluent mixes with ambient water and where concentrations of some substances may not comply with water quality guidelines or objectives" (CCME 2003). Mixing zones in the ultimate receiver (Victoria Lake Reservoir) are modelled using CORMIX, which is a United States Environmental Protection Agency supported mixing zone model and decision support system for environmental impact assessment of regulatory mixing zones resulting from point source discharges (Doneker and Jirka 2017). Input parameters of the model are similar to those presented in the EA Update AC study with the difference being the BER-FDP-07 discharge and revised WS-27 drainage area flows.

The mixing zone boundary (i.e., the location in the ultimate receiver where the water quality will meet the CWQG-FAL once fully mixed) is expected to occur between 100 and 300 m from the onshore outlet. This expectation was validated in the EIS AC study after mixing zone characteristics were assessed in Victoria Lake Reservoir considering the discharge from PP-FDP-02. In this AC assessment, the mixing zone boundary is updated after the discharge from BER-FDP-07 is added to the same ultimate receiver point as presented in Figure 3.6. Water quality at the outflow to the ultimate receiver is determined using a mass balance approach considering waters drained from contact-water (i.e., disturbed) and non-contact-water areas (i.e., natural undisturbed) areas within WS-27. As a conservative assumption, the volume and assimilative capacity of Pond L2 is ignored. Moreover, mixing assessment results are extracted from CORMIX at 100 m and 200 m from the outfall in Victoria Lake Reservoir to validate that the mixing zone boundary similar to the AC studies presented in the EIS and EA Update.

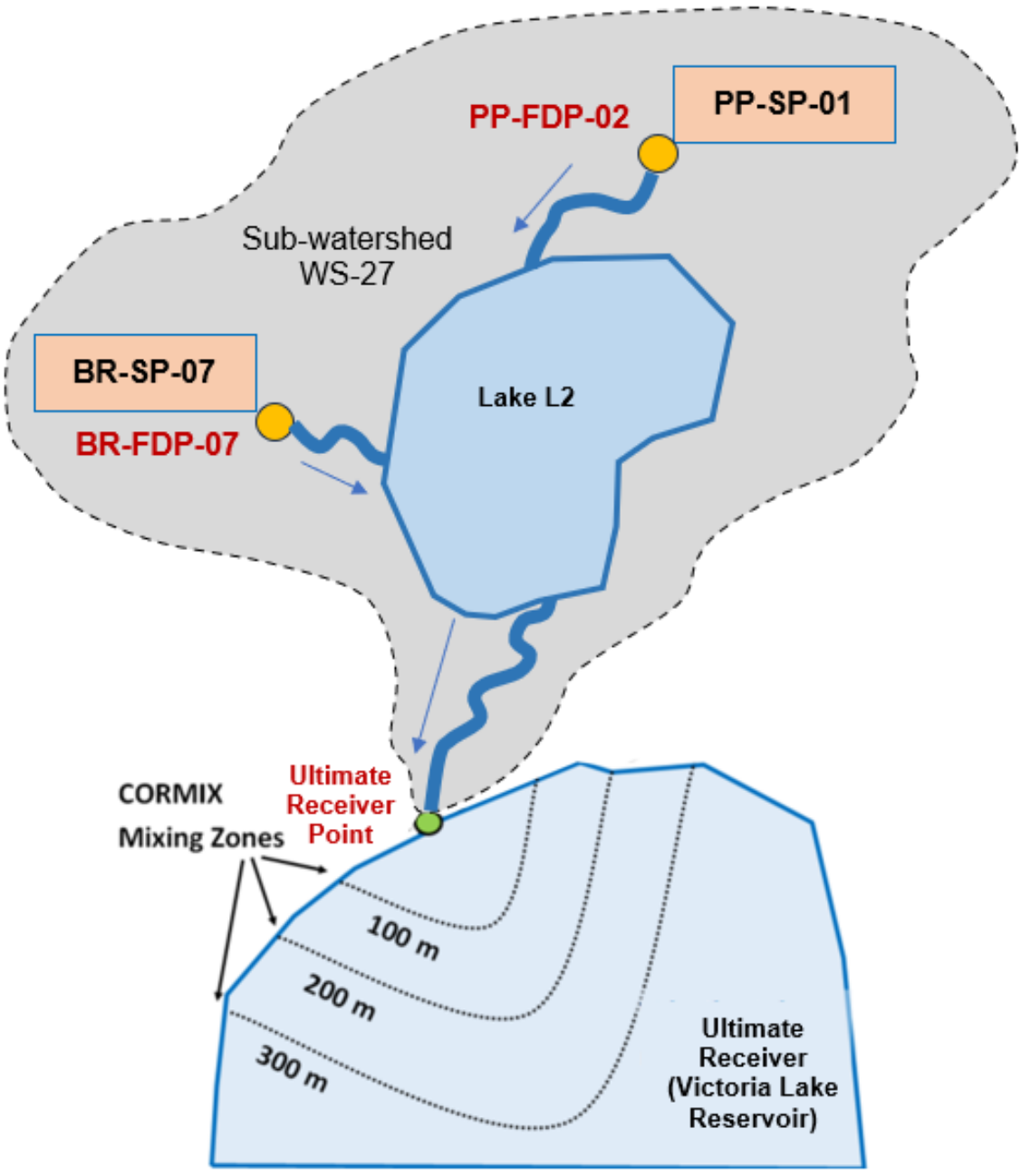

Figure 3.6 Conceptual Representation of Mixing Zone Assessment

3.3.2.2.1 Input Data

Water quantity inputs, include MAF and 7Q10 flows at the ultimate receiver point at the outlet of WS-27, and the expected effluent flow rates in regulatory and normal scenarios. The proposed Project refinements adjusted non-contact drainage area WS-27 MAF and 7Q10 values are 0.0494 L/s and 0.00244 L/s, respectively. Effluent flow rates are 41 m^3/d (BER-FDP-07) and 0 m^3/d (PP-FDP-02) in the regulatory scenario, and 498 m^3/d (BER-FDP-07) and 318 m^3/d (PP-FDP-02) in the normal scenario. The PP-FDP-02 regulatory discharge rate is 0 m^3/d as the drainage area does not receive stockpile seepage.

