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April 14, 2022

Ali Shaikh
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Sent via Email: ali.shaikh@nwb-oen.ca, licensing@nwb-oen.ca

Re: 2021 Annual Geotechnical Inspection Report for the Tailings Impoundment Area Hope Bay Project, Nunavut

Dear Mr. Shaikh,

In accordance with Part I, Item 9 of Type A Water Licence 2AM-DOH1335, please see Attachment #1 to this correspondence for the results of the Hope Bay Project 2021 Annual Geotechnical Inspection (AGI) of the Doris Tailings Impoundment Area (TIA), conducted by SRK Consulting (Canada) Inc.

Agnico Eagle Hope Bay is pleased to present responses to recommendations made during the AGI for the TIA in Attachment #2.

A secure link to a complete digital and downloadable copy of this full submission, including both attachments, is available at the location, saved here.

Should you have any questions please feel free to contact me at nancy.harvey@agnicoeagle.com.

Sincerely,

Nancy Duquet Harvey
Environmental Superintendent
Agnico Eagle Mines Limited – Hope Bay

Cc:
Licencing, NWB
John Roesch, KIA

Attachments:
Attachment 1 - 2021 TIA Annual Geotechnical Inspection Report (SRK, 2022)
Attachment 2 - Recommendations and Agnico Responses – TIA (Agnico, 2022)

Attachment 1
2021 Annual Geotechnical Inspection – Doris Tailings Impoundment Area

2021 Annual Geotechnical Inspection – Doris Tailings Impoundment Area

Hope Bay Mine, Nunavut, Canada
Agnico Eagle Mines Limited

SRK Consulting (Canada) Inc. ▪ 1CT022.077 ▪ March 2022

srk consulting

2021 Annual Geotechnical Inspection – Doris Tailings Impoundment Area

Hope Bay Mine, Nunavut, Canada

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Cover Image(s):
Photo of the Doris TIA taken during the annual inspection.

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The opinions expressed in this document have been based on the information available to SRK at the time of preparation. SRK has exercised all due care in reviewing information supplied by others for use on this project. While SRK has compared key supplied data with expected values, the accuracy of the results and conclusions from the review are entirely reliant on the accuracy and completeness of the supplied data. SRK does not accept responsibility for any errors or omissions in the supplied information, except to the extent that SRK was hired to verify the data.

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Executive Summary

Hope Bay is a gold mining and milling operation of Agnico Eagle Mines (Agnico Eagle). Hope Bay comprises three distinct areas of known mineralization, Doris, Madrid (North and South), and Boston. Doris Mine (Phase 1) is currently being operated (as of December 2018) under Nunavut Water Board (NWB) Type A Water License 2AM-DOH1335 - Amendment No.2. This license covers the current Phase 1 and well as the Phase 2 mining developments. Agnico Eagle contracted SRK Consulting (Canada) Inc. to conduct an annual geotechnical inspection (AGI) for the Tailings Impoundment Area (TIA) in accordance with all stipulated license conditions.

On February 2, 2021 TMAC Resources Inc. (TMAC) was purchased by Agnico Eagle and became a wholly owned subsidiary of Agnico Eagle. Effective as of January 1st, 2022, Agnico Eagle and TMAC amalgamated and continued under the Agnico Eagle name. Accordingly, by operation of law and without any further acts or steps necessary, TMAC ceased to exist and continued as Agnico Eagle, and Agnico Eagle possessed all of the property, rights, privileges and franchises and is subject to all liabilities, including civil, criminal and quasi-criminal, and all contracts, disabilities and debts of TMAC.

The TIA currently consists of a water retaining dam, the North Dam, and a tailings retaining dam, the South Dam. A second tailings retaining dam or saddle dam, the West Dam, will be built adjacent to the South Dam when the South Dam is raised. Subaerial tailings are currently retained by the South Dam, and the Reclaim Pond is impounded by the North Dam. The North Dam was constructed during the winters of 2011 and 2012, and Phase 1 of the South Dam was constructed in one season during the winter of the 2017 to 2018 season. In Phase 2, the South Dam will be raised to approximately 46 masl and the West Dam will be constructed. Construction of the Phase 2 South Dam raise is expected to commence, and be completed, by the time the tailings beach against the South Dam reaches the full supply level of the existing dam (36.5 masl or approximately 2.64Mt of total tailings tonnage). Following construction of the Phase 2 South Dam, construction of the West Dam is expected to start. The exact timing of the South Dam Phase 2 raise construction and West Dam construction will be depending on the restart of production activity and tailings discharge on site (currently suspended for 2022).

Table A provides a summary of the 2021 AGI inspection components for the TIA, and the primary recommendations stemming from the site inspection and subsequent review of monitoring data. The recommendations from the previous 2020 AGI are included for reference. Based on the results of the 2021 AGI, the North Dam and South Dam are functioning as designed, and no concerns were identified regarding the ongoing performance of these structures. There are maintenance items that require attention, and suggestions for improvement of the performance monitoring system. The items in Table A are considered important to the ongoing performance and safety of the TIA and require attention by Hope Bay staff prior to the 2022 annual geotechnical inspection. In addition to formal recommendations (black text), suggestions are captured in blue text, and where appropriate, an update status of certain recommendations or important context is provided in *red* text.

Table 1.A: Summary of 2021 AGI Recommendations

Inspection Item	2020 Recommendations (for reference)	2021 Recommendations
General TIA Management Recommendations		
Third Party Dam Safety Review	▪ Conduct an independent third-party Dam Safety Review (DSR) for both the North and South Dams in the summer of 2021. ▪ *Planning for this is in progress. An independent third-party Dam Safety Review is scheduled to be conducted for both the North and South Dams in summer of 2021 pending COVID-19 restrictions.*	▪ No recommendations. ▪ *A DSR was completed by a third party (Tetra Tech) in 2021. Agnico is actively working on review and implementation of the DSR comments where appropriate.*
Tailings Operating, Maintenance and Surveillance (OMS) Manual and Emergency Response Plan (ERP)	▪ A draft version of the 'Hope Bay Project Dam Emergency Plan' was completed by Hope Bay staff in 2021. This Dam Emergency Plan should be finalized by site and integrated with the into the OMS and TARP framework ▪ Once integrated, the suite of OMS, TARPs, ERP and Dam Emergency Plan should reviewed with all site operations annually and updated as necessary. ▪ All of these components should be reviewed against Agnico Eagle's corporate tailings management system and updated tailings standards through a gap analysis to identify required updates. ▪ The roles and responsibilities for the TIA are defined in the OMS update and must be updated with any changes in Agnico Eagle's corporate structure. ▪ *A revised OMS was issued in 2020* ▪ *TARPs were developed for the TIA in Q4 2020. Further refinement based on site input to the TARPs and integration with OMS manual should be completed in 2021*	▪ Overall, the OMS manual, TARPS and Dam Emergency plan must be reviewed by Agnico Eagle and updated to reflect the many recent changes, including, but not limited to the Dam Emergency Plan, the updated TARPs and change in key personnel listed in the OMS manual. Minor updates to the North and South dam monitoring SOPs are also recommended. ▪ All components should be reviewed against Agnico Eagle's corporate tailings management system and updated tailings standards through a gap analysis to identify required updates. ▪ *SRK and Agnico Eagle are currently collaborating on updates to these plans.* ▪ The suite of OMS, TARPs, ERP and Dam Emergency Plan must be reviewed with all site operations annually and updated as necessary. ▪ *Agnico Eagle are currently in the process of updated the Dam Emergency Plan.* ▪ Agnico Eagle should ensure all staff are properly informed and trained on the contents of the OMS Manual.
Compliance with Monitoring Frequency Requirements	▪ Conduct monitoring in accordance with the specified frequency in the Monitoring SOP and OMS. If changes in the monitoring frequency are required due to new operating schedules these must be proposed to and approved by the EOR. ▪ The North and South Dam Monitoring SOPs were updated in 2020. An additional update should be completed following any notable updates to the Tailings Management System.	▪ Recommended monitoring frequencies have been met in all categories except for visual inspections and survey monitoring. Agnico Eagle should aim to improve the frequency of these monitoring events in 2022. ▪ *It is understood that COVID-19 and site staffing limitations during this monitoring year impacted the ability to collect this data. Plans in place now from Agnico to further increase visual inspections in 2022.*
North Dam Inspection and Review of Monitoring Data		
Ground Temperature Cables (GTCs)	▪ No recommendations. ▪ Consider implementing satellite telemetry for the North Dam data loggers to allow daily transmission of the measurements rather than manual downloads. This would be a more proactive approach rather than a requirement at this time.	▪ No new recommendations.
Thermosyphons	▪ No recommendations.	▪ The joints on the thermosyphons are showing signs of weathering and rusting. The thermosyphon weld joints should be cleaned (wire-wheel) and repainted to slow additional corrosion.

Inspection Item	2020 Recommendations (for reference)	2021 Recommendations
CR1000 Datalogger Battery Voltage	■ The external CR1000 datalogger batteries should continue to be monitored and recharged annually or replaced as needed. ■ *The batteries have been recharged in March 2021*	■ The external CR1000 datalogger batteries should continue to be monitored and recharged annually or replaced as needed.
Inclinometers	■ The inclinometer probe and read-out were sent for recalibration and maintenance, but due to Covid-19 it was not possible to complete in 2020. The probe has and readout should be re-sent to the manufacturer for recalibration and maintenance in 2021. ■ *Note that TMAC has informed SRK that the inclinometer probe has now been sent off site (sent off site Q1 2021) for recalibration and maintenance.*	■ No recommendations. ■ *Site staff should maintain a record of probe and read-out service and recalibration dates. The next service and recalibration should be planned for 2024.*
Survey Monitoring Points	■ Backfill the erosion around survey monitoring point ND−DSP−100 at the North Dam. ■ Continue to carefully observe the North Dam downstream shell settlement points ND-SSP-080-3 and ND-SSP-110-3 to monitor for increased thaw settlement of the toe and undue deformation. ■ Installation of additional surficial survey points (SSP) on the upstream face of the North Dam to track deformation of the upstream face. These additional SSPs are recommended to better track the deformation of the upstream shell as foundation at the toe thaws due to elevated Reclaim Pond water levels. Note that this upstream foundation thaw is expected as per the original designs and there are no concerns with current thaw rate, however improved tracking of the displacement going forward will provide an early warning should adverse thaw conditions occur, and help ensure the dam design life is not being impacted.	■ No recommendations. ■ *Install a few key surficial survey points (SSP) on the upstream face of the North Dam. These additional SSPs will track the potential deformation of the upstream shell as the upstream foundation thaws due to thermal loading of an elevated Reclaim Pond water level. Note that upstream foundation thaw is expected as per the original designs and there have been no visual observation of settlement and there are no concerns with current thaw rate.* – *SRK and Agnico Eagle are currently collaborating on this item to further assess the need, as well as to determine a suitable time for potential additional survey monitoring point collection. This is not a critical path item and this additional survey point collection may not be done in 2022, as there is currently no mill operation resulting on site.*
Creep Displacement	■ No recommendations.	■ No recommendations.
Visual Inspection (Walk Over)	■ Complete weekly walkover surveys at the North Dam in accordance with the Monitoring SOPs. This is an important surveillance activity as defined in the OMS Manual and needs to be complied with. *Since 2018 there has been an improvement in the frequency of the walk over surveys but additional surveys were still required to be in accordance with the SOPs.*	■ Increase the completion of weekly visual inspections at the North Dam in accordance with the specified frequency. ■ *The number of visual inspections (formerly walk overs surveys) has improved in 2021, however additional inspections are required to be in compliance with the specified frequency.*
Monitoring of Flowing Water at the Toe of the North Dam	■ No recommendations. ■ Frost probe surveys are not required as part of the 2021 monitoring. If conditions change and a frost probe survey is required, the EOR will inform Hope Bay staff.	■ Modify the water quality monitoring SOP based on the absence of data to suggest the presence of TIA Reclaim Pond water in the flowing water at the toe of the North Dam. Recommended changes to the monitoring SOP are below, final changes to the frequency will be documented in an updated SOP. ■ Reduce the water quality and flow monitoring frequency for field measurements, from once per week to once per

Inspection Item	2020 Recommendations (for reference)	2021 Recommendations
		month in the periods while flowing water is observed (if observed). ■ Reduce the laboratory water quality monitoring frequency to once per year, during August, when flowing water is observed at the downstream toe, ensuring that this sample is collected and analyzed per the SOP, including all field parameters. This change in frequency also applies to the other LAS samples described in the monitoring SOP.
AGI Physical Inspection	■ No recommendations.	■ No recommendations. ■ *The v-notch weir at the toe of the dam is not performing correctly. To minimize future thermal impacts, the v-notch weir should be decommissioned and the velocity-area method used in its place when flow estimation is required.* ■ *If site elects to do some clean-up of the upstream pumping pad (when the Reclaim Pond water level is decreased, the crush material, currently located over the top of the dam shell, should be removed (to help improve visual monitoring in this area).*
South Dam Inspection and Review of Monitoring Data		
Ground Temperature Cables (GTCs) and D405 Dataloggers	■ GTCs provide thermal monitoring of the dam to ensure conditions remain within the intended design for safe operation and tailings containment. GTC replacement is recommended in some areas of the South Dam where recent instrument failure has occurred. Four replacement GTCs are suggested to be installed at this time (two upstream and two downstream). TMAC should work with the EOR to install these replacement GTCs as soon as practical. Priority should be given to the two upstream GTC replacements. ■ *Four replacement GTC strings are now on site (at the Doris North Camp). The exact timing of the installation of these cables has not yet been established due to current site limitations with available surface drill rigs.* ■ Beadedstream telemetry subscription requires annual renewal. TMAC should work with the EOR to ensure that the telemetry system operations are maintained. ■ Complete a walk over survey of the South Dam after spring melt and look for any exposed or damaged ground temperature cables. This will allow for preventative maintenance and placement of protective material to be done if exposed cables are observed, which will help to limit the potential for damage from wildlife. ■ Manually download data from each datalogger once annually in accordance with the monitoring SOP.	■ GTCs provide thermal monitoring of the dam to ensure conditions remain within the intended design for safe operation and tailings containment. GTC replacement is recommended in some areas of the South Dam where recent instrument failure has occurred. Four replacement GTCs are suggested to be installed at this time (two upstream and two downstream). The Agnico Eagle should work forward to install these replacement GTCs as soon as practical. Priority should be given to the two upstream GTC replacements. Four replacement GTC strings are on site (at the Doris North Camp) ■ Complete a detailed visual inspection of the South Dam after spring melt, especially looking for any exposed or damaged ground temperature cables. This will allow for preventative maintenance and placement of protective material to be done if exposed cables are observed, which will help to limit the potential for damage from wildlife. ■ Complete a manual download of data from each datalogger once in 2022, following the instructions in the monitoring SOP. ■ *Beadedstream telemetry subscription requires annual renewal. Agnico Eagle has taken over the subscription with Beadedstream and will be responsible for maintenance of the GTC telemetry system operations are maintained.*
Survey Monitoring Points	■ A monthly survey of the downstream toe is required as part of the Monitoring SOP. This monitoring requirement should be conducted at	■ A survey of the downstream toe is required as part of the Monitoring SOP with the intent of being completed at the same time as the monthly monitoring surveys (May to November), however the frequency requirement in the

Inspection Item	2020 Recommendations (for reference)	2021 Recommendations
	least once during August each year to track the lateral extent of ponding downstream of the dam.	SOP requires modification. The toe survey should be conducted at least once annually during snow-free conditions (typically August) each year to track the lateral displacement and the extent of ponding downstream of the dam. Additional dam toe surveys may be collected during monthly GPS survey events when the toe is mostly snow free. ■ Update the SOP and monitoring schedule to reflect the modified frequency. ■ *In 2021, a drone LiDAR survey was completed over the North Dam, South Dam and tailings beach. The LiDAR survey is valuable data for tracking the evolution of the TIA and provides an acceptable method for satisfying the downstream toe survey requirement.*
Visual Inspection (Walkover)	■ Complete weekly walkover surveys at the South Dam in accordance with the Monitoring SOPs. This is an important surveillance activity as defined in the OMS Manual and needs to be complied with.	■ Increase the completion of weekly visual inspections at the South Dam in accordance with the required weekly frequency.
Monitoring of Flowing and Ponded Water at the Toe of the South Dam	■ No recommendations.	■ No recommendations ■ *Signs of increased ponding water were observed in 2020 at the downstream toe of the South Dam. The ponded volume was notably less during the 2021 AGI inspection. Downstream of the Phase 1 South Dam, permafrost, including frost wedge polygons existed prior to construction which is indicative of the area being historically wet or ponded.* ■ *Drone images taken just after freshet and just before winter freeze up should be collected to assist with ongoing monitoring of the ponded water at the downstream portion of the South Dam toe.*
Annual Physical Inspection of the South Dam	■ Methods to limit tailings dispersion downstream of the dam should be considered in 2021. As the sub-aerial tailings beach grows, this is expected to become a more critical item. ■ The initial phases of some permafrost degradation and increased ponding water have been observed at the downstream toe of the South Dam. This downstream area is near the area where snow access roads were constructed as part of the Phase 1 South Dam construction (and is within the ultimate Phase 2 dam footprint). Remediation of this area should be considered prior to construction of the Phase 2 raise (Phase 2 raise not expected to be completed in 2021 at this time). This remediation would be expected to consist of the placement of 1.5m thickness of ROQ material directly over these areas (and against the current downstream dam fill / shell).	■ There are two zones on the 2H:1V downstream slope of the South Dam, specifically where the downstream GTCs were brought up the downstream slope, that some minor sloughing and tension cracking of the dam shell ROQ has occurred. These areas should be closely monitored and additional fill (toe berm) along these portions of the slope could provide some mitigation in these areas (See later bullet). ■ Phase 1 South Dam construction disturbance, where snow access roads were constructed appears to have initiated some permafrost degradation (thaw depressions and ponding) and should continue to be closely monitored. ■ *All ponding, tension cracking, sloughing and permafrost disturbance is within the Phase 2 South Dam footprint. Delayed construction of the Phase 2 raise may lead to further degradation of the permafrost in these areas. To proactively mitigate the risk of foundation thaw prior to construction of the South Dam Phase 2 raise, a thermal toe berm should be implemented. The toe berm would include at least 1.5 m of ROQ fill placed over this area (about 5 m in width). The toe berm fill would be integrated into the Phase 2 dam shell volume. Initial volumetric modeling of a 2 m thick, top crest width 5m with 2H:1V*

Inspection Item	2020 Recommendations (for reference)	2021 Recommendations
		side slopes indicates that neat-line volumes for this additional fill material would be in the range of 4,000 m^3. ▪ *Agnico Eagle has already sourced dust suppression agents for the TIA and should determine when the dust suppression measures should be implemented based on monitoring observations and the planned restart of production and tailings deposition.*
▪ TIA-Wide Monitoring		
Tailings Deposition System	▪ Saline mine water may only be discharged through the tailings pipeline from, or within, 300 m of the South Dam provided the freezing point depression is less than 0.5°C (less than 4,500 mg/L Cl maximum equivalent). While not current practice, this operational recommendation remains in place. ▪ The tailings discharge system must be operated in accordance with the designated tailings discharge plan. Primary spigot moves should be expected during, or shortly after, spring melt and again prior to winter freeze up. In the summer of 2021, it is expected that at least one additional spigot location will be required to be installed (north of the current spigot H location). ▪ No TIA bathymetric survey was conducted in 2020, as approved by the EOR. For 2020 deposition planning, conservative volume assumptions were used as part of the 2020 AGI tailings deposition plan (i.e. assuming larger deposited volumes or less available space). A bathymetry survey of the TIA reclaim pond should be completed in 2021 to allow for better determination of the tailings volume and available storage volume in the TIA. ▪ Plans should start to be made in 2021 for the Phase 2 raise of the South Dam; The raise is expected to be required once the tailings beach reaches against the existing dam reaches the full supply level for tailings (36.5 masl or approximately 2.64Mt of total tailings tonnage). The required timing is dependent on milling rates, but construction is expected in winter 2022 or 2023.	▪ The tailings discharge system must be operated in accordance with the tailings deposition plan (SRK 2021). Primary spigot moves should be expected during, or shortly after, spring melt and again prior to winter freeze up. The next winter discharge should be located at the northeastern extent of the subaerial beach (north of the current spigot H location) to limit ice entrainment due to winter sub-aerial deposition. Following spring melt, deposition from the South Dam (Spigot A, B and C) should resume. In the subsequent fall/winter, a move to the new northeastern extent of the subaerial beach should be anticipated. ▪ A bathymetric survey was conducted in 2021. With this newly available data, Agnico Eagle should work with SRK to complete tailings volume reconciliation and updated deposition planning prior to resuming production. ▪ Plans for the Phase 2 raise of the South Dam should be made in parallel with updates to the mine plan to ensure construction can occur in the appropriate season (winter); The raise is required to be in place once the tailings beach against the existing dam reaches the full supply level for tailings (36.5 masl or approximately 2.64Mt of total tailings tonnage). The required timing is dependent on the resumption of production and future milling rates. ▪ *Production activities and tailings discharge have been suspended in 2022. No immediate recommendations during periods when tailings discharge is not active.*
Emergency Dump Catch Basins	▪ The Western Emergency Dump Catch Basin still requires repairs. These repairs should still be planned to be carried out.	▪ The Western Emergency Dump Catch Basin still requires repairs and should be closely monitored. Additional liner slippage since 2020 was noted at the top of the liner crest. This pond still maintains the minimum required capacity but further liner slippage may result in a reduction of the capacity of this emergency catch basin.
Pipelines (Reclaim, Tailings Deposition and TIA Discharge)	▪ TMAC must carefully inspect all pipelines placed directly on the tundra for signs of vegetation dieback and associated flow path channeling. Where this is occurring, the pipeline must be relocated to follow existing all-weather road shoulders, and appropriate remediation needs to be put in place where damage has occurred.	▪ Agnico Eagle should carefully inspect all pipelines placed directly on the tundra for signs of vegetation dieback and associated flow path channeling. Where this is occurring, the pipeline must be relocated to follow existing all-weather road shoulders, and appropriate remediation needs to be put in place where damage has occurred.

Inspection Item	2020 Recommendations (for reference)	2021 Recommendations
	■ The permafrost thermal erosion feature that has developed along the northern shore of the TIA was backfilled by TMAC in 2019. This area should continue to be monitored to ensure that additional thermal erosion does not result in this area. ■ Monitoring should continue at the repaired TIA Reclaim Jetty Pad (710 Pumphouse pad) following the recommended survey frequency of twice monthly from May to November.	■ The smaller diameter TIA pipelines going from the North Dam to Doris Creek, that were used during the care and maintenance period and before tailings were placed in the TIA around 2017, are no longer connected or functional. Agnico Eagle should consider removing these nonfunctional pipelines from the tundra.
TIA Reclaim Pond Jetty (710 Pumphouse) Pad	■ Settlement monitoring at the Reclaim Jetty should continue in 2021 (twice monthly, May to November). ■ Major Jetty repairs were completed in 2020. There is still one area off the most WSW end of the reclaim jetty fill (i.e. by the area where the pipelines extend from the seacans into the TIA) that are still over steepened and should be carefully monitored. ■ Additional (relatively minor) fills are recommended on the west side of the pad where the full fill extents, of the proposed reclaim jetty repairs, were not fully met. ■ Once all repairs are complete, ensure the recommended survey monitoring points are reestablished.	■ Continue settlement monitoring at the TIA Reclaim Jetty (710 Pumphouse) following the recommended survey frequency of twice monthly, May through November. ■ Once the survey monitoring of the Reclaim Jetty resumes, and the surface is snow-free, conduct an audit of the existing survey monitoring points and establish survey monitoring points where proposed locations are missing or damaged. ■ Agnico Eagle should develop a plan to raise the Reclaim Jetty pad from its current minimum elevation of roughly 32.1 masl to above the Full Supply Level of the TIA (33.7 masl would raise the pad 0.2 meters above the TIA FSL), or some interim raise which the water level can be maintained with adequate freeboard below the pad. ■ Once any significant construction or remediation is complete, ensure the recommended TIA Reclaim Jetty survey monitoring points are reestablished. ■ *Agnico Eagle is in the process of reviewing options for modification of the TIA Reclaim Jetty to improve long term operation at this area.*
TIA Operational Water Balance and Level Targets	■ It is of paramount importance that the RBDS be re-commissioned by May 2021 to manage water levels in the Reclaim Pond. Further delay of this may result in reduced operations. ■ *During maintenance of the Roberts Bay Discharge Line in the fall of 2020, portions of the submersed line became buoyant requiring the submersed line to be shortened. The end of the Roberts Bay Discharge line is now at around 20m depth in Roberts Bay compared to the previous 40 meters depth. In Q1 2021, TMAC made a submission to the Nunavut Impact Review Board indicating why the revised discharge location does not pose a significant modification to the Hope Bay Mine or the previously assessed environmental effects. It is expected that this discharge line will be able to be used again before freshet 2021.* ■ If delays in approvals to use the Roberts Bay Discharge system are expected past the end of May 2021 then the EOR should be informed so additional plans can be made with site staff. Water levels in the TIA will continue to be carefully monitored (specifically during the periods where there is no discharge from the TIA to Roberts Bay).	■ Water level targets must be adhered to whenever practical. Short-term or risk-based exceedances may be acceptable. ■ Currently the main area of immediate impact from raised water levels is the TIA Reclaim Jetty. See recommendations in the section above. ■ The RBDS resumed in June 2021 and has since been stopped as of December 1, 2021 due to changes in the discharge water quality requirements (specifically changes in the toxicity testing requirements). From a TIA water management perspective, it is important that the RBDS be re-commissioned or alternative water management strategies be developed as the water level approaches the FSL of the TIA (33.5 masl). ■ Agnico Eagle and SRK are actively in the process of reviewing options for future water management in the TIA. Changes to the water balance and level targets will be reported on in future reports.

Inspection Item	2020 Recommendations (for reference)	2021 Recommendations
	■ Continue discharge 2021 to reduce the water levels in the pond to within the target elevation range. ■ Continue to monitor the South Dam beach length to maintain at least 100 meters separation between the Dam and the Reclaim Pond or any large pond.	
TIA Water Quality	■ No recommendations. ■ If water quality or water treatment capacity is expected to impact the ability to maintain the Reclaim Pond within the operational range, the EOR must be notified.	■ No recommendations. ■ *Agnico Eagle and SRK are in the process of reviewing options for future water management in the TIA. Changes to the water quality requirements will be reported on in future reporting.*
Climate Data	■ No recommendations.	■ No recommendations.

1 Introduction

1.1 General

Hope Bay is a gold mining and milling operation of Agnico Eagle Mines (Agnico Eagle). The Operation is located 705 km northeast of Yellowknife and 153 km southwest of Cambridge Bay in Nunavut Territory, and is situated east of Bathurst Inlet (Figure 1). The Operation comprises three distinct areas of known mineralization, Doris, Madrid (North and South), and Boston.

On February 2, 2021 TMAC Resources Inc. was purchased by Agnico Eagle; TMAC continues to exist as a legal entity and is now a wholly owned subsidiary of Agnico Eagle. All rights, obligations, liabilities of TMAC continue to reside with TMAC until or if an amalgamation with Agnico occurs. For the purposes of this report, all past, current and forward-looking recommendations regarding the two entities will refer to Agnico Eagle or Hope Bay, unless explicitly requiring reference to TMAC. All recommendations are intended for both TMAC and Agnico Eagle and should be interpreted based on the specific context.

Phase 1 and 2 of the TIA are now approved and the TIA is operated under the Amended Water Licences (2AM DOH1335). Phase 1 included mining and infrastructure at Doris (Figure 2), while Phase 2 includes mining and infrastructure at Madrid and Boston located approximately 10 and 60 km south from Doris, respectively. The Doris Tailings Impoundment Area (TIA) (Figure 3) will ultimately contain both Phase 1 and 2 tailings.

Construction of Phase 1 infrastructure started in 2007, and underground development commenced in 2010. The North Dam, which provides containment for the TIA at its northern perimeter, was constructed over two winter seasons, 2011 and 2012 (Figure 3). In the fall of 2012, the Project was placed into Care and Maintenance prior to completing infrastructure development required to allow commercial production. Following an ownership change of the Project, Phase 1 was taken out of Care and Maintenance in 2015 and transitioned into commercial production in 2017. Construction of the South Dam, providing southern TIA containment, was carried out between January and June of 2018 (Figure 3).

To fulfill regulatory compliance requirements for an annual geotechnical inspection (AGI) for the TIA containment dams as well as any supplementary infrastructure pertaining to the TIA operations such as pipelines and emergency catch basins, Agnico Eagle contracted SRK Consulting (Canada) Inc., the Design Engineer, to conduct the 2021 inspection. This report provides a summary of the conditions observed, a review of monitoring data, and recommendations to ensure ongoing successful performance of the tailings management system. SRK has conducted each formal AGI of the TIA since 2012.

John Kurylo, MSc, PEng, Principal Consultant with SRK and the Engineer of Record, conducted the on-site annual geotechnical inspection between August 4 and 6, 2021. Weather conditions during the inspection were overcast or partly cloudy. The detailed inspection of the dams and supporting infrastructure was carried out on foot, followed by an aerial survey of the TIA using a low altitude helicopter flyover. Nancy Duquet-Harvey, On-Site Environmental Superintendent with Agnico Eagle,

accompanied John during the walk over inspections. Photos detailing the inspection conditions are included as photologs, and comprehensive review and analysis of the monitoring data are provided in the appendices. A post inspection meeting was held on site with key personnel from relevant departments, where SRK presented the preliminary inspection findings.

Monitoring and surveillance activities occur throughout the year on a regular basis (Section 4.1), with Agnico Eagle and SRK working in close collaboration. The AGI includes a review and summary of TIA operations and monitoring data and follows a monitoring year period from October 1, 2020 to September 30, 2021 to end shortly after the on-site inspection is completed. This monitoring year is adjusted from past reports, previously January 1 to December 31 was used.

Sections 4 and 5 contain recommendations below each component to easily identify the important recommendations. In addition to these formal recommendations (black text), suggestions are captured in blue text, and where appropriate, an update status of certain recommendations or important context is provided in *red* text.

1.2 Inspection Requirements

Under Type A Water License 2AM-DOH1335 – Amendment No. 2, dated December 7, 2018, the specific TIA inspection requirements are stated in Part I, items 9 and 10 of the license:

9. The Licensee shall undertake a geotechnical inspection of all surface infrastructure and earthworks, annually between July and September, by a Geotechnical Engineer. The inspection shall be conducted in accordance with applicable best practices including the Canadian Dam Association Guidelines for water and waste containment facilities.

10. The Licensee shall submit to the Board for review, within ninety (90) days of completion of the geotechnical inspection, a report in accordance with Part I Item 9 and/or the Annual Report. The report shall include a cover letter from the Licensee outlining an implementation plan addressing each of the Geotechnical Engineer's recommendations and shall include the following:

a. *All quantities in cubic meters of dike seepage from the North, West, and South Dams pumped back into the Tailings Impoundment Area;*
b. *As-built drawings and a summary of the mitigation works undertaken along the shoreline of the Tailings Impoundment Area in response to erosion; and*
c. *All data and information generated from the monitoring of all project geotechnical instrumentation.*

2 Site Conditions

2.1 Tailings Impoundment Area History

A summary of the TIA permitting, construction, and operations history is provided in Table 1.

Table 1: Summary of TIA Development History

Period	Comments
2003	Doris North Project preliminary economic assessment is completed with Tail Lake designated as the TIA, assuming subaqueous deposition and a maximum tailings quantity of about 0.4 Mt (SRK 2002a).
2002 – 2005	Geotechnical, geophysical, geohydrological and permafrost investigations of dam foundations (North, South and alternate internal locations), TIA shoreline perimeter, and TIA talik (SRK 2002b, 2003 and 2005a, 2005b and 2005c).
2005	Environmental Assessment for the Doris North Project is completed which includes rigorous alternatives assessment confirming Tail Lake as the preferred TIA.
2006	Project Certificate is issued for the Doris North Project.
2006	Application for Schedule 2 listing of Tail Lake as TIA in accordance with the Metal Mining Effluent Regulations (MMER).
2008	Tail Lake MDMER Schedule 2 listing obtained.
Winter 2011 and Winter 2012	North Dam constructed (SRK 2012b).
Fall 2012	Project placed into Care and Maintenance before any tailings was ever produced.
2012 – 2015	Project in Care and Maintenance. Water within the TIA is managed in accordance with the Interim Water Management Plan (SRK 2012c) which includes pumping water from the Pollution Control Pond (PCP) to the TIA and discharging TIA water to Doris Creek.
2015 – 2016	TMAC submits application to amend the Water License and Project Certificate which amongst other things will result in a change from subaqueous tailings deposition to sub-aerial tailings deposition, increase the TIA capacity to 2.5 Mt, change the South Dam design to a frozen foundation dam, and construction of an Interim Dike. This amendment was approved November 4, 2016.
2017 – 2019	TMAC submits application to amend the Doris Water License and Project Certificate, and to obtain a new Water License in support of Phase 2 of the Hope Bay Mine. Amongst other things, this will result in increasing the TIA capacity to 18 Mt, constructing a South Dam raise, and the Interim Dike would no longer be required. The updated Project Certificate was issued in October 2018, and the amended and new Water License issued December 2018.
January 2017	Start of tailings deposition in TIA.
January – June 2018	Completion of Phase 1 South Dam construction.
August 2018	Additional installation of South Dam instrumentation, and cable extensions for the ground temperature cables.
May 2019	Instrumentation upgrades and additional data logger installations at the South Dam.
February – August 2020	Doris TIA discharge via the Roberts Bay Discharge (temporarily offline as of August 2020)
February 2021	Agnico Eagle Mines (Agnico Eagle) purchased the project and became responsible for the operation of the TIA
June 2021	Doris TIA discharge resumes via the Roberts Bay Discharge System (RBDS)

2.2 Tailings Management Strategy

2.2.1 Phase 1

Phase 1 tailings were subaerially deposited in the TIA (formerly Tail Lake), which was listed on Schedule 2 of the Metal and Diamond Mining Effluent Regulations (MDMER) specifically for use as a tailings facility. The TIA is located south-east of the Doris mill and mine (Figure 2). Containment for the TIA is provided through a water retaining frozen core dam (North Dam), and a geosynthetic clay liner (GCL) lined frozen foundation tailings dam (South Dam). Phase 1 tailings solids containment capacity is limited to 2.5 Mt.

2.2.2 Phase 2

Phase 2 tailings management increases the overall tailings solids containment capacity to approximately 18 Mt. The North Dam remains unchanged and is not planned to be raised; however, as part of Phase 2, the South Dam is raised and a new West Dam (also a frozen foundation GCL lined dam) is constructed (Figure 3).

2.3 Tailings Storage Requirements

The planned tailings production rates and associated tailings storage requirements for the Doris TIA are summarized in Table 2.

Table 2: TIA Containment Volume Design Criteria

Description	Value
Nominal Tailings Production Rate	2020 to 2023 → 2,000 tonnes per day (tpd)[1] 2024 → up to 3,500 tpd 2025 to End of Mine Life → up to 4,000 tpd
Tailings Specific Gravity	2.85
Deposited Tailings Dry Density	1.3 t/m^3
Tailings Solids Content	35% solids (by weight) initially, increasing to 65% (somewhat dependent on if mine water inputs continue to TIA or if this water is treated and discharged directly to Roberts Bay before going to the TIA)
Total Tailings Storage Requirement:	
By Mass	20.0 Mt
By Volume	15.4 Mm^3
Remaining Tailings Storage Requirement:	
By Mass	18.8 Mt
By Volume	14.5 Mm^3
Ice Entrainment Allowance:	
Percentage of Tailings Capacity	20%
By Volume	2.4 Mm^3

Description	Value
Tailings Beach Slope:	Between 0.5% and 1.0% (expected variability based on monitoring data and survey data)

Notes:

[1] 2021 to 2023 anticipated tailings production rates are 1,500 tpd

2.4 Tailings Impoundment Area Infrastructure

2.4.1 North Dam

The North Dam forms the northern boundary of the Doris TIA within a narrow natural valley, blocking the original Tail Lake outlet to Doris Lake (Figure 3). Complete North Dam geometric design parameters and design criteria are summarized in Table 3 and Table 4 respectively. Figure 4 through Figure 6 depict pertinent details of the North Dam and its instrumentation. Photolog 1 through Photolog 3 shows inspection photos of the upstream and downstream slopes, and the installed instrumentation.

The North Dam impounds the Reclaim Pond and was designed as a water retaining structure. The dam has a central frozen core with a secondary upstream GCL. The dam is constructed from local quarry rock and consists of processed fines for the core, 150 mm nominal sized transition material, and a run of quarry (ROQ) outer shell. To ensure maintenance of frozen foundation and frozen core conditions, the key trench of the dam is equipped with 12 horizontal thermosyphon evaporators (SRK 2007, 2012a, 2013a, 2015a).

Construction of the North Dam started in February 2011 and was completed in April 2012, over two distinct winter seasons. Complete as-built details are provided in SRK (2012b).

2.4.2 South Dam

The South Dam is located at the southern end of the former Tail Lake, on the watershed divide to Ogama Lake (Figure 3). The South Dam is designed as a frozen foundation dam consisting of a compacted rock fill dam (sourced from a local quarry) with a GCL keyed into the permafrost overburden and bedrock foundation for seepage control. Complete geometric design parameters and design criteria are summarized in Table 3 and Table 4 respectively, with Figure 7 through Figure 9 presenting pertinent details of the South Dam design. The dam is designed to retain beached tailings as opposed to water. The dam is to be constructed in two phases, incorporating a single downstream raise between Phase 1 and Phase 2.

South Dam construction began in January 2018 and Phase 1 construction was completed in June 2018. The South Dam instrumentation was mostly completed in August 2018. Photolog 4 and 5 shows the South Dam Inspection photos.

2.4.3 West Dam

The West Dam has been designed as a frozen foundation dam with a key trench and a GCL liner keyed into permafrost, similar in design to the South Dam. It is intended to retain beached tailings along low-lying ground on the western perimeter of the TIA (Figure 3). Complete geometric design parameters and design criteria are provided in Table 3 and Table 4. This dam will be constructed in a single stage using local quarry rock. This dam has not yet been constructed.

Table 3: TIA Containment Dams Geometric Design Parameters

Description	North Dam	South Dam	West Dam
Structure Type	Frozen core rock fill dam with geomembrane	Frozen foundation rock fill dam with geomembrane	Frozen foundation rock fill dam with geomembrane
Secondary Seepage Barrier	GCL		
GCL Deployment Slope	2.5H:1V	Phase 1 – 3H:1V Phase 2 – 4H:1V	3H:1V
Thermosyphons	12 sloped	None	None
Crest Centerline Length	220 m	515 m	470 m
Maximum Height	11.0 m	Phase 1 – 6.0 m Phase 2 – 14.0 m	5.0 m
Crest Elevation	37.5 masl	Phase 1 – 38.0 masl Phase 2 – 46.0 masl	46.0 masl
Core/GCL Elevation	35.0 masl	Phase 1 – 37.0 masl Phase 2 – 45.0 masl	45.0 masl
Full Supply Level (FSL)	33.5 masl	Phase 1: Water – 33.5 masl Tailings – 36.5 masl Phase 2: Water – 33.5 masl Tailings – 44.5 masl	Water – 33.5 masl Tailings – 44.5 masl
Original Tail Lake Water Level	28.3 masl		
Total Actual Freeboard (Crest to FSL)	4.0 m	Phase 1: Water – 4.5 m Tailings – 1.5 m Phase 2: Water – 12.5 m Tailings – 1.5 m	Water – 12.5 m Tailings – 1.5 m
Total Actual Minimum Freeboard (Core/GCL to FSL)	1.5 m	Phase 1: Water – 3.5 m Tailings – 0.5 m Phase 2: Water – 11.5 m Tailings – 0.5 m	Water – 11.5 m Tailings – 0.5 m
Required Normal Freeboard (CDA 2013)	Wind setup (0.07 m) + Wave runup (1.06 m) = 1.13 m		

Description	North Dam	South Dam	West Dam
Required Minimum Freeboard (CDA 2013)	Wind setup (0.06 m) + Wave runup (1.16 m) = 1.22 m Inflow Design Flood (IDF) Freeboard = 2.1 m (at end of mine life when Reclaim Pond is at its minimum size)		
Thermal Protection above Frozen Core	2.5 m	n/a	n/a
Crest Width	13 m	10 m	10 m
Upstream Structure Slope	6H:1V	4H:1V	4H:1V
Downstream Structure Slope	4H:1V	2H:1V	2H:1V
Key Trench Depth	Varies (2.0 – 5.0 m)	Varies (2.0 – 4.0 m)	4.0 m
Key Trench Upstream Slope	0.5H:1V	2H:1V	2H:1V
Key Trench Downstream Slope	0.5H:1V	1H:1V	1H:1V

Table 4: TIA Containment Dams Design Criteria

Description	North Dam	South Dam	West Dam
Settlement Allowance	1.00 m		
Foundation thaw of 1 m (partial thaw)		0.47 – 0.67 m	0.40 – 0.60 m
Foundation thaw of 7 m (full thaw)		2.45 – 3.85 m	2.03 – 3.43 m
Deformation Allowance (Total Strain due to Creep)	<2%	n/a	n/a
Original Design Life:			
Active use as water retaining structure	17 years		
Design base as water retaining structure	22 years		
Design base until breach	30 years		
Active use as solids retaining structure		17 years	17 years
Design base as solids retaining structure		25 years	25 years
Annual Exceedance Probability (AEP) for Inflow Design Flood (IDF)			
Risk Based	1/2,475 (0.0004)		
Standards Based	1/3 between 1/1,000 and the PMF[(1)]		
Static Stability Factor of Safety: Long-term (Drained Conditions)	1.3 during construction 1.5 during operation and closure 1.2 to 1.3 partial or rapid drawdown		
Pseudo-Static Stability Factors of Safety	1.0 during earthquake 1.2 post earthquake		
AEP for Earthquake Design Ground Motion	1/2,500 (0.0004)		
Peak Ground Acceleration (PGA)	0.060g[(2)]	0.036g	0.043g
Mean Annual Air Temperature Climate Change	+6.8°C up to year 2100		
Thermal Design Freezing Point Depression (Normal Conditions)			
Tailings	n/a	0 to -1°C	0 to -1°C
Overburden	-8°C	-2°C	-2°C
Frozen core	-2°C	n/a	n/a

Description	North Dam	South Dam	West Dam
Thermal Design Freezing Point Depression (Upset Conditions) Tailings Overburden Frozen core	 n/a -7°C -1°C	 0 to -1°C -2°C n/a	 0 to -1°C -2°C n/a
Seepage Allowance	78 m^3/day	50 m^3/day	<1 m^3/day

Notes:

[1] Value based on experiential engineered judgement.

[2] A peak ground acceleration for a 1/2475 return period was not available at the time of design of the North Dam, and therefore the PGA of 0.06 g was selected based on published data for Kugluktuk. This is further described in SRK (2007).

2.4.4 Spillway

As part of the Phase 2 TIA design (SRK 2017e) the water level was expected to be managed through annual discharges to Roberts Bay due to the substantive freeboard and design capacity to contain the PMF. This removed the previous spillway requirement.

Review of the operational beach slopes and tailings deposition plan (Appendix L of SRK 2021a) indicates current deposition plan will eventually decrease the Reclaim Pond to a capacity of between 133,000 m^3 and 209,000 m^3. Until the North Dam is breached, the IDF storage volume is greater than 640,000 m^3 and requires adequate control in accordance with (CDA 2019).

Based on the mine and operation plans, and corresponding dam design life, presented in the FEIS reports, a spillway was not originally planned for the Doris TIA. A reassessment of the need for a spillway, and the timing for construction, is planned to be completed by SRK and Agnico Eagle as part of the ongoing TIA water management reviews. Based on current plans, and assuming the Roberts Bay Discharge system continues to be operational, it is not until the last two to four years of the tailings deposition (depending on operational pond volumes) when the available pond storage in the TIA starts to approach the IDF storage volume requirement. At that point in time, it is expected that lowering the elevation of the TIA's normal operating water level (NOWL) will be required to help free up as much storage space as possible for the IDF storm event. To mitigate against the risk of an overtopping failure at the North Dam and to remove the dependency on an active management system (i.e. to have a passive outflow in the event pumps break down) an emergency spillway may be required prior to the end of mine life. A discharge from the spillway would only occur during a very low probability emergency event and is not planned for routine use.

The potential spillway construction timeline is linked to the later stages of the mine life, as indicated by the deposition planning models. However, these timelines could easily be impacted by production rates, unexpected conditions or poor management practices i.e. storing additional water in the TIA or in particular if the Roberts Bay Discharge system was to fail or be offline for more than one normal discharge period.

2.4.5 Tailing Deposition System

The tailings discharge system is designed as a single heat-traced and insulated pipeline with end point (i.e. single spigot) discharge at predetermined locations. The tailings deposition pipeline consists of a combination of 6-inch internal diameter steel and High-Density Polyethylene (HDPE) pipelines with no redundancy. There are no double lined pipeline sections for environmental containment. The pipeline is placed directly on the ground, which consists of either engineered rockfill pads, the all-weather road shoulders, or in some areas directly on the tundra.

Actual tailings deposition started in February 2017 and there are currently eight tailings discharge locations. A plan overview of the tailings deposition history is illustrated in Figure 10. Photos of the tailings deposition are shown in Photologs 7 and 8 attached.

Table 5 summarizes the deposition status as of September 2021. Actual tailings deposition rates are less than what was previously planned (Table 2). Deposition rates were increased in 2019 but have been reduced since December 2019, primarily due to COVID-19 related reductions (Figure 11 and Figure 12). The current deposition modelling and storage capacity assessment (Appendix L of SRK 2021a) includes a 20% allowance for ice entrainment.

Table 5: Actual Tailings Deposition Between September 2020 and September 2021

Period	Percent Solids (by Weight)	Tailings Solids (tpd)	Cumulative Tailings Solids (tonnes)	Cumulative Tailings Solids (m^3)
September 2020	20.0	383	1,513,105	540,395
October 2020	31.0	1,037	1,545,250	551,875
November 2020	26.0	878	1,571,582	561,279
December 2020	45.0	1,018	1,603,133	572,548
January 2021	42.3	1,090	1,636,926	584,616
February 2021	42.0	754	1,658,038	592,156
March 2021	44.5	526	1,674,344	597,980
April 2021	44.0	1,243	1,711,634	611,298
May 2021	42.0	1,291	1,751,654	625,591
June 2021	42.0	484	1,766,174	630,777
July 2021	32.0	756	1,789,610	639,147
August 2021	44.0	1,028	1,821,478	650,528
September 2021	47.0	961	1,850,308	660,824

2.4.6 Emergency Dump Catch Basins

Two Emergency Dump Catch Basins (EDCBs) have been constructed on either side of Doris Creek (Photolog 9). The EDCBs are lined cells constructed at a topographic low-point along the tailings and reclaim pipeline routes that allow for the pipelines to be drained during prolonged mill shutdowns or power failures to prevent pipeline freeze-up. They were designed to accommodate at least two consecutive shutdowns plus direct precipitation over the basin areas. The EDCBs were constructed in 2017. Table 6 summarizes their design and as-built containment capacities.

Table 6. EDCB Design and As-built Capacities

Component	Western EDCB	Eastern EDCB
Permitted Design Capacity	120 m^3	120 m^3
Required Design Capacity	97 m^3	85 m^3
As-Built Design Capacity	124 m^3	85 m^3

2.4.7 Reclaim Water System

Reclaim water is drawn from the TIA Reclaim Pond for re-use in the Process Plant. Reclaim water is drawn from a submerged suction line feeding a low suction head pump installed in an on-shore enclosure located at the Reclaim Pond (Figure 3). This heat-traced and insulated pipeline follows the TIA Access Road (aka Secondary Road) from the Reclaim Pond to the Doris mill and is placed directly on the ground (either tundra, all-weather road shoulder, or the engineered rockfill pads). There are no double-lined sections of this pipeline and there is no redundant pipeline.

Table 7 provides a summary of reclaim water volumes drawn from the TIA since tailings production started.

Table 7: Reclaim Water Volumes Between September 2020 and September 2021

Date	Reclaim Volume (m^3/month)	Cumulative Reclaim Volume (m^3)
September 2020	45,973	3,330,749
October 2020	71,946	3,402,695
November 2020	80,145	3,482,840
December 2020	86,495	3,569,335
January 2021	85,079	3,654,414
February 2021	77,385	3,731,799
March 2021	76,663	3,808,462
April 2021	78,336	3,886,798
May 2021	74,222	3,961,020
June 2021	57,629	4,018,649
July 2021	56,777	4,075,426
August 2021	66,438	4,141,864
September 2021	69,343	4,211,207

2.4.8 TIA Water Discharge System

The Roberts Bay Discharge System (RBDS) was commissioned in February 2020 and was run until August 2020, discharge resumed in June 2021. At the time of writing this report, discharge has been stopped as of December 1, 2021. Under normal operation, the discharge pump is located adjacent to the reclaim pump on the reclaim jetty which pumps water in a pipeline following the same route as the reclaim water pipeline until it branches off to the Doris Contact Water Treatment Plant (Figure 13). The

discharge to the Roberts Bay Discharge System is provided in Table 8. Historically, prior to tailings deposition, TIA water was discharged to Doris Creek (compliance monitoring station TL-2) during the open water seasons of 2014 and 2015 (SRK 2021a).

Table 8: Discharge from Doris TIA to Roberts Bay Discharge System

Date	Discharge to RBDS (m^3/month)	Cumulative Discharge to RBDS (m^3)
January 2020	-	-
February 2020	154,211	154,211
March 2020	168,053	322,264
April 2020	165,578	487,842
May 2020	167,282	655,124
June 2020	147,624	802,748
July 2020	163,955	966,703
August 2020	67,957	1,034,660
September 2020	-	1,034,660
October 2020	-	1,034,660
November 2020	-	1,034,660
December 2020	-	1,034,660
January 2021	-	1,034,660
February 2021	-	1,034,660
March 2021	-	1,034,660
April 2021	-	1,034,660
May 2021	-	1,034,660
June 2021	185,609	1,220,269
July 2021	152,586	1,372,855
August 2021	167,027	1,539,882
September 2021	137,679	1,677,561

2.5 Tailings Impoundment Area Instrumentation

The Dam instrumentation is monitored and maintained in accordance with the North and South Dam Monitoring Standard Operating Procedure (SOP) (SRK 2020b and 2020c)

2.5.1 North Dam

Permanent performance monitoring instrumentation for the North Dam consists of:

- 11 vertical ground temperature cables (GTCs);
- 13 horizontal GTCs;

- 18 surficial survey monitoring points located throughout the downstream face of the dam;
- 14 crest survey monitoring points located along the upstream and downstream crest of the dam;
- 3 deep settlement points;
- 6 inclinometers located within the downstream face; and
- 12 single bead thermistors, measuring thermosyphon contact temperatures.

Figure 4 through Figure 6 illustrates the location of North Dam instrumentation. All GTCs are connected to dataloggers allowing continuous data collection. Slope inclinometers are recorded manually using a slope inclinometer instrument owned by Agnico Eagle. Settlement monitoring is completed by total station ground survey. The Dam instrumentation is monitored and maintained in accordance with the North Dam Monitoring Standard Operating Procedure (SOP) (SRK 2020b)

2.5.2 South Dam

The active South Dam permanent performance monitoring instrumentation consists of:

- 9 horizontal GTCs;
- 12 vertical GTCs;
- 1 long GTC parallel to the top crest of the key trench;
- 19 surficial survey monitoring points (crest and downstream slope);
- 12 crest survey monitoring points; and
- 3 deep settlement points.

The monitoring instrument locations are shown on Figure 7 and Figure 9. All GTCs are connected to dataloggers allowing continuous data collection and transmitted and accessed from an online portal. Settlement monitoring is completed by total station and RTK GPS ground survey. The Dam instrumentation is monitored and maintained in accordance with the South Dam Monitoring Standard Operating Procedure (SOP) (SRK 2020c).

2.5.3 West Dam

The West Dam is not yet constructed.

2.5.4 Other TIA Instrumentation and Monitoring

Additional monitoring data collected for the TIA are summarized below:

- The water level in the TIA Reclaim Pond is monitored by an automated pressure transducer-datalogger installed at monitoring point TIA-2. The data is transmitted by a solar-powered iridium satellite transceiver to an online portal where it can be accessed remotely by Agnico Eagle and SRK. There is also a back-up datalogger installed to record pond levels should a problem occur

with the primary data collection system. The secondary datalogger also records water temperature which is beneficial from a thermal review perspective.

- The primary datalogger is configured to collect a reading every 15 minutes in the summer and every 60 minutes during the winter. The data is transmitted to the online portal daily.
- On at least an annual basis, Environmental Resources Management (ERM) conducts a water level reference survey and bathymetry survey of the TIA basin. Based on communications from ERM and Agnico Eagle, the water level constant elevation was adjusted from 27.761 masl (ERM 2017) to 27.71 m on August 15, 2019 at 00:00, this constant remained unchanged for 2021.

Additional detail of the installed tailings monitoring system is described by ERM (2017) and SRK (2020b):

- Tailings deposition is a continuous operation and the volumes are monitored with a flowmeter and an automated data collection system;
- Reclaim water is measured using a flowmeter with an automated data collection system;
- Mine water is measured by means of a totalizer instrument, recorded manually twice daily; and
- Comprehensive climate data from the Doris meteorological station is maintained in a database for review in conjunction with any TIA monitoring.

2.6 Water Management

2.6.1 Water Management Plan and Water and Load Balance

The TIA is used as the overall collector for all site contact water, which is either pumped or trucked to the TIA. Saline underground water (i.e., mine water) may also be pumped to the TIA if it is not discharged directly to Roberts Bay. Water stored in the Reclaim Pond is recycled for processing make-up to the extent possible. Excess water in the TIA is discharged to Roberts Bay by the RBDS. Prior to discharge to Roberts Bay, all water must meet MDMER limits.

There are no non-contact surface water diversions upstream of the TIA. The TIA is in an isolated catchment measuring 461 ha, the benefits of diversions are generally outweighed by the relative cost and complexity of constructing them on the tundra. A schematic of the TIA water management plan is presented in Figure 13.

The 2020 detailed review of the operational water and load balance is provided in a separate report (SRK 2021a).

2.7 Dam Hazard Classification

Dam hazard classifications for the TIA containment dams were made in accordance with the Canadian Dam Safety Guidelines (CDA 2013), as well as the CDA Technical Bulletin on Application of Dam Safety Guidelines to Mining Dams (CDA 2014, CDA 2019), as summarized in Table 9. The designated dam hazard classifications assigned to each structure is listed in Table 10 (SRK 2015, 2016b, 2017e).

Table 9: Dam Hazard Classification (as defined in CDA 2013)

Dam Class	Population at Risk[1]	Incremental losses		
		Loss of Life[2]	Environmental and Cultural Values	Infrastructure and Economics
Low	None	0	Minimal short-term loss No long-term loss	Low economic losses; area contains limited infrastructure or services.
Significant	Temporary only	Unspecified	No significant loss or deterioration of fish or wildlife habitat Loss of marginal habitat only Restoration or compensation in kind highly possible	Losses to recreational facilities, seasonal workplaces, and infrequently used transportation routes.
High	Permanent	10 or fewer	Significant loss or deterioration of *important* fish or wildlife habitat Restoration or compensation in kind highly possible	High economic losses affection infrastructure, public transportation, and commercial facilities.
Very high	Permanent	100 or fewer	Significant loss or deterioration of *critical* fish or wildlife habitat Restoration or compensation in kind possible but impractical	Very high economic losses affecting important infrastructure or services (e.g., highway, industrial facility, storage facilities for dangerous substances).
Extreme	Permanent	More than 100	Major loss of *critical* fish or wildlife habitat Restoration or compensation in kind impossible	Extreme losses affecting critical infrastructure or services (e.g., hospital, major industrial complex, major storage facilities for dangerous substances).

Notes:

[1] Definitions for population at risk:

None – There is no identifiable population at risk, so there is no possibility of loss of life other than through unforeseeable misadventure.

Temporary – People are only temporarily in the dam-breach inundation zone (e.g., seasonal cottage use, passing through on transportation routes, participating in recreational activities).

Permanent – The population at risk is ordinarily located in the dam-breach inundation zone (e.g., as permanent residents); three consequence classes (high, very high, extreme) are proposed to allow for more detailed estimates of potential loss of life (to assist in decision-making if the appropriate analysis is carried out).

[2] Implications for loss of life:

Unspecified – The appropriate level of safety required at a dam where people are temporarily at risk depends on the number of people, the exposure time, the nature of their activity, and other conditions. A higher class could be appropriate, depending on the requirements. However, the design flood requirement, for example, might not be higher if the temporary population is not likely to be present during the flood season.

Table 10: Dam Hazard Classification of TIA Containment Structures

Structure	Population at Risk (PAR)	Loss of Life	Environmental and Cultural Values	Infrastructure and Economics	Overall Hazard Classification
North Dam	SIGNIFICANT	SIGNIFICANT	HIGH	LOW	HIGH
South Dam	SIGNIFICANT	SIGNIFICANT	HIGH	LOW	HIGH
West Dam (Not constructed)	SIGNIFICANT	SIGNIFICANT	HIGH	LOW	HIGH

3 TIA Management System Review Findings

3.1 Third Party Dam Safety Review

In accordance with CDA Dam Safety Guidelines (CDA 2013, 2014, 2019), including the CDA Technical Bulletin on Dam Safety Reviews (CDA 2016), independent third-party dam safety reviews (DSRs) should be conducted in accordance with a frequency informed by the hazard classification of the structures. This frequency typically ranges between 5 and 10 years. It is recommended a dam with a HIGH hazard classification, such as the North Dam and South Dam, undergo a dam safety review every seven years.

The Dam Safety Review was completed in 2021 by Tetra Tech Inc. Findings from this DSR were not yet available at the time of writing and will be discussed in later reports.

The hazard rating was reviewed as part of the 2019 inspection. In 2021, no changes in the TIA operations or context warrant modification to the hazard rating of HIGH the constructed North and South Dams. The hazard rating shall be reviewed periodically to ensure that the rating remains valid.

Given both dams underwent a DSR in 2021, in accordance with CDA guidelines, the next DSR would be planned for 2028.

Recommendations:

- No recommendations.
- Review and implement recommendations from the DSR where appropriate

3.2 Tailings Operating, Maintenance and Surveillance Manual

Phase 1 tailings management is carried out under a Tailings Operation, Maintenance and Surveillance (OMS) Manual prepared in 2016 (TMAC 2016). Because tailings deposition in 2017 was inconsistent and less than the planned deposition rates due to mill commissioning challenges, a thorough review of OMS Manual procedures was not undertaken in 2017, although a minor update was completed (TMAC 2017). There were however significant operational changes in 2018, including significant personnel changes, and as a result the OMS Manual became outdated. Although the OMS Manual was updated in 2017 (TMAC 2017), that update was centered around changes associated with Phase 2, and the necessary operational and personnel changes were not adequately captured. In 2019 and 2020, an updated OMS capturing input from site personnel, changes from the Phase 2 project, as well as the updated North and South Dam monitoring SOPs (SRK 2020b, 2020c) was submitted to TMAC. The full document has been rewritten to further improve the usability of the document. An updated set of Trigger Action Response Plans (TARPs) was submitted to TMAC in Q4 2020 and have been redistributed to Agnico Eagle following ownership transition. It is expected that the next revision of the OMS will integrate the dam monitoring SOPs, TARPs, Dam Emergency Plan as well as any changes to the tailings management system under Agnico Eagle's corporate tailings management system.

The roles and responsibilities for those involved in managing the TIA are defined in the current OMS Manual but are out of date (Due to the ownership transition from TMAC to Agnico Eagle). An update to the *Organization and Individual Responsibilities* section in the TIA OMS are recommended. This will be documented in the next revision of the TIA OMS Manual. SRK understands the primary responsible party for the TIA remains with the Environment team, with the Process (Mill) team and on-site water management teams playing a supporting role. An abbreviated list of key responsible parties is provided below (Agnico Eagle personnel unless otherwise stated):

- Michel Julien – Accountable Executive Officer, Vice-president Environment and Critical Infrastructure
- Thomas Lepine – Engineer of Record & Technical Specialist, Environmental Management
- Eric Steinmetzer– Mine General Manager
- Nancy Duquet Harvey – Environmental Superintendent & Responsible Person
- Paul Simms – Process Operations (Mill) Superintendent
- Doug Brown – Health and Safety Manager
- John Kurylo – SRK Design Engineer and Engineer of Record (EOR) of the Doris TIA throughout 2021. EOR to be transferred over to Thomas Lepine in 2022.
- Peter Luedke – SRK engineering support and current Deputy Engineer of Record

John Kurylo, MSc, PEng, a licenced professional engineer in Nunavut Territory, and a Senior Consultant was the EOR throughout 2021 and at the time of inspection. All monitoring data for the TIA is submitted to the EOR monthly for review, and the EOR remains in constant communication with site staff regarding the overall operation of the TIA. Agnico Eagle has allowed free access to information and resources to allow the EOR to fulfill his duties.

Recommendation:

- Overall, the OMS manual, TARPS and Dam Emergency plan must be reviewed by Agnico Eagle and updated to reflect the many recent changes, including, but not limited to the Dam Emergency Plan, the updated TARPs and change in key personnel listed in the OMS manual. Minor updates to the North and South dam monitoring SOPs are also recommended.
- All components should be reviewed against Agnico Eagle's corporate tailings management system and updated tailings standards through a gap analysis to identify required updates.
- *SRK and Agnico Eagle are currently collaborating on updates to these plans.*
- The suite of OMS, TARPs, ERP and Dam Emergency Plan must be reviewed with all site operations annually and updated as necessary.
- Agnico Eagle should ensure all staff are properly informed and trained on the contents of the OMS Manual.

4 TIA Inspection and Monitoring Instrumentation Findings

4.1 Compliance with Monitoring Frequency Requirements

The North Dam monitoring frequency requirements were first outlined in the North Dam As-built Report (SRK 2012b) and subsequently finalized in the North Dam Monitoring Standard Operating Procedures (Monitoring SOP) which was updated in 2020 (SRK 2020b). The South Dam monitoring requirements are outlined in the South Dam Monitoring SOP (SRK 2020c).

Since transitioning to active tailings deposition in 2017, and commissioning of the South Dam in 2018, routine monitoring and inspections of the North and South Dam have been completed by site personnel. The monitoring frequency requirements and actual monitoring frequency for the 2021 monitoring year (October 1, 2020 to September 30, 2021) are summarized for North and South Dams in Table 11 and Table 12, respectively.

Table 11: North Dam Monitoring Frequency Requirements for the 2021 Monitoring Year[(1)]

Element	Item	Method	Responsibility	Required Frequency	Conformance with Frequency Requirements (SRK 2020b)[(1)(2)]	Comments
Thermal	Ground Temperature Cables	Datalogger	Agnico Eagle	Daily (automated)	Yes	Recorded four times daily
	Thermo-syphons				Yes	Record four times daily
	Datalogger downloads	Manual		Monthly	Yes	Data collected monthly
Deformation	Downstream Surface Settlement	Manual	Agnico Eagle	Monthly (May to Nov.)	No (Acceptable)	Surveys received monthly, except for November 2020
	Downstream Deep Settlement				No (Acceptable)	
	Crest Settlement				No (Acceptable)	
	Depressions				Yes	No changes observed
	Inclinometers			Monthly	No (Acceptable)	Data collected monthly, except when inclinometer was off site for servicing
Water Balance	Water Level	Datalogger / Pressure Transducer	Agnico Eagle	Daily (automated)	Yes	Readings every 15 min and uploaded daily during open water season, every 60 min and uploaded ever 5 days during winter.
	Water Level	Manual		Monthly	Yes	Manual water level surveys only required if a data logger is not in place, however monthly elevation checks are suggested in conjunction with the North Dam surveys. Water level constant for pressure transducer is checked annually during open water season.

Element	Item	Method	Responsibility	Required Frequency	Conformance with Frequency Requirements (SRK 2020b)[1][2]	Comments
	Seepage Monitoring[5]			Weekly when flowing water is observed	No (acceptable)	Water quality sampling occurred, however not always weekly. Water flow estimates were not provided. Frequency modified for 2022 (Section 4.2.8)
Visual	Visual Walkover Inspection and Reporting	Manual	Agnico Eagle	Weekly (below FSL[3]) Daily (at or above FSL)	No	34 inspections conducted during this monitoring year. The inspection rate is below the target (52 inspections)[4]
	Annual Geotechnical Inspection		Independent Qualified Licensed Geotechnical Engineer	Annually	Yes	August 2021 (This report)
Maintenance						
North Dam Thermal Datalogger	Datalogger Primary Batteries	Manually recharge	Agnico Eagle	Annually	Yes	Recharged March 2021
	Datalogger Backup Batteries	Manually replace		5-year cycle	Yes	Replaced during datalogger recalibration
	Datalogger Recalibration	Manual			Yes	Completed Jan. 2018
	Desiccant Packs	Manually replace		As required	Not required	No action required
Water Level Datalogger Station (TIA-2)	Datalogger Transmission Subscription	Online		Annually	Yes	33% of the data subscription remains
	Physical Datalogger Station	Manually recalibrate or replace		As required	Not required	No action required

Note(s):

1 The monitoring year (or data reporting period) included in this report was October 1, 2020 to September 30, 2021.

2 This column lists if the monitoring frequency is compliant with the monitoring frequency requirements during this monitoring year.

3 FSL: Full Supply Level

4 Due to COVID-19 and reduced personnel at site

5 The Seepage Monitoring standard operating procedure (SRK 2020b) monitors the flowing water at the toe of the North Dam for chemical signature of seepage originating in the TIA Reclaim Pond, no chemical signature has been observed to date. The Seepage Monitoring SOP also includes TL-5 geochemical sampling and Geochemical QA/QA monthly while water flow is observed at the North Dam toe.

