



**Klohn Crippen Berger**

# **Teck Highland Valley Copper Partnership**

## **2020 Annual Facility Performance Report**

### ***7 Day Pond Tailings Storage Facility***



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March 19, 2021

Teck Highland Valley Copper Partnership  
PO Box 1500  
Logan Lake, British Columbia  
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**Mr. Bryan Bale, P.Eng.  
Chief Engineer, Tailings**

Dear Mr. Bale:

**2020 Annual Facility Performance Report  
7-Day Pond Tailings Storage Facility**

We are pleased to submit the 2020 Annual Facility Performance Report for the 7-Day Pond Tailings Storage Facility. The inspection and this report were prepared to comply with Section 10.5.3 of the Health, Safety and Reclamation Code for Mines in British Columbia (the Code) (MEM 2017), and Section 4.2 of the Code Guidance Document (MEM 2016).

Yours truly,

**KLOHN CRIPPEN BERGER LTD.**



Pablo Urrutia, P.Eng.  
Engineer of Record, Designated Representative  
Senior Geotechnical Engineer, Associate

PU:cd

# Teck Highland Valley Copper Partnership

## 2020 Annual Facility Performance Report

### *7 Day Pond Tailings Storage Facility*

## EXECUTIVE SUMMARY

Klohn Crippen Berger Ltd. (KCB) was engaged by Teck Highland Valley Copper Partnership (THVCP) to complete the 2020 Annual Facility Performance Report<sup>1</sup> (AFPR) of the 7-Day Pond Tailings Storage Facility (TSF) for the period of October 2019 to September 2020. The 7-Day Pond TSF, located 180 m north of the Highland Mill and Bulk Flotation Building (Mill), has been assigned a “Low” consequence classification as defined by CDA (2013) and is used as a storage for tailings and water from the Mill during upset conditions.

The 7-Day Pond TSF is contained by the East Berm and pit waste dumps, which also act as access routes around the perimeter of the facility. Immediately downstream of the East Berm there are two vegetated areas (referred to herein as the treed areas), which are fully contained by access road fills. The 7-Day Pond TSF and treed areas are the low points of the surrounding catchment.

The performance of the 7-Day Pond TSF is assessed based on the following:

- compliance with design criteria;
- comparison of actual conditions to design assumptions; and
- presence or absence of potential dam safety concern indicators.

On this basis, the performance of the facility during the review period was acceptable.

In 2020, THVCP excavated 33,000 m<sup>3</sup> of tailings from the 7-Day Pond TSF and raised the East Berm to El. 1261.5 m, both of which increased the flood storage capacity of the facility sufficiently to meet flood requirements under the Code. In addition, a fixed pumping system was installed to dewater the pond, as required. These are significant upgrades to flood management related dam safety controls. During the review period, there was a net increase of approximately 7,000 m<sup>3</sup> (i.e., deposited minus excavated) of tailings stored in the impoundment.

Key tailings management roles for the 7-Day Pond TSF transitioned as planned in 2020:

- Mr. Pablo Urrutia, P.Eng. (representative of KCB), transitioned into the Engineer or Record (EoR) role, replacing Mr. Rick Friedel, P.Eng. Mr. Friedel remains involved to support the transition.
- Mr. Bryan Bale, P.Eng. (THVCP Chief Engineer - Tailings), transitioned into the TSF Qualified Person (QP), replacing Mr. Chris Anderson, P.Eng.

Preparation of an Operation, Maintenance and Surveillance (OMS) Manual and Emergency Preparedness and Response Plan (EPRP) for the facility started during the review period and the final document was issued in March 2021. The OMS Manual aligns with the most recent industry guidance documents and addresses recommendations made in the DSR (SRK 2019). A trial exercise of the EPRP was completed on December 9, 2020 in which THVCP and KCB representatives participated.

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<sup>1</sup> Past Annual Facility Performance Reports were referred to as Dam Safety Inspections (DSI).



Due to the COVID 19 pandemic and to meet provincial health regulations THVCP implemented protocols limiting site resources. To support this change, the EoR and THVCP agreed to modify the frequency of some routine surveillance activities which did not compromise the overall surveillance and management controls at the 7-Day Pond TSF but helped ensure priority activities were maintained.

The 7-Day Pond TSF surveillance program is appropriate for this facility and includes visual inspection, routine performance reviews, and a Trigger-Action-Response-Plan (TARP). The TARP includes four levels which represent conditions of potentially increasing concern ranging from a routine engineering review, design assumption deviation up to initiation of the ERP.

Information from routine surveillance activities was reported and reviewed once completed by THVCP during a weekly dam safety meeting. This information is also shared with and reviewed by the EoR. An overall performance assessment is completed by the EoR as part of the AFPR. In addition, a routine engineering review can be triggered by the first level of the TARP in response to a localized deviation from historic behaviour. Key observations from the performance review completed as part of the AFPR are:

- None of the reviews identified an issue of dam safety concern or unacceptable performance.
- Visual inspections by the dam inspector, the EoR or others working in the area did not identify any indications of unacceptable behaviour at the facility.
- Starting in April 2020, the 7-Day Pond TSF pond level was pumped down, in preparation for tailings excavation, and was operated for the remainder of the year with no significant pond present. This maximizes potential flood storage and promotes drying of the stored tailings.
- The minimum freeboard measured at the 7-Day Pond TSF during the review period was 0.75 m (prior to the pond being lowered) which is greater than the target minimum freeboard adopted by THVCP for the facility (0.5 m). After the pond level had been pumped down and the East Berm raised the freeboard increased to more than 3.5 m.

As required by permit (PE-376), water quality downstream of the 7-Day Pond TSF is monitored by THVCP. Water quality monitoring data for the area is summarized and reported in 2020 Annual Water Quality Monitoring Report. A copy of the report was provided to KCB as part of the AFPR and no significant non-compliances were noted.

All the recommendations related to facility performance identified during past AFPRs and the DSR (SRK 2019) have been closed, as of the issue date of this report. Recommendations closed during the review period are shown in italics and are summarized in Table 1. No recommendations, related to facility performance, were identified during the 2020 AFPR.

**Table 1 Previous Recommendations Related to Facility Performance – Status Update**

ID No.	Performance Area	Recommended Action	Priority <sup>1</sup>	Recommended Deadline (Status)
SDP-2016-02	Operations	Prepare an OMS manual and EPRP (This recommendation addresses DSR recommendation 7D-001).	3	Q1 2021 (Closed)
SDP-2018-01	Flood Routing	Execute agreed work plan to bring 7-Day Pond into compliance with the IDF under the Code (This recommendation addresses DSR recommendation 7D-002).	2	September 2020 (Closed)
SDP-2019-01	Storage Capacity	As part of flood routing work, THVCP to close out the 2018 DSR Recommendation (7D-004) regarding the non-conformance of operational freeboard against Code/CDA requirements.	3	Q3 2020 (Closed)
SDP-2019-02	Flood Routing	As part of close-out of flood compliance activities, confirm minimum freeboard under normal conditions (in addition to flood) and report in OMS Manual.	4	Q3 2020 (Closed)

Notes:

1. Recommendation priority guidelines, specified by Teck and assigned by KCB:

- Priority 1:* A high probability or actual dam safety issue considered immediately dangerous to life, health or the environment, or a significant risk of regulatory enforcement.
- Priority 2:* If not corrected, could likely result in dam safety issues leading to injury, environmental impact or significant regulatory enforcement; or, a repetitive deficiency that demonstrates a systematic breakdown of procedures.
- Priority 3:* Single occurrences of deficiencies or non-conformances that alone would not be expected to result in dam safety issues.
- Priority 4:* Best Management Practice – Further improvements are necessary to meet industry best practices or reduce potential risks.

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## 1 INTRODUCTION

Klohn Crippen Berger Ltd. (KCB) was engaged by Teck Highland Valley Copper Partnership (THVCP) to complete the 2020 Annual Facility Performance Report (AFPR) of the 7-Day Pond TSF on the Highland Valley Copper (HVC) mine site. The 2020 AFPR includes the review of the facility over the period between October 2019 to September 2020. The 7-Day Pond Tailings Storage Facility (TSF) is used to store tailings and water from the Highland Mill (Mill) during upset conditions and has been assigned a “Low” consequence classification as defined by the Canadian Dam Association (CDA) (2013). Refer to Figure 1 for a layout of the facility.

The AFPR scope of work consisted of:

- visual inspection of the physical conditions of the facility;
- review of surveillance data for the review period provided by THVCP;
- review of climate and water balance data for the site;
- review of the Operations, Maintenance & Surveillance (OMS) manual to confirm it is appropriate for the existing facility; and
- review of additional activities completed at the site during the review period, if any.

The inspection and this report were prepared to comply with Section 10.5.3 of the Health, Safety and Reclamation Code for Mines in British Columbia (MEM 2017), herein referred to as the Code, and Section 4.2 of the Code Guidance Document (MEM 2016).

The inspection was completed by KCB representatives Mr. Pablo Urrutia, P.Eng., and Narges Solgi, EIT on August 5, 2020. During the inspection, the weather was sunny. Designated roles related to tailings management, required under Part 10 of the Code, for the 7-Day Pond TSF at the end of the review period were filled by:

- Engineer or Record (EoR) - Mr. Pablo Urrutia, P.Eng. (representative of KCB):
  - ♦ Mr. Urrutia, P.Eng. transitioned into the EoR role in December 2020, replacing Mr. Rick Friedel, P.Eng.
- TSF Qualified Person - Mr. Bryan Bale, P.Eng. (THVCP Chief Engineer, Tailings):
  - ♦ Mr. Bale P.Eng. transitioned into the TSF Qualified Person role in September 2020, replacing Mr. Chris Anderson P.Eng.