The water quality of the ultimate receiver (Victoria Lake Reservoir) and the WS-27 watercourse within its drainage area is developed from the baseline water quality data as presented in the EIS. In Victoria Lake Reservoir, only total phosphorus had a 75th percentile concentration higher than the CWQG-FAL value. This exceedance is due to the artifact of the detection limit because it was higher than the CWQG-FAL value, as described in the AC study as presented in the EIS. In Victoria Lake Reservoir tributaries, parameters that have 75th percentile concentrations higher than CWQG-FAL values include total aluminum, total arsenic, total chromium (compared to chromium VI guideline value), total manganese, total phosphorus, and total zinc. High analysis detection limits are why total phosphorus and total zinc concentrations exceed the CWQG-FAL values.

The operation phase effluent water quality at each FDP is estimated from the maximum mean and 95th percentile discharge concentrations from the GoldSim™ water quality model. The 95th percentile concentrations at the ultimate receiver discharge point were calculated based on flow-weighted mixing of PP-FDP-02 and BER-FDP-07. Discharge quality indicate that parameters with 95th percentile concentrations higher than CWQG-FAL values at the ultimate receiver point include total aluminum, total arsenic, total chromium (chromium VI), total copper, total lead, total iron, total manganese, total phosphorus, total zinc, nitrite as nitrogen (N), nitrate as N, total ammonia as N and unionized ammonia as N. Parameters with average concentrations higher than CWQG-FAL values at the ultimate receiver point include total aluminum, total chromium, total copper, total phosphorus, total zinc, nitrite as N, and total and unionized ammonia as N (see Table 3.6). The ultimate receiver discharge quality had similar exceedances predicted for this discharge point in the EIS.

3.3.2.2.2 Mixing Assessment Results

The initial effluent concentration for an arbitrary parameter prior to discharge was assigned as 100 milligrams per litre (mg/L) to estimate the dilution to distance ratios in CORMIX. The extent of the mixing zones in Victoria Lake Reservoir was determined in terms of dilution ratios for the regulatory and normal scenarios (Table 3.5).

Table 3.5 CORMIX Dilution Ratios for Regulatory and Normal Conditions

Distance from Outfall	Regulatory	Normal
	Ultimate Receiver Point	
5 m	5.5	6.9
10 m	6.6	7.8
25 m	15.6	10.8
50 m	61.7	14
75 m	118	16.2
100 m	184.9	17.8
150 m	346.7	19.7
200 m	537.1	20.8

The expected water quality for the POPCs at the ultimate receiver point, and at 100 m and 200 m from the outfall to Victoria Lake Reservoir is presented in Table 3.6. The ultimate receiver point discharge to Victoria Lake Reservoir has slightly elevated concentrations for most parameters for the Project in comparison to the EIS results. The regulatory scenario Project ultimate receiver concentrations that exceed CWQG-FAL values and previously were below guidelines in the EIS are Fe, $N\text{-}NO_2$ and $N\text{-}NO_3$. Several parameters for the Project regulatory scenario are reduced below the CWQG-FAL value at the ultimate receiver point that were previously above in the EIS, which are mercury, cyanide (WAD), fluoride and sulphate.

Within the mixing zone, the baseline concentration of total phosphorus in the receiver was above the CWQG-FAL and, therefore, the concentration of total phosphorus in the mixing zone in both regulatory and normal scenarios is also above the CWQG-FAL, which was also observed in the EIS and EA Update. Other than total phosphorus, the other POPC concentrations at 100 m or less from the outfall in Victoria Lake Reservoir are equal to or below baseline or CWQG-FAL values, whichever is higher in the regulatory and normal scenarios. These results are similar to the EIS, which had only zinc above the CWQG-FAL value at 100 m from the ultimate receiver point for the regulatory scenario.

Table 3.6 POPC Concentrations in the Ultimate Receiver in Regulatory and Average Conditions

Parameter, Units	MDMER	CWQG-FAL Long-term	Victoria Lake Reservoir Tribs Baseline	Victoria Lake Reservoir Tribs Baseline	Victoria Lake Reservoir Baseline	Victoria Lake Reservoir Baseline		Regulatory			Normal			
			Mean	75th Percentile	Mean	75th Percentile	EIS Ultimate Receiver Point	Proposed Change Ultimate Receiver Point	100 m from Outfall	200 m from Outfall	EIS Ultimate Receiver Point	Proposed Change Ultimate Receiver Point	100 m from Outfall	200 m from Outfall
Aluminum (Total), µg/L	-	100	79	110	47	48	**144**	**145**	49	48	83	**104**	50	47
Arsenic (Total), µg/L	100	5	3.8	5.5	0.5	0.5	**24.4**	**20.9**	0.6	0.5	3.9	3.8	0.7	0.5
Cadmium (Total), µg/L		0.04	0.011	0.014	0.006	0.005	0.021	0.012	0.005	0.005	0.012	0.013	0.006	0.006
Chromium (Total), µg/L	-	1	1.2	1.5	0.6	0.5	**1.6**	**2.1**	0.5	0.5	**1.2**	**1.3**	0.6	0.6
Copper (Total), µg/L	100	2	1.2	1.5	0.57	0.81	**21.19**	**17.51**	0.90	0.81	**5.08**	**6.32**	0.90	0.59
Iron (Total), µg/L	-	300	210	270	59.3	70.5	288.0	**310.7**	71.8	70.5	210.0	220.5	68.4	59.8
Lead (Total), µg/L	80	1	0.25	0.25	0.39	0.25	**16.19**	**13.21**	0.32	0.25	0.25	0.26	0.38	0.39
Manganese (Total), µg/L	-	210	150	220	9.7	12.0	**238.0**	**256.2**	13.3	12.0	152.0	162.1	18.2	10.1
Mercury (Total), µg/L	-	0.026	0.008	0.009	0.013	0.013	**0.029**	0.012	0.013	0.013	0.010	0.011	0.013	0.013
Molybdenum (Total), µg/L	-	73	1.0	1.0	1.0	1.0	14.0	3.5	1.0	1.0	3.0	4.7	1.2	1.0
Phosphorus (Total), µg/L	-	4	62	68	**50**	**50**	**70**	**65**	**50**	**50**	**62**	**61**	**51**	**50**
Selenium (Total), µg/L	-	1	0.46	0.49	0.25	0.25	0.67	0.51	0.25	0.25	0.48	0.50	0.26	0.25
Silver (Total), µg/L	-	0.25	0.050	0.050	0.05	0.05	0.07	0.06	0.05	0.05	0.05	0.06	0.05	0.05
Uranium (Total), µg/L	-	15	0.068	0.078	0.05	0.05	0.62	1.34	0.06	0.05	0.16	0.76	0.09	0.05
Zinc (Total), µg/L	400	4	4.8	6.1	2.5	2.5	**84.8**	**70.1**	2.9	2.5	**4.8**	**4.9**	2.6	2.5
Nitrite (as N), µg/L	-	60	5.0	5.0	12	16	28	**175**	17	16	9	**71**	16	12
Nitrate (as N), µg/L	-	3,000	76	99	92	100	139	**7,463**	140	100	82	2,770	242	99
Ammonia (as N), Total, µg/L	-	568	53	69	25	25	**955**	**1,000**	30	25	280	**671**	61	27
Ammonia (as N), Un-ionized, µg/L	500	16	0.17	0.25	0.95	0.95	**100.13**	**81.48**	1.39	0.95	8.86	11.02	1.52	0.98
Cyanide (Total), µg/L	500	-	10	10	10	10	4	90	10	10	0	30	11	10
Cyanide (WAD), µg/L	-	5	1.0	1.0	1	1	**7**	1	1	1	2	2	1	1
Sulphate, µg/L	-	128,000 [b]	1,400	1,600	1,000	1,000	**153,177**	5,756	1,026	1,000	24,342	31,597	2,719	1,083
Fluoride, µg/L	-	120	60	60	60	60	**216**	74	60	60	84	96	62	60

