Version 6.1

Operation, Maintenance, and Surveillance Manual

HB Mine Tailings Facility, Salmo, British Columba

Regional District of Central Kootenay

SRK Consulting (Canada) Inc. ▪ CAPR003603 ▪ February 2026

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Various HB Mine Tailings Facility photos between 2022 and 2023.

VERSION HISTORY

Version	Date (YYYY-MM-DD)	Major Revision(s) Made	Revised by
4.2	2021-03-29	▪ Figure updates. ▪ General updates to reflect changes in M-218 Permit amendment approving the 2020 Reclamation and Closure Plan. ▪ Update of contact information.	Peter Mikes (SRK), Alayne Hamilton (RDCK)
5.0	2022-04-28	▪ Updates to reflect changes to site as a result of the 2021 remediation.	Peter Mikes (SRK), Alayne Hamilton (RDCK)
5.1	2023-02-27	▪ Updated text to reflect post-remediation conditions with major updates to the site history, facility components, and event-driven inspection triggers.	Peter Mikes (SRK), Alayne Hamilton (RDCK)
6.0	2024-06-27	▪ Version 6 is a major update to the OMS Manual that was re-organized to follow the format of MAC (2021a). The major changes to the OMS content and procedures consist of the following: – For brevity, the bulk of the Site History and Site Conditions have been moved to Appendices C and D, respectively. – Section 2 (OMS Governance) has been expanded with additional details on roles, responsibilities, training and competency requirements, and succession and transition planning. – Elements of the Trigger and Action Response Plan (TARP) have been consolidated and placed in Appendix F for easier reference. The TARP instrumentation triggers were updated with the TARP also expanded to include performance objectives for visual observations for the dam, cover, and drainage channels. The event-driven hydrometric triggers have also been updated to account for post-2022 construction performance. – Section 5 (Maintenance) was updated to include additional descriptions of typical maintenance activities, and a maintenance activity tracker was added to Appendix H. – Section 5 (Surveillance) was updated with additional details on surveillance procedures for the tailings cover and drainage channels. Weekly visual inspections of the dam and tailings pond are no longer required. – The routine inspection forms have been updated to match the TARP with updated instrumentation triggers.	Peter Mikes (SRK), Alayne Hamilton (RDCK)
6.1	2026-02-27	▪ Updated surveillance procedures for the new vibrating wire piezometer and slope inclinometer instrumentation installed in 2025 and for highwall monitoring. ▪ Added new appendix for the Design Basis Summary that was developed in 2025 to meet HSRC requirements. ▪ Other minor updates implemented based on the 2025 Dam Safety Review recommendations.	Peter Mikes (SRK), Reviewed by Alayne Hamilton (RDCK)

Notes: Versions 1 (dated 2015-07-10) to 4.1 (dated 2019-11-22) have been excluded from the table for brevity.

DOCUMENT DISTRIBUTION

Party, Company	No. Copies
Regional District of Central Kootenay – Nelson Office (including at the RDCK Emergency Operation Center)	2 (hard copy)
Regional District of Central Kootenay – Central Transfer Station Scale House	1 (hard copy)
Engineer of Record	1 (electronic)
Independent Tailings Review Board	1 (electronic)
Ministry of Energy, Mines and Low Carbon Innovation	1 (electronic)
Ministry of Environment	1 (electronic)

Printed copies of the OMS manual are considered uncontrolled documents. The most recent version available on the RDCK Server is considered a controlled document.

Printed copies of the Manual are to be readily available in the (1) the RDCK Nelson office, and (2) Central Landfill Gate house.

The OMS Manual and all associated documents shall be kept current with appropriate practices and procedures and, at a minimum, be reviewed annually by the required personnel (Table 2.2,Section 2.4).

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Useful Definitions

This list contains definitions of symbols, units, abbreviations, and terminology that may be unfamiliar to the reader.

AFPR	Annual Facility Performance Report
AP	Acid Potential
ARD	Acid Rock Drainage
bgs	below ground surface
CDA	Canadian Dam Association
Code	Health, Safety, and Reclamation Code for Mines in BC
DSR	Dam Safety Report
EGBC	Engineers and Geoscientists of British Columbia
EOR	Engineer of Record
EPRP	Emergency Preparedness and Response Plan
ha	hectares
LLDPE	Linear low-density polyethylene
MAC	Mining Association of Canada
NP	Neutralization Potential
OMS	Operation, Maintenance, and Surveillance
PMF	Probable Maximum Flood
ppm	parts per million
QA/QC	Quality Assurance/Quality Control
QPO	Quantifiable Performance Objective
RCP	Reclamation and Closure Plan
RDCK	Regional District of Central Kootenay
SI	Slope Inclinometer
STA	Station
TARP	Trigger Action Response Plan
TFT	Tailings Facility Technologist
TSF	Tailings Storage Facility
TSF QP	Tailings Storage Facility Qualified Person
UTM	Universal Transverse Mercator
VWP	Vibrating Wire Piezometer

1 Introduction

The objective of this Operation, Maintenance, and Surveillance (OMS) manual is to provide safe procedures for the operation, maintenance, and surveillance of the HB Mine Tailings Storage Facility (Facility) managed by the Regional District of Central Kootenay (RDCK). This document defines and describes the roles and responsibilities of personnel assigned to the facility and has been prepared to provide the individuals responsible for the maintenance, inspection, and environmental monitoring of the Site with information and instructions required to complete tasks in a safe and effective manner.

This document has been developed based on:

- Mine Permit No. M-218 last amended March 5, 2025.
- Health, Safety and Reclamation Code for Mines in British Columbia (“the Code”), (EMLI 2024a).
- Guidance Document Health, Safety and Reclamation Code for Mines and British Columbia – Part 10 – Tailings Storage Facilities and Dams (“HSRC Part 10 Guidance”) (EMLI 2024b)
- Developing an Operation, Maintenance and Surveillance Manual for Tailings and Water Management Facilities (MAC 2021a).
- Dam Safety Guidelines (CDA 2013).
- HB Mine Tailings Facility Reclamation and Closure Plan (RCP), RDCK, August 2020.

This document is not intended to provide design parameters or calculations, and reference is to be made to the technical documents for further details.

Other documents related to the management of the Facility consist of:

1. **Water Quality Management and Monitoring Plan (SLR 2026)** – Details the monitoring, reporting, and QA/QC program for water resources (e.g. surface water, tailings porewater, seepage and groundwater) at the Facility following the remediation and closure works completed in 2022.
2. **Reclamation Research Program (SLR 2022)** – Details how the research requirements outlined in the Mines Act Permit M-218 will be achieved and includes details regarding data, schedule and reporting used to monitor the tailings cover performance to achieve the mixed end land use (wildlife habitat and industrial) objectives.

2 OMS Governance

2.1 Roles, Responsibilities, and Authority

A list of individuals working for the RDCK responsible for the operation, maintenance, inspections, and instrumentation for the Facility, as well as external service advisors is provided in Table 2.1. This list is periodically reviewed to ensure contact names and phone numbers are kept up to date.

Table 2.1: Roles and Responsibilities

Role	Responsibility
General Manager of Environmental Services	■ Responsible for strategic planning of the site and accountable for management of the facility. ■ Alternative Mine Manger.
Mine Manager	■ Overall responsibility of the site. ■ Allocation of required human and financial resources. ■ Compliance with regulatory requirements and guidelines. ■ Reports dangerous occurrences including significant TSF or dam safety incidents to the Chief Inspector.
RDCK Tailings Facility Technologist (TFT) (or TSF Qualified Person)	■ Implementation of the OMS Manual and management plans for the site. ■ Co-ordination of the maintenance and inspection activities in accordance with the requirements of this document (e.g., co-ordinate annual inspections, routine and event-driven inspections, dam safety review, risk assessments and OMS Updates). ■ Overall management of the site with the Engineer of Record and internal/external resources. ■ Responsible for monitoring extreme precipitation events that warrant an event driven site inspection (Section 6.1.3). ■ Collection and filing of instrumentation data, inspection forms, and photographs, as well as file distribution. ■ Responsible for the identification of TARP triggers (Appendix F).
Engineer-of-Record	■ Professional responsibility of the facility design and evaluating the adequacy of the as-built facility relative to the design. ■ Responsible for ascertaining if the facility is in a safe condition or poses an unacceptable risk of failure. ■ Completion of the Annual Facility Performance Report (AFPR), and event-driven site inspections as required. ■ Responsible for providing Quantitative Performance Objectives and monitoring frequences required to ensure the facility is functioning as designed for inclusion in the OMS.
Independent Tailings Review Board	■ Review and comment on planning and design process, monitoring program, data analysis methodology, and work performance by the site team.
Site Operator	■ Routine maintenance (primarily maintenance of site access roads).

2.2 Communication

All primary lines of communication are through the TFT. Contact information is provided in Appendix I.

2.3 Control of OMS Documents

OMS procedures and requirements shall be reviewed annually, and the manual updated as required for continual improvement. Revisions to the OMS manual may be undertaken in response to, but not limited to the following:

- Variation of performance from design.
- Changes in site management organization, facility description, roles, and responsibilities, etc.
- Suggestions for improvement.
- Regulatory change.

Revision to the OMS manual shall be clearly documented on the Document Control page preceding the Table of Contents of this report. Once revisions have been made, the updated version or affected pages will be distributed to all involved parties identified in the Distribution List presented on the Document Control page. All material changes will be communicated in a timely fashion. Out-of-date materials shall be removed from active files and archived accordingly.

All records relating to the Facility, such as as-builts, inspection records, photographs, correspondence, etc., shall be kept together in an organized manner utilizing the RDCK filing methodology. All ongoing maintenance work, investigations and assessments, closure and reclamation activities, environmental monitoring, and emergency actions shall be documented to provide a history of the Facility for future use.

2.4 Training and Competence

All personnel working at the Facility shall have an appropriate understanding of the OMS manual and their respective roles and responsibilities. All site personnel should be aware of the visual signs that are indicative of the facility's structural integrity and safety.

Specific trainings requirements for each key position are listed in Table 2.2. In accordance with MAC (2021a), key documents are to be reviewed by each role as listed in the table. Training of personnel responsible for Facility inspections should also include a site walk-thru identifying areas for observation and instruction for instrumentation measurement. Instruction shall be provided by experienced staff and/or the Engineer of Record (EOR). Site inspection forms have been designed for multiple levels of inspection and guide personnel through the requirements of each type of inspection and steps for notification if abnormal conditions exist.

Table 2.2: Minimum Knowledge and Competency Requirements and Training

Role(s)	Minimum Knowledge and Competency requirements	Minimum Training
General Manager of Environmental Services / Alternative Mine Manger	■ Awareness of the responsibilities related to the TSF, dam safety, and applicable regulations. ■ Understanding of the significance of hazard and risk. ■ Understanding of the OMS Manual in relation to the TSF. ■ Understanding of regulatory and permit requirements.	■ EPRP ■ Review AFPR executive summaries and recommendations. ■ Review DSR report executive summaries and recommendations.
Mine Manager	■ Awareness of the responsibilities related to the TSF, dam safety, and applicable regulations. ■ Understanding of the significance of hazard and risk. ■ Understanding of the OMS Manual in relation to the TSF. ■ Understanding of regulatory and permit requirements.	■ EPRP ■ Review AFPR executive summaries and recommendations. ■ Review DSR report executive summaries and recommendations.
TFT	■ Awareness of the responsibilities related to the facility, its safety, and applicable regulations. ■ An understanding of the significance of hazard and risk of key failure modes. ■ Detailed understanding of this OMS Manual and EPRP. ■ Detailed understanding of regulatory requirements for various regulatory bodies in relation to the AFPRs and DSRs. ■ Detailed understanding of reporting requirements.	■ OMS Manual and EPRP. ■ Review AFPRs and recommendations. ■ Review DSR reports and recommendations. ■ Historic facility documents.
Engineer of Record	■ Understanding of contents of this OMS Manual. ■ Experience commensurate with the consequence classification and complexity of the facility. ■ Registration as Professional Engineer in BC. ■ Detailed understanding of dam safety regulatory responsibilities, as well as appliable standards, criteria, and guidelines. ■ Understanding of design and construction history and signs of key failure modes. ■ Understanding of reporting requirements.	■ OMS Manual and EPRP. ■ AFPRs. ■ DSR Reports. ■ Historic facility documents. ■ Specific training for onsite work.
Inspectors and Surveillance Personnel (RDCK employees, or external qualified consultants)	■ Understanding of contents of this OMS Manual. ■ Knowledge of specific risks if working in and around the facility, including key failure modes.	■ OMS Manual and EPRP. ■ HB Dam Tailings Facility Monitoring Protocols Memorandum (Appendix F). ■ Specific training for site work.
Maintenance Personnel and Contractors	■ Knowledge of specific risks if working in and around the facility, including key failure modes.	■ OMS Manual and EPRP. ■ Specific training for site work (including Mine Supervisor Certification if required).

2.5 Succession and Transition Planning

Personnel changes have the potential to create risk for the management of tailings facilities, and appropriate succession and transition planning is vital to manage this risk.

Succession planning should be considered for the long-term roles (TFT and EOR) to allow continuity in understanding of the facility. No successors to the TFT or EOR are currently in place. The contact list in Appendix I includes alternate contacts that are familiar with the site that can facilitate a transition should the current personnel not be able to fulfill the role.

3 Site and Facilities Description

This section provides an overview of the facility, the site conditions, and description of the facility components. Further details are provided in Appendices A (Key Figures and Drawings), C (Site History), and D (Site Conditions).

3.1 Facility Overview

3.1.1 Site History

The facility was owned and operated by Cominco (now Teck Resources Ltd.) from 1955 to 1978. The former HB mine is located approximately 2 km north of the facility. Commodities produced included lead, zinc, silver, cadmium, copper, gold, and talc. The RDCK purchased the tailings facility and surrounding land in February 1998 to establish additional buffer zone for the adjacent Central Landfill.

Details of the operational and closure history of the facility is provided in Appendix C.

3.1.2 Site Access

The Facility is located approximately 6 kilometres (km) south of the Village of Salmo, B.C. at an approximately latitude of 49°08’ N and longitude of 117°15’ W as presented in Figure A-1 in Appendix A. The Facility is contained within the Central Landfill boundary and Central Landfill Outer Property boundary defined by Parcel "A" (Explanatory Plan 88745I) of Sub-lot 36 District Lot 1236 Kootenay District Plan X69 (Except (1) Parts Included in Plans 8646, 14234, and (2) Part Included in SRW Plan 14948).

Access to the Facility is off Emerald Road, via unnamed gravel roads through the Central Landfill property from the main landfill entrance. Appendix A provides a layout of the gravel roads. The HB Dam is accessed via the gravel road along the outside refuse of limits in a southern direction. The impoundment area is accessed via the gravel road verging to the west along the northern refuse limits of the landfill. Access to the site is kept clear throughout the year; however, site access is best suited to four-wheel drive vehicles.

3.1.3 Reference Documentation

Reference documentation regarding design and construction of the facility is provided in Appendix C.

3.1.4 Datum and Coordinate System

Site surveys for the facility are currently referenced using UTM projection Zone 11 and datum NAD83; however, several different grid systems were previously used.

- Design and operation periods of the facility used two different local grids and datums in imperial units, with the second datum indicating a dam crest elevation 2520 feet.

- In October-November 2000, a local grid and datum in metric units was established for the dam area by Sproulers Enterprises Ltd. and used as a basis for the 2005 dam decommissioning (dam crest elevation 85 m).
- In 2012, third local grid and datum for the dam area was established by Ward Engineering Survey (dam crest elevation 109.3 m). Three control hubs were established as part of this local grid. The elevations on site were arbitrarily set by assigning an elevation of 100.00 m at Control Hub 6784 located to the south of the dam.
- In 2013 and 2016, facility-wide aerial site surveys were completed adopting UTM projection Zone 11 NAD83 (dam crest elevation 711 m).
- In 2015, replacement control hubs were installed at the three survey control locations during the spillway retrofit construction.

IMPORTANT: Many documents between 2014 and 2016 use an incorrect conversion between the Ward Survey datum and “meters above sea level”. These documents list the dam crest elevation as 713 m and most notably include the 2014 Dam Safety Review and the dam water level monitoring data.

3.2 Site Conditions and Natural Hazards

Site condition details (e.g. climate, topography, geology, hydrogeology, seismicity, etc.) are provided in Appendix D.

Relevant potential natural hazards for the immediate area around the facility include: rockfall above the spillway, forest fires, earthquakes, and floods. There is no history of any potential natural hazards related to animal damage at site. i.e., no historical beaver activity and been observed and no significant animal diggings in the dam fill. Some small burrows have been noted that were suspected to be caused by small rodents (moles or voles), but these rodents would not be expected to significantly weaken the dam fill structure or induce piping failures.

3.3 Facility Components

This section summarized the facility components. Details have been referenced from the RCP (RDCK, 2020) unless otherwise noted. Appendix A provides key figures and drawings of the facility.

3.3.1 HB Dam

The existing dam is approximately 28 m high and 210 m wide. The crest width of the earth dam is approximately 6 to 7 m. Typical cross-sections through the dam alignment are provided in Appendix A. Fill material is predominantly sandy silt with varying amounts of medium to coarse sand and fine gravel. Zones of soft material exist in the fills placed before 1967. Concerns regarding the deterioration of the timber crib used for early dam construction were addressed in the Decommissioning Plan and the 2020 RCP. It was concluded that slope stability would not be compromised by decay of the crib since it contributes to a small portion of the dam fill and the potential for cracking along the dam crest

and reduction of shear strength to the dam slope due to timber rotting is negligible. The foundation material under the dam consists of bedrock overlain by 2 to 4 metres of dense silty till with minor amounts of sand and gravel. The filter zone is composed of sand with some gravel.

A toe berm was constructed at the downstream toe of the tailings dam as part of the decommissioning works in 2005 and was expanded in 2021 according to the design presented in the 2020 RCP. The expanded toe berm has a crest width of 12 m with a 2.8H:1V downstream slope. A 1.5 m thick rock drain layer is present at the base of the tow berm with the remainder of the berm consisting of till that is separated from the rock drain by a layer of geotextile.

3.3.2 Spillway

A spillway is located at the west abutment of the dam that is sized to convey the probable maximum flood (PMF). The inflow design flood (IDF) has a magnitude of 70 m^3/s with a peak spillway discharge of 58 m^3/s (RDCK, 2020). The upper portion of the spillway is excavated through bedrock while the lower portion of the spillway is excavated in till. The riprap erosion protection in the lower section of the spillway is sized to be able to withstand a flood event corresponding to the 1 in 1,000-year event. In the event of the PMF, there is a risk of movement of the riprap and erosion of the underlying soil section of the spillway.

3.3.3 Upstream Beach and Tailings Pond Backfill

Till was placed upstream of the dam over of the tailings to mitigate concerns related to preferential pathways through the dam and foundation and to prevent ponding in the impoundment.

The Upstream Beach is referred to the area immediately adjacent to the HB Dam, which extended the dam crest by approximately 7 m upstream of the dam with a 2% grade to drain towards the tailings impoundment and a 4H:1V upstream slope.

The remainder of the area between the dam and the South Spur Channel is referred to as the “Tailings Pond Backfill” area where fill was placed to direct surface runoff to the spillway. The final surface has a typical grade of 1.3% that drains into the Tailings Surface Water Channels. The backfill consists primarily of till, along with some tailings affected soil that was imported from the Ross Property (see Section 3.3.6) as well as some tailings that was excavated during construction of the Tailings Surface Drainage Channel (see Section 3.3.5). The top 0.3 m of the fill consists of clean till material placed from the Till Borrow Area.

A geocomposite layer consisting of a geogrid and non-woven geotextile was installed between the tailings and fill materials throughout most of the Upstream Beach and Tailings Pond Backfill areas to provide ground reinforcement and improve trafficability conditions for the backfill placement.

3.3.4 Tailings Cover

The primary objective of the tailings cover system is to provide dust and erosion control and to prevent migration of the tailings due to wind and water. The cover acts as a barrier preventing direct contact of

the tailings by flora and fauna and provides a growth medium for the establishment of a sustainable vegetation to reclaim the area and meet the post-closure mixed land-use wildlife habitat and industrial objectives.

Except for the area south of the South Spur Channel (Tailings Pond Backfill Area), the cover has a nominal thickness of 0.3 m and consists of till sourced from the Till Borrow Area.

3.3.5 Tailings Surface Water Drainage Channels

Lined surface water drainage channels were constructed within the tailings cover to convey seasonal flows from the Central Landfill wetland area (Main Channel) and from two small ephemeral streams that enter the tailings deposition area (North and South Spur Channels). The channels are lined with a LLDPE liner and covered with a liner protection layer overlain by a layer of turf-reinforcement matting. Hydraulic modelling of the channel design indicates that the channels can convey up to approximately the 1 in 50-year, 24-hour rainfall event before overtopping. For extreme flood events up to the PMF, the modelling shows that overland velocities are up to 0.4 m/s indicating that cover erosion is not expected once vegetation is established.

Upstream of the main confluence of the three channels, the channels have a base width of 1.0 m, a typical depth of 0.3 m, and a liner protection layer thickness of 0.2 m. To minimize uplift pressure on the liner in these channels, the anchor trench of the LLDPE liner is located at a maximum height of 0.3 m above the base of the channel.

Downstream of the main confluence, the channel has a base width of 2.3 m wide, a channel depth that ranges from approximately 0.3 m at the confluence and 1.3 m at the spillway, and a liner protection layer thickness of 0.3 m. Over the last 73 m of the channel upstream of the spillway (STA 0+758 to STA 0+831), the LLDPE liner was replaced with a layer of CombiGrid to prevent liner uplift because of the deeper channel depths.

The inlets of the North and South Spur Channels include energy dissipation structures. The structures are lined with geotextile and covered with a 0.15 m thick liner protection layer and overlain by geotextile and riprap with a median particle diameter of 400 mm.

3.3.6 Ross Landform

Most of the tailings affected soils imported in 2021 and 2022 from the Ross Property were placed in the “Ross Landform” located in the northwest corner of the tailings facility. The imported soils were placed overtop of an already placed soil cover with a typical thickness of 0.3 m and was subsequently crowned to prevent ponded water. A 0.3 m thick cover was then constructed over the imported soils that consisted primarily of till that was blended with woodchips sourced from the piles at the north end of the tailings facility. The landform has an area of approximately 2 ha, a maximum height of 4 m, and a maximum slope of approximately 5H:1V.

3.3.7 Instrumentation

Instrumentation associated with water management and dam performance includes standpipe and vibrating wire piezometers, a seepage weir, survey hubs, slope inclinometer casings, groundwater monitoring wells, and surface water monitoring locations. Instrumentation details, including locations, installation elevations, and IDs, are summarized in Appendix E.

All instrumentation measurements (manual and automated) are compiled and stored electronically on the RDCK server with appropriate backup. Data are reviewed by qualified staff and the EOR to confirm instrument integrity, evaluate trends relative to design expectations, and assess performance against the QPO triggers in the TARP (Appendix F).

Piezometers

The piezometer network now consists of:

- **Standpipe piezometers**: Five existing standpipe piezometers (P1, P2, P3, P5, and P6) were installed in 2001 and 2005 located in the dam and foundation. In 2025, these piezometers were retrofitted with vibrating wire piezometer (VWP) sensors connected to automated dataloggers.
- **New (2025) VWPs:** Ten VWPs were installed in five new boreholes (SRK25-BH-01 to -05) near the HB Dam in August 2025 to improve characterization of the hydrogeologic regime through the dam and foundation and to support updated stability assessments.