The pond is operated under the general British Columbia Ministry of Energy, Mines and Petroleum Resources (EMPR) geotechnical permit M-11 for the mine (Mine ref. 0300010 HVC). The 7-Day Pond TSF, referred to as the Emergency Tailings Pond, is also permitted under the British Columbia Ministry of Environment (MOE) effluent permit PE-376 to receive upset condition discharges from the Mill.

## 2 FACILITY DESCRIPTION

The HVC mine site is located near Logan Lake, approximately 45 km south of Kamloops, in the interior of British Columbia. The 7-Day Pond TSF is located approximately 1 km southeast of the Valley Pit; refer to Figure 1.

The pond is used as a storage for tailings from the Mill during upset conditions. Mill Operations controls the discharge of tailings, as well as contributing sources of water including overflow from the thickeners, Sewage Treatment Plant (STP) effluent, and other pumped flows/surface runoff, as needed. Water leaves 7-Day Pond as seepage to the Valley Pit where it becomes part of pit water management. When needed, Mill Operations deploys portable pumps to draw down the water level in the 7-Day Pond TSF; pumped outflows are returned to the Mill.

Containment of the pond is provided by the East Berm and pit waste dumps on all sides of the facility. In its current configuration, after a raise to the East Berm was completed in November 2020 (refer to Section 3.1), the low point of the minimum containment level was raised to El. 1261.5 m. An additional 0.3 m of road surfacing was placed to raise the low point to El. 1261.8 m but this is not considered in flood storage estimates. Typical geometry and dimensions of the East Berm are summarized in Table 2.1. Based on the Photosat survey dated September 27<sup>th</sup>, 2020 and aerial survey completed on November 2<sup>nd</sup>, 2020, the 7-Day Pond TSF has capacity to store up to 135,500 m<sup>3</sup> of water or tailings below the freeboard limit (0.5 m).

Immediately downstream of the East Berm there are two vegetated areas, which are fully contained by access road fills, referred to herein as the treed areas. The 7-Day Pond TSF and treed areas are the low points of the surrounding catchment.

Tailings are discharged at the south end of the 7-Day Pond TSF forming a beach sloping to the north and a semi-permanent pond within the basin. Typically, the pond is low and does not require sustained pumping to maintain pond level over the course of a year. Pumping to maintain flood storage and to manage freeboard is generally not required outside of freshet periods.

**Table 2.1 Summary of Approximate Dam Geometry**

Dam	Construction Method	Nominal Crest Elevation (m)	Max. Dam Height (m)	Crest Length (m)	Min. Crest Width (m)	Upstream Slope	Overall Downstream Slope
East Berm	Unknown (believed single raise)	1261.5 <sup>(2)</sup>	6	200	8	1.5 H:1V	1.5 H:1V

Notes:

1. All dimensions are based on the Photosat survey dated September 27<sup>th</sup>, 2020 and on an aerial survey completed on November 2<sup>nd</sup>, 2020, provided by THVCP.
2. Crest elevation reported as top of general fill which is used to measure flood compliance. Road surfacing material raises the low point of the berm crest to ~El. 1261.8 m.

## 3 2020 ACTIVITIES

### 3.1 2020 Construction and Operations

#### Tailings Deposition

Based on a comparison between surveys from September 30, 2019 and September 27, 2020, approximately 7,000 m<sup>3</sup> of tailings (net) were deposited in the impoundment over that period. This estimate takes into consideration the volume of tailings that were excavated.

#### East Berm Crest Raise

The 7-Day Pond TSF East Berm (Figure 2) containment level was raised with general fill to El 1261.5 m (maximum of 1.5 m raise) between October and November 2020 to increase the available flood storage to store the inflow design flood (IDF). An additional 0.3 m of road surfacing was placed above the general fill but this is not considered in flood storage estimates as it is subject to regrading and is not water retaining.

With the completion of the raise, the facility is now in compliance with flood and freeboard requirements under the Code. Related recommendations from previous AFPR (Table 8.1) and the DSR (SRK 2019) are now closed.

#### Tailings Excavation

As part of the flood storage upgrade works, THVCP excavated approximately 33,000 m<sup>3</sup> of tailings from the 7-Day Pond TSF.

THVCP prepared a work plan for the excavation work which was approved by the THVCP QP and sent to the EoR for review. Prior to excavating tailings, THVCP pumped out the pond from the facility to promote drying of the tailings. The bulk of the tailings excavation was done from the southern beach area as it was accessible for the equipment and was the furthest away from the pond (i.e., the most drained area with the coarser fraction). Both were effective controls to limit the potential hazards related to excavation of saturated tailings.

## 4 WATER MANAGEMENT

### 4.1 Overview

A schematic of the tailings and water management system for the 7-Day Pond TSF is shown on Figure 3. Inflow and outflow rates/volumes are not monitored.

THVCP completed detailed design of a permanent dewatering pump system in 2019 and installation was completed in 2020 as per the flood management compliance work plan agreed with EMPR. THVCP uses this pumping system, on an as needed basis, to draw down the pond level at the 7-Day Pond TSF.

### 4.2 Climate

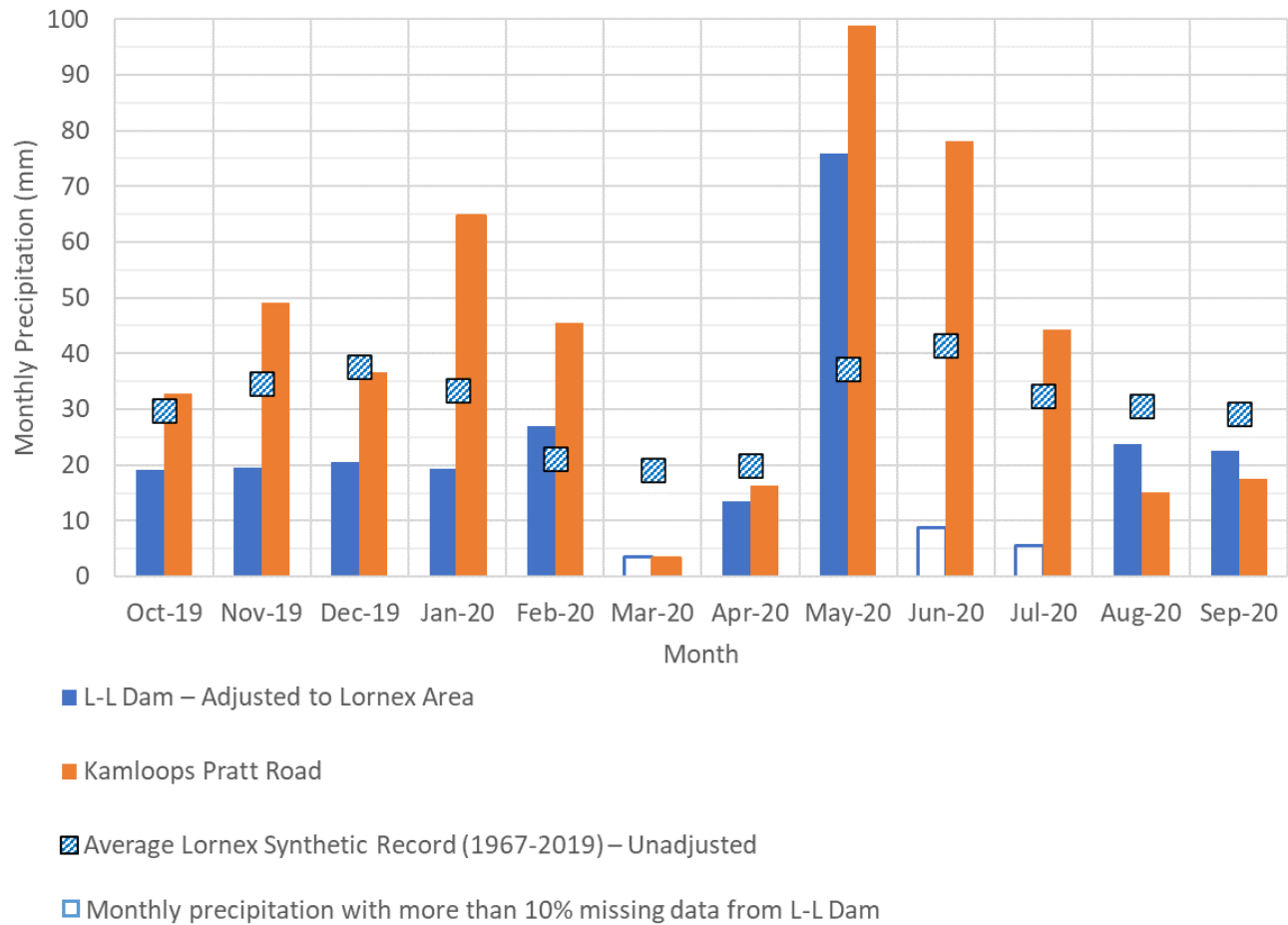
THVCP provided climate data from L-L Dam and Kamloops Pratt Road stations for 2020 AFPR reporting period to KCB for review. KCB applied the appropriate corrections to L-L Dam Weather Station data and Historical Average Lornex Synthetic Record, based on HVC site wide hydrology document (Golder 2019), and compared the climate data to typical values, refer to Appendix II-A.