Note:
Bold indicates value exceeds CWQG-FAL or baseline values in the ultimate receiver.

3.3.2.3 Change in Surface Water Quality Residual Effects

Mine contact water discharged from BER-FDP-07 will comply with the MDMER requirements prior to entering the receiving environment and non-contact water is expected to remain at baseline conditions.

Localized effects are expected in Pond L2 and watercourse 27 immediately downstream of BER-FDP-07. Taking into consideration proposed mitigation and management measures, it is predicted that the proposed Project refinements are likely to cause increased concentrations of some POPCs in watercourse 27, downstream of BER-FDP-07 with Fe, N-NO_2 and N-NO_3 above the CWQG-FAL values that were not identified in the EIS. Several parameters (mercury, cyanide (WAD), fluoride and sulphate) are predicted to have concentrations below the CWQG-FAL in watercourse 27 that were predicted to be above in the EIS. These local effects will extend into the ultimate receiving waterbody (Victoria Lake Reservoir) for up to one hundred meters before water quality parameter values are expected to return to either baseline levels or below the CWQG-FAL value, whichever is higher. It is noted that these localized effects may be overestimated due to the conservative approach taken in the supporting water quality modelling and AC study.

With the implementation of mitigation measures from the EIS and EA Update, the residual effects on surface water quality for the Project are expected to be similar to the EIS, with similar water quality in watercourse 27 with the new BER-FDP-07 discharge and similar extent of the mixing zone into Victoria Lake Reservoir (100 m from ultimate receiver point) at the LAA boundary. With removal of the stockpiles during the operation phase and vegetated rehabilitation, seepage quality is expected to be mitigated to meet regulations prior to reaching the ultimate receiver. Effects on water quality for most of the watercourses / waterbodies assessed are considered reversible as conditions will return to baseline conditions once BER-FDP-07 discharges cease following rehabilitation of the stockpile areas.

3.4 Fish and Fish Habitat

An assessment for Fish and Fish Habitat was provided in the EIS (Chapter 8) and EA Update (Chapter 9). The following effects were assessed for this VC:

- Change in fish habitat quantity
- Change in fish habitat quality
- Change in fish health and survival

The proposed additional fuel storage, expansion of the camp, additional laydown area, and addition to the process plant pad do not alter the effects prediction and significance conclusions in the EIS and EA Update with respect the above noted effects:

- The above features have been sited to avoid overprinting of fish habitat, to the extent practicable, and will follow standard mitigation measures with respect to erosion and sediment control, limiting potential for effects on fish and fish habitat.

- As indicated in Section 2.2, once constructed, water management will be in place to address runoff / drainage from these areas and reduce potential effects on fish and fish habitat.
- These features will be progressively rehabilitated once no longer required in a manner consistent with that described in the EIS and EA Update.

With respect to the additional stockpiles and as described in Section 3.3, additional analysis was conducted to assess potential effects on surface water quantity and quality. Changes in fish habitat quantity in consideration of the Project refinements are anticipated to result in a direct loss of fish habitat associated with the placement of the BER-FDP-07 sedimentation pond drainage channel outlet at the confluence with Pond L2 and the additional indirect loss of fish habitat in Stream 37 as a result of changes in watershed area associated with water management infrastructure (change from 53% to 61% loss in flow). As described in the EIS and EA Update, streams experiencing indirect loss are anticipated to continue to support fisheries at a reduced level of productivity for the duration of the Project. These streams will likely be less productive and contain primary (e.g., periphyton) and secondary (e.g., benthic invertebrates) producers, representative of low flow headwater communities. The Project refinements are conservatively estimated to result in the residual loss of 60 m^2 of fish habitat in the LAA. Where there are residual adverse effects, these will be counterbalanced through offsetting, as required by the *Fisheries Act*.

Effluent quality in consideration of Project refinements is predicted to meet the MDMER criteria, as described in the EIS and EA Update, and effluent mixing and assimilative capacity are predicted to remain within the mixing zone boundary extents, also as described in the EIS and EA Update. Water-based discharges are not expected to result in direct mortality of fish because water will be managed and treated to meet authorized limits prior to discharge. Changes in fish health and survival are consistent with those described in the EIS and EA Update.