All VWPs are connected to RST Affinity dataloggers housed in RST Secondary Enclosures. Piezometric levels are used to define the phreatic surface through the dam and foundation and are assessed against Quantifiable Performance Objective (QPO) trigger levels defined in the TARP. QPO thresholds for the new VWPs have yet to be established and will be incorporated into a future TARP update.

Seepage Weir

A 45-degree V-notch weir is installed near the downstream toe of the dam to monitor seepage quantity and quality. The weir was originally installed in 2012 and was relocated and integrated into the expanded toe berm drainage system in 2021. During routine inspections, seepage depth over the notch (for flow calculation) and turbidity/clarity are recorded and compared to the QPO trigger ranges in the TARP.

3.3.8 Old Decants

Historical information indicates two timber decant structures connected to 60 cm (24”) diameter steel pipes that extend through the dam. No water has been observed flowing out of the east decant culvert which was filled with concrete and was subsequently buried by the 2021 toe berm expansion. The west decant culvert was discovered to be flowing during 2005 decommissioning activities was backfilled and buried during the original toe berm construction. A decant drain was also formerly located north of the east abutment. In 2005, the decant structure was closed as part of the 2005 decommissioning works.

3.4 Regulatory Requirements and Guidelines

Applicable codes, guidelines, and regulations governing the facility are:

- Legislated Dam Safety Reviews in BC, V4.0 (EGBC 2023)
- Health, Safety and Reclamation Code for Mines in British Columbia (EMLI 2024a)
- Guidance Document Health, Safety and Reclamation Code for Mines and British Columbia – Part 10 – Tailings Storage Facilities and Dams ("HSRC Part 10 Guidance") (EMLI 2024b)
- Mine Emergency Response Plan Guidelines (EMLI 2017)
- Dam Safety Guidelines (CDA 2013)
- Application of Dam Safety Guidelines to Mining Dams Bulletin (CDA 2019)
- A Guide to the Management of Tailings Facilities (MAC 2021a)
- Developing an Operation, Maintenance and Surveillance Manual for Tailings and Water Management Facilities (MAC 2021b)

Mine Permit M-218 was issued by the Deputy Chief Permitting Officer on May 18, 2021, approving the 2020 RCP subject to conditions stipulating compliance. The reporting requirements are discussed in Section 7.4.

3.5 Dam Consequence Classification

The dam is classified as 'Very High' as defined by the CDA based on infrastructure and economic losses associated with dam failure. The classification constitutes the basis for analyzing the dam's safety as well as level and frequency of surveillance.

3.6 Design Basis and Key Design Information

A list of key reports that document basis for design and design criteria for the Facility is listed in Table 3.1 below. No design reports of the facility are available (or known to exist) prior to 1972. A complete listing of available design, construction and surveillance reports is provided in Appendix C.

Table 3.1: Summary of Key Design and As-Built Reports

Component/ Description	Report
Dam Construction (Operation Period)	■ Re: HB Tailings Dam Near Salmo, BC (Golder 1972) ■ Site Investigation at Existing H.B. Mines Tailings Pond (Golder 1974) ■ Proposed Dam Extension 1976 (Golder 1976)
2005 Dam Decommissioning	■ HB Mine Tailings Pond and Dyke Decommissioning Plan (BGC 2002) ■ HB Dam Decommissioning 2005 Construction Records (BGC 2005)
2020 Reclamation and Closure Design	■ 2020 Remediation and Closure Plan (RDCK 2020) ■ 2021-22 Remediation and Closure Construction Record Report (SRK 2023)

Notes: See Appendix C for a complete listing of available design, construction, and surveillance reports.

The key information and the design basis for the Facility is provided in the Design Summary Memorandum provided in Appendix B. The document was prepared to satisfy Section 10.5.4 of the Code that requires the EOR to prepare a document that details the design assumptions and criteria, including operating constraints, and that provides the basis for the design of all phases of the tailings facility lifecycle.

4 Operations

The objective of this section is to define the operating standards and procedures for the TSF, in accordance with regulatory requirements and best operating practices.

The site is not an operating mine. However, if the dam were to fail, then the consequence would be significant based on current consequence classification. The dam and associated works must therefore continue to function as intended.

4.1 Performance Objectives

Quantifiable Performance Objectives (QPOs) consist of measurable and quantifiable performance requirements for the facility. The quantifiable performance objectives currently measurable for the facility in its current closure-passive phase with the available information are included in the Trigger and Action Response Plan provided in Appendix F. QPOs have been established based on:

- Piezometer water level thresholds
- Weir seepage flow observations
- Tailings Impoundment ponding observations
- Survey hub settlement thresholds
- Observations of potential visual indicators of potential failure modes

4.2 Surface Water Management

Routine water management is not required at the site as inflows into the facility are discharged through the spillway and no ponded water is stored within the facility.

Inflows to the facility consist of surface water and precipitation. Outflows are observed as spill going through the spillway and seepage passing through the weir. The spillway is designed to manage the design flows.

4.3 Environmental Protection

A Water Quality Management and Monitoring Plan has been developed for the facility (SLR 2026). The plan includes surface water, porewater, seepage, and ground quality and quantity locations, frequencies and parameters, and QA/QC. Annual updates are reported in the Annual Reclamation Report.

5 Maintenance

5.1 Objectives

Facility maintenance is important to the safe operation of the facility. Maintenance could be preventative (planned tasks), predictive and corrective maintenance to address issues identified during routine inspections, or event-driven maintenance, required based on inspections triggered by extreme weather or reported sudden changes in conditions. Section 5.3 discusses triggers for each type of maintenance and descriptions of maintenance activities. Maintenance activities can be tracked using the record log in Appendix H.

The objectives of the maintenance program are:

- Identify and describe maintenance requirements for the facility
- Establish maintenance schedules and triggers
- Address requirements for routine, predictive/preventative, and event-driven maintenance

The maintenance program is intended to ensure components are maintained in accordance with performance criteria and legislative requirements and to avoid costly repairs associated with deteriorating conditions.

5.2 Inventory of Components Requiring Maintenance

The following components of the facility may require periodic maintenance:

- Dam crest and slopes
- Spillway and stilling basin
- Tailings Cover
- Tailings Surface Water Drainage Channels
- Dam Instrumentation
- Access to site

5.3 Maintenance Schedule and Triggers

Maintenance is performed on an as-needed basis as deemed necessary by the TFT and EOR, and as triggered by the results of routine and event-driven inspections.

5.3.1 Preventative Maintenance

Preventative maintenance is considered planned and recurring maintenance performed at specific intervals or frequencies that do not occur as a result of surveillance activities.

Currently, there are no regularly scheduled periodic preventative maintenance requirements. In future revisions of the OMS Manual, scheduling of vegetation clearing and maintenance should be scheduled to be a preventative maintenance activity once growth rates and conditions are determined.

5.3.2 Corrective and Event Driven Maintenance

Maintenance may be required following event triggered inspection or following routine inspection where conditions are observed that require maintenance.

Maintenance or repair requirements will typically be based on the condition of the facility at the time of post-event surveillance activities.

5.4 Description of Typical Maintenance Activities

All work should be carried out by qualified contractors for the specific maintenance task with direction provided by the TFT, and where necessary, under the direction of the EOR. Safe work procedures for each task should be developed by the qualified contractors in consideration of the Mines Act, the Code, and the BC Occupational Health and Safety Regulation.

Typical maintenance activities are listed in Table 5.1 with an estimated frequency. Repairs for more substantial damage or defects that require remedial design by the Engineer of Record are not included in the table. General comments or considerations for each task have been noted for consideration in the safe work procedures for each contractor.

Table 5.1: Maintenance Schedule and Frequency

	Maintenance Activity	Maintenance Type	Schedule/ Frequency
Dam Crest			
1	**Grade/Rutting Control:** ■ Ruts caused by vehicles should be regraded and re-compacted with camber to the upstream slope such that drainage of runoff will be directed back into the impoundment. Any depressions that may pool water should be removed. ■ Any fills used for surface grading must be resistance to rutting (i.e., crushed gravel).	Corrective / Event Driven	Scheduled based on observations
2	**Cracking:** Notify the EOR prior to any maintenance on cracks. Generally, the action would be to grade over minor cracks in crests. Material used to backfill cracks should be consistent with the parent material proximal to the crack.	Corrective / Event Driven	Scheduled based on observations
Dam Slopes			
1	**Animal Burrow Maintenance** Control any burrowing animals in the dam fill. Burrows can weaken the embankment and create seepage pathways for water. Remedial actions should consider rodent control, removal of favorable habitat conditions, and backfilling of burrows with compact fill. Permits may be required from the Wildlife Branch of the ENV before undertaking rodent control.	Corrective / Event Driven	Scheduled based on observations

	Maintenance Activity	Maintenance Type	Schedule/ Frequency
2	**Vegetation Maintenance**: ■ Control excessive or unwanted vegetation growth along the portions of the facility to allow for easy access and thorough inspections. Removal all trees ≥ 50 mm in diameter and ensure that all cuttings and debris are removed from the embankment area. ■ Areas of poor vegetation growth on the embankment slopes should be seeded with appropriate seed mix.	Corrective / Event Driven	Scheduled based on observations
3	**Erosion Maintenance (Rills/Gullies)** Erosion gullies and their associated debris cones should be backfilled and graded over to prevent any further erosion from occurring. In some cases, erosion gullies are formed due to settlement and/or cracking of nearby surfaces, such as crests and roads, and this aspect should be assessed before the gullies are filled. Depending upon the specific application, it is generally better to use angular material to backfill gullies since that material is more resistant to erosion than rounded particles. Contact the EOR and TFT prior to backfilling any erosion gulley/rill.	Corrective / Event Driven	Scheduled based on observations
Spillway and Stilling Basin			
1	**Debris, Obstructions, and vegetation growth:** Remove debris or obstructions in the spillway, inlet and stilling basin that has the ability to reduce the conveyance capacity of the spillway.	Corrective / Event Driven	Scheduled based on observations
2	**Riprap Maintenance**: Riprap shall be kept in good condition. Flood events and frost action may disturb the riprap. The riprap replaced should be angular and of comparable size to the riprap that was displaced. Any riprap should be graded consistently with adjacent materials so that no edges or corners are formed.	Corrective / Event Driven	Scheduled based on observations
Tailings Cover			
1	**Erosion Maintenance (Rills/Gullies**): Backfill all eroded areas where tailings are at risk to become exposed (i.e., if erosion is greater than 20 cm) and complete additional work to ensure that erosion does not develop in the same area again. Consult with the Engineer of Record prior to backfilling.	Corrective / Event Driven	Scheduled based on observations
2	**Tailings Boils**: Exposed tailings boils are to be buried beneath the cover. Contact the EOR prior to tailings boil remediation for guidance.	Corrective / Event Driven	Scheduled based on observations
3	**Settlement:** Any depressions caused by settlement near the dam (i.e., south of the South Spur Channel) that may pool water should be filled.	Corrective / Event Driven	Scheduled based on observations
4	**Vegetation Maintenance**: Areas of poor vegetation growth should be seeded with appropriate grass to minimize the potential for erosion.	Corrective / Event Driven	Scheduled based on observations
Tailings Surface Water Drainage Channels			
1	**Debris, Obstructions, and vegetation growth:** Remove debris or obstructions in the spillway, inlet and stilling basin that could reduce the conveyance capacity of the spillway.	Corrective / Event Driven	Scheduled based on observations
Dam Instrumentation			
1	**Piezometers**: As-needed maintenance may include: ■ Replacement of damaged caps and protective steel casing. ■ Replace IDs on piezometers if unreadable. ■ Maintain the water level indicator in good working order.	Corrective / Event Driven	Scheduled based on observations

	Maintenance Activity	Maintenance Type	Schedule/ Frequency
	■ If standing water is observed around the piezometers, the surface should be sealed with bentonite pellets to prevent the ingress of surface water down the casing.		
2	Seepage Weir: As-needed maintenance may include: ■ Removal of vegetation growth and debris from the seepage pond. ■ Blocking/plugging of any seepage flow that bypasses the weir.	Corrective / Event Driven	Scheduled based on observations
Site Access			
1	Facility access is to be properly maintained throughout the year such that maintenance and surveillance activities can be conducted as required. Access roads to the site are prone to rutting during wet periods and access to the site should be restricted during wet weather to preserve access for emergency situations.	Corrective / Event Driven	Scheduled based on observations

5.5 Maintenance Documentation

All documentation is the responsibility of the TFT. The following documentation is to be kept up to date with copies forwarded to the Mine Manager:

- For routine maintenance, inspection reports, and repair logs. A maintenance activity tracker is provided in Appendix H.
- For event driven maintenance, an incident report is to be prepared commensurate with the severity of the impact.

Refer to Section 7 for details.

6 Surveillance

6.1 Overview

The Facility surveillance program was developed to assess the current performance of the facility relative to its intended design parameters. The objective is to provide confirmation of the adequate performance of the facility, including containment, stability, and observational function by observing, measuring, and recording data relative to its potential failure modes. Surveillance is also used to aid in identifying maintenance requirements for the Facility.

Other plans and monitoring programs related to the facility management are noted below. Please refer to those documents for surveillance and reporting requirements related to those programs.

1. **Water Quality Monitoring:** As per the Water Quality Management and Monitoring Plan (SLR 2026)
2. **Vegetation and Cover Performance Monitoring:** As per the Reclamation Research Program (SLR 2022)
3. **Wildlife Monitoring:** As per the Reclamation Research Program (SLR 2022b)

6.1.1 Training Requirements

Personnel conducting surveillance activities must comply with the training and competence requirements set out for inspectors in Section 2.4. All inspectors must complete the HB Mine Tailings Facility Monitoring Protocol Acknowledgement Form provided in Appendix G.

Annual Facility Performance Reports (AFPRs) and their associated site inspections must be completed by a qualified person (as defined by the Code).

6.1.2 Monitoring Frequencies and Schedule

Required surveillance tasks and frequencies are presented in Table 6.1. The procedures are further described in the following sections.

As vegetation is not yet fully adequately established to prevent erosion because of the 2022 construction, the site TARP includes hydrometric triggers to monitor the site after significant precipitation events. Details of the event driven monitoring frequencies and triggers are provided in Section 6.1.3.

Table 6.1: Surveillance Monitoring and Frequency Summary

Surveillance Type/Task	Surveillance Method / Component	Activity	Frequency	Performance Indicator	Responsibility
Visual Inspections	Dam and Spillway	Observations of cracks, deformation, seepage, riprap movement, etc.	■ Weekly during freshet (Mid-March to Mid-April) ■ Monthly for remainder of year.	See TARP in Appendix F.	TFT[1]
	Tailings Surface Water Drainage Channels	Observations of liner exposures, deformation, blockages, etc.	Semi-annually (after freshet, before winter)	See TARP in Appendix F.	TFT[1]
	Tailings Cover	Observations of erosion, settlement, tailings boils etc.	Annually after freshet	See TARP in Appendix F.	TFT[1]
	Cover Drone Surveys	Survey of the tailings cover to monitor for ponding, settlement, erosion.	Annually after freshet.	See TARP in Appendix F.	TFT[1]
	Downstream Channel (between HB Dam and Outlet Ditch)	Observations of erosion, sedimentation, etc.	Semi-annually (after freshet, before winter)	See TARP in Appendix F.	TFT[1]
Instrumentation	Piezometers	Collect VWP readings that measure water levels in dam and foundation soils		Water level thresholds (See TARP in Appendix F.	TFT[1]
	Seepage Weir	Manual flow readings of v-notch seepage weir		See TARP in Appendix F.	TFT[1]
	Survey Hubs	Survey Hub readings	Every 5 years or following major seismic events	Displacement thresholds (See TARP in Appendix F).	TFT[1]
	Slope Inclinometers	Slope Inclinometer readings	Every 5 years or following major seismic events	Displacement thresholds (See TARP in Appendix F).	TFT[1]
AFPR Inspections	Visual Inspection, instrumentation, and document review	Site Inspection by Professional Engineer	Annually	Inspection to include: Dam, Spillway, Tailings Surface Water Drainage Channels, and Tailings Cover.	EOR
Dam Safety Reviews	DSR	Dam Safety Review Inspection by Professional Engineer	Every 5 years	Review to include Dam, Spillway, Tailings Surface Water Drainage Channels, and Tailings Cover.	Third-Party Consultant, Qualified Professional Engineer

Notes:

[1] Or trained designate.

6.1.3 Event-Driven Monitoring Frequencies and Schedule

In addition to the planned routine inspections, the facility is to be inspected after any usual or extreme hydrometric or seismic events. The triggers for these inspections are provided in the TARP in Appendix F. The TFT is responsible for assessing whether the triggers levels have been exceeded.

The TFT is responsible for receiving seismic activity notification alerts. Earthquake information can be obtained from:

- Geological Survey of Canada/NRCanada website: http://www.earthquakescanaa.nrcan.gc.ca/index-eng.php
- US Geological Survey website: http://earthquake.usgs.gov/earthquakes/map/
- https://sslearthquake.usgs.gov/ens/
- Local radio stations (earthquakes of these Magnitudes will likely be felt in Nelson and be reported on local radio stations)

Hydrometric notification alerts can be set up via the Windy app (or equivalent). Precipitation forecasts and recorded precipitation for regional weather stations may be obtained from the Environment Canada website http://weather.gc.ca/canada_e.html. Snowpack conditions for the site can be determined by visual site observations, Salmo Ski Hill Webcam (https://skisalmo.com/conditions/) or Drive BC webcam in Salmo (https://www.drivebc.ca/mobile/pub/webcams/id/158.html).

The following Facility components are to be inspected during event-driven inspections:

- Dam and Spillway
- Tailings Cover
- Tailings Surface Water Drainage Channels
- Access roads needed to access the dam in the event of an emergency.

6.1.4 Performance Objectives and Indicators for Potential Failure Modes

As a permanently closed site, structures at the site that have the potential to endanger human life or create environmental damage were either removed or upgraded to enhance long-term physical stability.

The surveillance program has been developed to allow for the early identification of conditions that can develop into failure modes. Potential failure modes and visual/performance indicators are summarized in Table 14, which provides a list of such modes typical for any similar earthfill embankment. There is no implication as to whether any of those modes are credible for the facility, but that all such are evaluated, and appropriate surveillance is in place. Further details regarding specific visual indicators are provided in the TARP (Appendix F).

Table 6.2: Potential Failure modes and Associated Performance Indicators

Failure Mode	Trigger/Hazard	Potential Visual Indicator	Potential Performance Indicators	Critical Controls
Overtopping	▪ Blocked Spillway	▪ Debris build-up in/around spillway ▪ Elevated pond level	▪ Insufficient water storage behind blocked spillway leads to total loss of freeboard	▪ Routine inspections
Internal Erosion or Piping	▪ Rising phreatic surface ▪ Animal burrowing ▪ Vegetation root penetration (into dam) ▪ Degradation of wooden timber crib/piping	▪ Turbid seepage ▪ Increasing seepage rate ▪ Emergence of seepage in new areas ▪ Sinkholes	▪ Loss of dam performance ▪ Piezometers indicating a rising phreatic surface	▪ Routine inspections ▪ Piezometers ▪ Seepage weir
Slope Instability	▪ Rising phreatic surface ▪ Earthquake	▪ Increasing rate of seepage emerging from dam toe ▪ Sloughing or slumping of the downstream slope ▪ Cracking along the crest or slopes	▪ Slope deformation beyond ability to perform dam function ▪ Piezometers indicating a rising phreatic surface ▪ Survey monuments showing displacement	▪ Routine and event-driven inspections ▪ Piezometers ▪ Seepage weir
Surface Erosion	▪ Large precipitation events	▪ Rill/gully erosion on the downstream slope	▪ Loss of dam performance	▪ Routine and event-driven inspections

A risk register is available for the site that is reviewed annually by the EOR and TSF QP and updated as required.

6.2 Surveillance Procedures

A Facility monitoring protocol Memorandum detailing the roles and expectations for the various inspection and monitoring tasks (updated version is attached as Appendix G).

6.2.1 Routine Inspections

Inspections shall be conducted using a methodical approach to provide consistency and ensure the appropriate information has been gathered and recorded. The inspection shall include all components of the dam; the crest and downstream slope, the abutments, the spillway, the tailings pond backfill area and the area below the dam, including the seepage weir. Site inspectors should not enter the weir pond.

A routine inspection form for the facility has been prepared to organize and list the various components of the facility as presented in Appendix G. Notes from previous inspections, photographs, and the Excel file that tracks unresolved abnormal observations should be reviewed prior to completing the field inspection such that a comparison can be made to the present conditions.

Items to assist in completing an inspection include the following:

- Clip board and pencils
- Inspection Form
- Cell phone with camera/video and GPS capabilities, as well as the RSTAR Affinity app (with approved access) to be able to download data from the VWP dataloggers.
- Tape measure, and
- Flashlight.

The RDCK maintains an inspection kit for use by staff or contractors, which is stored at the Central Landfill scale shack (550 Emerald Mine Road). This kit also contains a water level owned by the RDCK to allow for any groundwater well readings. Should another water level be required they may be rented from Pine Environmental (1-877-678-8383).

Abnormal Observations - Definition

For the purposes of routine inspections, an “abnormal site observation” is any condition that:

- Represents a new feature (e.g., new seepage area, new crack, new sinkhole, new erosion gully, new ponding area), or
- Represents a worsening of a previously observed feature (e.g., larger erosion gully, increased seepage flow or turbidity, enlarged crack or slump, increased settlement), or
- Indicates damage or malfunction of instrumentation or critical infrastructure (e.g., damaged piezometer standpipe or VWP enclosure, blocked or by-passed weir), or
- Appears inconsistent with expected seasonal behaviour or past inspection records, or
- Cannot be confidently classified by the inspector as “normal” for the facility.

Abnormal observations shall be evaluated against TARP to determine the appropriate emergency level as specified in the TARP and Emergency Preparedness and Response Plan (EPRP), and the appropriate EPRP response procedure followed.

Field Documentation Requirements for Abnormal Observations

Whan an abnormal observation is identified (and if safe to do so), the inspector shall:

1. **Record the observation in the inspection form** with the following details at a minimum:
   - Precise **location**, using descriptive wording and GPS coordinates.
   - **Date and time** of the observations.
   - **Weather and site conditions**, including recent precipitation, snowmelt, and estimated spillway or seepage conditions.

- **Description of the feature** including:
  - For cracks, slumps, sinkholes, rills, or gullies: approximate length, width, and depth; slope/area affected; and material type (e.g., till, tailings cover).
  - For seepage: estimated weir flow depth, clarity/turbidity, colour, and any observed by-pass flow around the weir.
  - For ponding: approximate surface area and depth, presence of vegetation, and whether ponding appears to be from seepage or surface runoff (precipitation).
  - For instrumentation: type of damage or issue (e.g., broken cap, mis-labelled piezometer, blocked standpipe, damaged datalogger enclosure).
- A comparison to previous condition (e.g., “new since last inspection,” “larger than observed in 2024,” “unchanged from previous visit”).

2. **Photograph the feature**, ensuring that:
   - At least one overview and one close-up photograph are taken.
   - Where practical, a scale (e.g., tape measure, clipboard) is visible in at least one photo.
3. **Prepare a sketch**, where helpful, to illustrate the location, orientation, and extent of the feature relative to dam features, instrumentation, or landmarks.

Inspections notes shall be kept on file at the RDCK office and distributed as noted in Section 7.3 of this report.