Table 12: South Dam Monitoring Frequency Requirements for the 2021 Monitoring Year [1]

Element	Item	Method	Resp.	Required Frequency	Conformance with Frequency Requirements (SRK 2020c)[1][2]	Comments
Thermal	Ground Temperature Cables	Datalogger	Agnico Eagle	Daily (automated)	Yes	Data is transmitted every 12 hours.
Deformation	Deep Settlement	Manual	Agnico Eagle	Monthly (May – Nov.)	No (acceptable)	Surveys collected monthly, except for November 2020
	Crest Settlement				No (acceptable)	Surveys collected monthly, except for November 2020

Element	Item	Method	Resp.	Required Frequency	Conformance with Frequency Requirements (SRK 2020c)[1][2]	Comments
	Surficial Settlement				No (acceptable)	Surveys collected monthly, except for November 2020
	Depressions				Yes	No issues observed
Water Balance	Water Level	Datalogger	Agnico Eagle	Daily	Yes	Refer to Table 11
	Seepage Monitoring	Manual	Agnico Eagle	Weekly when observed (flowing water)	Yes	No flowing water observed.
	Downstream Ponded Water	Manual	Agnico Eagle	Monthly when observed	Yes	Samples collected once in July 2021.
Visual	Visual Walkover Inspection	Manual	Agnico Eagle	Weekly (below FSL[3]) Daily (at or above FSL)	No	29 inspections conducted during this monitoring year. The inspection rate is below the target (52 inspections)[4]
	Annual Geotechnical Inspection		Independent Qualified Licensed Geotechnical Engineer	Annually	Yes	August 2021 (This report)
Maintenance						
South Dam Thermal Datalogger	Datalogger Batteries	Solar recharge	Agnico Eagle	As needed	Yes	No maintenance required
	Datalogger Recalibration	Manual				
	Desiccant Packs	Manual				
	Data logger transmission subscription	Online	SRK/Agnico Eagle	Annually	Yes	Beaded stream subscription renewal required

Note(s):

[1] The monitoring year (or data reporting period) included in this report was October 1, 2020 to September 30, 2021.

[2] This column lists if the monitoring frequency is compliant with the monitoring frequency requirements during this monitoring year.

[3] FSL: Full Supply Level

[4] Due to COVID-19 and reduced personnel at site

Recommendations:

- Recommended monitoring frequencies have been met in all categories except for visual inspections and one survey monitoring event. Agnico Eagle should aim to improve the frequency of these monitoring events in 2022.
- *It is understood that COVID-19 and site staffing limitations during this monitoring year impacted the ability to collect some data.*

4.2 North Dam Inspection and Monitoring

4.2.1 Ground Temperature Cables

To monitor long-term temperature of the frozen core and the dam foundation, a total of twenty-four GTCs were installed during the North Dam construction (SRK 2012b). Of the twenty-four installed GTCs, twenty-two are still functional. Since September 2012, GTC data for the North Dam is recorded every six hours by two Campbell Scientific CR1000 dataloggers (Photolog 3). Data is downloaded directly from the dataloggers by Agnico Eagle personnel.

The recorded temperature data is presented in Appendix A, and the detailed dam thermal review is presented in Appendix K. In general, the data logger and GTC system is performing well. The complete status of all North Dam GTCs is summarized in Table 13.

Table 13: North Dam Ground Temperature Cable Status

GTC ID	Status	Comments
ND-VTS-040-KT	Active	Disconnected for recalibration between January 1 to March 3, 2018
ND-HTS-040-31.5	Active	Disconnected for recalibration between January 1 to March 3, 2018
ND-HTS-040-33.5	Active	Cable disconnected from datalogger October 10, 2013 to May 13, 2014
		Connection to datalogger more permanently repaired July 2014
		Disconnected for recalibration between January 1 to March 3, 2018
ND-VTS-060-US	Inactive	Irreparably damaged between April 27 and August 8, 2012
ND-VTS-060-DS	Active	Disconnected for recalibration between January 1 to March 3, 2018
ND-VTS-060-KT	Active	Spliced during construction. Fully operational, except for recalibration January 1 to March 3, 2018
ND-HTS-060-28.8	Active	Bead 7 – No readings February 11, 2012 to December 8, 2013
		Bead 7 – No readings since April 21, 2014
		Bead 7 – Readings between November 1, 2014 and April 19, 2015
		Bead 7 – Readings between October 2015 and April 2016
		Bead 7 – Readings between October 2016 and June 2017
		Bead 7 – Readings between September 2017 and May 2018 (excluding recalibration period), resuming at the end of October 2018. Occasional erratic readings continue (since fall 2016) and are attributed to instrument errors.
		Bead 9 – No readings October 10, 2013 to May 20, 2014 and July 2014 onward
		Disconnected for recalibration between January 1 to March 3, 2018
ND-HTS-060-31.0	Active	Disconnected for recalibration between January 1 to March 3, 2018
ND-HTS-060-33.5	Active	Disconnected for recalibration between January 1 to March 3, 2018
ND-VTS-085-US	Active	Erratic data at most beads (excluding Beads 3, 6 and 9) between June 2016 and May 2017 with lower amplitude spikes between December 2016 and May 2017
		Erratic data subsided since May 2017

GTC ID	Status	Comments
		Disconnected for recalibration between January 1 to March 3, 2018
ND-VTS-085-DS	Active	Erratic data at most beads (excluding Beads 3, 6 and 9) between June 2016 and May 2017 with lower amplitude spikes between December 2016 and May 2017
		Erratic data subsided since May 2017
		Disconnected for recalibration between January 1 to March 3, 2018
ND-VTS-085-KT	Active	Erratic data at most beads (excluding Beads 3, 6 and 9) between June 2016 and May 2017 with lower amplitude spikes between December 2016 and May 2017
		Erratic data subsided since May 2017
		Disconnected for recalibration between January 1 to March 3, 2018
ND-HTS-085-25.3	Active	Disconnected for recalibration between January 1 to March 3, 2018
ND-HTS-085-29.4	Active	Disconnected for recalibration between January 1 to March 3, 2018
ND-HTS-085-33.5	Inactive	Irreparably damaged during construction
ND-VTS-130-US	Active	Bead 9 – Readings erratic for periods since June 2016 (temperature dropping randomly to less than -15°C)
		Disconnected for recalibration between January 1 to March 3, 2018
		Bead 1 offline since August 13, 2020
		Bead 8 offline from Feb 25 to September 21, 2021
ND-VTS-130-DS	Active	Small magnitude temperature spikes during summer months between 2013 and 2017 (Bead 3, 7, 8, 9, 11), no spikes observed in 2018
		Beads 3 – 8 were offline after the connector at the datalogger housing was damaged on September 24, 2017. Repaired and reconnected on March 11, 2018 following datalogger recalibration
		Disconnected for recalibration between January 1 to March 3, 2018. Beads 3 to 8 were disconnected and repaired between September 24, 2017 and March 3, 2018 (due to damaged cable connection)
ND-VTS-130-KT	Active	Disconnected for recalibration between January 1 to March 3, 2018
ND-HTS-130-28.8	Active	All beads were offline after the connector at the datalogger housing was damaged on September 24, 2017. Repaired and reconnected on March 4, 2018 following datalogger recalibration
		Disconnected for recalibration between January 1 to March 3, 2018
		Low temperature spikes and intermittent logging from Bead 2 in Summer 2018 to 2020
ND-HTS-130-31.0	Active	Disconnected for recalibration between January 1 to March 3, 2018
ND-HTS-130-33.5	Active	Fully operational, except for cable repair and recalibration between September 24, 2017 to March 3, 2018
ND-VTS-175-KT	Active	Spliced during construction
		Incorrectly connected to datalogger as ND-HTS-175-33.5 from August 9, 2012 to June 16, 2014
		Beads 9, 10 and 11 – No readings August 9, 2012 to June 16, 2014
		Disconnected for recalibration between January 1 to March 3, 2018

GTC ID	Status	Comments
ND-HTS-175-32.5	Active	Disconnected for recalibration between January 1 to March 3, 2018
ND-HTS-175-33.5	Active	Spliced during construction
		Incorrectly connected to datalogger as ND-HTS-175-KT, from August 9, 2012 to June 16, 2014
		Disconnected for recalibration between January 1 to March 3, 2018

Source: J:\01_SITES\Hope.Bay\!Project_Data (Not Job Specific)\06_NorthDamMonitoringData\[SiteMonitoringSummary.xlsx]ThermisorStatus

The North Dam GTCs were installed to ensure the dam core and key trench foundation section remain below the thermal design freezing point depression criteria of −2˚C and −8˚C, respectively under normal operating conditions. Under upset conditions these temperatures increase to −1˚C and −7˚C. In addition, ground temperature data along with thermosyphon monitoring data can be used to determine if the thermosyphons are functioning correctly (Section 4.2.2). Observations related to a review of the data presented in Appendix A and Appendix K are summarized in Table 14.

Table 14: Summary of Core and Key Trench Ground Temperature Cable Observations

Zone	Horizontal GTCs	Vertical GTCs	Observation
Design Temperature	−2˚C	−8˚C	The minimum criteria required to ensure Dam is performing in accordance with design specifications
Station 0+040	Meets	Meets	Performing as expected with substantive safety buffer and slight trend suggesting ongoing cooling
Station 0+060	Meets	Meets	Performing as expected with substantive safety buffer and slight trend suggesting ongoing cooling In conjunction with Appendix G, no evidence of seepage was noted at this station
Station 0+085	Meets	Meets	Generally performing as expected with substantive safety buffer within the core and slight trend suggesting ongoing cooling in the foundation. A rise in the temperature of the upstream-most beads of ND-HTS-085-29.4 and ND-HTS-085-25.3 was observed and has since returned to a lower seasonal maximum. In conjunction with Appendix G, no evidence of seepage was noted at the North Dam.
Station 0+130	Meets	Meets	Generally performing as expected with substantive safety buffer in the core and stable or a slight cooling trend within the core and the key trench foundation Erratic reading attributed to instrumentation error are noted in both ND-HTS-130-28.8 (Bead 2) and ND-VTS-130-US (Bead 9) in 2021. In conjunction with Appendix G, no evidence of seepage was noted at the North Dam.
Station 0+175	Meets	Meets	Generally performing as expected with substantive safety buffer and stable trend in the core, and slight cooling trend in the foundation

Recommendations:

- No recommendations.

- *Consider implementing satellite telemetry for the North Dam data loggers to allow regular transmission of the measurements rather than monthly manual downloads. This approach would be more proactive and has the potential to improve the efficiency of the download and processing procedures.*

4.2.2 Thermosyphons

Passive thermosyphons assist in cooling the North Dam key trench foundation. They function when the ambient air temperature is colder than the ground temperature where the thermosyphon is located. This happens because of phase change of the carbon dioxide gas with which the thermosyphon is filled. Therefore, during the winter months the cold ambient air temperature is used to draw heat from the foundation, but during the summer period the thermosyphons remain dormant.

Thermosyphon temperature monitoring for the North Dam has been automated. Single bead thermistors connected to the datalogger system are attached to each thermosyphon evaporator pipe below the ground surface, and insulation has been placed around the thermistor beads to ensure the evaporator pipe temperature, and not the ambient air temperature, is measured (SRK 2012b). Additionally, air temperatures are recorded at the dataloggers every six hours. This data is downloaded as part of the monthly ground temperature cable datalogger downloads.

To monitor the performance of the thermosyphons, thermosyphon evaporator pipe contact temperatures and air temperatures are plotted against time. During the winter months, when the thermosyphons are working, the thermosyphon pipe temperature should be roughly 5˚C warmer than the air temperature. If the thermosyphon pipe temperature during the winter months is approximately the same as the air temperature, it indicates that the thermosyphon is not working correctly.

Thermistor data indicates all the south and north thermosyphons are functioning except for North 2 (Appendix B). Since 2012, the measured pipe temperature of North 2 was only slightly higher than the measured air temperature, which indicates a malfunction. Ground temperature readings near the North 2 thermosyphon pipe support the conclusion that the North 2 thermosyphon is not working correctly.

As documented in past AGI's (SRK 2021b and 2020a) past efforts to investigate and remediate the non-functional thermosyphon through practical measures have been exhausted. Thermal modelling of the frozen core has considered loss of the North 2 thermosyphon. There are no significant concerns arising from the loss of the North 2 thermosyphon. Any additional measures will be taken as necessary based on the observed performance of the overall dam.

The thermosyphon radiator steel foundations are in good condition. The thermosyphons themselves do not show any physical damage; however, there is rust and peeling paint at the weld between the evaporator pipe and the twin radiators on most of the thermosyphons. AFC was not concerned about this surface rust during their inspection, however some preventative maintenance may be undertaken by cleaning and repainting around the weld.

Recommendations:

- The joints on the thermosyphons are showing signs of weathering and rusting. The thermosyphon weld joints should be cleaned (wire-wheel) and repainted to slow additional corrosion.

4.2.3 CR1000 External Datalogger Battery Voltage

Each CR1000 data logger is powered by an external lead acid battery. Battery voltage is an important indicator of datalogger performance. If the battery voltage drops below 12 V, it is operating outside of the optimal range. At or below 9.6 V, voltage is outside of the operating range and the recorded readings could be incorrect, or the datalogger will shut down and readings would not be recorded at all. The dataloggers record the minimum battery voltage four times daily. A graph of battery voltage versus time is provided in Appendix C.

The batteries have been recharged on multiple occasions since the North Dam was commissioned. At no time has the voltage dropped low enough to cause any concerns with data integrity. The batteries should continue to be monitored to ensure they maintain their charge through the winter months.

Recommendations:

- The external CR1000 datalogger batteries should continue to be monitored and recharged annually or replaced as needed.

4.2.4 Inclinometers

Six inclinometers were installed within the downstream face of the North Dam. These inclinometers are used along with the survey monitoring points to monitor deformation within the dam and dam foundation. Inclinometer readings are taken by Agnico Eagle site personnel.

Inclinometer measurements are provided in Appendix D. Data quality for the surveys has generally been good. The inclinometer profiles show only negligible displacements in the dam foundation, and small displacements over the portion of the inclinometer above the natural ground surface as summarized in Table 15. Inclinometer ND-IN-120-3 is the only inclinometer that suggests a trend of downslope movement, though the total magnitude is 3 cm. All other inclinometers are showing virtually no movement, or the movement is oscillating seasonally which likely indicates there is some movement of the inclinometer tube itself, as opposed to actual deformation of the dam or foundation.

Table 15: Summary of Inclinometer Measurement Observations (Sep. 2012 through September 2021)

Inclinometer	Maximum Overall Deformation			Maximum Foundation Deformation (m)	Observations
	Magnitude (m)	Location – Depth Below Dam Shell (m)	Location – Height Above Foundation (m)		
ND-IN-070-1	0.026	0	9.5	Less than 0.01	Displacement essentially constant since 2015
ND-IN-070-2	0.033	2.0	7.0	0.016	Seasonal oscillation.
ND-IN-070-3	0.013	2.0	5.5	Less than 0.01	Displacement essentially constant since 2015
ND-IN-120-1	0.012	0	7.0	Less than 0.01	Deformation essentially constant since May 2016
ND-IN-120-2	0.022	0	6.0	Less than 0.01	Displacement trend constant since November 2017.
ND-IN-120-3	0.030	0	3.7	Less than 0.01	General trend of movement in dam shell, towards the south and downstream of the dam

The inclinometer was sent to Durham-Geo Slope Indicator (DGSI) for service and recalibration between February and May 2021. No readings were collected during this period. The next service and recalibration should be planned for 2024.

Recommendations:

- No recommendations.
- *Site staff should maintain a record of probe and read-out service and recalibration dates. The next service and recalibration should be planned for 2024.*

4.2.5 Survey Monitoring Points

A series of 14 crest survey monitoring points, 3 deep survey monitoring points, and 18 surficial survey points were installed in the North Dam upon completion. These survey monitoring points were installed to monitor for any surface movement of the crest and downstream face, and deep settlement of the downstream foundation of the dam.

Survey monitoring of the North Dam occurred for six of seven occurrences during the monitoring year. The survey data should be collected monthly between May and November. Complete survey data is presented in Appendix E.

The overall vertical and horizontal displacement since completion of construction based on these readings are summarized in Table 16. Deep settlement and crest displacement have been very small and of similar magnitude, and has essentially been unchanged since September 2013, confirming that much of the measured displacement to date is all directly related to the period immediately following construction.

Downstream dam shell settlement follows the same general trends as the deep and crest settlement points; however, the total displacement magnitude is larger. There is also an increasing trend in displacement in two points (ND-SSP-155-2 and ND-SSP-110-3) since June 2016. The measured vertical displacement of these points is limited, but the horizontal displacement is increasing, which results in the overall increased displacement trend. Both these points are located near the downstream toe of the dam, and this increased displacement is likely a result of increased active layer thaw beneath the shallow rockfill toe of the dam. The survey data does not indicate any immediate concerns, but will continue to be closely monitored for acceleration in this trend going forward.

Table 16. Summary of Survey Monitoring Observations (2021 surveys relative to May 2012)

Location	No. of Stations	Vertical Displacement (m)		Horizontal Displacement (m)	
		Max.	Typical	Max.	Typical
Deep settlement points (DSP)	3	0.04	0.01	0.10	0.05
Crest settlement points (SMP)	14	-0.09	-0.02	0.11	0.05
Surficial settlement points – Downstream dam shell (SSP)	18	-0.22	0.11	0.36	0.08

Notes:

Negative vertical displacements are in the downward direction

Displacement values shown exclude surveys expected to have significant survey errors, indicated by a spike in the data.

Recommendations:

- No recommendations.
- *Install a few key surficial survey points (SSP) on the upstream face of the North Dam. These additional SSPs will track the deformation of the upstream shell as the upstream foundation thaws due to thermal loading of an elevated Reclaim Pond water level. Note that upstream foundation thaw is expected as per the original designs and there are no concerns with current thaw rate; however, improved tracking of the displacement going forward will provide an additional line of evidence (in addition to monitoring ground temperatures) should adverse thaw conditions occur.*

4.2.6 Creep Displacement

North Dam displacements as recorded by the inclinometers and survey points are expected to be caused primarily because of creep of the saline ice-rich permafrost foundation soils. Table 17 summarizes the predicted deformation as determined through rigorous numerical creep deformation modeling (SRK 2017c), as well as the allowable design values. Figure 15 presents a plot comparing predicted vertical displacement against measured vertical displacement along the crest of the dam near Station 1+20. This graph clearly demonstrates that the current displacement is less than predicted.

Table 17: Predicted North Dam Deformation Displacement

Period	Location	Max. Shear Strain Rate (year-1)	Max. Shear Strain (m/m)	Displacement (m)	
				Max. Horizontal	Max. Vertical
Overall allowable design values	Core	3.2E+02	2%	-	1.0
10 years post construction	Core crest	-	-	-	0.2
	Core	5.0E-08	5.0E-02	0.4	0.6
	Foundation	1.0E-07	~1.0E-01	0.4	0.6
30 years post construction	Core crest	-	-	-	1.0
	Core	2.0E-08	1.0E-01	0.8	1.0
	Foundation	4.0E-08	~2.0E-02	0.6	1.0

Recommendations:

- No recommendations.

4.2.7 Visual Inspection (Walk Over)

Visual inspections of the North Dam are required weekly when tailings deposition is occurring, and when the TIA water level is below the FSL. During the 2021 monitoring period, 34 weekly visual inspections were completed, and the associated reports and photos are included in Appendix F.

The visual inspection reports and tracks all changes to the dam surface, visible damage to instrumentation, signs of erosion or seepage, or any other surface anomalies. To date, the primary observations of note from the inspections include:

- Surface depressions in the upstream and downstream slopes of the dam;
- Minor cracking on the turn-around pad on the upstream side;
- Rust on the thermosyphons (Section 4.2.2);
- Erosion near the thermosyphons (Section 4.2.2); and
- Ponded or flowing water at the downstream toe of the dam (Section 4.2.8).

The surface depressions are located on the upstream and downstream faces of the dam. Six depressions on the North Dam fill have historically been classified as significant depressions requiring monitoring (D1, D2, D3, U1, U2 and U3), as illustrated in SRK 2021. Based on the AGI physical inspection (Photolog 1 and 2), SRK is satisfied that there were no substantial changes to the surface depressions since the 2017 AGI, and this observation is confirmed by the settlement data.

Some surficial cracking has been noted in past walk over inspections near the upstream face of the North Dam near the historic pumping access pad constructed while the mine was in care and maintenance. During the 2021 inspection, the pad was flooded so no visual inspection could be made, however the thermal monitoring data does not indicate concerning levels of thaw in the upstream foundation.

Recommendations:

- Increase the completion of weekly visual inspections at the North Dam in accordance with the specified frequency.
- *The number of visual inspections (formerly walk overs surveys) has improved in 2021, however additional inspections are required to be in compliance with the specified frequency.*

4.2.8 Monitoring of Flowing Water at the Toe of the North Dam

The monitoring of the flowing water at the North Dam toe is described in the Monitoring SOP (SRK 2020b) and monitors the flowing water for evidence that the source may be from the TIA Reclaim Pond chemical signature indicating seepage through the dam. The program includes routine water quality sampling and flow measurements if flow is observed. SRK's review of the 2021 water quality data (Appendix G) confirms that there is no data to suggest the presence of TIA Reclaim Pond water in the flowing water at the toe of the North Dam. Flow measurements were not collected in this monitoring period, however, flow observed was within the typical range (0 to 2.5l/s) during the visual inspections June through September 2021.

Recommendations:

- Modify the water quality monitoring SOP based on the absence of data to suggest the presence of TIA Reclaim Pond water in the flowing water at the toe of the North Dam. Recommended changes to the monitoring SOP are below, final changes to the frequency will be documented in an updated SOP.
  - Reduce the water quality and flow monitoring frequency for field measurements, from once per week to once per month while flowing water is observed, provided the laboratory water quality sample is being collected and analyzed as per the SOP.
  - Reduce the laboratory water quality monitoring frequency to once per year, during August, when flowing water is observed at the downstream toe, ensuring that this sample is collected and analyzed per the SOP, including all field parameters. This change in frequency also applies to the other LAS samples described in the monitoring SOP.

4.2.9 Physical Inspection of the North Dam

As part of the 2021 AGI an inspection of the North Dam was completed. No additional issues of concern were observed. The North Dam appears to be in good condition.

Recommendations in the 2020 AGI suggested spreading of the crush material on the pumping pad on the upstream side of the North Dam to avoid concerns about observed cracking. The recommendation to spread this material is changed to either leave the material in place (with the understanding that the cracking is not a concern), or removal of the crushed rock pad as a house-keeping item. Site staff are familiar with the cracking mechanism on this pad, and it is recognized not to be a concern, and spreading the material will likely result in additional visual changes in subsequent years as the material settles.

The attached Photolog (Photolog 1 to 3) provides a general overview of conditions on the North Dam.

Recommendations:

- No recommendations.
- *The v-notch weir at the toe of the dam is not performing correctly. To minimize future thermal impacts, the v-notch weir should be decommissioned and the velocity-area method used in its place when flow estimation is required.*
- *If site elects to do some clean-up of the upstream pumping pad (when the Reclaim Pond water level is decreased, the crush material should be removed as spreading the material may increase the incidence of visible cracking.*

4.3 South Dam Inspection and Monitoring

4.3.1 Ground Temperature Cables

To monitor long-term temperature of the frozen foundation dam, a total of twenty-seven GTCs were installed during South Dam construction (SRK 2018c). The GTCs are connected to Beaded Stream Dataloggers (D405) to allow continuous data capture. Summarized thermal data is shown in Appendix A. Table 18 provides a summary of the GTC status during the 2021 AGI inspection.

The thermal design freezing point depression criteria requires a ground temperature of less than -2°C at the upstream base of the key trench (Figure 9). The ground temperatures generally meet the thermal design criteria, and the dam is performing as expected.

Table 18: South Dam Ground Temperature Cable Status Summary

GTC ID	Station ID	Status	# of Sensors (Functional / As-built)	Comment
SD-VTS-065-KT	0+65	Active	11 / 11	▪ Damaged following construction (repaired)
SD-HTS-065-US	0+65	Active	5 / 5	▪ Damaged following construction (repaired)
SD-VTS-155-KT	1+55	Active	11 / 11	
SD-HTS-155-US	1+55	Active	5 / 5	
SD-VTS-155-US	1+55	Inactive	0 / 11	▪ Single sensor functioning until 11/8/2019
SD-VTS-155-DS	1+55	Active	11 / 11	
SD-HTS-155-KT	1+55	Inactive	0 / 11	▪ Damaged during construction (irreparable)
SD-HTS-240-KT	2+40	Active	11 / 11	
SD-VTS-240-KT	2+40	Active	11 / 11	
SD-HTS-240-US	2+40	Active	7 / 7	
SD-VTS-240-US	2+40	Inactive	0 / 11	▪ Measurements ended on 10/10/2019
SD-VTS-240-DS	2+40	Inactive	0 / 11	▪ Measurements ended on 10/22/2019
SD-VTS-365-KT	3+65	Inactive	0 / 11	▪ Damaged following construction (irreparable)
SD-HTS-365-KT	3+65	Active	11 / 11	▪ Damaged following construction (repaired)
SD-HTS-365-US	3+65	Active	11 / 11	

GTC ID	Station ID	Status	# of Sensors (Functional / As-built)	Comment
SD-VTS-365-US	3+65	Active	11 / 11	
SD-VTS-365-DS	3+65	Inactive	0 / 11	▪ Measurements ended on 8/3/2020
SD-VTS-US1	3+65	Active	2 / 13	▪ Installed in suspected ground ice wedge near upstream toe ▪ Bead 1 and 2 active
SD-VTS-US2	3+65	Active	1 / 15	▪ Installed in suspected ground ice wedge near upstream toe ▪ Bead 1 active
SD-VTS-460-KT	4+60	Active	11 / 11	
SD-HTS-460-KT	4+60	Active	11 / 11	
SD-VTS-460-US	4+60	Active	11 / 11	▪ Damaged following construction (repaired)
SD-VTS-460-DS	4+60	Active	11 / 11	
SD-HTS-460-US	4+60	Inactive	0 / 5	▪ Damaged following construction (irreparable)
SD-VTS-510-KT	5+10	Active	11 / 11	
SD-HTS-510-US	5+10	Active	5 / 5	▪ Damaged following construction (repaired)
SD-HTS-B1-KT	NA	Active	20 / 20	

Table 19: Summary of Key Trench foundation Ground Temperature Cable Observations

Zone	Horizontal GTC	Vertical GTC	Observation
Design Freezing Point Depression	−2˚C	−2˚C	The minimum criteria required to ensure Dam is performing in accordance with design specifications
Station 0+65	No GTC	Meets	Performing as expected with substantive safety buffer and slight trend suggesting ongoing cooling
Station 1+55	Offline	Meets	Performing as expected with substantive safety buffer. SD-HTS-155-KT has been offline since construction
Station 2+40	Meets	Meets	Performing as expected with substantive safety buffer
Station 3+65	Meets	Offline	Performing as expected with substantive safety buffer in the base of the key trench. SD-VTS-365-KT has been offline since construction.
Station 4+60	Meets	Meets	Performing as expected with substantive safety buffer and slight trend suggesting ongoing cooling
Station 5+10	No GTC	Meets	Performing as expected with substantive safety buffer and slight trend suggesting ongoing cooling
SD-HTS-B1-KT	Meets	N/A	Performing as expected with substantive safety buffer. Bead 1 and 2 (near station 2+40) exceed the foundation freezing point depression seasonally, however no adverse performance is observed at Station 2+40 in the other GTCs

Based on the operational GTCs, the thermal design criteria along the base of and in the foundation of the key trench is being met in all locations where data is available. A thorough review of the South Dam GTCs is provided in Appendix K.

Recommendations:

- GTCs provide thermal monitoring of the dam to ensure conditions remain within the intended design for safe operation and tailings containment. GTC replacement is recommended in some areas of the South Dam where recent instrument failure has occurred. Four replacement GTCs are suggested to be installed at this time (two upstream and two downstream). Agnico Eagle should work with the EOR to install these replacement GTCs as soon as practical. Priority should be given to the two upstream GTC replacements. Four replacement GTC strings are on site (at the Doris North Camp).
- Complete a detailed visual inspection of the South Dam after spring melt, especially looking for any exposed or damaged ground temperature cables. This will allow for preventative maintenance and placement of protective material to be done if exposed cables are observed, which will help to limit the potential for damage from wildlife.
- Complete a manual download of data from each datalogger once in 2022, following the instructions in the monitoring SOP.
- *Beadedstream telemetry subscription requires annual renewal. Agnico Eagle has taken over the subscription with Beadedstream and will be responsible for maintenance of the GTC telemetry system operations are maintained.*

4.3.2 Survey Monitoring Points

A series of 12 crest survey monitoring points, 3 deep settlement points, and 26 surficial survey monitoring points are proposed for the South Dam. Survey monitoring points were installed in August 2019. Surveys were collected monthly between May through November. For this monitoring period, six of the potential 7 surveys were collected. The November survey was missed due to workforce limitations on site. Complete survey data is presented in Appendix E.

Table 20: Summary of Survey Monitoring Observations (2021 surveys relative to August 2019)

Location	No. of Stations	Vertical Displacement (m)		Horizontal Displacement (m)	
		Max.	Typical	Max.	Typical
Deep settlement points (DSP)	3	-0.05	-0.02	0.05	0.03
Crest survey monitoring points (SMP)	14	-0.06	-0.04	0.04	0.02
Surficial survey settlement points - Downstream dam shell (SSP)	18	-0.05	-0.03	0.04	0.02

Notes:

SSP locations are surveyed by RTK GPS due to line-of-sight challenges, as such the accuracy of the measurements may be lower.

The overall vertical and horizontal displacement since August 2019 is limited in all survey locations. The relative increase in displacement in Fall 2020 appears to be a systematic error between the total station and RTK GPS survey methods for each survey location type. Following the apparent spikes in

Fall 2020, displacements have returned to a more typical magnitude. In 2021, the SMP and DSP points have indicated a downward displacement of 5-10 mm, however these displacements were not confirmed by the SSP points. The SSP points are surveyed by RTK GPS and the SMP and DSP points are surveyed by total station, so the discrepancy is attributed to survey error. At this point the limited displacements observed are not of concern, but detailed review of monitoring data will continue

Recommendation:

- A survey of the downstream toe is required as part of the Monitoring SOP with the intent of being completed at the same time as the monthly monitoring surveys (May to November), however the frequency requirement in the SOP requires modification. The toe survey should be conducted at least once annually during snow-free conditions (typically August) each year to track the lateral displacement and the extent of ponding downstream of the dam. Additional dam toe surveys may be collected during monthly GPS survey events when the toe is mostly snow free.
- Update the SOP and monitoring schedule to reflect the modified frequency.
- *In 2021, a drone LiDAR survey was completed over the North Dam, South Dam and tailings beach. The LiDAR survey is valuable data for tracking the evolution of the TIA and provides an acceptable method for satisfying the downstream toe survey requirement.*

4.3.3 Visual Inspection (Walk Over)

Visual inspections of the South Dam are required weekly when tailings deposition is occurring, and when the TIA water level is below the FSL. During this monitoring period, 29 of the possible 52 visual inspections were completed and the associated reports and photos are included in Appendix F.

The visual inspection reports and tracks all changes to the dam surface, visible damage to instrumentation, signs of erosion or seepage, or any other surface anomalies. At the South Dam it also provides record of the active spigot locations. To date, the primary observations of note from the visual inspections include:

- Changes in spigot locations.
- Instrumentation hardware issues or ice buildup on solar panels.
- Ponding or beach length encroachment on the dam.
- Changes in the size of ponded water on the downstream side of the dam.

Updated Visual Inspection forms were issued in 2021. The name of this monitoring component was modified from Walkover Survey to avoid confusion with naming of ground survey monitoring methods.

Recommendation:

- Increase the completion of weekly visual inspections at the South Dam in accordance with the required weekly frequency.

4.3.4 Monitoring of Flowing and Ponded Water at the Toe of the South Dam

The South Dam seepage and ponded water monitoring program is described in the Monitoring SOP (SRK 2020c). The program includes routine water quality sampling and flow measurements if flowing water is observed. Since dam construction in 2019, there has been no flowing water observed at the toe of the South dam. The purpose of the ponded water monitoring program is to establish a geochemical baseline and monitor for potential seepage or changes in thermal regime of the ice-rich tundra in the area. SRK's review of the 2021 geochemical monitoring data (Appendix G) confirms that the chemistry of the ponded water downstream of the South Dam is within baseline conditions suggesting no seepage or significant changes in the permafrost conditions at this location.

Recommendations:

- No recommendations
- *Signs of increased ponding water were observed in 2020 at the downstream toe of the South Dam. The ponded volume was notably less during the 2021 AGI inspection. Downstream of the Phase 1 South Dam, permafrost, including frost wedge polygons existed prior to construction which is indicative of the area being historically wet or ponded.*
- *Drone images taken just after freshet and just before winter freeze up should be collected to assist with ongoing monitoring of the ponded water at the downstream portion of the South Dam toe.*

4.3.5 Physical Inspection of the South Dam

As part of the AGI, a visual inspection of the South Dam was completed. Overall the dam is performing as expected and there were no significant issues of concern.

Ponded water has been observed at the downstream toe of the dam. This area contained frost wedge polygons and standing water prior to construction. Between 2018 and 2020, more water has been observed ponding in this area, however in 2021, the pond size was notably reduced.

A zone of tundra was also disturbed during construction of snow access roads. Signs of tension cracking and minor sloughing was observed on the downstream face of the dam (2H:1V) near this disturbance. The two zones where this is observed are near where the downstream GTCs were brought up the downstream slope. This area should be regularly inspected as part of the visual inspections and integrated with the ROQ toe berm if implemented

Both the ponding and tundra disturbance are within the footprint and will be covered by the ultimate Phase 2 South Dam raise, however additional degradation of the permafrost will require additional mitigation at the time of construction. To proactively mitigate the risk of foundation thaw prior to construction of the South Dam Phase 2 raise, SRK and Agnico Eagle have discussed the placement of an ROQ thermal toe berm. The toe berm would include at least 1.5 m of ROQ fill placed over this area (about 5 m in width). The toe berm fill would be integrated into the Phase 2 dam shell volume.

Along the downstream toe, limited amounts of tailings were visible on vegetation (i.e. a dust coating) and has been observed on the melting snow drifts early in the summer. It is hypothesized that this has

been transported during periods of strong winds from the north. Monitoring such as water quality sampling as well as visual monitoring is ongoing and will inform the need for dust mitigation. As the subaerial tailings beach grows, the potential for dust generation at the South Dam also increases. At this time the wind transported tailings visible on the ground is in very small quantities and only observed on or immediately downstream South Dam toe and is not a significant concern and currently no action is suggested beyond ongoing monitoring. Photolog 4 and 5 provides a general overview of the South Dam conditions at the time of the AGI.

Recommendations:

- There are two zones on the 2H:1V downstream slope of the South Dam, specifically where the downstream GTCs were brought up the downstream slope, that some minor sloughing and tension cracking of the dam shell ROQ has occurred. These areas should be closely monitored and additional fill (toe berm) along these portions of the slope could provide some mitigation in these areas (see later bullet).
- Phase 1 South Dam construction disturbance, where snow access roads were constructed appears to have initiated some permafrost degradation (thaw depressions and ponding) and should continue to be closely monitored.
- *All ponding, tension cracking, sloughing and permafrost disturbance is within the Phase 2 South Dam footprint. Delayed construction of the Phase 2 raise may lead to further degradation of the permafrost in these areas. To proactively mitigate the risk of foundation thaw prior to construction of the South Dam Phase 2 raise, a thermal toe berm should be implemented. The toe berm would include at least 1.5 m of ROQ fill placed over this area (about 5 m in width). The toe berm fill would be integrated into the Phase 2 dam shell volume. Initial volumetric modeling of a 2m thick, top crest width 5m with 2H:1V side slopes indicates that neat-line volumes for this additional fill material would be in the range of 4,000m3.*
- *Agnico Eagle has already sourced dust suppression agents for the TIA and should determine when the dust suppression measures should be implemented based on monitoring observations and the planned restart of production and tailings deposition. Inactive deposition and the resultant decreasing moisture in the tailings beach surface is likely to result in increased tailings dust dispersion.*

4.4 Tailings Deposition System

Table 5, Figure 10, and Figure 11 provide a summary of tailings deposition in the TIA to date. Generally, the tailings deposition rates to date have been lower than the planned rates. In 2021, the tailings solids contents were highly variable as the mill was operated intermittently. Monthly averages ranged from 26% to 47% with an average around the target 35%.

Tailings deposition has occurred as single point discharge from 3 separate locations in 2020-21 monitoring period; two locations along the eastern shoreline of the TIA, including one winter location near the northern limit of the subaerial tailings beach (Spigot H) and one near “Varley’s Corner” (Spigot F) during variable milling conditions or when milling was stopped; and, one location from the South

Dam for summer deposition (Spigot A). The well-established beach will now maintain a beach length over 200 m at the FSL of the North Dam (upper limit of the reclaim pond water levels). Though good progress has been made on beach establishment, there is currently a large pond on the tailings beach which is hydraulically isolated from the reclaim pond and could present ice entrainment of beach length issues. Tailings deposition will need to continue from the South Dam in accordance with the update of the tailings deposition plan (Figure 12) as provided in the 2020 AGI (SRK 2021b).

Saline mine water is typically discharged to the TIA via a separate mine water discharge line to the reclaim pond. If saline water (greater than 4,500 mg/l Cl equivalent) must be directed to the TIA through the tailings pipeline, then it should be discharged from a spigot location that is at least 300 m away from the South Dam crest so that the freeze back of the tailings beach against the South Dam is not impacted.

Recommendations:

- The tailings discharge system must be operated in accordance with the tailings deposition plan (SRK 2021). Primary spigot moves should be expected during, or shortly after, spring melt and again prior to winter freeze up. The next winter discharge should be located at the northeastern extent of the subaerial beach (north of the current spigot H location) to limit ice entrainment due to winter sub-aerial deposition. Following spring melt, deposition from the South Dam (Spigot A, B and C) should resume. In the subsequent fall/winter, a move to the new northeastern extent of the subaerial beach should be anticipated.
- A bathymetric survey was conducted in 2021. With this newly available data, Agnico Eagle should work with SRK to complete tailings volume reconciliation and updated deposition planning prior to resuming production.
- Plans for the Phase 2 raise of the South Dam should be made in parallel with updates to the mine plan to ensure construction can occur in the appropriate season (winter). The raise is required to be in place once the tailings beach against the existing dam reaches the full supply level for tailings (36.5 masl or approximately 2.64Mt of total tailings tonnage). The required timing is dependent on the resumption of production and future milling rates.
- *Production activities and tailings discharge have been suspended in 2022.*

4.5 Emergency Dump Catch Basins

The Eastern Dump Catch Basin is in good condition as shown in Photolog 9. The Western Dump Catch Basin however has wrinkled liner that does not appear to be adequately anchored and may not perform as intended. Currently it appears this structure has the required containment volume, but some liner slippage has been noted and repairs at the earliest opportunity are suggested by SRK. Agnico Eagle has agreed to do this reconstruction at the earliest opportunity on site / when practical.

Recommendations:

- The Western Emergency Dump Catch Basin still requires repairs. These repairs should still be planned to be carried out as soon as practical. Additional liner slippage since 2020 was noted at

the top of the liner crest. Further liner slippage may result in a reduction of the capacity of this emergency catch basin.

4.6 Pipelines (Reclaim, Tailings Deposition and TIA Discharge)

Pipelines are placed directly on the ground, which could be either rockfill pads, road shoulders or directly on the tundra. There are signs of vegetation dieback because of pipelines placed directly on the tundra along the northern shore of the TIA upstream of the Reclaim Pump Station. This is becoming a preferred flow path for surface runoff which could ultimately lead to rapid surface erosion and subsequent thermal erosion of permafrost.

Recommendations:

- Agnico Eagle should carefully inspect all pipelines placed directly on the tundra for signs of vegetation dieback and associated flow path channeling. Where this is occurring, the pipeline must be relocated to follow existing all-weather road shoulders, and appropriate remediation needs to be put in place where damage has occurred.
- The smaller diameter TIA pipelines going from the North Dam to Doris Creek, that were used during the care and maintenance period and before tailings were placed in the TIA around 2017, are no longer connected or functional. Agnico Eagle should consider removing these nonfunctional pipelines from the tundra.
- *Going forward, Agnico Eagle should consider abandoning the practice of placing pipelines directly onto the tundra. Additional pipelines (specifically any pipelines that are no longer in use) should be removed from the tundra where practical. Any pipeline removal should consider approaches to ensure that additional permafrost damage does not result from the removal activities.*

4.7 TIA Reclaim Pond Jetty (710 Pumphouse) Pad

Settlement and tension cracking have been observed since construction at the TIA Reclaim Jetty Pad (also referred to as the 710 Pumphouse pad). In 2020, the major repairs were made to the Reclaim Jetty pad provide shallower side slopes to reduce the risk of a failure which would impact the operation of the 710 pumphouse. There is still one area of the jetty (WSW end where the pipelines extend from the seacans into the reclaim pond) that is oversteepened. Survey monitoring was completed on a regular basis and did not indicate any concerning levels of displacement once the repairs were complete. An as-built of the repaired TIA reclaim jetty / pumphouse pad is presented in the 2020 AGI (SRK 2021), and the most recent Reclaim Jetty monitoring summary is provided in Appendix H.

In 2021, the Reclaim Jetty access road and part of the pad was flooded due to high water levels in the TIA. The road and pad begin to flood at approximately 32.1 masl. The water level should be maintained below this level whenever possible, and if the operational water balance requires the water level to exceed this elevation, then raising or modifying the Reclaim Jetty location will need to be executed along a similar timeline.

Recommendations:

- Continue settlement monitoring at the TIA Reclaim Jetty (710 Pumphouse) following the recommended survey frequency of twice monthly, May through November.
- Once the survey monitoring of the Reclaim Jetty resumes, and the surface is snow-free, conduct an audit of the existing survey monitoring points and establish survey monitoring points where proposed locations are missing or damaged.
- Agnico Eagle should develop a plan to raise the Reclaim Jetty pad from its current minimum elevation of roughly 32.1 masl to above the Full Supply Level of the TIA (33.7 masl would raise the pad 0.2 meters above the TIA FSL), or some interim raise which the water level can be maintained with adequate freeboard below the pad.
- Once any significant construction or remediation is complete, ensure the recommended TIA Reclaim Jetty survey monitoring points are reestablished.

4.8 TIA Operational Water Balance and Level Targets

The TIA operational water and load balance tool is used to predict water levels in the TIA and communicate water balance updates and projections monthly. The operational water level range target for 2022 is 31.5 masl or less and therefore the Reclaim Pond should be maintained within this range to limit thermal loading on the North Dam. It is expected that during freshet the water levels may temporarily rise above 31.5 masl, however, the Reclaim Pond must be lowered into the range as soon as is practical. Above 32.1 masl, the Reclaim Jetty begins to flood, which has access implications, and significantly higher water levels may lead to adverse impacts to operational capacity to pump water from the Reclaim Pond.

The targets above are based on treated water discharge via the RBDS. Due to recent changes in the MDMER discharge water quality requirements, and the need to stop Roberts Bay discharge on December 1, 2021, Agnico Eagle and SRK are in the process of reviewing options for future water management in the TIA. Changes to the operational water and load balance and level targets will be reported on in future reports.

In addition to the Reclaim Pond water level targets, the South Dam beach length must be maintained and no large ponding should occur within 100 m of the dam (SRK 2020c).

Recommendations:

- Water level targets must be adhered to whenever practical. Short-term or risk-based exceedances may be acceptable.
- Currently the main area of immediate impact from raised water levels is the TIA Reclaim Jetty. See recommendations in the section above.
- The RBDS resumed in June 2021 and has since been stopped as of December 1, 2021 due to changes in the discharge water quality requirements. From a TIA water management perspective, it is of paramount importance that the RBDS be re-commissioned or alternative water management

strategies be arranged to limit thermal loading on the North Dam, and/or a reduction in operations as the water level approaches the FSL of the TIA (33.5 masl). Agnico Eagle and SRK are in the process of reviewing options for future water management in the TIA. Changes to the water balance and level targets will be reported on in the future.

4.9 TIA Water Quality

The TIA water quality is monitored at compliance station TL-1 at the Reclaim Water pump station and will continue to be monitored were compliant with MDMER prior to September 30, 2021 (this monitoring period). After the MDMER water quality requirement changes on December 1, 2021, site has stopped all treated TIA water discharge to the RBDS. Details of the TIA water quality are provided in the annual water and load balance reviews (typically March of the following year). Agnico Eagle and SRK are in the process of reviewing options for future water management in the TIA. Beyond this discharge restriction, there have been no significant changes in the TIA water quality in the past year.

Recommendations:

- No recommendations.
- *Agnico Eagle and SRK are in the process of reviewing options for future water management in the TIA. Changes to the water quality requirements will be reported on in the future.*

4.10 Climate Data

For reference, the updated climate data received from the Doris meteorological station is provided in Appendix I. The data presented summarizes the historical climate record, the 2021 climate record and a comparison of 2021 air temperatures to all air temperature data since 2004. The climate data shown is sourced from monthly data submissions from Stantec, uploaded to the SRK Environmental Data Management System database.

Recommendations:

- No recommendations.

5 Recommendations and Conclusions

Based on the results of the 2021 AGI, the Doris TIA and associated structures (primarily the North Dam and South Dam) are functioning as designed. Some items were observed during the physical inspection and some anomalies were identified during the monitoring data review; however, these are either within expected performance or determined to be of no significant concern to dam performance. Improvements to the overall tailings management system were also identified (e.g. Integration of the OMS Manual with the TARPS, ERP and Dam Emergency Plan, as well as Agnico Eagle corporate and new site structure). Table 21 presents a summary of the recommendations listed throughout this report.

Table 21: Summary of Recommendations

Inspection Item	2020 Recommendations (for reference)	2021 Recommendations
General TIA Management Recommendations		
Third Party Dam Safety Review	▪ Conduct an independent third-party Dam Safety Review (DSR) for both the North and South Dams in the summer of 2021. ▪ *Planning for this is in progress. An independent third-party Dam Safety Review is scheduled to be conducted for both the North and South Dams in summer of 2021 pending COVID-19 restrictions.*	▪ No recommendations. ▪ *A DSR was completed by a third party (Tetra Tech) in 2021. Agnico is actively working on review and implementation of the DSR comments where appropriate.*
Tailings Operating, Maintenance and Surveillance (OMS) Manual and Emergency Response Plan (ERP)	▪ A draft version of the 'Hope Bay Project Dam Emergency Plan' was completed by Hope Bay staff in 2021. This Dam Emergency Plan should be finalized by site and integrated with the into the OMS and TARP framework ▪ Once integrated, the suite of OMS, TARPs, ERP and Dam Emergency Plan should reviewed with all site operations annually and updated as necessary. ▪ All of these components should be reviewed against Agnico Eagle's corporate tailings management system and updated tailings standards through a gap analysis to identify required updates. ▪ The roles and responsibilities for the TIA are defined in the OMS update and must be updated with any changes in Agnico Eagle's corporate structure. ▪ *A revised OMS was issued in 2020* ▪ *TARPs were developed for the TIA in Q4 2020. Further refinement based on site input to the TARPs and integration with OMS manual should be completed in 2021*	▪ Overall, the OMS manual, TARPS and Dam Emergency plan must be reviewed by Agnico Eagle and updated to reflect the many recent changes, including, but not limited to the Dam Emergency Plan, the updated TARPs and change in key personnel listed in the OMS manual. Minor updates to the North and South dam monitoring SOPs are also recommended. ▪ All components should be reviewed against Agnico Eagle's corporate tailings management system and updated tailings standards through a gap analysis to identify required updates. ▪ *SRK and Agnico Eagle are currently collaborating on updates to these plans.* ▪ The suite of OMS, TARPs, ERP and Dam Emergency Plan must be reviewed with all site operations annually and updated as necessary. ▪ *Agnico Eagle are currently in the process of updated the Dam Emergency Plan.* ▪ Agnico Eagle should ensure all staff are properly informed and trained on the contents of the OMS Manual.
Compliance with Monitoring Frequency Requirements	▪ Conduct monitoring in accordance with the specified frequency in the Monitoring SOP and OMS. If changes in the monitoring frequency are required due to new operating schedules these must be proposed to and approved by the EOR. ▪ The North and South Dam Monitoring SOPs were updated in 2020. An additional update should be	▪ Recommended monitoring frequencies have been met in all categories except for visual inspections and survey monitoring. Agnico Eagle should aim to improve the frequency of these monitoring events in 2022. ▪ *It is understood that COVID-19 and site staffing limitations during this monitoring year impacted the ability to collect*

Inspection Item	2020 Recommendations (for reference)	2021 Recommendations
	completed following any notable updates to the Tailings Management System.	*this data. Plans in place now from Agnico to further increase visual inspections in 2022.*
	North Dam Inspection and Review of Monitoring Data	
Ground Temperature Cables (GTCs)	■ No recommendations. ■ Consider implementing satellite telemetry for the North Dam data loggers to allow daily transmission of the measurements rather than manual downloads. This would be a more proactive approach rather than a requirement at this time.	■ No new recommendations.
Thermosyphons	■ No recommendations.	■ The joints on the thermosyphons are showing signs of weathering and rusting. The thermosyphon weld joints should be cleaned (wire-wheel) and repainted to slow additional corrosion.
CR1000 Datalogger Battery Voltage	■ The external CR1000 datalogger batteries should continue to be monitored and recharged annually or replaced as needed. ■ *The batteries have been recharged in March 2021*	■ The external CR1000 datalogger batteries should continue to be monitored and recharged annually or replaced as needed.
Inclinometers	■ The inclinometer probe and read-out were sent for recalibration and maintenance, but due to Covid-19 it was not possible to complete in 2020. The probe has and readout should be re-sent to the manufacturer for recalibration and maintenance in 2021. ■ *Note that TMAC has informed SRK that the inclinometer probe has now been sent off site (sent off site Q1 2021) for recalibration and maintenance.*	■ No recommendations. ■ *Site staff should maintain a record of probe and read-out service and recalibration dates. The next service and recalibration should be planned for 2024.*
Survey Monitoring Points	■ Backfill the erosion around survey monitoring point ND−DSP−100 at the North Dam. ■ Continue to carefully observe the North Dam downstream shell settlement points ND-SSP-080-3 and ND-SSP-110-3 to monitor for increased thaw settlement of the toe and undue deformation. ■ Installation of additional surficial survey points (SSP) on the upstream face of the North Dam to track deformation of the upstream face. These additional SSPs are recommended to better track the deformation of the upstream shell as foundation at the toe thaws due to elevated Reclaim Pond water levels. Note that this upstream foundation thaw is expected as per the original designs and there are no concerns with current thaw rate, however improved tracking of the displacement going forward will provide an early warning should adverse thaw conditions occur, and help ensure the dam design life is not being impacted.	■ No recommendations. ■ *Install a few key surficial survey points (SSP) on the upstream face of the North Dam. These additional SSPs will track the potential deformation of the upstream shell as the upstream foundation thaws due to thermal loading of an elevated Reclaim Pond water level. Note that upstream foundation thaw is expected as per the original designs and there have been no visual observation of settlement and there are no concerns with current thaw rate.* – *SRK and Agnico Eagle are currently collaborating on this item to further assess the need, as well as to determine a suitable time for potential additional survey monitoring point collection. This is not a critical path item and this additional survey point collection may not be done in 2022, as there is currently no mill operation resulting on site.*
Creep Displacement	■ No recommendations.	■ No recommendations.
Visual Inspection (Walk Over)	■ Complete weekly walkover surveys at the North Dam in accordance with the Monitoring SOPs. This	■ Increase the completion of weekly visual inspections at the North Dam in accordance with the specified frequency.

Inspection Item	2020 Recommendations (for reference)	2021 Recommendations
	is an important surveillance activity as defined in the OMS Manual and needs to be complied with. *Since 2018 there has been an improvement in the frequency of the walk over surveys but additional surveys were still required to be in accordance with the SOPs.*	■ *The number of visual inspections (formerly walk overs surveys) has improved in 2021, however additional inspections are required to be in compliance with the specified frequency.*
Monitoring of Flowing Water at the Toe of the North Dam	■ No recommendations. ■ Frost probe surveys are not required as part of the 2021 monitoring. If conditions change and a frost probe survey is required, the EOR will inform Hope Bay staff.	■ Modify the water quality monitoring SOP based on the absence of data to suggest the presence of TIA Reclaim Pond water in the flowing water at the toe of the North Dam. Recommended changes to the monitoring SOP are below, final changes to the frequency will be documented in an updated SOP. ■ Reduce the water quality and flow monitoring frequency for field measurements, from once per week to once per month in the periods while flowing water is observed (if observed). ■ Reduce the laboratory water quality monitoring frequency to once per year, during August, when flowing water is observed at the downstream toe, ensuring that this sample is collected and analyzed per the SOP, including all field parameters. This change in frequency also applies to the other LAS samples described in the monitoring SOP.
AGI Physical Inspection	■ No recommendations.	■ No recommendations. ■ *The v-notch weir at the toe of the dam is not performing correctly. To minimize future thermal impacts, the v-notch weir should be decommissioned and the velocity-area method used in its place when flow estimation is required.* ■ *If site elects to do some clean-up of the upstream pumping pad (when the Reclaim Pond water level is decreased, the crush material, currently located over the top of the dam shell, should be removed (to help improve visual monitoring in this area).*
South Dam Inspection and Review of Monitoring Data		
Ground Temperature Cables (GTCs) and D405 Dataloggers	■ GTCs provide thermal monitoring of the dam to ensure conditions remain within the intended design for safe operation and tailings containment. GTC replacement is recommended in some areas of the South Dam where recent instrument failure has occurred. Four replacement GTCs are suggested to be installed at this time (two upstream and two downstream). TMAC should work with the EOR to install these replacement GTCs as soon as practical. Priority should be given to the two upstream GTC replacements. ■ *Four replacement GTC strings are now on site (at the Doris North Camp). The exact timing of the installation of these cables has not yet been established due to current site limitations with available surface drill rigs.* ■ Beadedstream telemetry subscription requires annual renewal. TMAC should work with the EOR to ensure that the telemetry system operations are maintained.	■ GTCs provide thermal monitoring of the dam to ensure conditions remain within the intended design for safe operation and tailings containment. GTC replacement is recommended in some areas of the South Dam where recent instrument failure has occurred. Four replacement GTCs are suggested to be installed at this time (two upstream and two downstream). The Agnico Eagle should work forward to install these replacement GTCs as soon as practical. Priority should be given to the two upstream GTC replacements. Four replacement GTC strings are on site (at the Doris North Camp) ■ Complete a detailed visual inspection of the South Dam after spring melt, especially looking for any exposed or damaged ground temperature cables. This will allow for preventative maintenance and placement of protective material to be done if exposed cables are observed, which will help to limit the potential for damage from wildlife. ■ Complete a manual download of data from each datalogger once in 2022, following the instructions in the monitoring SOP.

Inspection Item	2020 Recommendations (for reference)	2021 Recommendations
	■ Complete a walk over survey of the South Dam after spring melt and look for any exposed or damaged ground temperature cables. This will allow for preventative maintenance and placement of protective material to be done if exposed cables are observed, which will help to limit the potential for damage from wildlife. ■ Manually download data from each datalogger once annually in accordance with the monitoring SOP.	■ *Beadedstream telemetry subscription requires annual renewal. Agnico Eagle has taken over the subscription with Beadedstream and will be responsible for maintenance of the GTC telemetry system operations are maintained.*
Survey Monitoring Points	■ A monthly survey of the downstream toe is required as part of the Monitoring SOP. This monitoring requirement should be conducted at least once during August each year to track the lateral extent of ponding downstream of the dam.	■ A survey of the downstream toe is required as part of the Monitoring SOP with the intent of being completed at the same time as the monthly monitoring surveys (May to November), however the frequency requirement in the SOP requires modification. The toe survey should be conducted at least once annually during snow-free conditions (typically August) each year to track the lateral displacement and the extent of ponding downstream of the dam. Additional dam toe surveys may be collected during monthly GPS survey events when the toe is mostly snow free. ■ Update the SOP and monitoring schedule to reflect the modified frequency. ■ *In 2021, a drone LiDAR survey was completed over the North Dam, South Dam and tailings beach. The LiDAR survey is valuable data for tracking the evolution of the TIA and provides an acceptable method for satisfying the downstream toe survey requirement.*
Visual Inspection (Walkover)	■ Complete weekly walkover surveys at the South Dam in accordance with the Monitoring SOPs. This is an important surveillance activity as defined in the OMS Manual and needs to be complied with.	■ Increase the completion of weekly visual inspections at the South Dam in accordance with the required weekly frequency.
Monitoring of Flowing and Ponded Water at the Toe of the South Dam	■ No recommendations.	■ No recommendations ■ *Signs of increased ponding water were observed in 2020 at the downstream toe of the South Dam. The ponded volume was notably less during the 2021 AGI inspection. Downstream of the Phase 1 South Dam, permafrost, including frost wedge polygons existed prior to construction which is indicative of the area being historically wet or ponded.* ■ *Drone images taken just after freshet and just before winter freeze up should be collected to assist with ongoing monitoring of the ponded water at the downstream portion of the South Dam toe.*
Annual Physical Inspection of the South Dam	■ Methods to limit tailings dispersion downstream of the dam should be considered in 2021. As the sub-aerial tailings beach grows, this is expected to become a more critical item. ■ The initial phases of some permafrost degradation and increased ponding water have been observed at the downstream toe of the South Dam. This downstream area is near the area where snow access roads were constructed as part of the	■ There are two zones on the 2H:1V downstream slope of the South Dam, specifically where the downstream GTCs were brought up the downstream slope, that some minor sloughing and tension cracking of the dam shell ROQ has occurred. These areas should be closely monitored and additional fill (toe berm) along these portions of the slope could provide some mitigation in these areas (See later bullet).

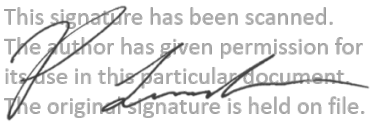
Inspection Item	2020 Recommendations (for reference)	2021 Recommendations
	Phase 1 South Dam construction (and is within the ultimate Phase 2 dam footprint). Remediation of this area should be considered prior to construction of the Phase 2 raise (Phase 2 raise not expected to be completed in 2021 at this time). This remediation would be expected to consist of the placement of 1.5m thickness of ROQ material directly over these areas (and against the current downstream dam fill / shell).	▪ Phase 1 South Dam construction disturbance, where snow access roads were constructed appears to have initiated some permafrost degradation (thaw depressions and ponding) and should continue to be closely monitored. ▪ *All ponding, tension cracking, sloughing and permafrost disturbance is within the Phase 2 South Dam footprint. Delayed construction of the Phase 2 raise may lead to further degradation of the permafrost in these areas. To proactively mitigate the risk of foundation thaw prior to construction of the South Dam Phase 2 raise, a thermal toe berm should be implemented. The toe berm would include at least 1.5 m of ROQ fill placed over this area (about 5 m in width). The toe berm fill would be integrated into the Phase 2 dam shell volume. Initial volumetric modeling of a 2 m thick, top crest width 5m with 2H:1V side slopes indicates that neat-line volumes for this additional fill material would be in the range of 4,000 m^3.* ▪ *Agnico Eagle has already sourced dust suppression agents for the TIA and should determine when the dust suppression measures should be implemented based on monitoring observations and the planned restart of production and tailings deposition.*
▪ TIA-Wide Monitoring		
Tailings Deposition System	▪ Saline mine water may only be discharged through the tailings pipeline from, or within, 300 m of the South Dam provided the freezing point depression is less than 0.5°C (less than 4,500 mg/L Cl maximum equivalent). While not current practice, this operational recommendation remains in place. ▪ The tailings discharge system must be operated in accordance with the designated tailings discharge plan. Primary spigot moves should be expected during, or shortly after, spring melt and again prior to winter freeze up. In the summer of 2021, it is expected that at least one additional spigot location will be required to be installed (north of the current spigot H location). ▪ No TIA bathymetric survey was conducted in 2020, as approved by the EOR. For 2020 deposition planning, conservative volume assumptions were used as part of the 2020 AGI tailings deposition plan (i.e. assuming larger deposited volumes or less available space). A bathymetry survey of the TIA reclaim pond should be completed in 2021 to allow for better determination of the tailings volume and available storage volume in the TIA. ▪ Plans should start to be made in 2021 for the Phase 2 raise of the South Dam; The raise is expected to be required once the tailings beach reaches against the existing dam reaches the full supply level for tailings (36.5 masl or approximately 2.64Mt of total tailings tonnage). The required timing is dependent on milling rates,	▪ The tailings discharge system must be operated in accordance with the tailings deposition plan (SRK 2021). Primary spigot moves should be expected during, or shortly after, spring melt and again prior to winter freeze up. The next winter discharge should be located at the northeastern extent of the subaerial beach (north of the current spigot H location) to limit ice entrainment due to winter sub-aerial deposition. Following spring melt, deposition from the South Dam (Spigot A, B and C) should resume. In the subsequent fall/winter, a move to the new northeastern extent of the subaerial beach should be anticipated. ▪ A bathymetric survey was conducted in 2021. With this newly available data, Agnico Eagle should work with SRK to complete tailings volume reconciliation and updated deposition planning prior to resuming production. ▪ Plans for the Phase 2 raise of the South Dam should be made in parallel with updates to the mine plan to ensure construction can occur in the appropriate season (winter); The raise is required to be in place once the tailings beach against the existing dam reaches the full supply level for tailings (36.5 masl or approximately 2.64Mt of total tailings tonnage). The required timing is dependent on the resumption of production and future milling rates. ▪ *Production activities and tailings discharge have been suspended in 2022. No immediate recommendations during periods when tailings discharge is not active.*

Inspection Item	2020 Recommendations (for reference)	2021 Recommendations
	but construction is expected in winter 2022 or 2023.	
Emergency Dump Catch Basins	▪ The Western Emergency Dump Catch Basin still requires repairs. These repairs should still be planned to be carried out.	▪ The Western Emergency Dump Catch Basin still requires repairs and should be closely monitored. Additional liner slippage since 2020 was noted at the top of the liner crest. This pond still maintains the minimum required capacity but further liner slippage may result in a reduction of the capacity of this emergency catch basin.
Pipelines (Reclaim, Tailings Deposition and TIA Discharge)	▪ TMAC must carefully inspect all pipelines placed directly on the tundra for signs of vegetation dieback and associated flow path channeling. Where this is occurring, the pipeline must be relocated to follow existing all-weather road shoulders, and appropriate remediation needs to be put in place where damage has occurred. ▪ The permafrost thermal erosion feature that has developed along the northern shore of the TIA was backfilled by TMAC in 2019. This area should continue to be monitored to ensure that additional thermal erosion does not result in this area. ▪ Monitoring should continue at the repaired TIA Reclaim Jetty Pad (710 Pumphouse pad) following the recommended survey frequency of twice monthly from May to November.	▪ Agnico Eagle should carefully inspect all pipelines placed directly on the tundra for signs of vegetation dieback and associated flow path channeling. Where this is occurring, the pipeline must be relocated to follow existing all-weather road shoulders, and appropriate remediation needs to be put in place where damage has occurred. ▪ The smaller diameter TIA pipelines going from the North Dam to Doris Creek, that were used during the care and maintenance period and before tailings were placed in the TIA around 2017, are no longer connected or functional. Agnico Eagle should consider removing these nonfunctional pipelines from the tundra.
TIA Reclaim Pond Jetty (710 Pumphouse) Pad	▪ Settlement monitoring at the Reclaim Jetty should continue in 2021 (twice monthly, May to November). ▪ Major Jetty repairs were completed in 2020. There is still one area off the most WSW end of the reclaim jetty fill (i.e. by the area where the pipelines extend from the seacans into the TIA) that are still over steepened and should be carefully monitored. ▪ Additional (relatively minor) fills are recommended on the west side of the pad where the full fill extents, of the proposed reclaim jetty repairs, were not fully met. ▪ Once all repairs are complete, ensure the recommended survey monitoring points are reestablished.	▪ Continue settlement monitoring at the TIA Reclaim Jetty (710 Pumphouse) following the recommended survey frequency of twice monthly, May through November. ▪ Once the survey monitoring of the Reclaim Jetty resumes, and the surface is snow-free, conduct an audit of the existing survey monitoring points and establish survey monitoring points where proposed locations are missing or damaged. ▪ Agnico Eagle should develop a plan to raise the Reclaim Jetty pad from its current minimum elevation of roughly 32.1 masl to above the Full Supply Level of the TIA (33.7 masl would raise the pad 0.2 meters above the TIA FSL), or some interim raise which the water level can be maintained with adequate freeboard below the pad. ▪ Once any significant construction or remediation is complete, ensure the recommended TIA Reclaim Jetty survey monitoring points are reestablished. ▪ *Agnico Eagle is in the process of reviewing options for modification of the TIA Reclaim Jetty to improve long term operation at this area.*
TIA Operational Water Balance and Level Targets	▪ It is of paramount importance that the RBDS be re-commissioned by May 2021 to manage water levels in the Reclaim Pond. Further delay of this may result in reduced operations. ▪ *During maintenance of the Roberts Bay Discharge Line in the fall of 2020, portions of the submersed line became buoyant requiring the submersed line to be shortened. The end of the Roberts Bay*	▪ Water level targets must be adhered to whenever practical. Short-term or risk-based exceedances may be acceptable. ▪ Currently the main area of immediate impact from raised water levels is the TIA Reclaim Jetty. See recommendations in the section above. ▪ The RBDS resumed in June 2021 and has since been stopped as of December 1, 2021 due to changes in the

Inspection Item	2020 Recommendations (for reference)	2021 Recommendations
	Discharge line is now at around 20m depth in Roberts Bay compared to the previous 40 meters depth. In Q1 2021, TMAC made a submission to the Nunavut Impact Review Board indicating why the revised discharge location does not pose a significant modification to the Hope Bay Mine or the previously assessed environmental effects. It is expected that this discharge line will be able to be used again before freshet 2021. ■ If delays in approvals to use the Roberts Bay Discharge system are expected past the end of May 2021 then the EOR should be informed so additional plans can be made with site staff. Water levels in the TIA will continue to be carefully monitored (specifically during the periods where there is no discharge from the TIA to Roberts Bay). ■ Continue discharge 2021 to reduce the water levels in the pond to within the target elevation range. ■ Continue to monitor the South Dam beach length to maintain at least 100 meters separation between the Dam and the Reclaim Pond or any large pond.	discharge water quality requirements (specifically changes in the toxicity testing requirements). From a TIA water management perspective, it is important that the RBDS be re-commissioned or alternative water management strategies be developed as the water level approaches the FSL of the TIA (33.5 masl). ■ Agnico Eagle and SRK are actively in the process of reviewing options for future water management in the TIA. Changes to the water balance and level targets will be reported on in future reports.
TIA Water Quality	■ No recommendations. ■ If water quality or water treatment capacity is expected to impact the ability to maintain the Reclaim Pond within the operational range, the EOR must be notified.	■ No recommendations. ■ *Agnico Eagle and SRK are in the process of reviewing options for future water management in the TIA. Changes to the water quality requirements will be reported on in future reporting.*
Climate Data	■ No recommendations.	■ No recommendations.