Therefore, the proposed refinements do not change the characterization of residual effects, proposed mitigation, or overall conclusions described in the EIS and EA Update as related to fish habitat quantity, fish habitat quality and fish health and survival, except for a small change in the quantity of fish habitat lost.

3.5 Terrestrial Environment

The EIS (Chapters 9-12) and EA Update (Chapters 10 and 11) assessed potential Project-related effects on Vegetation, Wetlands, Terrain and Soils, Avifauna, Caribou, and Other Wildlife. The following effects were assessed for these VCs:

- Vegetation, Wetlands, Terrain and Soils:
  - Change in Species Diversity
  - Change in Community Diversity
  - Change in Wetland Function
  - Change in Terrain and Terrain Stability
  - Change in Soils Quality and Quantity

- Avifauna and Other Wildlife
  - Change in Habitat
  - Change in Mortality Risk
- Caribou
  - Change in Habitat
  - Change in Movement
  - Change in Mortality Risk

As described in the EIS and EA Update, a conservative approach was used to address uncertainty in the environmental effects assessment for habitat loss and/or alteration. This conservative approach also allows for refinements to the site layout, as these typically occur through detailed Project design and planning. Specifically, the assessment assumed the following:

- That all habitat within the Project Area would be disturbed, altered or lost, resulting in a direct loss or change of vegetation and habitat; in practice, not all vegetation will be cleared within the Project Area.
- That all wetlands within the Project Area would be disturbed, altered or lost, resulting in a direct loss of wetland function; in practice, not all wetlands within the Project Area will be altered or disturbed.

Given the conservative assumptions described above and that Project refinements detailed in Table 2.1 will occur entirely within the Project Area, there is no change in the assessment of habitat loss and/or alteration presented in the EIS for the terrestrial VCs.

In addition, the Project refinements do not result in a change in the assessments of sensory disturbance on avifauna, other wildlife, and caribou. Again, as this new infrastructure will be within the Project Area and do not represent additional major noise or light sources, the refinements do not result in substantive changes to noise, dust or light emissions relative to those presented in the EIS and EA Update (refer to Section 3.1 of this Attachment). The assessment in the EIS and EA Update also conservatively assumed that indirect habitat alteration/loss would occur within a buffer around the mine site. As the proposed Project refinements are located within the mine site, the assessed buffers as described in the EIS and EA Update remain valid.

The primary pathways for change in mortality risk are through vegetation clearing and earthworks, vehicular collisions, human-wildlife conflicts, and predation. Project refinements are not anticipated to result in measurable changes to these pathways.

With regards to the assessment of a change in caribou movement, the primary effect pathway is from the alteration or loss of existing caribou paths along a preferred migration corridor within the Project Area. As described in the EIS and EA Update, a primary spring / fall migration corridor used by Buchans herd caribou directly overlaps with Project infrastructure. Residual effects on a change in movement are predicted to be significant, as the mine site has been determined to present a potential obstacle to caribou migration. The prediction of a significant residual effect on caribou movement also considered the physical barriers from Project infrastructure that may affect the permeability of the Project Area for caribou. Project refinements represent minor changes to the footprint of mine infrastructure (as presented in the EIS and EA Update) and do not change the EIS / EA Update prediction of a significant residual environmental effect on caribou. In addition, they do not represent new, permanent features on the landscape and will be rehabilitated and decommissioned when no longer required.

The proposed Project refinements therefore do not result in changes to the characterization of residual adverse effects, proposed mitigation, or overall conclusions described in the EIS and EA Update for Vegetation, Wetlands, Terrain and Soils, Avifauna, Caribou, and Other Wildlife.

3.6 Socio-Economic Environment

The EIS (Chapters 13-16) and EA Update (Chapter 12) assessed potential Project-related effects on Infrastructure and Services, Community Health, Economy and Employment, and Land and Resource Use. The following effects were assessed for these VCs:

- Infrastructure and Services
  - Change in local housing and temporary accommodations
  - Change in local services and infrastructure
- Community Health
  - Change in community well-being
  - Change in physical health conditions
- Employment and Economy
  - Change in regional labour force
  - Change in economic activities of outfitters
  - Change in economy
- Land and Resource Use
  - Change in land use
  - Change in resource use
  - Change in recreational use

Predicted effects on infrastructure and services are associated primarily with Project-related population growth. The proposed Project refinements will not result in an overall change to Project-related population growth described in the EIS and EA Update. However, as noted in Table 2.1, due to adjustments in Project scheduling, construction and operation personnel may temporarily overlap at the Project site over the next two to four years, resulting in a temporary increase in the number of employees at the work site concurrently. The additional personnel on site will be accommodated through the camp expansion, mitigating potential effects on community infrastructure and services. There will be a small increase in Project-related traffic (approximately an additional 2-3 busses (return trips) every 2 weeks), but this small increase is not anticipated to result in additional effects on public roads. Therefore, the refinements do not result in changes to the characterization of residual adverse effects, proposed mitigation, or overall conclusions described in the EIS and EA Update for Infrastructure and Services.

With respect to community health, effects pathways as described in the EIS and EA Update may result in a change to community well-being (availability of health services and infrastructure) and physical health conditions (potential effects on air and water quality and country foods due to Project-related emissions). As described in Section 3.1 and 3.3 of this document, the proposed Project refinements do not alter the atmospheric environment and surface water quality predictions presented in the EIS and, therefore, do not alter the conclusions of the Human Health Risk Assessment. As indicated above, there will be a small increase in Project-related traffic, but this is not anticipated to result in additional effects on community health as a result of vehicle-related noise and air emissions. As a result, the Project refinements do not result in changes to the characterization of residual adverse effects, proposed mitigation, or overall conclusions described in the EIS for Community Health.