Follow-up Procedure for Abnormal Observations

The follow-up procedure for abnormal observations is detailed in the five-step Emergency Response Plan (ERP) process in the EPRP that is summarized as follows:

1. **Event Detection:** When an abnormal observation is made, the inspector shall treat it as a potential ERP event, document it as described above and immediately consult the EPRP and the TARP to confirm whether the condition corresponds to a listed trigger or warning sign.
2. **Emergency Level Determination:** The inspector shall promptly contact the TFT and provide all relevant observations and photos. The TFT with input from the inspector shall and EOR as needed, will classify the condition as Emergency Level 1, 2, or 3 in accordance with the EPRP/TARP.
3. **Notification and Communication:** Once the emergency level is determined, the inspector shall support the TFT in implementing the notifications required for that level following the applicable notification charts in the EPRP.
4. **Expected Actions:** For Level 1 minor risk situations, as directed by the TFT and/or EOR, the inspector or designated personnel may be requested to provide additional monitoring information. For additional information on including expected actions for higher level emergencies, consult the EPRP.

5. **Tracking, Follow-up, and closure:** As part of the follow-up procedures for abnormal observations, each abnormal observations shall be assigned a unique ID and tracked in subsequent inspections until it is repaired, shown to be stable, or judged by the EOR not to be a dam safety concern. A spreadsheet is to be maintained to track these features as described in Section 7.3.

6.2.2 Instrumentation Measurements

The piezometer and seepage weir measurements are collected during routine inspections. The survey hubs and slope inclinometer instrumentation are collected at the frequencies noted in Table 6.1. The data are compiled and distributed to RDCK staff responsible for the Facility as well as to the Facility's EOR for continual monitoring.

All monitoring data is stored electronically with backup. Any manual notes are scanned, and the raw data saved together with any transposed data. Data is reviewed by qualified staff immediately following collection to confirm the integrity of the instrumentation, as well as to ensure that the facility performance is consistent with expectations.

Piezometric Levels

The vibrating wire piezometers (VWPs) installed in the existing standpipe piezometers (P1, P2, P3, P5, P6) and in the 2025 boreholes (SRK25-BH01 to BH05) are connected to RST RSTAR Affinity data loggers housed in surface enclosures. The VWPs provide daily measurements of pore pressure/water levels. The data loggers are downloaded via Bluetooth and reviewed following the procedures outlined Appendix E.

The performance of the piezometers is evaluated against the "trigger levels" noted in the TARP (Appendix F). The expected ranges and triggers levels shown in the TARP are based on the results of the stability analyses completed for the dam in 2023 (SRK 2024). The Yellow "Minor Risk Situation" trigger levels are also noted in the routine inspection form.

Should the "trigger levels" be exceeded, the reading must be retaken for conformation, and the appropriate TARP response in the EPRP followed.

Seepage Rate

The rate of seepage is recorded at the v-notch weir located near the toe of the dam. The following information is to be recorded on the inspection form:

- Record the depth of water relative to the bottom of the v-notch V. The depth is used to calculate the seepage rate.
- The clarity (lack of sediments) of the seepage
- Observations of any by-passing flow that may impact the seepage rate read.

A photograph of the seepage pond should also be taken.

Survey Hubs

Twelve new survey hubs were installed in 2021, as part of the closure construction works. The survey hubs were monitored annually between 2021 through 2025 and are now monitored by a qualified surveyor every 5 years or following a major seismic event.

Slope Inclinometers

Four Slope Inclinometer (SI) casings were installed in 2025 in boreholes SRK25-BH-01, SRK25-BH-03, SRK25-BH-04, and SRK25-BH-05. The casings are intended to monitor lateral displacements in the dam and foundation, and are to be monitored every 5 years, or following a major seismic event. Appendix E provides the procedure for collection of slope inclinometer measurements.

6.2.3 Tailings Cover Inspections

The tailings cover and Tailings Surface Water Conveyance Channels are to be inspected annually after freshet as part of the annual inspection by the Engineer-of-Record. The inspection will record observations on any of the following:

- Areas of differential settlement and ponding
- Erosion
- Formation of tailings boils
- Channel blockages and excessive vegetation growth in the channels
- Channel deformation
- Liner displacement or exposure.

For each feature, the following information will be collected:

- GPS location of the feature and assignment of an ID that notes (ex. 2024-SET-01):
  - Year of identification
  - Feature type (Settlement, Ponding, Erosion, tailings exposition, channel blockage, or channel deformation.
  - Unique number
- GPS of all ponding limits (if applicable)
- Photographs of each feature.

Drone surveys of the tailings cover area also to be completed annually to track the development of ponding/differential settlement. The surveys should be completed under snow-free conditions near the freshet period (April).

6.2.4 Bedrock Spillway Highwall Inspections

Photographic monitoring of the bedrock highwall above the spillway is intended to provide a consistent visual record so that any progressive rock movement or rockfall that could reduce spillway capacity is detected early and assessed by a Qualified Professional Engineer.

A fixed photo point for the photographs is established at the west dam abutment with its location shown in Appendix E. Photos shall be taken from this point annually during the AFPR site inspection. Additional photos may be taken from the same point during routine or event-driven inspections if warranted (e.g., after large storms or earthquakes). At least one panoramic photograph should be taken to capture the entire highwall, plus additional close-up photographs of any notable features (e.g., erosion gullies, overhangs, or rockfall/spalling areas).

As part of the AFPR, the current photos are to be compared with those from previous years taken at the same point to identify any new or enlarged rockfall/talus areas, or any apparent movement, opening of joints, or new overhangs/blocks on the highwall. Any rockfall in the spillway or visible changes in the highwall shall be recorded in the inspection form and AFPR, including approximate location, size, and whether spillway conveyance could be affected, with supporting photographs.

If any movement, new rockfall, or other instability indicators are observed, the site inspector shall bring the issue to a Qualified Professional Engineer to determine if further assessment, increased monitoring, or remedial works are required.

6.3 Periodic Reviews

6.3.1 Annual Facility Performance Report

The Annual Facility Performance Report is a yearly technical performance review of the Facility, prepared by the EOR, that:

- Describes the current condition and performance of the TSF over the previous year.
- Assesses how the facility is performing relative to its design, the Code, and the OMS Manual.
- Summarizes inspections, monitoring and instrumentation results, and any analyses completed.
- Identifies any issues, non-conformances, changes to the facility or operating practices, and associated risks.
- Provides recommendations and required actions to ensure continued safe performance of the facility.

The report also includes an annual inspection completed by the EOR or qualified designate, that includes all aspects of the facility including the annual tailings cover inspection (Section 6.2.3) and the bedrock spillway highwall inspection (Section 6.2.4). The site visit is generally carried out in the summer.

6.3.2 Dam Safety Reviews

A Dam Safety Review (DSR) is arranged every five years as per Section 10.5.4 of the Code. The DSR is carried out by an independent third party and is a systematic assessment of all aspects of design, construction, maintenance, operation, processes, and systems affecting the safety of the facility. This review encompasses all elements of the facility, but focusses on the dam, and is based on the state-of-practice at the time of the inspection as opposed to when the facilities may have been designed.

The last DSR was completed by Tetra Tech in 2024. The next DSR is scheduled to occur in 2029 and must be submitted to the Ministry of Mines and Critical Metals on or before March 31, 2030.

6.4 Surveillance and Review Documentation and Reporting

See Section 7.

7 Reporting and Communication

7.1 Communications

Contact details for site contacts and alternative contacts are provided in Appendix H.

7.2 Maintenance Reporting

The TFT is responsible for documenting maintenance activities that are carried out for the Site and reporting them to the Mine Manager. A summary of maintenance activities is to be provided to the EOR annually as part of the annual review of the facility performance, or as required. Maintenance records are to be stored as noted in Table 7.1.

Table 7.1: Maintenance Documentation and Reporting

Report	Responsible Party	Distribute to	Purpose	File location
Maintenance Log	TFT	Mine Manager, EOR	Track maintenance activities	RDCK Server

7.3 Surveillance Reporting

An inspection flow chart is provided on Figure 8 to summarize the inspection process for the Facility, identify responsible personnel, documentation requirements, and reporting protocol.

A summary of surveillance documentation and reporting is provided in Table 7.2 with additional details below. All files are stored on the RDCK server (12-630-30-Dam Inspections).

It is extremely important that dam safety and management policies are communicated to all interested parties involved with the maintenance and surveillance of the facility. The Mine Manager must ensure that all the issues, concerns, or incidents are reported promptly.

Table 7.2: Surveillance Documentation and Reporting

Report/Manual	Responsible Party	Distribute to	Purpose	Frequency of Update
Routine Inspections	TSF QP or designate	TSF QP	Visual Inspection, instrumentation readings	As per Table 6.1
Event Driven Inspections	TSF QP or designate	TSF QP, Mine Manager, EOR	Visual Inspection, instrumentation readings	As required
AFPR [1]	EOR	Mine Manager, TSF QP	Ensure that facility is performing as expected and to fulfill permit requirements.	Annually
DSR	Third Party Consultant/ Qualified P. Eng.	Mine Manager, TSF QP, EOR	Independent review of TMA design and operation.	Every 5 years
Tailings Cover Feature Database	EOR	TSF QP	Tracking all cover defects and features that may require maintenance (e.g., areas of settlement, ponding, tailings boils).	Annually
Water Quality Sampling	Refer to the Water Quality Management and Monitoring Plan			

Notes:

[1] The AFPR includes the tailings cover inspection (Section 6.2.3) and bedrock spillway highwall inspection (Section 6.2.4).

7.3.1 Routine Inspections

Routine Inspection forms and photographs are to be submitted to the RDCK Administrator on the same day as the inspection. If any TARP thresholds are exceeded, the response and distribution is as per the EPRP.

The RDCK Administrator is to:

- Enter the inspection data into the ongoing monitoring Excel file.
- Distribute the updated Excel file to RDCK staff and EOR.
- Save the submitted photos and inspection forms to file.

Abnormal observations/features are to be tracked in the monitoring Excel file. For each feature, the following are noted: Unique ID, location, a recent photograph, commentary on any change in conditions (status), and direction/advice provided by the EOR. The Excel file should be reviewed prior to routine inspections.

Additional details are provided in the Monitoring Protocols Memorandum (Appendix F).

7.3.2 Event Driven Inspections

Event driven inspections reporting protocols are the same as for Routine Inspections, except that the Mine Manager and EOR are to be included in the distribution.

7.3.3 AFPR

The findings and recommendations of the AFPR are documented in the report to the TFT and Mine Manager. This report provides information to be used to revise the operation, maintenance, and surveillance programs as necessary and to assist in planning for future management of the facility. The annual reports are issued to the BC Government prior to March 31st of the following year.

7.3.4 Tailings Cover Inspections

The tailings cover inspection will track and monitor any defects or areas of concern related to the cover that may require maintenance. The results will be maintained in a database/GIS system that provides a summary of the locations and keeps a photographic record of each feature. The database GIS system is maintained by the EOR.

An annual memorandum is to be prepared that includes a summary site plan, photographs of the features and comparison to the previous year's photograph (if applicable), and recommendations for maintenance. The memorandum is to be appended to the AFPR.

7.4 Regulatory Reporting

Amended Permit M-218 (Permit) was issued by the Deputy Chief Permitting Officer on March 5, 2025, and includes several reporting stipulations in addition to the Code. The TFT is responsible for compliance with the permit requirements.

Table 7.3: Mine Permit M-218 Reporting Requirements

Item	Description	Status
Compliance	■ A.8(a): The permittee shall track the compliance status of all permit conditions and inspection orders and shall prepare and submit an annual Compliance Status report to the Chief Inspector by March 31. ■ A.8(b): A post-closure monitoring compliance summary report shall be submitted to the Chief Permitting Officer by March 31, 2027.	Ongoing
Tailings Geochemistry	■ A Tailings Geochemistry Monitoring and Assessment Report shall be submitted to the Chief Inspector by March 31, 2024.	Complete (Part of the Water Quality Management and Monitoring Plan (SLR 2022a))
Environmental Monitoring	■ An annual Reclamation Report shall be submitted to the Chief Inspector by March 31 of the following year. The report shall include summaries and interpretations of all environmental monitoring work, and raw and tabulated lab	Ongoing

Item	Description	Status
	data. Current annual reclamation reporting requirements stipulated by the MCM should be reviewed prior to annual report preparation.	
	■ C.4: A Surface Water and Groundwater Management Plan shall be maintained. The plan shall include surface water, porewater, seepage, and ground quality and quantity locations, frequencies and parameters, and QA/QC. The annual updates are to be reported in the Annual Reclamation Report.	Ongoing
	■ A revegetation and vegetation metals uptake monitoring program shall be developed.	Ongoing
	■ The Surface Water Quality Model Report shall be updated by March 31, 2027 and updated every 5 years thereafter.	Ongoing
Reclamation and Closure	■ An updated Reclamation and Closure Plan shall be submitted to the Chief Inspector by March 31, 2027. The plan shall include a compilation and interpretation of all monitoring for the life of the mine, and detailed closure and maintenance activities, contingency/remediation plans, a schedule for completion of the works, and Closure Management Manual for post-closure conditions, and a liability cost estimate.	In progress
Safety	■ An Annual Safety Stats Summary Report shall be provided to an inspector by January 31 of the year following.	Ongoing
Monitoring, Maintenance and Oversight	■ An Operation, Maintenance and Surveillance Manual (OMS) for the closed facility shall be prepared that includes quantitative performance objectives and trigger-action response plans.	This document
	■ An AFPR shall be submitted to the Chief Inspector. An assessment of surface and ground water quality data and water levels in the impoundment shall be included in the annual dam safety inspection report.	Ongoing (Section 6.3.1)
	■ An Independent Tailings Review Board Annual Activities Summary Report shall be submitted to the chief inspector by March 31 of the year following.	Ongoing

References

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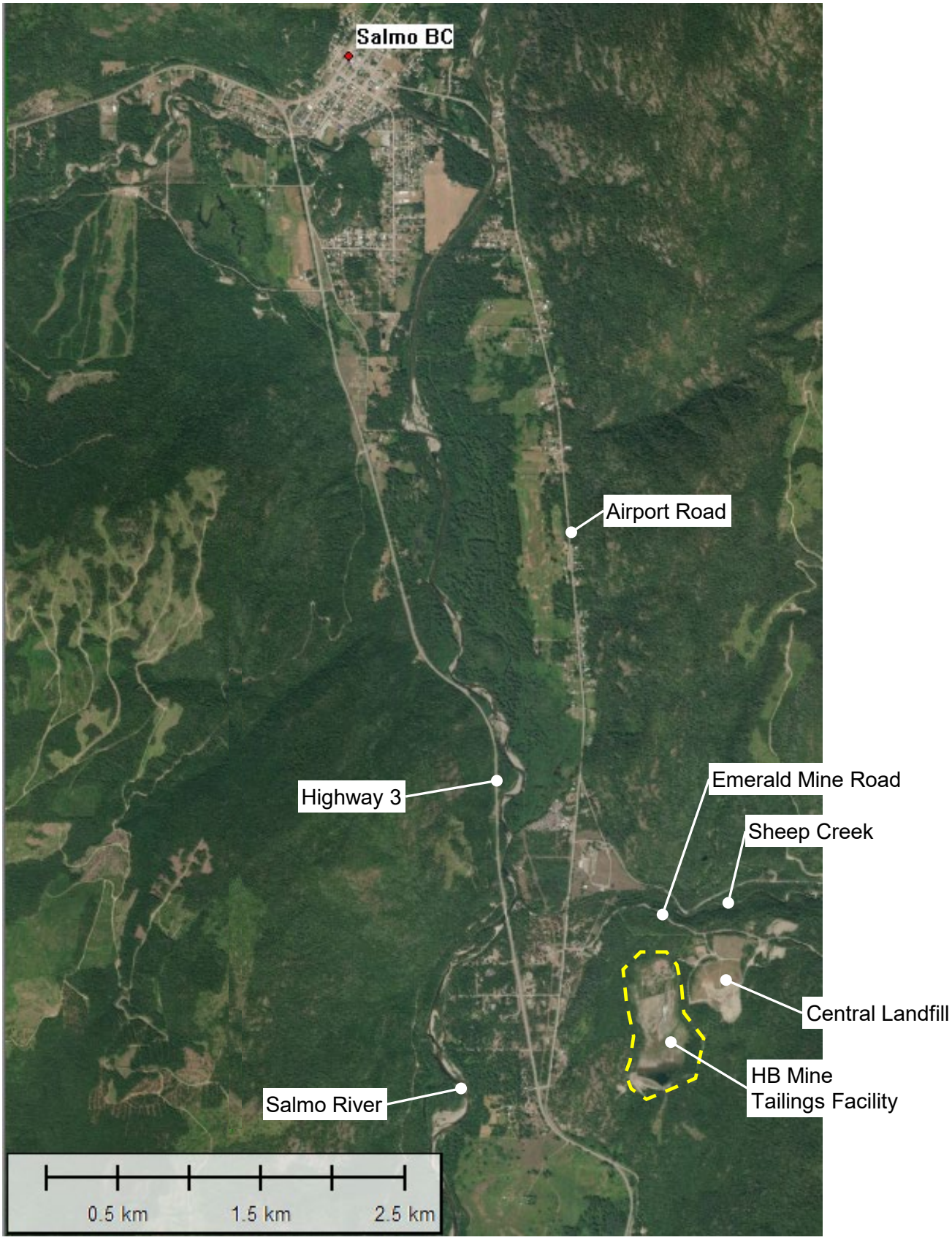
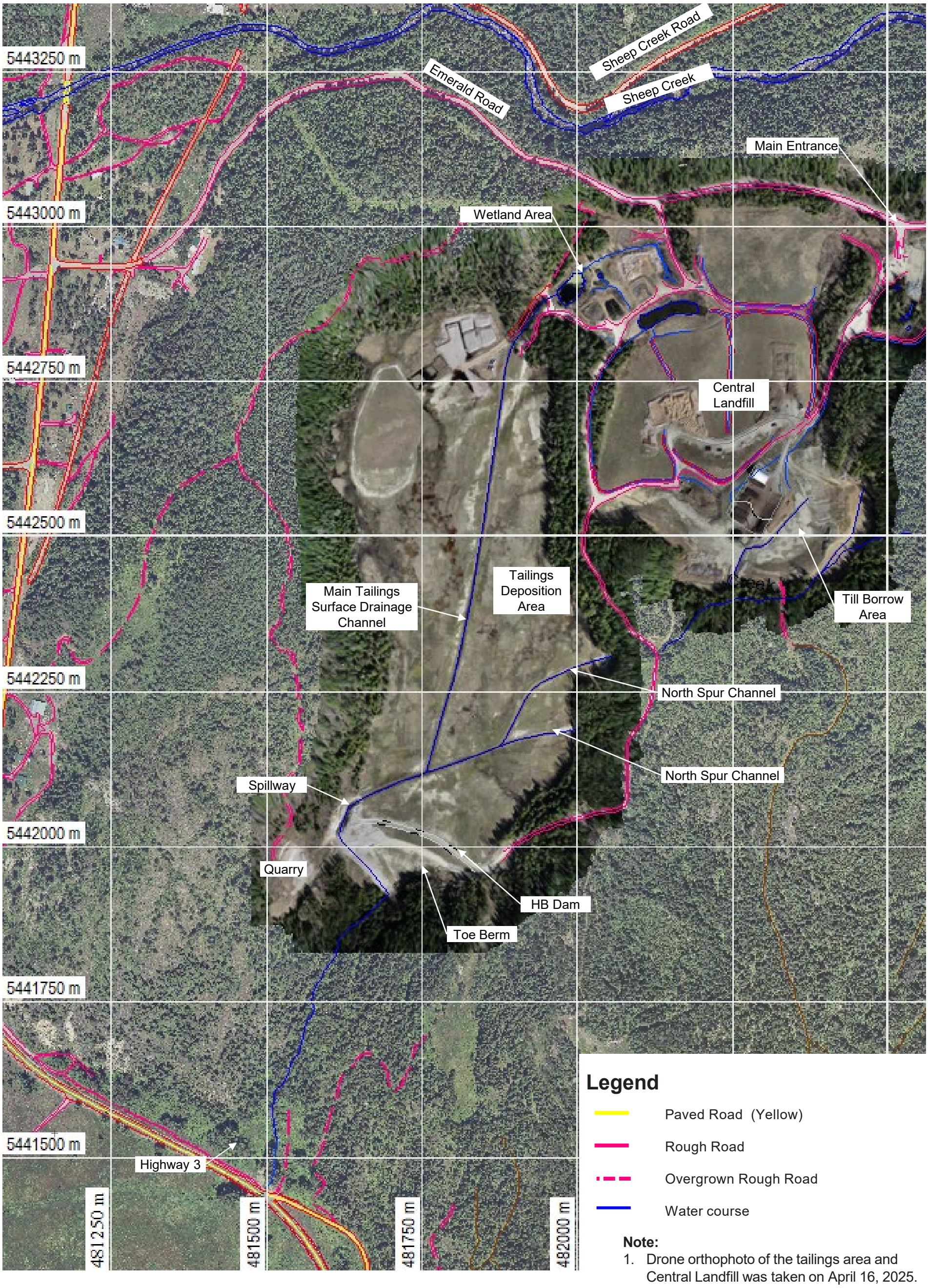
SRK Consulting (Canada) Inc. 2024. TARP Review – Interim Piezometer Triggers. Prepared for Regional District of Central Kootenay: Nelson, BC. Project number: CAPR002031. Issued March 13.