Closure

This report, 2021 Annual Geotechnical Inspection – Doris Tailings Impoundment Area, was prepared by



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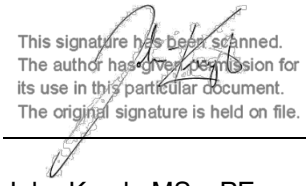

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All data used as source material plus the text, tables, figures, and attachments of this document have been reviewed and prepared in accordance with generally accepted professional engineering and environmental practices.

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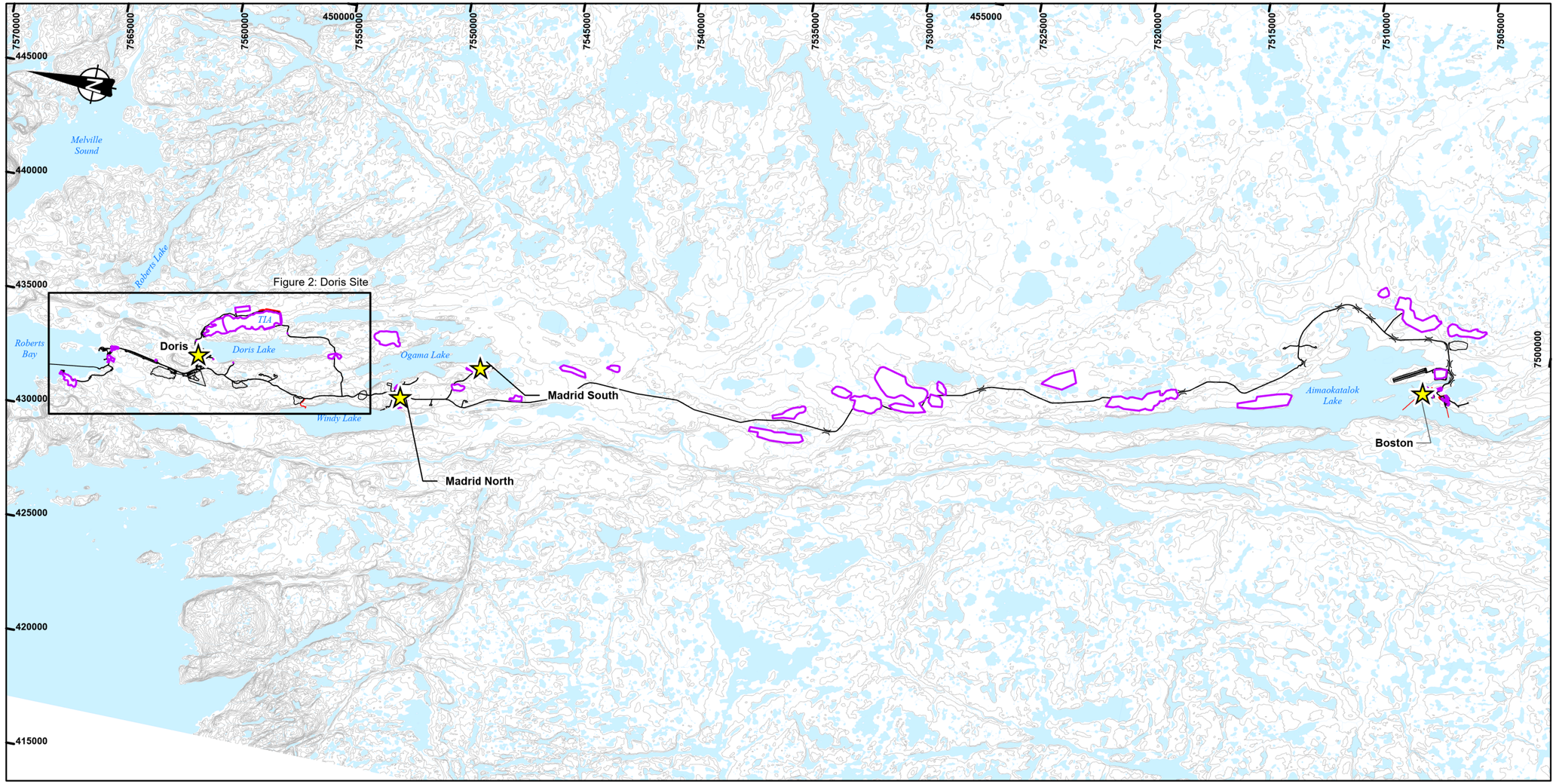
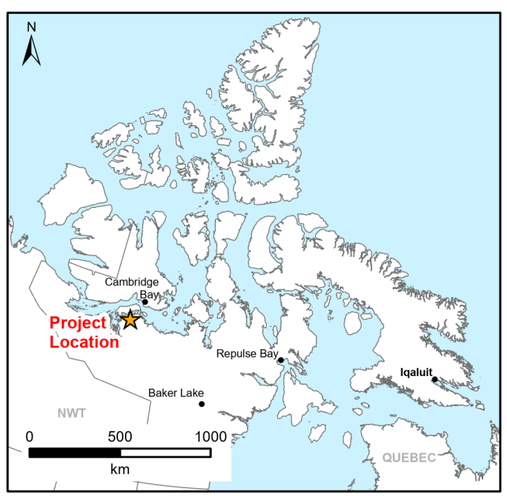
TMAC Resources Inc., 2017. Hope Bay Project Doris and Madrid Water Management Plan, Hope Bay, Nunavut. December 2017.

Figures





LEGEND

- Underground Mine Portal
- Existing/Permitted Infrastructure
- Proposed Infrastructure
- Contours
- Stream
- Future Quarries

NOTES

1. Contours shown at 10m intervals.
2. Coordinate System: .

REFERENCES

1. Base Topo Data: CanVec, Natural Resources Canada

0 2000 4000 6000 8000 10000
Meters

srk consulting

Job No: 1CT022.077.300

Filename: 1CT022.077_Fig_1_SiteLocationMap_rev00

AGNICO EAGLE

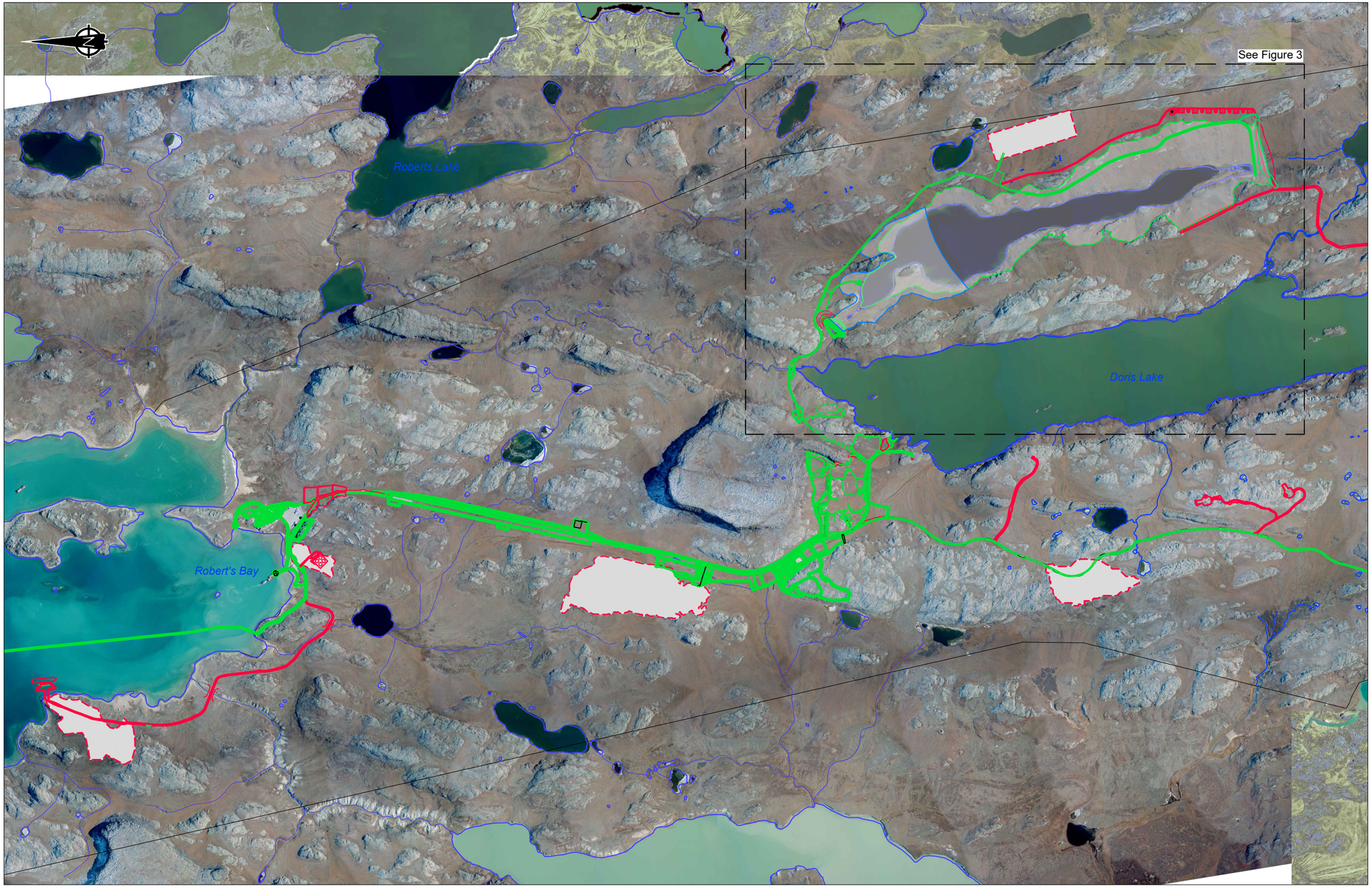
Doris TIA

2021 Annual Geotechnical Inspection

Project Location Map

Date:	Approved:	Figure:
Nov. 2021	PL	1

Z:\01_SITES\Hope.Bay\1CT022.077_2021 Geotechnical Investigations\1040_AutoCAD\GIS\20211115_UpdateArcPro\1CT022.077_Fig_1_SiteLocationMap_rev00.aprx



LEGEND

- As-Built Infrastructure
- Proposed Infrastructure
- Quarries

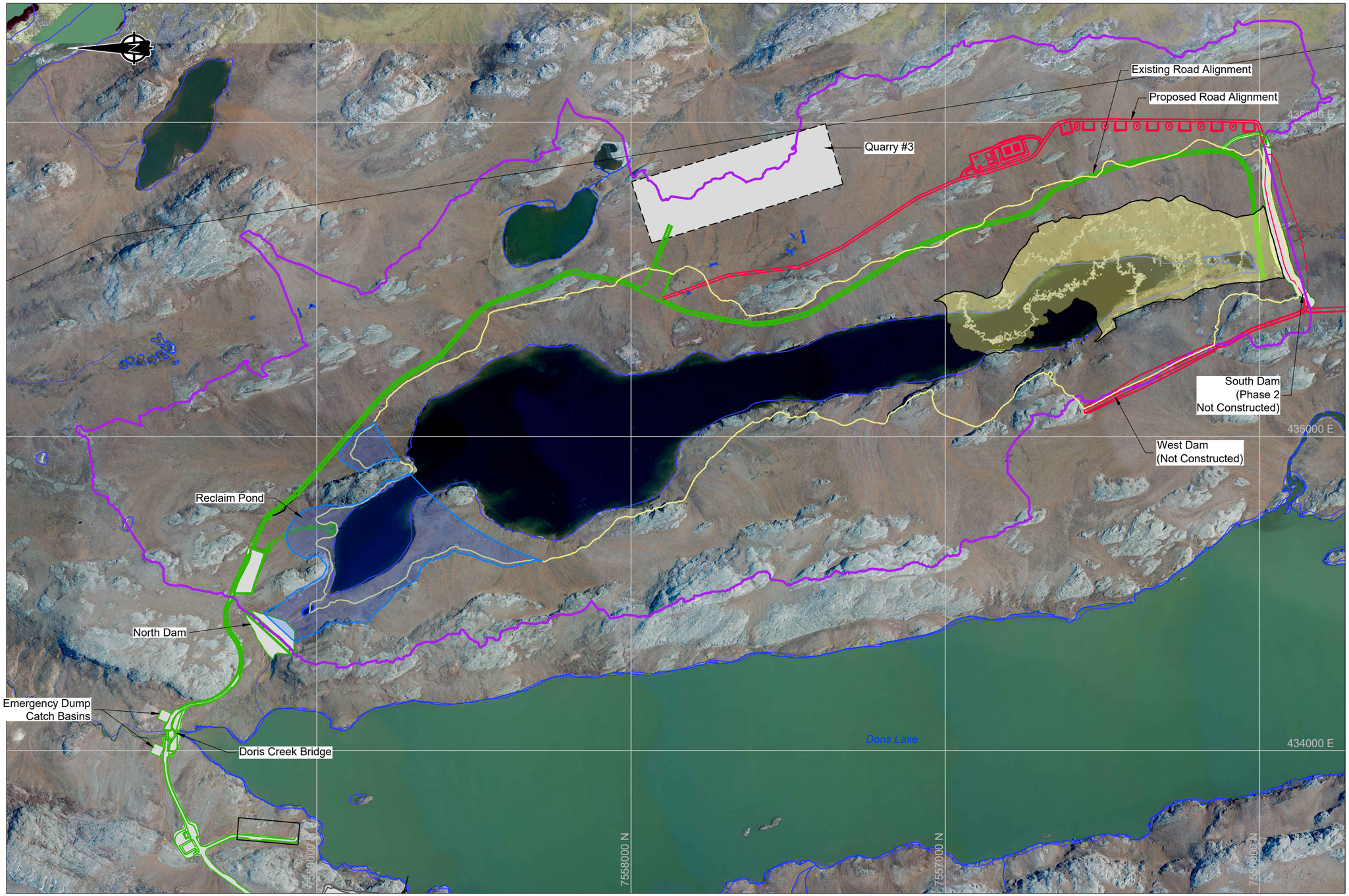
REFERENCE

NAD83 CSRS UTM Zone 13.
Aerial image captured in 2007, provided by client.

0m 300 600 900 1200

srk consulting	AGNICO EAGLE	2021 Annual Geotechnical Inspection
SRK JOB NO.: 1CT022.077	Doris TIA	Doris Site Layout
FILE NAME: 1CT022.077 - PLM.dwg		DATE: Nov. 2021 / APPROVED: PDL / FIGURE: 2

P:\01_SITES\Hope Bay\ACAD\2021 Drawings\2021 AG\1CT022.077 - PLM.dwg



LEGEND

- Existing Infrastructure
- Proposed Road Realignment
- Ultimate Tailings Extent
- Dam / Dike
- Ultimate Reclaim Pond Extent
- Watershed Boundary
- Quarry
- Subaerial Tailings Beach 2021

REFERENCE

NAD83 UTM Zone 13.
Aerial image captured in 2007, provided by client.
2021 Tailings Beach survey collected by drone LiDAR in August 2021, data provided by client.

0m 100 200 300 400 500

srk consulting

SRK JOB NO.: 1CT022.077
FILE NAME: 1CT022.077 - Doris TIA.dwg

AGNICO EAGLE

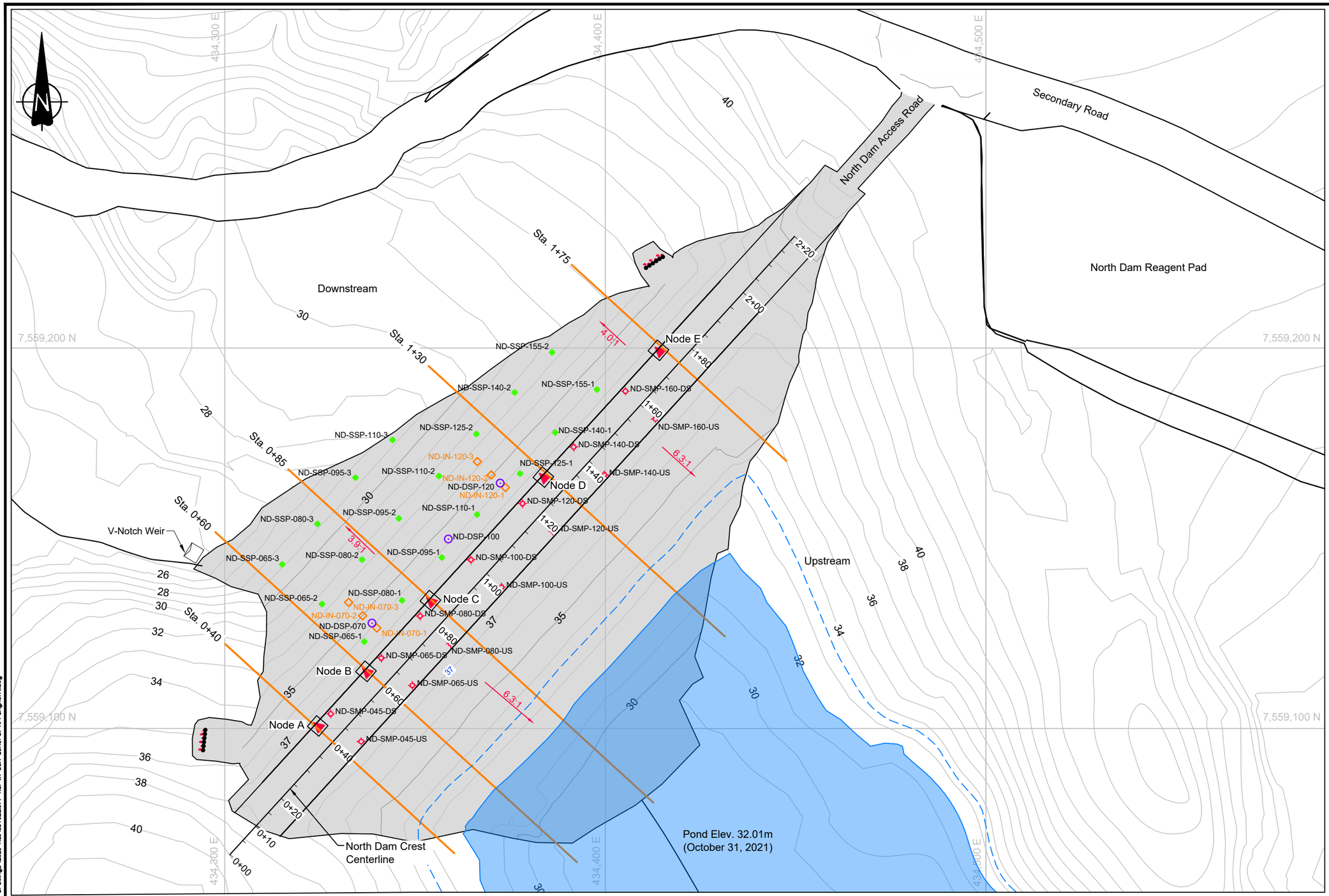
Doris TIA

2021 Annual Geotechnical Inspection

Doris TIA General Arrangement

DATE: Nov. 2021 | APPROVED: PDL | FIGURE: 3

P:\01_SITES\Hope Bay\ACAD\2021 Drawings\2021 AGI\1CT022.077 - Doris TIA.dwg



LEGEND

- Survey Monitoring Point (Crest)
- Deep Settlement Point
- Surficial Survey Point
- Inclinometer Location
- Major Contour
- Full Supply Level (Elev. 33.5 masl)
- Datalogger Node
- Thermosyphon Radiator

NOTES

1. Topographic contour data was provided by the Client. As-Built contour data for the terrain model was provided by the Contractor.
2. Contours shown at 1.0m intervals.

REFERENCE

NAD83 UTM Zone 13.

P:\01_SITES\Hope Bay\ACAD\2021 Drawings\2021 AGI\1CT022.077-North Dam General Arrangment.dwg

srk consulting

SRK JOB NO.: 1CT022.077

FILE NAME: 1CT022.077-North Dam General Arrangment.dwg

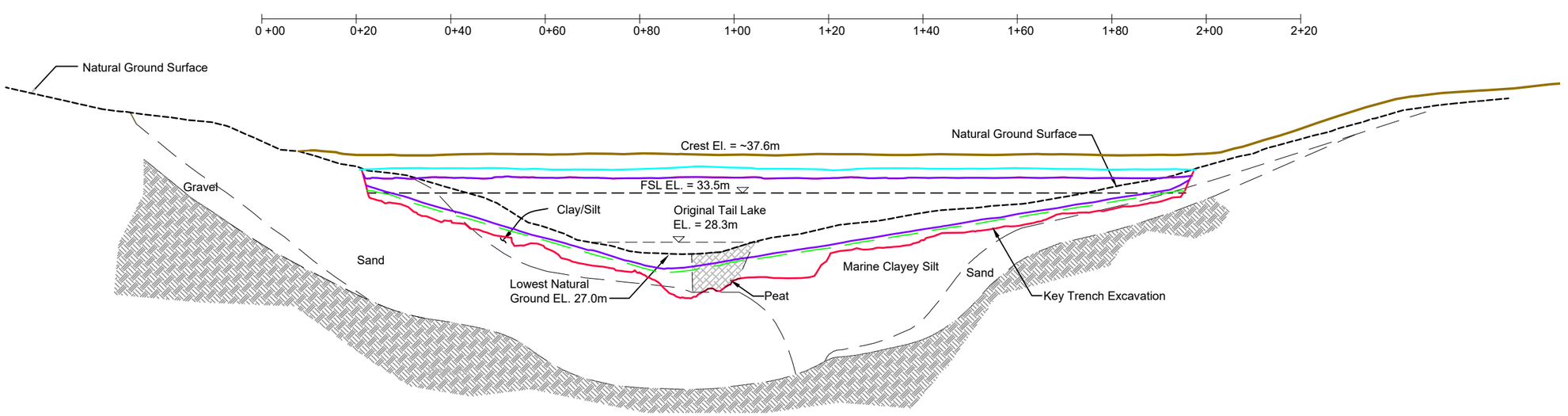
AGNICO EAGLE

Doris TIA

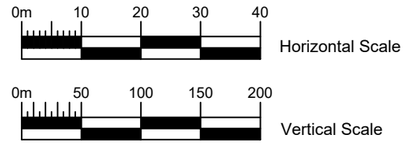
2021 Annual Geotechnical Inspection

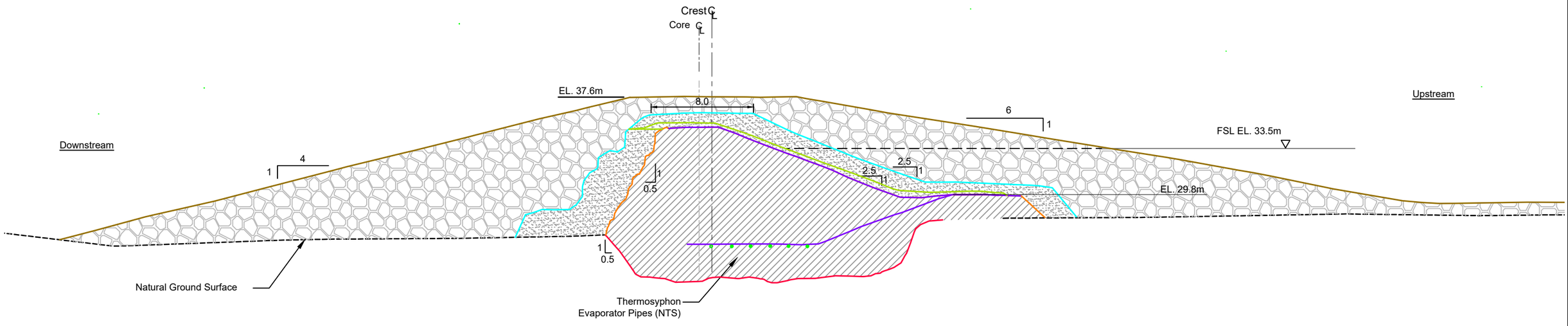
North Dam General Arrangement and Instrumentation

DATE:	APPROVED:	FIGURE:
Nov. 2021	PDL	4

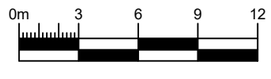


SECTION ALONG
NORTH DAM CREST CENTERLINE





NORTH DAM TYPICAL SECTION



LEGEND

- Natural Ground
- Stratigraphic Boundary
- Core Material
- Transition Material
- Run of Quarry (ROQ)
- Surfacing Material
- Bedrock
- Peat
- Thermosyphon Evaporator Pipe (NTS)
- Geosynthetic Clay Liner (GCL)
- Core Material
- Key Trench
- GCL Cover Material
- Transition Material
- ROQ Material
- Thermosyphon Evaporator Pipes
- Thermosyphon Evaporator Pipes

NOTES

1. The subsurface geology has been extrapolated from a series of geotechnical investigations consisting of drill holes, auger holes and shallow test pits. Bedrock contact and geological unit contacts are therefore likely to vary somewhat.

P:\01_SITES\Hope Bay\ACAD\2021 Drawings\2021 AG\1CT022.077-North Dam Typical Sections.dwg

srk consulting

SRK JOB NO.: 1CT022.077
FILE NAME: 1CT022.077-North Dam Typical Sections.dwg

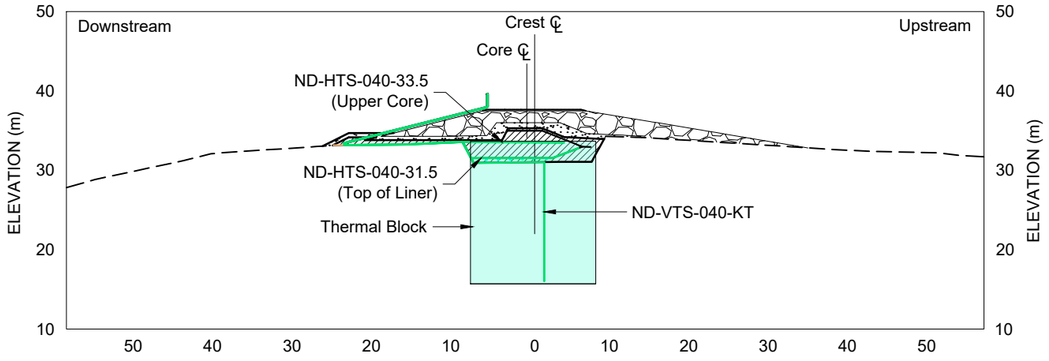
AGNICO EAGLE

Doris TIA

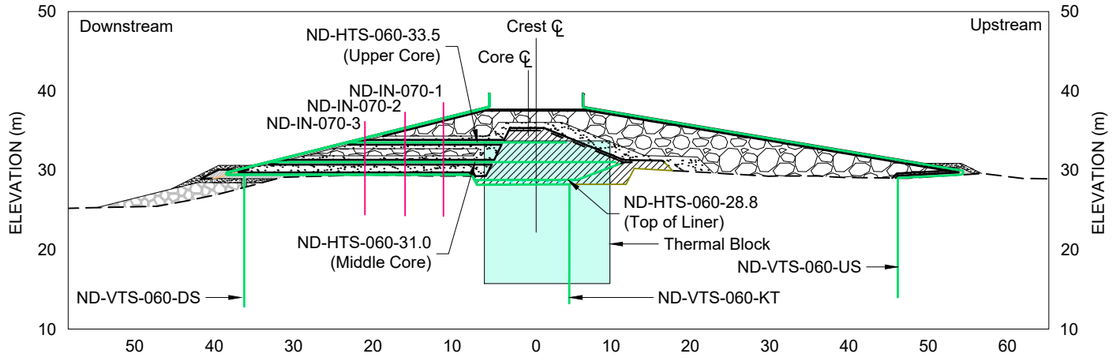
2021 Annual Geotechnical Inspection

North Dam Foundation Conditions and Typical As-Built Section

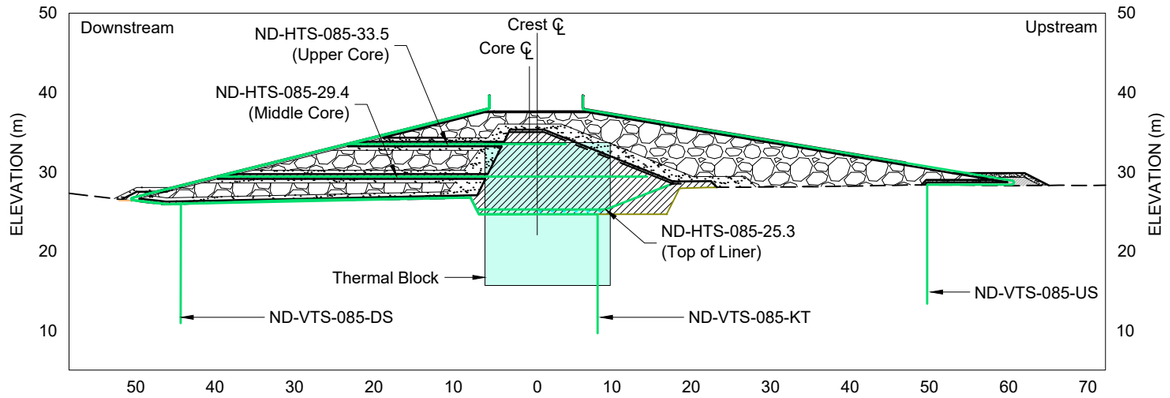
DATE:	APPROVED:	FIGURE:
Nov. 2021	PDL	5



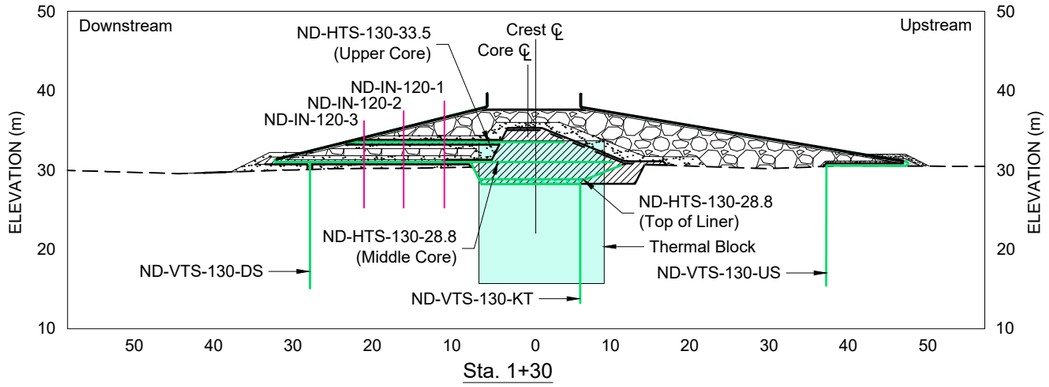
Sta. 0+40



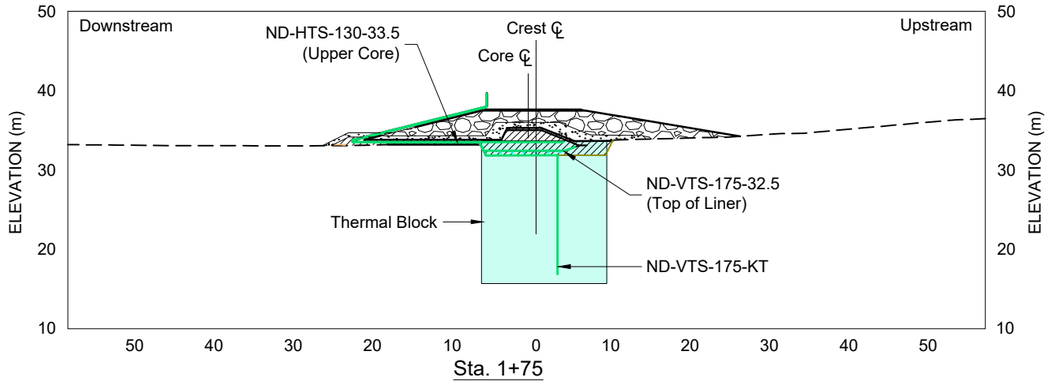
Sta. 0+60



Sta. 0+85



Sta. 1+30



Sta. 1+75

LEGEND

- Ground Temperature Cable
- Core Material
- Thermal Block
- Transition Material
- Run of Quarry (ROQ) Material
- Surfacing Material

NOTES

1. Topographic and as-built contour data from the terrain model was provided by the Client (TMAC).
2. All units shown are in meters unless otherwise stated.

0m 5 10 15 20 25 30

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AGNICO EAGLE

Doris TIA

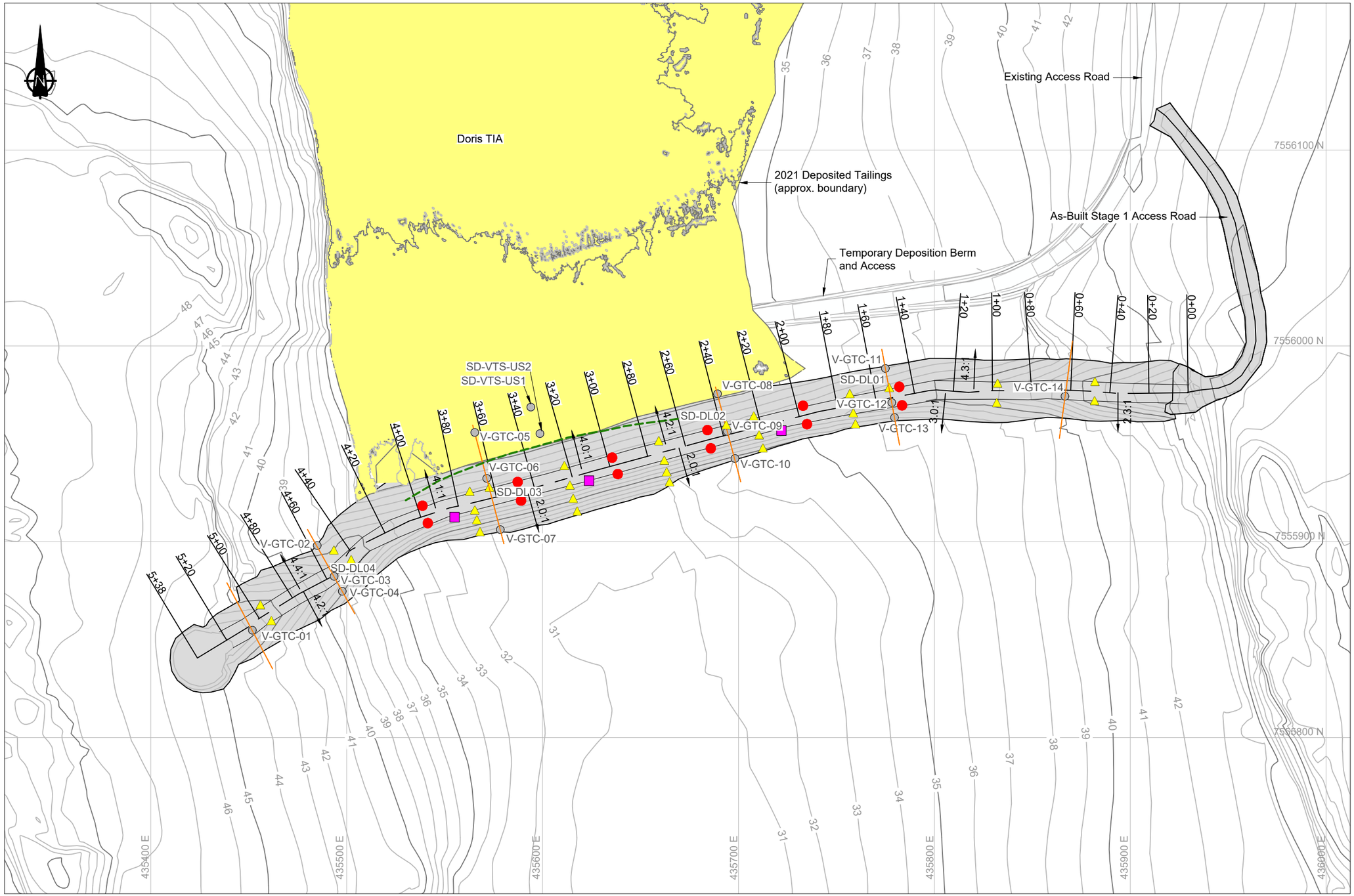
2021 Annual Geotechnical Inspection

North Dam Instrumentation
Cross Sections

SRK JOB NO.:	1CT022.077
FILE NAME:	1CT022.077 - Sections.dwg

DATE:	APPROVED:	FIGURE:
Nov. 2021	PDL	6

P:\01_SITES\Hope Bay\ACAD\2021 Drawings\2021 AG\1CT022.077 - Sections.dwg



LEGEND

- Survey Monitoring Point (Crest)
- Surficial Survey Point
- Deep Settlement Point
- Datalogger Location
- Vertical Ground Temperature Cable
- Horizontal Key Trench Cable (SD-HTS-B1-KT)

NOTES

1. Topographic and As-built data was provided by the Client
2. Contours shown at 1.0m interval.
3. All units shown are in meters unless otherwise stated.
4. 2021 Tailings Beach survey collected by drone LiDAR in August 2021, data provided by client.

REFERENCES

NAD83 UTM Zone 13.

srk consulting

SRK JOB NO.: 1CT022.077

FILE NAME: 1CT022.077 - SD Instrumentation Plan.dwg

AGNICO EAGLE

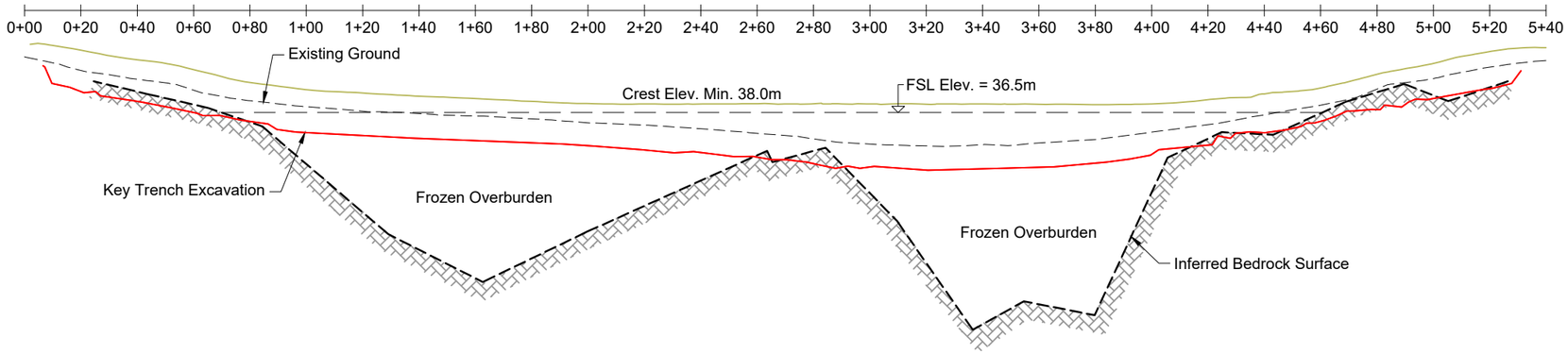
Doris TIA

2021 Annual Geotechnical Inspection

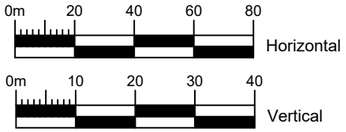
South Dam General Arrangement and Instrumentation

DATE:	APPROVED:	FIGURE:
Nov. 2021	PDL	7

P:\01_SITES\Hope Bay\ACAD\2021 Drawings\2021 AG\1CT022.077 - SD Instrumentation Plan.dwg



SECTION ALONG
SOUTH DAM CREST CENTERLINE

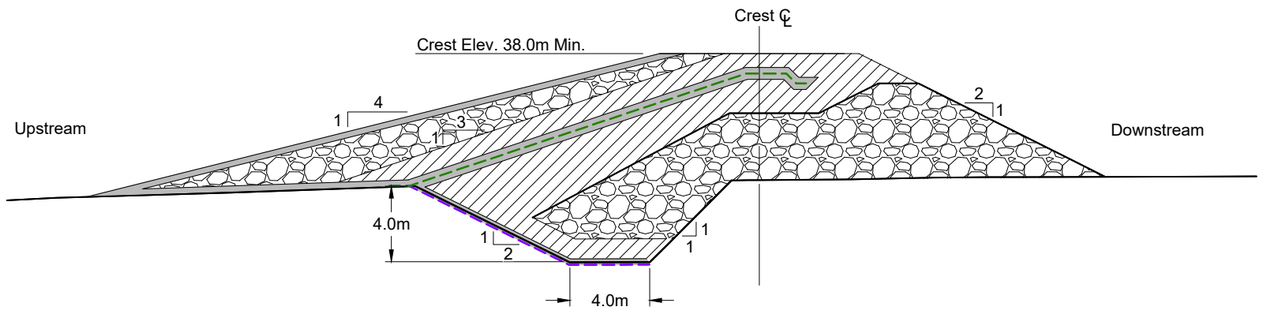


LEGEND

- Thermistor Bead Location
- Lower GCL Liner
- Upper GCL Liner
- Bedding Material
- Transition Material
- Run of Quarry Backfill

NOTES

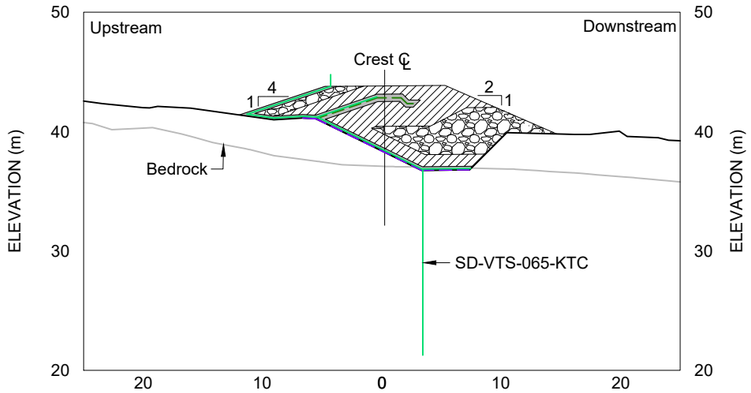
1. Topographic and as-built contour data from the terrain model was provided by the Client.
2. All units shown are in meters unless otherwise stated.



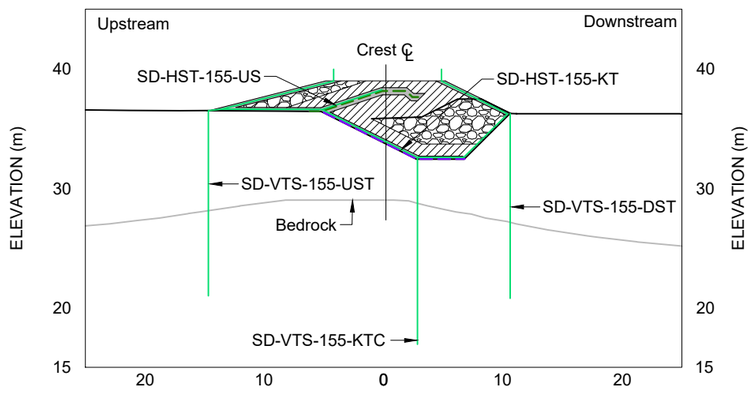
SOUTH DAM TYPICAL SECTION

srk consulting	AGNICO EAGLE	2021 Annual Geotechnical Inspection
SRK JOB NO.: 1CT022.077	Doris TIA	South Dam Foundation Conditions and Typical As-Built Section
FILE NAME: 1CT022.077 - SD Instrumentation Plan.dwg	DATE: Nov. 2021 / APPROVED: PDL	FIGURE: 8

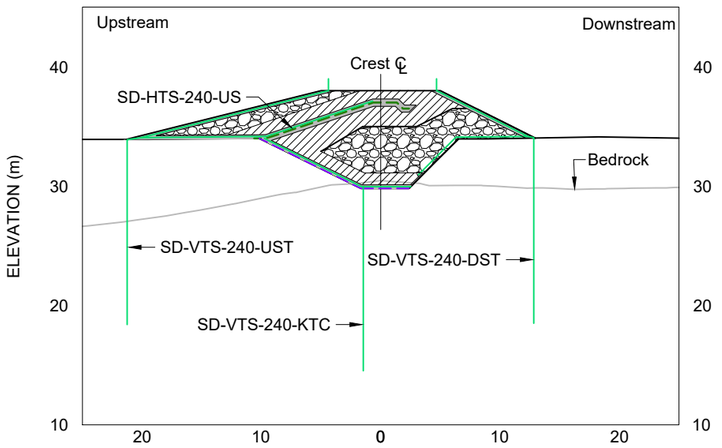
P:\01_SITES\Hope Bay\ACAD\2021 Drawings\2021 AGI\1CT022.077 - SD Instrumentation Plan.dwg



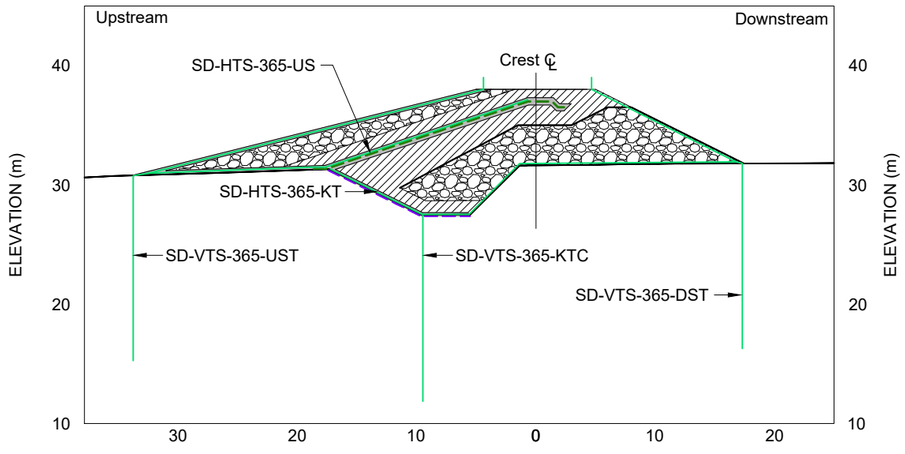
Sta. 0+65



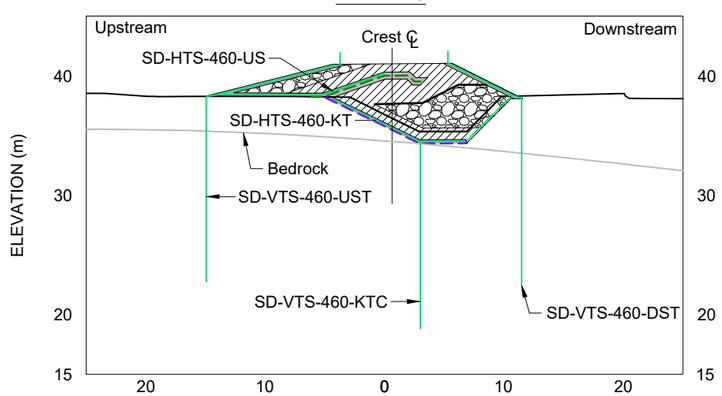
Sta. 1+55



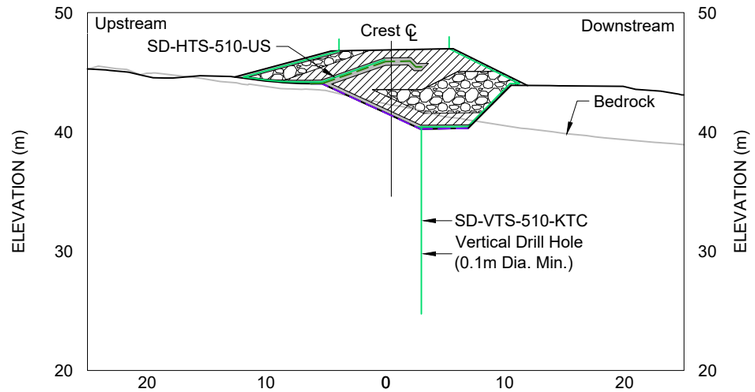
Sta. 2+40



Sta. 3+65



Sta. 4+60



Sta. 5+10

LEGEND

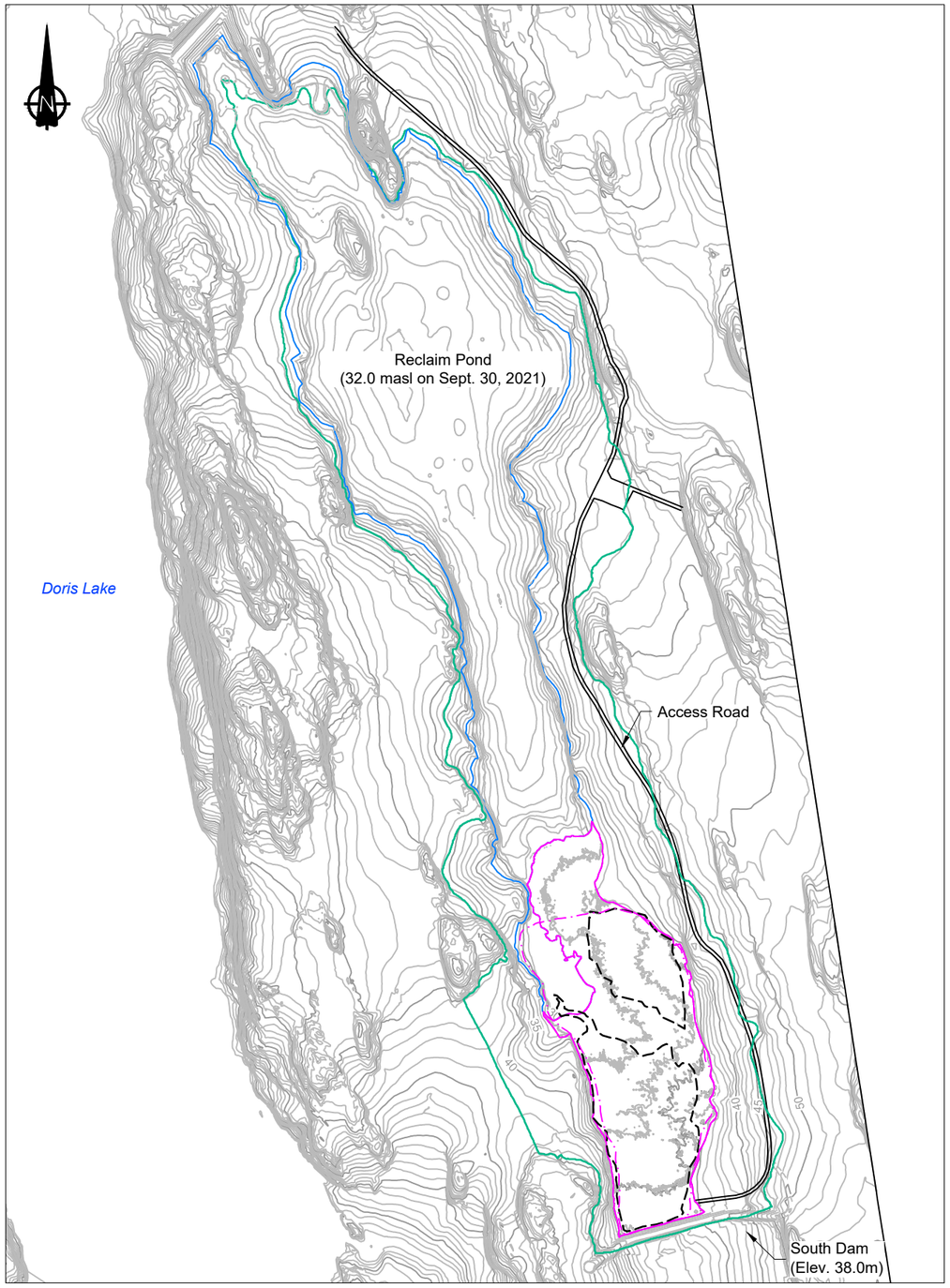
- Ground Temperature Cable
- Lower GCL Liner
- Upper GCL Liner
- Bedding Material
- Transition Material
- Run of Quarry Backfill

NOTES

1. Topographic and as-built contour data from the terrain model was provided by the Client.
2. All units shown are in meters unless otherwise stated.

srk consulting	AGNICO EAGLE	2021 Annual Geotechnical Inspection	
SRK JOB NO.: 1CT022.077	Doris TIA	South Dam Instrumentation Cross Sections	
FILE NAME: 1CT022.077 - SD Instrumentation Plan.dwg		DATE: Nov. 2021	APPROVED: PDL
			FIGURE: 9

P:\01_SITES\Hope Bay\ACAD\2021 Drawings\2021 AG\1CT022.077 - SD Instrumentation Plan.dwg



LEGEND

- Major Contour (5m)
- Minor Contour (1m)
- Ultimate Tailings Extent
- 2021 Surveyed Tailings Limit
- 2020 Surveyed Tailings Limit
- 2019 Surveyed Tailings Beach

NOTES

1. Topographic and As-built data was provided by the client.
2. Contours shown at 1.0m intervals.
3. All units shown are in meters unless otherwise stated.

REFERENCE

1. Sentinel 2 Satellite imagery captured August 22, 2021.
2. 2019 tailings surveys dated December 22 and 25, 2019.
3. 2020 tailings survey dated December 15-28, 2020.
4. 2021 Tailings Beach survey collected by drone LiDAR in August 2021, data provided by client.
5. 2021 Bathymetry survey collected by ERM between August 19 and 25, 2021, data provided by client.

0m 50 100 150 200

srk consulting

AGNICO EAGLE

Doris TIA

SRK JOB NO.: 1CT022.077

FILE NAME: 1CT022.077 - 2021 Deposition History.dwg

2021 Annual Geotechnical Inspection

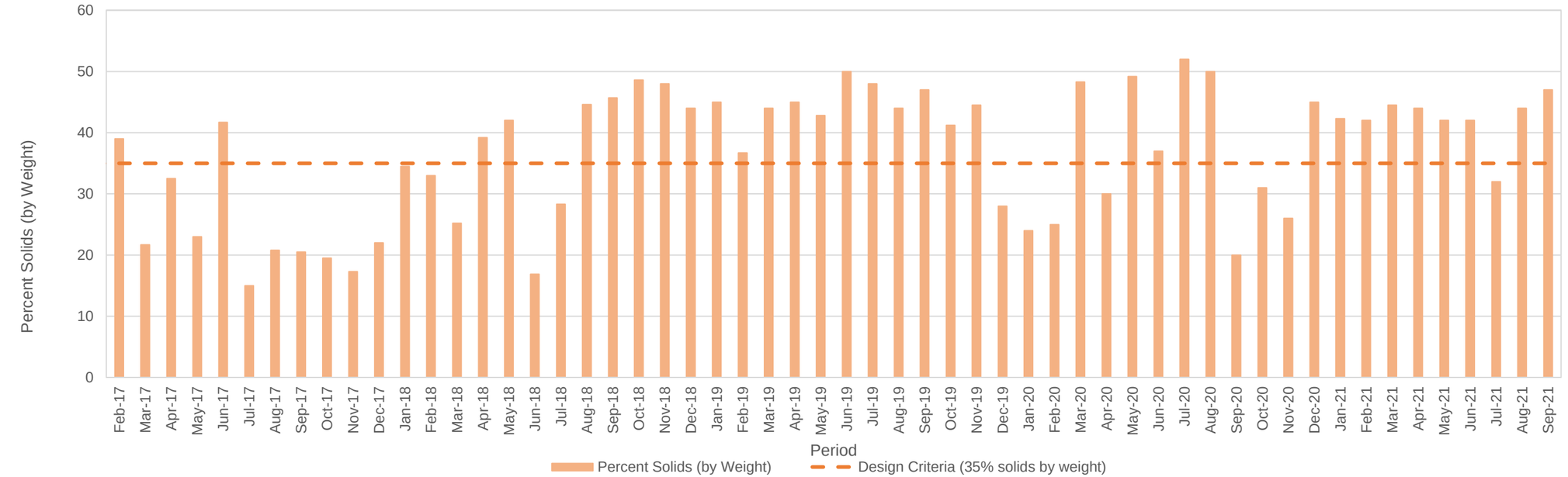
Actual Tailings Deposition History

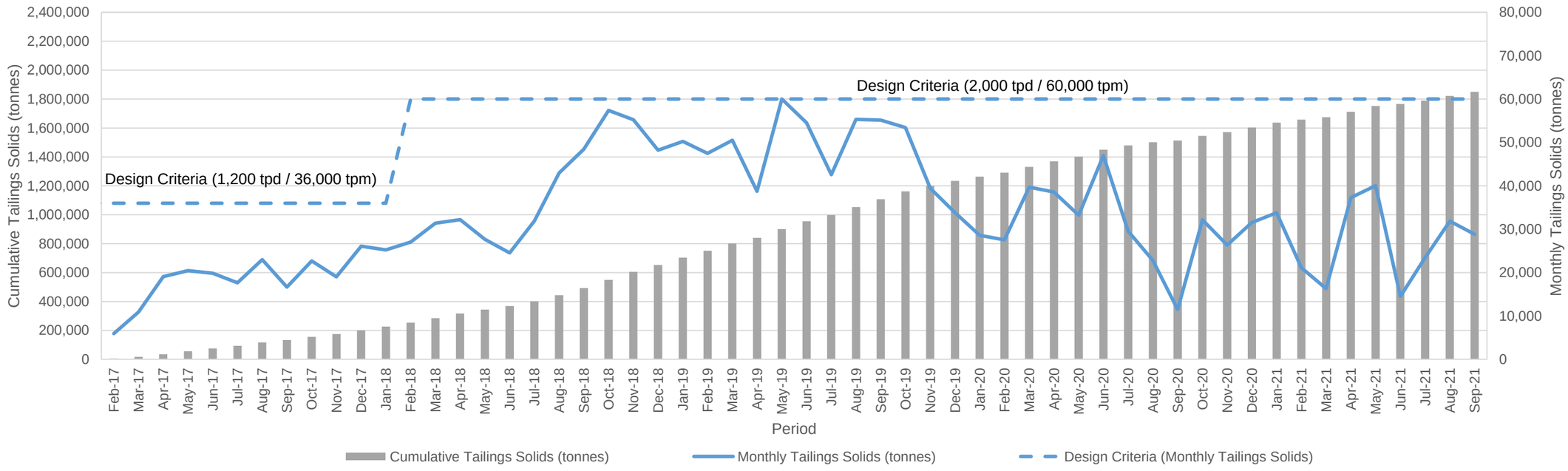
DATE: Nov. 2021

APPROVED: PDL

FIGURE: 10

P:\01_SITES\Hope Bay\ACAD\2021 Drawings\2021 AGI\1CT022.077 - 2021 Deposition History.dwg





srk consulting

Job No: 1CT022.077

Filename: 11_TailingsDepositionHistory.pptx

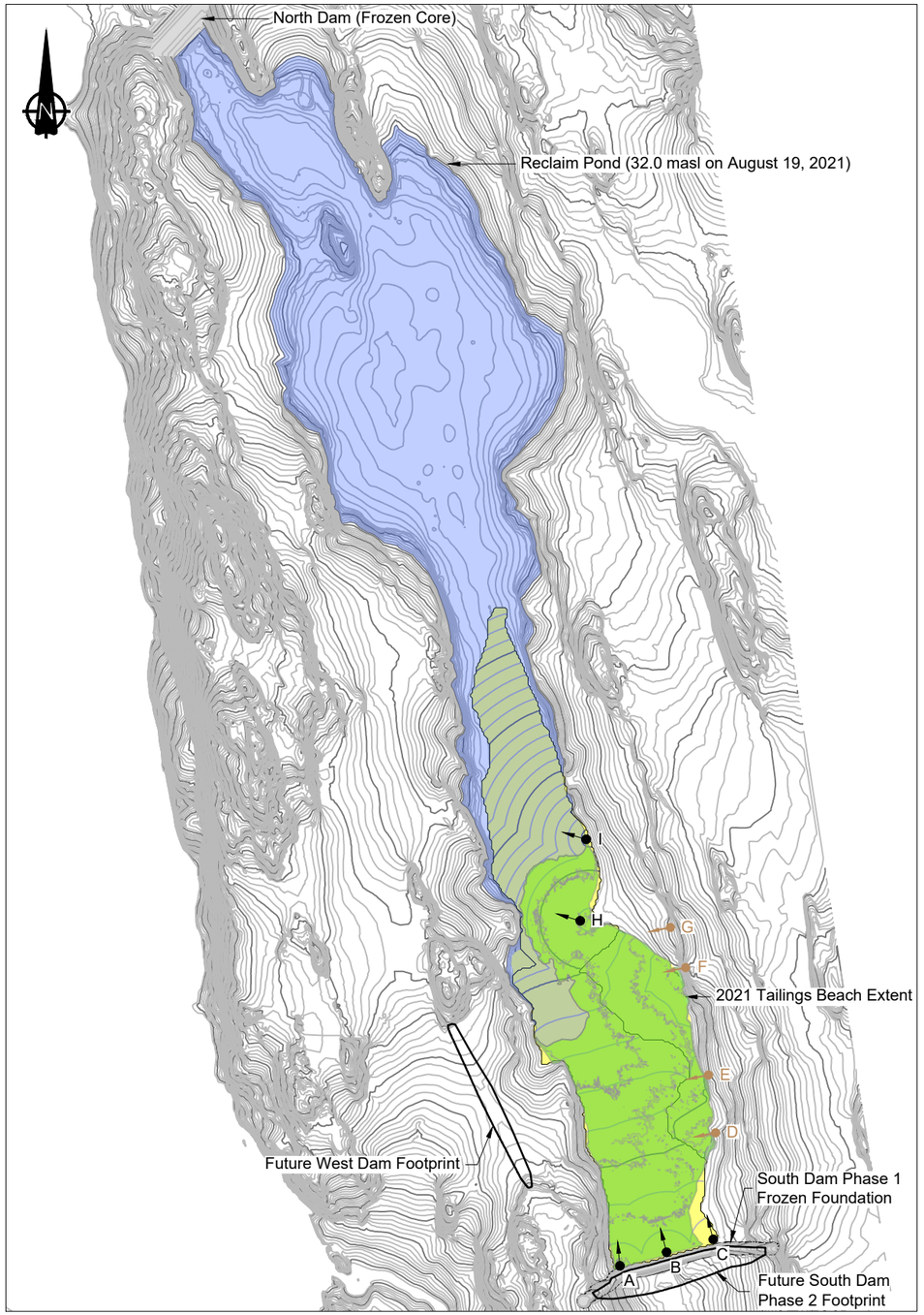
AGNICO EAGLE

DORIS TIA

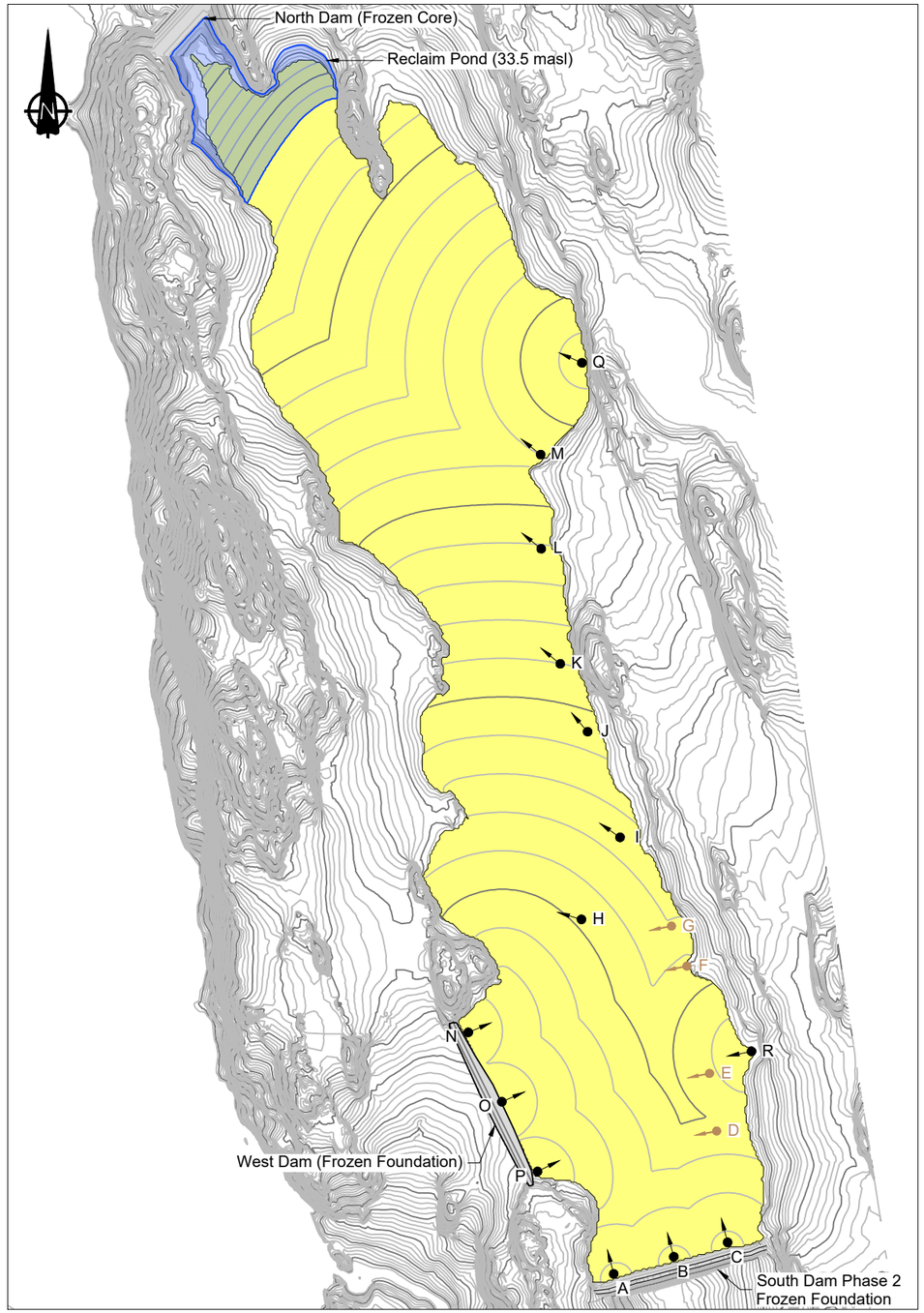
2021 Annual Geotechnical Inspection

Actual Tailings Deposition Values (Design / Actual)

Date: Dec. 2021 | Approved: PDL | Figure: **11**



Projected Short-term Tailings Deposition - 730,000 tonnes Deposited after December 2020



Projected Tailings Deposition LOM - 18,240,000 tonnes Deposited after December 2020

LEGEND

- Old Spigot Location
- Modeled Spigot Location
- Reclaim Pond
- Dam Footprint
- Planned Tailings Deposition
- Subaerial Tailings Beach (2021)

NOTES

1. Scenario 1 production rates are assumed to be 2,000 t/day from 2021 to 2023, and 4,000 t/day from 2024 and onward. Sub-aerial and sub-aqueous slopes are assumed at 0.5% and 1.5%, respectively.
2. Deposition model scenario is based on the bathymetry survey completed in 2019 and tailings beach survey completed in December 2020 by TMAC. Sub-aqueous portion of 2020 tailings is assumed to be 1.5%.
3. A deposited tailings dry density of 1.3 t/m³ was used.
4. Topographic data and surveys were provided by the client.
5. Contours are shown every 0.5 m.