Project demand for, and expenditures on, services, labour, materials and equipment are the primary pathways for changes in regional labour force, regional business and economy. As indicated above, due to adjustments in Project scheduling, construction and operation, personnel may temporarily overlap at the Project site over the next two to four years, resulting in a temporary increase in the expected work force. Employment of these workers will continue to follow the mitigation measures identified in the EIS and EA Update and will follow requirements set out in the Community Cooperation Agreements with the communities and Socio-economic Agreements with the Indigenous Groups. The Project refinements therefore do not result in changes to the characterization of residual adverse effects, proposed mitigation, or overall conclusions described in the EIS for Employment and Economy.

With respect to land and resource use, the primary effects pathways are through the Project activities and components, as these may restrict access to, or cause loss of, areas used for resource activities and/or recreation. As the Project refinements will occur within the assessed Project Area, they will not result in measurable changes to these pathways. In addition, while there will be a temporary increase in the number of workers onsite, the current mitigation that prohibits hunting, fishing and/or harvesting of wildlife by onsite personnel will continue to be in place, including the restriction of firearms or angling gear on site. Therefore, the Project refinements do not result in changes to the characterization of residual adverse effects, proposed mitigation, or overall conclusions described in the EIS for Land and Resource Use.

3.7 Indigenous Groups

An assessment of potential Project-related effects on Indigenous Groups was provided in the EIS (Chapter 17) and EA Update (Chapter 12). The following effects were assessed for this VC:

- Change in current use
- Change in Indigenous health conditions
- Change in Indigenous socio-economic conditions
- Change in physical and cultural heritage

Given that the Project refinements will occur within the existing Project Area, the Project refinements are not anticipated to result in measurable changes to the effects as predicted in the EIS and EA Update on Indigenous groups related to current use, socio-economic conditions or physical and cultural heritage. With respect to Indigenous health conditions, the discussion provided in Section 3.6 of this document for Community Health is also applicable to Indigenous Groups. As indicated in Section 3.6, the Project refinements do not alter the conclusions of the Human Health Risk Assessment, which evaluated potential human health risks for Indigenous and non-Indigenous receptors. Therefore, changes to the characterization of residual adverse effects, proposed mitigation, or overall conclusions described in the EIS and EA Update for Indigenous Groups are not predicted as a result of the Project refinements. Calibre will continue to engage with Indigenous groups, including Indigenous resource users, throughout the life of the Project.

3.8 Historic Resources

The assessment of potential Project-related effects on Historic Resources was provided in the EIS (Chapter 18). As noted in the EIS, there are no known registered archaeological sites within the Project Area. As discussed in Section 18.2.3.4 of the EIS, there is one area of archaeological potential within the Project Area, however this area does not overlap with the footprints of the refined Project infrastructure. Therefore, the Project refinements do not result in changes to the characterization of residual adverse effects, proposed mitigation, or overall conclusions described in the EIS for Historic Resources.

3.9 Dam Infrastructure

The EIS assessed potential Project-related effects on Dam Infrastructure (Chapter 19). The following effects were assessed for the VC:

- A change in water quality in Victoria Lake Reservoir
- A change in water balance in Victoria Lake Reservoir
- A change in dam stability for the Victoria Dam

The proposed Project refinements do not result in changes in water quality or water balance with respect to Victoria Lake Reservoir, as described in Section 3.3, above. In terms of a potential change in dam stability for the Victoria Dam, the effects pathways include vibrations due to blasting and potential inundation from a failure of the TMF. The proposed Project refinements do not result in changes to the expected vibration frequency or intensity presented in the EIS generally, or specific to the Victoria Dam.

Based on these factors, the proposed Project refinements do not result in a change to the characterization of residual adverse effects, proposed mitigation, or overall conclusions described in the EIS for Dam Infrastructure.

4 Additional Mitigation and Management Measures

The Project refinements being proposed do not constitute new activities but rather an expansion or extension of activities that are already a part of the approved Project (i.e., construction, operation and decommissioning of ore stockpiles, fuel storage, accommodations camp, laydown areas, and the process plant pad). Therefore, the mitigation and monitoring proposed in the EIS and EA Update to reduce residual effects associated with the approved Project activities would continue to be effective and applicable in relation to the Project refinements. As described in Sections 2.2.1 and 2.2.2, the Water Management Plan will be updated to incorporate the infrastructure and development areas in this proposed Project change, including BER-SP-07 and its FDP, prior to construction. The ARD/ML Management Plan developed for the Project will be revised prior to construction to include maximum storage holding times for the HMG and MG ore in the new stockpiles to align with aging predictions and water quality source terms.

5 Conclusions

Based on the above, the proposed Project refinements described in Table 2.1 do not constitute a substantive change to the scope of the Project, either individually or in combination. Given the conservative effects assessment approach used within the EIS and EA Update, no further assessment, beyond the information provided herein, is considered necessary. The Project refinements do not result in changes to the characterization of residual adverse effects, proposed mitigation, or overall conclusions described in the EIS and EA Update; the conclusion that routine Project activities will not cause significant adverse environmental effects on the VCs, with the exception of caribou, remains unchanged. As there are no changes to the residual effects characterizations as presented in the EIS and EA Update, there are also no predicted changes to the cumulative effects assessment presented in the EIS and EA Update. Also as indicated in Section 2, as the proposed changes do not represent new types of activities or infrastructure, the assessment of accidental events as presented in the EIS and EA Update is also considered applicable and valid.