The following observations were noted for the reporting period (refer to Figure 4.2):

- More than 10% of the L-L Dam weather station precipitation data were missing in March, June, and July. Due to these data gaps, the review of 2020 climates to historic normals was augmented with a regional weather station.
- All storm events during 2020 were less than the 10-year return period rainfall event (40 mm in 24 hours). The largest 24-hour rainfall events measured at the L-L Dam Weather Station during the review period, were: 23.1 mm on May 30; 18.2 mm on May 17; and 12.9 mm on September 19.
- January through April precipitation was significantly less than historic normals except the precipitation in February which was higher than average.
- May precipitation was almost twice as much as the historic normals.
- Figure 4.2 indicates low precipitation at site during June and July; however, this is due to L-L Dam Weather Station data gaps during this period. THVCP inspection reports and regional climate station data indicate precipitation during this period was above historic normals.
- Snowpack depth measurements, from the Highland Valley station, indicate the snow had been melted by May 1, 2020.
- Seasonal rise and fall of pond levels in most TSFs at the HVC site are associated with freshet. This does not apply to the 7-Day Pond TSF, however, where falls on pond levels are primarily driven by pumping prior to freshet (Figure 5.1 and Section 5.2). Nevertheless, KCB looked at other TSFs on site to correlate pond level response to freshet and concluded that pond levels at these TSFs did not start to fall until mid to late June in 2020. This timing indicates that the 2020 pond level response was driven primarily by precipitation, rather than snowmelt.



**Figure 4.1 Monthly Precipitation**



### 4.3 Water Balance

Figure 3 is a simplified water schematic for the pond. Inflows and outflows are not measured. Outflows from the 7-Day Pond TSF are either related to dewatering by pumping or seepage (primarily to the Valley Pit). The water balance of the facility is maintained through pumping, as necessary, during high flow periods. With pumping, the facility can manage potential inflows to maintain appropriate flood capacity.

Dewatering works prior to tailings excavation started in April 2020 and continued until early May, when the pond level was lowered to about El. 1258 m (i.e., lower than the typical pond levels, at that time of the year, measured since 2017). Refer to Section 5.2 for further discussion of pond levels during the review period.

## 4.4 Flood Management

Based on the dam's consequence classification of "Low", the Inflow Design Flood (IDF) required by the Code is 1/3<sup>rd</sup> between the 975-year flood and Probable Maximum Flood (PMF). For facilities that store the IDF, rather than routing the IDF, a minimum IDF duration of 72 hours is required under the Code. Following completion of the East Berm crest raise and tailings excavation (Section 3.1), the 7-Day Pond TSF now has adequate capacity to store the IDF required under the Code.

**Table 4.1 Inflow Design Flood for Bethlehem No.1 TSF and Seepage Pond**

Dam	Outflow/ Storage	Consequence Classification	Inflow Design Flood		IDF Depth	IDF Volume
			Required <sup>(1)</sup>	Design Event		
East Berm	Stored	Low	1/3 <sup>rd</sup> between the 975- year and PMF	1/3 <sup>rd</sup> between the 975- year and PMF	180.7 mm <sup>(2)</sup>	92,100 m <sup>3</sup>

Notes:

1. Per the Code (MEM 2017) for tailings and water retaining facilities.
2. Based on Golder (2016).

## 4.5 Freeboard

THVCP has adopted 0.5 m as the target minimum flood freeboard for 7-Day Pond TSF. This exceeds the minimum freeboard required to accommodate wind and wave run-up based on the method proposed by CDA (2014), which is recommended by the Code. The minimum freeboard observed during the review period (0.75 m) was measured between January and February, prior to crest raise. Following the crest raise (Section 3.1), the freeboard increased to 2.25 m for that same pond level. Pond levels during the review period are discussed further in Section 5.2.

## 5 REVIEW OF MONITORING RECORDS AND DOCUMENTS

### 5.1 Monitoring Plan

An Operation, Maintenance and Surveillance (OMS) Manual was prepared in 2020 in accordance with the most recent industry guidance documents (MAC 2019), and will be issued in final prior to March 31, 2020. The OMS Manual documents existing routine activities and surveillance requirements which had been implemented by THVCP starting in 2017 and those recommended in the DSR (SRK 2019). In addition, the document includes operational procedures for routine tailings excavation, including preparation of a work plan prior to the work which must be approved by the THVCP QP.

Surveillance activities were completed as prescribed in the OMS manual or as agreed with the EoR (Table 5.1). Starting in March 2020, THVCP was required to implement protocols to meet provincial health regulations related to reducing the spread of the COVID 19 pandemic. This included reducing the number of people on site to essential personnel only. Prior to reducing site personnel at the dams, THVCP requested KCB review the 7-Day Pond TSF surveillance program to identify site activities which could be completed at a reduced frequency, that would allow THVCP to reduce site personnel, but not compromise the overall surveillance controls at the facility. The modified frequency recommended by KCB is summarized in Table 5.1 and remains appropriate during 2021 while site personnel restrictions remain in place.

The 7-Day Pond TSF surveillance program is appropriate for the facility. It includes visual inspection, measured behaviour, routine performance reviews, and a Trigger-Action-Response-Plan (TARP). The TARP includes four levels which represent conditions of potentially increasing concern ranging from a routine engineering review, design assumption deviation up to initiation of the ERP. At 7-Day Pond TSF, there were no exceedances of any level of the TARP levels during the review period.

Information from routine surveillance activities was reported and reviewed once completed by the THVCP Tailings Group, including the QP, during the weekly intra-departmental meetings. This information is also shared with and reviewed by the EoR. An assessment of performance is completed by the EoR as part of the AFPR based on the following:

- compliance with design criteria;
- comparison of actual conditions to design assumptions;
- consistency between measured response<sup>2</sup> and expected behaviour<sup>3</sup>; and
- presence or absence of potential dam safety concern indicators.

On this basis, the performance of the dams during the review period was acceptable. The site visit for the most recent dam safety review (DSR) (SRK 2019) was completed in 2018. The Code requires a DSR be undertaken every five years for tailings dams; therefore, the next DSR should be scheduled for 2023. The status of recommendations from the most recent DSR (SRK 2019) are discussed further in Section 7.2.

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<sup>2</sup> "Measured response" refers to instrumentation readings and visual observations during inspections.

<sup>3</sup> "Expected behaviour" for an inactive facility is based on interpretation of the historic measured response.

**Table 5.1 Monitoring Activities**

TSF Monitoring	Facility	Minimum Frequency <sup>(1)</sup>	Responsibility	Documentation	2020 Frequency Compliance <sup>(1)</sup>	Notes for the Review Period
Inspections						
Routine Visual Inspection <sup>(2)</sup>	7-Day Pond TSF	Quarterly	THVCP	THVCP Inspection Reports	Yes	-
Event-Driven Inspection		Event Driven <sup>(3)</sup>	THVCP	THVCP Inspection Reports	N/A	No event-driven inspections were triggered during 2020.
Annual Facility Performance Report		Annually	KCB	Inspection Report by KCB	Yes	This report
Dam Safety Review		Every 5 years	THVCP	Report	n/a	Next DSR is due in 2023.
Instrumentation Monitoring						
Pond level	7-Day Pond TSF	Monthly	THVCP	THVCP Inspection Reports	Yes	Pond levels were measured until pond level was drawn down in April, as discussed in Section 5.2.
Surveys						
Survey	7-Day Pond TSF	Annually	THVCP	Data reviewed by KCB as part of AFPR	Yes	-

Notes:

- Frequency of routine surveillance activities were modified in 2020 related to site resources restrictions required to meet COVID 19 provincial health regulations, as discussed in Section 5.1.
- Visual inspections include pond level measurements and observations for any evidence of unusual conditions and/or dam safety concerns (e.g., settlement, sinkholes, slope sloughing, erosion, seepage, piping, etc.).
- THVCP staff are to complete an event-driven inspection in response to one of the following events:
  - Earthquake greater than magnitude 5, within 100 km of the site or any earthquake felt at site.
  - Rainfall event greater than the 10-year, 24-hour duration storm; 39.9 mm (Golder 2019).
- There is no dam safety related instrumentation at the 7-Day Pond TSF.

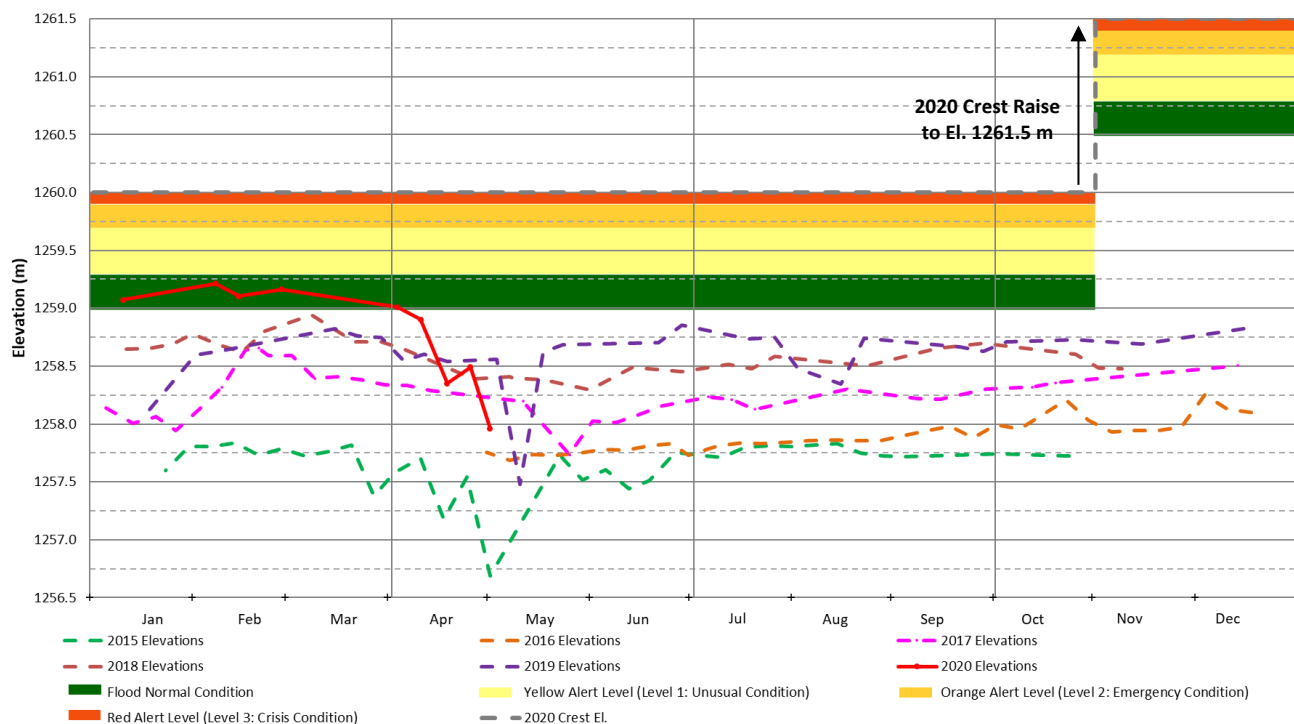
## 5.2 Pond Level

Key observations based on 2020 pond levels and observations during the review period (Figure 5.1) are as follows:

- The peak pond level rose in late 2019 reaching a peak in February 2020 which was within the “Flood Normal” condition but was below the “unusual condition” level.
- The drop in pond level, starting in April 2020, is related to THVCP pumping down the pond in preparation for tailings excavation (Section 3.1). No further pond levels were recorded after the pond was drained down. The facility was visually inspected quarterly, as per THVCP's monitoring plan, which confirmed that no pond was present at the facility after May.