Appendix A Key Figures and Drawings



srk consulting		OMS Manual
		Site Location
Job No: CAPR003603 Filename: HB_2025AFPR_PortraitFigures_CAPR003603.pptx	HB Mine Tailings Facility	Date: December 2025 / Approved: PHM / Figure: **A-1**



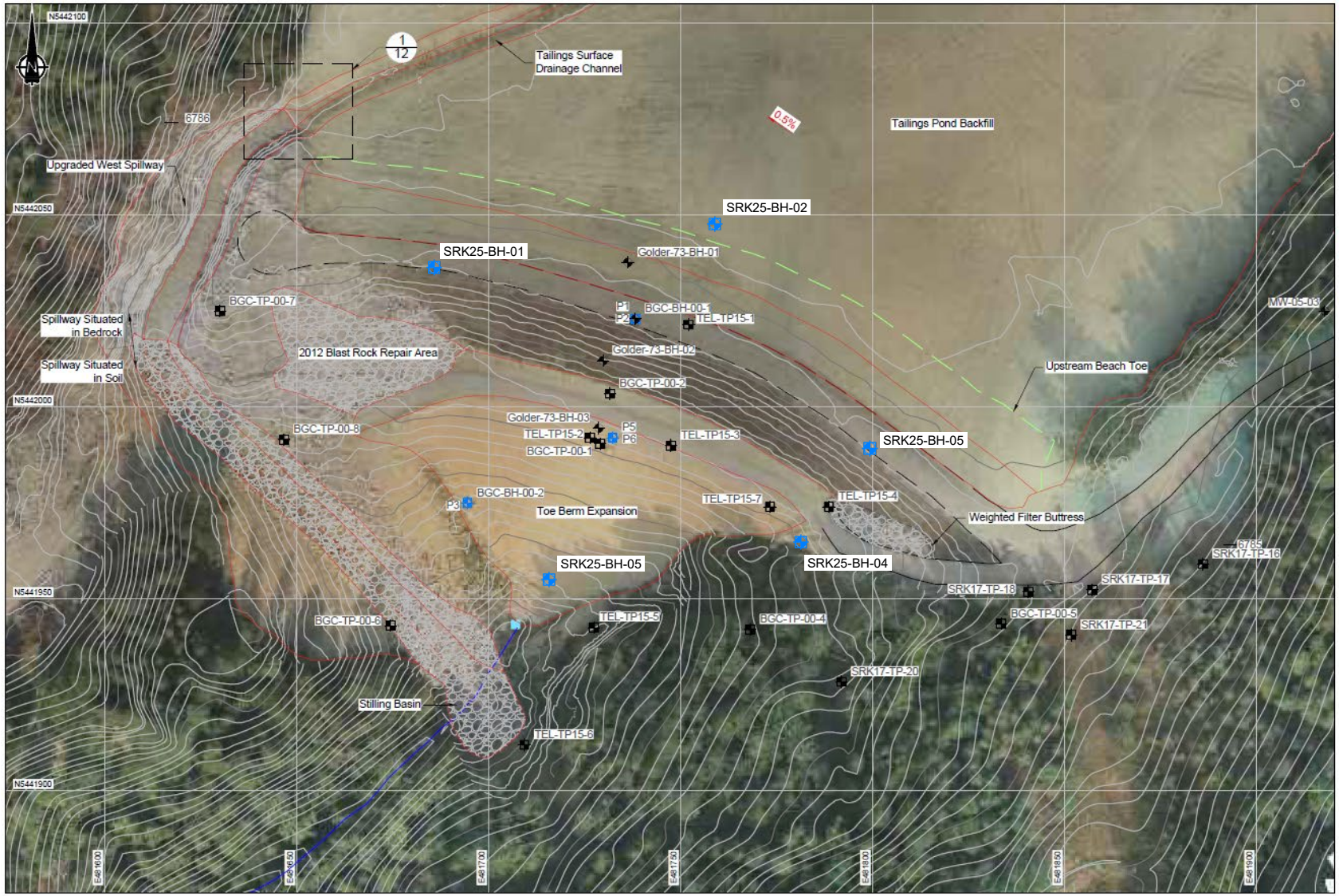
Legend

- Paved Road (Yellow)
- Rough Road
- Overgrown Rough Road
- Water course

Note:

1. Drone orthophoto of the tailings area and Central Landfill was taken on April 16, 2025. The aerial photo outside of the project area (lighter shading) was taken in 2016.

srk consulting		OMS Manual
		Tailings Facility General Arrangement
Job No: CAPR003603 Filename: HB_2025-AFPR_TailingsGenArrangment.pptx	HB Mine Tailings Facility	Date: December 2025 / Approved: PHM / Figure: **A-2**



Notes:

1. Drawing from the 2021-22 Remediation and Closure Construction Record Report (SRK 2023a).
2. Piezometers installed in 2025 (SRK25-BH-01 to -05) were added to the figure.

srk consulting

Job No: CAPR003603

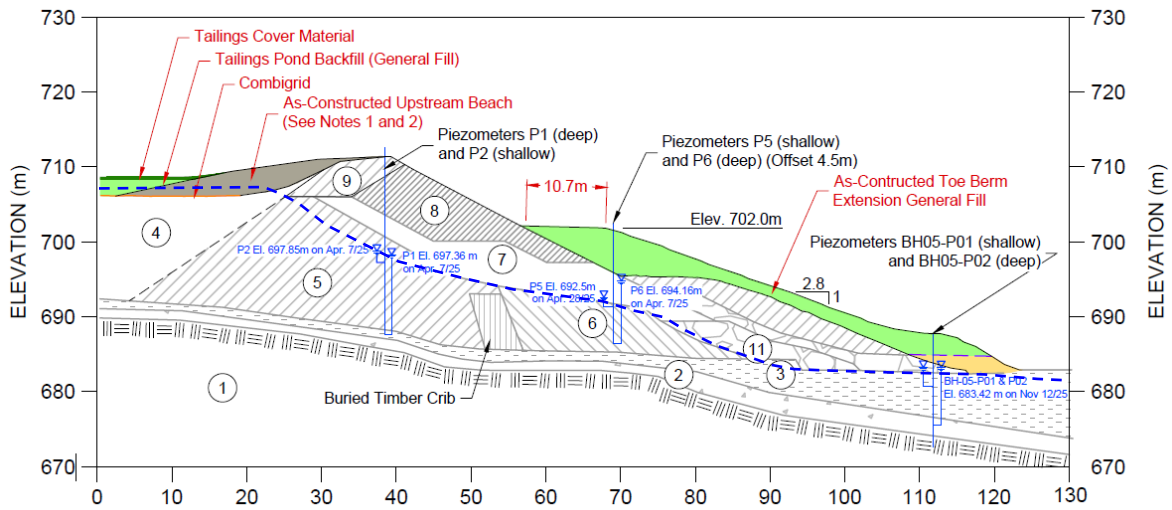
Filename: HB_2025AFPR_FiguresLandScape_CAPR003603.pptx

HB Mine Tailings Facility

OMS Manual

HB Dam General Arrangement

Date:	Approved:	Figure:
December 2025	PHM	**A-3**



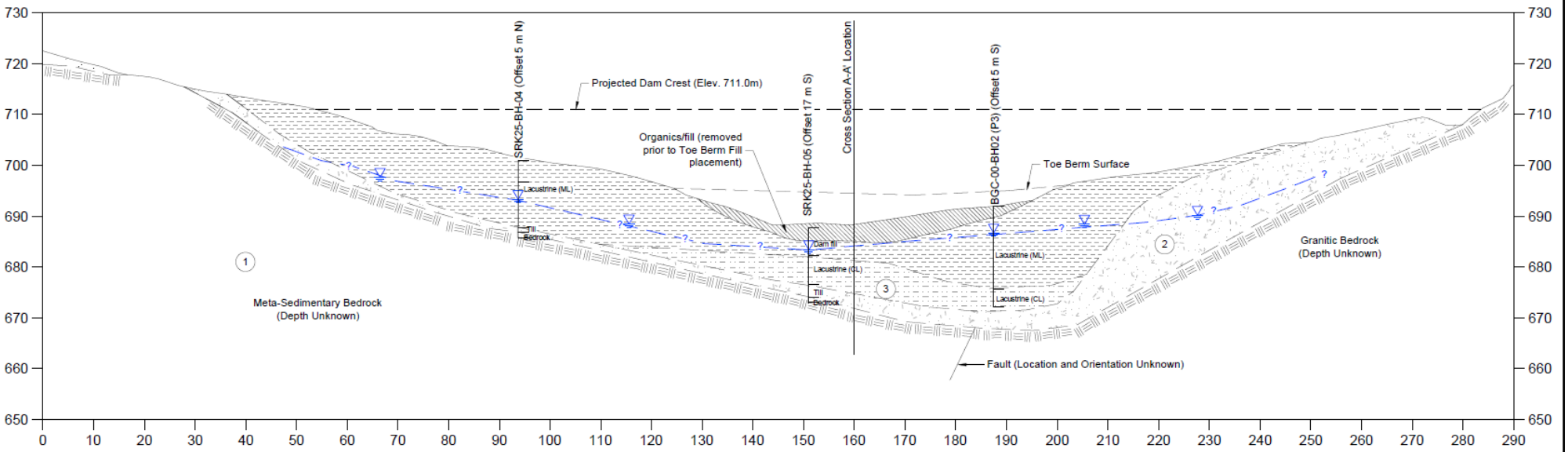
PRE-CONSTRUCTION MATERIALS

- Geotextile
- Zone 1 - Bedrock
- Zone 2 - Native Till
- Zone 3 - Native Glaciolacustrine
- Zone 4 - Tailings (1955 - 1978)
- Zone 5 - Original Dam (1955 - 1967)
- Zone 6 - Stabilizing Berm (1964 - 1967)
- Zone 7 - Filter Blanket (1974/75 and 1997)
- Zone 8 - Common Fill (1975 and 1977)
- Zone 9 - Select Impervious Fill (1975 and 1977))
- Zone 10 - Rock Toe Drain (1977)
- Zone 11 - Rock Drain (2005)
- Zone 12 - Till Toe Berm (2005)
- Zone 13 - Riprap (2005)
- Zone 14 - Repaired Filter Blanket (2012)
- Zone 15 - Repaired Till Fill (2012)
- Zone 16 - Coarse Rock Blanket and Shear Key (2012)
- Zone 17 - Weighted Filter (2016)

CONSTRUCTION MATERIALS

- Combigrid
- Non-woven Geotextile
- Tailings Cover Material
- General Fill
- Toe Berm Drain Rock
- Upstream Beach Material

Cross Section A-A'



B/04 **Cross Section B-B'**

File Sources:
Section A: C:\Users\pmikes\SRK Consulting\NA CAPR003603 HB Mine 2025 26 Engineer of Record Services - Internal\!030_AutoCAD\CAPR002046 - Stability Sections.dwg"
Section B:"C:\Users\pmikes\SRK Consulting\NA CAPR003603 HB Mine 2025 26 Engineer of Record Services - Internal\!030_AutoCAD\CAPR002046 - Dam EC.dwg"

srk consulting

Job No: CAPR003603

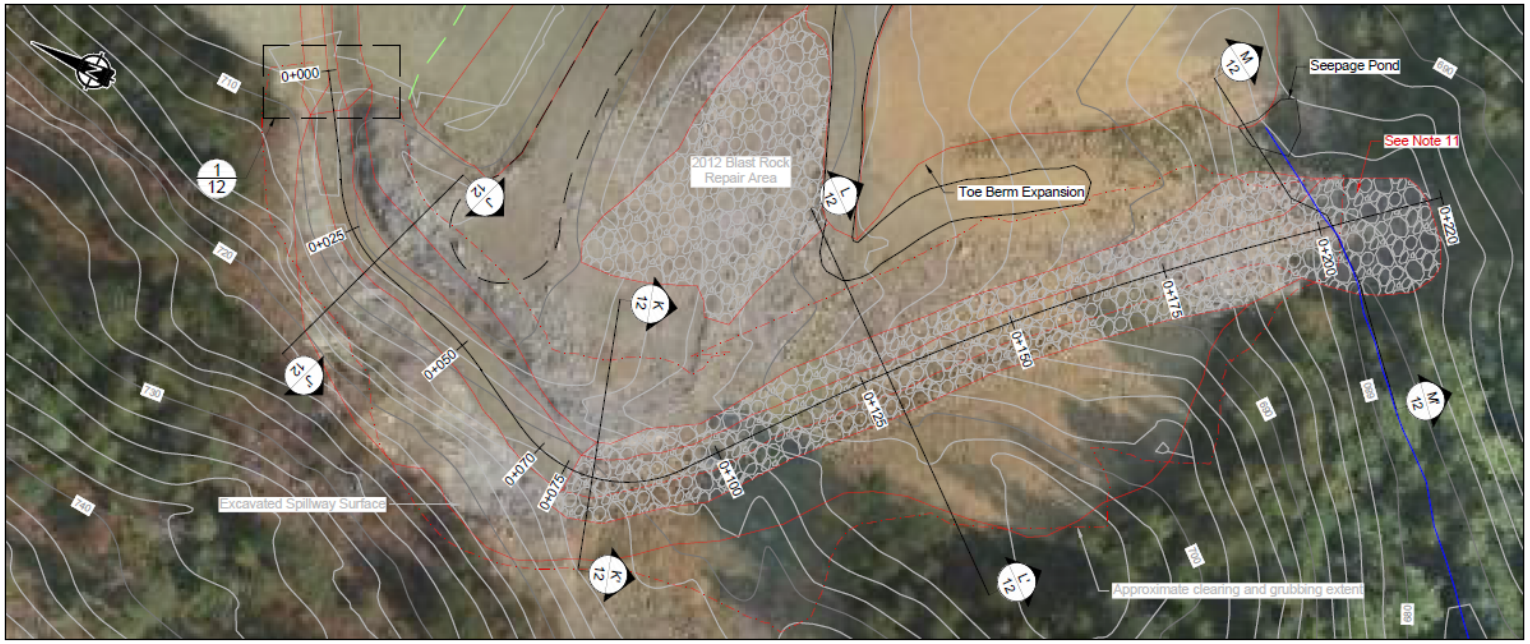
Filename: HB_2025AFPR_FiguresLandScape_CAPR003603.pptx

HB Mine Tailings Facility

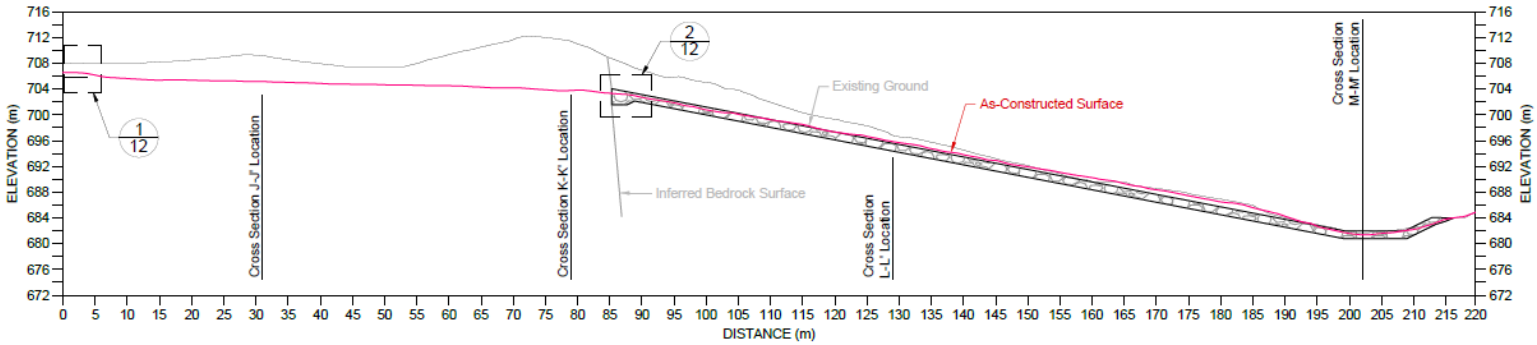
OMS Manual

HB Dam Sections

Date:	Approved:	Figure:
December 2025	PHM	**A-4**



Spillway Plan



Spillway Profile

LEGEND

As-Constructed Infrastructure | Riprap | Site Access Road

NOTES

1. All units are in meters unless otherwise specified.
2. Contours are shown at 2.0 m intervals.
3. All dimensions in meters unless stated otherwise.
4. The contractor shall use controlled blasting methods to minimize damage to the abutment rock and to ensure the stability of the dam embankment.
5. A blast plan is to be submitted and approved by the Engineer and requires to be submitted to EMPR for approval a minimum 30 days prior to the planned start of blasting.
6. A blast monitoring station shall be placed on bedrock within 50m of the spillway at the dam centerline. Blast monitoring data, including the distance to the monitoring station, the vibration frequency, and peak particle velocity shall be reported to the Engineer following each blast.
7. The peak particle velocity must be kept below 2.5 cm/second.
8. Additional excavation may be required to remove rock deemed by the Engineer to be a potential future spillway blockage risk.
9. Spillway riprap to have a median particle size (D_{50}) of 600mm and meet the material specifications provided in Drawing 02.
10. The geotextile is to meet the product specifications provided in the Technical Specifications.
11. Geotextile panels are to have a minimum 0.3m overlap, with the upstream panel placed over the downstream panel.
12. The upgraded spillway was tied into the existing stilling basin at STA 0+175. Additional riprap was placed on the north bank of the stilling basin to minimize flow velocity and for any floodwater that could backwater into the seepage monitoring weir area. Further details are provided in Field Instruction #10.

REFERENCES

Preconstruction topographical contour data was obtained from RDCK and is based on a 2016 aerial LiDAR survey.

srk consulting

Job No: CAPR003603

Filename: HB_2025AFPR_FiguresLandScape_CAPR003603.pptx

HB Mine Tailings Facility

OMS Manual

HB Dam Spillway – Plan and Profile

Date:	Approved:	Figure:
December 2025	PHM	A-5

Appendix B Design Summary Memorandum

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REVISION 1

Design Summary Memorandum

To	Alayne Hamilton	**Client**	Regional District of Central Kootenay
From	Mary Harang, Peter Mikes, P.Eng.	**Project**	CAPR003603
Cc		**Date**	February 23, 2026
Subject	HB Mine Tailings Facility - Design Summary		

File name: HBTF_DesignBasisSummary_CAPR003603_REV1_2026-02-23.docx

1 Introduction

This memorandum presents key information and the design basis for the HB Mine Tailings Facility and is intended to serve as the Design Summary document required by the Health, Safety and Reclamation Code (HSRC) for Mines in British Columbia. Section 10.5.4 of the HSRC states the Engineer-of-Record (EOR) shall prepare a design summary document that details the design assumptions and criteria, including operating constraints, and that provides the basis for the design of all phases of the tailings facility lifecycle.

This Design Summary Memo has been prepared based on the suggested outline provided in Appendix V of the HSRC Code Guidance for Tailings Storage Facilities and Dams (EMLI 2024).

To preserve context and avoid repetition, this memo is not intended to be a comprehensive resource of all design criteria and assumptions, nor is it intended to summarize the results of technical assessments. Instead, it provides reference to the key documents where additional criteria, assumptions, and analysis results can be found.

The memo is intended to be a living document that will be updated as required. Changes to this document from the previous version will be identified with ***bold italics*** with revision control.

Revisions

Rev.	Date (YYYY/MM/DD)	SRK Consulting			RDCK Approval	Descriptions/Remarks
		Prepared By:	Reviewed By:	Approved By:		
A	2025/05/23	M. Harang	P. Mikes	P. Mikes	A. Hamilton	Issued for Use
1	2026/02/23	P. Mikes	-	-	-	Added 2025 instrumentation. Document modified to be an Appendix to OMS Manual.

2 General Site Information

Component	Description	Source
Mine Location	7 kilometers south of Salmo, B.C.	SRK, 2025
TSF Location	481,841 E; 5,442,021 N	SRK, 2025
Current Datum	UTM NAD83, Zone 11	SRK, 2025
Elevation	710 m	RDCK, 2020
Topography	Hanging valley at the base of the west slope of Iron Mountain. West of the facility, a north-south trending bedrock ridge separates the site from the Salmo River floodplain.	RDCK, 2020
Climate	Warm, dry to moderately moist summers and cool, snowy winters	RDCK, 2020
Key Communities and First Nations	■ Salmo, BC ■ RDCK Electoral Area G ■ Lower Similkameen Indian Band, Upper Nicola Band, Okanagan Nation Alliance, Penticton Indian Band, Okanagan Indian Band, Osoyoos Indian Band, Shuswap Band, Tobacco Plains Indian Band, Ktunaxa Nation Council, ?akisq?nuk First Nation, ?aq?am, yaqan nu?kiy, Sinixt Confederacy.	RDCK, 2020
Regulatory and Permitting	Mine Permit No. M-218, last amendment March 5, 2025.	MCM 2025
Environment	Discharge to the Salmo River, approximately 1 km west of the facility, which is a habitat for several fish of special concern (BC status).	RDCK, 2020

3 Key Design Basis

3.1 Mine and TSF Plan

Component	Description	Source
Tailings deposition periods	1955-1966, and 1974-1977	RDCK, 2020
Tailings stored	≈ 6.3 million tonnes	RDCK, 2020
Ore Processed	Lead, zinc, silver, cadmium, copper, gold.	MINFILE
TSF Footprint area	26 ha	RDCK, 2020
Maximum tailings thickness	Approximately 23 m (20 m tailings + 3 m cover) immediately upstream of the dam	SRK, 2025

3.2 TSF Design criteria basis

Component	Description	Source
Consequence Classification	■ Very High ■ Rating is based on economic and infrastructure losses primarily because of a washout/inundation of Highway 3.	SRK, 2018b
Dam Breach-worst case release volumes	■ Total (tailings plus water) released volume: 1,408,000 Mm^3 ■ Volume of solid tailings released: 704,000 Mm^3	SRK, 2018b
Seismic	■ 1 in 10,000-year seismic event (84^{th} percentile) ■ Site Class D ■ Peak Ground Acceleration (PGA) = 0.256.	RDCK, 2020
Flood	■ Designed to convey the Probable Maximum Flood (PMF) and considered climate change. Specific details are covered in Section 6.	RDCK, 2020
Environmental Design Flood	■ N/A; TSF does not impound water and spillway sized for PMF.	RDCK, 2020
Estimated allowable seepage	■ N/A; no criteria.	-
Tailings Cover	■ Cover functions: Prevent dust, prevent wind and water erosion of tailings, prevent direct contact between tailings and flauna/flora, provide a growth media for vegetation. ■ Minimum target thickness: 0.3 m	RDCK, 2020

3.3 Design - Geotechnical

Component	Description	Source
Dam geometry	■ Maximum embankment height (measured crest to downstream toe): 28 m ■ Crest length: 210 m ■ Crest width: 6 to 7 m	OMS Manual
Toe berm geometry	■ Toe berm was expanded in 2021 to improve seismic stability. ■ Crest width: 12 m ■ Crest elevation: 702 m ■ Slope: 2.8H:1V	RDCK, 2020
Upstream beach	■ Constructed in 2021/2022, the beach consists of low permeability till to mitigate concerns related to preferential pathways through the dam and foundation and to prevent ponding near the dam. ■ Crest width: approximately 7 m upstream of the dam. ■ Slope: 4H:1V.	RDCK, 2020
Dam section and Construction Materials	■ A typical dam section is provided in Figure A-4 in the OMS Manual (Appendix A). ■ The dam is an earthen embankment structure with two downstream raises constructed during operations in 1975 and 1977, with a buttress that was constructed in 2005 and expanded in 2021. ■ A detailed construction history is provided in the site OMS manual and further details on the construction material can be found in SRK (2019d)	SRK 2025. SRK, 2019d
Crest elevation	■ 710.8 m (UTM NAD 83 Zone 11 geodetic elevation datum).	SRK, 2025
Slopes	■ Upstream: 1.5H:1V ■ Downstream: 2.9H: 1V	SRK, 2025

Component	Description	Source
Factors of Safety for Slope Stability	■ Long-term steady state ≥ 1.5 ■ Post-earthquake ≥ 1.3	SRK, 2025
Allowable deformation	■ The dam has been closed for approximately 50 years with no plans for future modifications. As a result, no significant deformation is expected and no set criteria for allowable deformation has been specified. ■ As the dam has an available freeboard of 2.4 m during passing of the PMF, the facility can tolerate some deformation. ■ There are two potential causes of deformation: earthquakes and decay/ rotting of timber and drainage structures within the dam. ■ A deformation analysis was completed that concluded under the worst-case scenario, where the timber completely rots the potential for settlement along the dam crest is negligible. ■ While no significant deformation is expected, the OMS Manual Trigger and Response Plan includes deformation thresholds for the dam survey hubs/slope inclinometers to monitor deformation.	RDCK, 2020 OMS Manual
Controlling potential failure modes	**Overtopping** ■ Overtopping is a close to non-credible failure mode as the spillway was expanded in 2021 to convey the PMF event, and the facility no longer retains water. ■ Overtopping would require a spillway blockage caused by large-scale failure of the bedrock highwall and no remedial action for a significant period. **Internal Erosion and Piping** ■ The dam contains significant drainage pipes and wooden drainage features that are not fully understood. Deformation and piping along preferential seepage pathways are possible. This risk was mitigated in 2021 through the removal and backfilling of the tailings pond and expansion of the toe berm, and as a result, the risk has been reduced to as low as reasonably practicable. **Slope Instability** ■ Portions of the original dam fill placed between 1955 and 1965 (Zone 5 in Figure A-4 in Appendix A of the OMS Manual) may be susceptible to liquefaction in the event of an earthquake. ■ The most recent stability analysis of the facility under current conditions indicates that the facility exceeds CDA minimum FOS requirements under static and post-seismic loading conditions following a 1 in 10,000-year seismic event and considering full liquefaction of the tailings and original dam fill (SRK 2020). (FOS > 1.3). ■ As a result, while some deformation of the dam crest may occur that may require remedial work, large-scale deformation is not expected that would lead to a dam failure. **Surface Erosion** ■ Surficial erosion caused by snowmelt or rainfall runoff is possible. No significant erosion has been observed since 2013 when minor erosion of the repaired portion of the dam occurred due to limited vegetation present on the recently repaired slope. ■ The expanded toe berm (constructed in 2021) was hydroseeded in September 2022 but remains prone to surficial erosion. In the short-term, there is a heightened risk of silt erosion from the exposed till materials that could escape the facility. ■ Once the site is vegetated with well-established grass coverage, an erosion assessment of the downstream slope of the dam concluded that the slope is adequate to withstand the runoff from the 200-year, 24-hour rainfall event without any significant erosion (SRK 2019c).	SRK, 2025 SRK, 2020 RDCK, 2020