6 References

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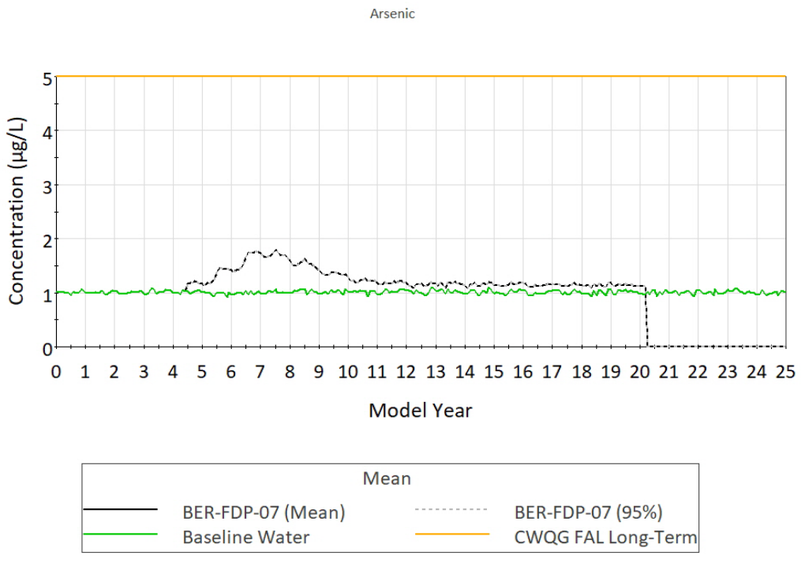
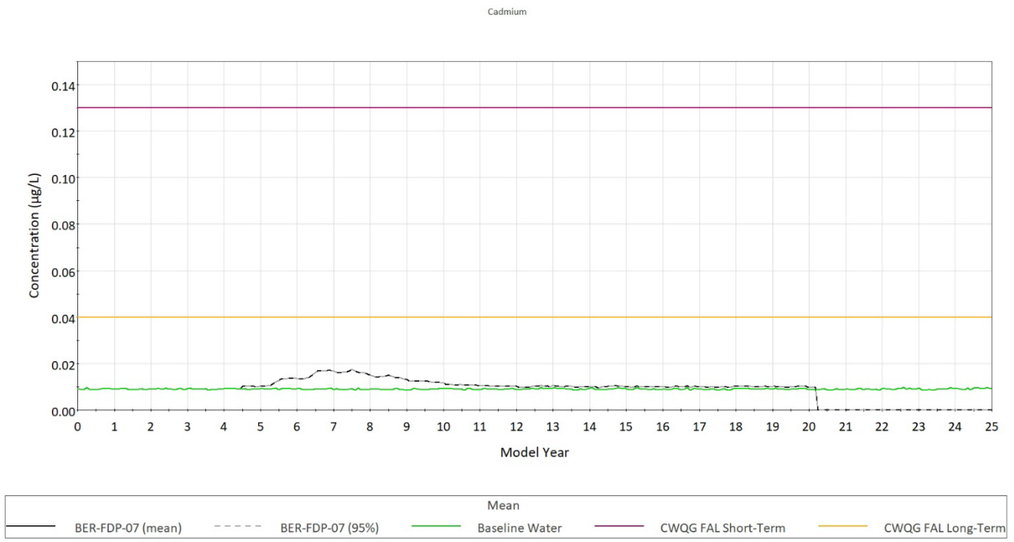
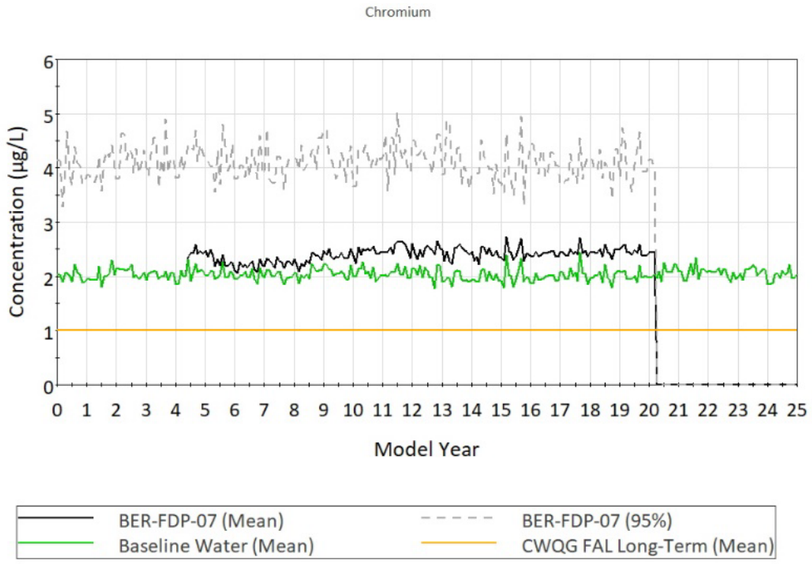
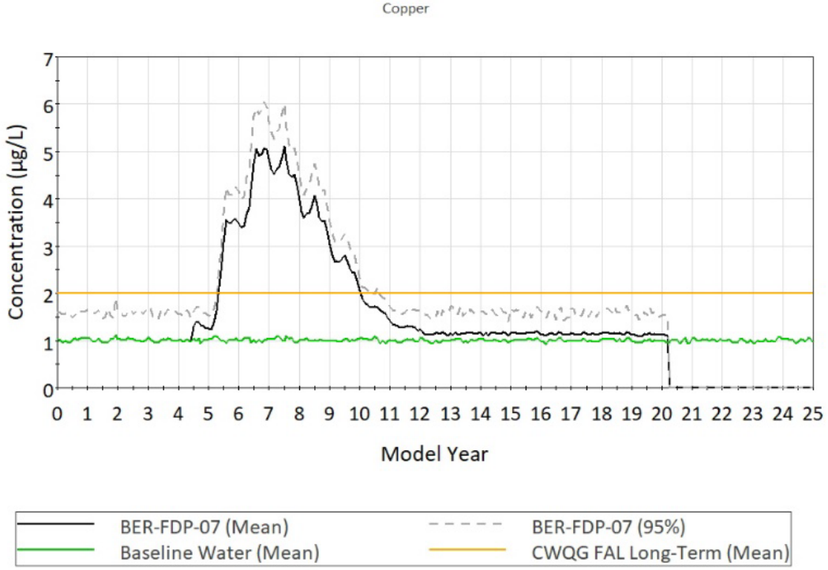
Appendix A Figure BER FDP-07 Water Quality Model Results for Select Parameters