THVCP defined alert levels for the 7-Day Pond TSF which, if exceeded, initiate escalating levels of action. The alert level criteria shown in Figure 5.1 was applicable during the AFPR review period.

**Figure 5.1 7-Day Pond TSF Pond Levels with Alert Level Ranges**



### Notes:

1. Alert levels used during review period, prior to raise: Flood Normal Condition: El. 1259.3 m (0.7 m freeboard); Level 1 – Unusual Condition: El. 1259.7 m (0.3 m freeboard); Level 2 – Emergency Condition: El. 1259.9 m (0.1 m freeboard); Level 3 – Crisis Condition: El. 1260.0 m (0 m freeboard [near overtopping]).
2. In Figure 5.1, the shift in alert levels based on the 2020 criteria after the crest raise is shown for reference.

## 5.3 Geotechnical Instrumentation

There are no geotechnical instruments at the 7-Day Pond TSF. None are recommended at this time.

## 5.4 Seepage

Seepage from the 7-Day Pond TSF is collected in the Wishing Well Sump located in the Valley Pit. This sump also collects water from other sources, and water is pumped from the sump to the thickeners. No Seepage was observed from the East Berm downstream slope during the 2020 Annual Facility Performance Report site visit.

## 5.5 Water Quality

As required by permit (PE-376), water quality downstream of the 7-Day Pond TSF is monitored by THVCP. As discussed in 5.4, seepage from 7-Day Pond TSF is collected at Vallyer Pit, pumped to the thickeners, and remains in THVCP's process water system. A summary of data to be included in the 2020 Annual Water Quality Monitoring Report was provided to KCB by THVCP for review as part of the AFPR. Select observations and findings from the monitoring data are summarized as follows:

- There are three permitted surface water quality monitoring sites in the Highland Valley Pit area, as shown on the site monitoring plan in Appendix III. Of the three monitoring sites, Sample Site #602 (Waste Water Treatment Plant) is the closest to the 7-Day Pond TSF (Sample Site #602 discharges to 7-Day Pond TSF).
- All sampling sites were in compliance with the required sampling frequencies and parameters except for:
  - ◆ One sample collected in January at Sample Site #602 exceeded the permit level for biological oxygen demand (BOD); and
  - ◆ Sample Site #202 (Lornex Waste Rock Dump Seepage) missing measurements of dissolved organic carbon (DOC) in June.

The 2020 monitoring results were screened against applicable BC Water Quality Guidelines (WQG). Further discussion on specific WQG exceedances and water quality trends observed during 2020 are separately reported in the 2020 Annual Water Quality Monitoring Report which is submitted by THVCP to Ministry of Environment and EMPR.

## 6 INSPECTION OBSERVATIONS AND PHOTOGRAPHS

Copies of the field inspection forms, photographs and summary observations made during the AFPR site visit are included in Appendix I. No issue in terms of dam safety was observed. A summary of general observations and comments during 2020 AFPR site visit is as follows:

- Top ~2 m of the tailings appeared to be unsaturated and surface was cracked due to dewatering works to facilitate excavation of impoundment. No free pond was observed in the facility except for the small ponded water in the low point of the northeast corner of the facility.
- Tailings were being excavated at the time of inspection along the east flank of the facility, to form a drainage channel along the perimeter towards the pump sump. Equipment was working on the perimeter East Berm and not travelling over the tailings surface.

## **7 ASSESSMENT OF DAM SAFETY**

### **7.1 Dam Classification Review**

The 7-Day Pond TSF has been assigned a “Low” consequence classification as defined by CDA (2013). This was reviewed by KCB and THVCP representatives during a workshop held on February 12, 2020 and remained unchanged. The EoR at the time of the review was Mr. Friedel, P.Eng.

### **7.2 Status of 2018 Dam Safety Review Recommendations**

A DSR site visit of the 7-Day Pond TSF was completed by SRK Consulting (SRK) in 2018 and the final report was issued in March 2019 (SRK 2019). The report concluded the facility is well-managed with a high level of technical stewardship and appropriate operating procedures. The credible failure modes are understood and effectively controlled.

All recommendation from the 2018 DSR (SRK 2019) have been closed, which is documented in Appendix IV. Reporting on the status of the 2018 DSR will not be included in future AFPRs.

### **7.3 Failure Mode Review**

KCB understands that Teck’s long-term goal for all tailings facilities is to reach landform status with all potential failure modes that could result in catastrophic release of tailings and/or water being reduced to non-credible. The long-term goal for the 7-Day Pond TSF is for all potential failure modes to be non-credible based on Extreme consequence loading conditions. Evaluation of failure modes with respect to this goal is ongoing. Management and status of failure modes, and related controls, which have the greatest influence on design and performance are summarized herein.

#### **Overtopping**

Following the crest raise of the East Berm, the 7-Day Pond TSF now has adequate capacity to store the IDF, required under the Code, with adequate freeboard. Overtopping risks are further managed by the pumping system installed in 2020 which is operated based on pond alert levels.

#### **Slope Stability – Foundation Irregularities / Dam Fill / Earthquake**

Based on site investigations (KCB 2019b), the berm is founded on competent Glacial Till material. The fill and foundation materials are not susceptible to significant strength loss or liquefaction based on comparison to similar materials under similar conditions around the site. Slope stability met or exceeded factor of safety design criteria for both static and seismic loading conditions as reported by KCB (2019d).

### **7.4 Emergency Preparedness and Response**

The emergency preparedness and response plan (EPRP) for the 7-Day Pond TSF forms a part of the OMS Manual that is being prepared and will be issued prior to March 31, 2021. The EPRP is consistent with other tailings facilities at the site and site emergency procedures, and is appropriate for the current structure.



Training and testing of the EPRP was completed on December 9, 2020. The training consisted of a trial of the EPRP using hypothetical scenario at the L-L Dam. Participants included members of THVCP's operation team (including site management), THVCP QP and EoR. Along with testing of the system, THVCP contacts offsite emergency response resources to ensure that contact information is current.

## 8 SUMMARY

The observed performance of the 7-Day Pond TSF is consistent with expected performance and within design requirements. The changes made to the facility during the review period (i.e., crest raise, installation of pumping system and drawdown of pond) have improved or added additional dam safety controls which reduce the key potential risks associated with the structure.

All the recommendations related to facility performance identified during past AFPRs and the DSR (SRK 2019) have been closed, as of the issue date of this report. Recommendations closed during the review period are shown in italics and are summarized in Table 8.1. No recommendations, related to facility performance, were identified during the 2020 AFPR.

**Table 8.1 Previous Recommendations Related to Facility Performance – Status Update**

ID No.	Performance Area	Recommended Action	Priority <sup>1</sup>	Recommended Deadline (Status)
SDP-2016-02	Operations	<i>Prepare an OMS manual and EPRP (This recommendation addresses DSR recommendation 7D-001).</i>	3	Q1, 2021 (Closed)
SDP-2018-01	Flood Routing	<i>Execute agreed work plan to bring 7-Day Pond into compliance with the IDF under the Code (This recommendation addresses DSR recommendation 7D-002).</i>	2	September 2020 (Closed)
SDP-2019-01	Storage Capacity	<i>As part of flood routing work, THVCP to close out the 2018 DSR Recommendation (7D-004) regarding the non-conformance of operational freeboard against Code/CDA requirements.</i>	3	Q3, 2020 (Closed)
SDP-2019-02	Flood Routing	<i>As part of close-out of flood compliance activities, confirm minimum freeboard under normal conditions (in addition to flood) and report in OMS Manual.</i>	4	Q3, 2020 (Closed)

Notes:

- Recommendation priority guidelines, specified by Teck and assigned by KCB:
  - Priority 1: A high probability or actual dam safety issue considered immediately dangerous to life, health or the environment, or a significant risk of regulatory enforcement.
  - Priority 2: If not corrected, could likely result in dam safety issues leading to injury, environmental impact or significant regulatory enforcement; or, a repetitive deficiency that demonstrates a systematic breakdown of procedures.
  - Priority 3: Single occurrences of deficiencies or non-conformances that alone would not be expected to result in dam safety issues.
  - Priority 4: Best Management Practice – Further improvements are necessary to meet industry best practices or reduce potential risks.

## 9 CLOSING

This report is an instrument of service of Klohn Crippen Berger (KCB). The report has been prepared for the exclusive use of Teck Highland Valley Copper Partnership (Client) for the specific application to the 2020 Annual Facility Performance Report Project, and it may not be relied upon by any other party without KCB's written consent.

KCB has prepared this report in a manner consistent with the level of care, skill and diligence ordinarily provided by members of the same profession for projects of a similar nature at the time and place the services were rendered. KCB makes no warranty, express or implied.