<table>
<tr><th>Component</th><th>Description</th><th>Source</th></tr>
<tr><td>Drainage and filter controls</td><td>■ Two historical decant structures used during operations have been decommissioned and plugged.
■ The west decent pipe was observed to be flowing during the 2005 toe berm construction. A filter was constructed around the outlet of the pipe to control seepage.
■ The “Filter Blanket” layer constructed above the “Original Dam Fill” zone controls the phreatic level with the dam. The Filter Blanket zone connects to a rock drain at the base of the two berm.
■ A filter compatibility assessment found that the filters are gradationally compatible with the materials being protected.</td><td>RDCK, 2020</td></tr>
<tr><td>Strength parameters</td><td>■ The basis for the material parameters can be found in SRK, 2019c.
<table>
<tr><th rowspan="2">Zone/Material</th><th rowspan="2">Bulk Density[1] (kN/m³)</th><th colspan="2">Strength Parameters[1]</th></tr>
<tr><th>Cohesion (kPa)</th><th>Friction Angle (°)</th></tr>
<tr><td>1 – Bedrock</td><td>26</td><td colspan="2">Infinite Strength</td></tr>
<tr><td>2 – Native Till</td><td>20</td><td>0</td><td>36</td></tr>
<tr><td>3 – Native glacio-lacustrine</td><td>18.5</td><td>0</td><td>32</td></tr>
<tr><td>4 – Tailings</td><td>18.3</td><td>0</td><td>30</td></tr>
<tr><td>5 – Original Dam</td><td>19.0</td><td>0</td><td>28</td></tr>
<tr><td>6 – Stabilizing berm
8 – Common fill
12 – Till Toe Berm
Toe Berm Expansion</td><td>21.3</td><td>0</td><td>36</td></tr>
<tr><td>7 – Filter Blanket</td><td>20.7</td><td>0</td><td>38</td></tr>
<tr><td>Zone 10 – Rock Toe Drain
Toe Berm Expansion Drain</td><td>20.7</td><td>0</td><td>38</td></tr>
<tr><td>Zone 11 – Rock Drain</td><td>20.7</td><td>0</td><td>38</td></tr>
</table>
Note(s):
1. SRK (2017c)</td><td>SRK, 2019c</td></tr>
</table>

3.4 Design – Water

Components	Description	Source
Annual water balance	■ The HBTF is a flow-through facility. Inflows consist of surface water run-on, groundwater infiltration, and precipitation. Outflows consist of evaporation, seepage through the dams, groundwater exfiltration, and outflows through the spillway. ■ The water balance for the facility is functional. With the expansion of the spillway in 2021, the facility does not impound water, and the spillway is sized to convey the PMF event.	RDCK, 2020
TSF Catchment Area	2.18 km^2	SRK, 2025
Flood design	■ Inflow Design Flood (IDF): 70 m^3/s ■ Peak spillway outflow: 58 m^3/s ■ IDF peak water level: 708.5 m	SRK, 2018a
Dam freeboard	▪ Available normal freeboard: 4.3 m	SRK, 2019b

Components	Description	Source
	▪ Available minimum freeboard (during passage of IDF): 2.4 m ▪ Required minimum freeboard: 0.94 m ▪ Required normal freeboard: n/a – no pond under normal conditions	RDCK, 2020
Spillway design	▪ Designed to convey the PMF. ▪ Spillway invert elevation: 705.8 m ▪ Base width: 5 m ▪ Channel side slope [H:V]: 0.75:1 in bedrock, 2:1 in till ▪ Peak spillway flow: 58 m^3/s ▪ Maximum depth above spillway: 3.28 m ▪ A spillway plan and profile is shown in Figure A-5 of the OMS Manual (Appendix A).	SRK, 2019b RDCK, 2020
Spillway Erosion assessment during PMF	Potential for some erosion and undercutting of the 2012 Blast Rock Repair Area but no significant erosion of the original dam. No loss of tailings expected.	RDCK, 2020
Tailings Surface Drainage Channels	▪ Drainage channels in the tailings cover were constructed in 2021 to convey flows from the Central Landfill wetland area and from two small ephemeral streams that enter the tailings deposition area to the spillway ▪ Hydraulic modeling of the as-built conditions indicates that the channels overtop during the 1 in 50-year flood event. ▪ A maximum permissible PMF overland flow velocity of 1.0 m/s was adopted to reduce the risk of erosion of the vegetated tailings cover.	SRK, 2023

4 Quantifiable Performance Objectives

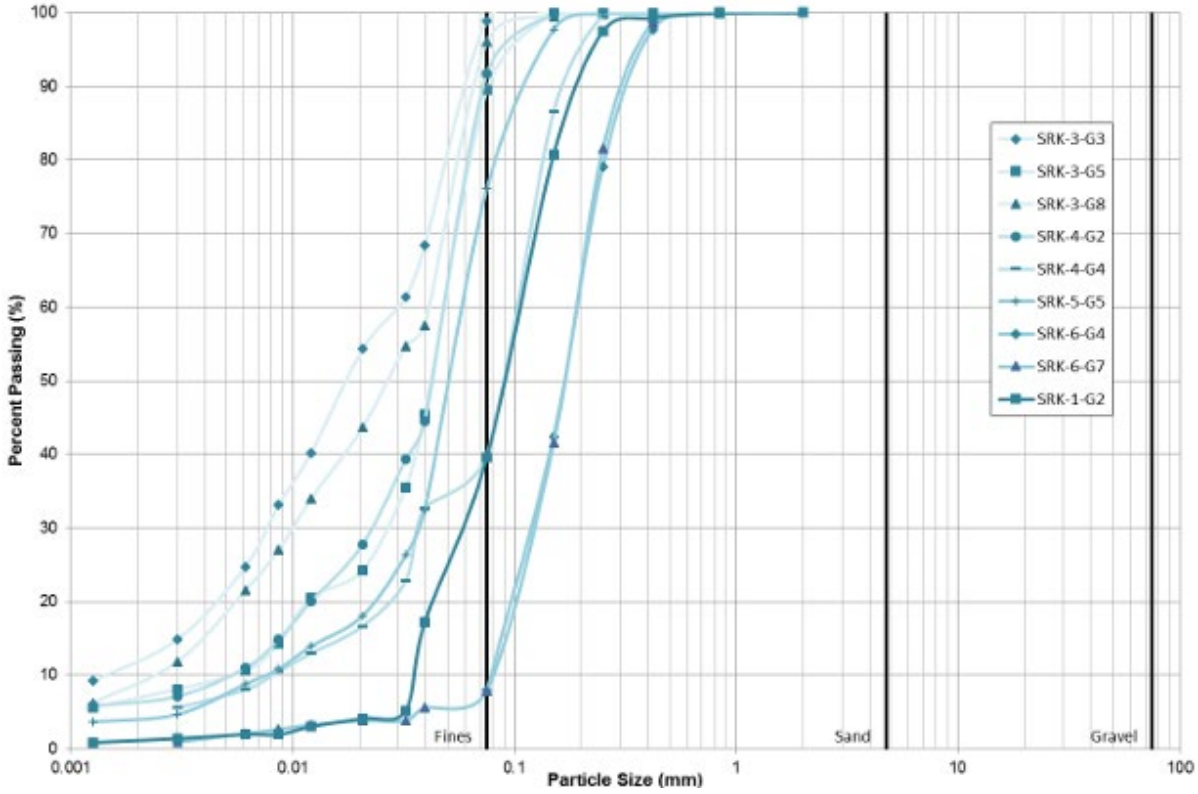
Quantifiable Performance Objectives (QPOs) consist of measurable and quantifiable performance requirements for the facility. The quantifiable performance objectives currently measurable for the facility in its current closure-passive phase with the available information are included in the Trigger and Action Response Plan (TARP) provided in Appendix B OMS Manual and components are summarized in the following table.

Components	Description	Source
Pore Pressures	Piezometers installed in the HB Dam are monitored to assure pore pressures are within the Trigger Action Response Plan (TARP) levels	SRK, 2024
Deformation	▪ 12 survey monuments (hubs) are installed on the dam to monitor deformations to the TARP levels. ▪ 4 Slope inclinometer casings were installed in 2025 to allow for lateral deformation monitoring in the dam and foundation ▪ Visual inspection observations (cracking, sinkholes, erosion, etc.) are recorded during routine inspections and evaluated against TARP thresholds. ▪ Annual cover surveys are completed to monitor for cover settlement.	SRK, 2024 SRK 2026
Minimum beach length	Not applicable	SRK, 2024
Seepage	The seepage monitoring weir is monitored for flow rate and clarity and evaluated against TARP levels.	SRK, 2024

5 Tailings Characterization

Components	Description	Source
Particle Size Distribution	■ Tailings were spigotted from the north end of the tailings deposition area, resulting in a grain size segregation during deposition, with coarse sand tailings present at the north end of the facility, and fine silt tailings at the south end of the facility. ■ Particle size distributions are shown in Figure 1. The sample locations can be found in SRK (2017a).	RDCK, 2020 SRK, 2017a
Specific gravity	2.9 – 3.1	SRK, 2017a
Density	■ Four relative density tests were completed the tailings with a minimum and maximum bulk density range of 1,868 kg/m^3 to 2,235 kg/m^3.	SRK, 2017a
ICOLD tailings type classification	As per ICOLD Bulletin 181 (ICOLD 2020) ■ Tailings at the north end of the tailings deposition area would be classified as Coarse Tailings (silty SAND, non-plastic) ■ Tailings at the south end of the tailings deposition area would be classified as Fine Tailings (SILT, with trace to some clay, low to moderate plasticity). (note: the tailings are non-plastic)	SRK, 2017a
Tailings discharge gradation	Unknown	
Beach slopes	0.5% average	
Typical Atterberg Limits	Non-plastic	SRK, 2017a
Average Sulphide Sulphur (by diff.)	4.54 wt%	SRK, 2017a
Neutralization potential ratio	>4.0	SRK, 2017a
Neutral metal leaching potential	Pore water chemistry, including the concentrations of heavy metals contained in the sulphides, will be controlled at relatively low levels by the non-acidic carbonate weathering environment. For example, the solubility of zinc is controlled by the mineral smithsonite (ZnCO3). Under weathering conditions resulting from oxygen diffusion into the tailings, sulphide minerals will oxidize to sulphates, the acid generated will be neutralized by reaction with carbonate minerals, and the main metals of concern (cadmium, lead, and zinc) will be precipitated as carbonates. Sulphate will likely be precipitated as calcium sulphate.	RDCK, 2020
Constituents of potential concern	Lead, zinc, cadmium	RDCK, 2020

Figure 1: Tailings Particle Size Distributions



Sources: SRK (2017a)

6 Climate

Components	Description	Source
Snow precipitation	Snowfall typically starts accumulating in November with maximum accumulation occurring in March. Snow melt at the facility generally occurs in late March and April.	RDCK, 2020
Monthly average precipitation		SRK, 2019a

Month	Precipitation (mm)
January	82.2
February	58.2
March	71.8
April	58.0
May	70.1
June	77.2
July	47.0
August	35.9

Components	Description		Source
	September	43.9	
	October	62.2	
	November	98.2	
	December	103.3	
Mean annual precipitation	808 mm		SRK, 2019a
Monthly average evaporation	Evaporation estimates were not included in the original hydrological analysis since they were not required for the closure design (no pond).		SRK, 2019a
PMP / PMF (considers climate change)	■ Spring PMP (rainfall dominated) = 270 mm; ■ Spring PMP (snow dominated) = 165 mm; Probable maximum snowmelt estimated as two times the 1 in 100-year snowmelt depth. ■ Summer PMP = 250 mm; ■ Climate change was predicted to increase rainfall values by +9%.		SRK, 2019a
Maximum daily snowmelt	40 mm for a 1 in 100-year snowmelt; 55 mm considering climate change.		SRK, 2019a
Climate Change	The model developed for the Project estimated that by 2100 the following increases: ▪ Mean air temperature: +1.9% (°C) ▪ Mean annual precipitation: +66 mm (9%) ▪ Mean annual wind speeds: + 1.9% ▪ 100-year maximum snowmelt: + 35%		SRK, 2019a

7 Earth Sciences

Components	Description	Source
Geohazards	■ Potential for highwall instability above the spillway has not been assessed, but no obvious signs of instability observed. ■ Earthquakes, wildfires.	SRK 2025
Seismic Hazard Assessments	■ Southern Cordillera, major faults in this zone: the southern Purcell Trench fault; the Kettle River and Granby faults, the Okanagan and Eagle River faults, Slocan Lake fault, and Columbia River fault ■ Probabilistic seismic hazard assessment completed for return periods between 1/475 and 1/10,000-year.	SRK, 2017b
Maximum Design Earthquake (1 in 10,000-year)	■ Mean Peak Ground Acceleration (PGA) = 0.210 g ■ Site Class D	SRK, 2017b
Bedrock geology	Phyllite bedrock underneath most of the dam. Granitic bedrock outcrop at the west abutment of the dam.	RDCK, 2020
Overburden geology	■ 0 to 47.8 m thick across the site. Generally, consists of sands and gravels overlying a silty to sandy glacial till. ■ 3 to 6 m thick beneath the original dam, increases south of the dam to approximately 14.3 m thick. ■ Beneath the western half of the dam, the bedrock is overlain by a dense lodgement till (gravelly sand with some silt and traces of clay).	RDCK, 2020

Components	Description	Source
	■ Near the centre of the dam, the bedrock is overlain by the lodgement till, which is itself overlain by very stiff stratified glaciolacustrine deposits consisting of sands, silts, and clays. ■ Beneath the eastern portion of the dam, the bedrock is overlain by the compact stratified glaciolacustrine material consisting primarily of sandy silt.	
Hydrogeology	■ Hydrogeological characterization of the Central Landfill and tailings facility is completed every five years as part of the Central Landfill monitoring program. The most recent characterization was completed in 2024 (GHD 2024). ■ The groundwater flow at the facility occurs predominantly within the tailings and overburden unit. ■ Generally, follows topography in the tailings deposition area and mostly southward through the dam. ■ 5-10 m/yr.	GHD, 2024
Water table depth	■ Generally, <1 m below ground surface (bgs) within the TSF and approximately 4 m bgs downgradient of the dam.	SRK, 2025

8 Closure Design

The closure design is presented in the 2020 Reclamation and Closure Plan (RDCK 2020), with the design implemented in 2021 and 2022.

Components	Description	Source
Closure Objectives	■ Overall objective for the remediation of the site is to successfully limit, counteract, prevent, or mitigate the escape or migration contamination from the facility to remove any adverse effects on the environment or human health. ■ Transition the facility to "passive closure" as defined by the Canadian Dam Association.	RDCK, 2020
Land Use and Capability Objectives	■ Mixed land use including wildlife habitat and industrial. ■ Re-establishment of a vegetation mat (food source, cover, hide, etc.) and self-sustaining native vegetation without continued dependence on fertilizer and reseeding. ■ Establishment of a vegetation cover with sufficient density and species diversity to stabilize the surface against the effects of long-term erosion. ■ Establishment of plant material that does not show environmentally significant uptake of metals. ■ Groundwater quality that does not degrade below applicable regulatory criteria/guidelines at the property boundary.	RDCK, 2020
Physical Stability Measures	■ Toe buttress expanded to increase stability. ■ Tailings pond backfilled to prevent ponding near the dam. ■ Establishment of a sufficient vegetation cover to stabilise the surface against long-term erosion. ■ Spillway expanded such that the facility survives a PMF event without significant loss of tailings. ■ Drainage channels constructed to convey surface flows to the spillway.	RDCK, 2020
Geochemical Stability Measures.	■ Establishment of a tailings cover and drainage channel to prevent migration of tailings and reduce infiltration into the tailings.	RDCK, 2020

References

[EMLI] BC Ministry of Energy, Mines and Low Carbon Innovation, 2024. Code Guidance – Part 10 – Tailings Storage Facilities (TSF) and Dams, June.

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[MCM] BC Ministry of Mining and Critical Minerals, 2025. Permit M-218: Approving Mine Plan and Reclamation Program for HB Mine Tailings. Amended March 5.

[RDCK] Regional District of Central Kootenay, 2020. HB Mine Tailings Facility Remediation and Closure Plan. May.

SRK Consulting (Canada) Inc., 2017a. HB Mine Tailings Facility – 2016 Tailings Characterization Factual Report. Prepared for Regional District of Central Kootenay. SRK Project Number 1CR012.001. May.

SRK Consulting (Canada) Inc., 2017b. Probabilistic Seismic Hazard Assessment for the HB Mine Tailings Facility. Prepared for the Regional District of Central Kootenay. SRK Project Number 1CR012.004. May 26.

SRK Consulting (Canada) Inc., 2018a. HB Mine Tailings Facility Closure and Remediation – Preliminary Design Report. Prepared for the Regional District of Central Kootenay. SRK Project Number 1CR012.004. June.

SRK Consulting (Canada) Inc., 2018b. HB Mine Tailings Facility – Dam Break Analysis. Prepared for the Regional District of Central Kootenay. SRK Project Number 1CR012.005. September.

SRK Consulting (Canada) Inc., 2019a. HB Mine Tailings Facility Closure Design – Hydrological Analysis. Prepared for the Regional District of Central Kootenay. SRK Project Number 1CR012.006. December 12.

SRK Consulting (Canada) Inc., 2019b. HB Mine Tailings Facility Spillway Design. Prepared for the Regional District of Central Kootenay. SRK Project Number 1CR012.004. December 13.

SRK Consulting (Canada) Inc., 2019c. HB Mine Tailings Dam Deformation Analysis. Prepared for the Regional District of Central Kootenay. SRK Project Number 1CR012.005. December 13.

SRK Consulting (Canada) Inc., 2019d. Review of HB Mine Tailings Facility Dam Zones and Geotechnical Properties. Prepared for the Regional District of Central Kootenay. SRK Project Number 1CR012.005. December 13.

SRK Consulting (Canada) Inc., 2020. HB Dam Stability Analysis Update. Prepared for the Regional District of Central Kootenay. SRK Project Number 1CR012.005. January 9.

SRK Consulting (Canada) Inc. 2023. 2021-22 Remediation and Closure Construction Record Report. FINAL. Prepared for Regional District of Central Kootenay: Nelson, BC. Project number: CAPR002046. Issued May. 2023.

SRK Consulting (Canada) Inc., 2025. 2024 Annual Facility Performance Report – HB Mine Tailings Facility. Prepared for Regional District of Central Kootenay: Project number: CAPR003031. March.

SRK Consulting (Canada) Inc. 2026. 2025 Piezometer Installation Report. FINAL. Prepared for Regional District of Central Kootenay: Nelson, BC. Project number: CAPR003603. Issued January. 2026.

[TTEBA] Tetra Tech EBA Inc. 2014. Dam Safety Review of HB Mine Tailings Storage Facility, Salmo, BC. Prepared for the Regional District of Central Kootenay. File K13103109-01. May 28.

Appendix C Site History and Key References

C-1. Site History

Operations

The former HB Mine is located 8 km southeast of Salmo and approximately 2 km north of the Facility. Operations of the HB Mine were conducted from 1912 to 1978. Commodities produced included lead, zinc, silver, cadmium, copper, gold, and talc. The ore was hosted in limestone. EMLI records for the mine are provided in MINFILE number 082FSW004.

The Facility was owned and operated by Teck Cominco Ltd. (Cominco) from 1955 to 1978. The earth dam was initially constructed in 1955 using a timber crib structure and borrows material to a height of approximately 12 m. The timber crib failed and moved approximately 3 to 5 m in 1964 resulting in the placement of drains and toe protection to stabilize the failure. A tailing flume line was used to join the HB Mine to the Facility presently located on RDCK property. Remnants of the tailing flumes, located along the northern property boundary of Emerald Mine Road and through the western buffer zone leading to the northern edge of the impoundment, are still visible north and west of the landfill. Dam raises continued by the downstream method until operations were suspended in 1967.

The Facility was re-opened in 1974 following a stability investigation conducted by Golder Associates Ltd. (Golder). The stability investigation included the advancement of three boreholes and recommendations to prepare a downstream filter blanket, which was subsequently constructed. Dam raisings were also conducted in 1975 and 1977 to reduce the phreatic surface within the dam. Facility operations were suspended by Cominco in 1978 with property acquisition by David Minerals Ltd. in 1981. David Minerals retained Klohn Leonoff Ltd. (KL) to investigate the feasibility of using the existing tailings impoundment area for the deposition of tailings; however, it is believed no further developments occurred at the Facility.

1980 – 1999 Site Activities

Between 1981 and 1997, ownership of the facility passed from David Minerals to Nor-Quest Resources, then to Nu-Dawn Resources (Nu-Dawn) and Raynerd Resources, and finally to Seattle Corporation. During this time Teck continued to hold the permit for the facility as all other parties failed to acquire a permit under the Mines Act. In 1998, RDCK purchased the tailings impoundment area and surrounding land.

As a condition of the RDCK's purchase, EMLI requested permanent decommissioning of the tailings facility and outlined geotechnical recommendations to allow permanent decommissioning of the Facility.

2005 Decommissioning

On September 29, 2000, BGC Engineering Inc. (BGC) was retained by the RDCK to prepare a decommissioning plan of the Facility in accordance with requirements stipulated in the Mines Act. Facility surveys and geotechnical investigations were conducted in October and November 2000 to

confirm the configuration of the dam and impoundment and geotechnical conditions of the dam. The investigation included the installation of Piezometers P1, P2, and P3. The report entitled “H.B. Mine Tailings Pond and Dyke Decommissioning Plan” (Decommissioning Plan) (BGC, February 2002) presented a review of available data, a summary of previous and recent site investigations, and a decommissioning plan to current day standards.

An application for approval of the Decommissioning Plan was submitted to the Chief Inspector of Mines and Permit M-218 (Permit) was issued by the Deputy Chief Inspector of Mines on April 10, 2002, approving the Decommissioning Plan subject to conditions stipulating compliance.

The following construction activities were completed in the summer of 2005 to satisfy decommissioning requirements for the Facility.