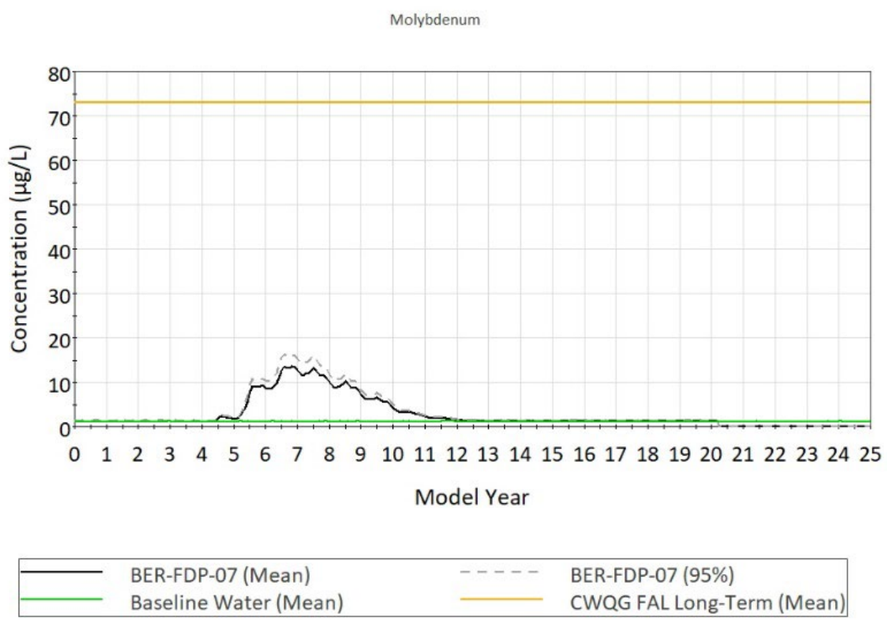


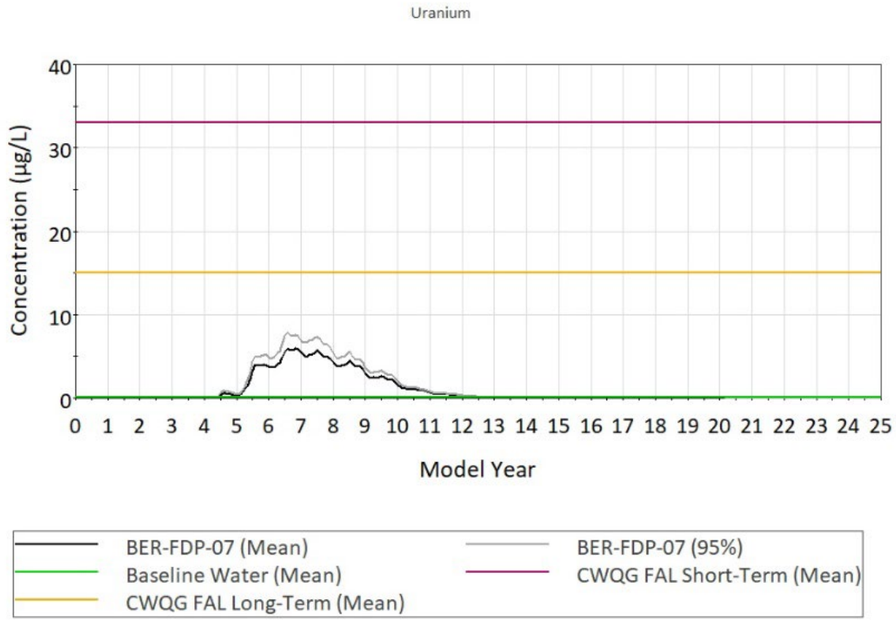


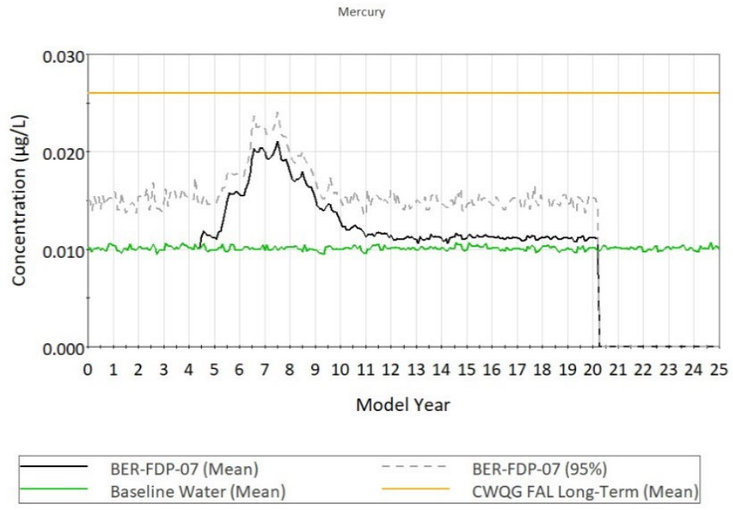


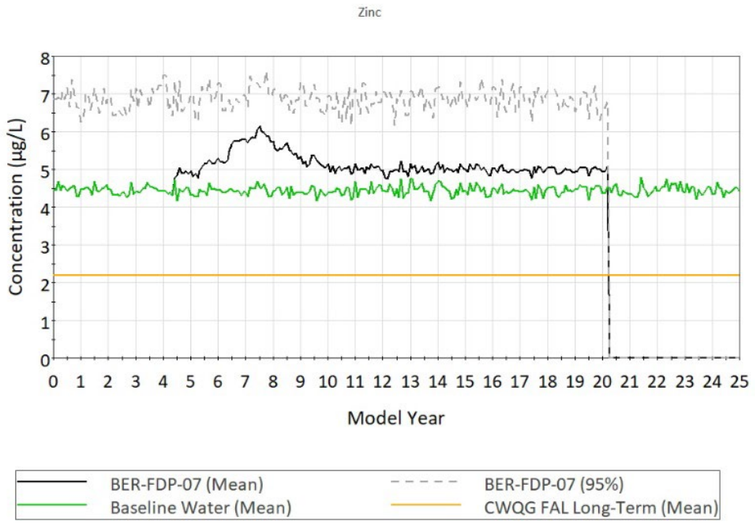


BER-FDP-07 Water Quality Model Results for Select Parameters

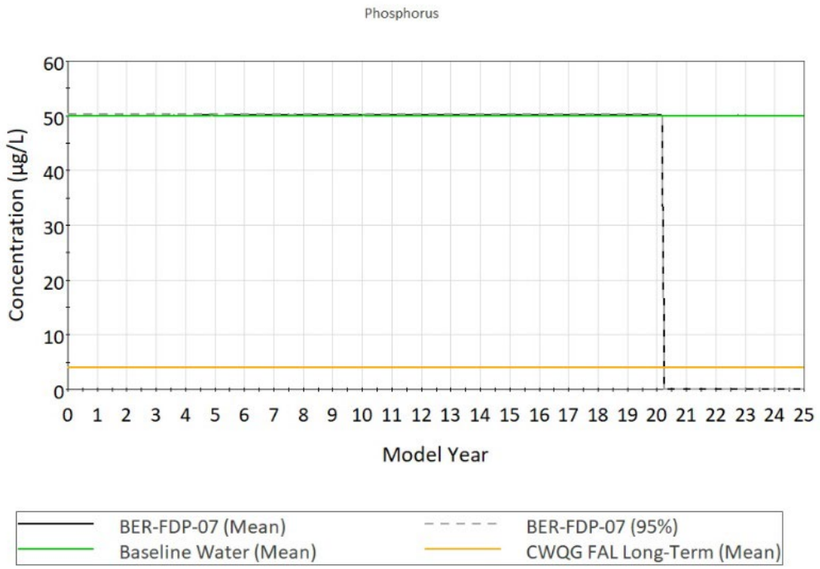