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1. The report is to be read in full, with sections or parts of the report relied upon in the context of the whole report.
2. The Executive Summary is a selection of key elements of the report. It does not include details needed for the proper application of the findings and recommendations in the report.
3. The observations, findings and conclusions in this report are based on observed factual data and conditions that existed at the time of the work and should not be relied upon to precisely represent conditions at any other time.
4. The report is based on information provided to KCB by the Client or by other parties on behalf of the client (Client-supplied information). KCB has not verified the correctness or accuracy of such information and makes no representations regarding its correctness or accuracy. KCB shall not be responsible to the Client for the consequences of any error or omission contained in Client-supplied information.
5. KCB should be consulted regarding the interpretation or application of the findings and recommendations in the report.

### KLOHN CRIPPEN BERGER LTD.



Pablo Urrutia, P.Eng.  
Engineer of Record, Designated Representative  
Senior Geotechnical Engineer, Associate

Rick Friedel, P.Eng., P.E.  
Senior Reviewer

## REFERENCES

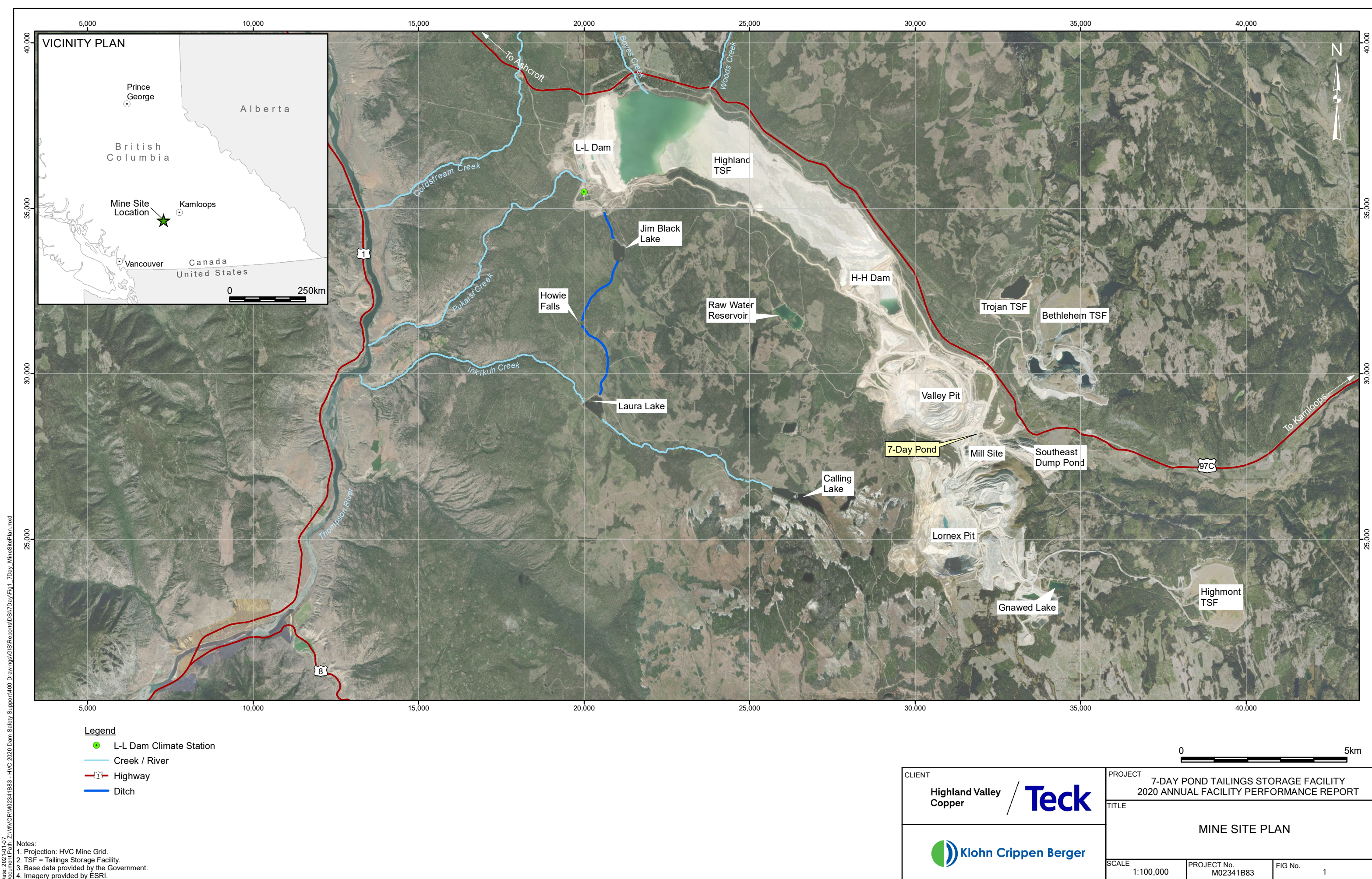
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## FIGURES

Figure 1	Mine Site Plan
Figure 2	7-Day Pond Plan
Figure 3	Flow Schematic

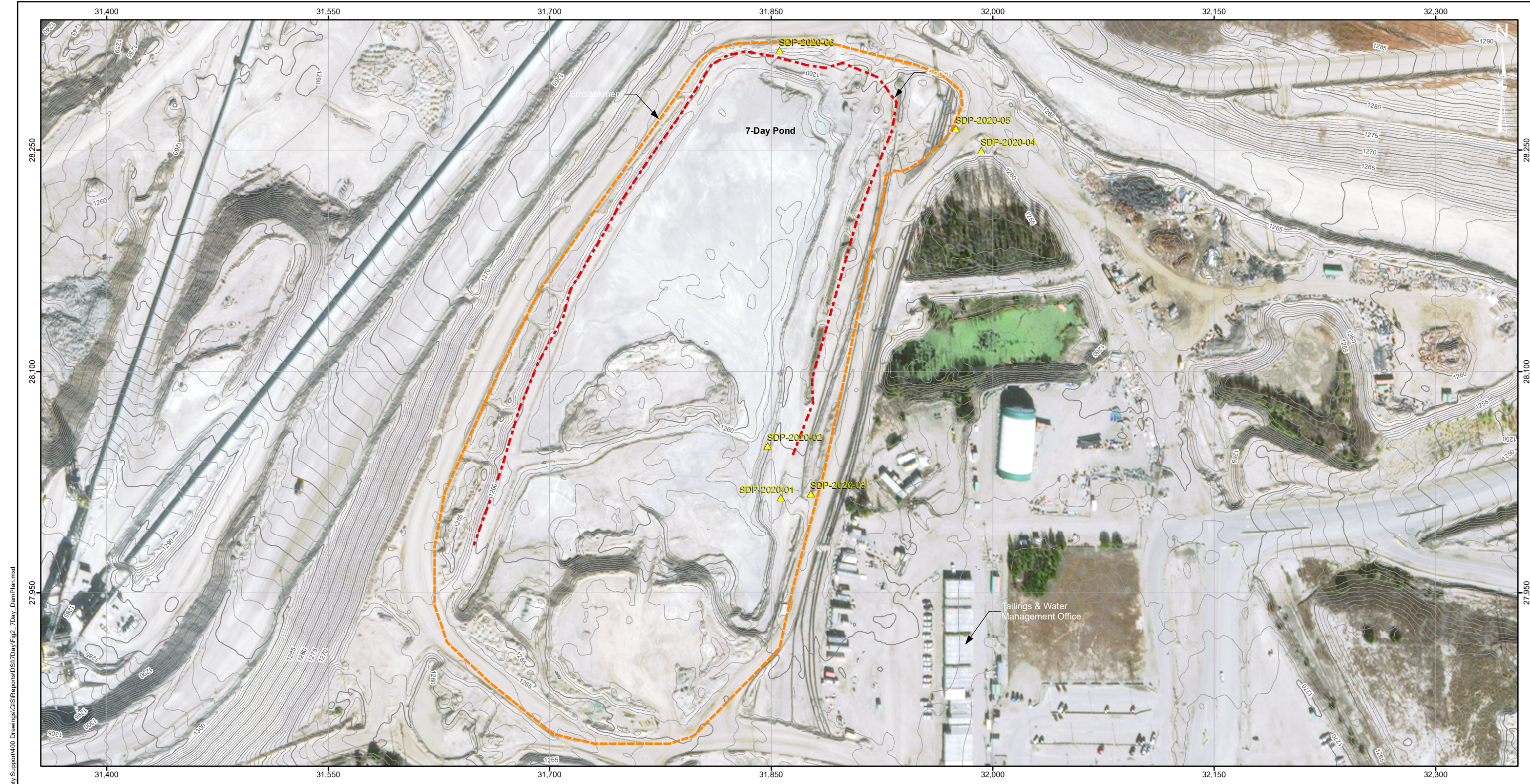




Date: 2021-01-07  
Document Path: Z:\MVC\RM02341B83 - HVC 2020 Dam Safety Support\400 Drawings\GIS\Reports\DS17Day\Fig1\_7Day\_MineSitePlan.mxd

- Notes:
- 1. Projection: HVC Mine Grid.
  - 2. TSF = Tailings Storage Facility.
  - 3. Base data provided by the Government.
  - 4. Imagery provided by ESRI.