- An open channel spillway was constructed along the former west abutment of the dam. Excavation into bedrock was required for the upper portion of the outlet channel. The spillway channel was lined with riprap and a granular filter layer to prevent erosion due to the steep gradient. The outlet channel was designed to terminate in a riprap-lined stilling pool to allow for sediment settlement prior to discharge into the downstream outlet ditch.
- A toe berm was constructed at the downstream toe of the tailings dam.
- An erosion protection layer was constructed along the upstream face of the dam that consisted of a riprap layer underlain by a filter layer.
- A decant drain was formerly located north of the east abutment was decommissioned. The decant consisted of a 900 mm (36”) diameter intake structure with a corrugated metal pipe (CMP) that drained into a steel and fibreglass flume and then into the outlet ditch. The decant intake structure and pond inlet area was backfilled with low-permeability till and the CMP was plugged with cement-bentonite grout and high slump concrete. The steel and fibreglass decant flume and the unfilled portion of the CMP were dismantled and removed from the Site.
- Piezometers P5 and P6 were installed and Piezometer P4 was decommissioned due to uncertainties associated with the data from P4.

2012 Slough Event and Reconstruction

In July 2012, the Facility’s earth dam suffered a large slough on the downstream slope approximately 40 m from the west abutment of the dam. The cause of sloughing was attributed to heavy rainfall and the presence of preferential seepage pathways that existed between the tailings pond and foundation that lead to the development of two sinkholes and piping through the foundation. The first response included lowering the pond level using pumps and lowering the spillway sill elevation (approximately 0.3 m) by means of removing cobbles and the control bar from the spillway inlet. During the emergency phase of the response there was continuous monitoring of the Dam. The lowered water level revealed the two sinkholes near the base of the upstream armour.

Subsequently, the Dam was repaired, and an intensive monitoring program developed. During the initial ‘response’ phase, work was completed on a “field fit” buttress, the dam’s continuous filter blanket

and a French drain. The subsequent 'recovery' activities involved reconstructing/repairing of the dam's low permeability zone, a shear key, a coarse rock blanket, the access road, and the sinkholes. Hydroseeding of the downstream slope was completed in spring 2013 and 2015.

It was determined the spillway sill level should be further lowered beyond the modifications completed as part of the emergency response. In November and December 2012, the spillway was lowered an additional 0.65 m below the base of the existing spillway configuration.

Following the impact of the 2012 events, in 2013 the dam crest was re-graded and re-sloped to the upstream slope. Geotextile overlaid with gravel were placed at the surface for additional protection. In addition, the spillway was retrofitted in 2015 to replace riprap that was used during the 2012 repair works.

2021-2022 Remediation and Closure

In August 2016, the RDCK Board elected to proceed with transitioning the Facility to Passive Closure as defined by the Canadian Dam Association guidelines (CDA 2019). This is intended to successfully limit, counteract, prevent, or mitigate the escape or migration of contamination from the Facility resulting in adverse effects on the environment or human health. Further, by stabilizing the dam and eliminating pond management this transition is expected to minimize site inspection and maintenance. The 2020 Reclamation and Closure Plan (RDCK 2020) was subsequently developed that included the following closure works:

- Expansion of the HB Dam toe berm to improve seismic stability and mitigate the risk of liquefaction of the original dam fill.
- Construction of an expanded spillway at the western abutment that can convey the probable maximum flood.
- De-watering of the tailings pond and backfilling of the pond to eliminate the ability for water to pond upstream of the dam and mitigate the risk of internal erosion and piping.
- Construction of a tailings cover to prevent the erosion, escape, and migration of the tailings from the facility, remove the direct contact exposure pathway for human and most ecological receptors, and to provide a final surface that will aid in revegetation.
- Construction of lined channels over the tailings cover to convey surface drainage over the tailings facility.
- Tailings affected soils from a downstream property were imported to the site and placed in an engineered landform in the northwest corner of the Facility.
- Revegetation of the tailings cover and other disturbed areas.

Construction began in June 2021 and was halted on November 23, 2021, due to wet weather that resulted in non-trafficable conditions within the tailings impoundment. Construction resumed in July 2022 and was completed in September. The 2022 construction consisted of completion of the tailings cover and tailings pond backfill, construction of the lined channels over the tailings cover, and site revegetation.

The construction record drawings are presented in the Construction Record Report (SRK 2025).

C-2. Key References

A list of the available design, construction, and surveillance reports are presented in Table B.1.

Table B.1: Key References

Date	Document Title	Author(s)
1972 Jun 22	Report to Cominco Ltd. Re: HB Tailing Dam near Salmo, BC	Golder Brawner Associates
1974 Jan	Report to Cominco Ltd. on Site Investigation at Existing HB Mines Tailings Pond	Golder Brawner Associates
1974 Jun	HB Mine Tailing Dike Extension – Instructions to Tenders	Cominco
1975 Jun 6	Site Inspection, H.B. Tailings Pond Dyke, Salmo BC	Golder Associates
1975 Oct 6	H.B. Tailings Dam Construction	Golder Associates
1976 Jan 27	Letter and Progress report to Department of Mines and Petroleum Resources	Cominco
1976 Mar 25	PCB File No 0262100–PE–1853 Stability of Tailings Dam HB Mine – correspondence and reports	Various
1976 Dec	Report to Cominco Ltd on Proposed Dam Extension 1976 HB Mine	Golder Associates
1977 Feb	HB Tailing Dike Extension Specification No. HB0.010-1	Cominco
1977 Mar 29	Letter to Cominco re HB Tailing Dike Extension proposal and Specification	Golder Associates
1977 May 5	Tailings Pond Extension 1977 Stability of Dam	Dept. Mines and Petroleum Resources
1977 Jun 9	Letter to Cominco: HB Mine Tailing Dam Spillway	Senior Reclamation Inspector
1981 Nov 27	Tailings Disposal Scheme	Klohn Leonoff
1987 Oct 16	Inspection Report Re: H.B. Mill Project	Ministry of Energy, Mines and Petroleum Resources
1993 May 6	Report of Inspector of Mines	Ministry of Energy, Mines and Petroleum Resources
1997 Jun 10	Report of Geotechnical Inspector	Ministry of Employment and Investment
1998 Jul 7	HB Mine Water Quality Assessment	Interior Reforestation
1999 Jul 28	ABA Testing of H.B. Mine Tailings	Cominco
2002 Feb 5	H.B. Mine Tailings Pond and Dyke Decommissioning Plan	BGC Engineering
2004 May 31	Inspection of H.B. Mines Tailings Dam Facility	Golder Associates
2005 Apr 28	Bid Documents – Tailings dam Decommissioning	RDCK
2005 Aug	Contaminated Attenuation Zone Evaluation, Southern Groundwater Flow Path, Central Landfill Site	Conestoga-Rovers & Associates
2005 Nov 2	H.B. Dam Decommissioning Project, July 6, 2005, to October 12,	BGC Engineering

Date	Document Title	Author(s)
	2005 Construction Records	
2005 Dec	Completion Report, Mine Related Issues, Action Plan Items 10, 11 & 12, Central Landfill Site, Salmo BC	Conestoga-Rovers & Associates
2007 Sept	2007 Formal Inspection Report	Conestoga-Rovers & Associates
2008 Nov 24	2008 Formal Inspection Report	Conestoga-Rovers & Associates
2009 Aug 18	2009 Formal Inspection Report	Conestoga-Rovers & Associates
2011 Jan 19	Formal Annual Dam Inspection Report 2010	EBA Engineering Consultants
2011 Dec 20	Formal Annual Dam Inspection Report 2011	EBA Engineering Consultants
2012 Oct 31	Assessment of Embankment Dam Sloughing	EBA Engineering Consultants
2012 Oct 31	Embankment Dam Slough Response Construction Report	EBA Engineering Consultants
2013 Mar 1	HB Dam – Fluctuations in Piezometric Head	EBA Engineering Consultants
2013 Mar 1	HB Dam – Temporary Lining of Spillway Channel	EBA Engineering Consultants
2013 Mar 1	HB Dam – Lowering of Existing Spillway	EBA Engineering Consultants
2013 Mar 1	HB Dam – Water Level Management	EBA Engineering Consultants
2013 Mar 1	HB Dam – Short Term Instrumentation and Monitoring	EBA Engineering Consultants
2014 May 28	Dam Safety Review	Tetra Tech EBA
2014 Oct 27	Independent Third-Party Review of Dam Safety Inspection	Peter Lighthall
2014 Sep 15	2014 Formal Annual Dam Inspection	Tetra Tech EBA
2015 Jun 29	HB Tailings Facility – Letter of Assurance	Tetra Tech EBA
2015 Sep 10	Spillway Retrofit – Detailed Design	Tetra Tech EBA
2015 Dec 1	Spillway Retrofit – Tender and Construction Report	Tetra Tech EBA
2016 Jan 11	HB Mine Tailings Facility Geotechnical Investigation.	Thurber Engineering
2016 Apr 12	2015 Dam Safety Inspection	Tetra Tech EBA
2016 May 9	HB Tailings Facility – Updated Stability Analyses	Tetra Tech EBA
2016 Aug	Remediation and Closure Preliminary Assessment	SRK Consulting
2017 Mar 17	2016 Dam Safety Inspection	Tetra Tech
2017 Apr 6	Design of Weighted Filter for Left Abutment contact	Tetra Tech
2017 May	2016 Tailings Characterization Factual Report	SRK Consulting
2018 Mar	2017 Dam Safety Inspection	SRK Consulting
2018 Sep	HB Mine Tailings Facility Preliminary Design Failure Modes and Effects Analysis Workshop.	SRK Consulting
2019 Mar	2018 Dam Safety Inspection	SRK Consulting
2020 Aug	Remediation and Closure Plan	RDCK
2021 Feb	2020 Dam Safety Inspection	SRK Consulting
2022 Mar	2021 Dam Safety Inspection	SRK Consulting

Date	Document Title	Author(s)
2023 Mar	2022 Dam Safety Inspection	SRK Consulting
2023 May	2021-22 Remediation and Closure Construction Record Report	SRK Consulting
2023 May 4	2023 Post-Freshet Inspection and Maintenance Recommendations	SRK Consulting
2023 Jun 22	Hydraulic Assessment of the As-Built HB Spillway	SRK Consulting
2023 Nov 24	2023 Repair Construction Observations	SRK Consulting
2024 Feb	Tailings Geochemistry Monitoring Program – 2023 Update	SRK Consulting
2024 Mar	2023 Dam Safety Inspection	SRK Consulting
2025 Mar	2024 Annual Facility Performance Review	SRK Consulting
2026 Jan	2025 Piezometer Installation Report	SRK Consulting

Appendix D Site Conditions

D-1. Climate

The climate for the region is characterized by warm, dry to moderately moist summers and cool, snowy winters. Snowfall typically starts accumulating in November with maximum accumulation occurring in March. Snow melt at the facility generally occurs in late March and April. Meteorological parameters are not measured at HB Mine Tailings Facility (elevation 710 m).

The closest active station to the facility is Castlegar Airport, BC (Climate ID: 1141455), located approximately 36 km northwest of the facility in an adjacent valley at an elevation of 495 m. Historically, an Environment Canada climate data station was located in Salmo, BC (Climate ID: 1146944) that operated from 1972 to 1980. The comparison of the climate data indicates that precipitation in Salmo (elevation 670 m), is slightly higher and temperatures generally cooler than in Castlegar, BC.

A hydrological analysis of the site was undertaken to develop inputs to the hydraulic designs of the spillway and other conveyance structures at the facility (RDCK 2020). A regional analysis was implemented that included data from 22 climate stations within 150 km to establish a long-term synthetic period of record for air temperature, precipitation, wind speed, and snowmelt. Probabilistic climate change modelling was incorporated into the analysis to address climate change trends and effects that may occur at the facility in the future. The analysis of data from 1980 to 2017 indicates the following:

- Mean monthly site temperatures range from -3.6°C in January to 19°C in July;
- Mean annual total precipitation of 808 mm.

D-2. Topography and Drainage

The Facility is located at the base of the west slope of Iron Mountain. The major drainage in the area of the Facility is the southward flowing Salmo River, which occupies a floodplain to the west of the Facility. Between the Salmo River floodplain and the Facility is a bedrock ridge trending north south, which rises steeply above the Facility.

The Facility covers an area of approximately 30 hectares (ha) and occupies the middle to bottom of a “hanging valley”. A soil cover over the tailings is graded to drain to a spillway located at the southwest corner of the tailings impoundment. Drainage channels are also present within the cover that directs surface water to the spillway from the landfill wetland area (Main Channel) and from two ephemeral streams on the east side of the impoundment (North and South Spur Channels). No water is impounded within TSF under normal conditions. The dam overflow discharges toward the south in a narrow valley, crosses Highway 3 to the south, and flows through a man- made ditch system to the Salmo River.

D-3. Geology

The geology of the Facility is derived from site-specific stratigraphic data collected through numerous investigations carried out at, and in the vicinity of the Facility between 1999 and 2005.

Bedrock

The majority of the study area is underlain by phyllite bedrock. A granitic bedrock outcrop is present at the west abutment of the dam. An argillite bedrock outcrop is present approximately 30 m east of the east abutment of the dam with the depth to bedrock estimated to be at least 6 m at the east abutment. Near the centre of the dam, bedrock was encountered approximately three to six metres below the original ground surface (BGC-BH-00-1 and Golder-73-01).

Overburden

The native geologic sequence typically encountered at the Facility consists of overburden materials (glacial and post-glacial deposits), ranging in thickness from 0 to 47.8 meters (MW-02-2004(D)) overlying the bedrock surface. In select areas of the Facility, the overburden is absent and the bedrock surface is exposed as bedrock outcrops. The overburden generally consists of sands and gravels, overlying a thin layer of silty to sandy glacial till which mantles the bedrock surface in select areas. The glacial till is occasionally absent, with the sands and gravels extending to the bedrock surface. Occasional lenses/layers of silt and/or silty clay exist within the sands and gravels.

Beneath the western half of the HB Dam, the bedrock is overlain by a dense lodgement till consisting of gravelly sand that contains some silt and traces of clay. Near the center of the dam, the bedrock is overlain by the lodgement till, which is itself overlain by stratified glaciolacustrine deposits consisting of sands, silts, and clays. Beneath the eastern portion of the dam, the bedrock is overlain by the stratified glaciolacustrine material consisting primarily of sandy silt. The overburden thickness is generally shallow beneath the original dam (three to six meters) and increases in thickness towards each abutment as well as to the south of the dam (14.3 m at MW-01-2004, located approximately 140 m down valley).

Tailings

The tailings have an approximate maximum thickness of 20 metres near the south-central portion deposition area, immediately upstream of the dam. Tailings were spigotted from the north end of the tailings deposition area, resulting in a grain size segregation during deposition, with coarse sand tailings present at the north end of the facility, and fine silt tailings at the south end of the facility.

Geochemical testing of the tailings was undertaken in May 1999 on behalf of Teck Cominco (Cominco 1999), and in December 2016 (SRK 2017a and 2017b). The geochemical results have demonstrated no acid rock drainage (ARD) concerns based on neutralization potential/acid potential (NP/AP) ratios of over 4.0. Metals of environmental interest reported for tailings solids samples included lead (1228 to 2344 ppm), zinc (1945 to 4600 ppm), arsenic (23 to 135 ppm), copper (9 to 73 ppm), and cadmium (15

to 50 ppm). Tailings porewater chemistry estimates were evaluated to determine if secondary minerals were controlling water chemistry and concluded that secondary minerals already present or forming in the weathering profile of the tailings are expected to control pore water chemistry if the water table were to be lowered. Changes to the water table are therefore not predicted to substantially alter pore water chemistry. To confirm porewater predictions, three tailings porewater samples were collected in June 2021, prior to removal of the tailings pond and placement of the cover. At the time of this report update, the porewater sample analysis has not been received. Additional porewater sampling will be completed annually, until a stable trend is observed.

Geotechnical characterization program of the tailings was undertaken in December 2016 (SRK 2017a). Six boreholes were drilled in the facility with samples tested for particle size distribution, water content, specific gravity, relative density, and 1D consolidation, and triaxial strength testing. The testing showed that grain size segregation occurred during deposition of the tailings, with coarser sand tailings (mean particle size of 0.18 mm) at the north end of the facility, and fine silt tailings (mean particle size of 0.018 mm) at the south end of the facility. Additional details and test results can be found in the SRK (2017b) report.

D-4. Hydrogeology

The groundwater flow at the Facility is believed to occur predominantly within the tailings and overburden unit. Groundwater is typically encountered less than 1 m below ground surface (bgs) within the tailings depositions area and at approximately 4 m bgs downgradient of the dam.

The topographic ridges located east and west of the Facility represent groundwater recharge areas, and groundwater discharge areas are present on along the eastern side of the Facility. A groundwater divide is located along the northern portion of the landfill property. Groundwater from a portion of the landfill flows westward into the tailings impoundment. From the Facility, all groundwater and surface water flow is believed to be directed toward the south.

D-5. Seismicity

The HB Mine Tailings Facility is located in the Southern Cordillera seismic zone as defined by the Geological Survey of Canada. The major “ductile-brittle” faults reported within this zone consist of the southern Purcell Trench fault; the Kettle River and Granby faults, the Okanagan and Eagle River faults, Slocan Lake fault, and Columbia River fault. The region is a relatively inactive seismic region of Western Canada with the largest earthquake being a magnitude 6.0 event in 1918 in the Valemont area of the Rocky Mountain Trench. In 1986, a magnitude 5.5 earthquake occurred near Prince George, causing some minor damage.

A probabilistic seismic hazard assessment was undertaken for the facility with the results presented in Appendix C-2 of the RCP (RDCK 2020).

D-6. Biological Environment

The Facility is located in the Interior Cedar-Hemlock biogeoclimatic zone and within the Montane Cordillera ecozone. The ecoregion typically contains mature forests consisting of western hemlock and western red cedar, and seral stands consisting of lodgepole pine and Douglas-fir with some western white pine and western larch. Characteristic wildlife includes mule and white-tailed deer, woodland caribou, grizzly and black bear, and grouse. Additional details of the biological characteristics are provided in the RCP (RDCK 2020).

D-7. Environmental Receptors

Water from the tailings impoundment is discharged into the outlet ditch which drains to the southern property boundary, under Highway 3 via a culvert, and then into the Salmo River, located approximately 1 km west of the Facility via a man-made ditch. South of the Facility, across Highway 3, Lot A Plan NEP 23118 Block 5 District Lot 275 is privately owned. This privately owned property contains a water supply well that has been used intermittently for livestock. There have been no occupants on the property since 2015.

Receptors of concern include on-site trespassers (hikers, campers), on-site workers, off-site general public, on/off-site terrestrial vegetation, on/off site wildlife (mammals, birds), on/off-site soil invertebrates, and on/off-site aquatic life (fish, invertebrates, plants). The receptors of concern were included in an exposure pathway evaluation, and any receptors with potentially complete exposure pathways were included in a quantitative assessment in SLR's 2019 Prospective Human Health and Ecological Risk Assessment, that formed part of the RDCK's 2020 RCP and Mines Act permit amendment application.

References

Cominco Ltd., 1999. ABA Testing of H.B. Mine Tailings. Letter prepared for the Ministry of Energy and Mines Branch by Bruce Donald. July 28.

[RDCK] Regional District of Central Kootenay, 2020. HB Mine Tailings Facility Remediation and Closure Plan. May.

SRK Consulting (Canada) Inc. 2017a. HB Mine Tailings Facility – 2016 Tailings Characterization Factual Report. Prepared for Regional District of Central Kootenay. SRK Project Number 1CR012.001. May.

SRK Consulting (Canada) Ltd., 2017b. Memo – Prediction of Geochemical Performance of HB Tailings Under Proposed Remediation Conditions. May 23.

Appendix E Instrumentation Details

Appendix E.1 Instrumentation Asbuilt Details

E-1. Instrumentation Locations

Table 1 provides a list of the instrumentation co-ordinates, with the locations shown in Figure E-1.

Table 1: Instrumentation Locations

Designation	Northing (m)	Easting (m)	Ground Elevation (m)	Comment
Standpipe Piezometers (See Section E-2 for Further Details)				
P1	5,442,024	481,740	711.35	VWP installed in the standpipe in 2025.
P2	5,442,024	481,740	711.35	VWP installed in the standpipe in 2025.
P3	5,441,977	481,694	692.54	VWP installed in the standpipe in 2025.
P5	5,441,995	481,732	701.02	VWP installed in the standpipe in 2025.
P6	5,441,947	481,732	701.02	VWP installed in the standpipe in 2025.
Vibrating Wire Piezometers (See Section E-2 for Further Details)				
SRK25-BH01-P1	5,442,036	481,694	711.17	3 VWP's in SRK25-BH01.
SRK25-BH01-P2	5,442,036	481,694	711.17	
SRK25-BH01-P3	5,442,036	481,694	711.17	
SRK25-BH02-P1	5,442,050	481,753	708.68	1 VWP in SRK25-BH02.
SRK25-BH03-P1	5,441,992	481,797	711.10	3 VWP's in SRK25-BH03.
SRK25-BH03-P2	5,441,992	481,797	711.10	
SRK25-BH03-P3	5,441,992	481,797	711.10	
SRK25-BH04-P1	5,441,965	481,779	699.86	1 VWP in SRK25-BH04.
SRK25-BH05-P1	5,441,955	481,717	688.30	2 VWP's in SRK25-BH05.
SRK25-BH05-P2	5,441,955	481,717	688.30	
Seepage Weir				
@ Dam Toe	5,441,937	481,704	n/a	45°v-notch steel plate.
Survey Hubs				
H01	5,442,035.34	481,687.12	710.78	Rebar embedded in concrete.
H02	5,442,028.81	481,714.39	710.97	Rebar embedded in concrete.
H03	5,442,012.80	481,711.00	702.87	Rebar embedded in concrete.
H04	5,442.020.86	481,740.42	711.15	Rebar embedded in concrete.
H05	5,442,005.80	481,735.46	703.02	Rebar embedded in concrete.
H06	5,442.000.63	481,780.99	710.33	Rebar embedded in concrete.
H07	5,441,989.10	481,773.25	702.99	Rebar embedded in concrete.
H08	5,441,978.90	481,701.82	694.06	Rebar embedded in concrete.
H09	5,441,978.77	481,763.80	701.57	Rebar embedded in concrete.
H10	5,441,999.30	481,707.12	701.54	Rebar embedded in concrete.

Designation	Northing (m)	Easting (m)	Ground Elevation (m)	Comment
H11	5,441,993.00	481,730.16	701.69	Rebar embedded in concrete.
H12	5,441,966.04	481,718.41	691.23	Rebar embedded in concrete.
CP6785	5,441,964.12	481,893.43	719.32	Control Point in bedrock by east abutment.
CP6786	5,442,074.29	481,617.38	722.00	Control Point in bedrock by west abutment.
Slope Inclinometers (See Section E-3 for Further Details)				
SRK25-BH-01	5,442,036	481,694	711.17	
SRK25-BH-03	5,441,992	481,797	711.10	
SRK25-BH-04	5,441,965	481,779	699.86	
SRK25-BH-05	5,441,955	481,717	688.30	

Sources: SRK (2026)

Notes:

[1] Standpipe piezometer co-ordinates collected by GPS on December 31, 2014. Survey hub co-ordinates collected by GPS on November 11, 2021. VWP piezometer and slope inclinometer co-ordinates collected by GPS in the fall of 2025.

E-2. Piezometer Asbuilt Details

All vibrating wire piezometers (VWPs) consist of 170 kPa and 350 kPa VW2100 models provided by RST Instruments. The VWPs are connected to RST Affinity data loggers enclosed in RST “Secondary Enclosures”. The piezometer locations are shown in Figure E-1

In addition to the new piezometers installed in 2025, VWPs were also installed in the existing standpipe piezometers and connected to RST Affinity data loggers. These data loggers are also enclosed in RST Secondary Enclosures installed overtop the standpipe piezometer protective steel casings. Kevlar VWP cables were used for the installed in the standpipes The VWPs installed in the standpipes have Kevlar cables to prevent cable stretching. Each sensor was installed 0.1 m above the standpipe bottom, except for P5, which was unable to be lowered below a depth of 6.7 m below the top of pipe. The VWP is believed to be stuck at a PCV joint. The VWP is planned to be lowered in 2026.