REFERENCE

1. NAD83 CSRS UTM Zone 13.
2. 2021 Tailings Beach survey collected by drone LiDAR in August 2021, data provided by client.
3. 2021 Bathymetry survey collected by ERM between August 19 and 25, 2021, data provided by client.

0m 100 200 300 400 500 600

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2021 Annual Geotechnical Inspection

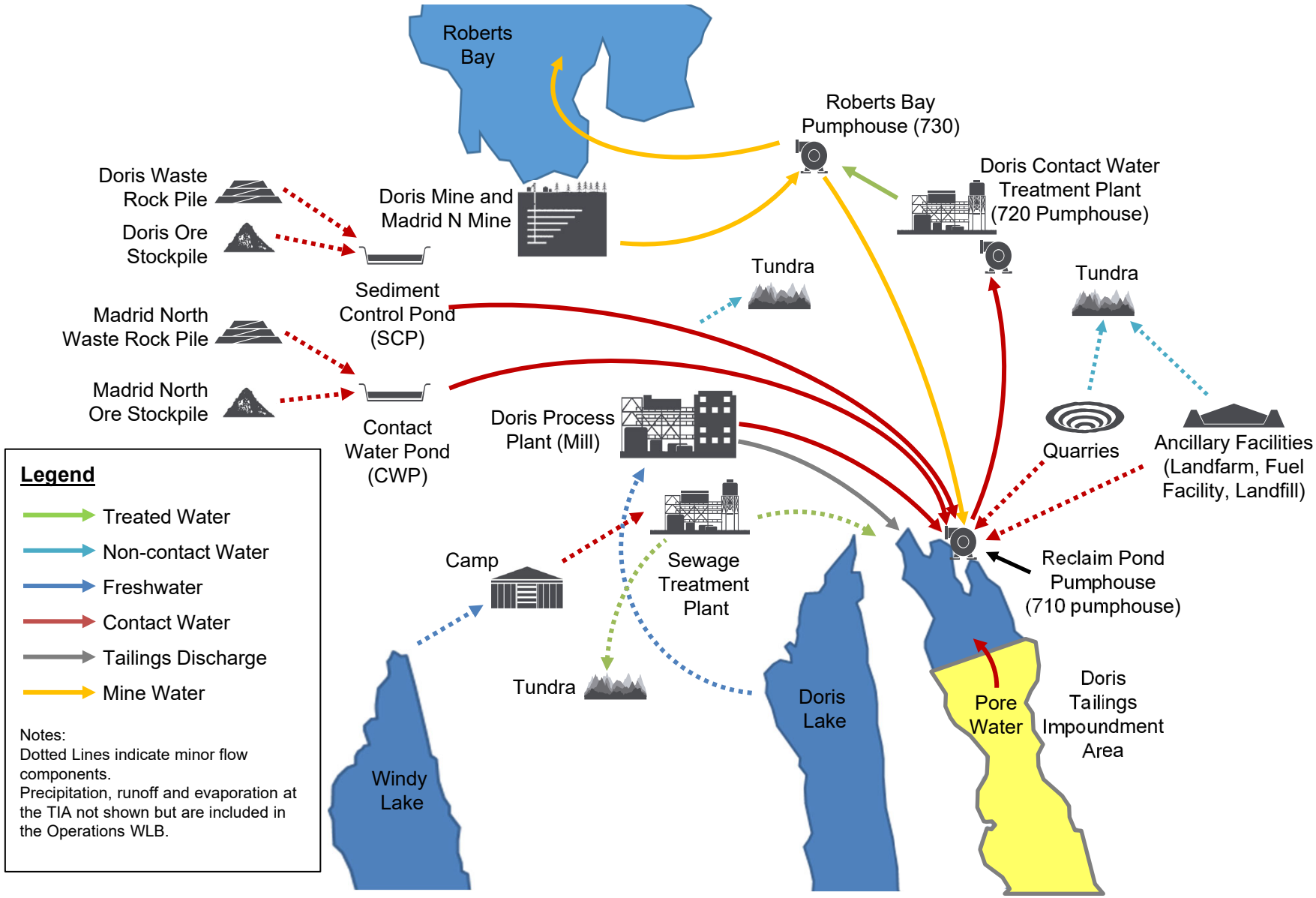
Planned Tailings Deposition

SRK JOB NO.:	1CT022.077
FILE NAME:	1CT022.077 - 2021 Tailings Deposition.dwg

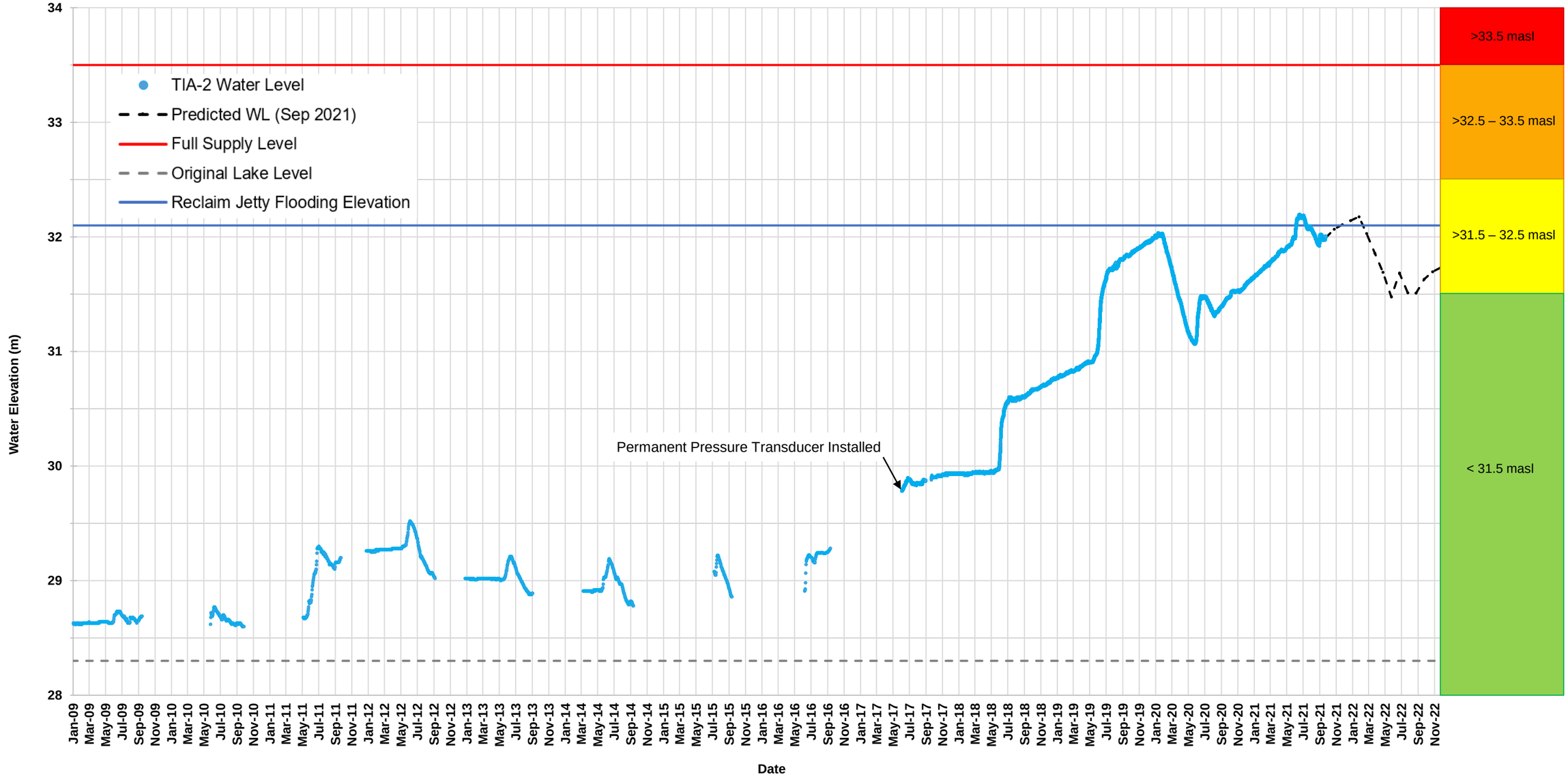
Doris TIA

DATE:	APPROVED:	FIGURE:
November 2021	PDL	12

P:\01_SITES\Hope Bay\ACAD\2021 Drawings\2021 AGI\1CT022.077 - 2021 Tailings Deposition.dwg

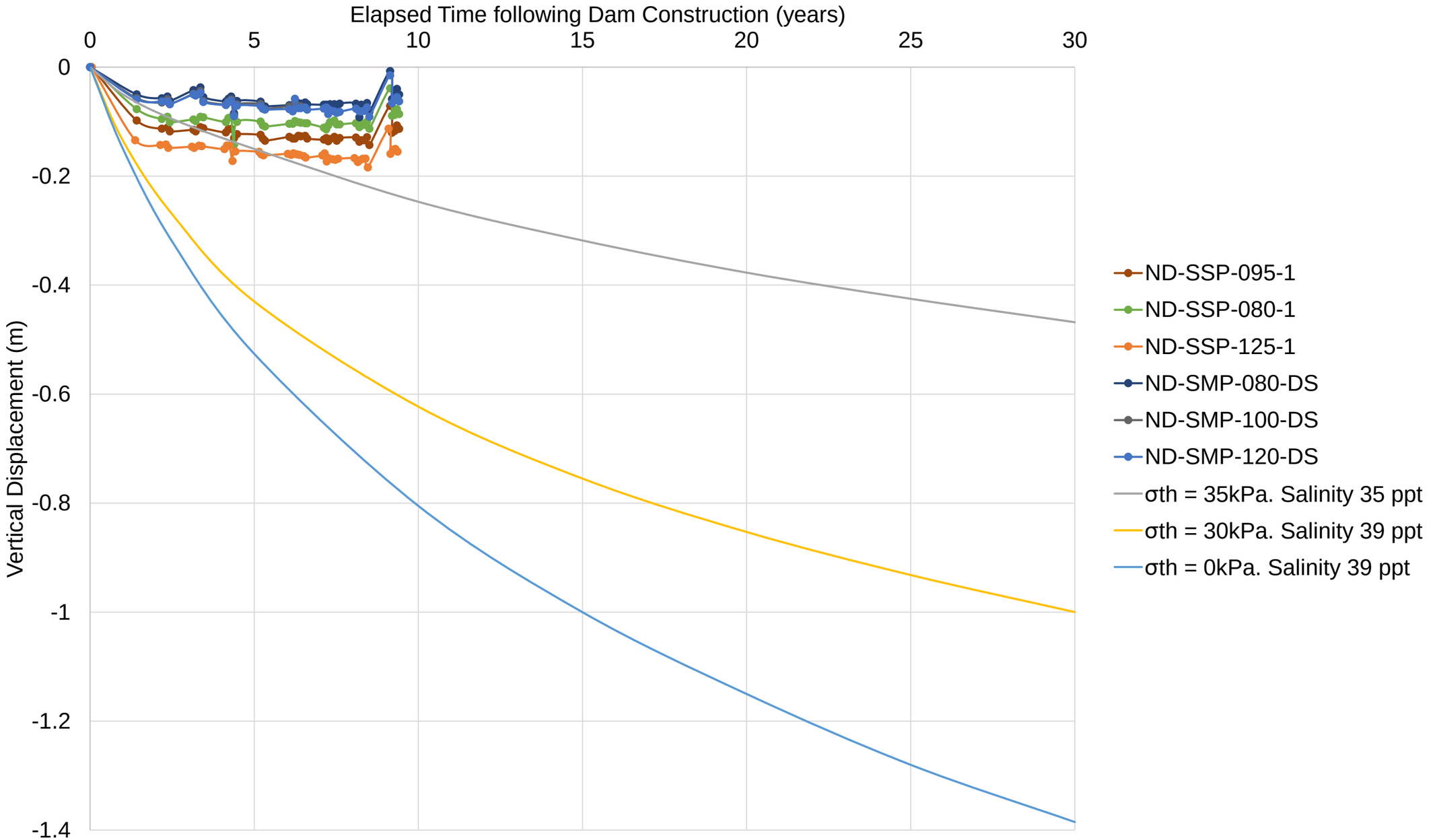


srk consulting	AGNICO EAGLE	2021 Annual Geotechnical Inspection
		Schematic of TIA Water Management
Job No: 1CT022.077 Filename: DorisTIA_WaterMgmtSchematic_1CT022.077.pptx	Doris TIA	Date: December 2021 / Approved: PDL / Figure: 13



Notes:
1) The predicted water level presented here is based on the September 2021 detailed operational TIA water balance as discussed in the report. The forward-looking projections of the operational TIA water and load balance tool are speculative and for planning purposes only

srk consulting	AGNICO EAGLE	2021 Annual Geotechnical Inspection
		Actual and Predicted Water Level in TIA
Job No: 1CT022.077 Filename: 14_ActualsPredWaterLevel_20211206.pptx	Doris TIA	Date: Dec. 2021 · Approved: PDL · Figure: **14**



srk consulting	AGNICO EAGLE	2021 Annual Geotechnical Inspection
		Measured vs. Modelled Vertical Displacement at Station 1+20 (North Dam)
Job No: 1CT022.077	Doris TIA	Date: Dec. 2021 / Approved: PL / Figure: **15**
Filename: 15_CreepDisp_20211206.pptx		

Photo Logs

1

2

3

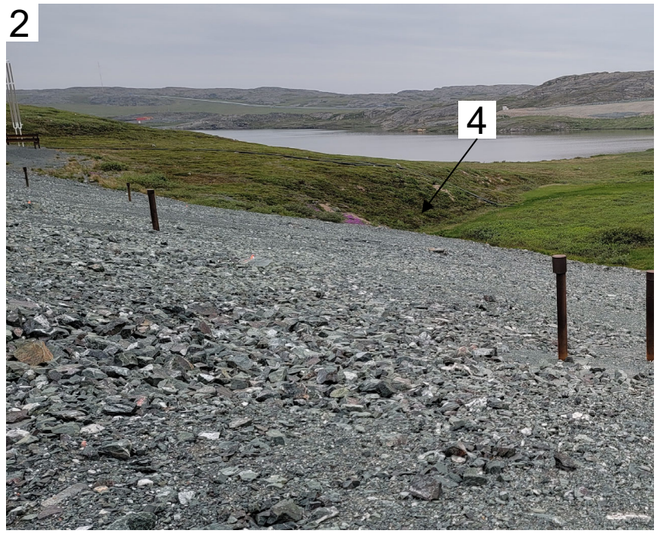
Photos:
Top: Aerial photos of the North Dam (2019 left, 2020 middle, and 2021 right image).
Photo 1: View of the submerged upstream pumping pad.
Photo 2: View of the upstream face of the dam, looking west.
Photo 3: View looking west along the dam crest.

Note:
All photos from 2021 unless specifically noted

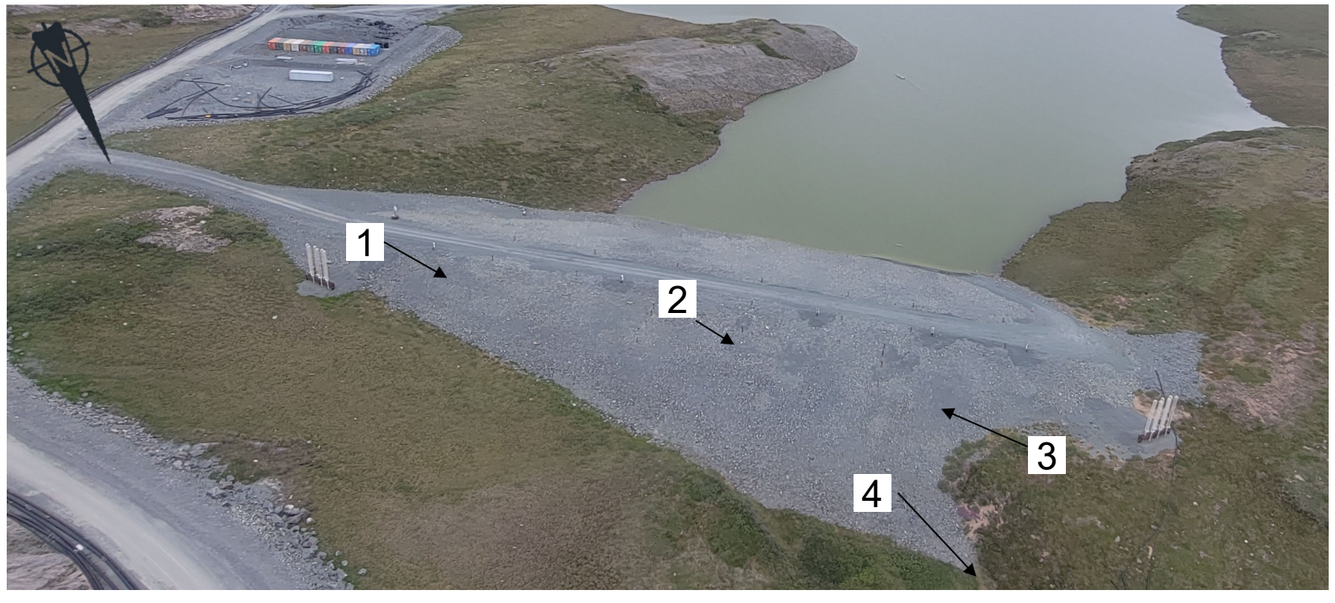
srk consulting	AGNICO EAGLE	2021 Annual Geotechnical Inspection
		North Dam Upstream Face
Job No: 1CT022.077 Filename: 2021_TIA_AGI_PhotoLog_202011208.pptx	Doris TIA	Date: December 2021 / Approved: PL / JK / Photolog: **1**

1

2



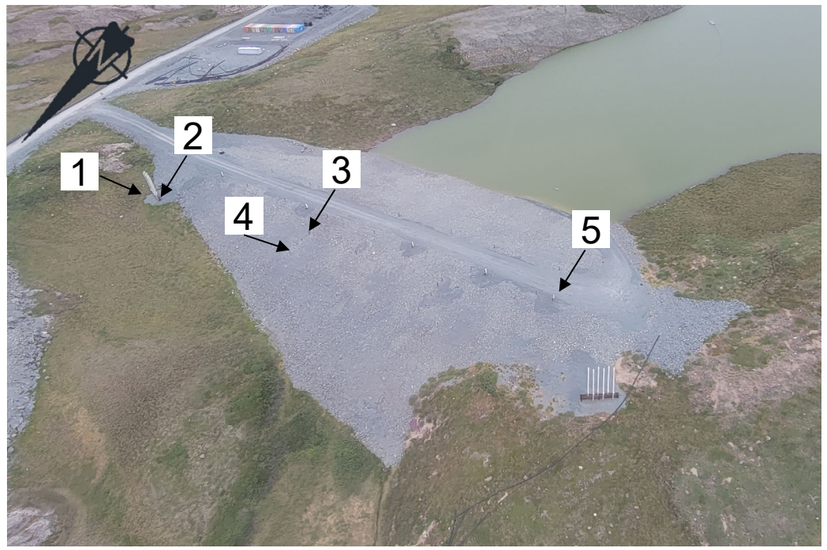
3



4

Photos:
Photo 1: View of the North Dam, looking west along the downstream dam face.
Photo 2: View of the downstream dam face and primary drainage leading away from the downstream toe of North Dam. Inclinometer monuments are visible in the foreground.
Photo 3: View of the downstream shell from West.
Photo 4: Close-up of the V-notch weir installed at the downstream toe.
Bottom Left: Aerial photo of the North Dam.

srk consulting	AGNICO EAGLE	2021 Annual Geotechnical Inspection
		North Dam Downstream Face
Job No: 1CT022.077 Filename: 2021_TIA_AGI_PhotoLog_202011208.pptx	Doris TIA	Date: December 2021 / Approved: PL / JK / Photolog: **2**



Photos:
Photo 1: View of the North thermosyphon risers and radiators.
Photo 2: View of the rust on the weld between the North thermosyphons radiators and risers.
Photo 3: View of deep settlement points and inclinometers on the downstream shell.
Photo 4: View inside the monument protecting one of the crest settlement monitoring points.
Photo 5a and 5b: Example of ground temperature cable datalogger housing and wiring (Node E).
Bottom Left: Overview photo (south-southwest view) of North Dam. Photo locations shown on overview.

srk consulting	AGNICO EAGLE	2021 Annual Geotechnical Inspection
		North Dam Instrumentation and Thermosyphons
Job No: 1CT022.077	Doris TIA	Date: December 2021 / Approved: PL / JK / Photolog: **3**
Filename: 2021_TIA_AGI_PhotoLog_202011208.pptx		

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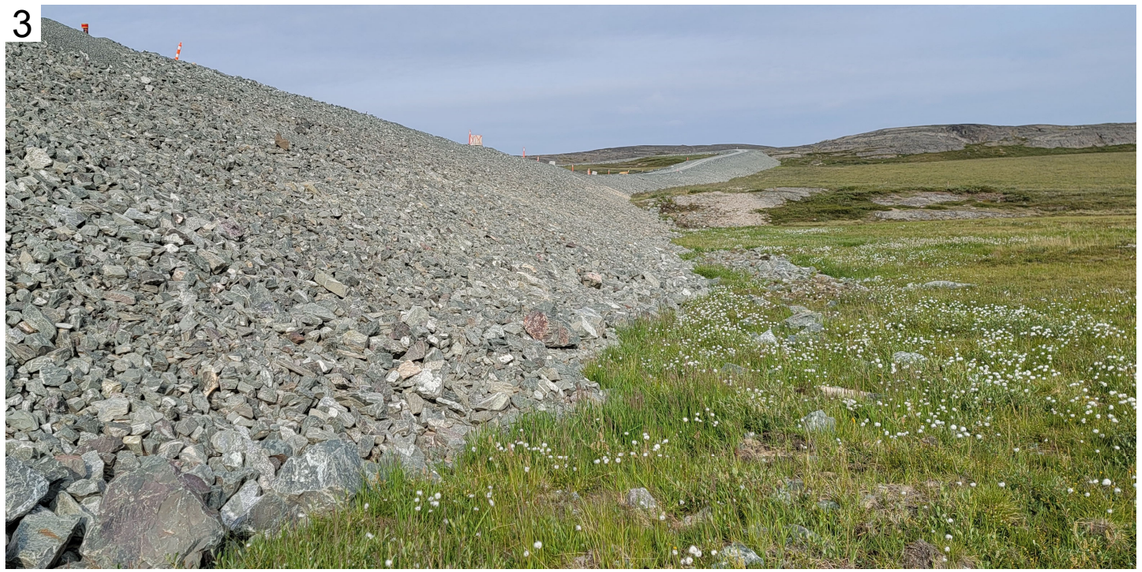

4

Photos:
Photo 1: Aerial photo of the South Dam, 2021, looking east.
Photo 2: Aerial photo of the South Dam, 2021, looking east.
Photo 3: The downstream toe of the South Dam, looking east.
Photo 4: The western most spigot point (Spigot A) on the upstream face of the South Dam, looking east.

srk consulting	AGNICO EAGLE	2021 Annual Geotechnical Inspection
		South Dam Inspection
Job No: 1CT022.077 Filename: 2021_TIA_AGI_PhotoLog_202011208.pptx	Doris TIA	Date: December 2021 / Approved: PL / JK / Photolog: **4**

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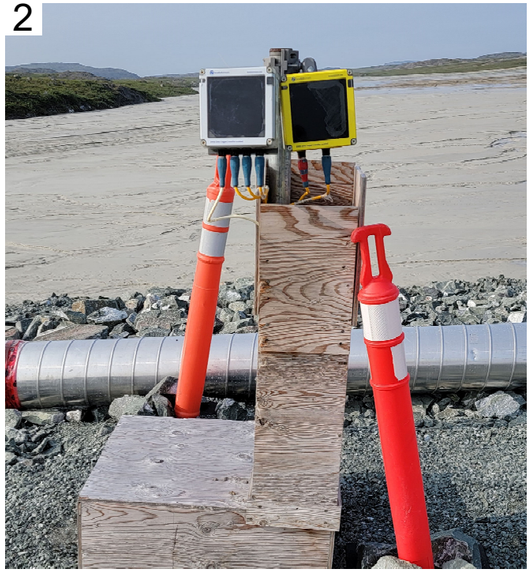
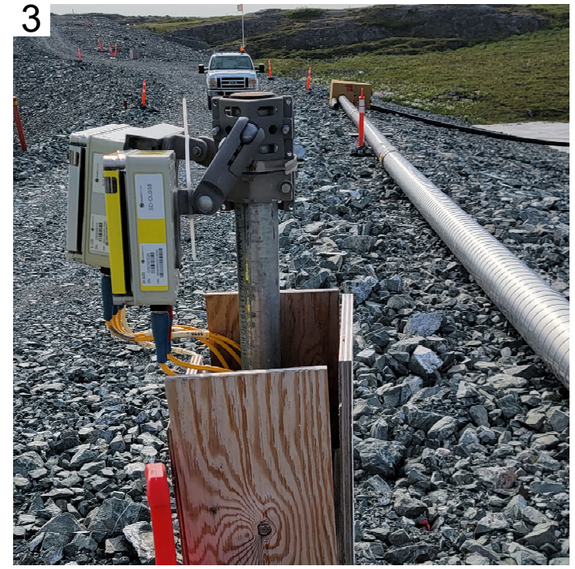


3



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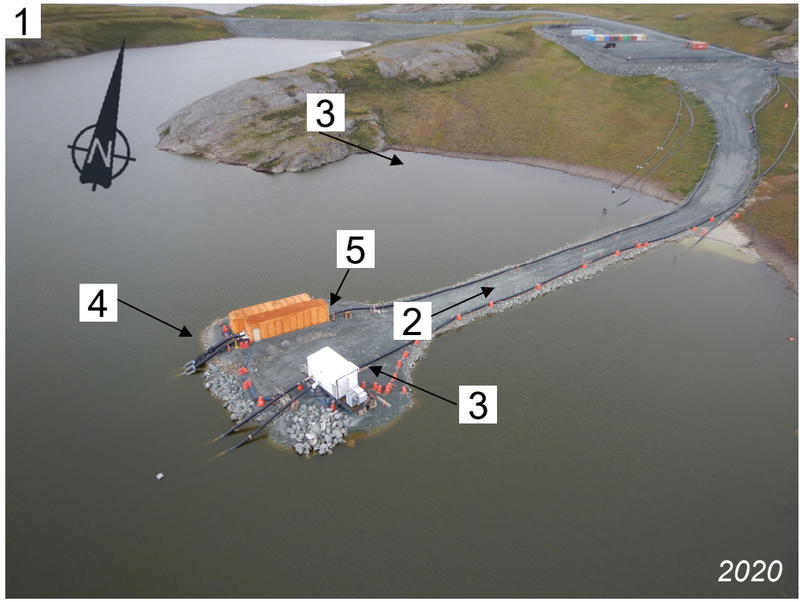
Photos:
Photo 1: View along the South Dam crest, looking east.
Photo 2: One of the data logger nodes on the upstream crest. Plywood casing is used to prevent animal damage.
Photo 3: Close-up of the BeadedStream DL505 datalogger and solar panel units.
Photo 4: View along the downstream dam toe, looking west.
Photo 5: Crest settlement monitoring point and other instruments under wooden enclosure, looking east.
Photo 6: Close-up of a surficial settlement point on the downstream face.

srk consulting	AGNICO EAGLE	2021 Annual Geotechnical Inspection
		South Dam Instrumentation
Job No: 1CT022.077 Filename: 2021_TIA_AGI_PhotoLog_202011208.pptx	Doris TIA	Date: December 2021 / Approved: PL / JK / Photolog: **5**

1



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5

Photos:
Photo 1: Aerial photo of the Reclaim Pond Jetty and 710 Pumphouse, prior to repairs in 2020.
Photo 2: Jetty access road, looking northeast, reclaim pipelines on either side.
Photo 3: Pumphouse on the south side of the Jetty pad, slight flooding of the pad can be seen on the left side.
Photo 4: Reclaim line exiting the seacan pumphouse.
Photo 5: North side of the Reclaim Pond Jetty pad, following 2020 repairs. Settlement monitoring points can be seen on the right side near the crest.

srk consulting	AGNICO EAGLE	2021 Annual Geotechnical Inspection **Reclaim Pond Jetty and Pumphouse (710)**
Job No: 1CT022.077 Filename: 2021_TIA_AGI_PhotoLog_202011208.pptx	Doris TIA	Date: December 2021 / Approved: PL / JK / Photolog: 6

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Photos:
Photo 1: East side of the TIA with the tailings beach and northern-most spigot.
Photo 2: The South Dam and tailings beach, looking west.
Photo 3: The South Dam and tailings beach, looking northwest.
Photo 4: The reclaim pond looking northwest, Explosives storage and access to Quarry D visible.
Photo 5: The reclaim pond shoreline on the west side of the TIA.
Photo 6: The western shoreline of the TIA with the North Dam in the foreground, looking south.

srk consulting	AGNICO EAGLE	2021 Annual Geotechnical Inspection
Job No: 1CT022.077	Doris TIA	**Tailings Deposition and Reclaim Pond Shoreline**
Filename: 2021_TIA_AGI_PhotoLog_202011208.pptx		Date: December 2021 / Approved: PL / JK / Photolog: 7

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Photos (Timeseries):
Photo 1: Tailing beach development off the South Dam as of 2018.
Photo 2: Tailings beach development off the South Dam as of 2019.
Photo 3: Tailings beach development off the South Dam as of 2020.
Photo 4: Tailings beach development off the South Dam as of 2021.

srk consulting	AGNICO EAGLE	2021 Annual Geotechnical Inspection
		Tailing Deposition Time-series
Job No: 1CT022.077 Filename: 2021_TIA_AGI_PhotoLog_202011208.pptx	Doris TIA	Date: December 2021 / Approved: PL / JK / Photolog: **8**

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Photos:
Photo 1: Aerial photo of the Emergency Dump Catch Basins (EDCB).
Photo 2: The western EDCB looking east.
Photo 3: The northern corner of the western EDCB, where the wrinkled zone of liner has shifted.
from the tuck-trench at the crest, potentially impacting containment volume.
Photo 4: The eastern EDCB, in good condition.

srk consulting	AGNICO EAGLE	2021 Annual Geotechnical Inspection
		Emergency Dump Catch Basins
Job No: 1CT022.077 Filename: 2021_TIA_AGI_PhotoLog_202011208.pptx	Doris TIA	Date: December 2021 / Approved: PL / JK / Photolog: **9**

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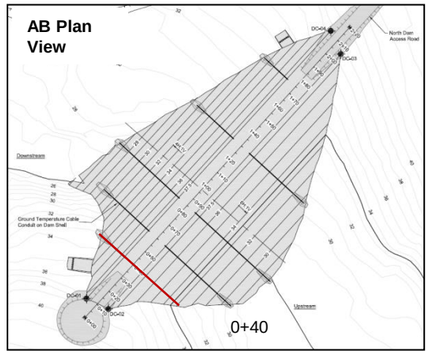
Photos:
Photo 1: Doris Creek Bridge (East Abutment) showing the electrical line, tailings pipelines and racking, looking south.
Photo 2: Doris Creek Bridge (West Abutment) showing the electrical line, tailings pipelines and racking, looking southwest.
Photo 3: Reclaim pipelines over the south pipe racking on the Doris Creek Bridge, looking east.
Photo 4: Abutment fill and thermistor at northwest corner of bridge has been damaged. The void should be backfilled and the thermistor box be relocated similar to the northeast thermistor (Photo 6).
Photo 5: Tailings and reclaim pipelines over the north pipe rack looking east. Damaged guardrail observed, which should be repaired.
Photo 6: Tailings pipeline over the north pipe racking on the Doris Creek Bridge, looking west.
Photo 7: Northwest bridge abutment.

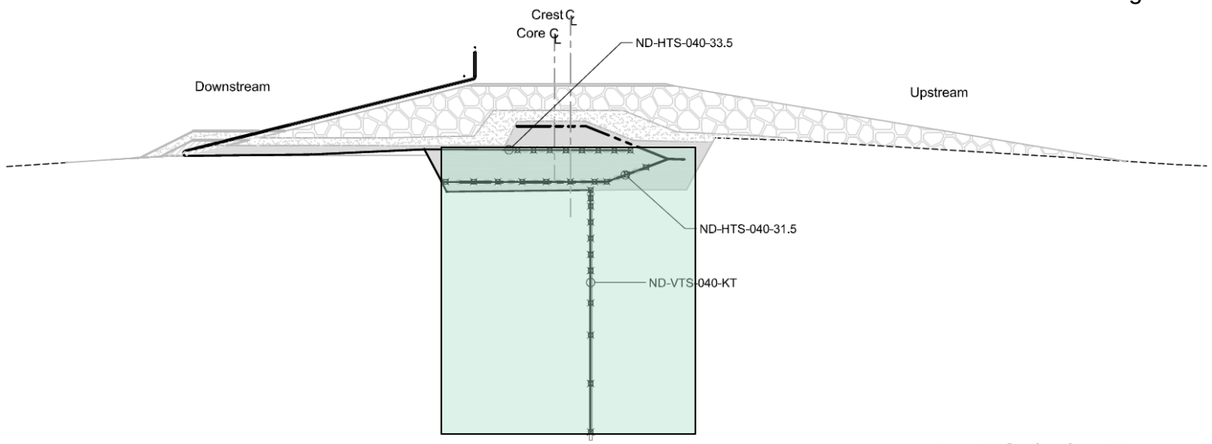
srk consulting	AGNICO EAGLE	2021 Annual Geotechnical Inspection
		Tailings Discharge and Reclaim Pipeline (Near TIA)
Job No: 1CT022.077	Doris TIA	Date: December 2021 / Approved: PL / JK / Photolog: **10**
Filename: 2021_TIA_AGI_PhotoLog_202011208.pptx		

Appendix A – Ground Temperature Cables

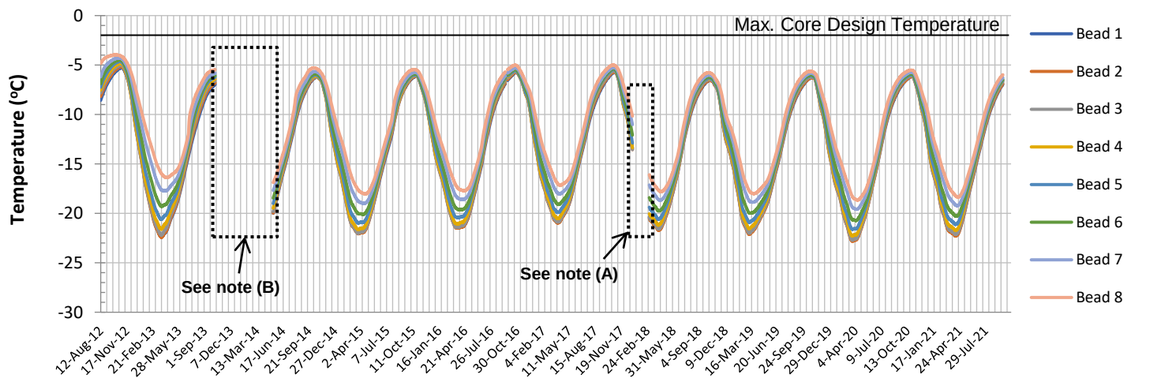


Legend:

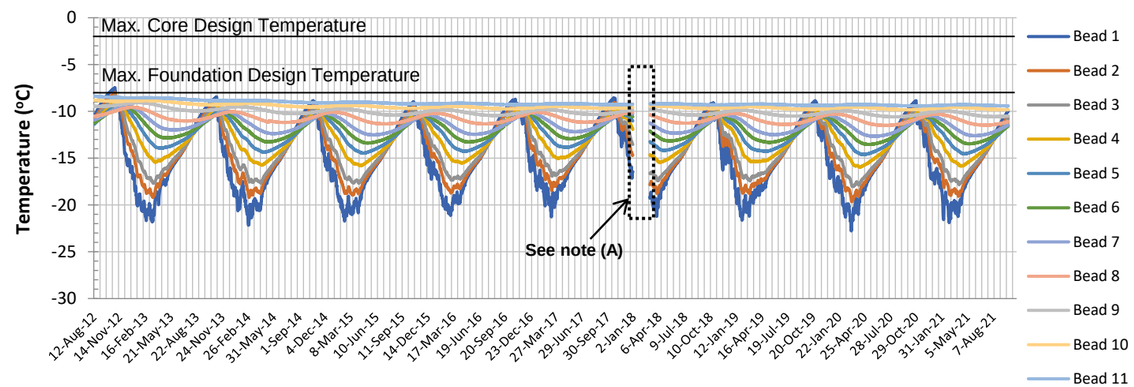
- GTC Status: Cable irreparably damaged
- GTC Status: Bead damaged or data missing
- Design Thermal Block



ND-HTS-040-33.5



ND-VTS-040-KT



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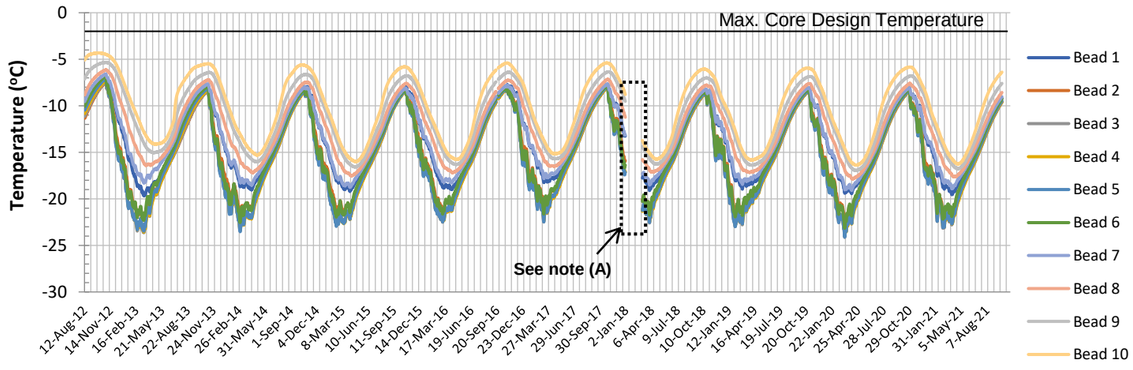
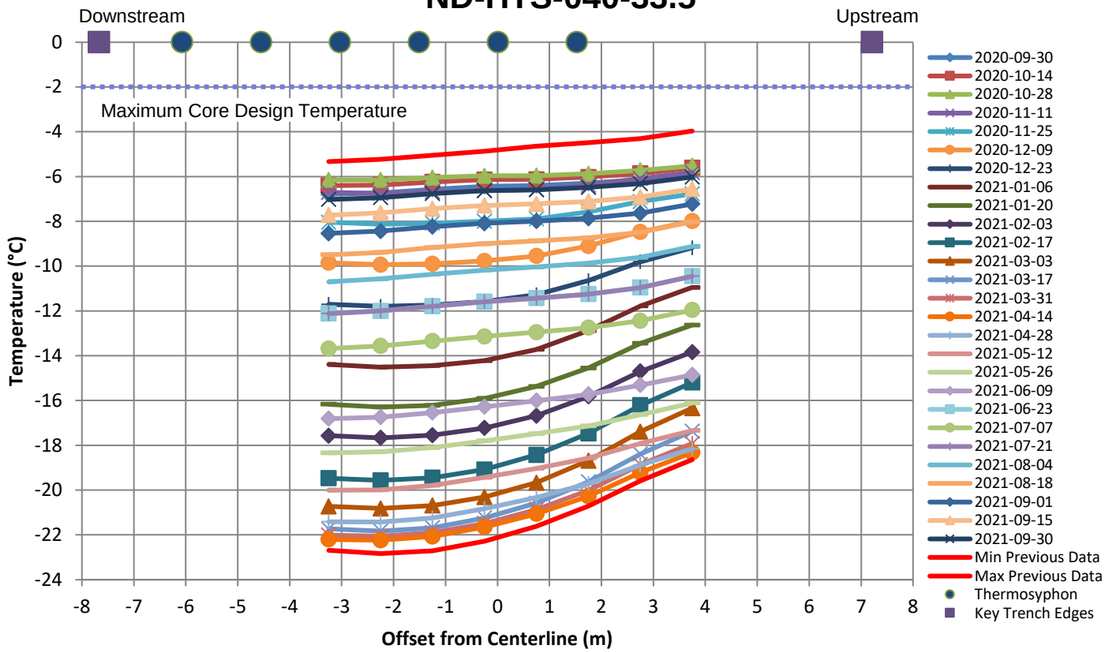


Notes:

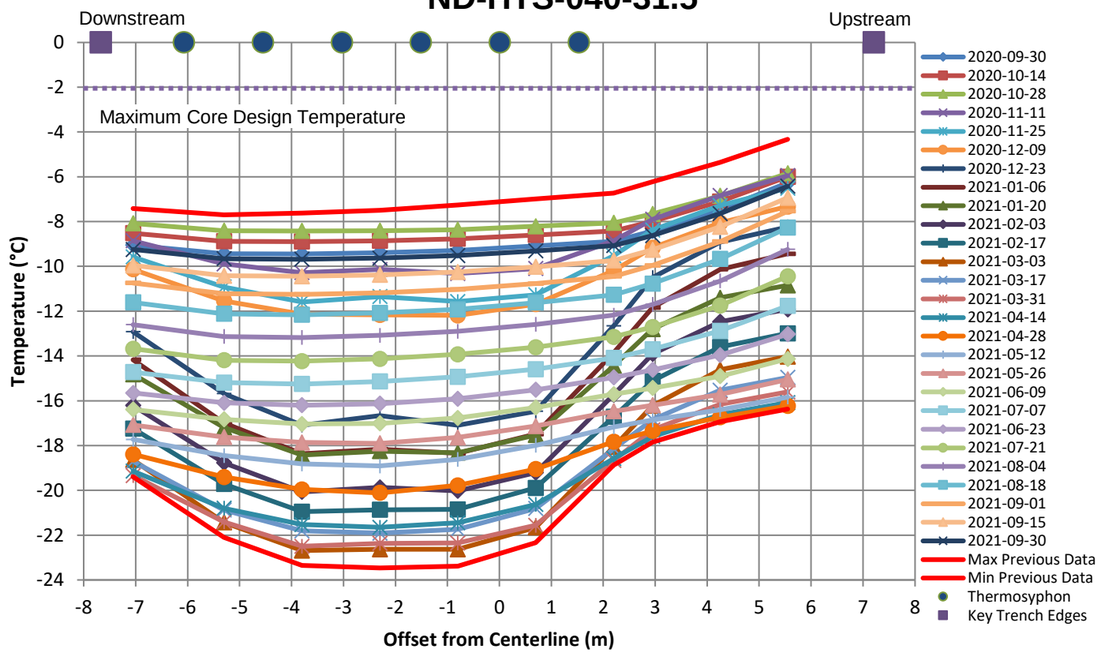
- Bead numbers increase from downstream to upstream (horizontal) and top to bottom (vertical)
- **(A)** Data logger was disconnected from January 1, 2018 to March 3, 2018 for recalibration
- **(B)** GTC was disconnected from datalogger

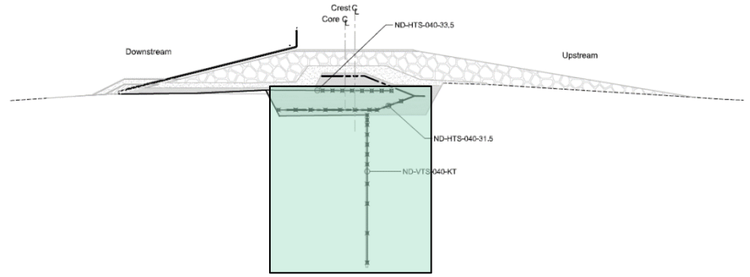
srk consulting	AGNICO EAGLE	2021 AGI – North Dam
Job No: 1CT022.077 Filename: 1_App_A_ND_GTC_PT2.pptx	DORIS TIA	**Station 0+40 Ground Temperature Cable Temperature Vs. Time** Date: Nov. 2021 | Approved: PDL | Figure: **A.1**

ND-HTS-040-33.5



ND-HTS-040-31.5

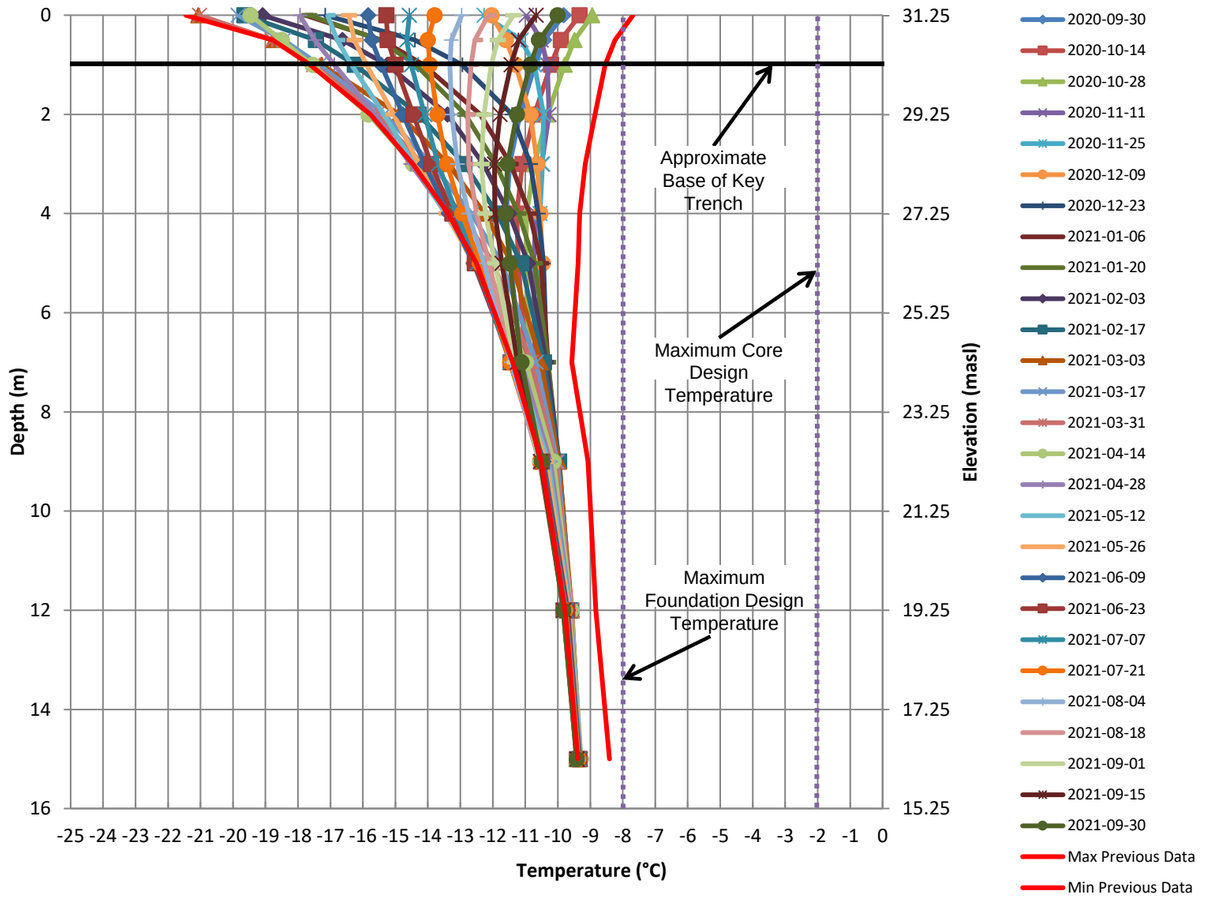




Legend:

- GTC Status: Cable irreparably damaged
- GTC Status: Bead damaged or data missing
- Design Thermal Block

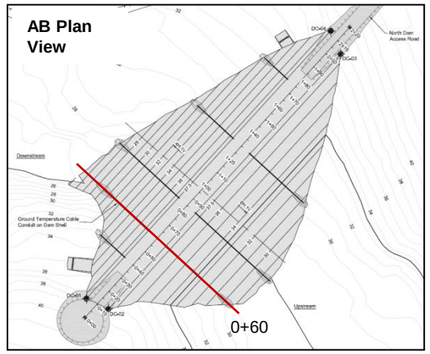
ND-VTS-040-KT

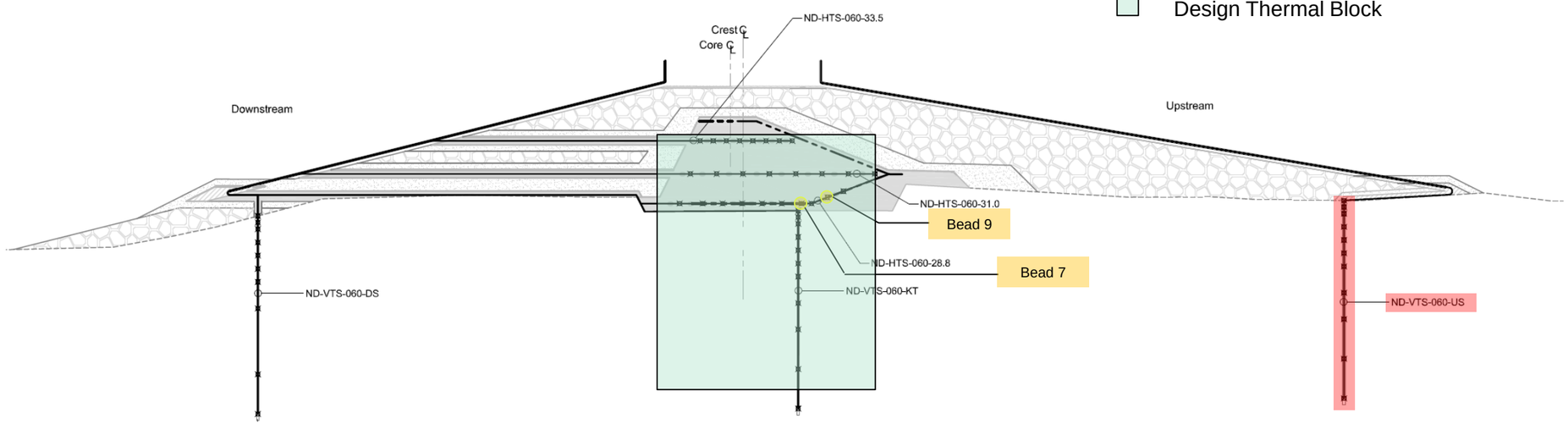


Note:

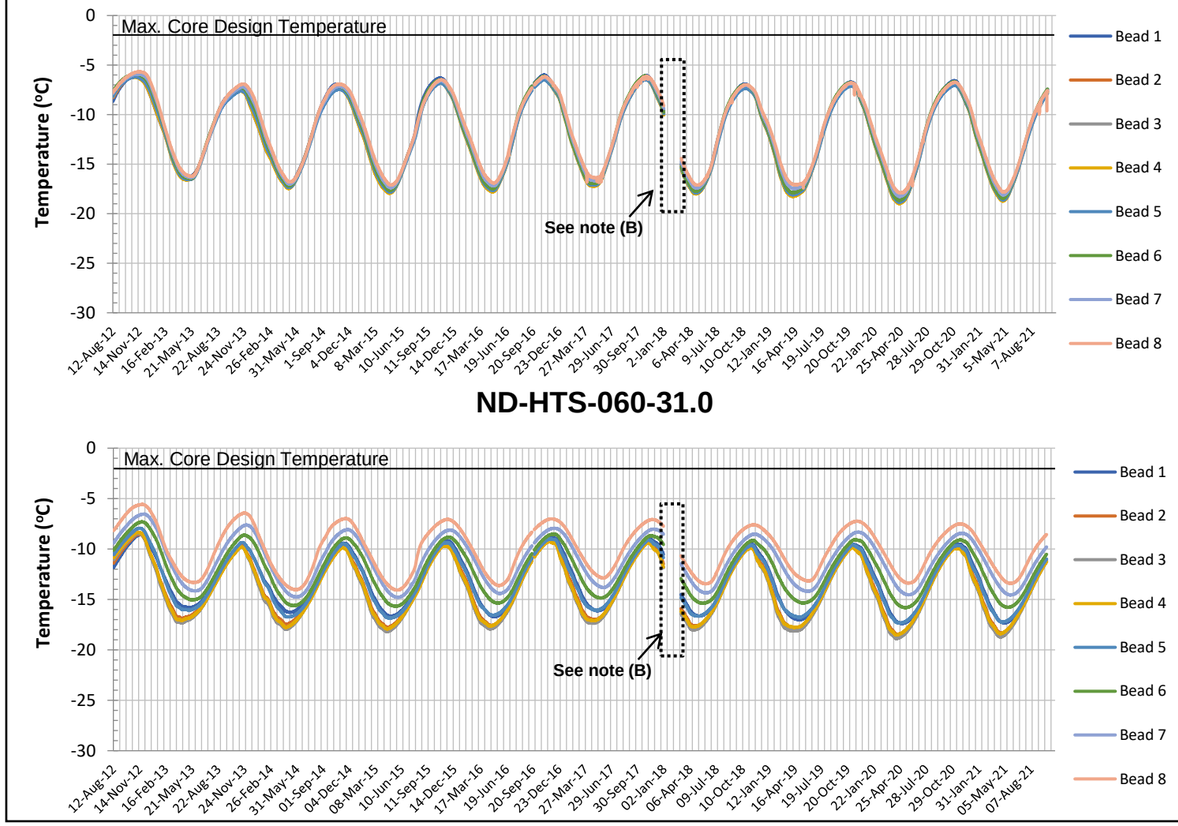
- Previous Data was recorded between August 2012 and September 2020

srk consulting	AGNICO EAGLE	2021 AGI – North Dam
		Station 0+40 Ground Temperature Cable Readings by Location
Job No: 1CT022.077 Filename: 1_App_A_ND_GTC_PT1.pptx	DORIS TIA	Date: Nov. 2021 / Approved: PDL / Figure: **A.2**



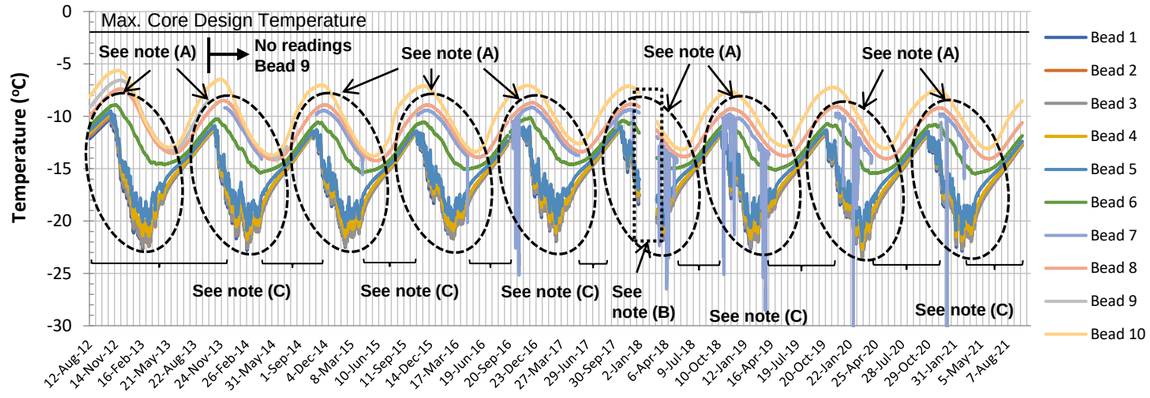


ND-HTS-060-33.5



ND-HTS-060-31.0

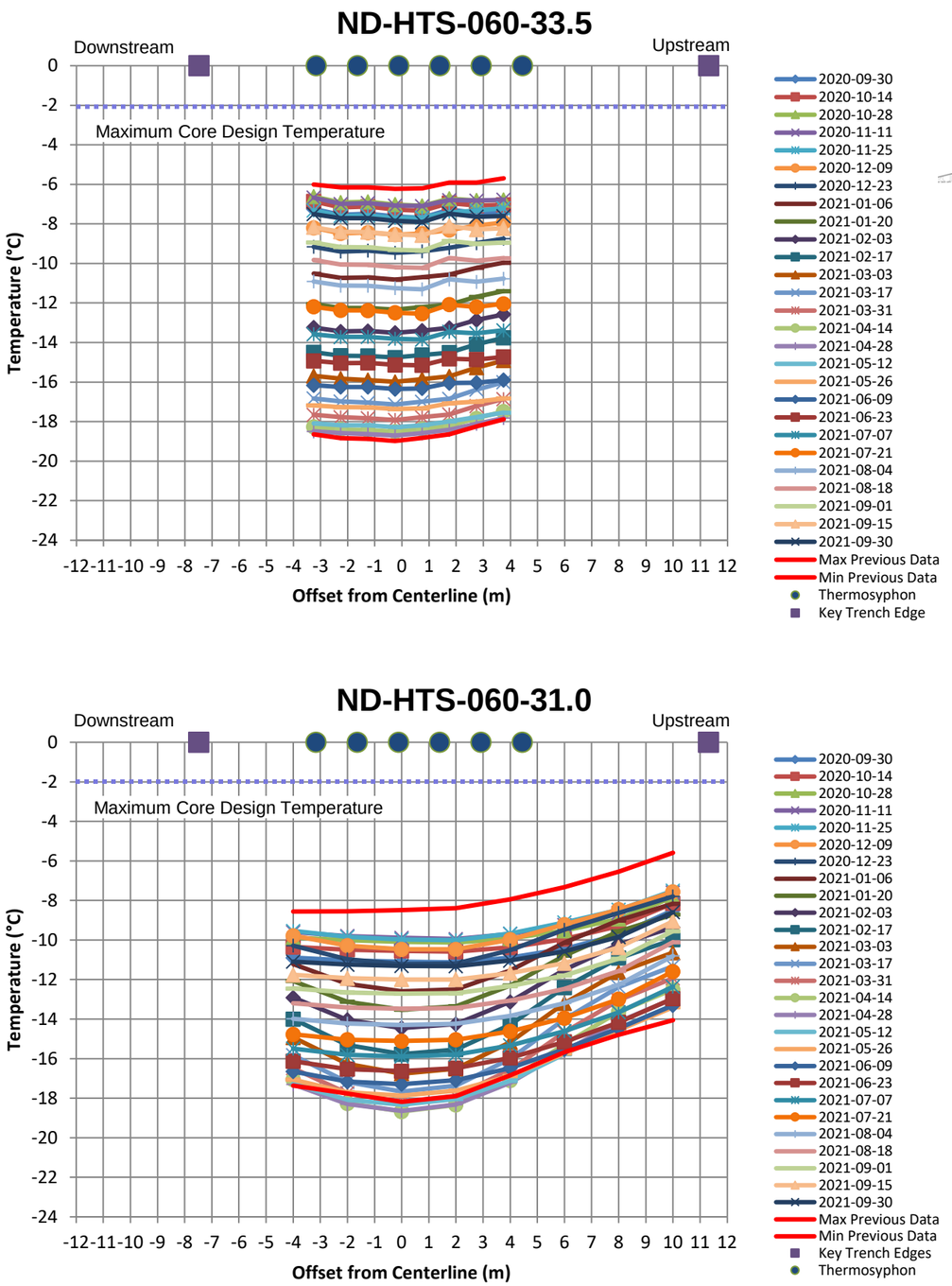
ND-HTS-060-28.8

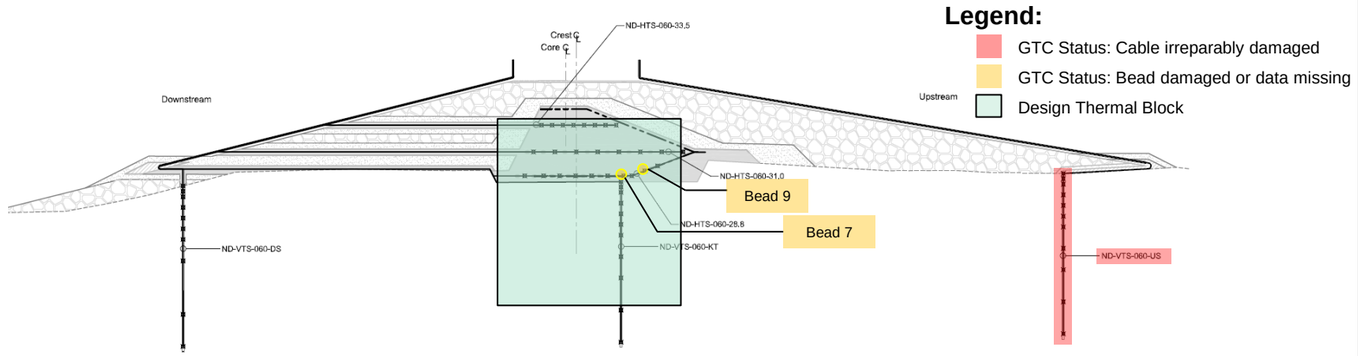


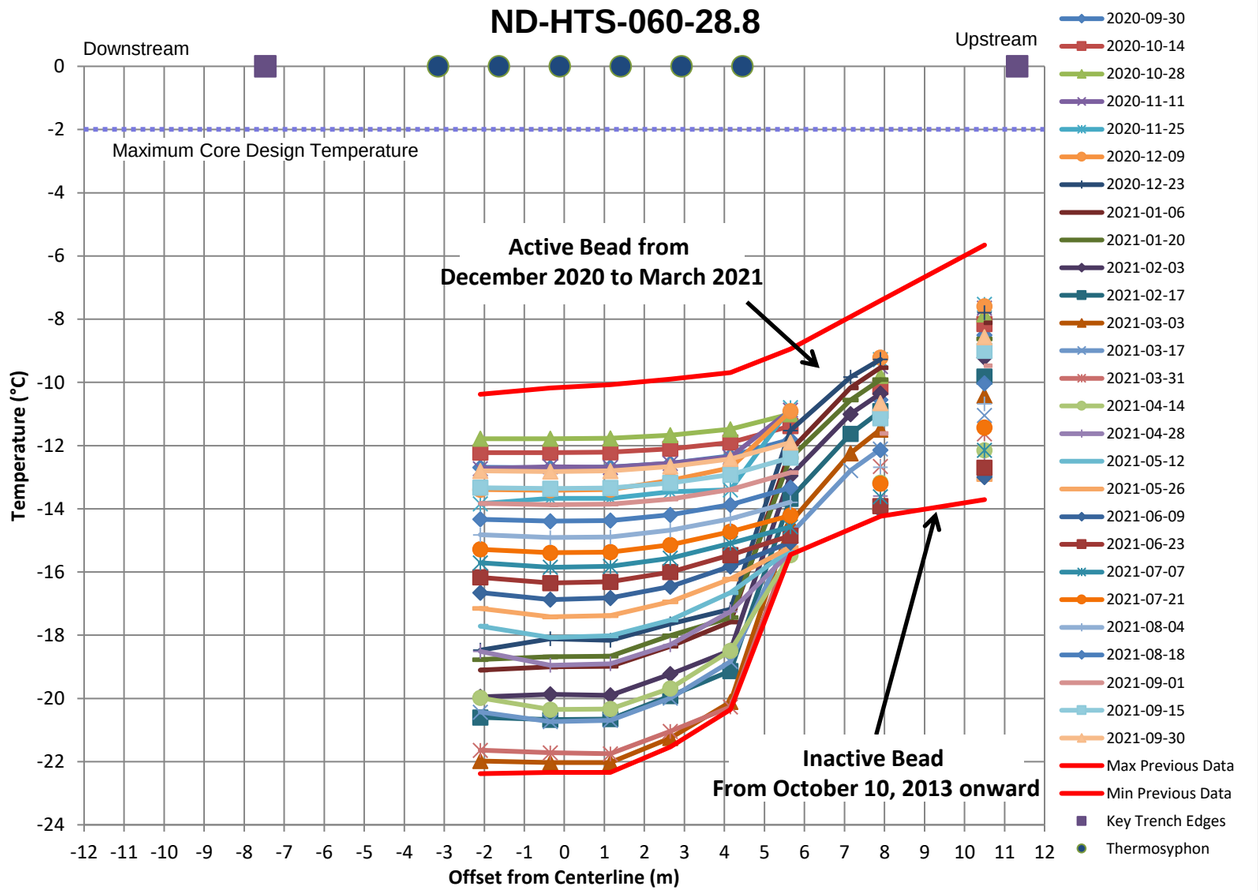
Notes:

- Bead numbers increase from downstream to upstream (horizontal) and top to bottom (vertical)
- **(A)** Variation in Ground Temperature Cable readings during winter months due to close proximity of Ground Temperature Cable beads to thermosyphon pipes
- **(B)** Data logger was disconnected from January 1, 2018 to March 3, 2018 for recalibration
- **(C)** No readings from Bead 7

srk consulting	AGNICO EAGLE	2021 AGI – North Dam
Job No: 1CT022.077 Filename: 1_App_A_ND_GTC_PT2.pptx	DORIS TIA	**Station 0+60** **Horizontal Temperature Cable Temperature Vs. Time**
		Date: Nov. 2021 / Approved: PDL / Figure: **A.3**