- Legend**
- Waypoint (SDP-2020-xx)
  - Embankment
  - Bench
  - Index Contour (5 m)
  - Intermediate Contour (1 m)

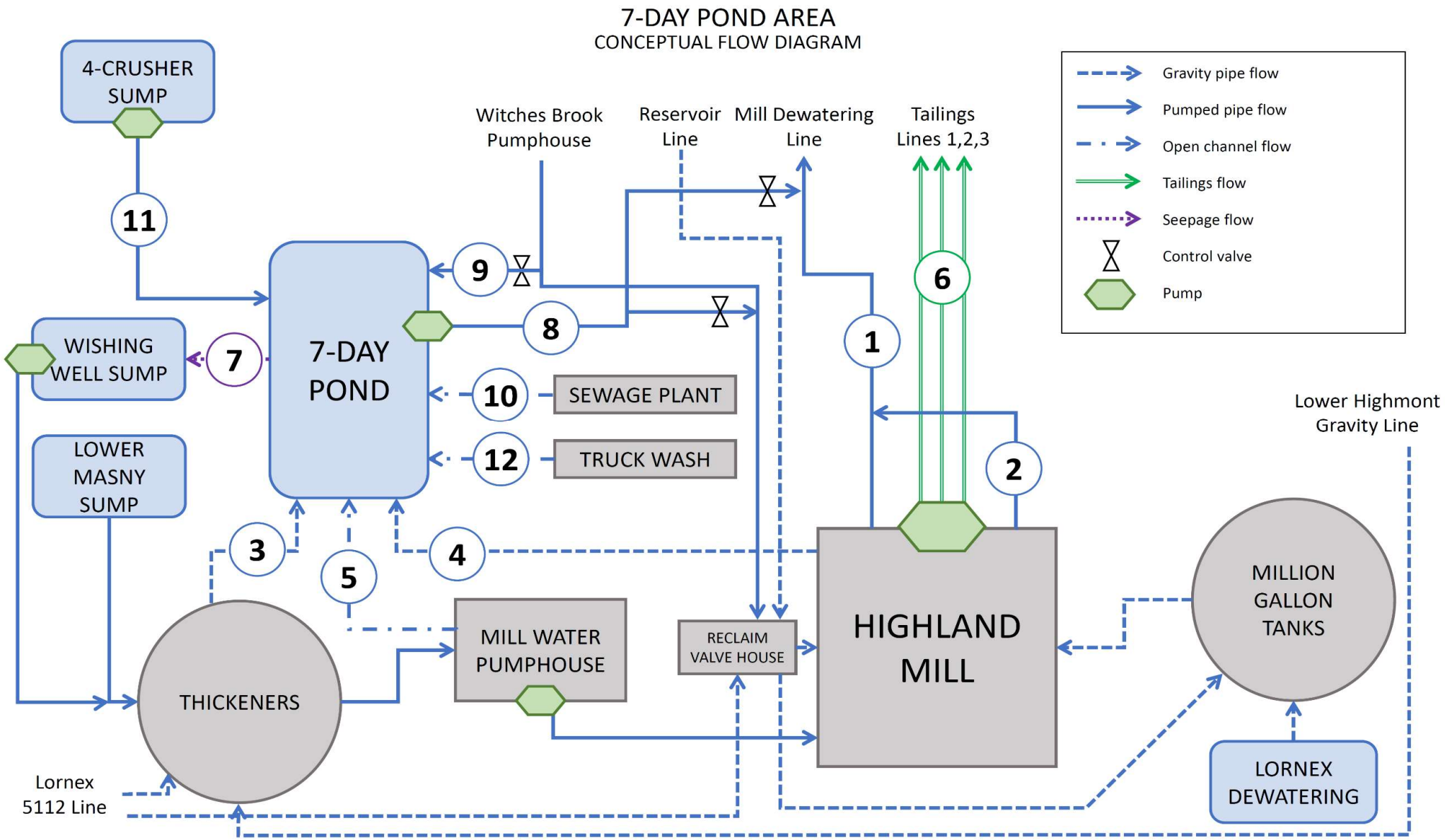
Notes:  
1. Projection: HVC Mine Grid.  
2. Imagery and topography obtained September, 2020.



CLIENT Highland Valley Copper	PROJECT 7-DAY POND TAILINGS STORAGE FACILITY 2020 ANNUAL FACILITY PERFORMANCE REPORT		
	TITLE 7-DAY POND PLAN		
	SCALE 1:2,500	PROJECT No. M02341B83	FIG No. 2



FILE PATH: Z:\MVC\RM02341B83 - HVC 2020 DAM SAFETY SUPPORT\700 DELIVERABLES\720 WORKING\2020 DS\12 7-DAY POND TAILINGS STORAGE FACILITY\FIGURE\DO NOT ISSUE - FOR PED (FIG3)\FIG 3 - PED.XLSX - 2021-01-14 17:25



No.	Name	Description	Status
1	Mill Dewatering Line	36" dia. HDPE pipe	Operational
2	Old #3 Tailings Line to MDL	36" HDPE Pipeline	Operational
3	Inflow #3	HDPE pipe, semi-regular flow from thickener overflow (majority) and surface water around the Mill (minor component).	Operational
4	Inflow #2 (a.k.a. Dog & Easy)	36" dia. HDPE pipe, irregular flow from: i) overflow from MOP (connects U/S of discharge point); ii) overflow from sump in Mill which collects excess surface water from cleaning activities.	Operational
5	Overflow from Mill Water Pumphouse	Irregular open channel overflow from 325 ft Thickeners	Operational
6	Tailings Lines	36" HDPE Pipelines	Operational
7	Seepage to Valley Pit	Seepage reports to Wishing Well Sump in Valley Pit	N/A
8	Pump to Mill Diversion Line	HDPE pipeline and portable pump (deployed when needed)	N/A
9	Witches Brook Drain	6" HDPE pipe with control valve, capped	Operational
10	Inflow from Sewage Treatment Plant	Regular, treated effluent in trench running south to north and discharging at the NE corner of the pond	Operational
11	Inflow from No. 4 Crusher	1x HDPE pipe, irregular flow	Operational
12	Inflow from Truck Wash	Surface runoff from truck wash collected by drainage ditch	Operational

NOT FOR CONSTRUCTION

<small>AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.</small>	CLIENT <b>Highland Valley Copper</b> / <b>Teck</b>		PROJECT 7-DAY POND TAILINGS STORAGE FACILITY 2020 ANNUAL FACILITY PERFORMANCE REPORT	
	<b>Klohn Crippen Berger</b>		TITLE FLOW SCHEMATIC FOR 7-DAY POND TAILINGS STORAGE FACILITY	
	SCALE NTS	PROJECT No. M02341B83	FIG. No. 3	



## **APPENDIX I**

### **Annual Facility Performance Report Inspection Checklist, Observations and Photographs**

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## Appendix I

### Annual Facility Performance Report Inspection Checklist and Photographs

#### INSPECTION CHECKLIST

<b>Facility:</b>	7-Day Pond	<b>Inspection Date:</b>	August 05, 2020
<b>Weather:</b>	Sunny	<b>Inspector(s):</b>	Pablo Urrutia, P.Eng. Narges Solgi, EIT
<b>Freeboard (pond level to dam crest):</b>	No significant free water was ponding at the time of inspection		

#### Outlet Condition Survey

Description	Outlet Controls?	Was it flowing?	Flow rate	Visual Review?	Testing / Detailed Inspection?
Portable Pump not installed at the time of the inspection	N/A	N/A	N/A	N/A	N/A

**Are the following components of the facility in SATISFACTORY CONDITION?**  
(check one if applicable)

WASTE DUMP WALLS	Yes/No
U/S Slope	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Crest	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

**Were any of the following POTENTIAL PROBLEM INDICATORS found?**

INDICATOR	WASTE DUMP WALLS
Piping	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Sinkholes	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Seepage	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
External Erosion	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Cracks	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Settlement	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Sloughing/Slides	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Animal Activity	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Excessive Growth	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Excessive Debris	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

**List and describe any deficiencies (all deficiencies require assessment and/or repair):**

- No dam safety deficiencies observed

**Comments / Notes:**

- Refer to Inspection Observations Section.

## INSPECTION OBSERVATIONS

- **Crest:** The haul road which forms the crest of the dam around 7-Day Pond was in good physical condition. No indicators of significant concern were observed (e.g. cracking, slumping) (Photo I-1).
- **Upstream and Downstream Slopes:** Upstream slopes were in good physical condition. The upstream slopes were not vegetated, but no indicators of significant concern were observed (e.g. animal activity, cracking, slumping, surface erosion features). Excavation was ongoing at the time of inspection. The visible parts of the downstream slope of the haul road forming the east containment of the impoundment was in good physical condition (Photo I-2 to Photo I-4).
- **Tailings Beach and Pond:** Impoundment was being excavated at the time of inspection and there was no pond. No tailings deposition was in place (Photo II-3 and Photo II-7).
- **Outflow Pump:** Had not been installed at the time of inspection.
- **Seepage:** None observed.

## INSPECTION PHOTOGRAPHS

### LEGEND:

- SDP = 7-Day Pond.
- SDP-2020-## refers to 2020 Annual Facility Performance Report waypoint shown on Figure 2.
- All photographs taken during inspection August 05, 2020.

**Photo I-1      7-Day Pond. No discharge to the pond. Tailings were being excavated at the time of inspection (SDP-2020-01)**





**Photo I-2      7-Day Pond tailings excavation ongoing (SDP-2020-02)**





**Photo I-3 View of an excavator loading the haul truck at 7-Day Pond facility (SDP-2020-03)**





**Photo I-4      Treed area downstream (D/S) of 7-Day Pond retaining berm formed by east perimeter access road (SDP-2020-04)**





**Photo I-5 Tailings and water pipelines along downstream side of east perimeter access road crest (SDP-2020-05)**



**Photo I-6 Tailings dust due to hauling truck traffic (SDP-2020-05)**





**Photo I-7 View of 7-Day Pond from North perimeter (SDP-2020-06)**



## APPENDIX II

### Climate Data

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## Appendix II Climate Data

THVCP provided weather data from the L-L Dam climate station (El. 1186 m) which is the nearest climate station to the site but is at a lower elevation than 7-Day Pond TSF catchment (>El. 1261.5 m, i.e. dam crest). Climate data was adjusted for elevation, using the recommended adjustment factors from L-L Dam to Lornex Area (Average El. 1268 m), from Golder (2019). To support key precipitation trends and impacts on observed dam performance, data from Kamloops Pratt Road (Environment Canada Station No. 116C8P0, El. 729.0 m) was reviewed for comparison. Previous Annual Facility Performance Reports compared the 7-Day TSF data with Kamloops Airport (Environment Canada Station No. 1163781, El. 345 m) data, but this station was missing too much data in 2020. Precipitation records from L-L Dam (adjusted) and Kamloops Pratt Road between October 2019 and September 2020 are tabulated and plotted in Table II-1 and Figure II-1, respectively. Precipitation normals, reported in Table II-1, is based on the Highland Valley Lornex Synthetic Record using Golder (2019).