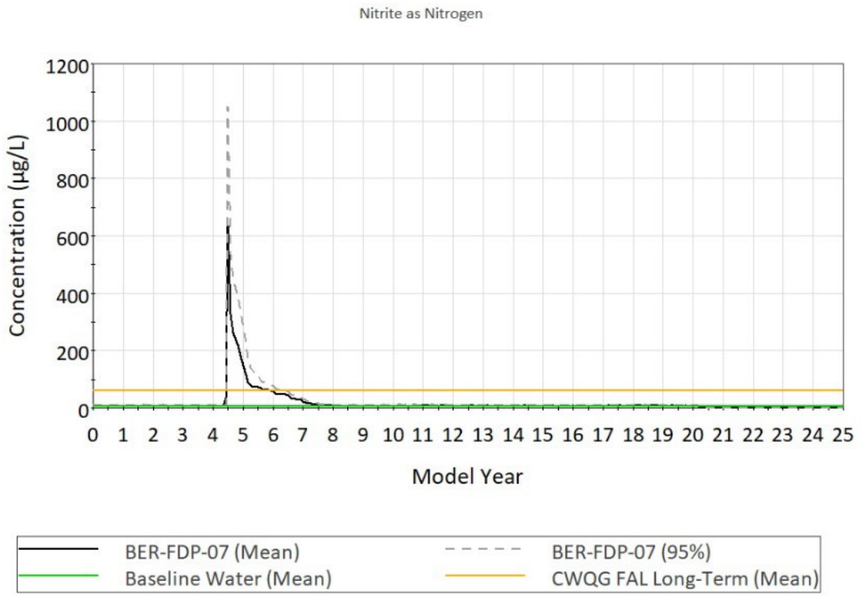


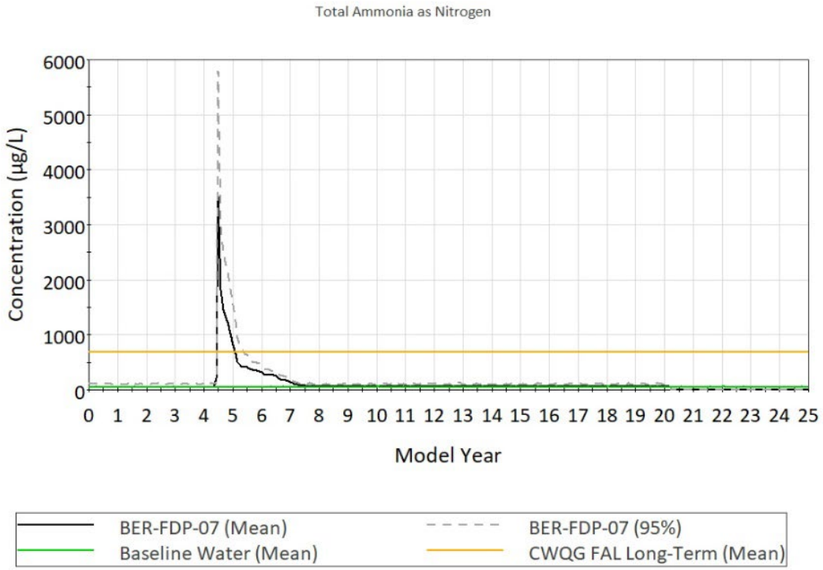


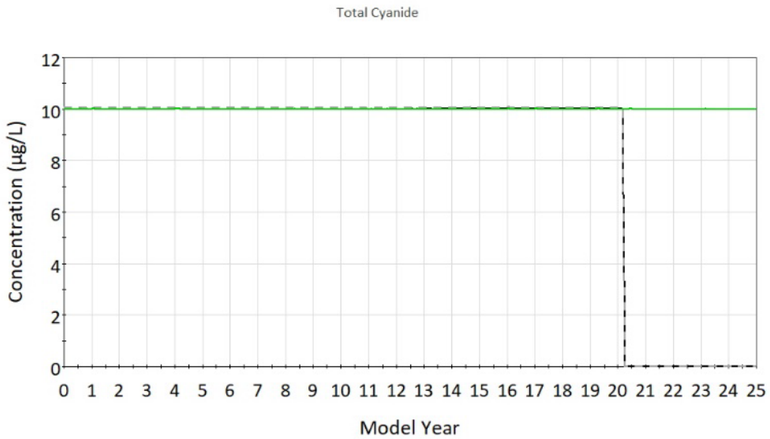


BER-FDP-07 Water Quality Model Results for Select Parameters









BER-FDP-07 Water Quality Model Results for Select Parameters