Table 2 provides the as-built installation details, including sensor depths, elevations, and serial numbers. Table 3 provides the calibration details for each piezometer including the factory calibration and temperature compensation coefficients, and initial B-unit/temperature measurements (in air) that were recorded immediately prior to the piezometer installations. The RST VWP calibration sheets are provided in SRK (2026).

Table 2: Piezometer Installation Summary

Borehole	Sensor ID	RST VWP Serial Number	Sensor Depth (mbgs[1])	Sensor Elevation (m)	Stratigraphy Unit
New Boreholes					
SRK25-BH-01	BH1-P1	VW207290	7.92	703.25	Dam Filter Blanket
	BH1-P2	VW205598	17.68	693.49	Original Dam Fill (1955 - 1967)
	BH1-P3	VW206744	21.95	689.22	Foundation Soils
SRK25-BH-02	BH2-P1	VW205607	9.75	698.93	Tailings
SRK25-BH-03	BH3-P1	VW207291	6.40	704.70	Dam Filter Blanket
	BH3-P2	VW205206	11.28	699.82	Original Dam Fill (1955 - 1967)
	BH3-P3	VW203736	17.07	694.03	Foundation Soils
SRK25-BH-04	BH4-P1	VW203686	12.80	687.06	Foundation Soils
SRK25-BH-05	BH5-P1	VW207292	7.01	681.29	Foundation Soils
	BH5-P2	VW207289	12.19	676.11	Foundation Soils
Existing Standpipe Piezometers					
BGC-00-01	P1	VW206494	18.30	693.05	Foundation Soils
	P2	VW206708	14.10	697.25	Original Dam Fill (1955 - 1967)
BGC-00-02	P3	VW206495	20.30	672.11	Foundation Soils
BGC-05-01	P5	VW207287	6.70[2]	694.29[2]	“Stabilizing Berm” (1964 – 1967)
	P6	VW206707	15.10	685.89	“Stabilizing Berm” (1964 – 1967)

Sources:https://srk.sharepoint.com/sites/NACAPR003603/Internal/400_Piezometer%20Installation/Instrumentation/VWP_Datalogger_Metadata.xlsx?web=1

Notes:

[1] mbgs = meters below ground surface.

[2] The VWP installed in the P5 standpipe was unable to be lowered past 6.7 m below the top of pipe. The VWP is believed to be hung up at a PVC joint. The P5 VWP is a 170kPA model sensor that has a diameter of 25 mm, which is wider than the 350 kPa models with a diameter of 19 mm.

Table 3: VWP Calibration Data Summary

Sensor ID	Sensor Depth (mbgs[1])	Calibration Factor (kPa/B Unit)	Temperature Factor (kPa/°C rise)	Initial Reading in Air (B Units)	Initial Temperature in Air (°C)
New Boreholes					
BH1-P1	7.92	0.057464	-0.02258	10118.16	16.43
BH1-P2	17.68	0.096102	-0.10655	8803.7	16.28
BH1-P3	21.95	0.10187	0.17139	8615.28	16.23
BH2-P1	9.75	0.10562	-0.083838	8727.16	21.86
BH3-P1	6.40	0.05489	0.01166	10070.33	23.53
BH3-P2	11.28	0.097485	-0.076404	8473.51	23.65
BH3-P3	17.07	0.11334	-0.05327	8381.9	23.72
BH4-P1	12.80	0.10945	-0.11054	8603.31	22.08
BH5-P1	7.01	0.056996	-0.02794	10406.28	25.77
BH5-P2	12.19	0.056075	-0.008847	10107.76	25.43
Existing Standpipe Piezometers					
P1	18.30	0.10568	0.18402	8585.84	17.37
P2	14.10	0.10574	0.17196	8623.83	17.7
P3	20.30	0.10893	0.18137	8778.86	19.25
P5	6.70[2]	0.05685	-0.01129	10083.09	2.05
P6	15.10	0.10058	0.19613	8465.79	-29.73[3]

Sources:https://srk.sharepoint.com/sites/NACAPR003603/External/2025%20Drilling%20Program/Instrumentation/VWP_Datalogger_Metadata.xlsx?web=1

Notes:

[1] mbgs = meters below ground surface.

[2] The VWP installed in the P5 standpipe was unable to be lowered past 6.7 m below the top of pipe. The VWP is believed to be hung up at a PVC joint. The P5 VWP is a 170kPA model sensor that has a diameter of 25 mm, which is wider than the 350 kPa models with a diameter of 19 mm.

[3] During the initial readings on August 10, a negative temperature value of -29°C was recorded. Following installation of the datalogger in October, the measured temperatures fluctuated between -29°C and +10.4°C. On November 13, 2025, the connection of the VWP was repaired with the VWP subsequently recording temperatures of around 10.4°C.

E-3. Slope Inclinometer Asbuilt Details

Four inclinometers were installed in 2025 at the locations shown in Figure E-1. The installation details are summarized in provided in Table 4. The snap-and-seal, 70 mm diameter inclinometer casings were provided by RST with casing anchors used to prevent buoyant uplift of the inclinometer casing during installation. Further installation details are provided in SRK (2026).

Table 4: Inclinometer Installation Details

Borehole ID	Top of Casing Elevation (m)	Azimuth of A0 (degrees) [1]	Borehole Depth (mbgs) [2]	Inclinometer Bottom Reading Depth (m) [3]
SRK25-BH-01	711.3	170	45.7	45.0
SRK25-BH-03	711.2	200	25.9	24.0
SRK25-BH-04	700.0	190	15.2	15.0
SRK25-BH-05	688.4	210	15.2	15.0

Notes:

[4] The A_0 azimuth is the alignment of the groove orientated in the direction of expected movement.

[5] mbgs = meters below ground surface

[6] Depth relative to the top of the inclinometer casing.

Initial readings of the inclinometers were collected on October 10, 2025, with the results provided in SRK (2026).

E-4. References

SRK Consulting (Canada) Inc. 2026. 2025 Piezometer Installation Report. FINAL. Prepared for Regional District of Central Kootenay: Nelson, BC. Project number: CAPR003603. Issued January. 2026.

Appendix E.2 Piezometer Reading Procedure

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OMS Manual
Appendix E-2: Piezometer Reading Procedure

Version	1.0	**Client**	Regional District of Central Kootenay
Date	February 24, 2026	**Project**	CAPR003603

File name: AppE-2_Piezo Readings.docx

Vibrating wire piezometers (VWPs) installed in the existing standpipe piezometers (P1, P2, P3, P5, P6) and in the 2025 boreholes (SRK25-BH-01 to BH-05) are connected to RST RSTAR Affinity data loggers housed in surface enclosures. Instrumentation specifications are provided in SRK (2026)[1] and the instrumentation manuals can be found on the RST website[2]. The VWPs provide daily measurements of pore pressures/water levels.

The purpose of this document is to describe how the field data collector will:

- Download vibrating wire piezometer (VWP) data from the RSTAR Affinity data loggers in the field using a Bluetooth-enabled mobile device, and
- Review the data on the RSTAR Affinity dashboard and compare the data to Trigger and Action Response Plan (TARP) thresholds for dam safety assessment.

The piezometers are to be downloaded during each routine and event driven inspection.

1 Roles and Responsibilities

Field Data Collector (TFT or designate)

- Carries mobile device to site, connects to each logger via Bluetooth, and initiates data synchronization.
- Confirms that data have been uploaded (or cached for later upload) and documents the download in the inspection record.
- After returning from site, exports and reviews data on the RSTAR Affinity dashboard and compares readings to TARP thresholds.

[1] SRK Consulting (Canada) Inc. 2026. 2025 Piezometer Installation Report. FINAL. Prepared for Regional District of Central Kootenay: Nelson, BC. Project number: CAPR003603. Issued January. 2026.

[2] https://rstinstruments.com/product/vibrating-wire-piezometer/

- Immediately informs the appropriate personnel of any unusual readings or potential TARP trigger exceedances as per the Notification Charts (See TARP)

TFT and EOR

Provide thresholds and interpretation guidance and determine whether any TARP/EPRP actions are required.

2 Required Equipment and References

Equipment

- Bluetooth-enabled smartphone or tablet (Android or iOS) with:
  - RSTAR Affinity Field Utility app installed and up to date. App must be logged into the RDCK / HBTF Affinity account (same account used for the web dashboard). If access is needed, contact the TFT.
  - Sufficient battery charge for the site visit.
- Mobile data (LTE) enabled, or plan to upload cached data later when in coverage.

References (have available electronically or printed)

- OMS Appendix F – TARP
- Instrumentation plan showing the VWP locations

3 Pre-field Preparation

Before going to site, the field data collector shall:

1. **Confirm Access and Credentials**: Verify that you can log into the RSTAR Affinity dashboard and Field Utility app with your RDCK account.
2. **Review Logger/Instrument List:** Obtain the current list of Affinity loggers and associated VWPs (e.g., P1/P2 logger, P3 logger, P5/P6 logger, SRK25-BH-01 to -05 loggers).
3. **Check Last Download Dates**: in the RSTAR Affinity dashboard (https://rdck.rstaraffinity.cloud/dashboard), note the last download date for each logger so you can set an appropriate date range and ensure some overlap for QA/QC.
4. **Review TARP Thresholds**: Review the current TARP elevation thresholds. Note that new VWPs in the SRK25 boreholes do not yet have formal triggers; treat any unusual step changes or trends as “unusual observations” and flag them for TFT/EOR review.

4 Field Procedure – Downloading VWP Data via Bluetooth

Perform this procedure at each RSTAR Affinity logger location.

1. **Visual Check of Enclosure and Site Conditions**
   - Confirm the logger enclosure is intact (no damage, vandalism, or open doors).
   - Note any visible damage to cables, labels, or nearby piezometers in the inspection form.
2. **Prepare Mobile Device**
   - Ensure Bluetooth is ON.
   - Ensure mobile data (LTE) is ON if coverage is available.
3. **Open Field Utility and Connect**
   - Launch the RSTAR Affinity Field Utility app.
   - Log in if required.
   - From the site list, select the HB Mine Tailings Facility site.
   - Allow the app to scan for nearby loggers; select the logger corresponding to the piezometers at that location (check the logger ID/serial on the label if needed).
4. **Check Logger Status (Optional but Recommended)**
   - In the logger's Profile/Status view, confirm:
     - Bluetooth connection is good (RSSI not extremely low).
     - Battery level is reasonable.
     - No error messages reported by the logger.
5. **Sync Logger Data (Download)**
   - Open **Logger Options**
     - In the Field Utility app, tap Logger Options (usually bottom right)
   - **Start Sync**
     - Tap **Sync Logger Data**.
     - When prompted for data range, choose one of:
       - **Only New Readings**, or
       - **Custom Range** from the day after the last download to today, with 1–2 days overlap for QA/QC.
   - **Monitor Sync**
     - Wait for the sync to complete; do not walk out of Bluetooth range during sync.

- If an error occurs, retry once; if it persists, note the issue in your field log and inform the TFT.

6. **Upload to Server / Cached Actions**
   - **If LTE or Wi-Fi is Available**
     - After sync completes, the app will automatically upload data to the server.
     - Remain in coverage until the upload confirms (no outstanding “cached actions”).
   - **If No or Poor Cell Coverage**
     - The Field Utility app will store the newly synced data as **cached actions** on your mobile device.
     - While still at the logger (or later the same day), open **More** → **Cached Actions** in the app and confirm that the data sync for each logger is listed as an action waiting to send.
     - Once you return to an area with cell coverage (e.g., on the access road or back in town), open the Field Utility app and send all cached actions so the data are uploaded to the RSTAR Affinity server.
7. **Field Documentation**
   - **Record in Inspection Notes**
     For each logger visited, record at minimum:
     - Date and time of sync.
     - Data range synced (from/to dates).
     - Whether data were uploaded immediately or stored as cached actions for later upload.
     - Any observed issues with the logger, enclosure, or piezometer infrastructure.

---

5 Office Procedure – Reviewing Data and Comparing to TARP

After all cached actions have been uploaded and you are back in the office:

1. **Access Data on RSTAR Affinity Dashboard**
   - **Log Into Dashboard**
     - Open a web browser and go to the RDCK’s RSTAR Affinity URL (https://rdck.rstaraffinity.cloud/dashboard)
     - Log in with your RDCK credentials.
   - **View Instrument Data**

- Select the HB Mine Tailings Facility site.
- Select **Fleet Management**
- Expand each individual data logger to view the name of each instrument associated with each logger
- For each VWP (instrument) on the logger, under actions, select "**View/Edit Instrument**"
- Select the **Visualization** tab
- Confirm that the most recent dates present match your field download notes
- Check for Obvious Errors
  - Confirm timestamps are continuous and reasonable (no large gaps).
  - Look for flat-lined, spiky, or clearly unrealistic values (e.g., water elevation above ground or far below historical minimum).

2. **Compare to TARP Thresholds**
   - **Continuing on the Visualization tab,** for each piezometer with TARP thresholds (P1, P2, P3, P5, P6), determine:
     - The current water level elevation (latest reading).
     - The maximum water level elevation in the period since the last review (e.g., since last monthly download or over the current freshet).
   - **Compare vs TARP Triggers**
     - Compare the elevations to the "Green / Minor Risk (Emergency Level 1) / Moderate Risk (Emergency Level 2)" thresholds in the TARP.
   - **For the New VWPs (SRK25-BH-01 to -05)**
     - Until specific triggers are established, review trends qualitatively:
       - Look for sudden step changes that cannot be explained by known precipitation or snowmelt events.
       - Compare against nearby instruments (e.g., P1/P2, P5/P6, BH2-P1).
     - Treat any unusual change as an "unusual observation" and report to the TSF QP/EOR.
3. **Actions if Triggers Are Approached or Exceeded**
   - **If a Threshold is Exceeded,**
     - Inform the TFT. The TFT will:
       - Classify the event as Emergency Level 1, 2, or 3 using the TARP and EPRP
       - Initiate notifications and actions per the EPRP Notification Charts.
     - Support any additional data collection requested (e.g., more frequent downloads or manual checks).

6 Documentation and Reporting

After each download and review cycle, the field data collector shall:

1. **Transmit to TFT/EOR**
   - Provide a batch report to the TFT/EOR for ongoing review.
     - Select **Batch Reports** under Data Management.
     - Under instrumentation type, select “Vibrating Wire Piezometer”.
     - Under Data Range, select “User defined Data Range” and specify the rate range since last transmittal to the TFT/EOR.
     - Under “Select Instrument”, select all.
     - Select **Download**
   - Email downloaded zip file to TFT/EOR.

Appendix E.3 Slope Inclinometer Reading Procedure

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OMS Manual
Appendix E-3: Slope Inclinometer Reading Procedure

Version	1.0	**Client**	Regional District of Central Kootenay
Date	February 24, 2026	**Project**	CAPR003603

File name: AppE-3_SI Readings.docx

Slope inclinometer (SI) casings are grooved, rigid plastic tubes installed vertically in boreholes that act as access pipes for a slope inclinometer probe. The probe is lowered along the casing to repeatedly measure lateral displacement versus depth, allowing identification of zones of deformation or potential instability in the dam and its foundation.

Four SI casings were installed in 2025 in boreholes SRK25-BH-01, SRK25-BH-03, SRK25-BH-04, and SRK25-BH-05 (See Figure E-1 for locations). The casings are founded in bedrock and are intended for periodic or event-driven monitoring of lateral displacements in the dam and toe berm area.

1 Objectives

- Confirm that the dam and toe berm are not experiencing progressive lateral deformation.
- Identify any localized shear zones or deformation planes that could indicate developing instability.
- Provide additional information to support interpretation of survey hub data and overall stability assessments.

2 Frequency

A baseline set of readings (initial survey was established from the October 10, 2025, survey, with the results reported in SRK (2026). Going forward, readings are to be collected every 5 years, to coincide with Dam Safety Reviews, unless otherwise directed by the EOR. This could occur if there are any surficial signs of displacement such as cracking, slumping, or unusual survey hub movements.

In addition, readings are to be collected following significant seismic events as per the TARP.

At any time the EOR or TSF QP determines that additional lateral displacement data is required (e.g.,

3 Equipment Required

- RST digital inclinometer probe and cable compatible with the installed SI casing. The probe may be rented from RST or Pine Environmental.
- Inclinometer readout unit/software (RST Digital Inclinometer system). A readout unit will be provided with the probe rental. The probe and readout unit will produce a .CSV file that SRK will analyse the data using the software program “Inclinalysis” by SRK.
- Field notebook or inspection form.
- Measuring tape and marker for casing reference.

4 Measurement Procedure

4.1 Step 1 – Preparation

Before going to site:

- Review the most recent **baseline and prior SI profiles** and any interpretations prepared by the EOR.
- Review the Probe readings procedures provided with the probe and cross-reference with this procedure. If there are any uncertainties, contact the EOR for further information.
- Review the SI casing IDs and locations (SRK25-BH-01, -03, -04, -05) and note the starting inclinometer bottom reading depths for each borehole (See Table 4 in Appendix E-1 of the OMS Manual).
- Confirm that the inclinometer probe and reel are calibrated and functioning (check most recent calibration certificate if available).
- Plan safe access to each casing, considering slope, ground conditions, and weather conditions.

4.2 Step 2 – Field Reading Procedure

For each SI casing:

1. Locate and inspect casing
   - Confirm casing ID matches the instrumentation plan.
   - As needed, remove the VWP datalogger to expose the SI casing (no tools required), inspect the top cap and collar for damage or obstruction; and note any issues on the inspection form.
2. Set reference orientation
   - Align the probe in the designated A–axis groove (A0 reference groove) according to the installation notes and RST procedures.
   - Record the reference direction (e.g., “A-axis roughly parallel to dam centerline”) if known.

3. Take readings (A+/A– and B+/B– pairs)
   - Zero the readout unit as per the manufacturer's instructions.
   - Lower the probe to the **bottom of the casing** (as per installation depth in Table 4 in Appendix E-1 of the OMS Manual).
   - Take readings at **0.5 m intervals**, recording all four faces (A+, A–, B+, B–) automatically via the digital system.
   - Maintain consistent dwell time at each depth as per RST guidelines to ensure stable readings.
   - Repeat in the opposite direction (up-hole) if required by the data collection protocol.
4. Record field metadata
   - Date and time.
   - Casing ID (e.g., SRK25-BH-03 SI).
   - Operator.
   - Weather and recent events as applicable (e.g., "post-earthquake M 5.1 within 80 km")
   - Any access or instrument issues.

4.3 Step 3 – Data Processing and QA/QC

1. Download and store raw data
   - Transfer the SI data files from the readout unit to the RDCK server under the instrumentation folder (e.g., 12-630-30-Dam Inspections\Instrumentation\SI Data\YYYY).2024-06-27_HBTF...rev01.docx +1
   - Use a consistent naming convention (e.g., HBTF_SI_SRK25-BH-03_YYYYMMDD.dat).
2. Provide the raw data files to SRK for processing (i.e. processing of the profile and quality checks below). **DO NOT RETURN THE INCLINOMETER PROBE RENTAL UNTIL QC CHECKS ARE COMPLETED TO CONFIRM THAT THE READINGS ARE VALID.**
3. Process profiles
   - Import data into the RST software or approved spreadsheet to:
     - Convert A/B face readings into incremental horizontal displacement versus depth.
     - Integrate incremental displacements to obtain cumulative displacement profiles relative to the baseline survey.
   - Check that:
     - Depths are consistent with casing installation details.
     - No obvious data errors (e.g., step changes at the top only, repeated depths, sensor saturation).

4. Quality checks
   - Confirm that any apparent large displacements are not due to:
     - Mis-orientation of the probe.
     - Wrong depth interval or mis-keyed casing ID.
     - Obstruction or snagging of the probe.
   - **If data quality is questionable, repeat the survey if practical and safe.**

4.4 Step 4 – Interpretation and Comparison to TARP

At present, explicit SI thresholds are not yet defined in the TARP. Until they are established, SI results shall be interpreted qualitatively in conjunction with:

- **Survey hub displacement thresholds** (horizontal and vertical) in the TARP.
- Visual observations of cracking, sloughing, or other signs of deformation

For each SI, the EOR shall:

1. Compare the current cumulative displacement profile to:
   - The **baseline profile** (October 10, 2025), and
   - The most recent previous profiles
2. Assess whether:
   - Displacements are within typical measurement noise (order of a few millimetres).
   - There is any localized shear zone indicated by a sharp change in displacement over a short depth interval.
   - There is progressive increase in displacement over time that correlates with:
     - Survey hub movements, or
     - Other observed conditions (e.g., slope erosion, cracking).
3. Treat any of the following as an **"unusual observation"** requiring prompt review by the EOR and screening under the TARP/EPRP:
   - A clear, consistent shear zone in any axis.
   - Cumulative horizontal displacement that appears to be increasing between surveys, especially if > ~10–20 mm at any depth or depth range.
   - Any SI trends that align with unusual survey hub displacements or visible slope distress.

If SI data indicate potential instability or clearly abnormal movement, the TSF QP shall work with the EOR to:

- Classify the condition under the TARP as a Minor, Moderate, or High-Risk Situation, and

- Follow the appropriate ERP steps for Event Detection, Emergency Level Determination, and Notification.

4.5 Step 5 – Documentation and Reporting

After each SI survey:

1. Update instrumentation records
   - Record:
     - Date of reading.
     - Casing ID.
     - Summary comment (“no significant movement detected” or brief description of any changes).
   - Save processed displacement profiles and plots on the RDCK server with backup, consistent with Section 7.3 of the OMS Manual
2. Inspection forms
   - Note that SI readings were collected and reviewed in the relevant **routine, event-driven, or DSR inspection form** (Appendix F), and cross-reference any unusual findings.
3. EOR review
   - Provide SI data and interpretations to the EOR as part of:
     - Periodic instrumentation transmittals, and
     - The data package for Annual Facility Performance Reports and Dam Safety Reviews.
4. Follow-up
   - Any unusual SI result and associated EOR recommendations (e.g., increased SI reading frequency, additional stability analysis, or remediation) shall be:
     - Logged by the TFT in the **unusual observation tracker** (See Section 6.2 in the OMS Manual),
     - Logged by the TFT in the **maintenance activity tracker**, if physical works are required.

Appendix F Trigger and Action Response Plan

Table 1: EVENT DRIVEN CRITERIA

	Earthquake Event	Precipitation Event [1]
Criteria	• Magnitude > 4.0 within 40 km • 6.0 > Magnitude ≥ 5.0 within 80 km • 7.0 > Magnitude ≥ 6.0 within 120 km • 8.0 > Magnitude ≥ 7.0 within 200 km • Magnitude ≥ 8.0 within 320 km	**Snowmelt Periods when there is a potential for Rain-on-Snow Events:** ▪ After any rain event >35 mm in a 24-hr period. **All Other Periods** ▪ After any rain event > 50 mm in a 24-hr period.
Responsibility	▪ The **Tailings Facility Technologist (TFT)** is responsible for monitoring the triggers for event-driven inspections.	
Monitoring Method	▪ Notification alerts can be set up via the Geological Survey of Canada (or equivalent) ▪ An earthquake of the above magnitudes would likely be felt at the RDCK office in Nelson and would be reported in the local news.	▪ Notification alerts can be set up via the Windy app (or equivalent). ▪ A rain gauge is present at the Compost Facility that is monitored by the facility operators. ▪ Historical precipitation records for regional weather stations are available through the Environment Canada website (http://weather.gc.ca/canada_e.html) or through the MSN weather app.
Inspection Requirements	▪ The following facility components are to be inspected during event-driven inspections: – Dam and Spillway – Tailings Cover – Tailings Surface Water Drainage Channels – Access roads needed to access the dam in the event of an emergency. ▪ The inspection should be completed within 24 hours or as soon as practicable. Report any damage to the EOR.	