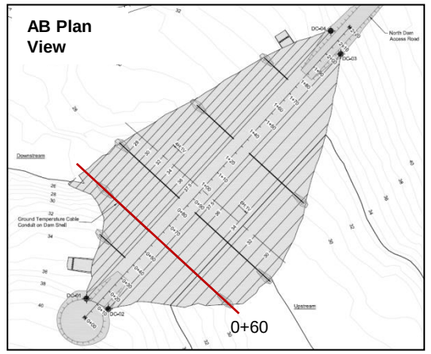


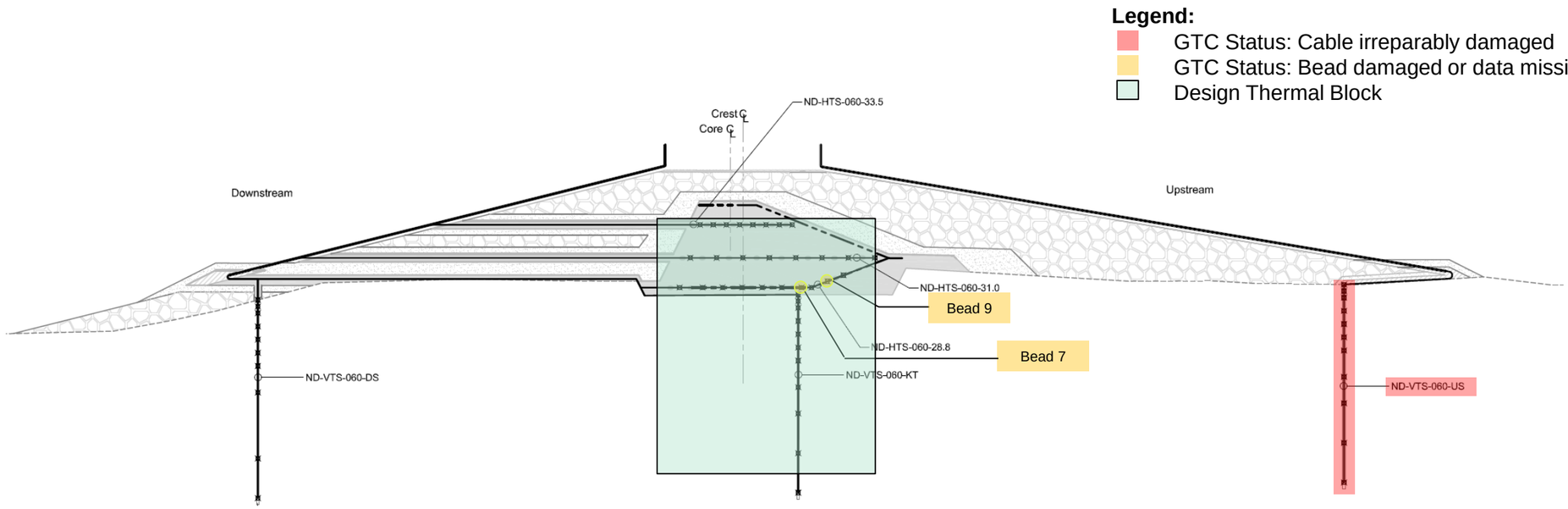


Note:

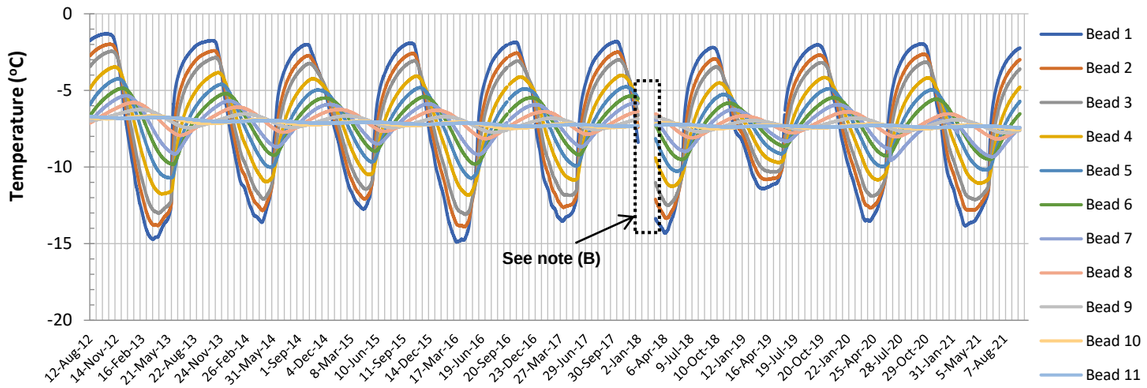
- Previous Data was recorded between August 2012 and September 2020

srk consulting	AGNICO EAGLE	2021 AGI – North Dam
		Station 0+60 **Horizontal Ground Temperature** **Cable Readings by Location**
Job No: 1CT022.077 Filename: 1_App_A_ND_GTC_PT1.pptx	DORIS TIA	Date: Nov. 2021 / Approved: PDL / Figure: **A.4**

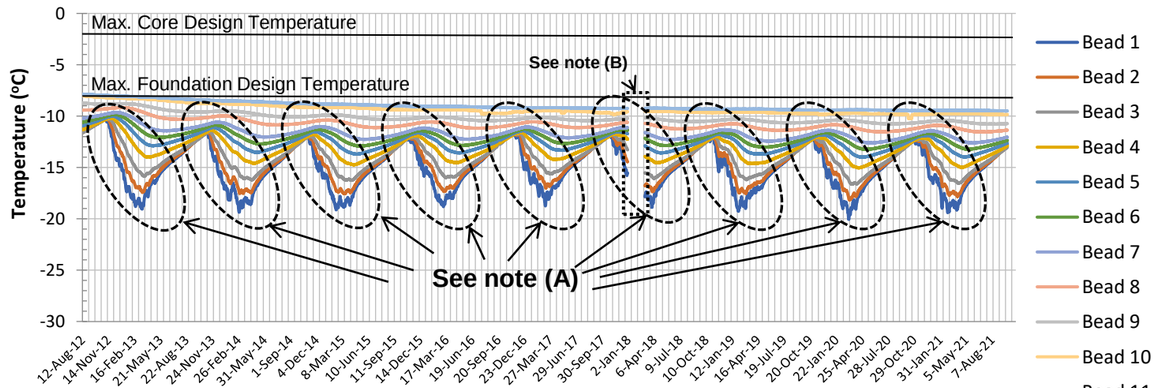




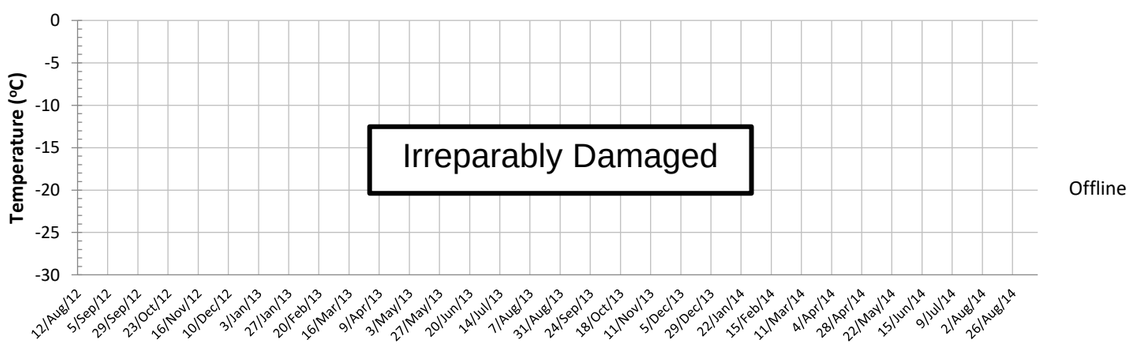
ND-VTS-060-DS



ND-VTS-060-KT



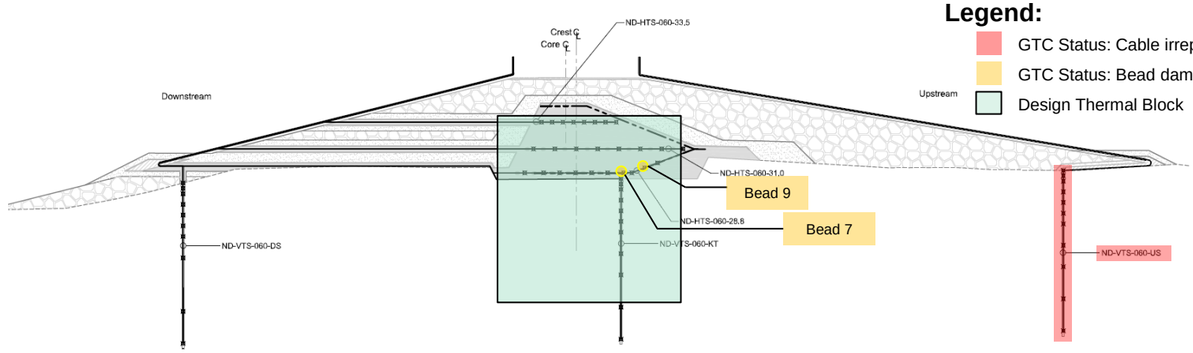
ND-VTS-060-US



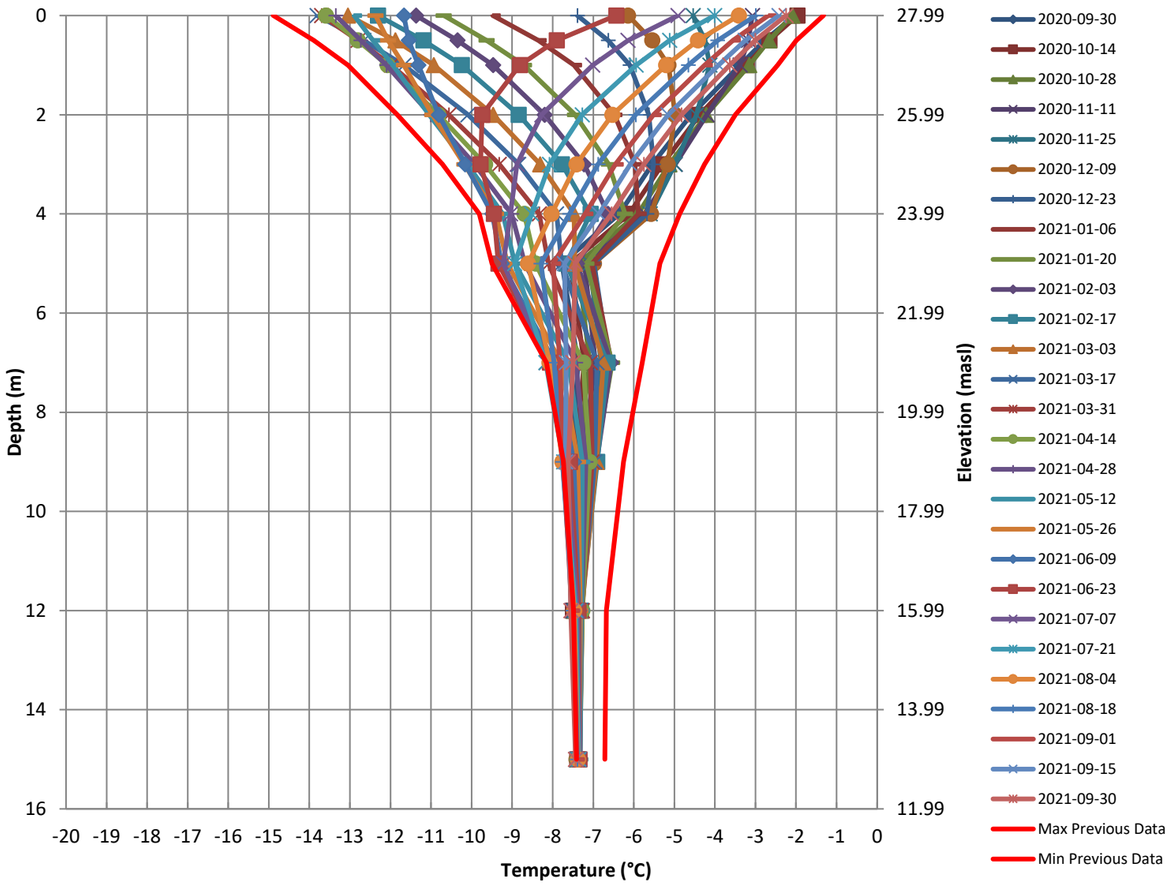
Notes:

- Bead numbers increase from downstream to upstream (horizontal) and top to bottom (vertical)
- **(A)** Variation in Ground Temperature Cable readings during winter months due to close proximity of Ground Temperature Cable beads to thermosyphon pipes
- **(B)** Data logger was disconnected from January 1, 2018 to March 3, 2018 for recalibration

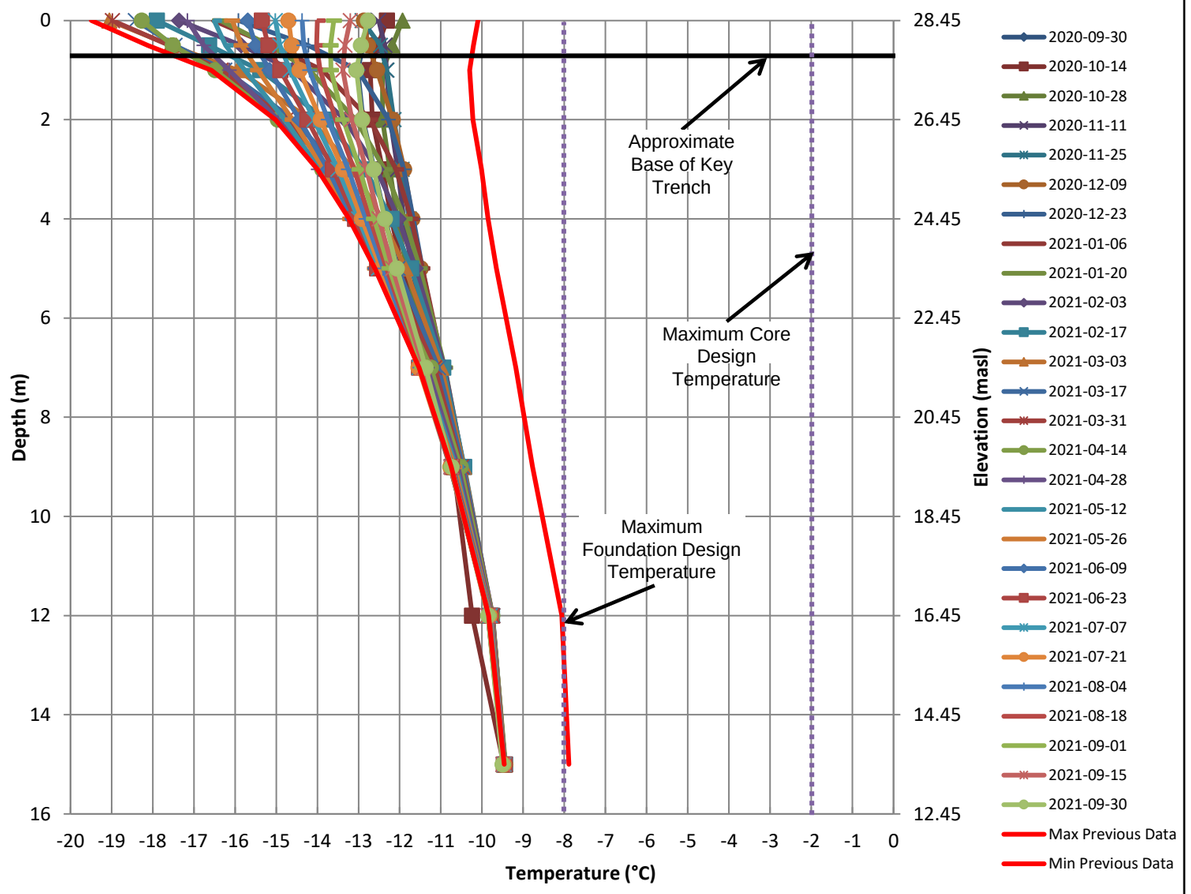
srk consulting	AGNICO EAGLE	2021 AGI – North Dam
		Station 0+60 Vertical Temperature Cable Temperature Vs. Time
Job No: 1CT022.077 Filename: 1_App_A_ND_GTC_PT2.pptx	DORIS TIA	Date: Nov. 2021 | Approved: PDL | Figure: **A.5**



ND-VTS-060-DS



ND-VTS-060-KT



Note:

- Previous Data was recorded between August 2012 and September 2020

srk consulting

Job No: 1CT022.077
Filename: 1_App_A_ND_GTC_PT1.pptx

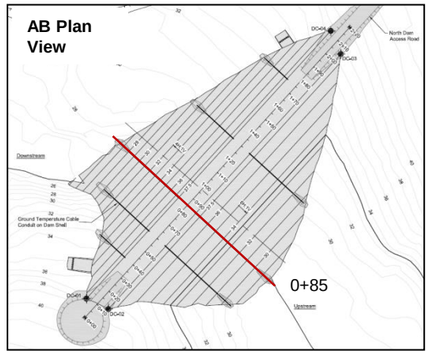
AGNICO EAGLE

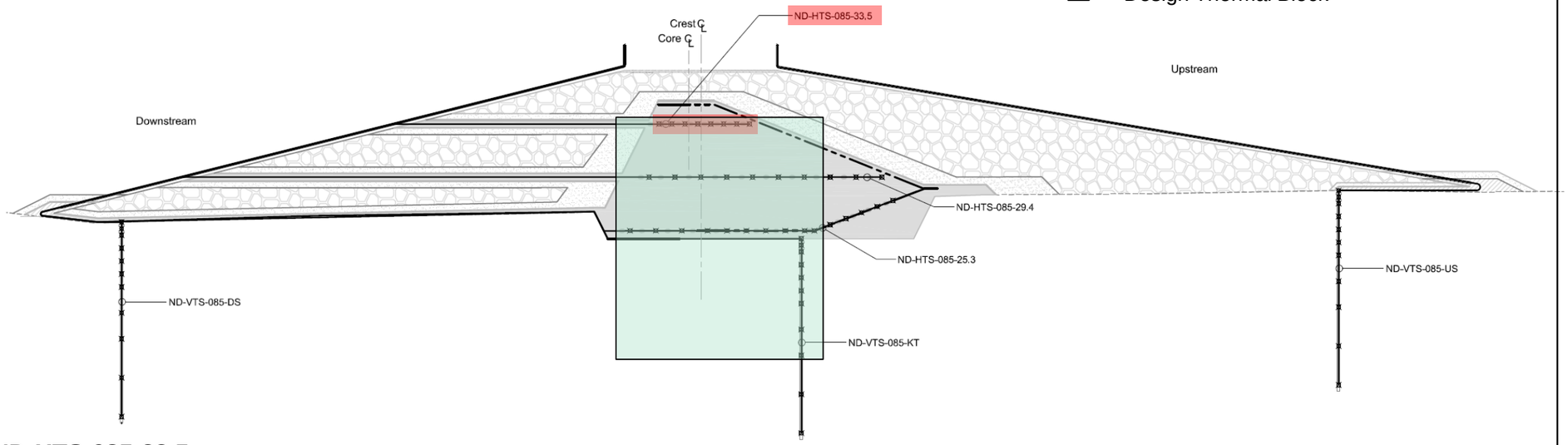
DORIS TIA

2021 AGI – North Dam

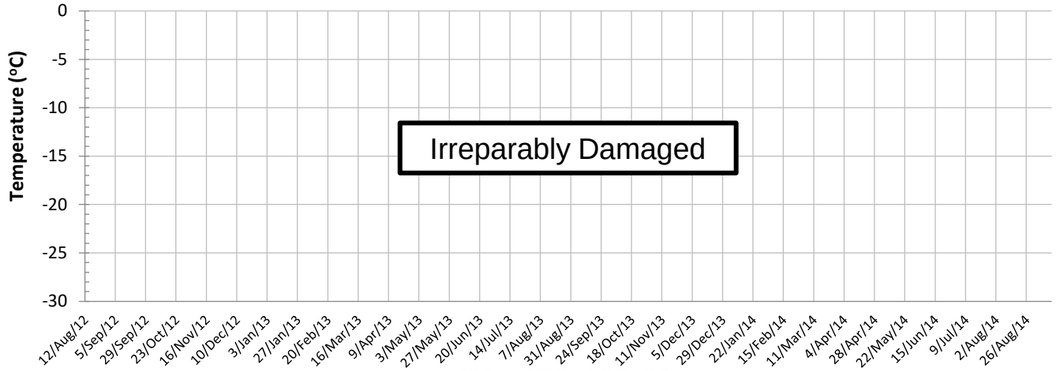
Station 0+60
Vertical Ground Temperature Cable Readings by Location

Date:	Approved:	Figure:
Nov. 2021	PDL	**A.6**

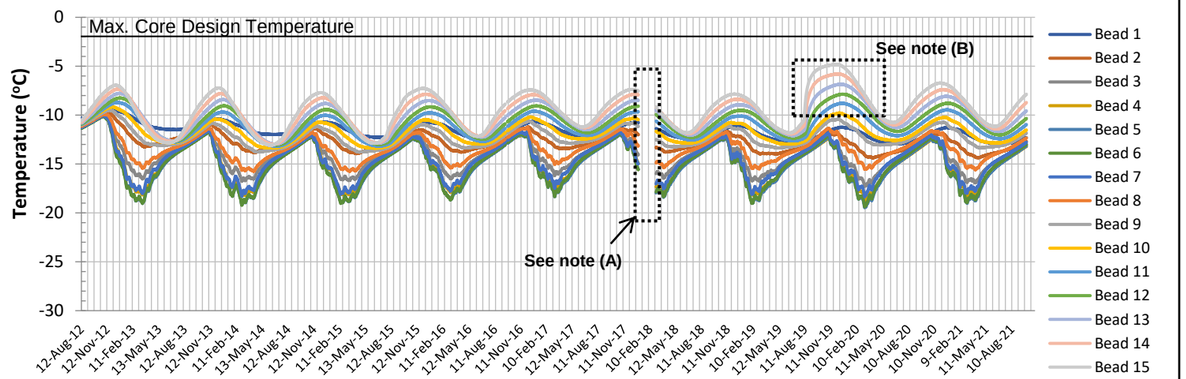




ND-HTS-085-33.5

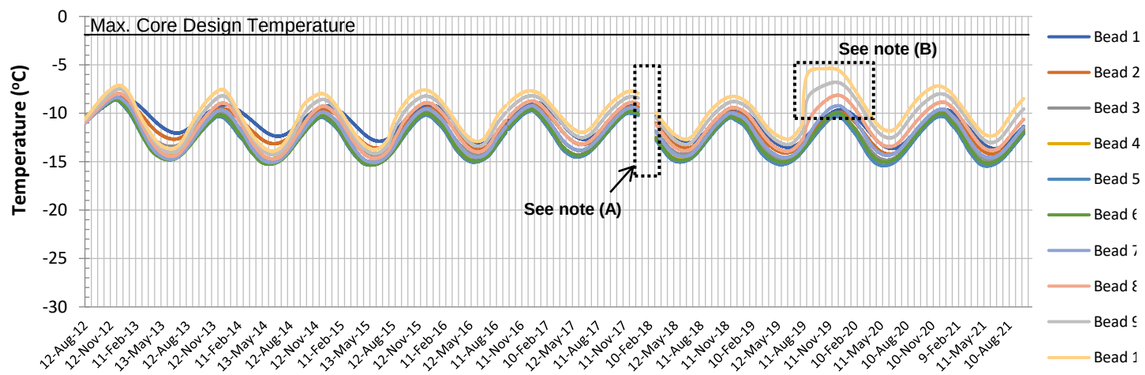


ND-HTS-085-25.3



Offline

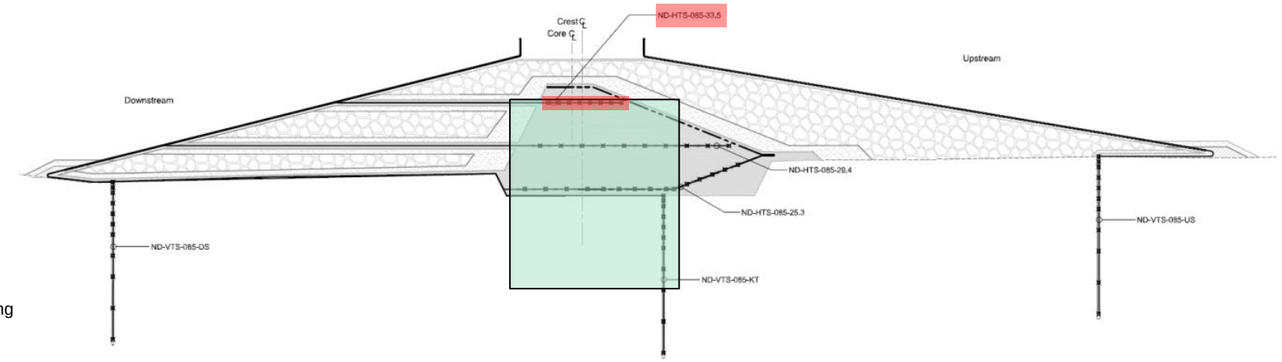
ND-HTS-085-29.4



Notes:

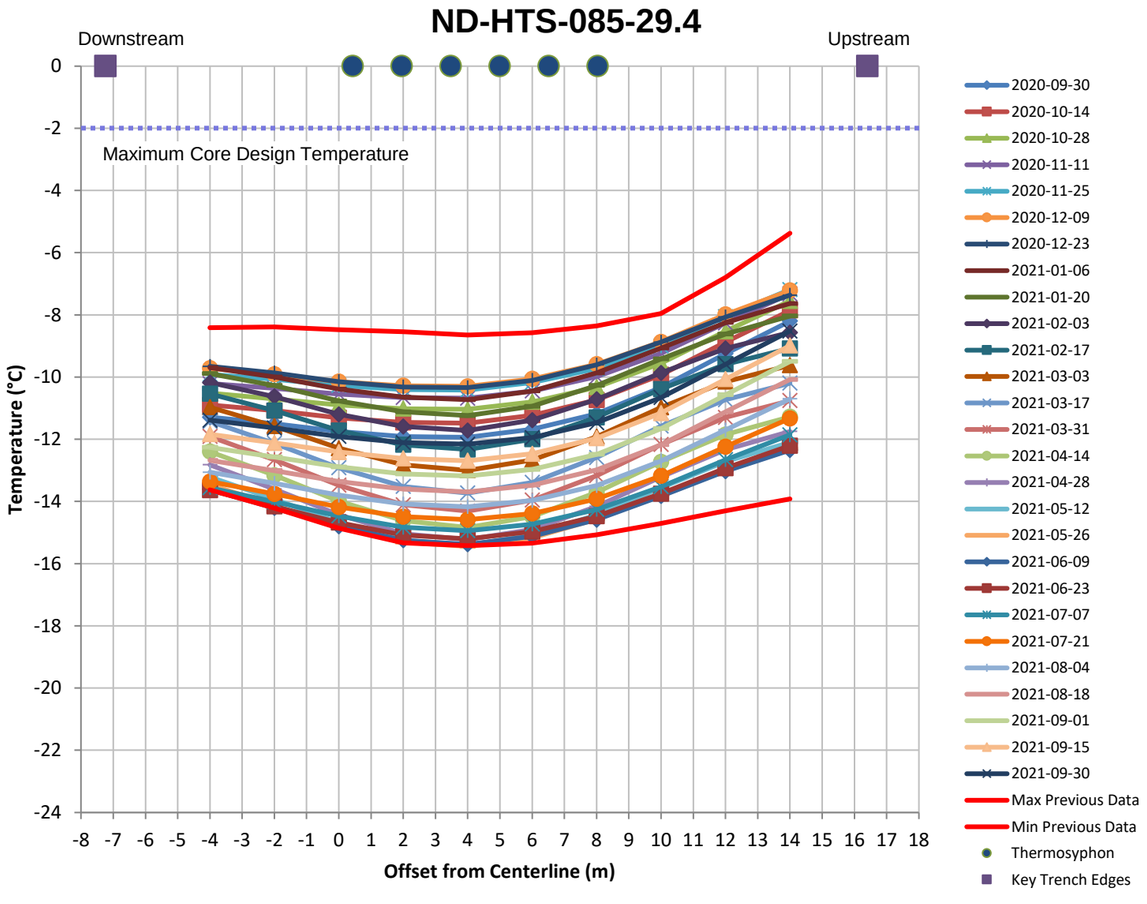
- Bead numbers increase from downstream to upstream (horizontal) and top to bottom (vertical)
- **(A)** Data logger was disconnected from January 1, 2018 to March 3, 2018 for recalibration
- **(B)** Temperature rise is expected to be a result of the rise in the reclaim pond water level

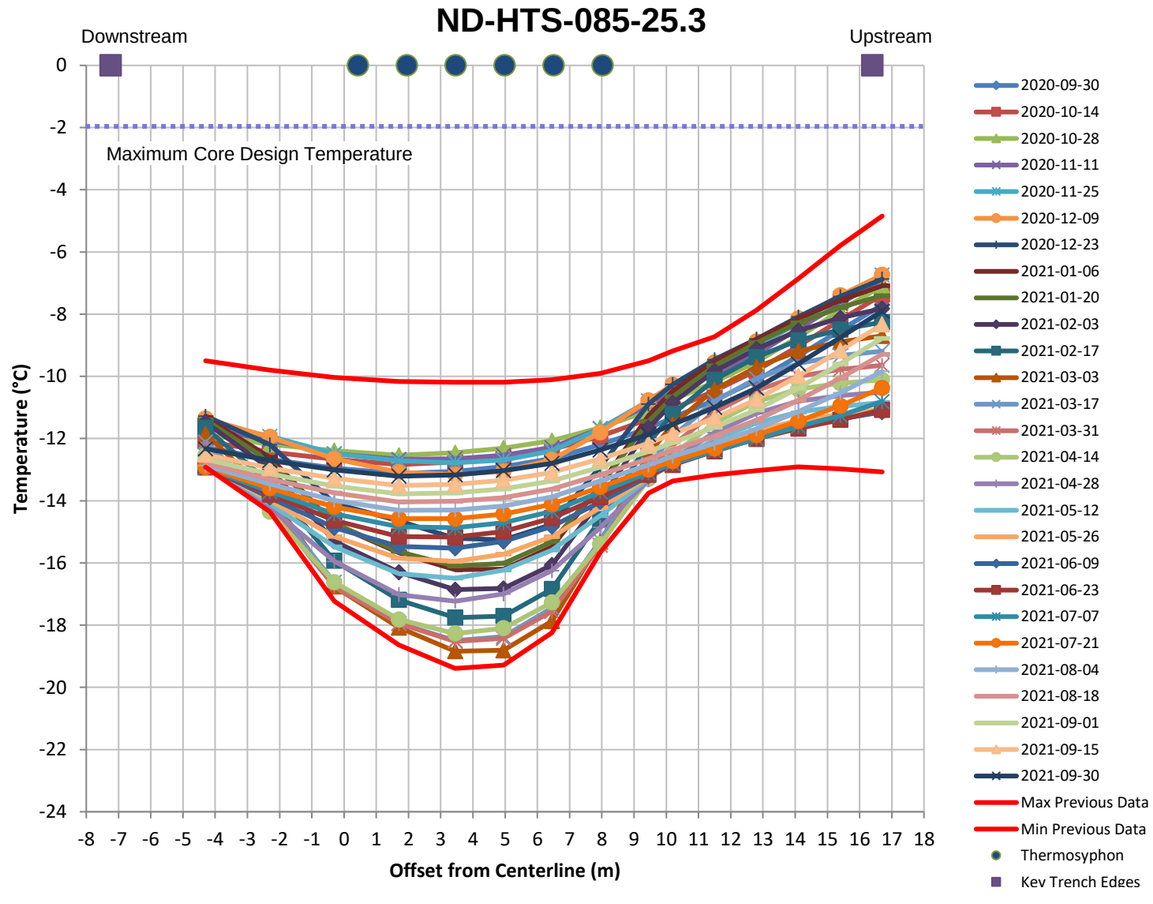
srk consulting	AGNICO EAGLE	2021 AGI – North Dam
Job No: 1CT022.077 Filename: 1_App_A_ND_GTC_PT2.pptx	DORIS TIA	**Station 0+85** **Horizontal Temperature Cable Temperature Vs. Time**
		Date: Nov. 2021 / Approved: PDL / Figure: **A.7**



Legend:

- GTC Status: Cable irreparably damaged
- GTC Status: Bead damaged or data missing
- Design Thermal Block

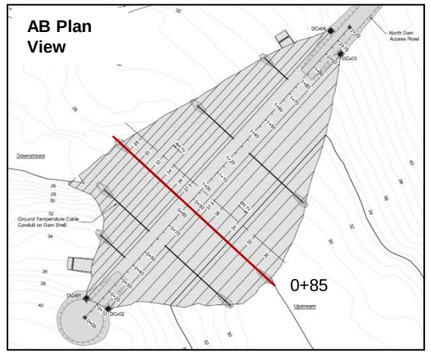




Note:

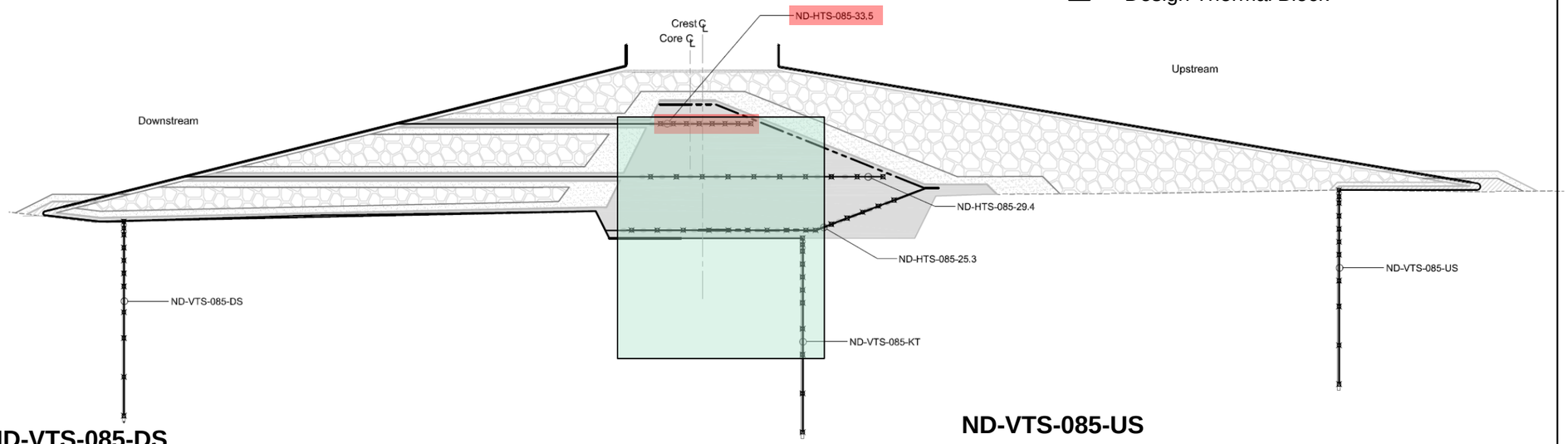
- Previous Data was recorded between August 2012 and September 2020

srk consulting	AGNICO EAGLE	2021 AGI – North Dam
		Station 0+85 Horizontal Ground Temperature Cable Readings by Location
Job No: 1CT022.077 Filename: 1_App_A_ND_GTC_PT1.pptx	**DORIS TIA**	Date: Nov. 2021 / Approved: PDL / Figure: **A.8**



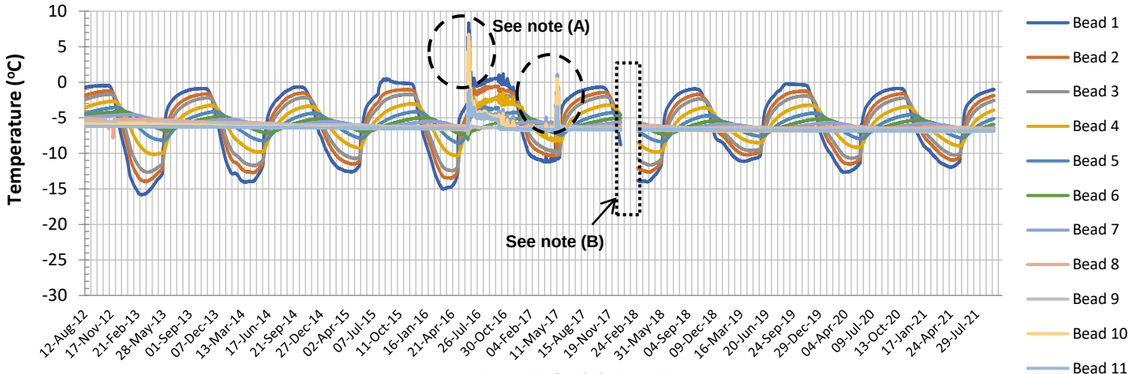
Legend:

- GTC Status: Cable irreparably damaged
- GTC Status: Bead damaged or data missing
- Design Thermal Block

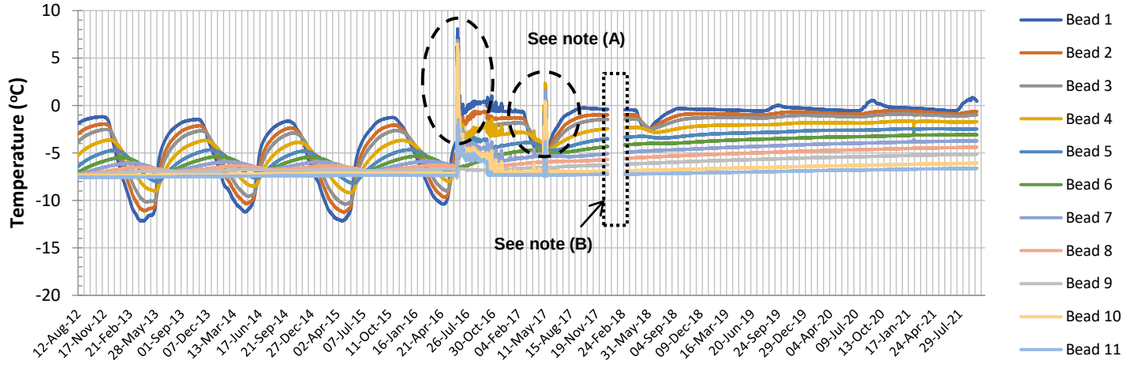


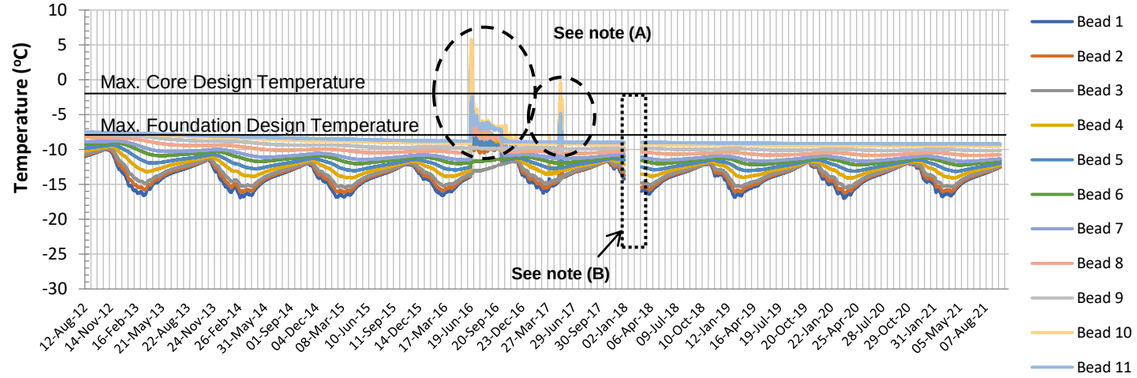
ND-VTS-085-DS

ND-VTS-085-US



ND-VTS-085-KT



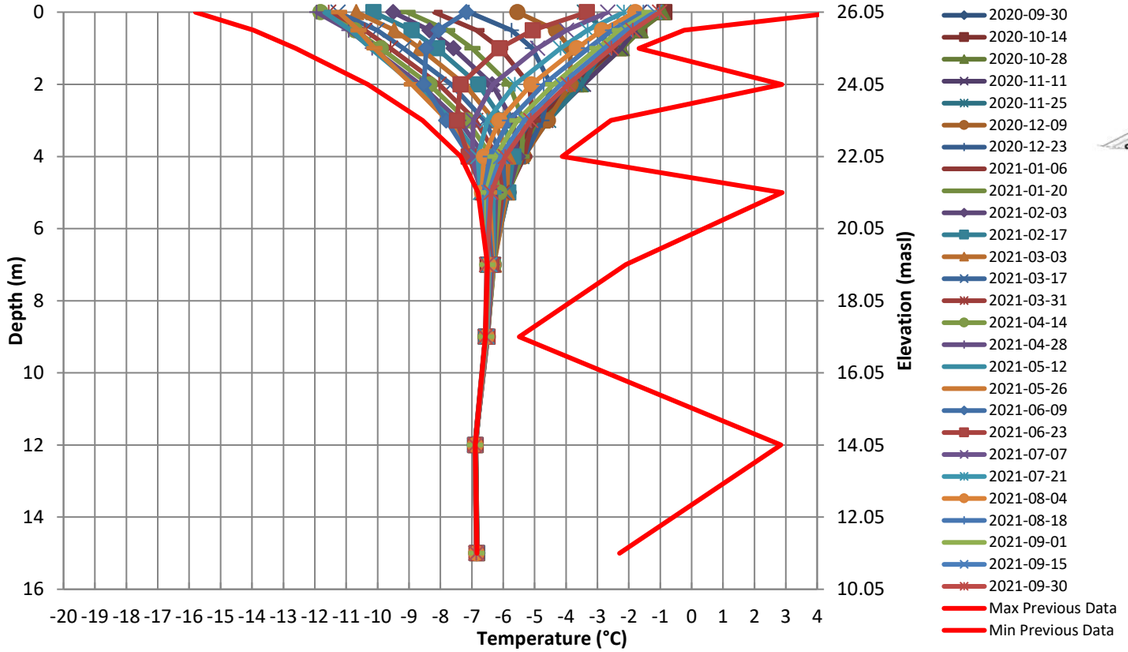


Notes:

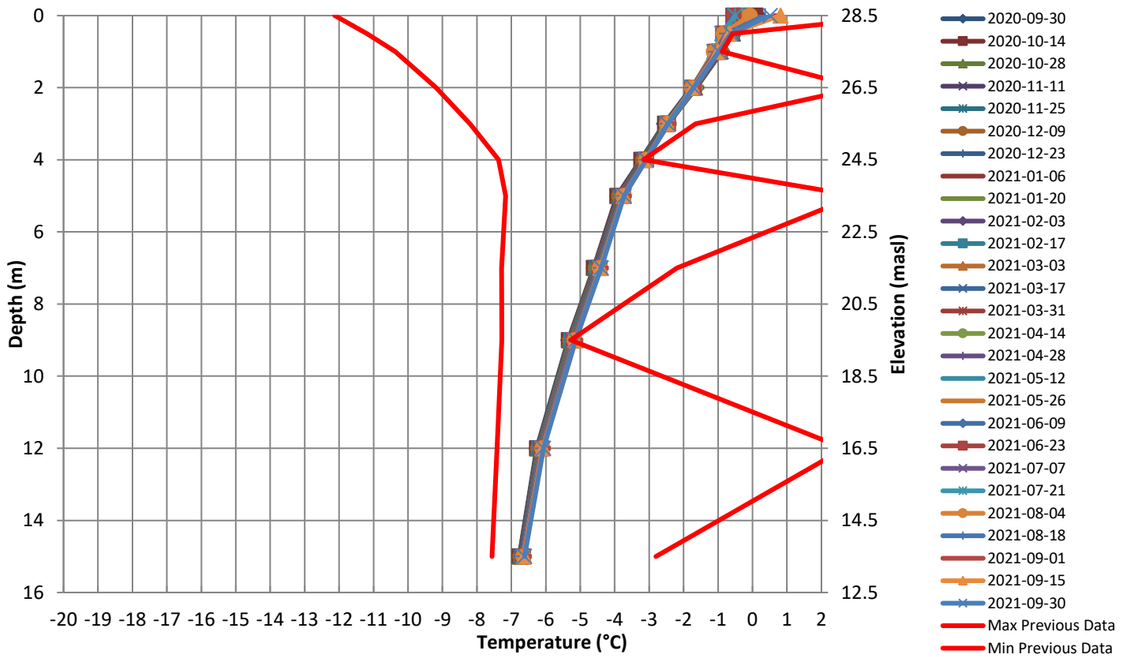
- Bead numbers increase from downstream to upstream (horizontal) and top to bottom (vertical)
- **(A)** Temperature in Bead 1, 2, 4, 5, 7, 8, 10, 11 spiked in the Spring of 2016 and 2017. Erratic readings in some elevations suggest a data logger issue. Since the first observation of temperature spikes, in September 2016, ND-VTS-085-US indicates the upstream foundation is gradually warming. This is expected to be a result of the increased water level in the reclaim pond.
- **(B)** Data logger was disconnected from January 1, 2018 to March 3, 2018 for recalibration.

srk consulting	AGNICO EAGLE	2021 AGI – North Dam
		Station 0+85 Vertical Temperature Cable Temperature Vs. Time
Job No: 1CT022.077 Filename: 1_App_A_ND_GTC_PT2.pptx	DORIS TIA	Date: Nov. 2021 / Approved: PDL / Figure: **A.9**

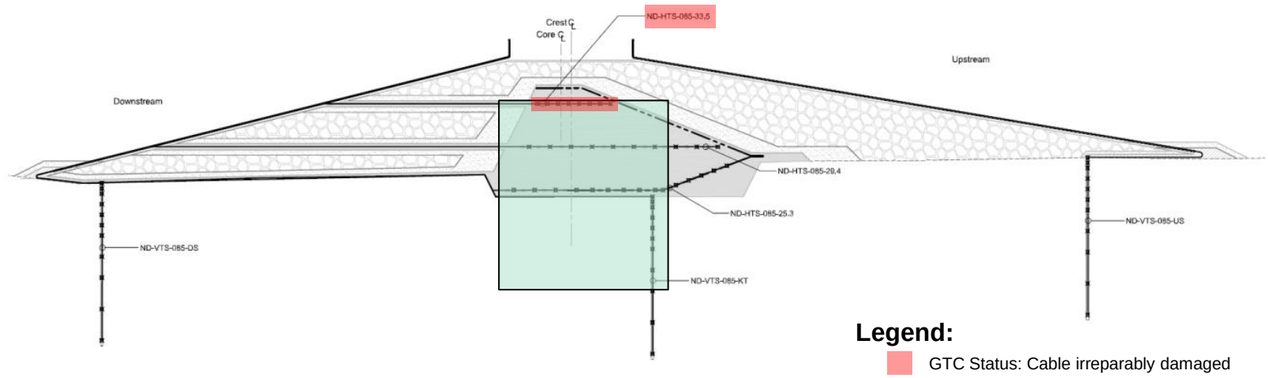
ND-VTS-085-DS



ND-VTS-085-US



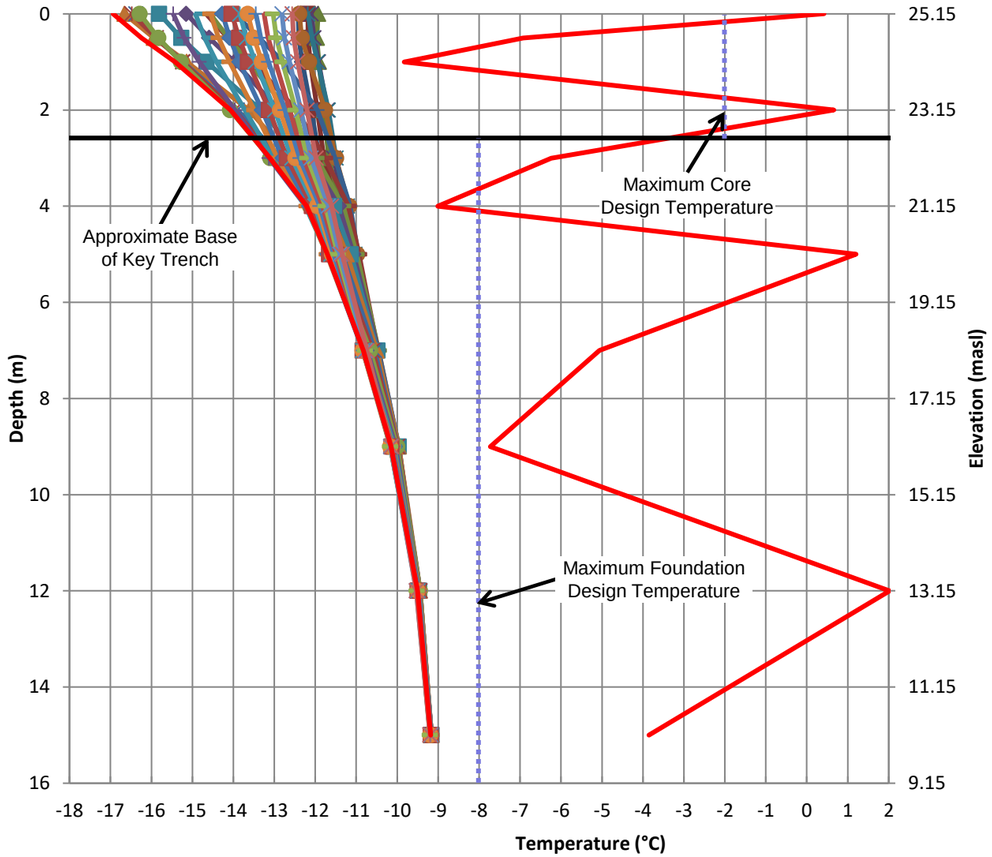
2020-09-30
2020-10-14
2020-10-28
2020-11-11
2020-11-25
2020-12-09
2020-12-23
2021-01-06
2021-01-20
2021-02-03
2021-02-17
2021-03-03
2021-03-17
2021-03-31
2021-04-14
2021-04-28
2021-05-12
2021-05-26
2021-06-09
2021-06-23
2021-07-07
2021-07-21
2021-08-04
2021-08-18
2021-09-01
2021-09-15
2021-09-30
Max Previous Data
Min Previous Data



Legend:

- GTC Status: Cable irreparably damaged
- GTC Status: Bead damaged or data missing
- Design Thermal Block

ND-VTS-085-KT



2020-09-30
2020-10-14
2020-10-28
2020-11-11
2020-11-25
2020-12-09
2020-12-23
2021-01-06
2021-01-20
2021-02-03
2021-02-17
2021-03-03
2021-03-17
2021-03-31
2021-04-14
2021-04-28
2021-05-12
2021-05-26
2021-06-09
2021-06-23
2021-07-07
2021-07-21
2021-08-04
2021-08-18
2021-09-01
2021-09-15
2021-09-30
Max Previous Data
Min Previous Data

Note:

- Previous Data was recorded between August 2012 and September 2020

srk consulting

Job No: 1CT022.077
Filename: 1_App_A_ND_GTC_PT1.pptx

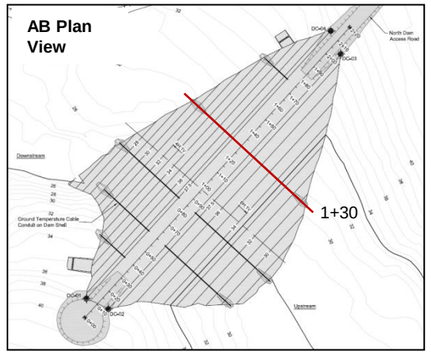
AGNICO EAGLE

DORIS TIA

2021 AGI – North Dam

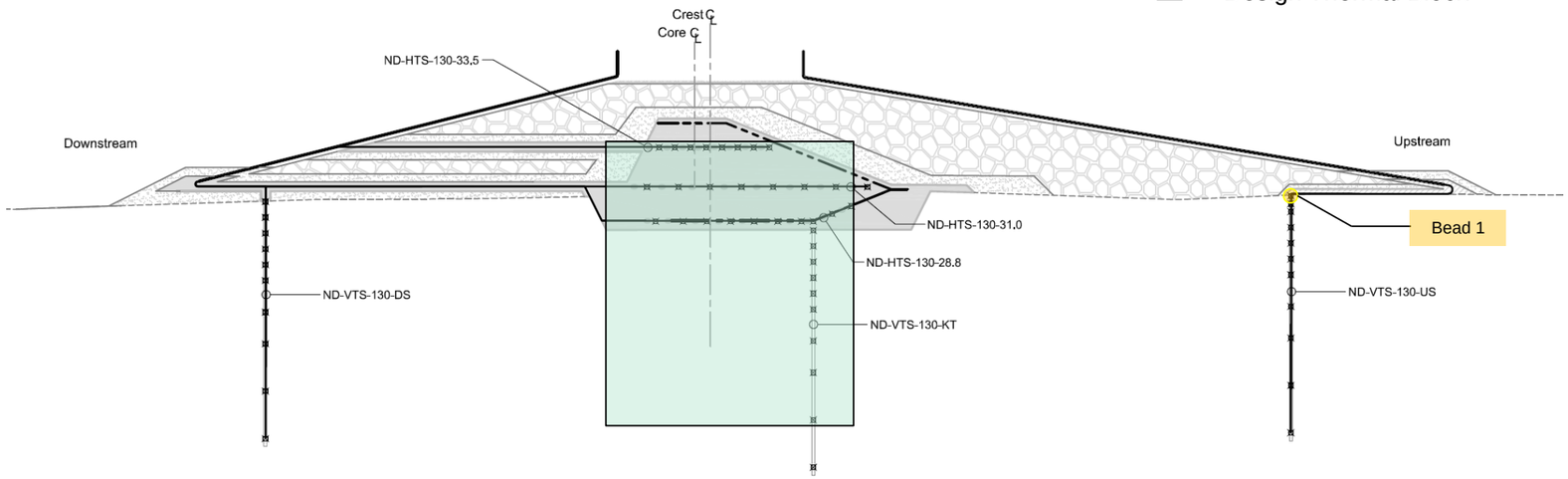
Station 0+85
Vertical Ground Temperature Cable Readings by Location

Date: Nov. 2021 | Approved: PDL | Figure: **A.10**

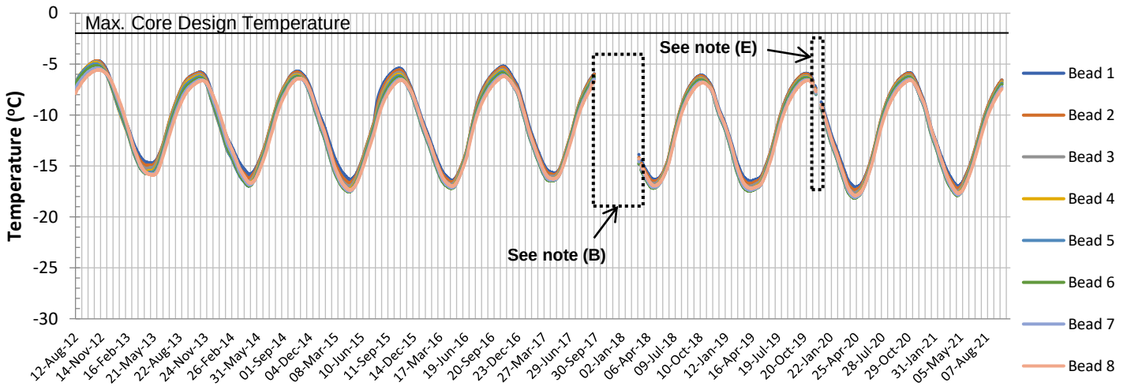


Legend:

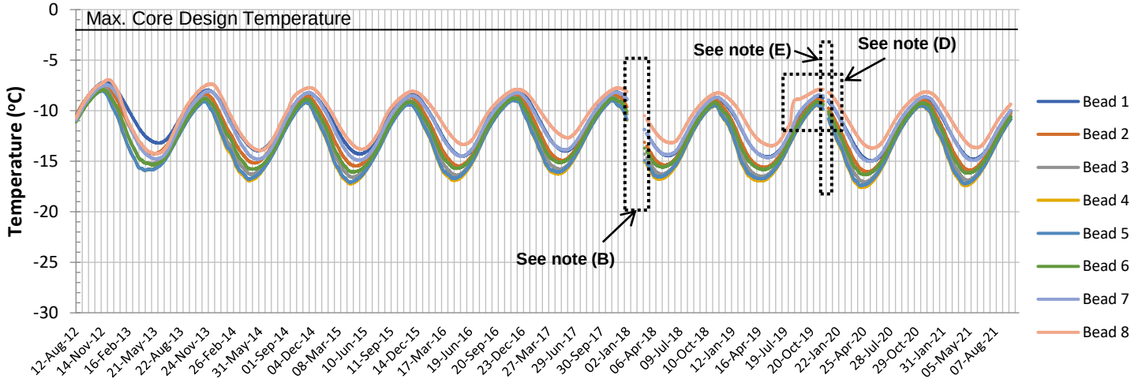
- GTC Status: Cable irreparably damaged
- GTC Status: Bead damaged or data missing
- Design Thermal Block



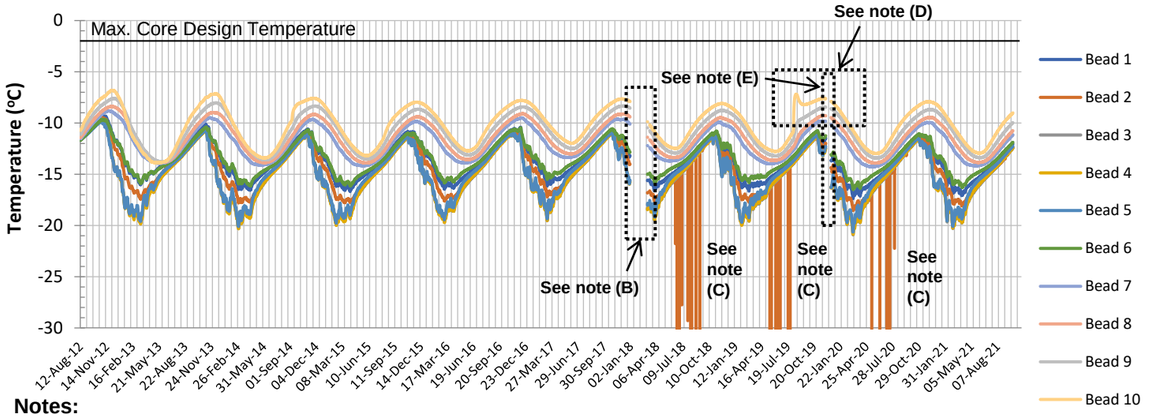
ND-HTS-130-33.5



ND-HTS-130-31.0



ND-HTS-130-28.8

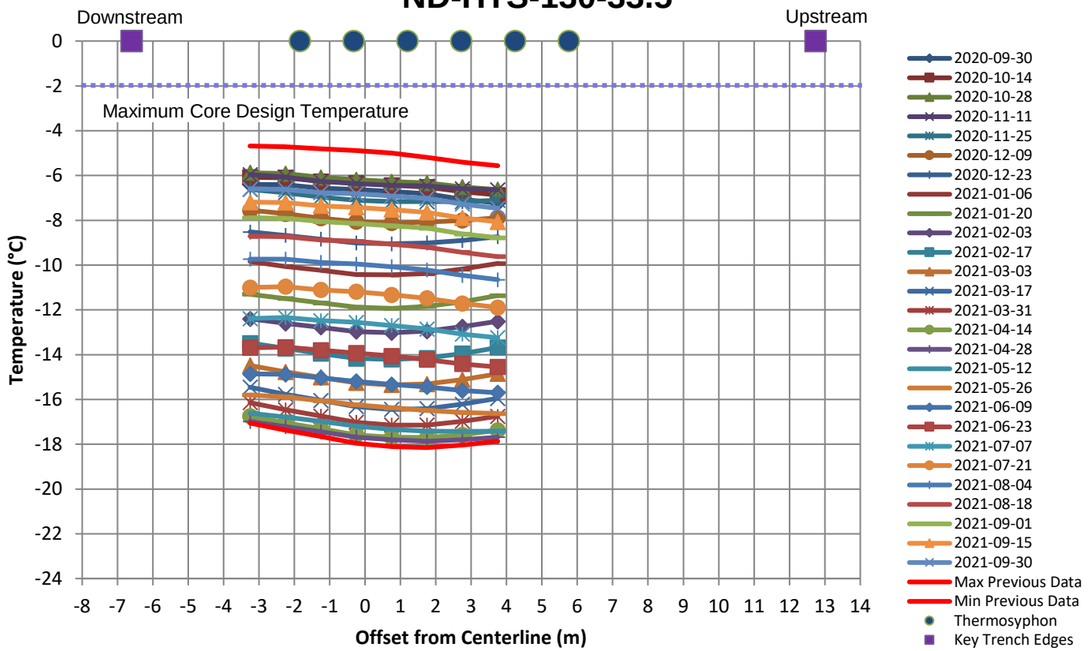


Notes:

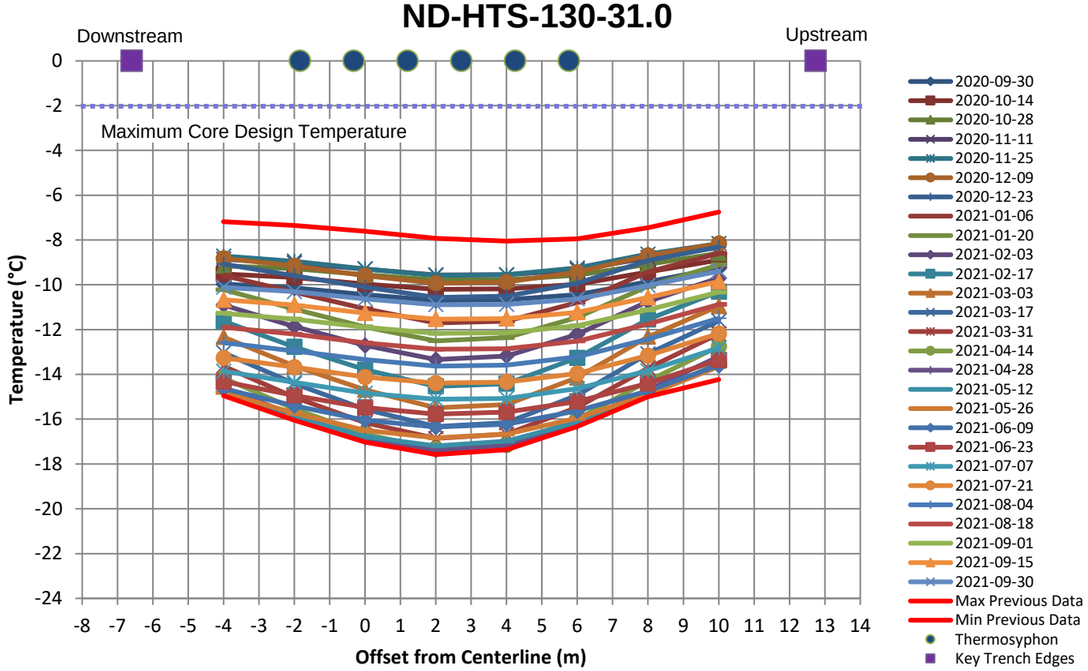
- Bead numbers increase from downstream to upstream (horizontal) and top to bottom (vertical)
- **(A)** Data logger was disconnected from January 1, 2018 to March 3, 2018 for recalibration
- **(B)** ND-HTS-130-33.5 was disconnected from September 24, 2018 to March 3, 2018 due to damage of the cable lead at the datalogger housing. The lead was repaired prior to the reconnection of the datalogger
- **(C)** Low temperature spikes and intermittent data logging from Bead 2 of ND-HTS-130-28.8 were observed in the Summer of 2018, 2019 and 2020. Likely a data logger issue, these spikes will be monitored
- **(D)** Temperature increase at the upstream most bead, this is related to the rise in reclaim pond water levels
- **(E)** Data collection gaps between November 21, 2019 and December 20, 2019

srk consulting	AGNICO EAGLE	2021 AGI – North Dam
Job No: 1CT022.077 Filename: 1_App_A_ND_GTC_PT2.pptx	DORIS TIA	**Station 1+30** **Horizontal Temperature Cable Temperature Vs. Time**
		Date: Nov. 2021 / Approved: PDL / Figure: **A.11**

ND-HTS-130-33.5

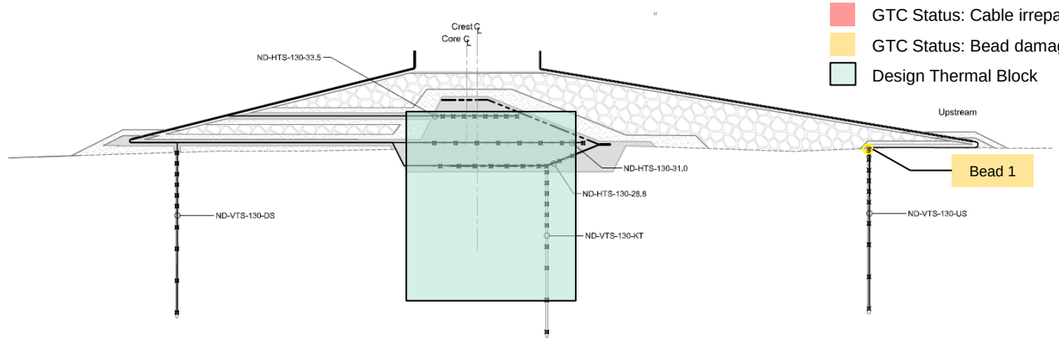


ND-HTS-130-31.0

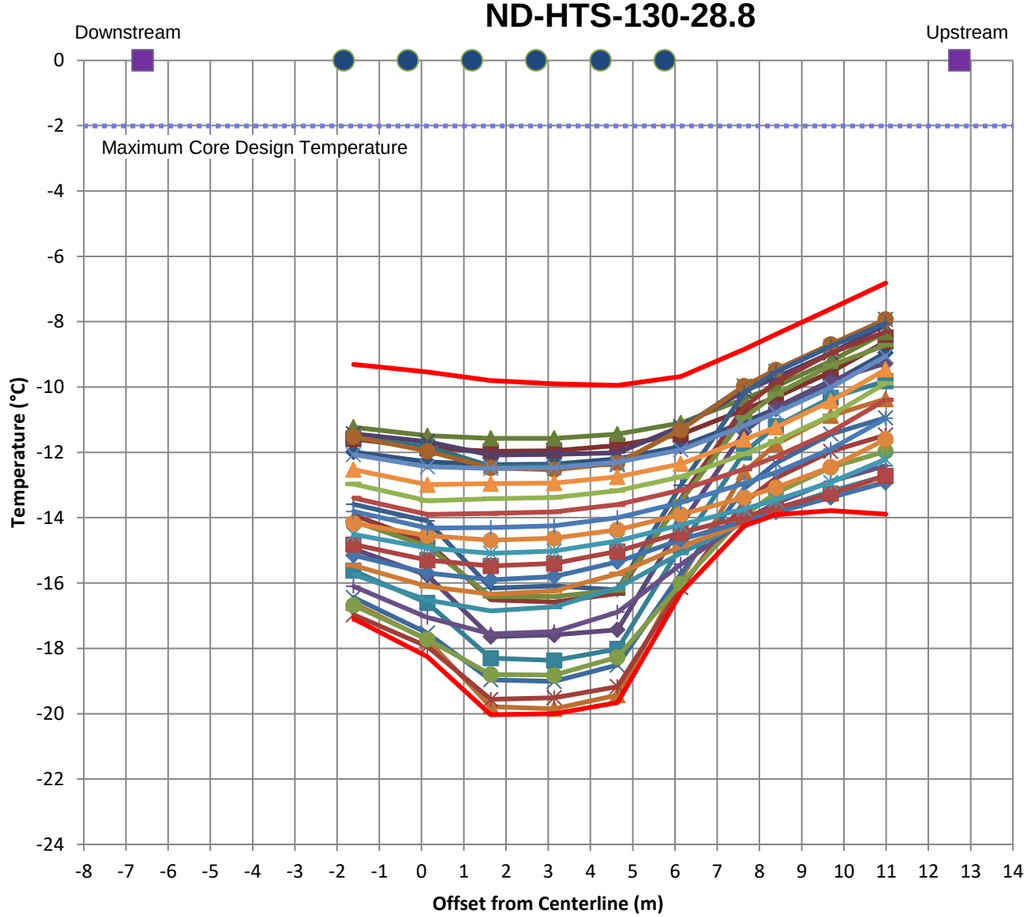


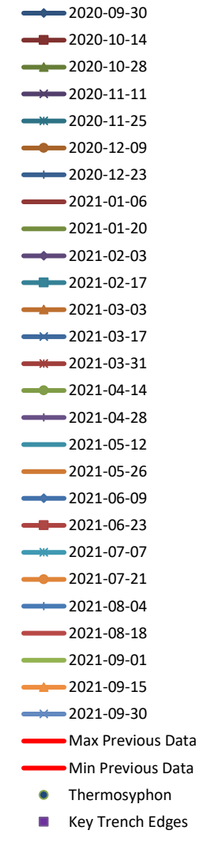
Legend:

- GTC Status: Cable irreparably damaged
- GTC Status: Bead damaged or data missing
- Design Thermal Block



ND-HTS-130-28.8

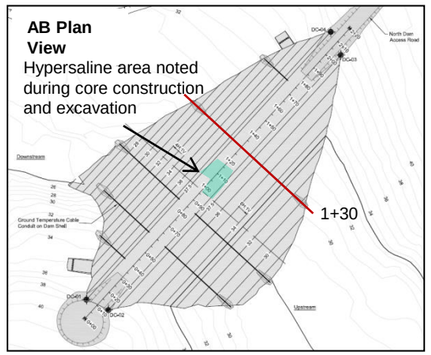




Note:

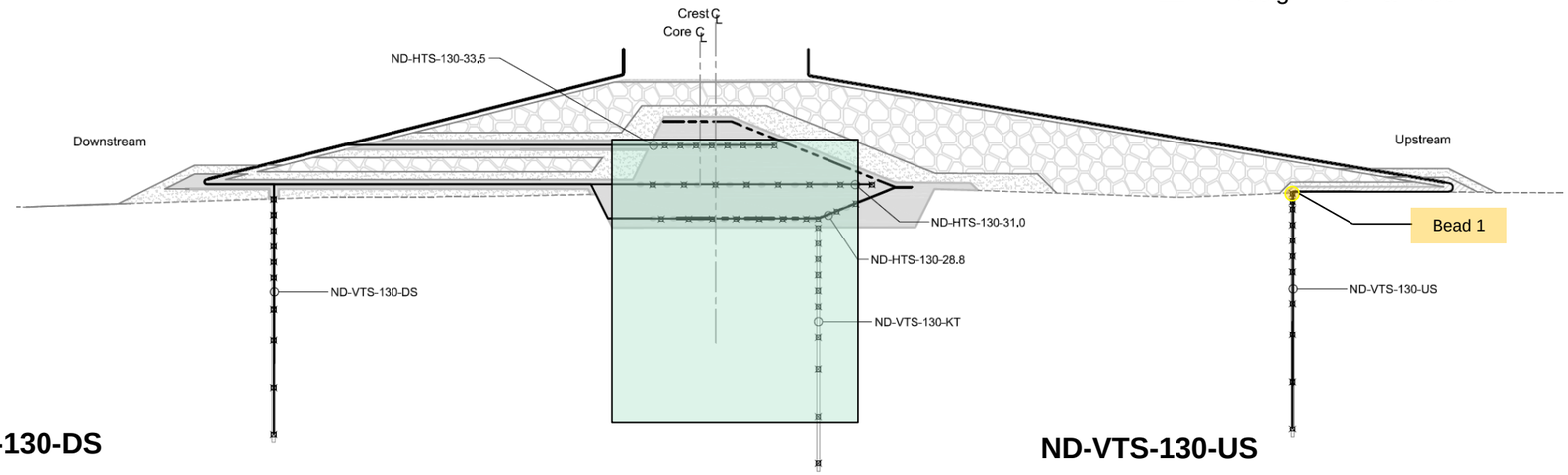
- Previous Data was recorded between August 2012 and September 2020

srk consulting	AGNICO EAGLE	2021 AGI – North Dam
Job No: 1CT022.077 Filename: 1_App_A_ND_GTC_PT1.pptx	DORIS TIA	**Station 1+30** **Horizontal Ground Temperature** **Cable Readings by Location**
		Date: Nov. 2021 / Approved: PDL / Figure: **A.12**

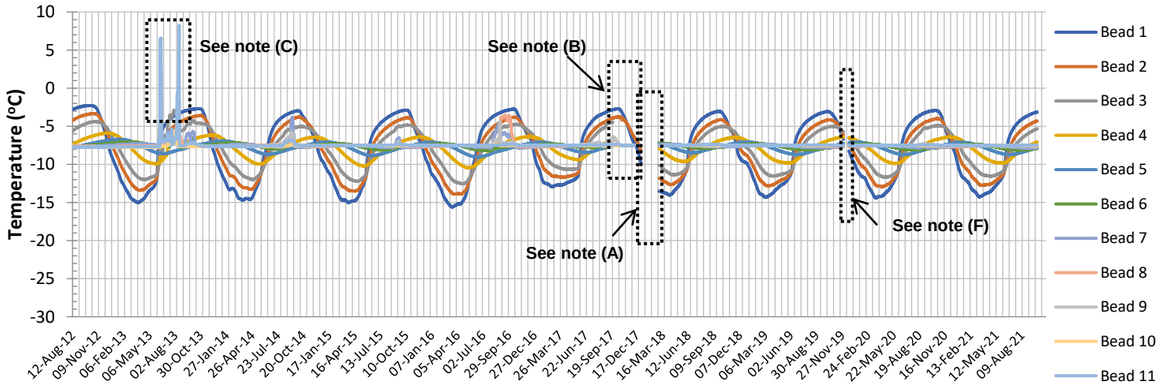


Legend:

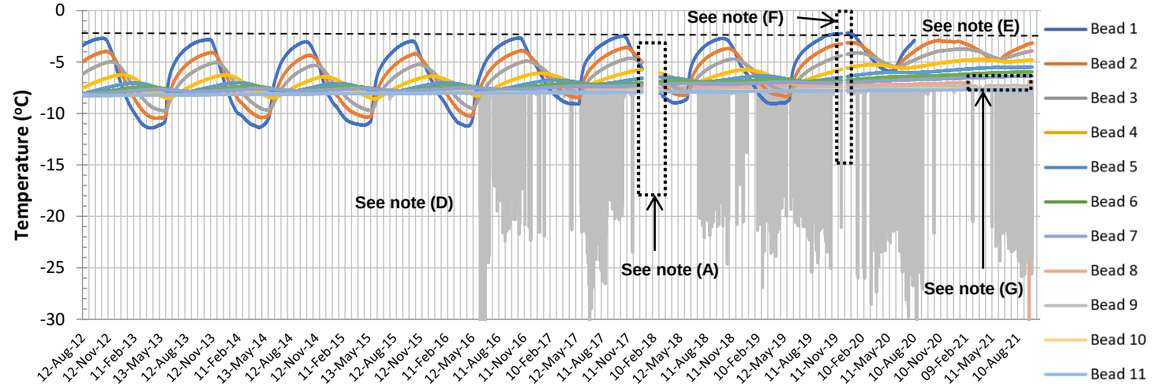
- GTC Status: Cable irreparably damaged
- GTC Status: Bead damaged or data missing
- Design Thermal Block



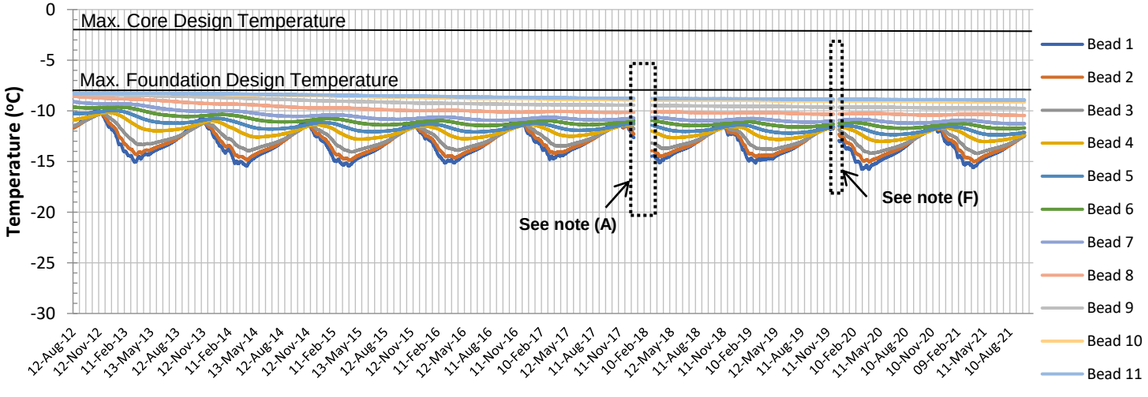
ND-VTS-130-DS



ND-VTS-130-US



ND-VTS-130-KT

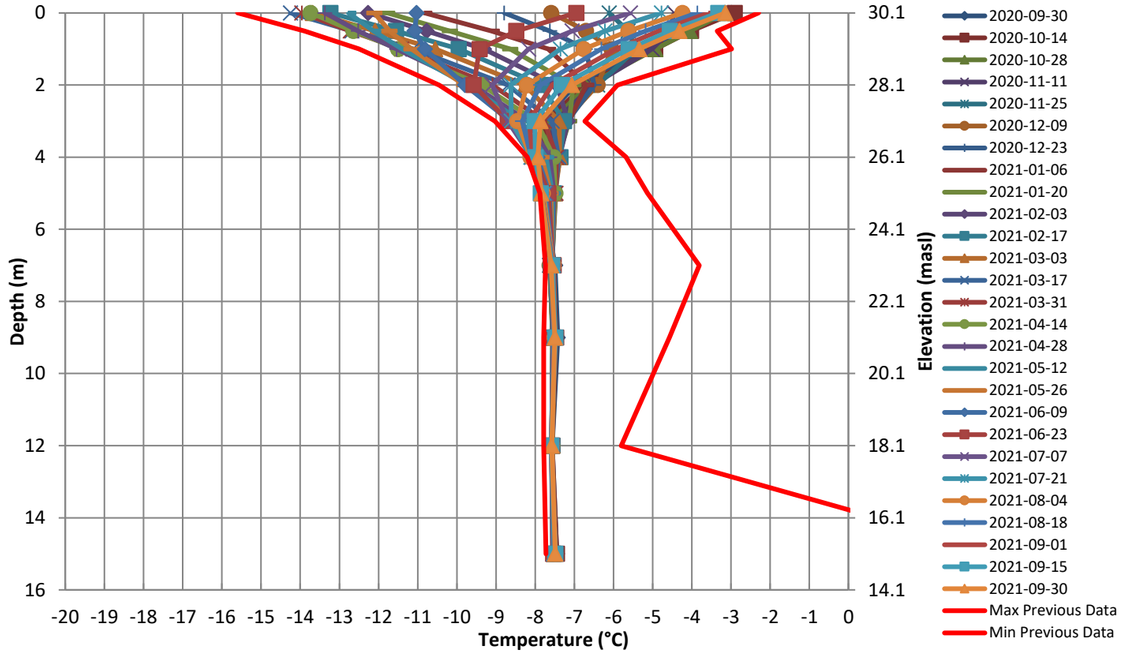


Notes:

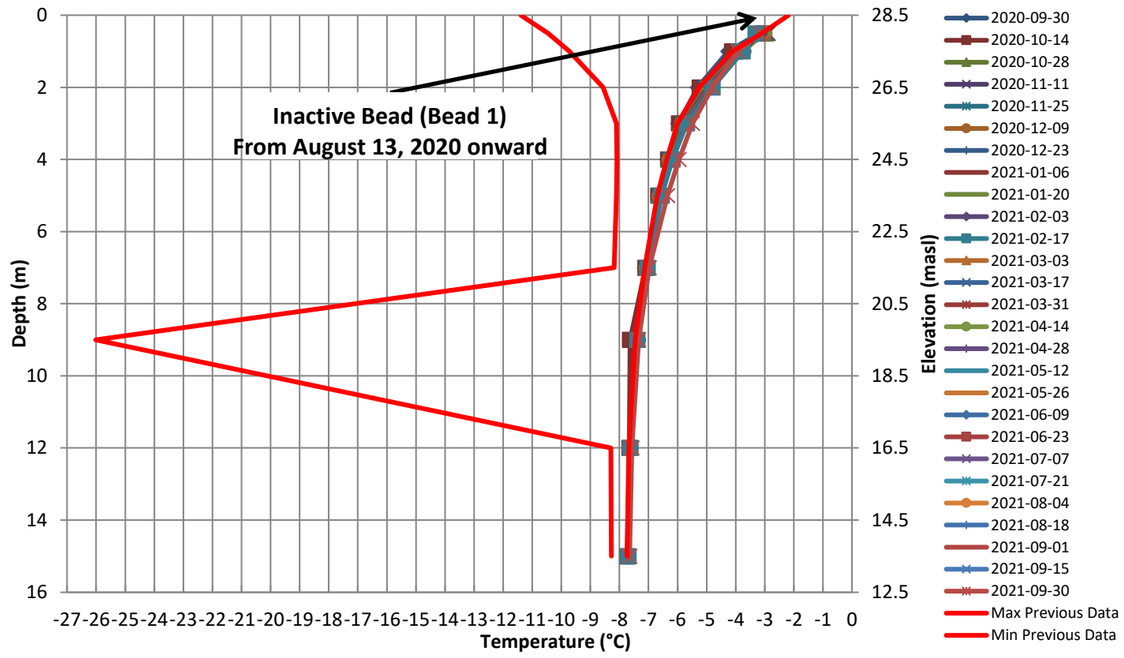
- Bead numbers increase from downstream to upstream (horizontal) and top to bottom (vertical)
- **(A)** Data logger was disconnected from January 1, 2018 to March 3, 2018 for recalibration
- **(B)** Beads 3 to 8 of ND-VTS-130-DS were disconnected from September 24, 2018 to March 3, 2018 due to damage of the cable lead at the datalogger housing. The lead was repaired prior to the reconnection of the datalogger
- **(C)** Temperature spike is attributed to an instrumentation error rather than a change in the ground temperature.
- **(D)** Reoccurring low temperature spikes in Bead 9 of ND-VTS-130-US began June 2016, around the same period when the Station 0+085 readings began to spike. These are expected to be an instrumentation issue rather than a change in the ground temperature regime
- **(E)** Bead 1 of ND-VTS-130-US became inactive on August 13, 2020
- **(F)** Data collection gaps between November 21, 2019 and December 20, 2019
- **(G)** Bead 8 of ND-VTS-130-US was inactive between February 25 and September 21, 2021.

srk consulting	AGNICO EAGLE	2021 AGI – North Dam
		Station 1+30 **Vertical Temperature Cable Temperature Vs. Time**
Job No: 1CT022.077 Filename: 1_App_A_ND_GTC_PT2.pptx	**DORIS TIA**	Date: Nov. 2021 | Approved: PDL | Figure: **A.13**

ND-VTS-130-DS



ND-VTS-130-US

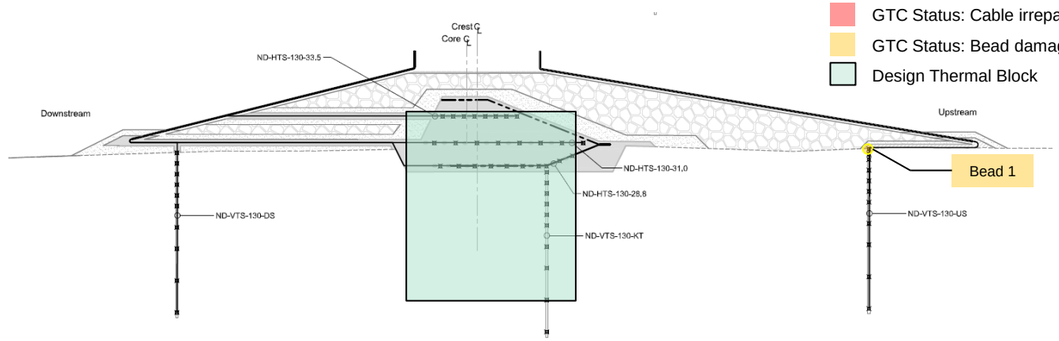


Note:

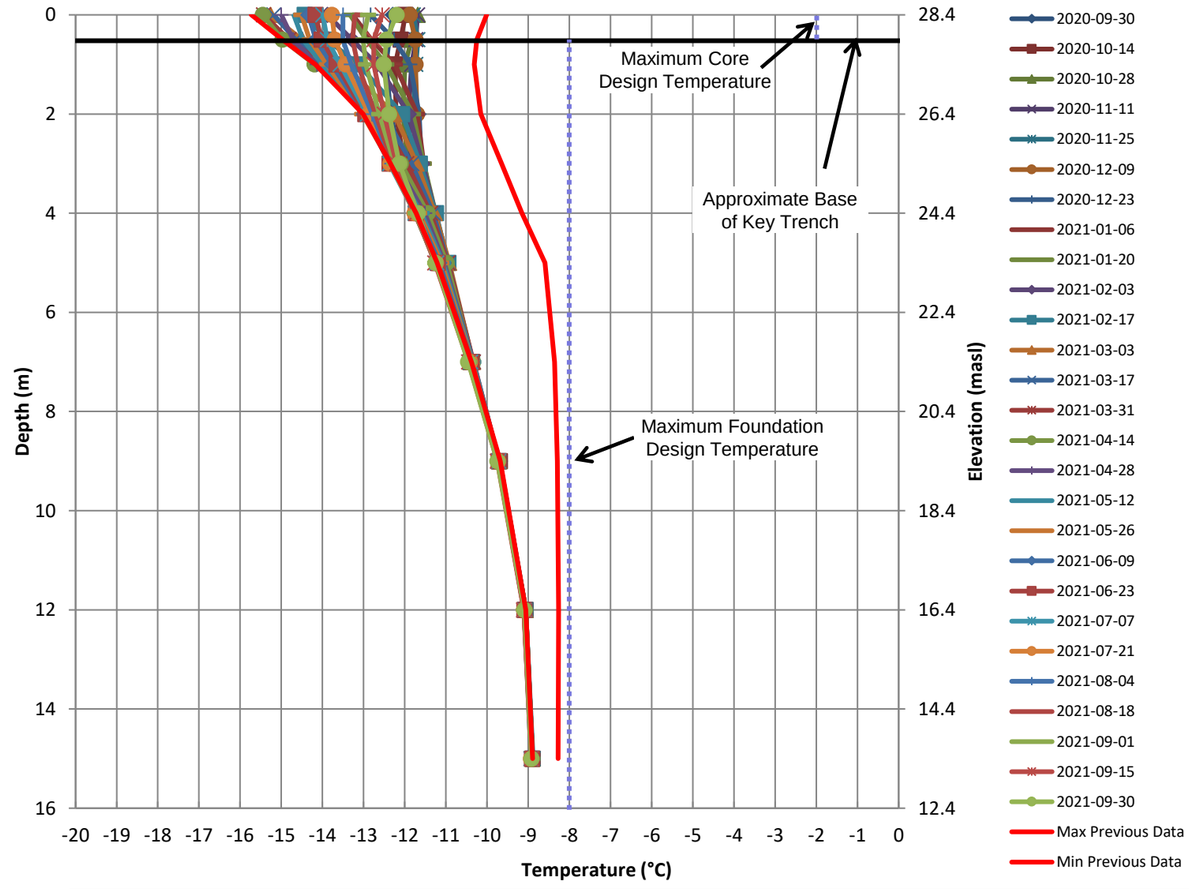
- Previous Data was recorded between August 2012 and September 2020

Legend:

- GTC Status: Cable irreparably damaged
- GTC Status: Bead damaged or data missing
- Design Thermal Block



ND-VTS-130-KT



srk consulting

AGNICO EAGLE

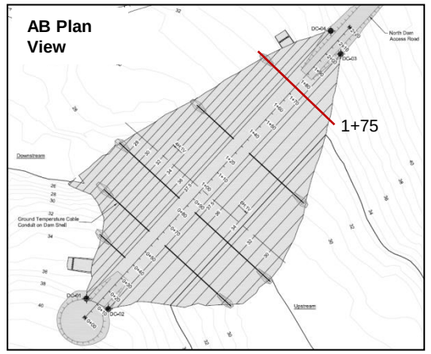
2021 AGI – North Dam

Station 1+30
Vertical Ground Temperature Cable Readings by Location

Job No: 1CT022.077
Filename: 1_App_A_ND_GTC_PT1.pptx

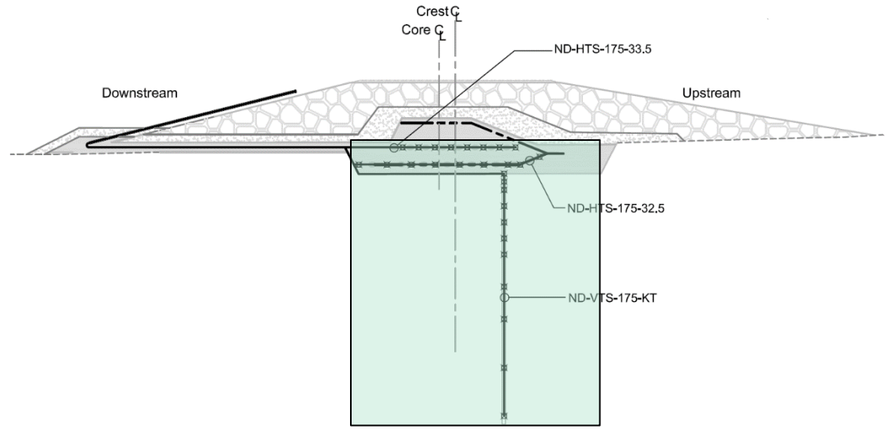
DORIS TIA

Date: Nov. 2021
Approved: PDL
Figure: **A.14**

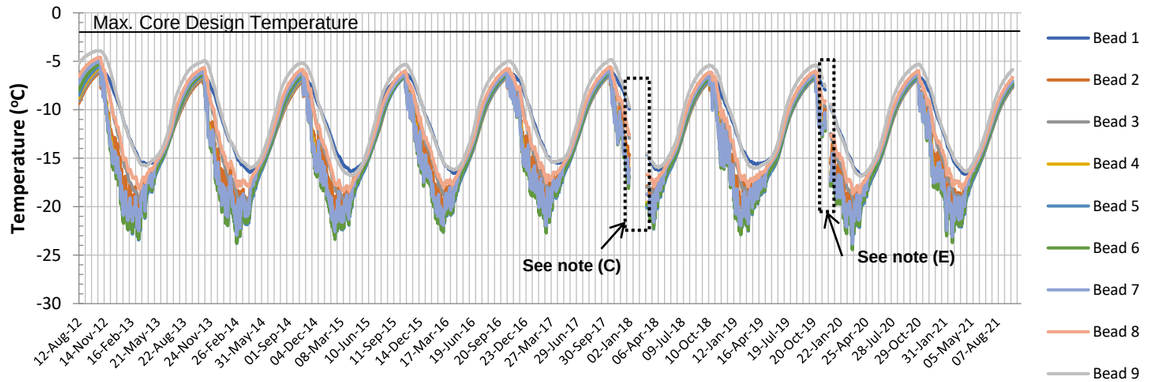


Legend:

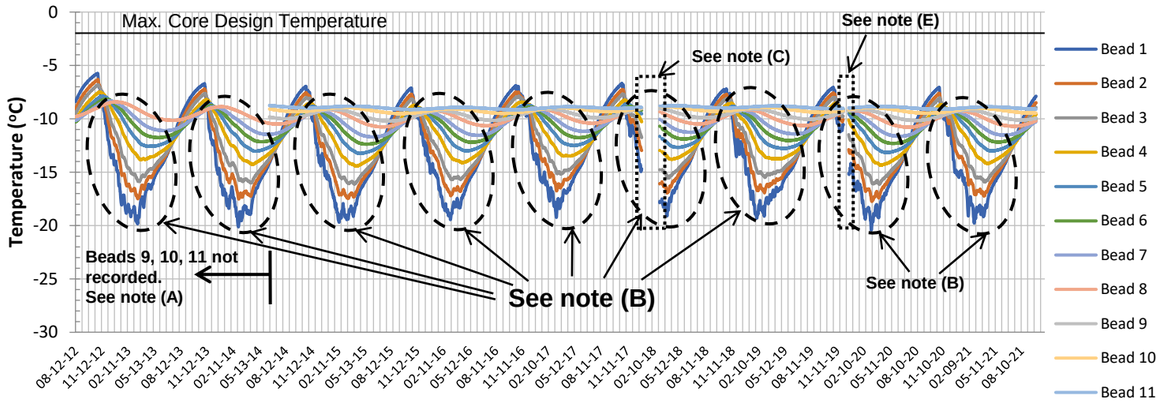
- GTC Status: Cable irreparably damaged
- GTC Status: Bead damaged or data missing
- Design Thermal Block



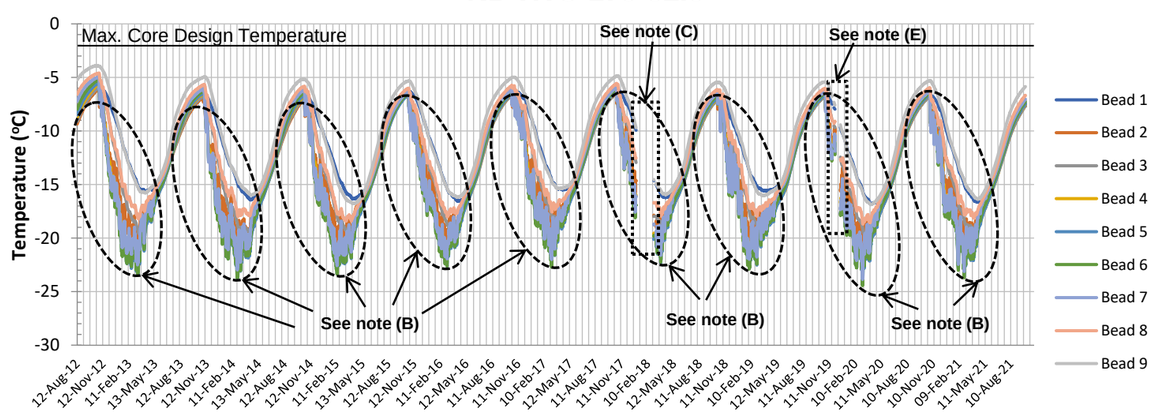
ND-HTS-175-33.5



ND-VTS-175-KT



ND-HTS-175-32.5

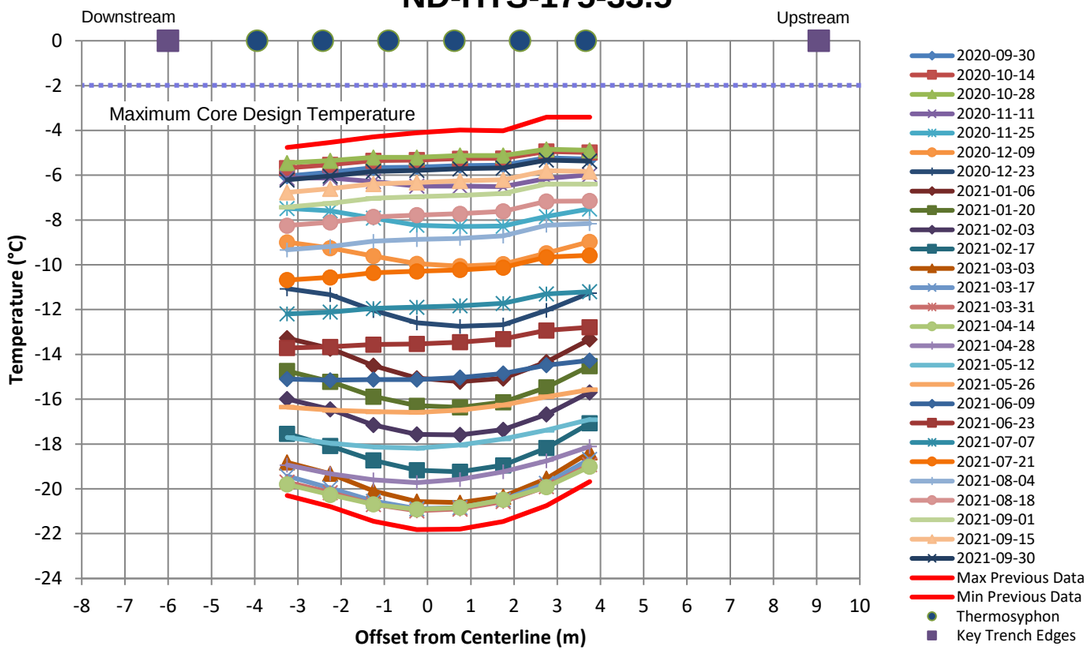


Notes:

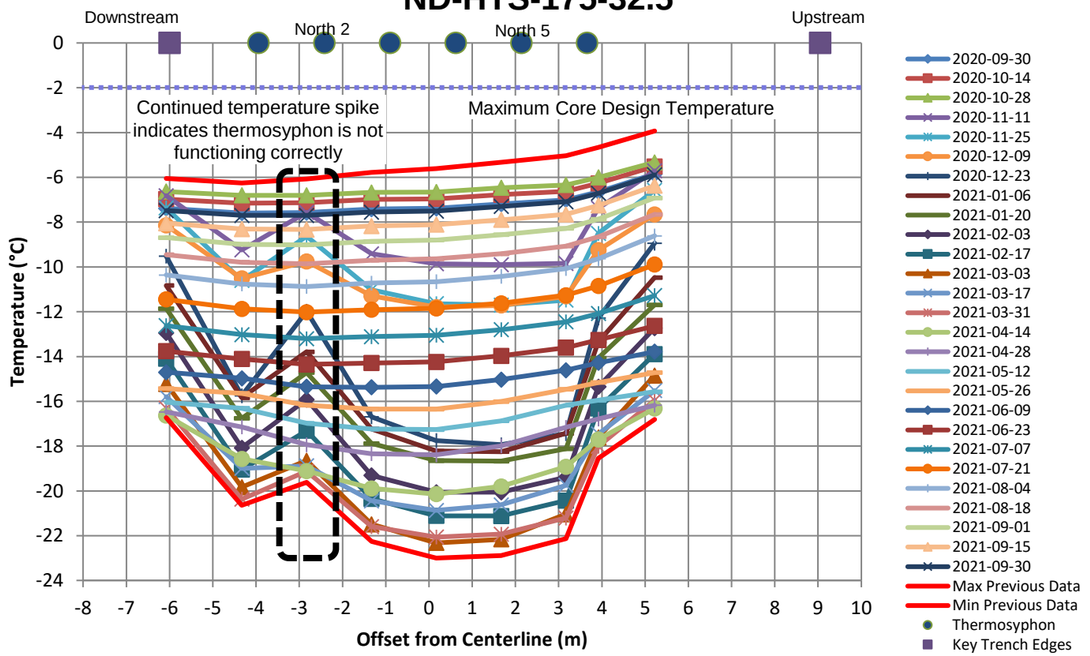
- Bead numbers increase from downstream to upstream (horizontal) and top to bottom (vertical)
- **(A)** Incorrectly connected to datalogger at ND-HTS-175-33.5; therefore, no readings for beads 9, 10 and 11.
- **(B)** Variation in Ground Temperature Cable readings during winter months due to close proximity of Ground Temperature Cable beads to thermosyphon pipes
- **(C)** Data logger was disconnected from January 1, 2018 to March 3, 2018 for recalibration
- **(D)** Data collection gaps between November 21, 2019 and December 20, 2019

srk consulting	AGNICO EAGLE	2021 AGI – North Dam
Job No: 1CT022.077 Filename: 1_App_A_ND_GTC_PT2.pptx	DORIS TIA	**Station 1+75** **Ground Temperature Cable** **Temperature Vs. Time**
		Date: Nov. 2021 / Approved: PDL / Figure: **A.15**

ND-HTS-175-33.5

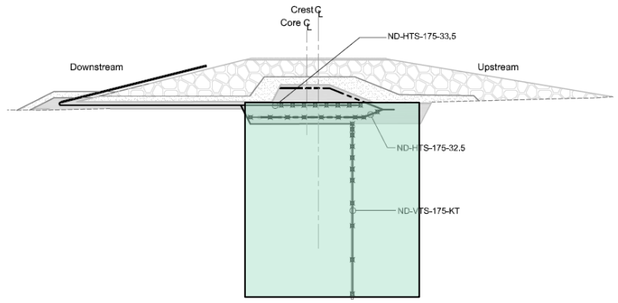


ND-HTS-175-32.5



Note:

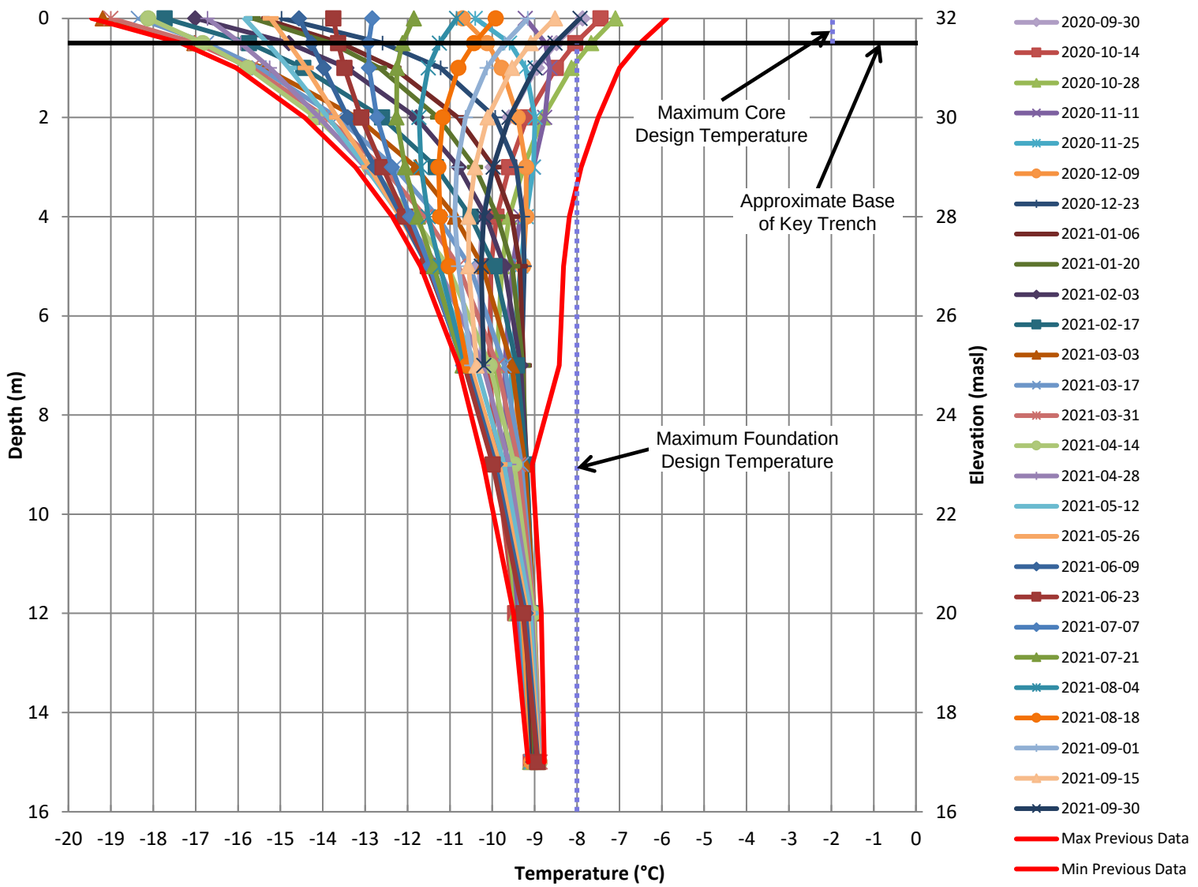
- Previous Data was recorded between August 2012 and September 2020



Legend:

- GTC Status: Cable irreparably damaged
- GTC Status: Bead damaged or data missing
- Design Thermal Block

ND-VTS-175-KT



srk consulting

Job No: 1CT022.077
Filename: 1_App_A_ND_GTC_PT1.pptx

AGNICO EAGLE

DORIS TIA

2021 AGI – North Dam

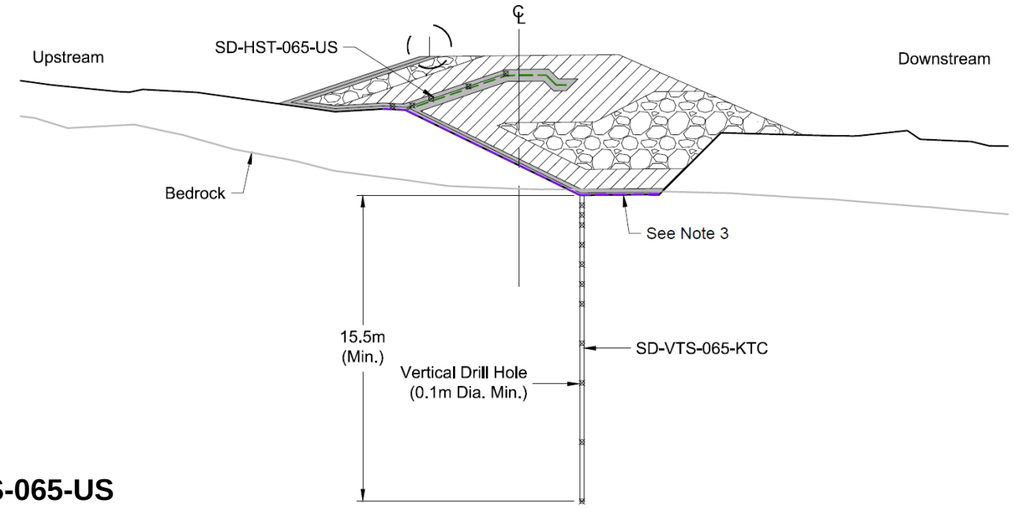
Station 1+75
Ground Temperature Cable Readings by Location

Date: Nov. 2021 | Approved: PDL | Figure: **A.16**

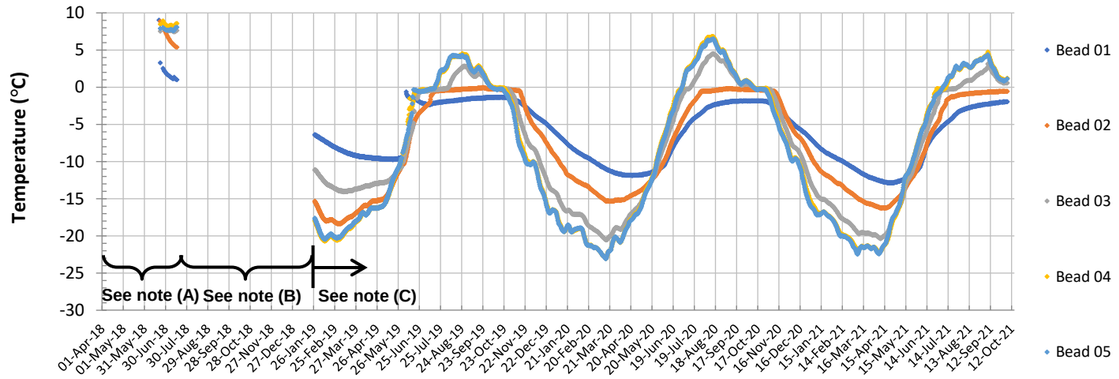
Legend:

GTC Status: Cable irreparably damaged

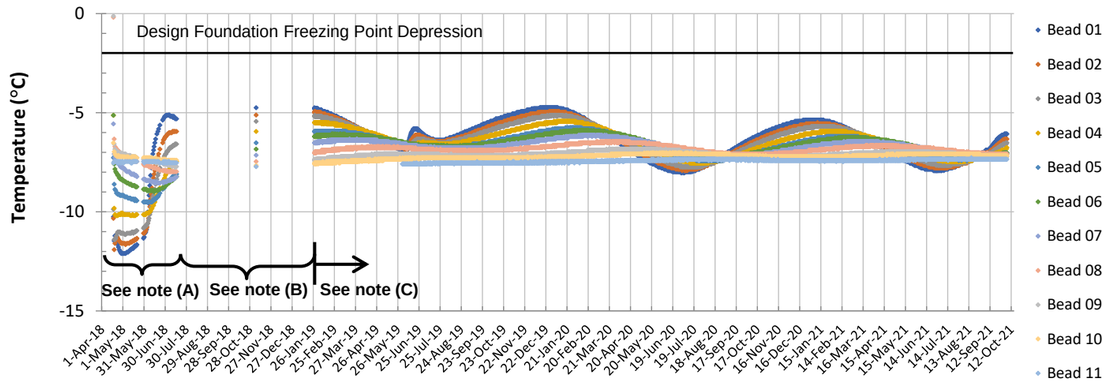
GTC Status: Bead damaged or data missing



SD-HTS-065-US



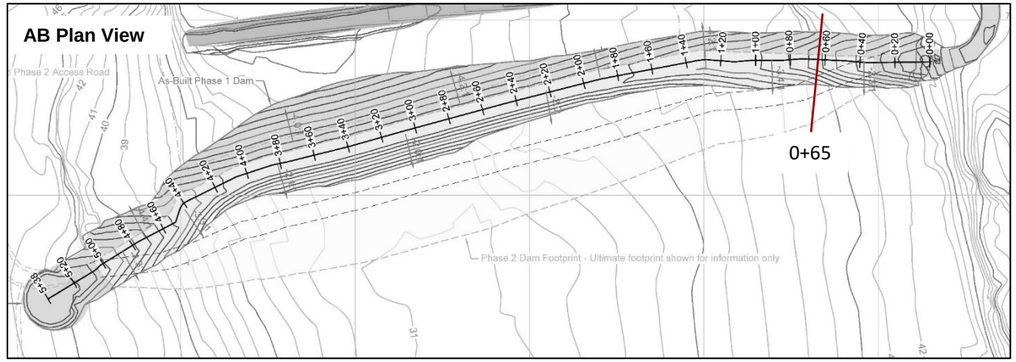
SD-VTS-065-KT

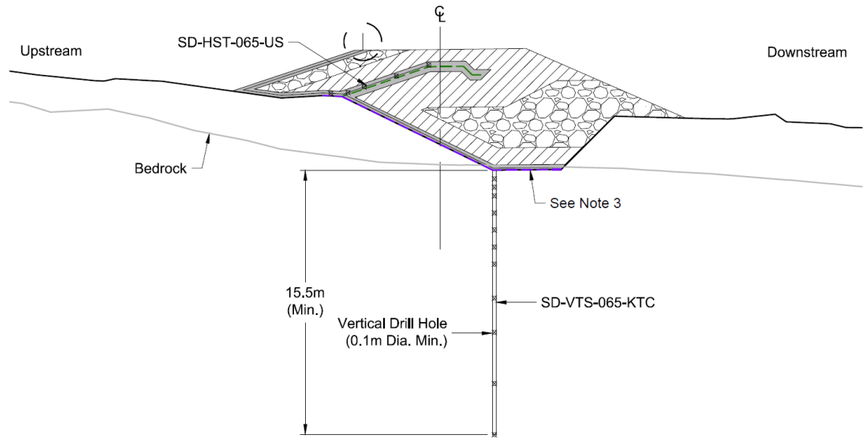


Notes:

- Bead numbers increase from upstream to downstream (horizontal) and top to bottom (vertical)
- Cables were damaged after construction but repaired.
- **(A)** Measurements collected between April and July 2018 were taken during construction
- **(B)** No measurements were collected between August 2018 to late January 2019 as the GTC's were extended and repaired, and the data loggers were set up on site. One set of manual spot measurements were collected in November 2018 to check interim dam performance
- **(C)** From the end of January 2019 onwards, data loggers were installed to provide higher resolution and more frequent data transmissions

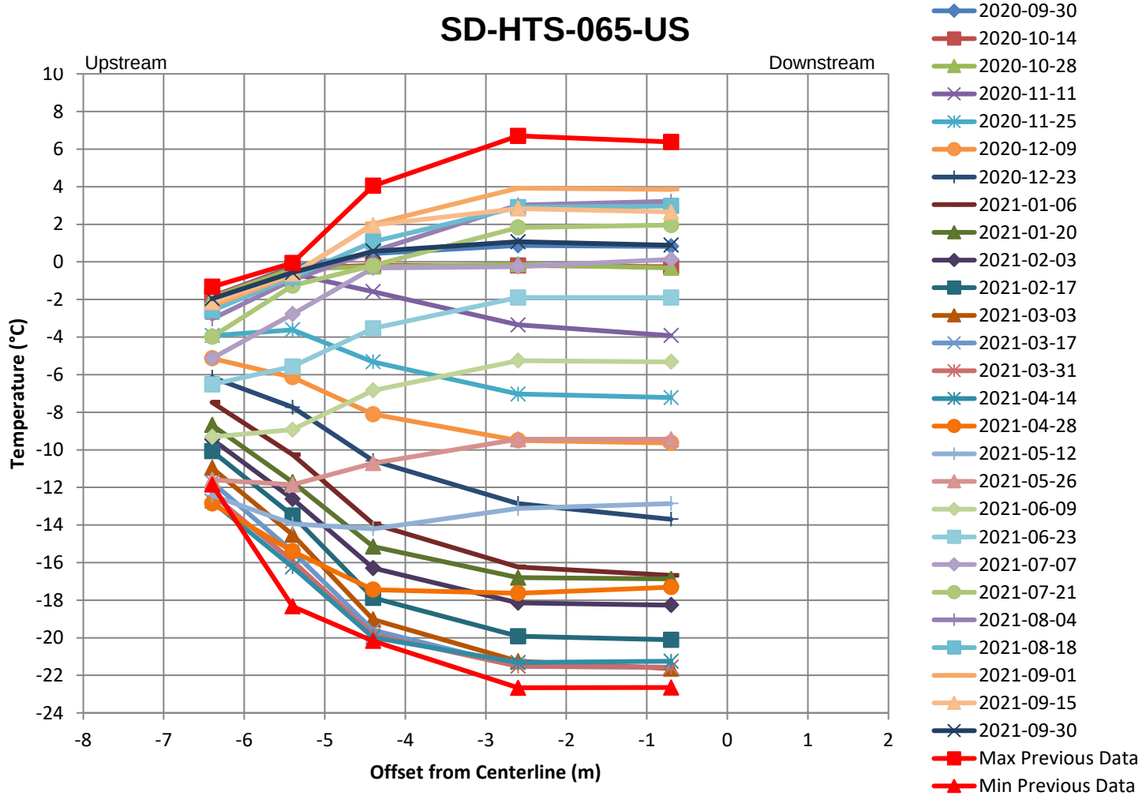
srk consulting	AGNICO EAGLE	2021 AGI – South Dam
		Station 0+65 Ground Temperature Cable Temperature Vs. Time
Job No: 1CT022.077 Filename: 1_App_A_SD_GTC.pptx	DORIS TIA	Date: Nov. 2021 / Approved: PDL / Figure: **A.17**

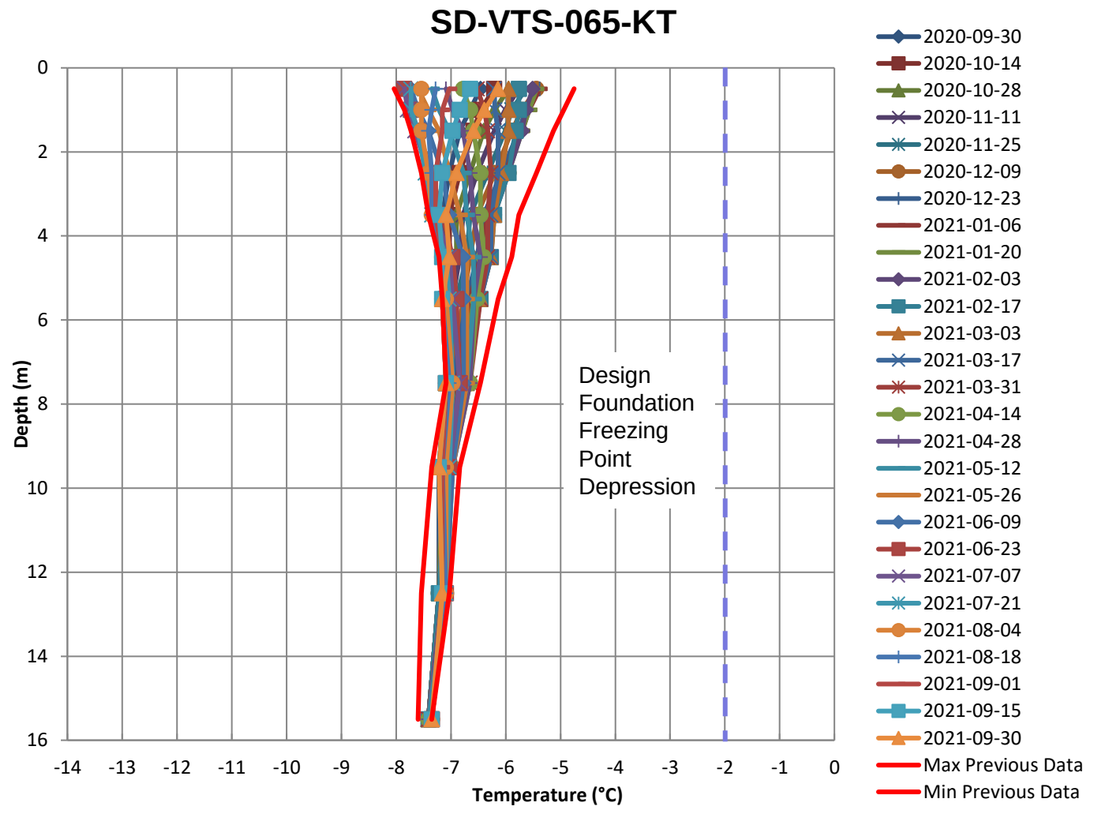




Legend:

- GTC Status: Cable irreparably damaged
- GTC Status: Bead damaged or data missing



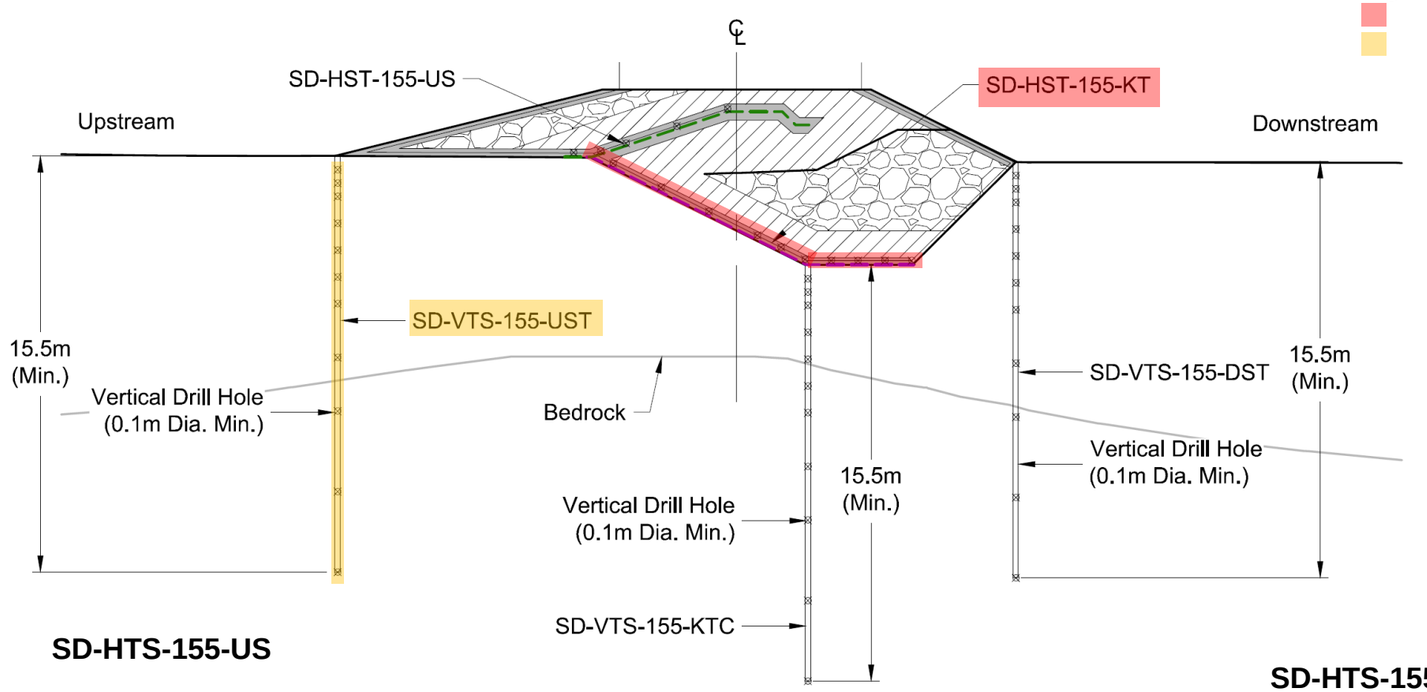


Note:

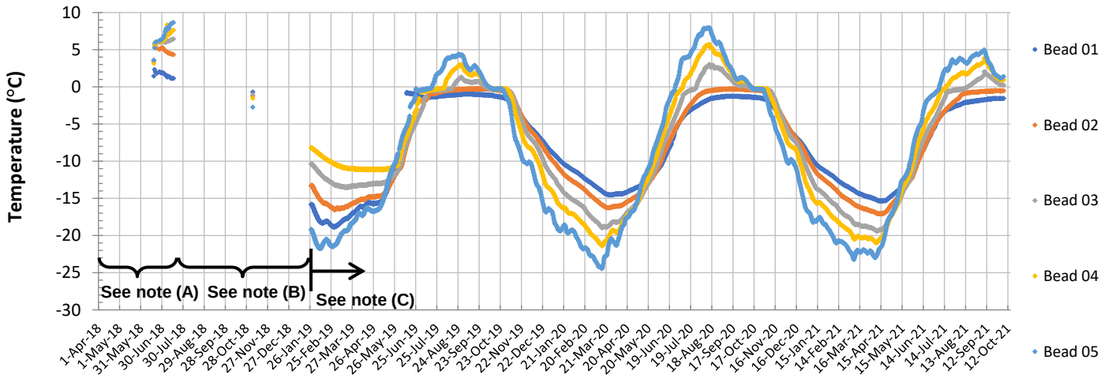
- Previous Data was recorded between January 2019 and September 2020

srk consulting	AGNICO EAGLE	2021 AGI – South Dam
		Station 0+65 Ground Temperature Cable Readings by Location
Job No: 1CT022.077 Filename: 1_App_A_SD_GTC.pptx	DORIS TIA	Date: Nov. 2021 / Approved: PDL / Figure: **A.18**

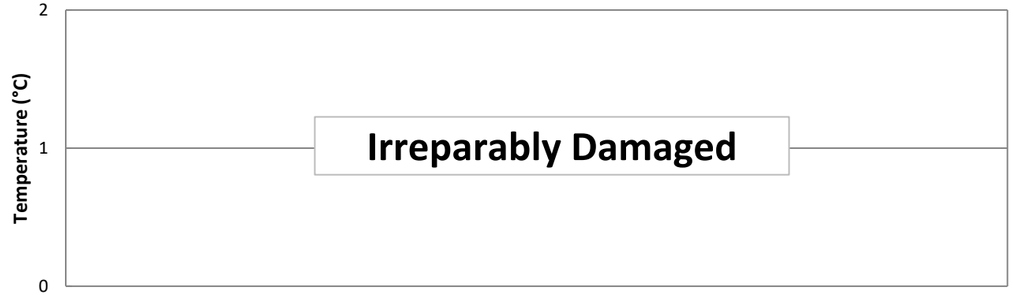
Legend:
- GTC Status: Cable irreparably damaged
- GTC Status: Bead damaged or data missing



SD-HTS-155-US

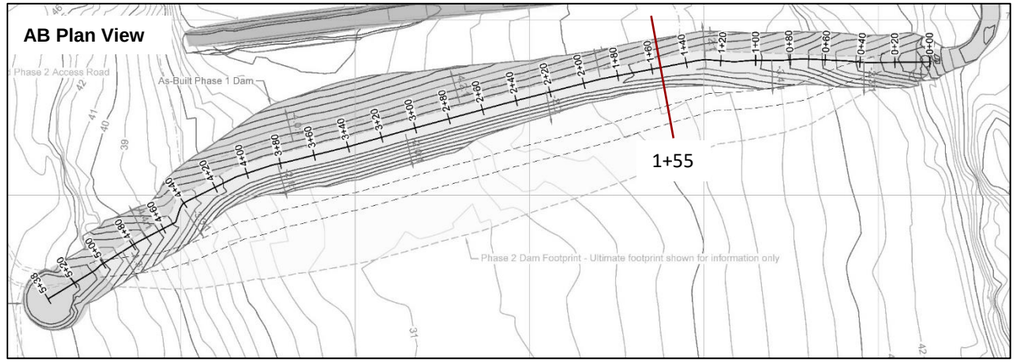


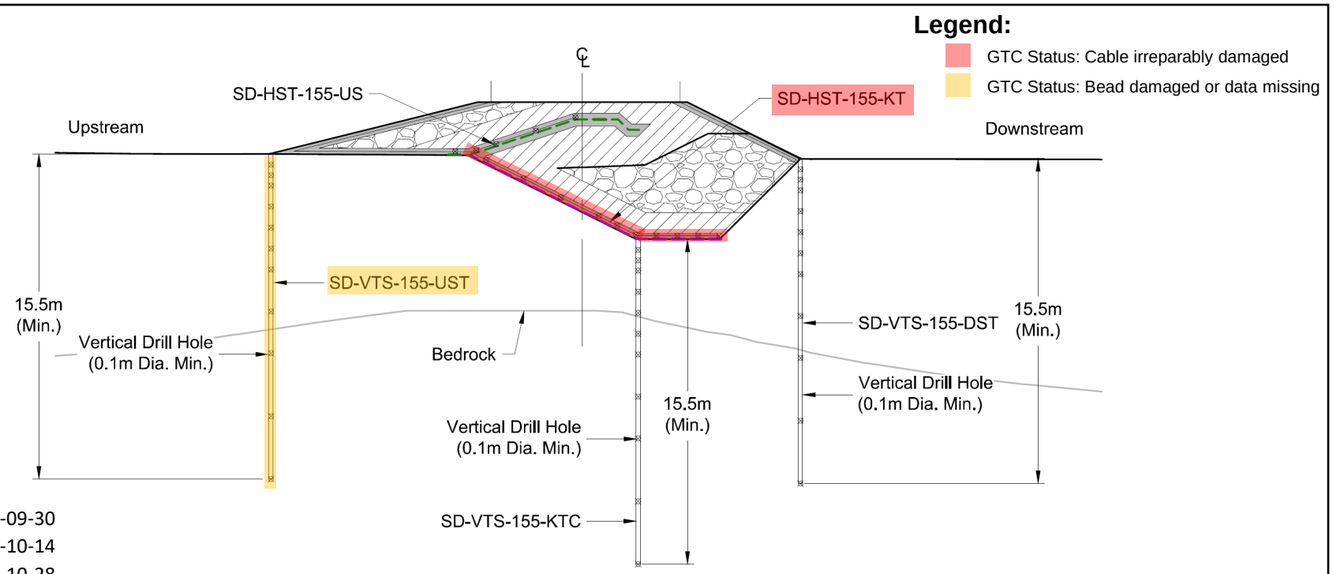
SD-HTS-155-KT

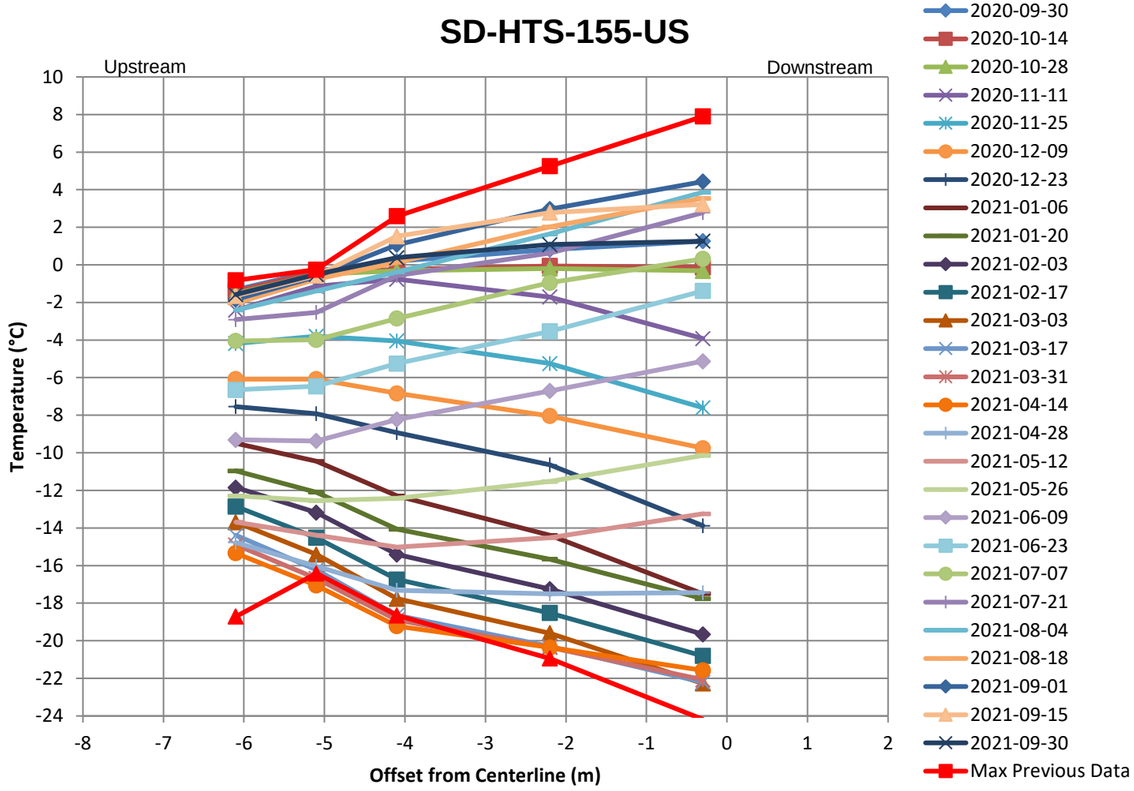


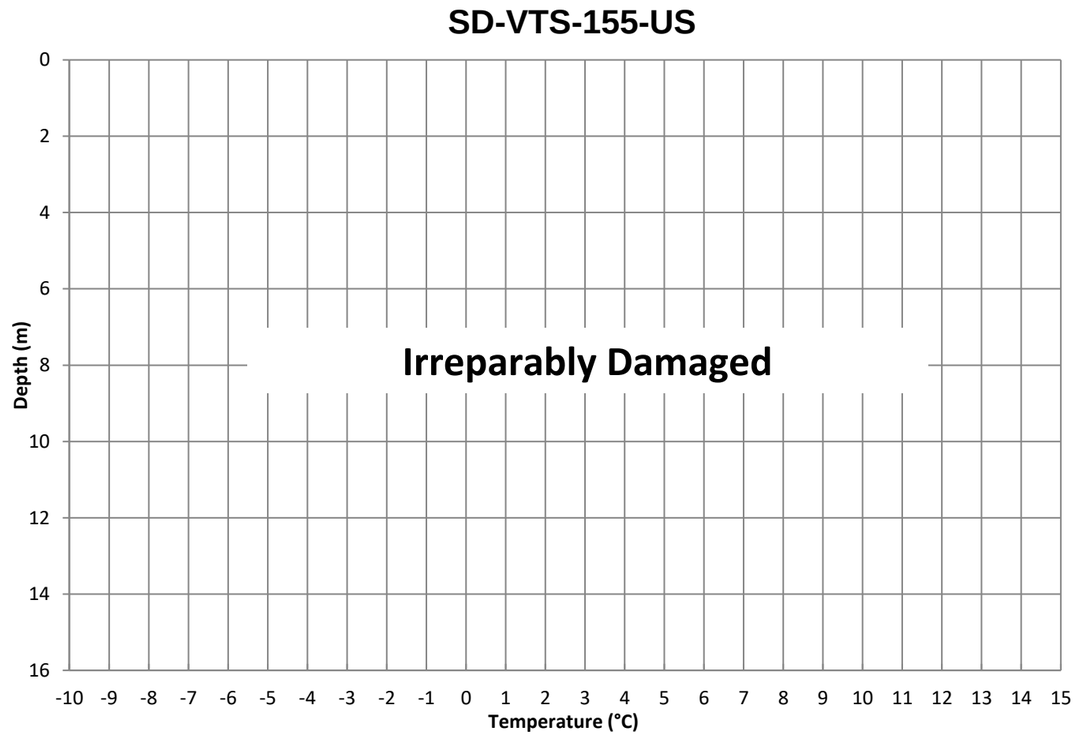
Notes:
- Bead numbers increase from upstream to downstream (horizontal) and top to bottom (vertical)
- SD-HTS-155-KT cable irreparably damaged during construction
- **(A)** Measurements collected between April and July 2018 were taken during construction
- **(B)** No measurements were collected between August 2018 to late January 2019 as the GTC's were extended and repaired, and the data loggers were set up on site. One set of manual spot measurements were collected in November 2018 to check interim dam performance
- **(C)** From the end of January 2019 onwards, data loggers were installed to provide higher resolution and more frequent data transmissions

srk consulting	AGNICO EAGLE	2021 AGI – South Dam
		Station 1+55 **Horizontal Temperature Cable** **Temperature Vs. Time**
Job No: 1CT022.077 Filename: 1_App_A_SD_GTC.pptx	**DORIS TIA**	Date: Nov. 2021 / Approved: PDL / Figure: **A.19**