Seasonal snowpack depth is not measured at the L-L Dam weather station. Instead, monthly measurements at the Highland Valley snow survey station (Station No. 1C09A) near the Trojan TSF are used by THVCP to monitor snowpack. The measurements are sorted by survey period (the first of January through May) to compare snowpack depths, in snow-water equivalent (SWE), for the same period each year. Historical average and 2020 snowpack depths based on available records are summarized in Table II-2.

The following observations were noted for the reporting period (refer to Figure II-1):

- More than 10% of the L-L Dam weather station precipitation data were missing in March, June, and July. Due to these data gaps, the 2020 climate data from site was augmented with data from a regional weather station to support a comparison with historic normals.
- All storm events during 2020 were less than the 10-year return period rainfall event (40 mm in 24 hours). The largest 24-hour rainfall events measured at the L-L Dam Weather Station during the review period, were: 23.1 mm on May 30; 18.2 mm on May 17; and 12.9 mm on September 19.
- January through April precipitation was significantly less than historic normals except the precipitation in February which was higher than average.
- May precipitation was almost twice as much as the historic normals.
- Figure II-1 indicates low precipitation at site during June and July; however, this is due to L-L Dam Weather Station data gaps during this period. THVCP inspection reports and regional climate station data indicate precipitation during this period was above historic normals.
- Snowpack depth measurements, from the Highland Valley station, indicate the snow had been melted by May 1, 2020.

- Seasonal rise and fall of pond levels in most TSFs at the HVC site are associated with freshet. This does not apply to the 7-Day Pond TSF, however, where falls on pond levels are primarily driven by pumping prior to freshet (Figure 5.1 and Section 5.2 of the main text). Nevertheless, KCB looked at other TSFs on site to correlate pond level response to freshet and concluded that pond levels at these TSFs did not start to fall until mid to late June in 2020. This timing indicates that the 2020 pond level response was driven primarily by precipitation, rather than snowmelt.

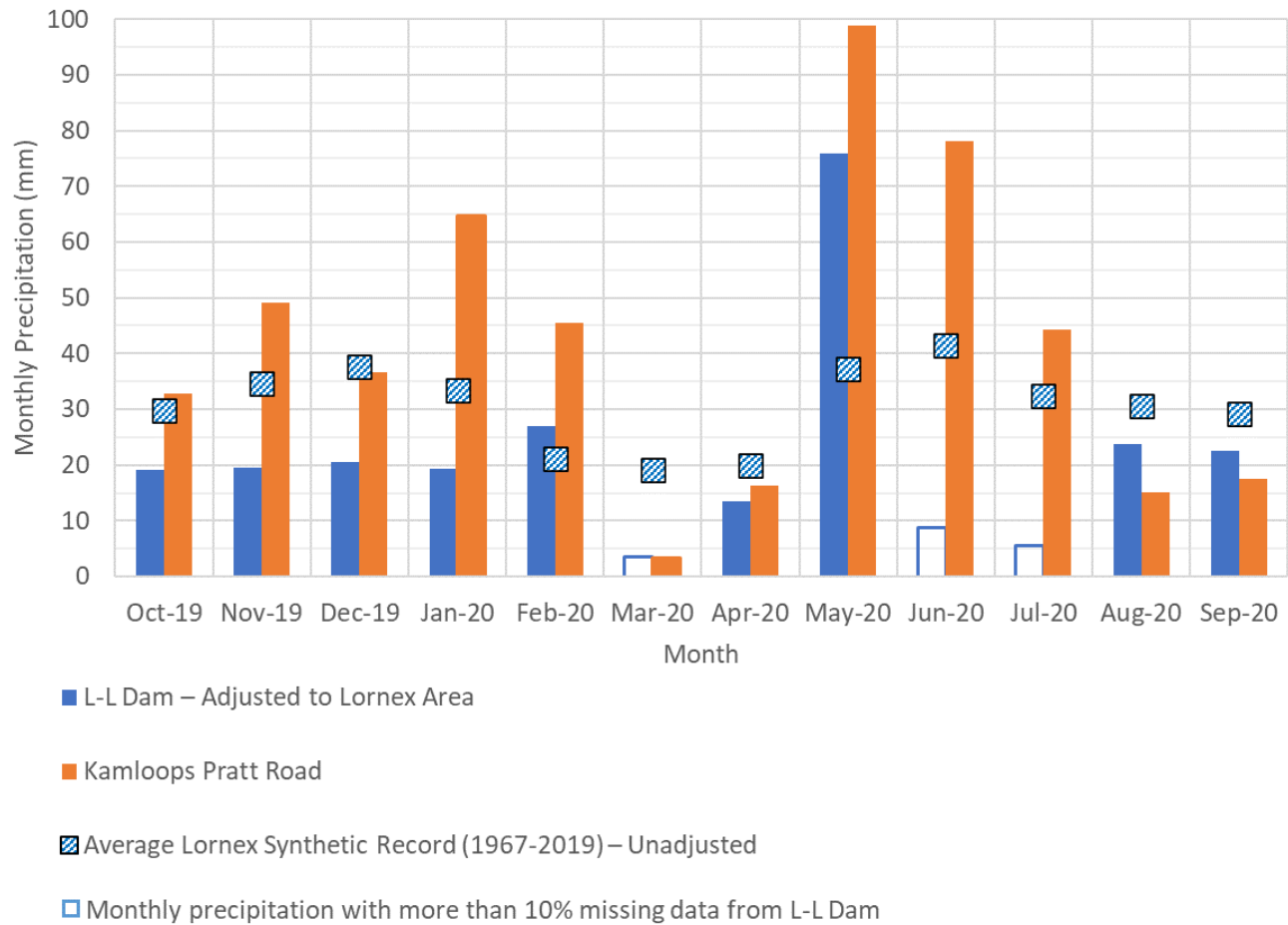
**Table II-1 Monthly Precipitation**

Month	Availability of Data (%)	Precipitation (mm)		
	L-L Dam Weather Station	L-L Dam Weather Station Data Adjusted to Lornex Area <sup>(1)</sup>	Average Lornex Synthetic Record Unadjusted <sup>(2)</sup>	Kamloops Pratt Road Weather Station
Oct 2019	100	19.2	29.7	32.8
Nov 2019	100	19.6	34.7	49.2
Dec 2019	97	20.5	37.6	36.6
Jan 2020	100	19.4	33.5	64.8
Feb 2020	100	27.0	21.2	45.4
Mar 2020	89	3.6 <sup>(4)</sup>	19.2	3.4
Apr 2020	100	13.4	20.0	16.4
May 2020	100	75.9	37.2	98.8
Jun 2020	32	8.7 <sup>(4)</sup>	41.5	78.0
Jul 2020	11	5.6 <sup>(4)</sup>	32.4	44.2
Aug 2020	100	23.8	30.7	15.2
Sep 2020	100	22.5	29.1	17.6
Annual Total	-	-	366.8	502.4

Notes:

- Available data from L-L Dam climate station was adjusted by a L-L Dam-to-Lornex Area adjustment factor of 0.91 (Golder 2019).
- Estimated by Golder (2019) using appropriate adjustment factors and average precipitation measured at Highland Valley Lornex climate station (Environment Canada ID No. 1123469 at El. 1268 m from 1976 to 2011). Golder (2019) infilled the data gaps prior to November 2011 and created a long-term synthetic precipitation record. Monthly average of the synthetic record is shown herein, refer to Golder (2019) for detailed information.
- Review period for the 7-Day Pond Annual Facility Performance Report is from October 2019 through September 2020.
- Monthly precipitation with more than 10% missing data.

**Figure II-1 Monthly Precipitation**



**Table II-2 Historical Average and 2020 Snowpack Depths**

Survey Period	Years of Record <sup>(1)</sup>	Historic Average Snowpack Depth <sup>(2)</sup> (mm SWE <sup>(3)</sup> )	2020 Snowpack Depth (mm SWE <sup>(3)</sup> )	Percent Change Relative to Historic Average
January 1 <sup>st</sup>	11	50.2	Not surveyed	N/A
February 1 <sup>st</sup>	25	83.5	Not surveyed	N/A
March 1 <sup>st</sup>	54	91.2	100	10%
April 1 <sup>st</sup>	52	100.8	Not surveyed	N/A
May 1 <sup>st</sup>	53	28.1	0	-100%
May 15 <sup>th</sup>	25	2.4	Not surveyed	N/A
June 1 <sup>st</sup>	8	0	Not surveyed	N/A

Notes:

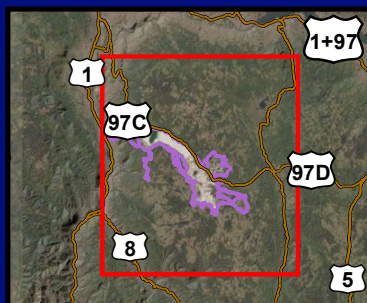
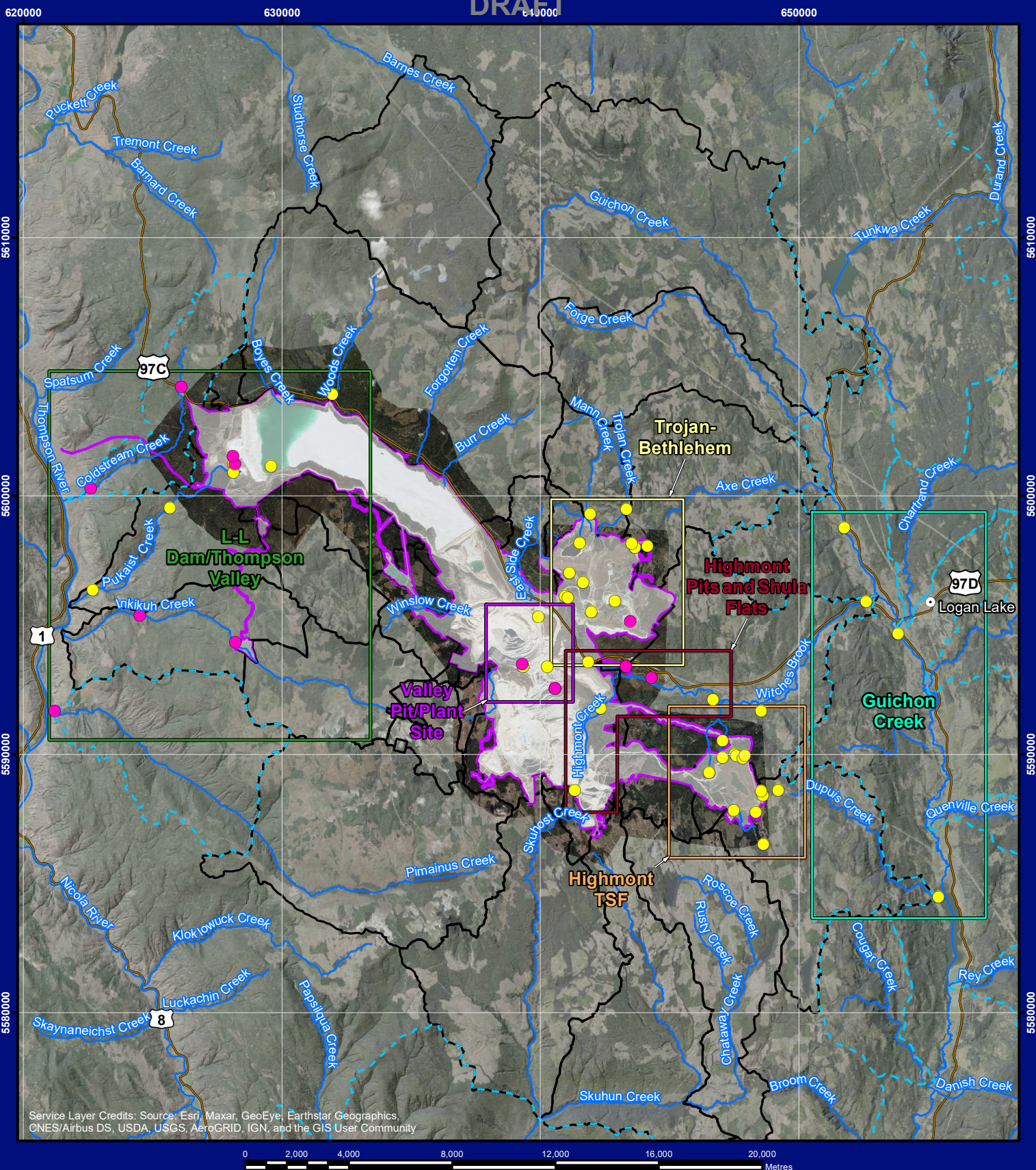
1. At the Highland Valley snow survey station (Station No. 1C09A) near the Bethlehem TSF. Data prior to 1966 were not included as the station was moved to its current location in 1965.
2. Calculated based on available period on record.
3. SWE = snow water equivalent.

## APPENDIX III

### Map of Water Quality Monitoring Points

---





- |                               |                      |
|-------------------------------|----------------------|
| Guichon Creek                 | Permitted Mine Area  |
| Highmont Pits and Shula Flats | <b>Sampling Site</b> |
| Highmont TSF                  | Permitted            |
| L-L Dam/Thompson Valley       | Voluntary            |
| Trojan-Bethlehem              | <b>Watersheds</b>    |
| Valley Pit/Plant Site         | Freshwater Atlas     |
| Highway                       | HVC Updated          |

Highland Valley / **Teck** Copper

Teck Resources Limited  
PO Box 1500  
Logan Lake, BC, Canada

**Figure E-1**

**Water Quality Monitoring Sites,  
Highland Valley Copper, 2020**

**1:200,000**

PROJECTION: NAD 1983 UTM Zone 10N

DATE: 2021-02-04

GIS No.: HVCE-01-007a

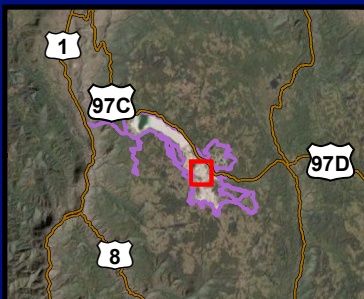






Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community  
Satellite Image: Acquired in 2019

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Metres



#### Sampling Site

- Permitted
- Voluntary
- Permitted Mine Area
- Highway

Highland Valley  
Copper

**Teck**

Teck Resources Limited  
PO Box 1500  
Logan Lake, BC, Canada

**Figure 3.2-1**  
**Water Quality Monitoring Sites in**  
**the Valley Pit/Plant Site Area,**  
**Highland Valley Copper, 2020**  
**1:17,500**



PROJECTION: NAD 1983 UTM Zone 10N

DATE: 2021-02-04

GIS No.: HVCE-01-007b



## **APPENDIX IV**

### **DSR Recommendations – THVCP Workplan**

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Appendix IV  
DSR Recommendations – THVCP Workplan

Table IV-1 7-Day Pond TSF: 2018 SRK DSR Recommendations for Deficiencies and Non-Conformances

ID No.	Recommended Action	DSR Assigned Priority <sup>(1)</sup>	Status (Scheduled completion)	Workplan To Complete
<b>7-Day Pond Tailings Storage Facility</b>				
7D-001	<p><i>There is currently no OMS or EPRP for the 7-Day Pond TSF (it is understood that one is in progress)</i></p> <p><i>Prepare an OMS manual and EPRP that includes the following, at a minimum:</i></p> <ul style="list-style-type: none"><li>- Details on normal and maximum operating levels and freeboard requirements based on the outcomes of a flood routing assessment</li><li>- Guidance on inspection activities and frequencies</li><li>- Details on pumping requirements under normal conditions, during freshet, and as a response to storm events</li><li>- Communication framework and clear designation of responsibilities between the Mill Operations team and Tailings Water Management group for managing the 7-Day Pond, including defined strategies for long-term tailings storage</li><li>- Traffic safety plans and alternative routes in the event of an overtopping failure or 7-Day Pond breach (as part of the EPRP)</li></ul>	2	CLOSED	<i>Clarified in the OMS Manual update started in 2020.</i>
7D-002	<p><i>Facility currently does not capacity to store the IDF. To meet Code requirements, one or more of the following methods needs to be implemented to provide IDF storage:</i></p> <ul style="list-style-type: none"><li>- Reduce upstream catchment area by confirming existing culverts, catch basins, and swales have capacity for the IDF and/or upgrade these components for the IDF. Or reduce upstream catchment area by constructing new diversions.</li><li>- Remove and relocate tailings from 7-Day Pond to another facility</li><li>- Install a continuous water management system to reduce reliance on storage (such as a spillway or pump with backup system)</li><li>- Raising the perimeter of the facility to provide storage</li></ul> <p><i>SRK understands that the current plans involve raising the perimeter dam, installing permanent pumping systems, and continuously excavating tailings excavation to meet Code IDF storage requirements and provide contingency storage for tailings from the Mill. It is recommended that the initial options assessment also consider the feasibility of additional alternatives that do not require raising or constructing new dams, such as increasing tailings relocation rates, constructing/upgrading upstream diversions, or installing an emergency spillway. This should not impact the proposed milestone schedule in THVCP 2019, and the preferred option should still be selected by mid-2019 and implemented within a year.</i></p>	1	CLOSED	<i>Tailings excavation and perimeter berm raised in 2020.</i>
7D-003	<p><i>No site investigations have been undertaken to confirm foundation conditions and material properties. No stability analyses have been completed.</i></p> <p><i>To explicitly meet Code requirements, complete site investigation to confirm foundation conditions and assess susceptibility to liquefaction and/or strength reduction under seismic loading. Run stability analyses applying the results of the site investigation. It is understood that this work is underway.</i></p>	3	CLOSED	<i>Addressed with site investigation and stability analyses completed in 2019 and documented in KCB (2019b and 2019d).</i>
7D-004	<p><i>Current operational freeboard requirements do not meet Code / CDA requirements and are not linked to a flood routing assessment.</i></p> <p><i>SRK supports KCB's initial recommendation to develop a long-term strategy for 7-Day pond to manage ongoing tailings storage requirements and meet Code requirements</i></p>	3	CLOSED	<i>Addressed with flood routing assessment and crest raise design documented in KCB (2019c and 2019d).</i>

Notes:

1. Recommendation priority guidelines, specified by Teck and assigned by DSR author:
- Priority 1: A high probability or actual dam safety issue considered immediately dangerous to life, health or the environment, or a significant risk of regulatory enforcement.
- Priority 2: If not corrected could likely result in dam safety issues leading to injury, environmental impact or significant regulatory enforcement; or, a repetitive deficiency that demonstrates a systematic breakdown of procedures.
- Priority 3: Single occurrences of deficiencies or non-conformances that alone would not be expected to result in dam safety issues.
- Priority 4: Best Management Practice – Further improvements are necessary to meet industry best practices or reduce potential risks.