Notes:

[1] The precipitation triggers have been set based on-site observations of erosion performance in 2023. These triggers should be reviewed annually and are expected to increase as vegetation becomes established on the dam, cover, and in the borrow areas.

Table 2: TRIGGER AND ACTION RESPONSE PLAN

	Green Acceptable Situation	Emergency Level 1 Minor Risk Situation	Emergency Level 2 Moderate Risk Situation	Emergency Level 3 High Risk Situation
Visual Inspection Observations				
Displacement, sloughing, or bulging of the HB Dam downstream slope or crest	▪ No crest settlement/heave. ▪ No signs of deformation on the slope face.	▪ < 100 mm crest settlement/heave. ▪ Minor deformation on the slope face.	▪ 100 mm < displacement < 500 mm crest settlement/heave. ▪ Moderate deformation on the slope face (ex. Bulging > 0.5 m in height).	▪ > 500 mm crest settlement heave. ▪ Significant deformation on the slope face (ex. Bulging > 2 m in height).
Cracking on the HB Dam crest	No evidence of long-term cracks opening and no new cracks.	Little evidence of long-term cracks opening and/or minor new cracks.	Some evidence of long-term cracks opening and/or moderate new cracks.	Significant evidence of long-term cracks opening and/or new cracks opening.
Sinkhole in HB Dam crest, upstream or downstream slope	No evidence of sinkhole development.	Little evidence of sinkhole development.	Some evidence of sinkhole development (> 0.5 m in diameter).	Significant evidence of sinkhole development (> 1m in diameter).
Seepage through the dam, quantity and quality (in area other than Seepage weir)	No evidence of seepage, or steady rate of clear seepage consistent with previous observations.	Visible increase in seepage rates at known locations.	▪ Visible increase in seepage rate, and/or seepage with turbidity. ▪ New seepage locations [Note 1]	Significant seepage rate, or seepage with significant turbidity.
Erosion at HB Dam: Crest, slopes, or spillway	No evidence of new or growing erosion.	Little evidence of new or growing erosion.	▪ Increasing growing evidence of erosion. ▪ New sections of the spillway exposed, or material displaced at the spillway.	▪ New sections of the dam exposed, or material displaced at dam. ▪ New water pathways being seen in conjunction with the erosion.
Spillway blockage	Spillway is clear.	Some blockage or debris or significant vegetation noted in spillway.	Vegetation or debris impeding water flow in spillway.	Channel is blocked and water is rising/pooling in the Tailings Impoundment (outside of drainage channels).
Drainage Channels on Tailings Cover	Channels are vegetated with grassy vegetation.	▪ No vegetation is present along a significant portion of the channels, and the Turf Reinforcement Matting has been damaged or degraded. ▪ Deformation or debris impedes water flow (flow has the potential to bypass the channel during large storm events). ▪ The LLDPE liner is visible.	▪ Tailings are observed in the channel. ▪ Flow is by-passing the channels (due to vegetation, debris, or deformation) and there is some evidence of cover erosion.	▪ n/a

Notes:

1. Refer to the most recent Annual Facility Performance Report for information on the known seepage locations.

	Green Acceptable Situation	Emergency Level 1 Minor Risk Situation	Emergency Level 2 Moderate Risk Situation	Emergency Level 3 High Risk Situation
Instrumentation Readings				
Piezometers [1, 2]				
P1 (water elevation)	< 698.00 m	698.00 m ≤ El. < 702.5 m	El. ≥ 702.5 m	n/a – See Note 3.
P2 (water elevation)	< 698.50 m	698.50 m ≤ El. < 702.5 m	El. ≥ 702.5 m	n/a – See Note 3.
P3 (water elevation)	< 687.10 m	El. ≥ 687.10 m	n/a	n/a – See Note 3.
P5 (water elevation)	< 693.30 m	693.30 m ≤ El. < 697.3 m	El. ≥ 697.30 m	n/a – See Note 3.
P6 (water elevation)	< 693.30 m	693.30 m ≤ El. < 697.3 m for 3 months; Or 693.60 m ≤ El. < 697.3 m	El. ≥ 697.30 m	n/a – See Note 3.
Seepage Weir				
v-notch flow and turbidity	▪ Flow < 3 L/s and clear.	▪ Clear seepage with flow between 3L/s and 5L/s.	▪ Flow > 5 L/s. ▪ Visible turbidity that can't be explained by local runoff.	n/a – See Note 3.
Survey Hubs				
Horizontal Displacement (incremental and total)	< 50 mm incremental < 100 mm Total	50 mm < Incremental < 100 mm 100 mm < Total < 200 mm	> 100 mm Incremental >200 mm Total	n/a – See Note 3.
Vertical Displacement (incremental and total)	< 50 mm Incremental <100 mm Total	50 mm < Incremental < 100 mm 100 mm < Total < 200 mm	> 100 mm Incremental > 200 mm Total	n/a – See Note 3.
Responses (See Notification Charts in Appendix C-1				
	n/a – Regular Frequency Monitoring	See Figures C-01 and C-02 in Appendix C-01	See Figures C-03 and C-04 in Appendix C-01	See Figures C-05 and C-06 in Appendix C-01

Notes:

1. El. = water elevation.
2. Details of the derivation of the piezometer thresholds are provided in the SRK memo, "TARP Review – Interim Piezometer Triggers". The triggers are considered 'interim values' as the stability analysis used to derive the triggers will be updated following the installation of additional piezometers in 2025.
3. **High Risk Situation Triggers have not been defined for the instrumentation as the visual observation triggers will govern the decision to initiate the Emergency Response Plan.** Should a 'Moderate Risk Situation" instrumentation trigger be exceeded, the EOR will provide further direction to take, including if/when the Emergency Response Plan needs to be initiated.

Appendix G Inspection Forms

DATE: 25/02/2026
FROM: Alayne Hamilton, Environmental Projects Lead
SUBJECT: HB TAILINGS FACILITY MONITORING PROTOCOLS
FILE: 6300-HBD-01-OMS

Dam safety is the RDCK's number one priority for management of the HB Tailings Facility (HB Facility). As conditions and compliance requirements at the HB Facility are continuously in flux, this updated memo is intended to update staff involved in the HB Facility on the roles and expectations for the various monitoring tasks. The following is an identification of roles of RDCK staff and contractors/consultants directly involved in HB Facility monitoring:

Name	Role	Responsibility
RDCK Staff		
Uli Wolf	Alternate Mine Manager/GM Enviro Services	General oversight, strategic planning
Amy Wilson	Resource Recovery Manager/Mine Manager/Environmental Site Manager	Management of site budget and staff, General oversight, strategic planning
Alayne Hamilton	Environmental Projects Lead/Tailings Facility Technologist (TFT)/Mine Supervisor/Alternative Administrator	Coordination of site O&M, inspections, and planning; routine and visual dam inspections; working alone check-in/out
Russ Archibald	Site Operator	Site maintenance
Matt Morrison	Organics Coordinator	Routine and visual dam inspections
Cam Rose	Compost Facility Operator	Routine and visual dam inspections
Emma Clark	Administrative Coordinator	Monitoring data entry, distribution of data
Contractor / Consultant		
Peter Mikes	SRK Consulting	Engineer of Record (EoR)
Ben Foulger	SLR Consulting	Environmental Qualified Professional for Construction and Post-Closure Monitoring
Ico de Zwart	Masse Environmental	Environmental monitoring
Jenn Ross	Masse Environmental	Environmental monitoring

Notes: O&M – operations and maintenance

The HB Facility requires frequent inspections and collection of instrumentation measurements to monitor conditions such that any potential issues are addressed immediately to avoid dam safety issues. The level and frequency of inspections varies based on seasonal conditions and weather events. Standard frequency and expectations of RDCK mandated tasks are identified below:

Task	Role	Frequency	Expectation
Routine Inspection	RDCK TFT, Organics Coordinator, or Compost Facility Operator	Weekly during freshet (mid-March to mid-April), monthly for remainder of year, or event-driven	▪ Inspection of Facility as per Routine Inspection Form. ▪ Download of Vibrating Wire Piezometers Data Loggers and comparison to Trigger Action Response Plan (TARP) triggers within one working day. ▪ Submission of form and photos to Environmental Projects Lead same day. ▪ If form not to be submitted same day, data MUST be transmitted to Environmental Projects Lead on the same day. ▪ Submission of photographs to TFT within two working days.

Task	Role	Frequency	▪ Expectation
Routine Inspection (cont.)			▪ Notifications as per TARP and EPRP Appendix C (attached) upon observation of any concerns or adverse conditions at Facility.
Task	**Role**	**Frequency**	**Expectation**
Event Driven Inspection	Same as Routine Inspection	As required	Same as Routine Inspection
Monitoring File Upkeep & Distribution	TFT or Admin	Immediately upon receipt of data	▪ Entry of inspection data submitted to ongoing monitoring data file. ▪ Distribution of Piezometer Data Report to RDCK staff and EoR ▪ Save submitted photos to file and file inspection forms.

Notes: EPRP – emergency preparedness and response plan

The Routine Inspection Form is attached for reference. If form submission is delayed, the measurement weir and notification that the piezometer data loggers have been downloaded shall be forwarded if form submission is not possible same day. These measurements and observations shall be submitted via the following sequence:

1. email to Environmental Projects Lead/TFT (ahamilton@rdck.bc.ca), or
2. phone call or text to (778-317-1272).

You must receive a response that the information was received. If you do not receive a response within a reasonable time, you must proceed to the next option for submission (email Amy Wilson, awilson@rdck.bc.ca), ensuring the information is received prior to the end of work day.

The minimum photos to be collected during every inspection include: upstream slope, spillway entrance, downstream slope, and east abutment seepage area. Additional photos shall be collected of any abnormalities or other concerns. Photos shall be emailed to ahamilton@rdck.bc.ca or downloaded directly to the RDCK network to '6300-HBD-30-Dam Inspections-*YYYY*' folder.

Any abnormalities or other dam safety concerns should be reported immediately as per the Emergency Preparedness and Response Plan (EPRP). The Emergency Response Communication Flowchart (Figure 4.1) from the EPRP is attached for reference.

All dam inspections must be completed with a second person present as a safety precaution. Bear spray must be carried at all times. All incidents or hazardous conditions unrelated to dam operations including but not limited to personal injury, vehicle accidents, wildlife encounters, or equipment damage must be reported immediately to the Environmental Projects Lead by phone, and to the RDCK Safety Advisor (Dave Barnhart dbarnhart@rdck.bc.ca)

ATTACHMENTS:
Routine Inspection Form, updated March 2025
EPRP Appendix C, updated January 2026
Trigger Action Response Plan

See Acknowledgement on following page for sign-off

Please complete the Correspondence Acknowledgement below and return the COPY of this Memorandum to the RDCK Office, Attn: Alayne Hamilton.

CORRESPONDENCE ACKNOWLEDGEMENT

I, _____, hereby confirm that I have received the HB Tailings Facility Monitoring Protocols and supporting documents referenced therein. I understand my roles and responsibilities.

Date: _____

Signature: _____

ROUTINE INSPECTION FORM

HB MINE TAILINGS STORAGE FACILITY

PERMIT M-218

Date: _____ **Name/Company:** _____

Time: **Weather:** _____

Supplies: Inspection form, clip board, keys, tape measure, camera, pencil/pen, flashlight, water level meter, safety vest

Facility Component	***Satisfactory Condition?*** Yes	No	***Observations*** (Picture # & description, Measurement, Sketch, Location, Comments on Deficiencies found)
Dam Crest			Note any ponding on crest, cracking, settlements, ruts/puddles.
Surface Drainage (ponding/rutting)	☐	☐	
Erosion	☐	☐	
Cracking	☐	☐	
Differential settlement	☐	☐	
Upstream Slope			Note any ponding on near the dam
Erosion/ Erosion Control	☐	☐	
Slide/Slump/Cracks/	☐	☐	
Differential Settlement/Sinkholes	☐	☐	
Downstream Slope			
Erosion/Erosion Control	☐	☐	
Slide/Slump/Bulging/ Cracks	☐	☐	
Sinkholes/Differential Settlement	☐	☐	
Seepage/Drainage	☐	☐	
Spillway			Note any obstruction or excessive debris in spillway entrance/channel, any signs of riprap movement.
Entrance	☐	☐	
Erosion/Erosion Control	☐	☐	
Channel wall instability (slides/slumps)	☐	☐	
Flow?	☐	☐	Note turbidity of flow (circle which applies): clear cloudy
Dam Toe (@ Weir)			Note on clarity of the seepage (below) and any signs of sediment deposition.
Erosion/Erosion Control	☐	☐	
Seepage/Drainage	☐	☐	
Sediment deposition	☐	☐	Measurement Weir: _____cm Estimate of water bypassing weir _____% Turbidity of flow upstream of weir (circle which applies): clear cloudy

ROUTINE INSPECTION FORM

HB MINE TAILINGS STORAGE FACILITY

PERMIT M-218

Facility Component	***Satisfactory Condition?*** Yes / No	***Observation*** (Picture # & description, Measurement, Sketch, Location, Comments on Deficiencies found)
West Abutment		*(abutment where side of dam meets the spillway)*
Erosion	☐ ☐	
Slide/Slump/Cracks/ Settlement	☐ ☐	
Seepage/Drainage	☐ ☐	If seepage observed, note turbidity (circle which applies): clear cloudy
East Abutment		*(abutment where downstream side of dam meets the natural slope on east end – near parking end)*
Erosion	☐ ☐	Note any observations of buttress, including: flow, turbidity - take pictures
Slide/Slump/Cracks/ Settlement	☐ ☐	
Seepage/Drainage	☐ ☐	If seepage observed, note turbidity (circle which applies): clear cloudy
Wildlife	*Note any wildlife observed (species, number, sex, location, direction of travel, age (adult/juvenile))*	

Instrumentation	**Seepage Weir**		Minor Risk Thresholds	Moderate Risk Thresholds
	Depth _____	cm	Depth > 11.6 cm	Depth > 14.3 cm

Piezometer Dataloggers (check off once downloaded)

P1/P2 (ADL 05848) ☐	P3 (ADL 05841) ☐	P5/P6 (ADL 05852) ☐
SRK25-BH-01 (ADL 05845) ☐	SRK25-BH-02 (ADL 05842) ☐	SRK25-BH-03 (ADL 05847) ☐
SRK25-BH-04 (ADL 05850) ☐	SRK25-BH-05 (ADL 05851) ☐	

Instrumentation Issues:

Performance

☐ normal → File with RDCK records.

☐ abnormal → Advise RDCK:

- Alayne Hamilton (778) 317-1272
- Amy Wilson (250) 352-8178 (t) / (250) 505-8146 (c)
- Uli Wolf (250) 352-8168 (t) / (250) 505-3691 (c)
- Peter Mikes, Engineer of Record, (250) 420-7296 (c) / (604) 601-8489 (t)

Notify Ministry of Energy and Mines if unsafe dam conditions:

- Jerrold Jewsbury (250)417-6007 (t) / (250)420-1860 (c)

Notify Provincial Emergency Program if emergency event occurs:

- 1-800-663-3456

Notes:

Signature: _____

Appendix H Maintenance Activity Tracker

Appendix H

MAINTENANCE ACTIVITY TRACKER
OPERATION, MAINTENANCE AND SURVEILLANCE MANUAL
HB MINE TAILINGS STORAGE FACILITY SALMO, BRITISH COLUMIA

Date (yyyy-mm-dd)	Activity	Schedule	Person Conducting Activity	Details of Activity (When, Who, What, How, Why)	As-built Documentation	Additional Comments
2005	Other	One-Time	• Maglio Installations • BGC	Major construction project that included the west spillway construciton, toe berm and decommissioning of decant structures.	BGC report, "HB Dam Decommissioning Projects, July 6, 2005 to October 12, 2005 Construction Records" (Nov 2, 2005)	
2021-07-27	Repairs	One-Time	• Maglio Installations • EBA	• Dam reconstruction to address a slough that occured sometime between June 25 and July 2.	EBA report, "HB Mine Tailings Strorage Facility Embankment Dam Slough Response" (Oct. 31, 2012)	
2015-07-31	Repairs	One-Time	• Sorenson Excavating Ltd. •Tetra Tech	Retrofitting of the riprap spillway to replace riprap that was used for the 2012 slough report.	Tetra Tech EBA report "HB Dam Spillway Retrofit - Tender and Construction Report" (Dec 1, 2025)	
2021 - 2022	Other	One-Time	• Integrated Sustainability • SRK	Major constriction project to implement the 2020 Reclamation and Closure Plan design.	SRK report "2021-22 Remediation and Closure Construction Record Report" (May 2023)	
NOTE: Items listed before 2021 capture major events only.						
2023-06-09	Maintenance	One-Time	• Integrated Sustainability	•150 kg of 11-44-10 fertilizer and 48 kg of seed applied to the Toe Berm face.	Integrated Field Report	Field report sent to AJ on June
2023-08-24	Repairs	One-Time	• Dynamic Contracting Ltd. • SRK	• Additional riprap added to spillway inlet. • Repair to a slough of the spillway side-slope. • Repairs to two bulges "Hippos" of the Tailings Surface Drainage Channel liner located immedialy downstream of the North and South Spur energy dissipation structures.	SRK letter "2023 Repair Construction Observations" (Nov. 24, 2023)	
Sep-24	Repairs	One-Time	RDCK	• Hinge of the protective casing that encloses piezometers P1 and P2 was repaired. • Additional boulders were placed between the west dam abutment and the spillway to prevent inadvertent ingress. • Minor grading and water-bar construction completed on the road between east dam abutment and toe berm crest to divert surface runoff away from the dam	2024 AFPR	
2025-07-29	Maintenance	One-Time	RDCK / SRK	Removal of tailings exposures on the cover surface (addresses AFPR recommendation 2022-01). All identified tailings exposures were excavated from the cover using hand-shovels and were placed in a low-lying area adjacent to the Ross Landform and were subsequently buried.	2025 AFPR	
2025-08-08	Monitoring	One-Time	RDCK	A burrowing rodent assessment was completed on the downstream slope of the dam on August 8, 2025. Monitoring and backfilling of burrows (completed upon the advice of a qualified pest control specialist) was completed on August 29, September 29, and October 29, 2025.	2025 AFPR	
2025-10-10	Repairs	One-Time	RDCK	Repairs completed on the toe berm crest near the east abutment to address a small sinkhole where settlement of toe berm fills into the underlying weighted filter, and to construct a small swale to direct water away from the toe berm slope. This maintenance work was completed in response to April 28, 2025, site inspection observations	2025 AFPR	

Appendix I Contact List

APPENDIX I – CONTACT LIST

OPERATION, MAINTENANCE AND SURVEILLANCE MANUAL
HB MINE TAILINGS STORAGE FACILITY, SALMO, BRITISH COLUMBIA

Contact	Name	Contact Information	Notes
Regional District of Central Kootenay			
Main Nelson Office Line	(office hours)	250-352-6665	
General Manager Environmental Services	Uli Wolf uwolf@rdck.bc.ca	(T) 250-551-1176	Alternate Mine Manager
Mine Manager	Amy Wilson awilson@rdck.bc.ca	(T) 250-352-8178 (C) 250-505-8146	
Tailings Facility Technologist	Alayne Hamilton ahamilton@rdck.bc.ca	(T) 250-352-1519 (C) 778-317-1272	
Senior Project Manager	AJ Evenson aevenson@rdck.bc.ca	(O) 250-352-8191 (C) 250-551-0774	Alternate Mine Manager
Site Operator	Russ Archibald	(C) 250-505-4631	
Emergency Program Supervisor	Dan Seguin dseguin@rdck.bc.ca	(C) 250-354-5343	Contact Dan for use of RDCK automated Emergency Use System
RDCK Duty Officer	-	**250-551-5960**	**Call in case of Dam Safety Emergency or Suspected Dam Concern**
Engineer of Record – SRK Consulting (Canada) Inc.			
Engineer of Record (EOR)	Peter Mikes pmikes@srk.com	(O) 604-681-4196 (C) 250-420-7296	Based in Cranbrook
EOR Alternate 1	Trevor Podaima tpodaima@srk.com	(O) 306-955-4768 (C) 306-321-6676	Based in Saskatoon
EOR Alternate 2	Stuart McPhee smcphee@srk.com	(O) 604-681-4196 (C) 778-879-4345	Based in Castlegar/Nelson
Ministry of Energy, Mines and Low Carbon Innovation			
Mine Incident Reporting Line	On Call Inspector mineincidents@gov.bc.ca	1-888-348-0299	
TSF Manager	Mark Smith mark.smith@gov.bc.ca	(C) 778-362-4736	Based in Kelowna
Health and Safety Inspector	Jerrold Jewsbury jerrrold.jrewsbury@gov.bc.ca	(O) 250-417-6007 (C) 250-420-1860	Based in Cranbrook
Other BC Government Agencies			
Emergency Management British Columbia	24 Hour Line	1-800-663-3456	For spills or environmental emergencies.
Ministry of Transportation and Infrastructure	Regional Traffic Management Center	1-866-707-7862	

Contact	Name	Contact Information	Notes
Ministry of Environment	Brad McCandlish	250-354-6393	Snr Env. Protection Officer - Permitting
	Tamara Mickel	778-671-9024	Env. Protection Officer - Compliance/Spills
	Kootenay Region, Nelson	250-354-6333	
	Headquarters, Victoria	250-387-6121	
Local Emergency Contacts – USE 911			
Fire Department - Salmo	Volunteer Fire Department	250-357-9912	
Ambulance - Salmo	When 911 is not available	250-357-9324	
Police – RCMP	Salmo	250-357-2212	
	Trail	250-364-2566	
Local Government			
Village of Salmo	Office	250-357-9433	
Downstream Property Owners/Users (No Residents)			
Teck Resources Ltd.	Michelle Unger Michelle.unger@teck.com	(O) 250-427-8422 (C) 250-432-5264	Owners of properties surrounding downstream channel between Hwy 3 and Salmo River
	Martin and Trudie Ross mtross@emirates.net.ae	(C) 250-551-1478 011 971 294 6540 (C) 011 971 50 659 2512	
Other **Consultants / Contractors**			
SLR Consulting	Ben Foulger bfoulger@slrconsulting.com	(O) 250-352-1388 (C) 250-777-4144	Environmental Qualified Professional
Masse Environmental	Jennifer Ross	250-505-4002	Environmental monitoring; routine dam inspections
Kootenay Technical Surveys	Mark Buckley	250-368-7279	Surveyor
Custom Dozing	Jason McNeil	(O) 250-357-2361 (C) 250-354-8393	
Equipment Rentals	Impact Equipment	250-364-9964	Trail
Equipment Rentals	Andex Equipment Rentals	250-352-6291	Nelson
Equipment Rentals	Trowlex Rentals & Sales	250-365-3315	Castlegar
Equipment Rentals	Canadian Dewatering	250-365-3200	Pumps