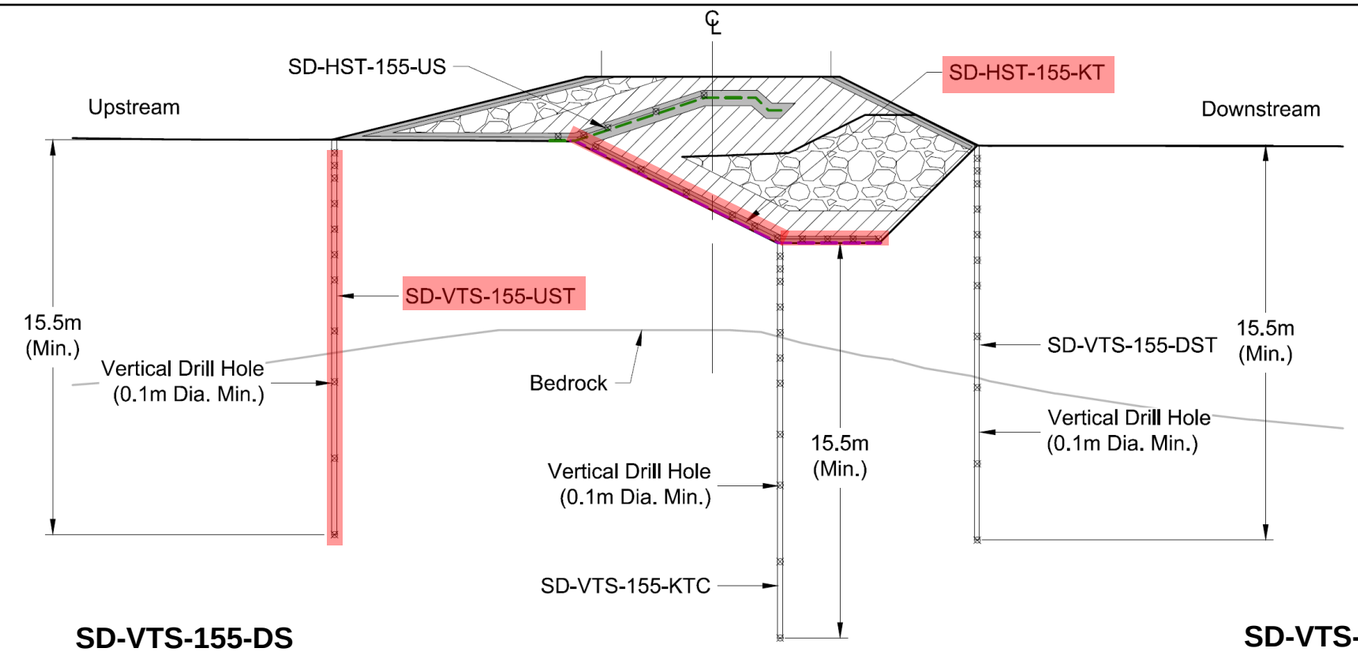




Notes:

- Previous Data was recorded between January 2019 and September 2020
- SD-HTS-155-KT irreparably damaged during construction
- No data collected after November 7, 2019 for SD-HTS-155-US. GTC assumed to be irreparably damaged

srk consulting	AGNICO EAGLE	2021 AGI – South Dam
Job No: 1CT022.077 Filename: 1_App_A_SD_GTC.pptx	DORIS TIA	**Station 1+55 Ground Temperature Cable Readings by Location**
		Date: Nov. 2021 / Approved: PDL / Figure: **A.20**

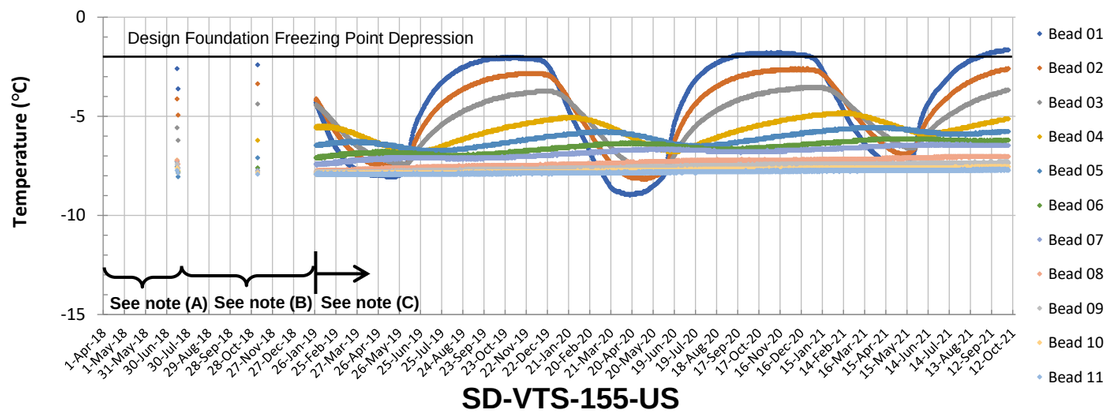


Legend:

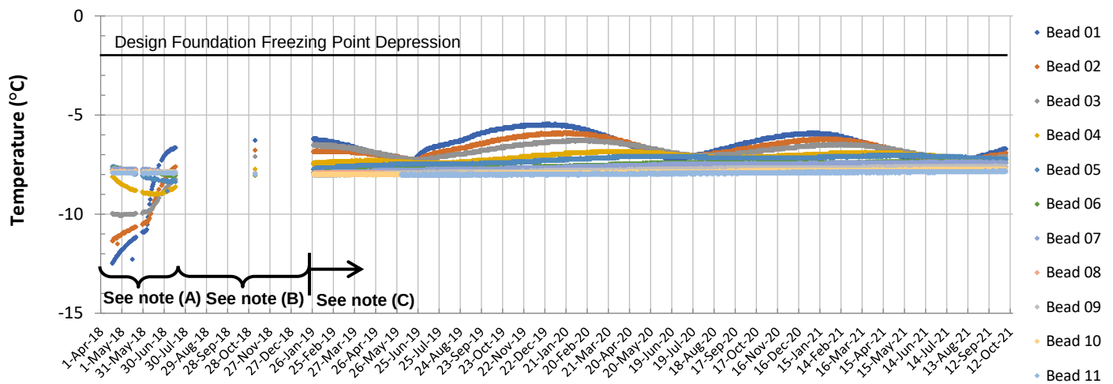
- GTC Status: Cable irreparably damaged
- GTC Status: Bead damaged or data missing

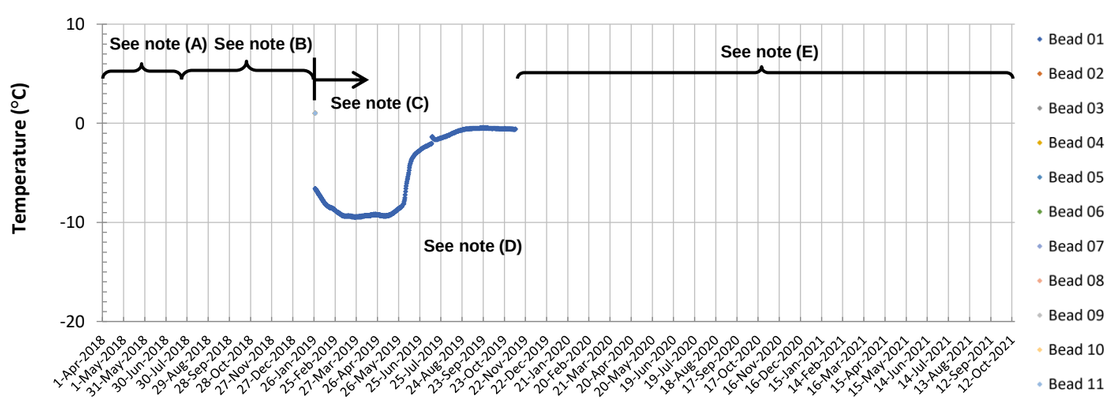
SD-VTS-155-DS

SD-VTS-155-KT



SD-VTS-155-US

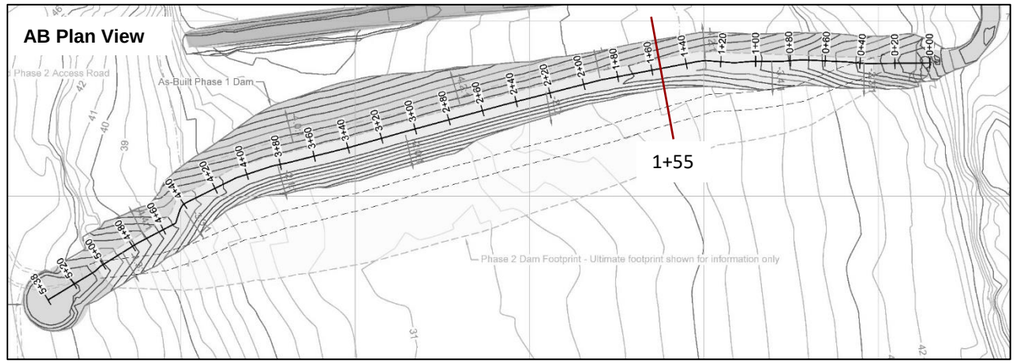


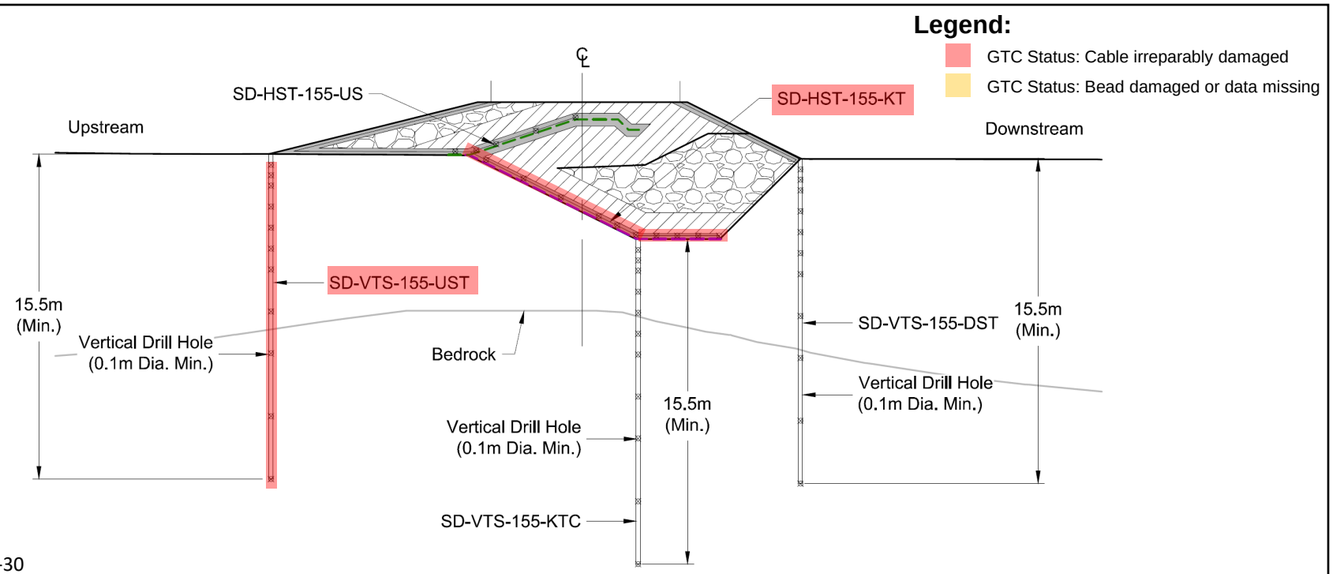


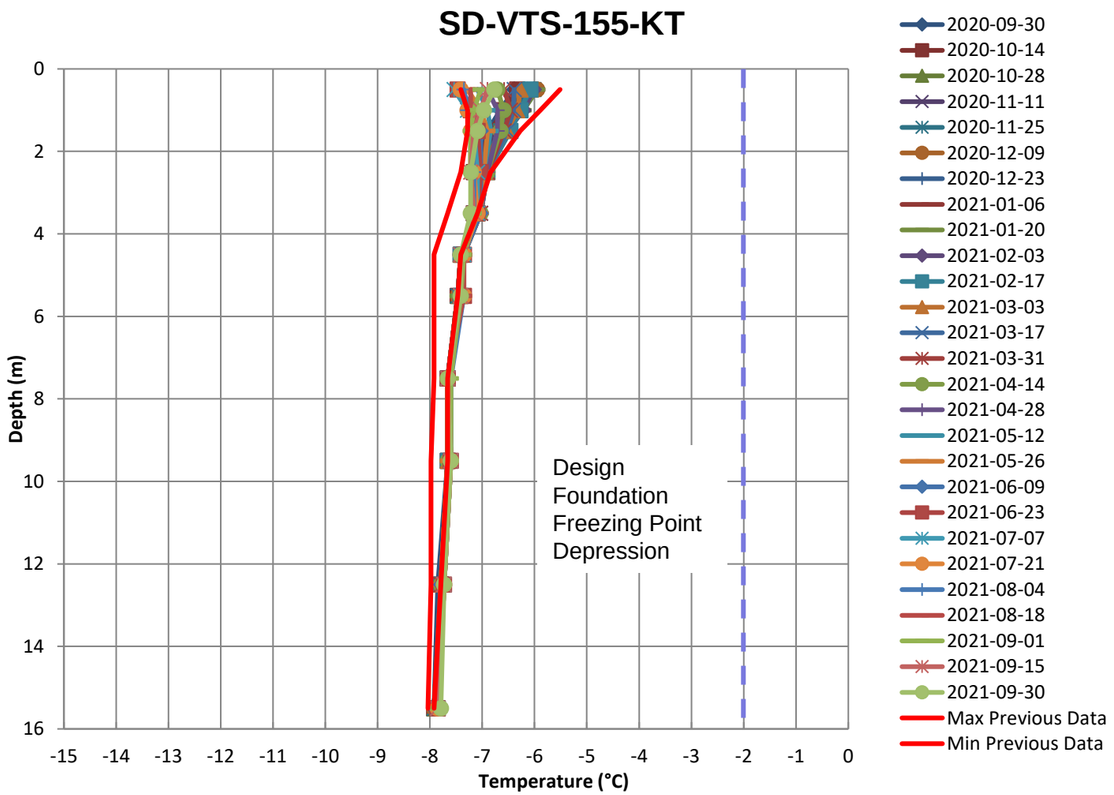
Notes:

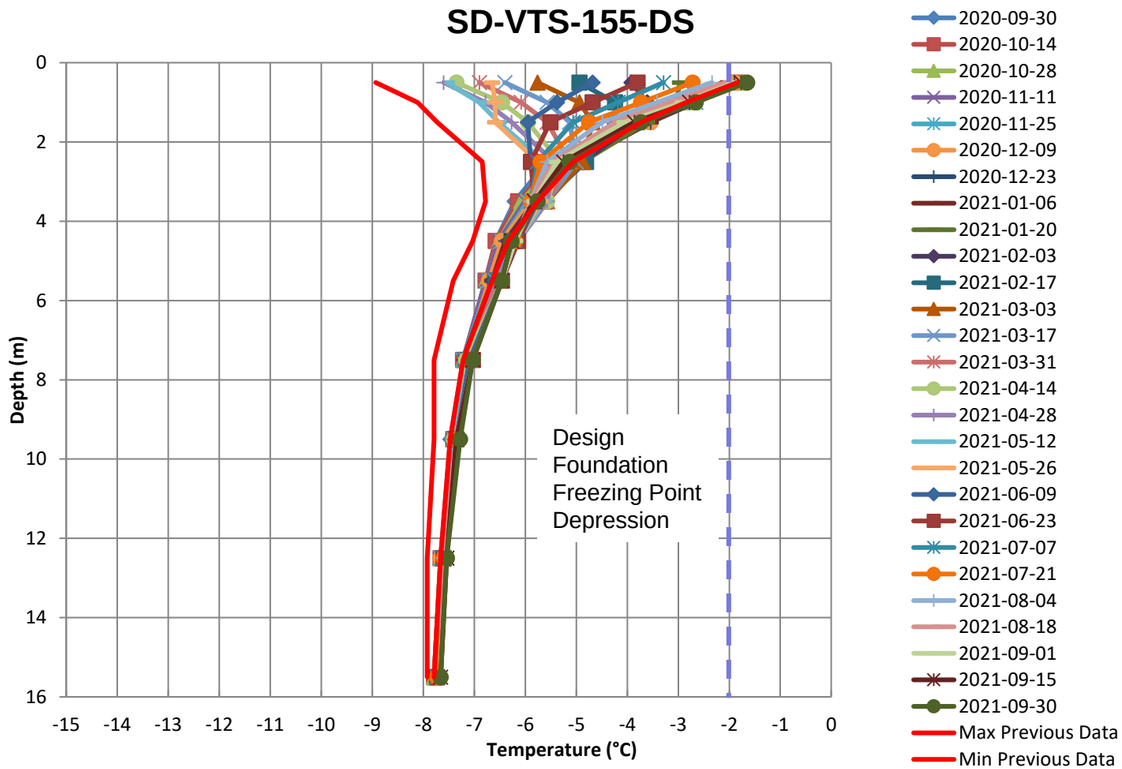
- Bead numbers increase from upstream to downstream (horizontal) and top to bottom (vertical)
- **(A)** Measurements collected between April and July 2018 were taken during construction
- **(B)** No measurements were collected between August 2018 to late January 2019 as the GTC's were extended and repaired, and the data loggers were set up on site. One set of manual spot measurements were collected for some cables in November 2018 to check interim dam performance
- **(C)** From the end of January 2019 onwards, data loggers were installed to provide higher resolution and more frequent data transmissions
- **(D)** Only top bead working. Beads 2-11 are damaged and not transmitting
- **(E)** No data collected after November 7, 2019 for SD-HTS-155-US. GTC assumed to be irreparably damaged

srk consulting	AGNICO EAGLE	2021 AGI – South Dam
Job No: 1CT022.077 Filename: 1_App_A_SD_GTC.pptx	DORIS TIA	**Station 1+55** **Vertical Temperature Cable Temperature Vs. Time**
		Date: Nov. 2021 / Approved: PDL / Figure: **A.21**





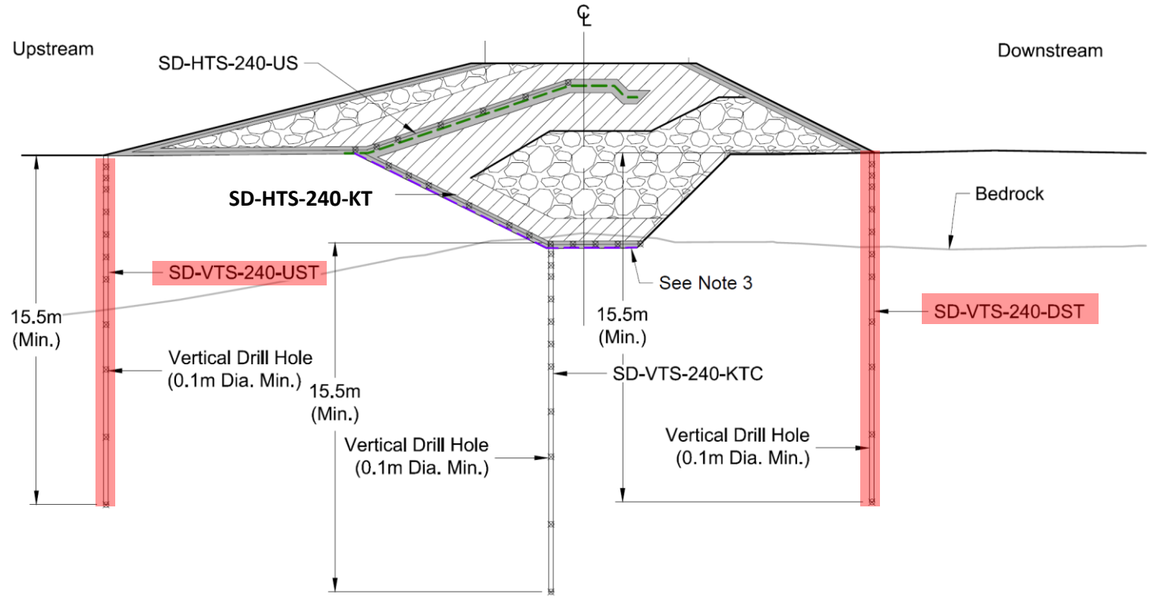




Note:

- Previous Data was recorded between January 2019 and September 2020

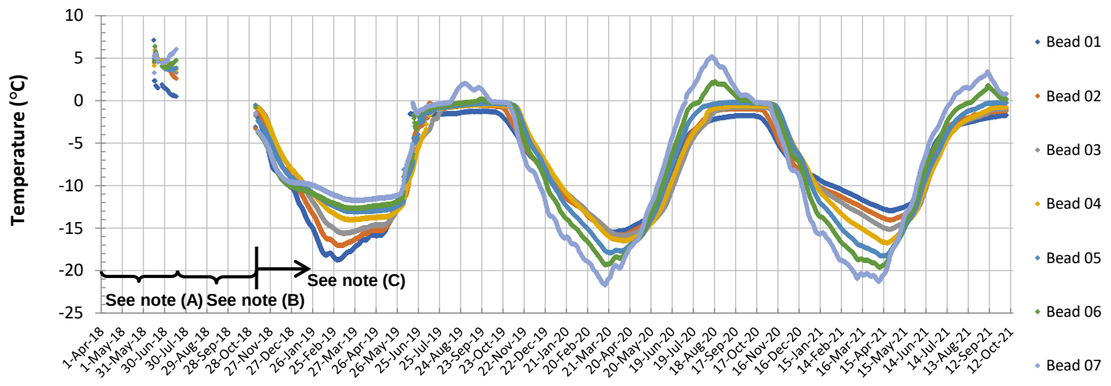
srk consulting	AGNICO EAGLE	2021 AGI – South Dam
		Station 1+55 Ground Temperature Cable Readings by Location
Job No: 1CT022.077 Filename: 1_App_A_SD_GTC.pptx	DORIS TIA	Date: Nov. 2021 / Approved: PDL / Figure: **A.22**



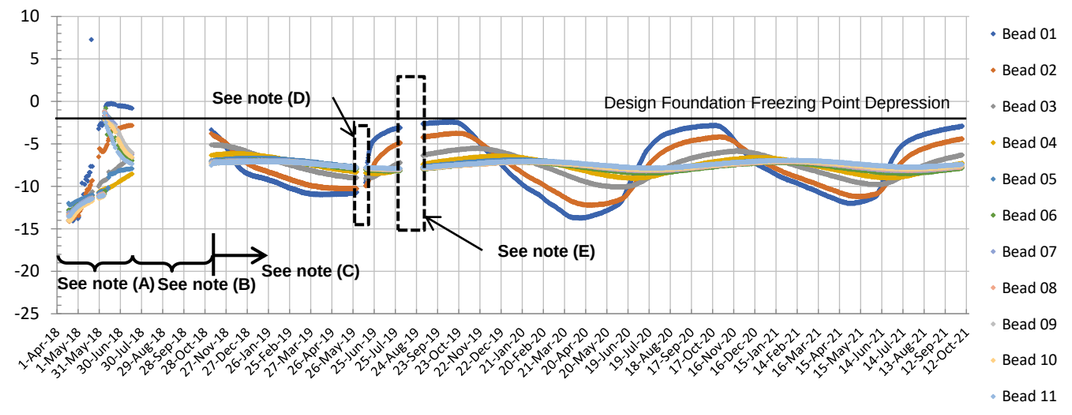
Legend:

- GTC Status: Cable irreparably damaged
- GTC Status: Bead damaged or data missing

SD-HTS-240-US



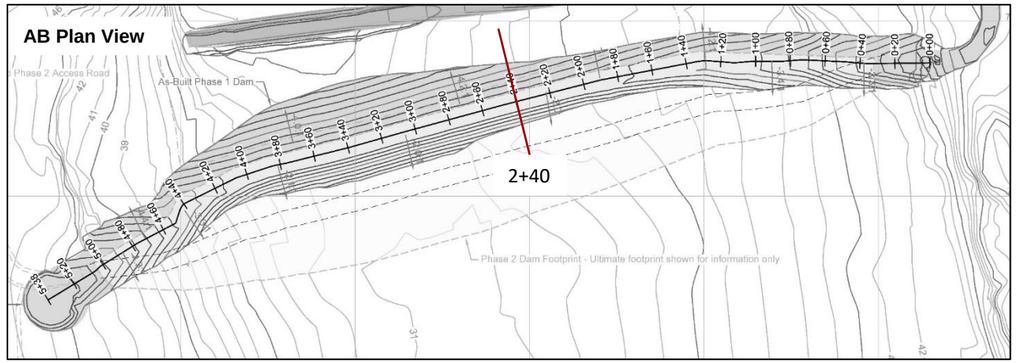
SD-HTS-240-KT

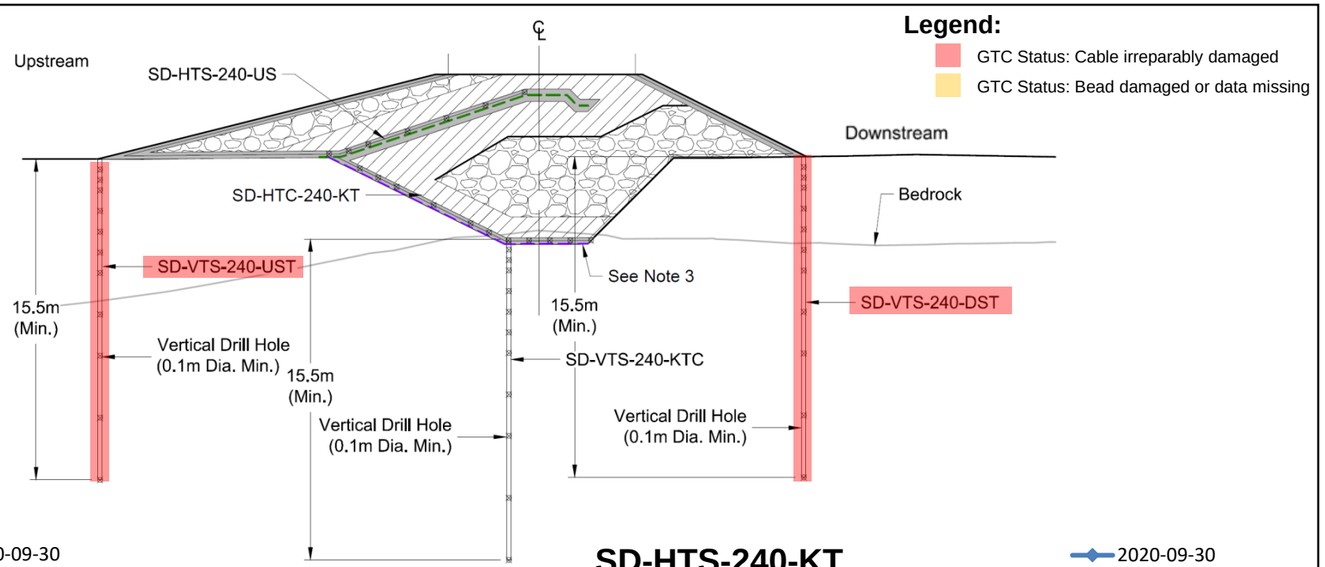


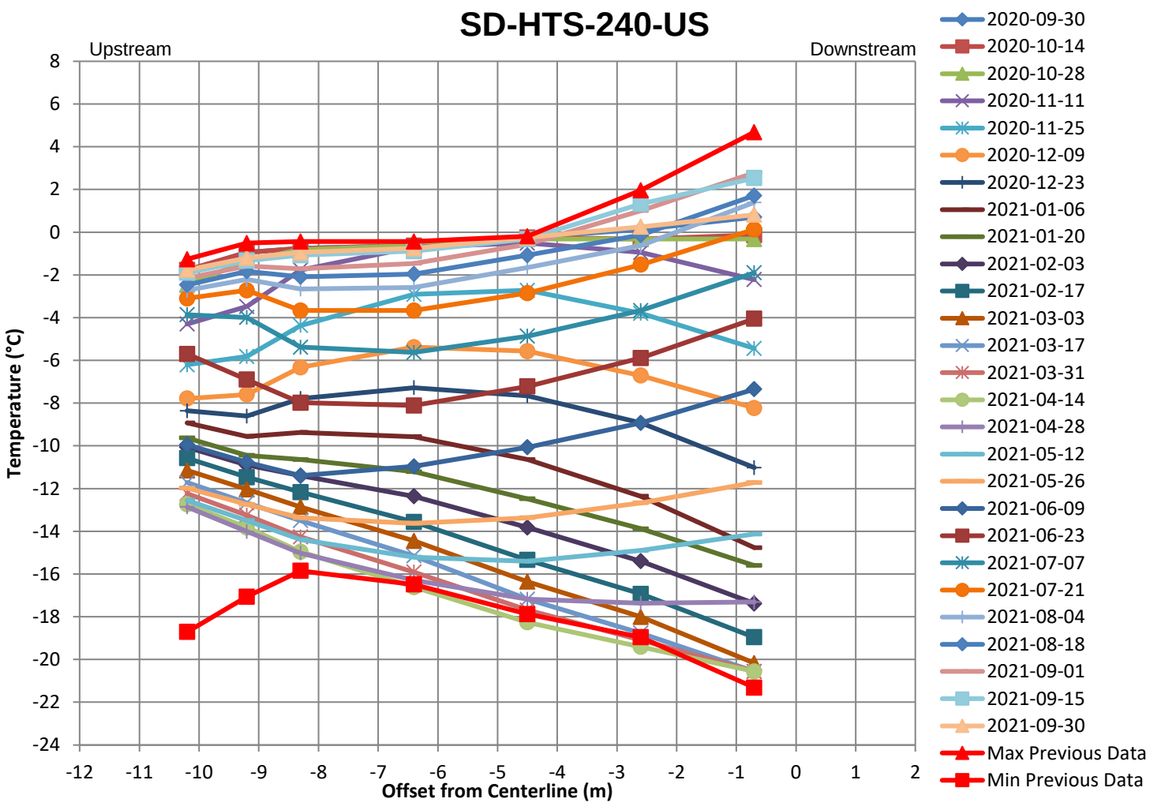
Notes:

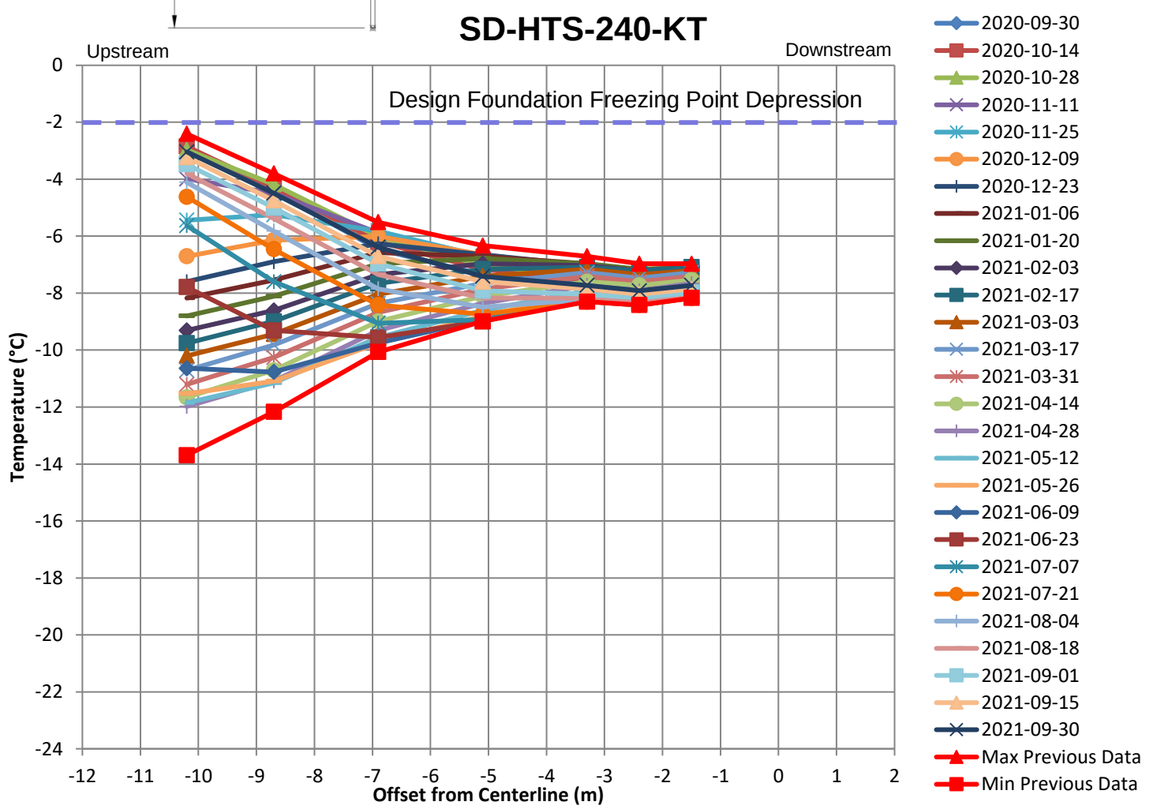
- Bead numbers increase from upstream to downstream (horizontal) and top to bottom (vertical)
- **(A)** Measurements collected between April and July 2018 were taken during construction
- **(B)** No measurements were collected between August 2018 to November 2018 as the data loggers were set up on site.
- **(C)** From November 2018 onwards, data loggers were installed to provide higher resolution and more frequent data transmissions.
- **(D)** No data collected between May 31, 2019 and June 13, 2019 for SD-HTS-240-KT
- **(E)** No data collected between August 1, 2019 to September 2, 2019 for SD-HTS-240-KT

srk consulting	AGNICO EAGLE	2021 AGI – South Dam
Job No: 1CT022.077 Filename: 1_App_A_SD_GTC.pptx	DORIS TIA	**Station 2+40** **Horizontal Temperature Cable Temperature Vs. Time**
		Date: Nov. 2021 / Approved: PDL / Figure: **A.23**





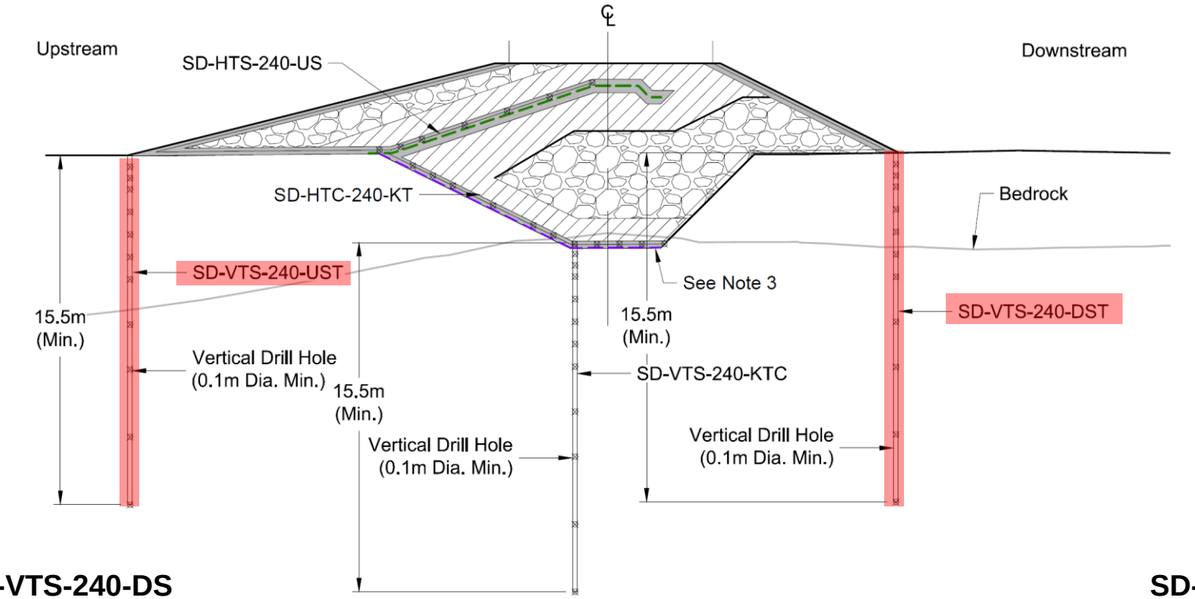




Note:

- Previous Data was recorded between November 2018 and September 2020

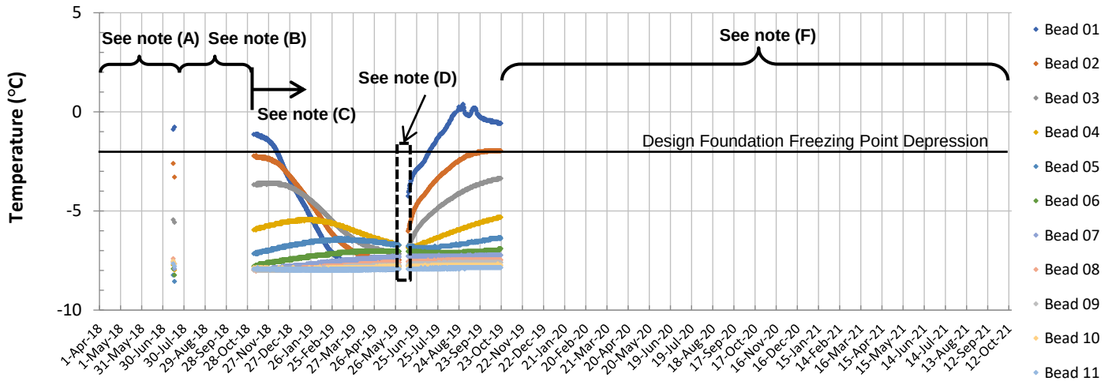
srk consulting	AGNICO EAGLE	2021 AGI – South Dam
		Station 2+40 Ground Temperature Cable Readings by Location
Job No: 1CT022.077 Filename: 1_App_A_SD_GTC.pptx	DORIS TIA	Date: Nov. 2021 / Approved: PDL / Figure: **A.24**



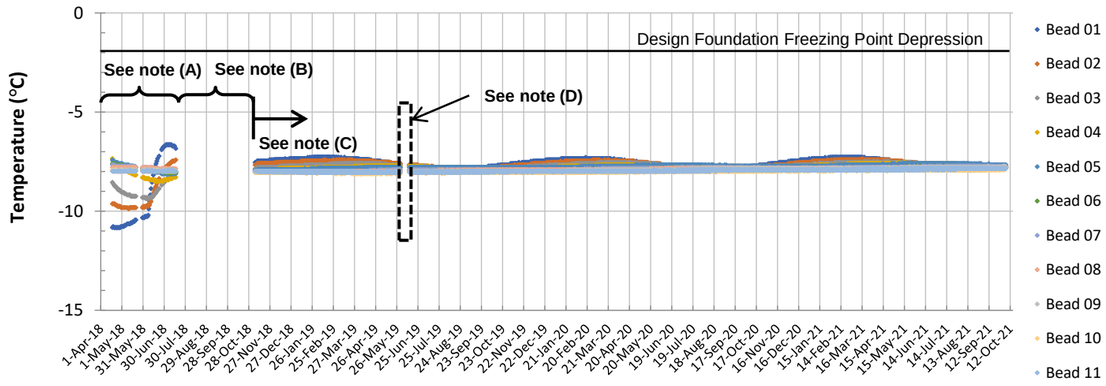
Legend:

- GTC Status: Cable irreparably damaged
- GTC Status: Bead damaged or data missing

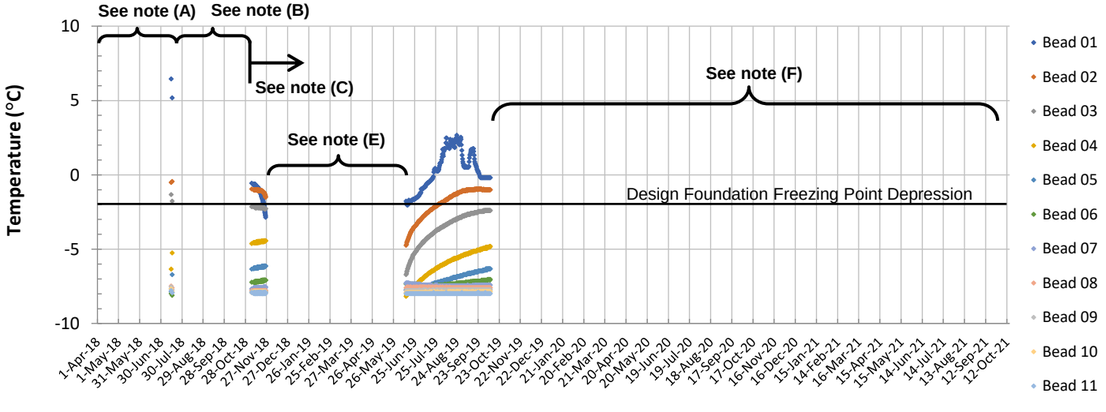
SD-VTS-240-DS



SD-VTS-240-KT



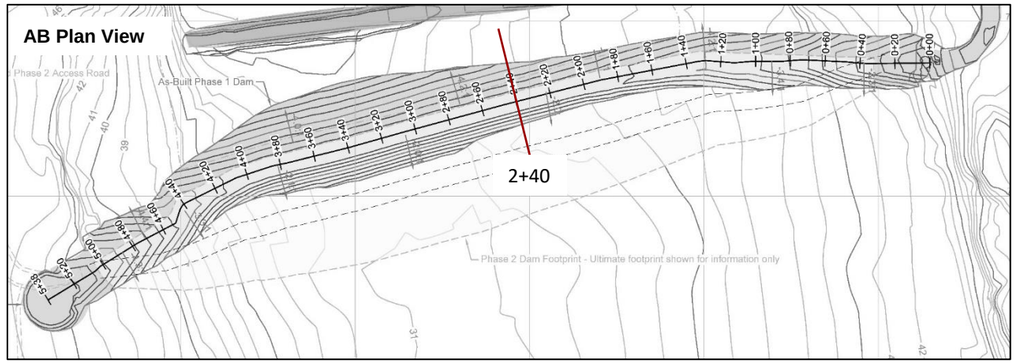
SD-VTS-240-US

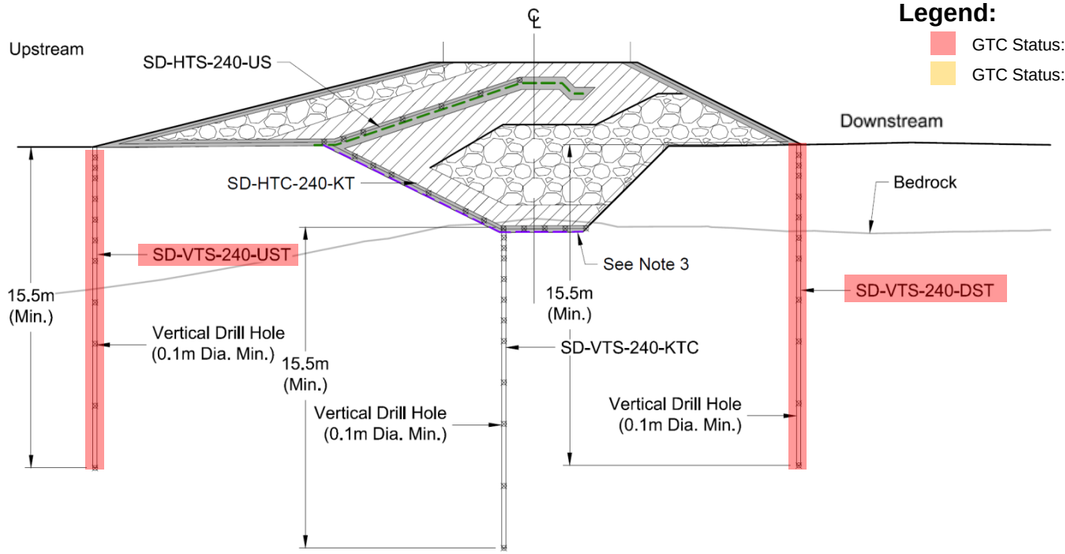


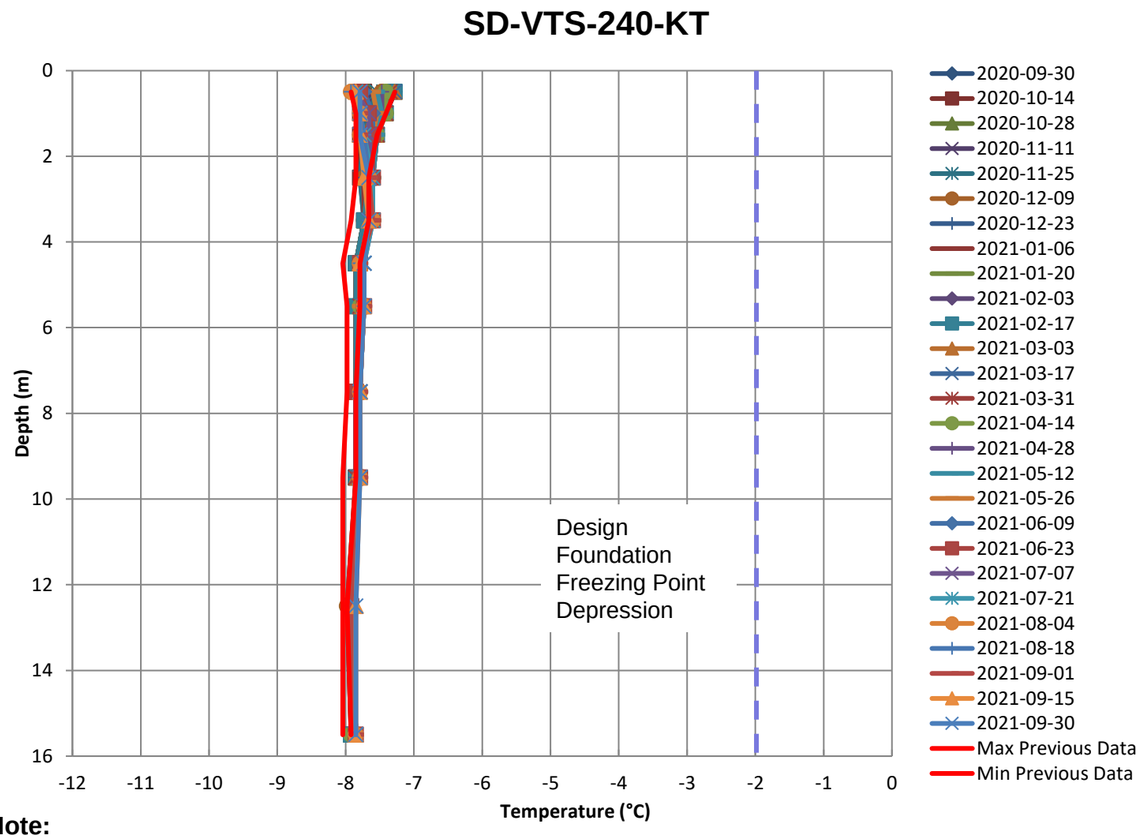
Notes:

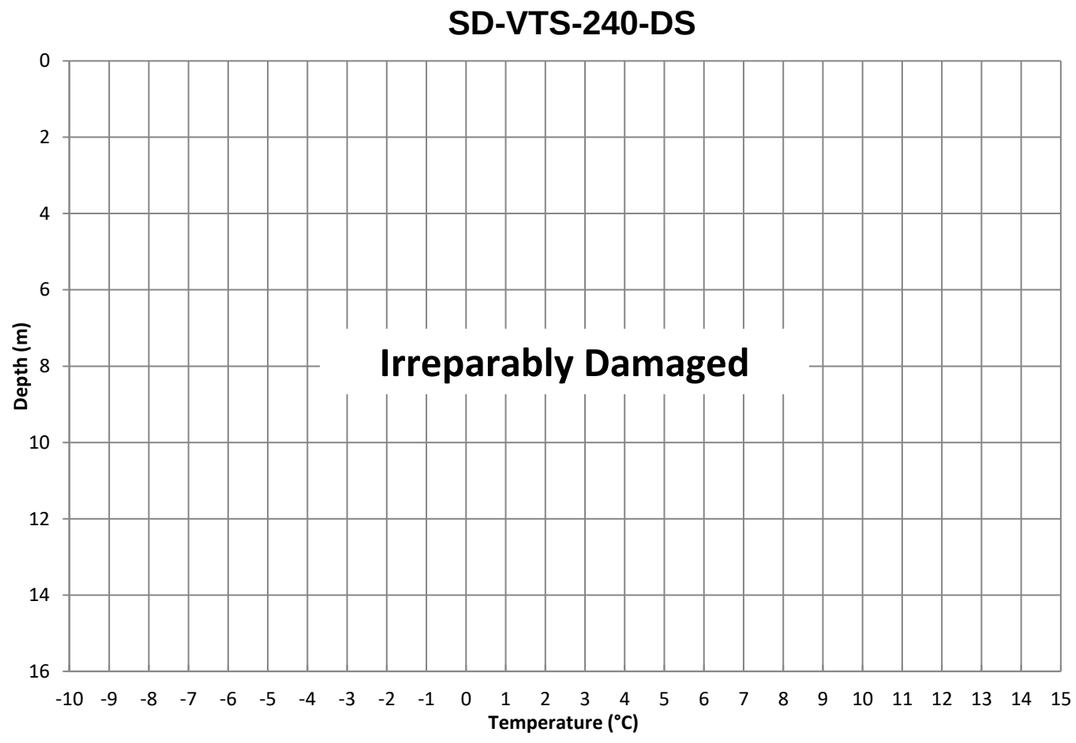
- Bead numbers increase from upstream to downstream (horizontal) and top to bottom (vertical)
- **(A)** Measurements collected between April and July 2018 were taken during construction
- **(B)** No measurements were collected between August 2018 to November 2018 as the data loggers were set up on site
- **(C)** From November 2018 onwards, data loggers were installed to provide higher resolution and more frequent data transmissions
- **(D)** No data collected between May 31, 2019 and June 13, 2019
- **(E)** No readings, cable was damaged and repaired in June 2019
- **(F)** No data collected after October 10, 2019 for SD-HTS-240-US and after October 22, 2019 for SD-HTS-240-DS. Both cables are assumed to be inactive and damaged beyond repair

srk consulting	AGNICO EAGLE	2021 AGI – South Dam
		Station 2+40 **Vertical Temperature Cable Temperature Vs. Time**
Job No: 1CT022.077 Filename: 1_App_A_SD_GTC.pptx	DORIS TIA	Date: Nov. 2021 · Approved: PDL · Figure: **A.25**





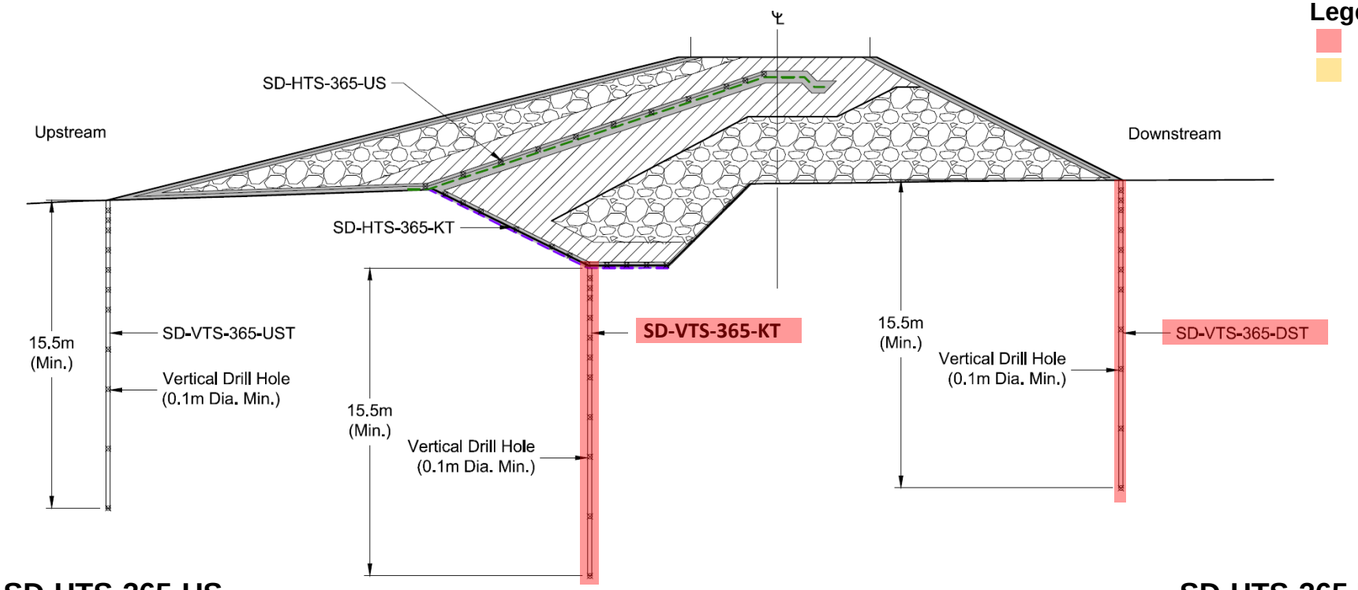




Note:

- Previous Data was recorded between November 2018 and September 2020
- No data collected after October 22, 2019 for SD-VTS-240-DS. GTC assumed to be irreparably damaged
- No data collected after October 10, 2019 for SD-VTS-240-US. GTC assumed to be irreparably damaged

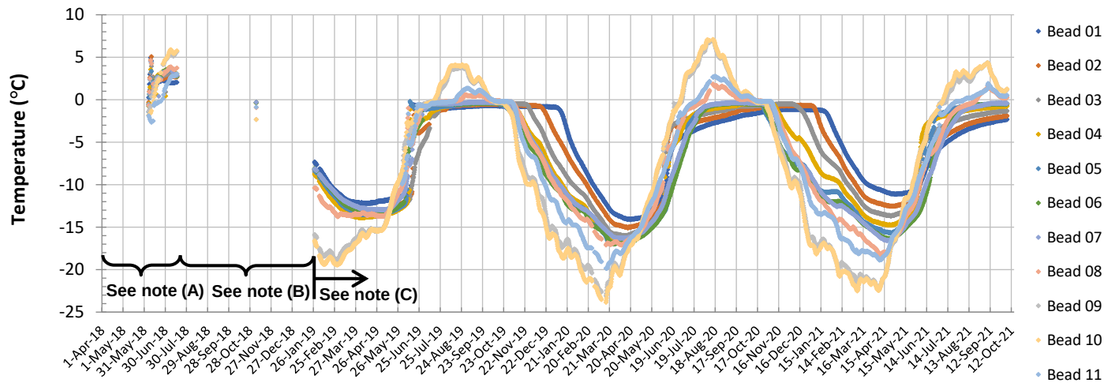
srk consulting	AGNICO EAGLE	2021 AGI – South Dam
		Station 2+40 Ground Temperature Cable Readings by Location
Job No: 1CT022.077 Filename: 1_App_A_SD_GTC.pptx	DORIS TIA	Date: Nov. 2021 / Approved: PDL / Figure: **A.26**



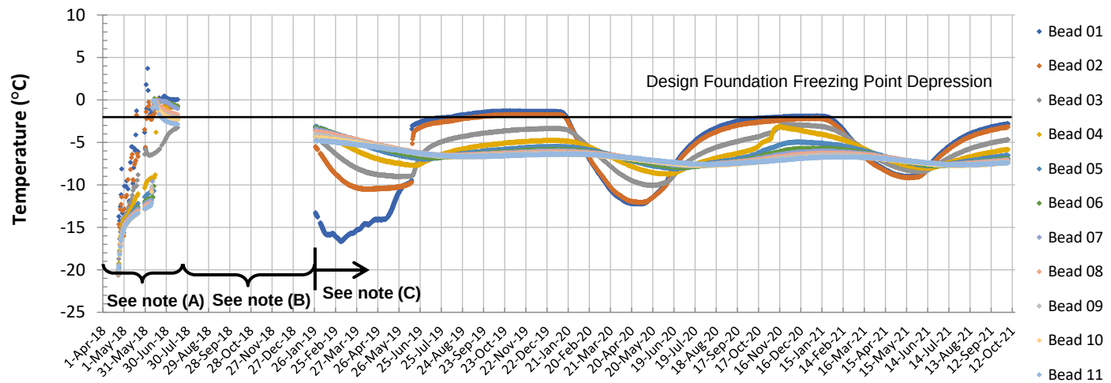
Legend:

- GTC Status: Cable irreparably damaged
- GTC Status: Bead damaged or data missing

SD-HTS-365-US



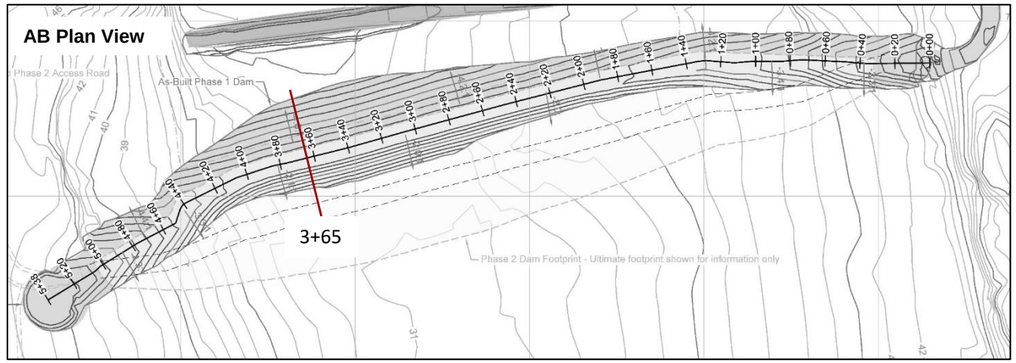
SD-HTS-365-KT

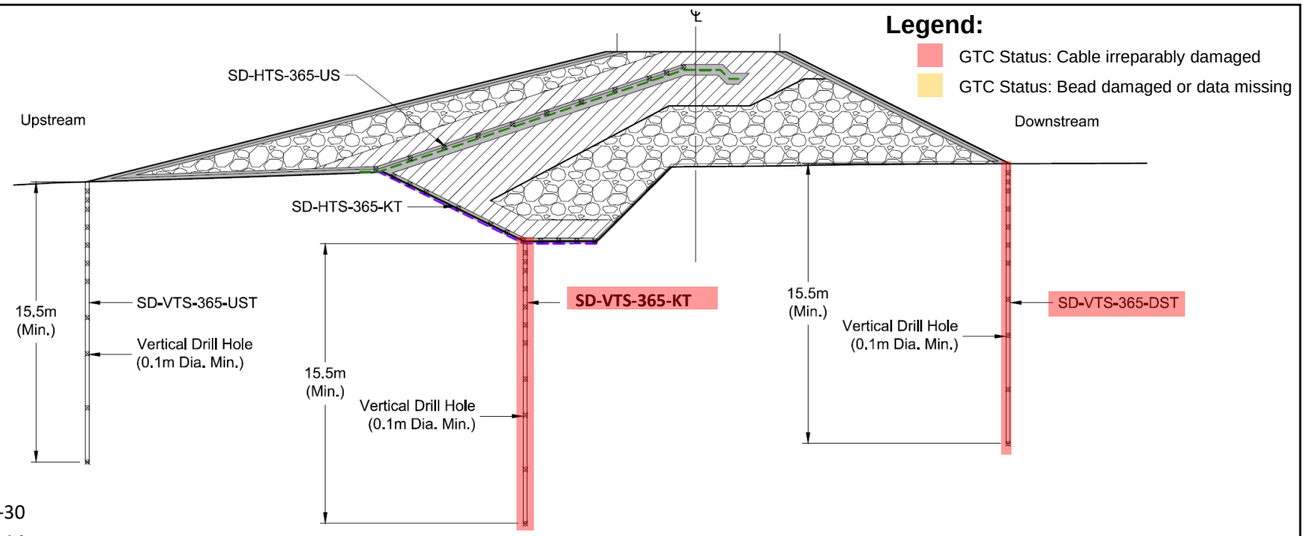


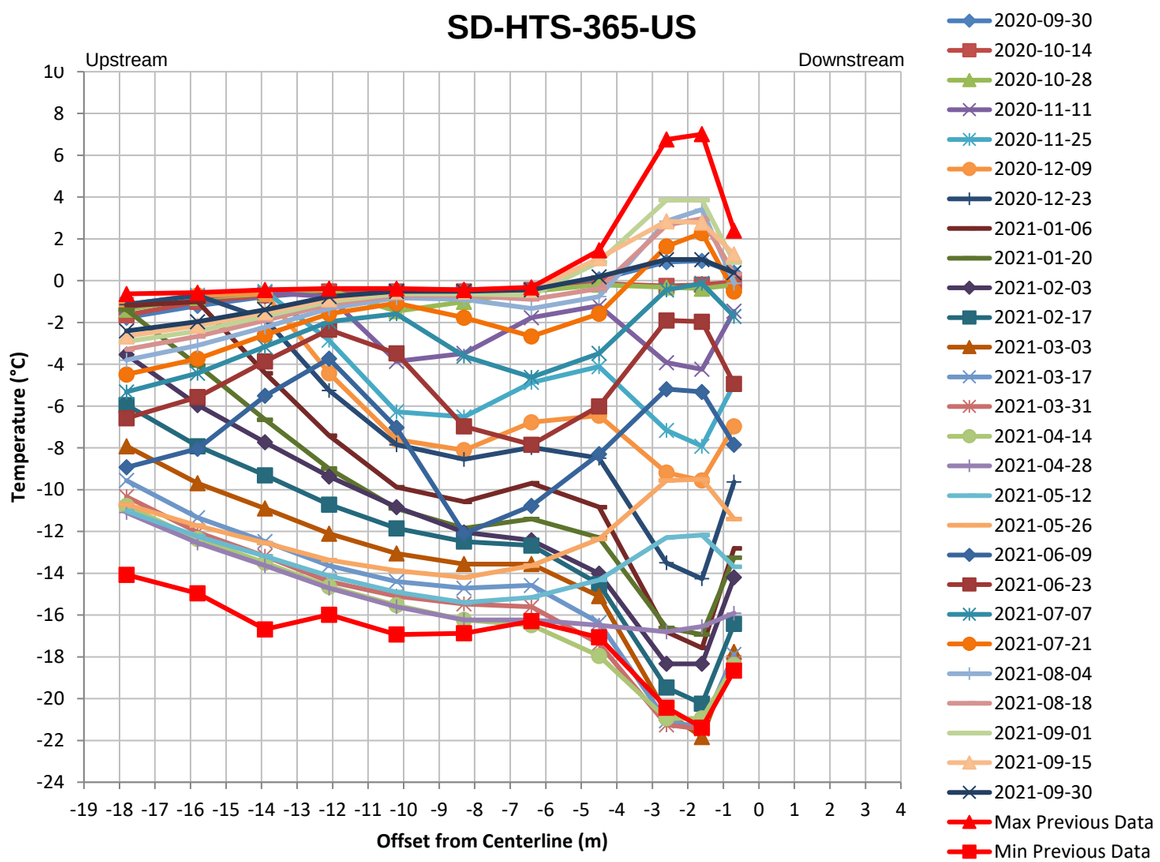
Notes:

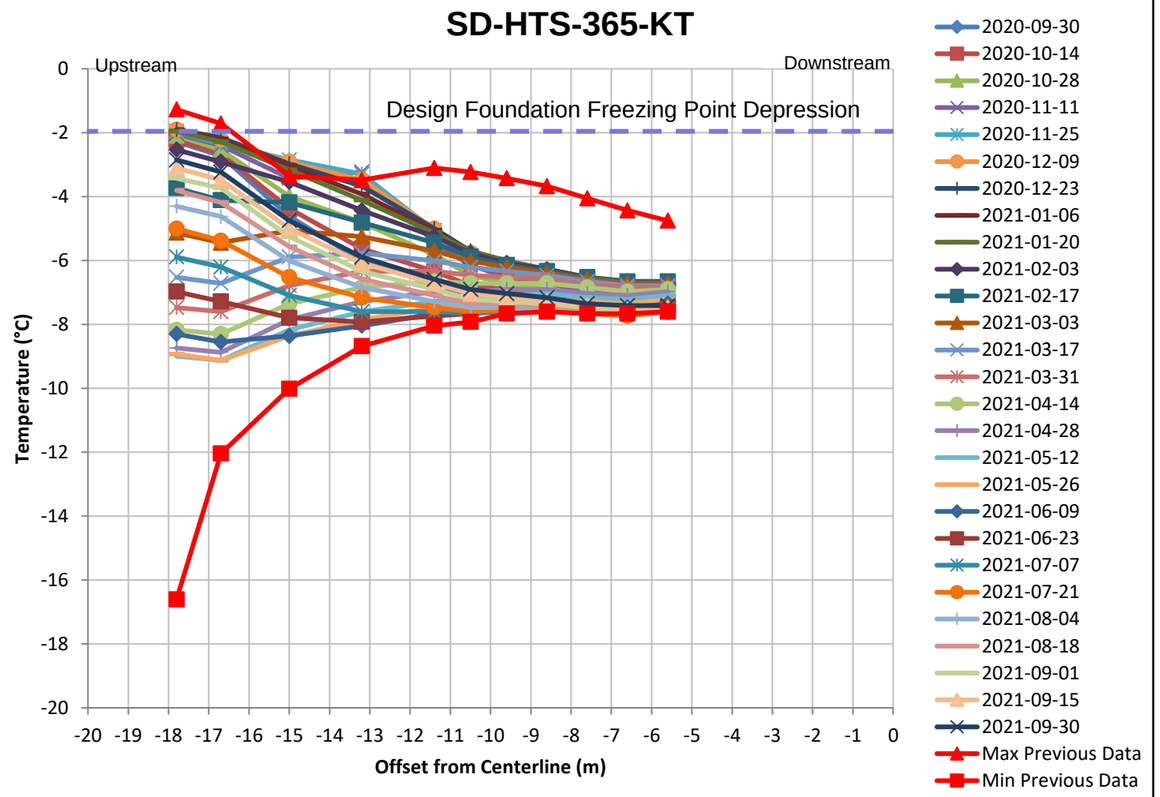
- Bead numbers increase from upstream to downstream (horizontal) and top to bottom (vertical)
- **(A)** Measurements collected between April and July 2018 were taken during construction
- **(B)** No measurements were collected between August 2018 to late January 2019 as the GTC's were extended and repaired, and the data loggers were set up on site. One set of manual spot measurements were collected for some cables in November 2018 to check interim dam performance
- **(C)** From the end of January 2019 onwards, data loggers were installed to provide higher resolution and more frequent data transmissions

srk consulting	AGNICO EAGLE	2021 AGI – South Dam
		Station 3+65 Horizontal Temperature Cable Temperature Vs. Time
Job No: 1CT022.077 Filename: 1_App_A_SD_GTC.pptx	DORIS TIA	Date: Nov. 2021 / Approved: PDL / Figure: **A.27**









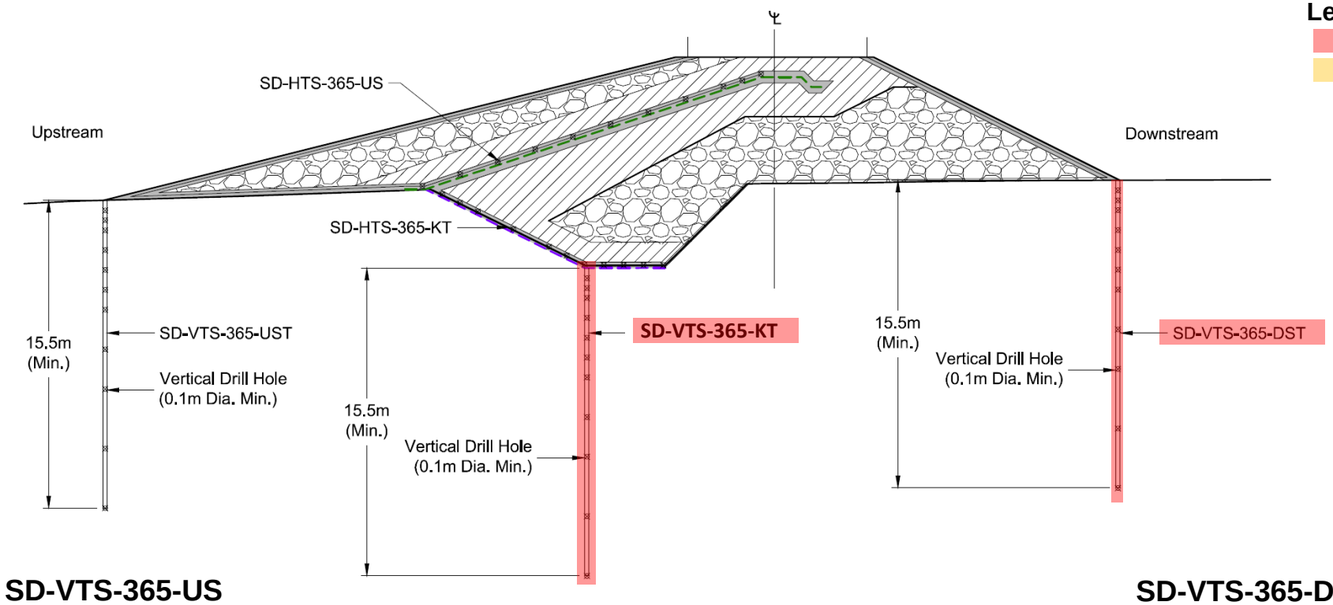
Note:

- Previous Data was recorded between January 2019 and September 2020

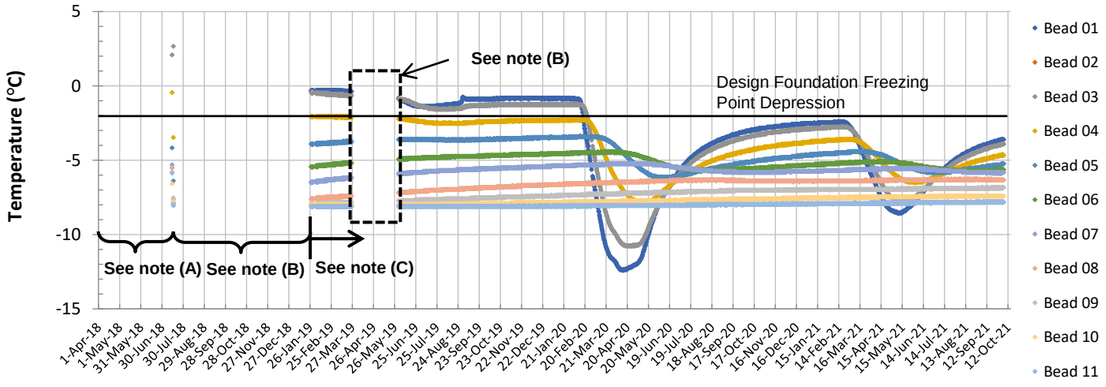
srk consulting	AGNICO EAGLE	2021 AGI – South Dam
		Station 3+65 Horizontal Temperature Cable Readings by Location
Job No: 1CT022.077 Filename: 1_App_A_SD_GTC.pptx	DORIS TIA	Date: Nov. 2021 / Approved: PDL / Figure: **A.28**

Legend:

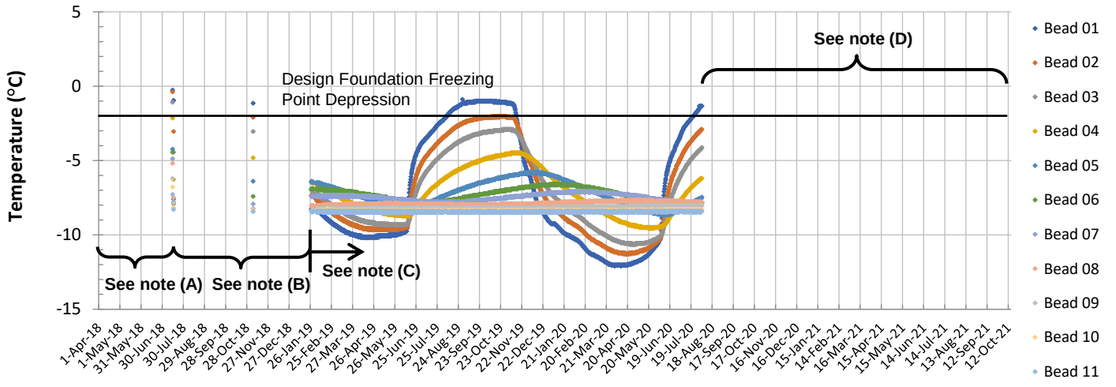
- GTC Status: Cable irreparably damaged
- GTC Status: Bead damaged or data missing



SD-VTS-365-US



SD-VTS-365-DS

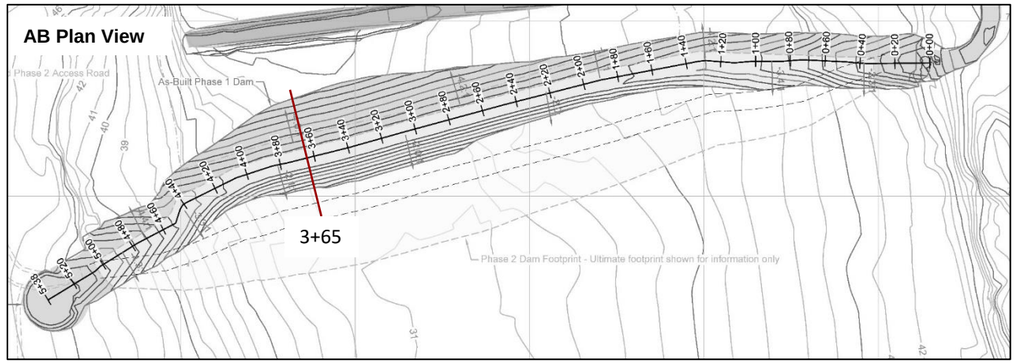


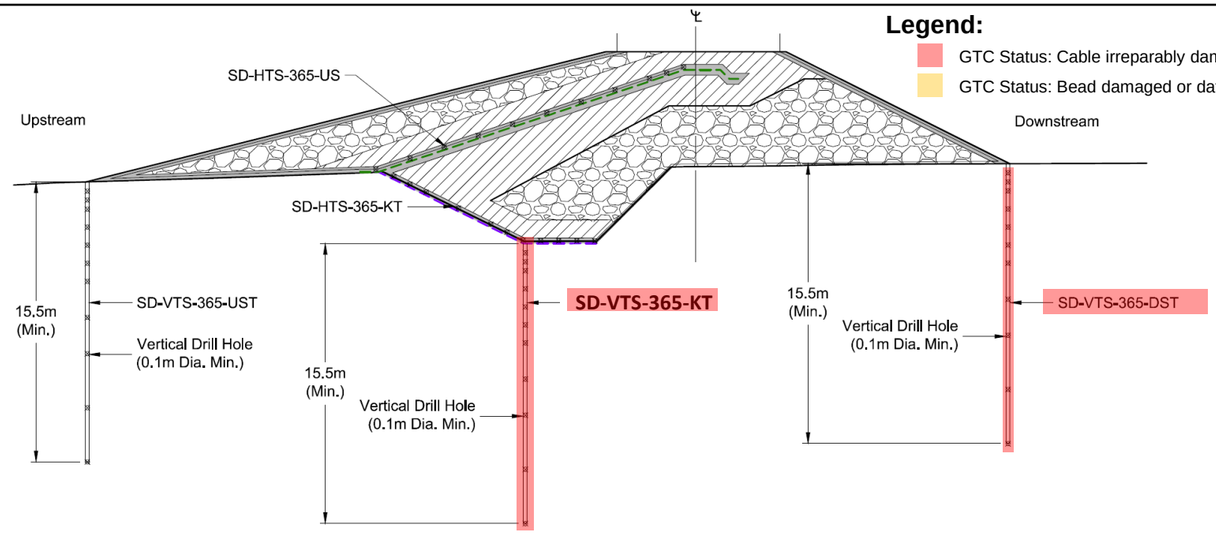
SD-VTS-365-KT

Notes:

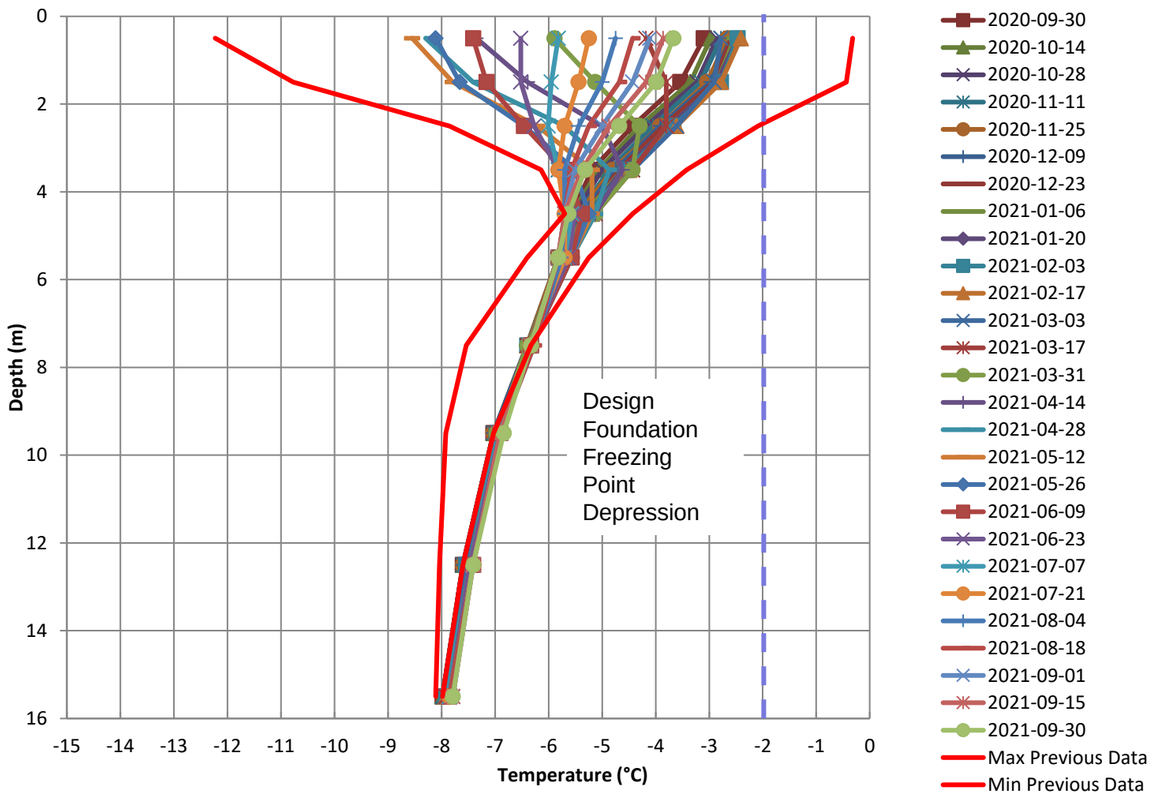
- Bead numbers increase from upstream to downstream (horizontal) and top to bottom (vertical)
- SD-VTS-365-US cable damaged after construction but repaired
- SD-VTS-365-KT irreparably damaged after construction
- **(A)** Measurements collected between April and July 2018 were taken during construction
- **(B)** No measurements were collected between August 2018 to late January 2019 as the GTC's were extended and repaired, and the data loggers were set up on site. One set of manual spot measurements were collected for some cables in November 2018 to check interim dam performance
- **(C)** From the end of January 2019 onwards, data loggers were installed to provide higher resolution and more frequent data transmissions
- **(D)** No data collected after August 3, 2020 SD-VTS-365-DS. GTC assumed to be irreparably damaged

srk consulting	AGNICO EAGLE	2021 AGI – South Dam
		Station 3+65 **Vertical Temperature Cable** **Temperature Vs. Time**
Job No: 1CT022.077 Filename: 1_App_A_SD_GTC.pptx	**DORIS TIA**	Date: Nov. 2021 / Approved: PDL / Figure: **A.29**

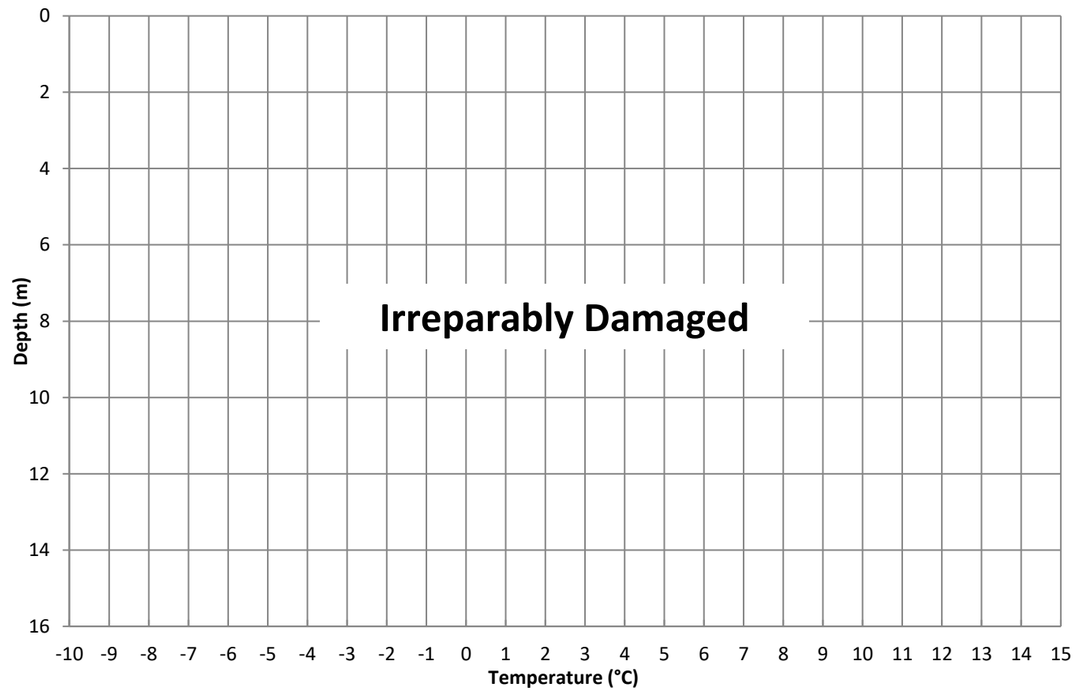




SD-VTS-365-US



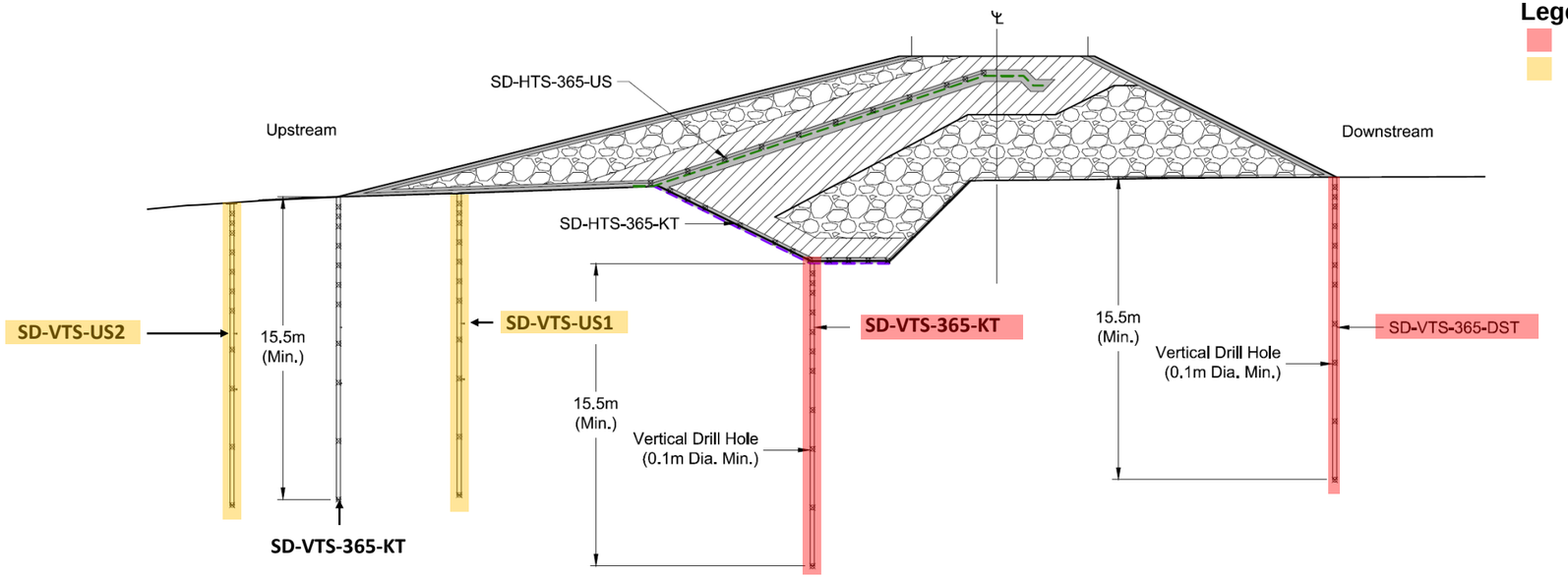
SD-VTS-365-DS



Note:

- Previous Data was recorded between January 2019 and September 2020
- No data collected after August 3, 2020 SD-VTS-365-DS. GTC assumed to be irreparably damaged

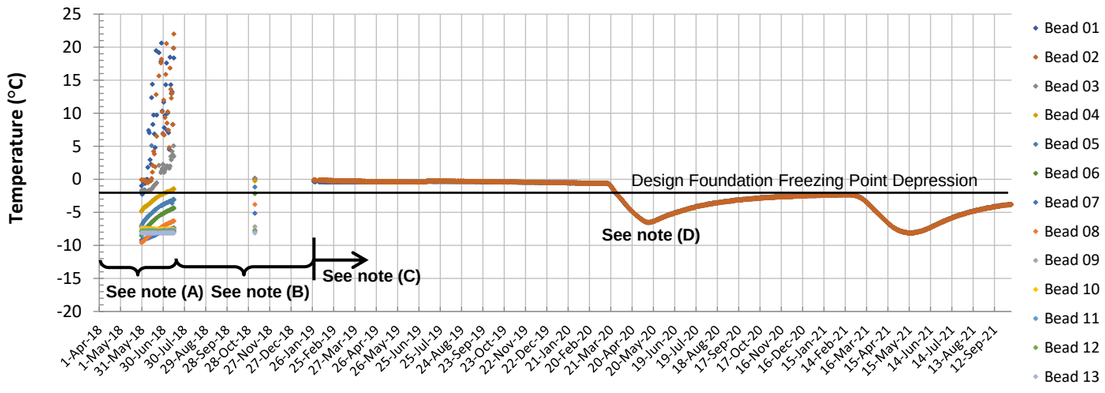
srk consulting	AGNICO EAGLE	2021 AGI – South Dam
		Station 3+65 Ground Temperature Cable Readings by Location
Job No: 1CT022.077 Filename: 1_App_A_SD_GTC.pptx	DORIS TIA	Date: Nov. 2021 / Approved: PDL / Figure: **A.30**



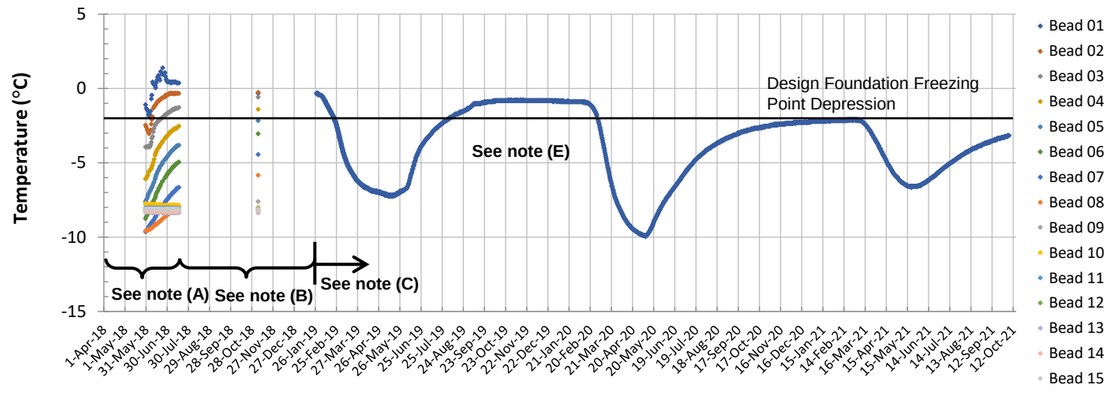
Legend:

- GTC Status: Cable irreparably damaged
- GTC Status: Bead damaged or data missing

SD-VTS-US1



SD-VTS-US2

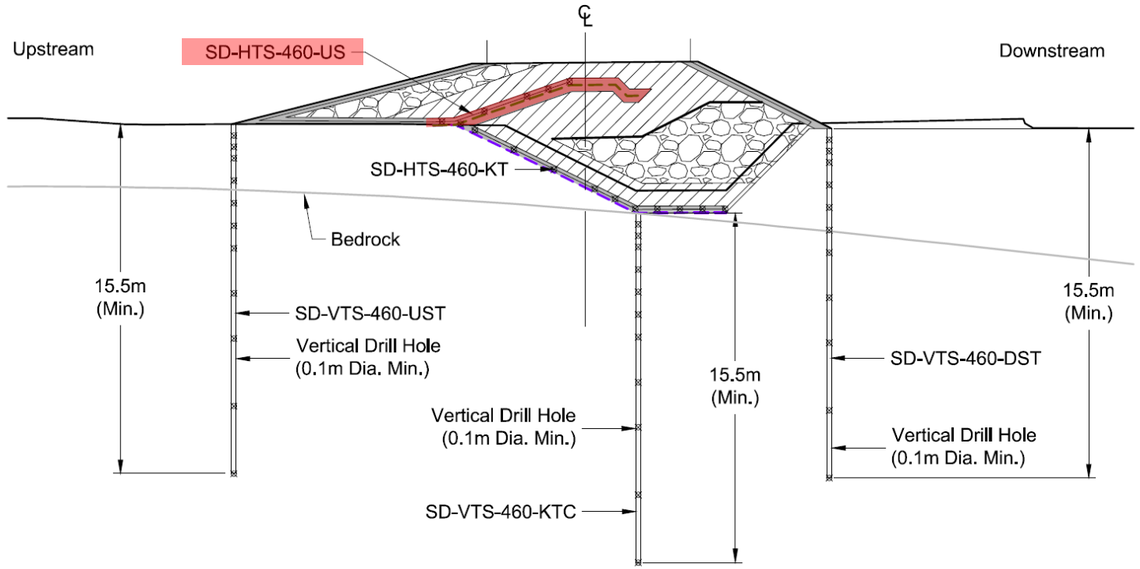


Notes:

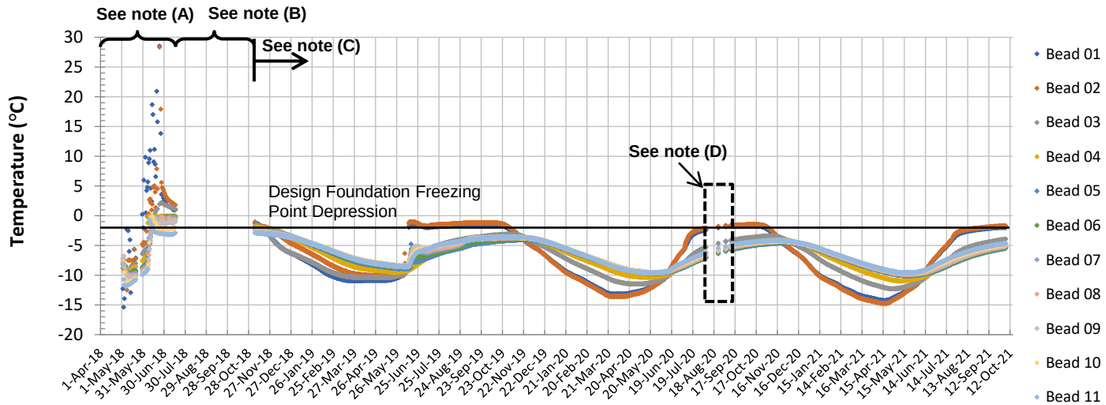
- Bead numbers increase from upstream to downstream (horizontal) and top to bottom (vertical)
- **(A)** Measurements collected between April and July 2018 were taken during construction
- **(B)** No measurements were collected between August 2018 to late January 2019 as the GTC's were extended and repaired, and the data loggers were set up on site. One set of manual spot measurements were collected in November 2018 to check interim dam performance
- **(C)** From the end of January 2019 onwards, data loggers were installed to provide higher resolution and more frequent data transmissions
- **(D)** Only top two beads are working (Bead 01 and Bead 02) for SD-VTS-US1
- **(E)** Only top bead working (Bead 01) for SD-VTS-US2

srk consulting	AGNICO EAGLE	2021 AGI – South Dam
Job No: 1CT022.077 Filename: 1_App_A_SD_GTC.pptx	DORIS TIA	**Station 3+65** **Vertical Temperature Cable Temperature Vs. Time**
		Date: Nov. 2021 / Approved: PDL / Figure: **A.31**

Legend:
- GTC Status: Cable irreparably damaged
- GTC Status: Bead damaged or data missing



SD-HTS-460-KT



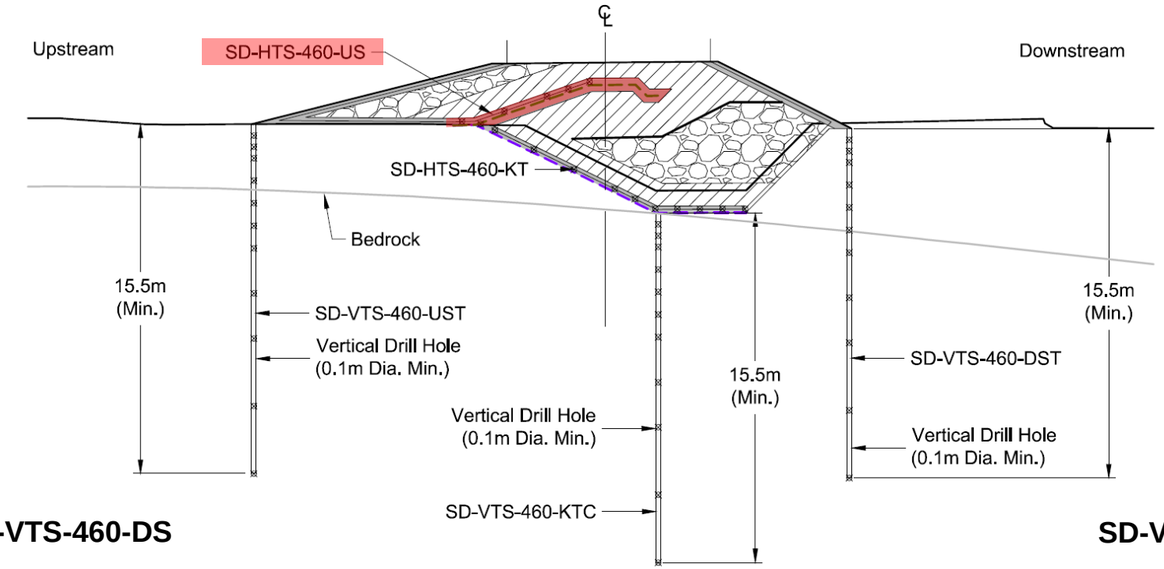
SD-HTS-460-US

Notes:
- Bead numbers increase from upstream to downstream (horizontal) and top to bottom (vertical)
- **(A)** Measurements collected between April and July 2018 were taken during construction
- **(B)** No measurements were collected between August 2018 to November 2018 as the GTC's were extended and repaired, and the data loggers were set up on site.
- **(C)** From November 2018 onwards, data loggers were installed to provide higher resolution and more frequent data transmissions
- **(D)** Data collection gaps between August 7, 2020 and September 11, 2020 for SD-HTS-460-KT

srk consulting	AGNICO EAGLE	2021 AGI – South Dam
Job No: 1CT022.077 Filename: 1_App_A_SD_GTC.pptx	DORIS TIA	**Station 4+60** **Horizontal Temperature Cable Temperature Vs. Time**
		Date: Nov. 2021 / Approved: PDL / Figure: **A.32**

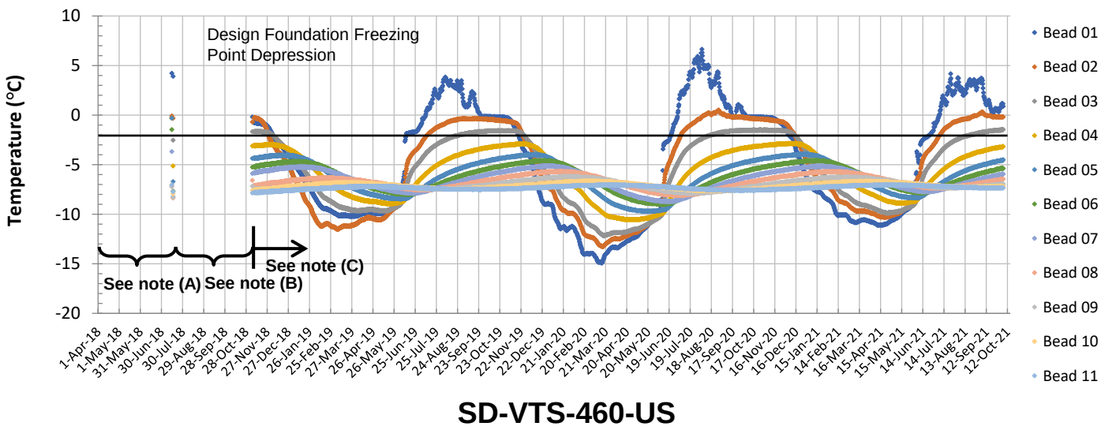
Legend:

- GTC Status: Cable irreparably damaged
- GTC Status: Bead damaged or data missing

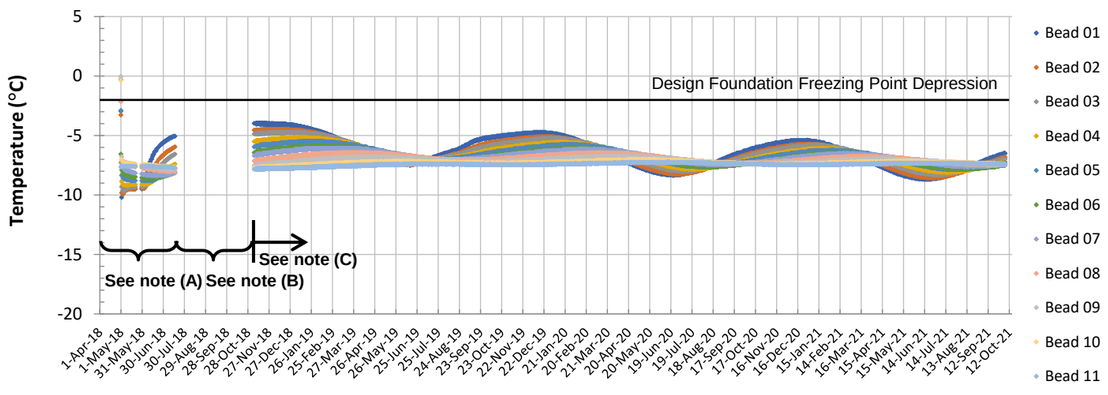


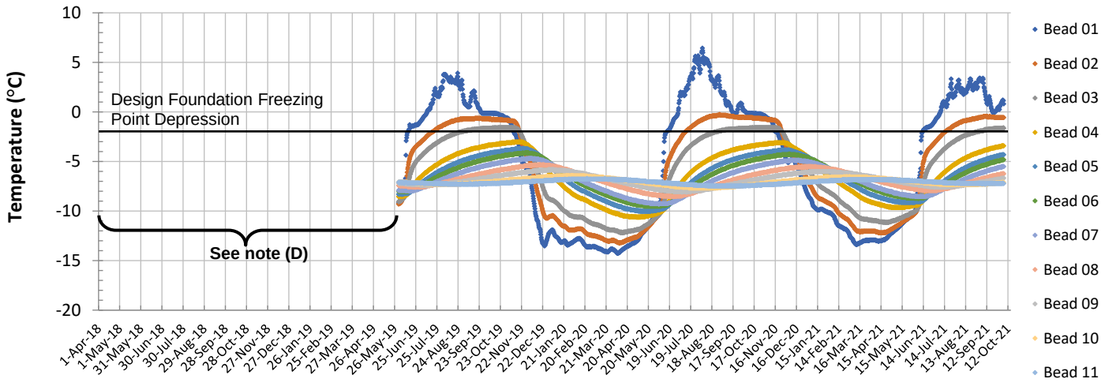
SD-VTS-460-DS

SD-VTS-460-KT



SD-VTS-460-US

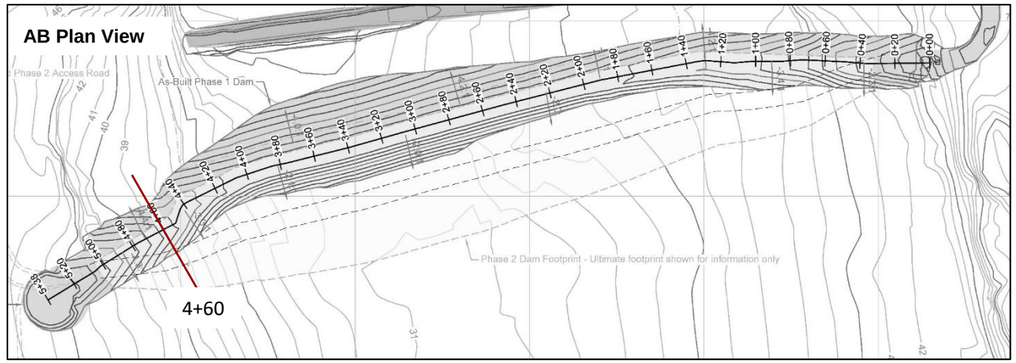


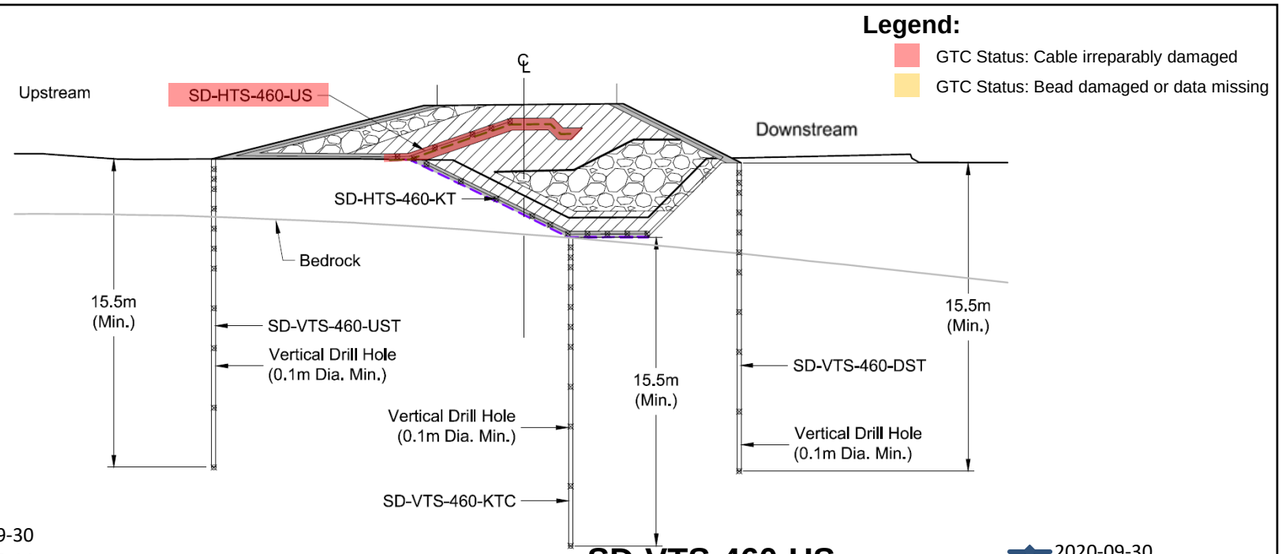


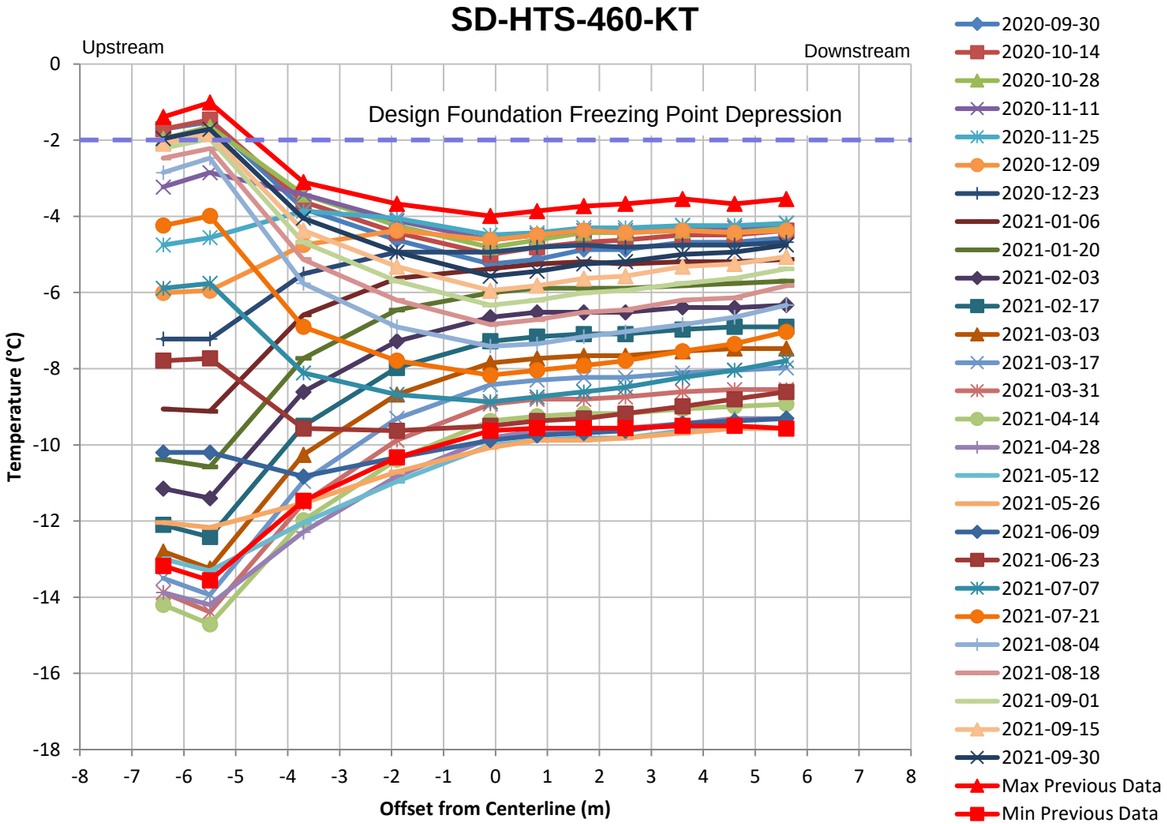
Notes:

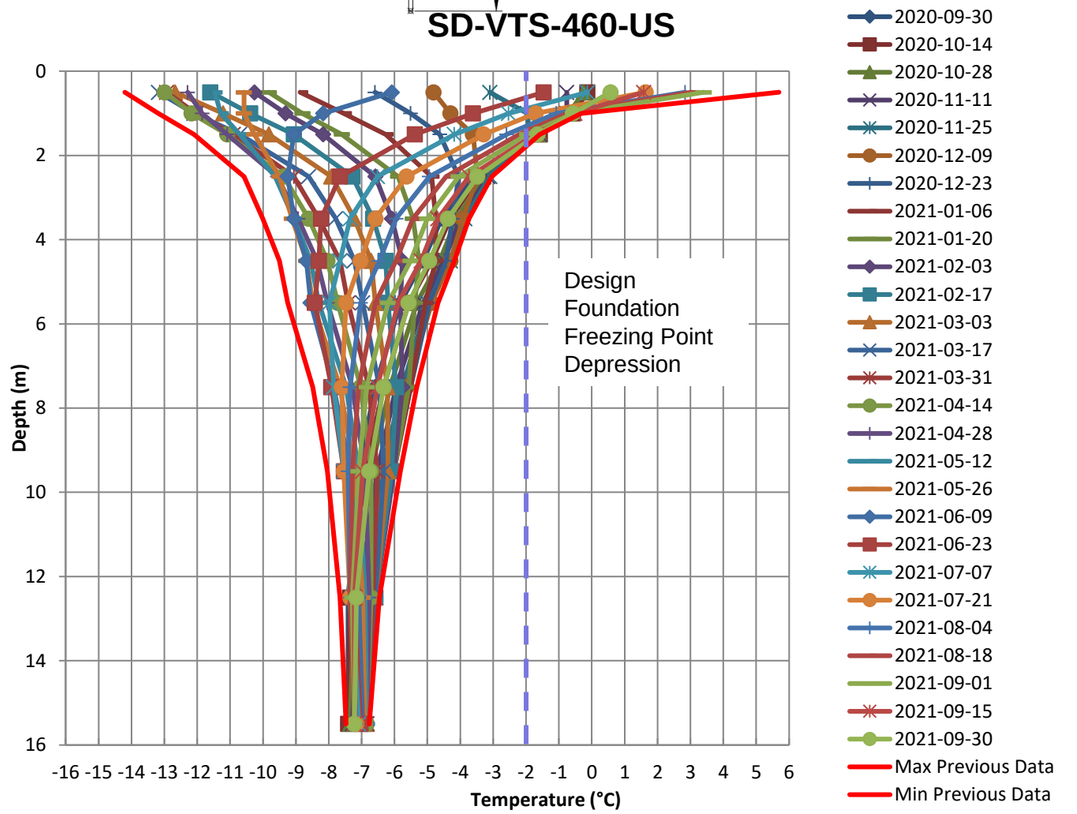
- Bead numbers increase from upstream to downstream (horizontal) and top to bottom (vertical)
- **(A)** Measurements collected between April and July 2018 were taken during construction
- **(B)** No measurements were collected between August 2018 to November 2018 as the GTC's were extended and repaired, and the data loggers were set up on site.
- **(C)** From November 2018 onwards, data loggers were installed to provide higher resolution and more frequent data transmissions
- **(D)** SD-VTS-460-US cable was damaged after construction but repaired, started transmitting late August 2019.

srk consulting	AGNICO EAGLE	2021 AGI – South Dam
		Station 4+60 Vertical Temperature Cable Temperature Vs. Time
Job No: 1CT022.077 Filename: 1_App_A_SD_GTC.pptx	DORIS TIA	Date: Nov. 2021 / Approved: PDL / Figure: **A.33**









Note:

- Previous Data was recorded between November 2018 and September 2020
- Bead offset from centerline for SD-HTS-460-US is approximate.

srk consulting

AGNICO EAGLE

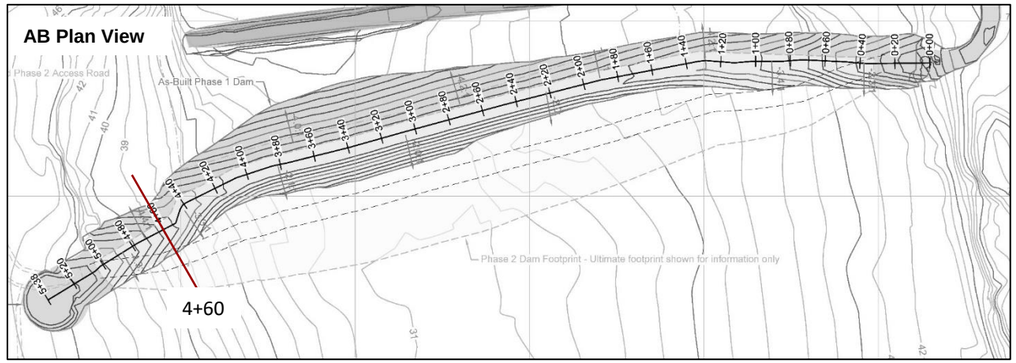
2021 AGI – South Dam

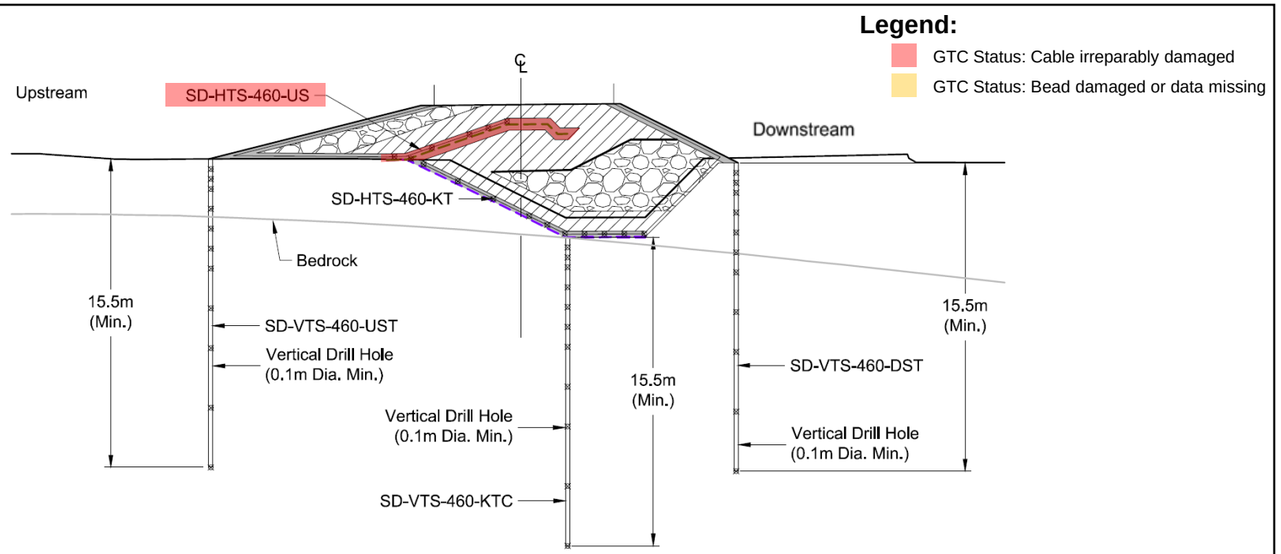
Station 4+60
Ground Temperature Cable Readings by Location

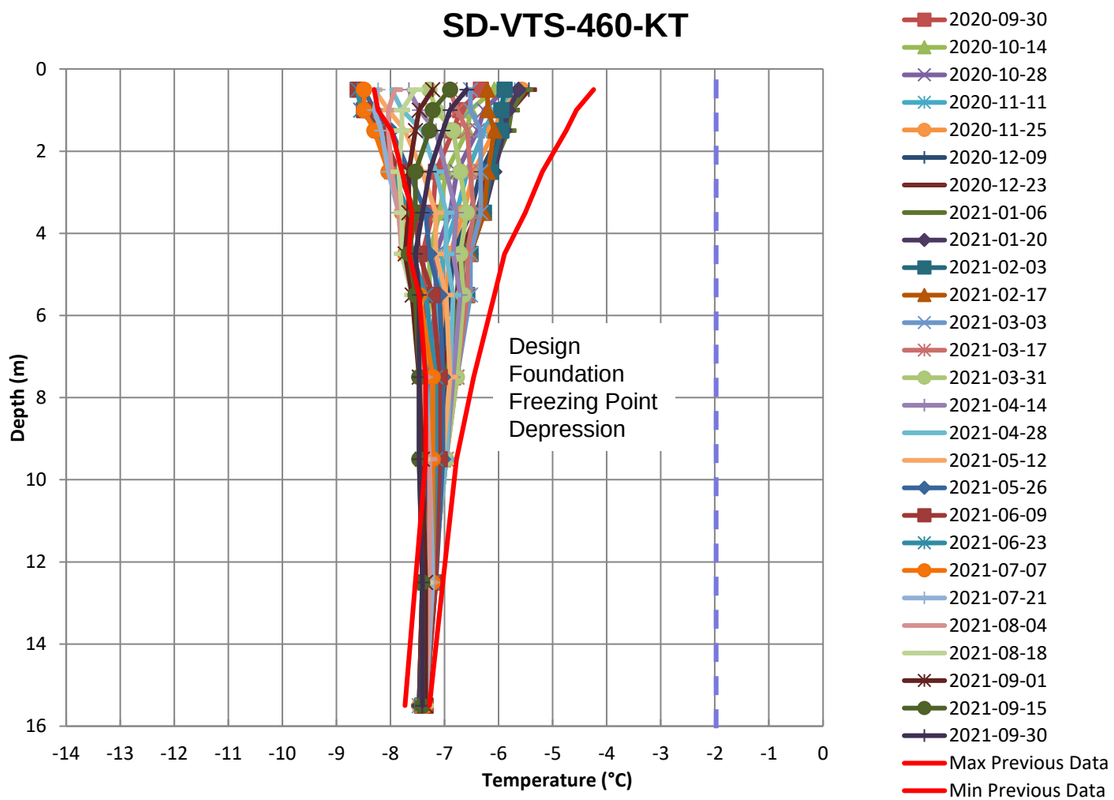
Job No: 1CT022.077
Filename: 1_App_A_SD_GTC.pptx

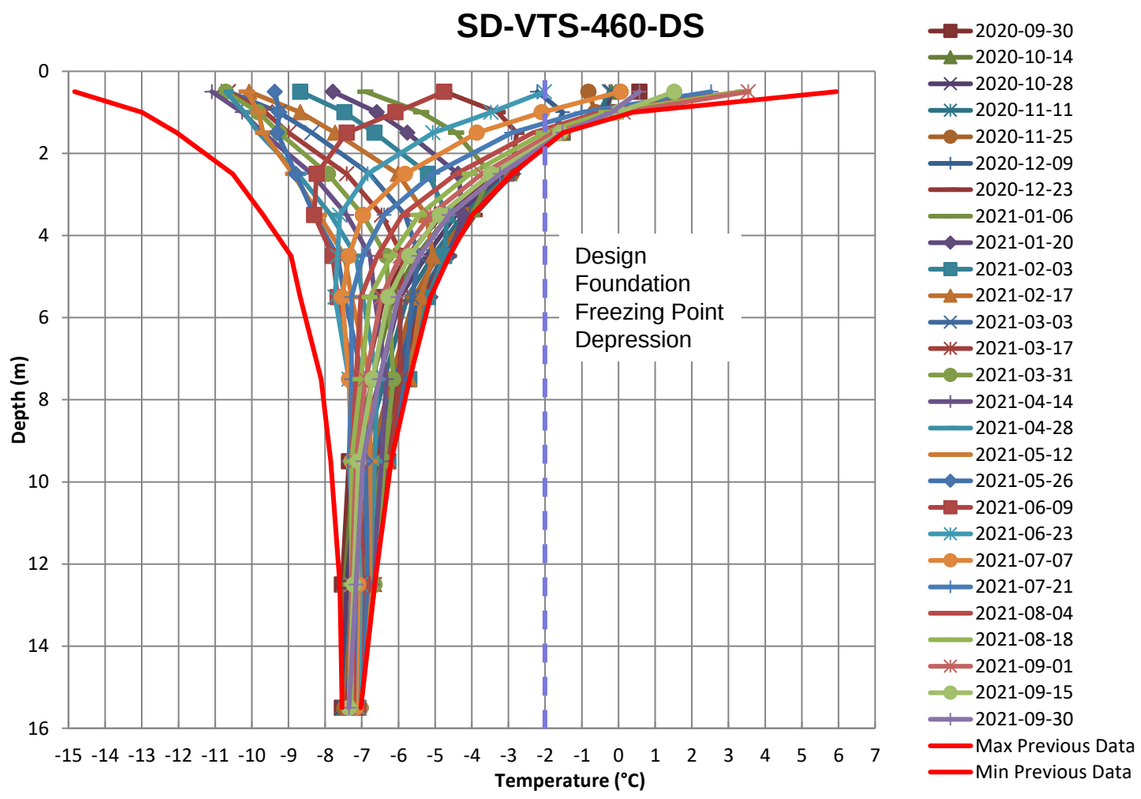
DORIS TIA

Date: Nov. 2021 | Approved: PDL | Figure: **A.34**









Note:

- Previous Data was recorded between November 2018 and September 2020

srk consulting

AGNICO EAGLE

2021 AGI – South Dam

Station 4+60
Ground Temperature Cable Readings by Location

Job No: 1CT022.077
Filename: 1_App_A_SD_GTC.pptx

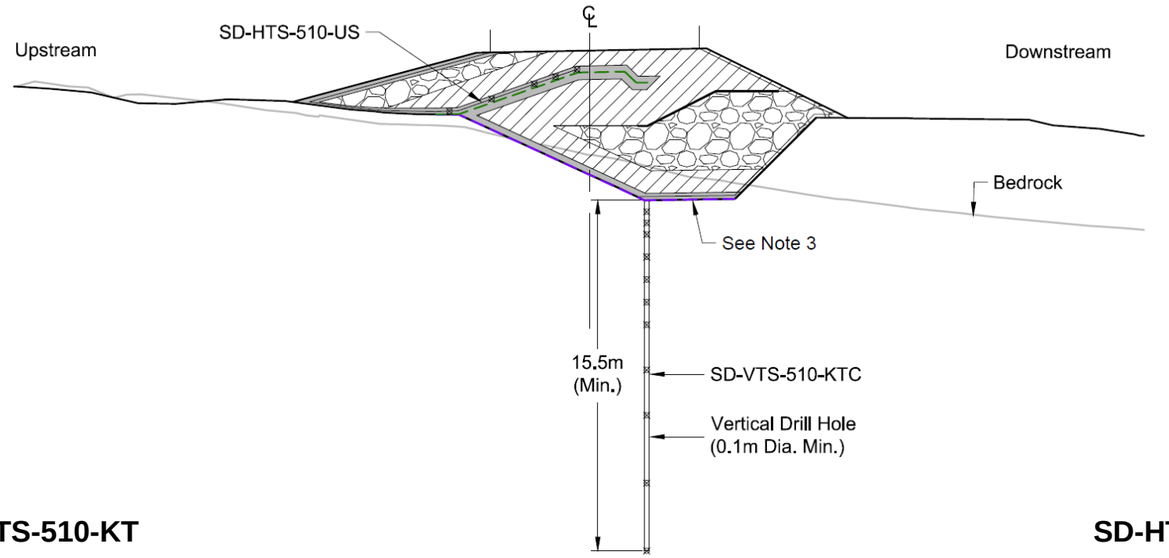
DORIS TIA

Date: Nov. 2021
Approved: PDL
Figure: **A.35**

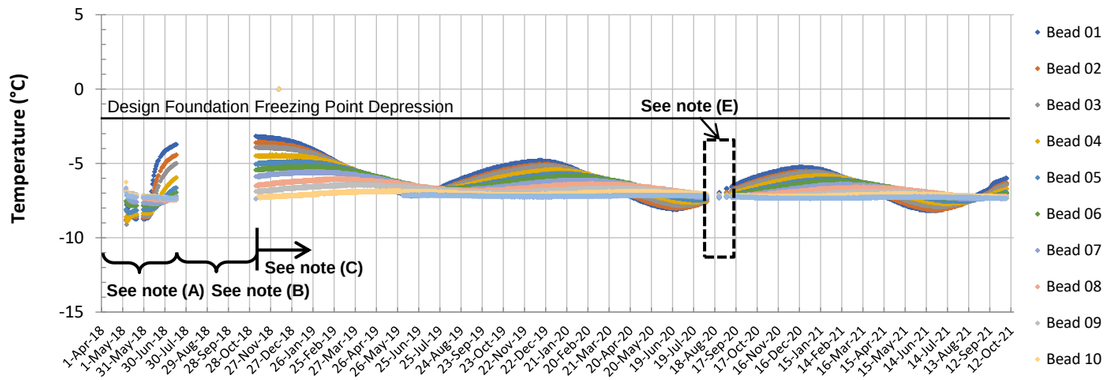
Legend:

GTC Status: Cable irreparably damaged

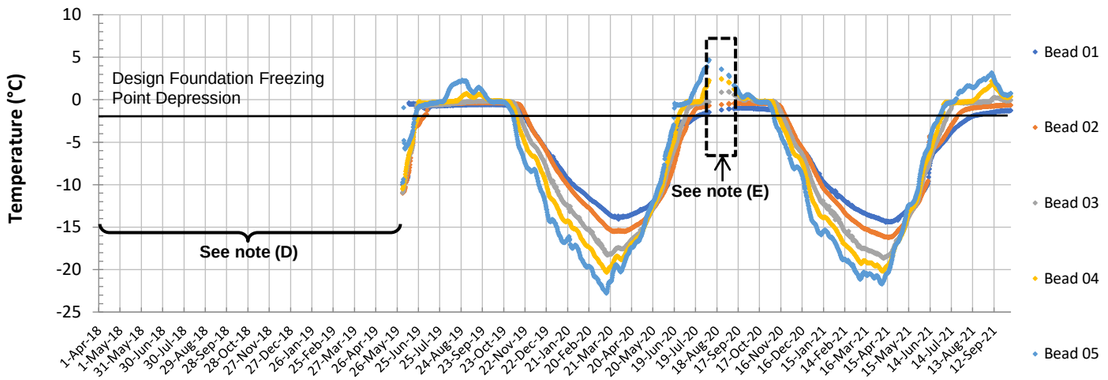
GTC Status: Bead damaged or data missing



SD-VTS-510-KT



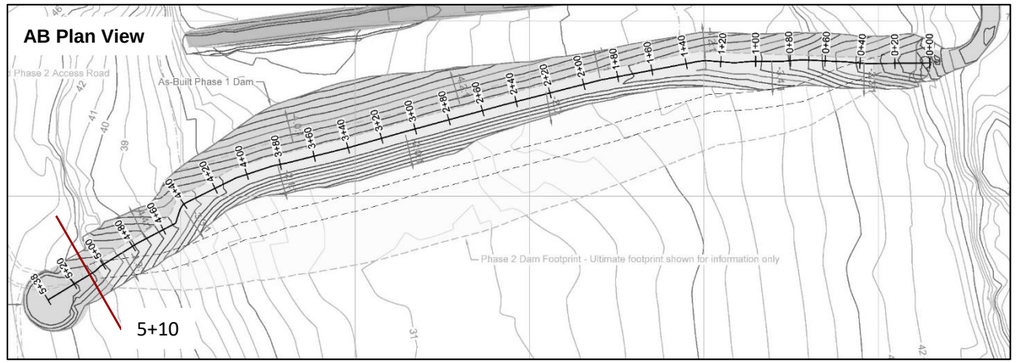
SD-HTS-510-US

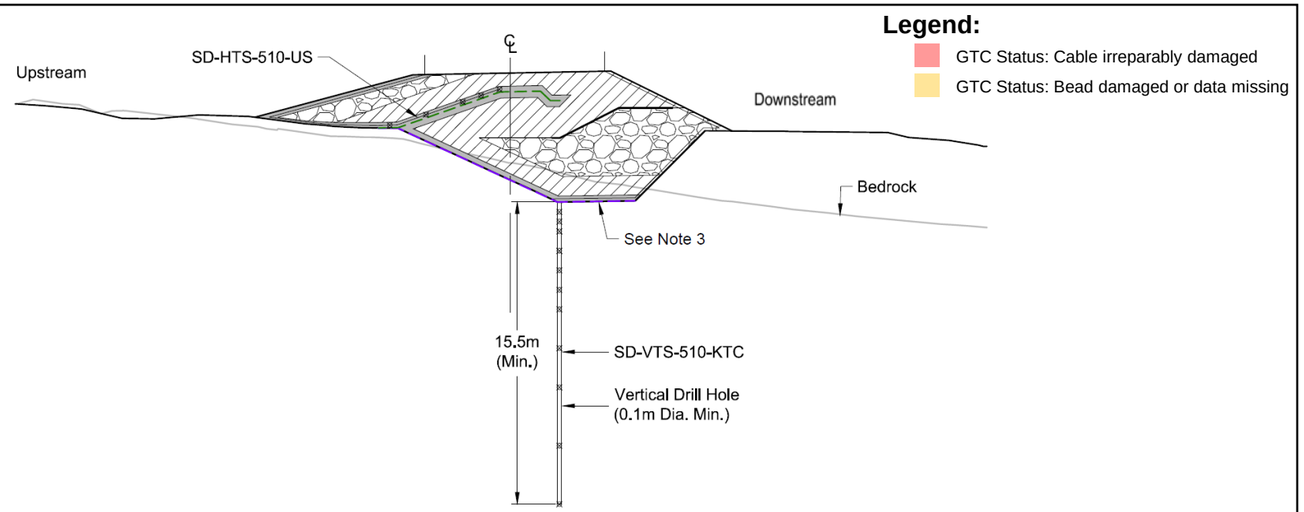


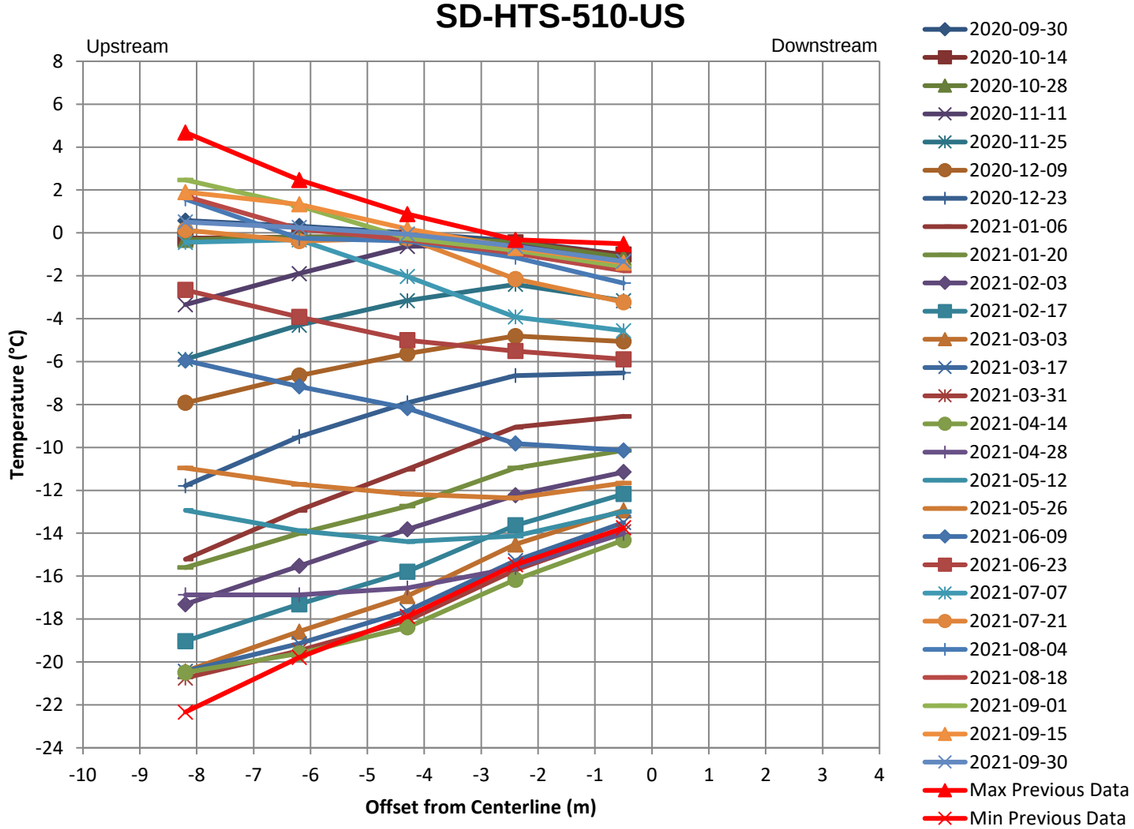
Notes:

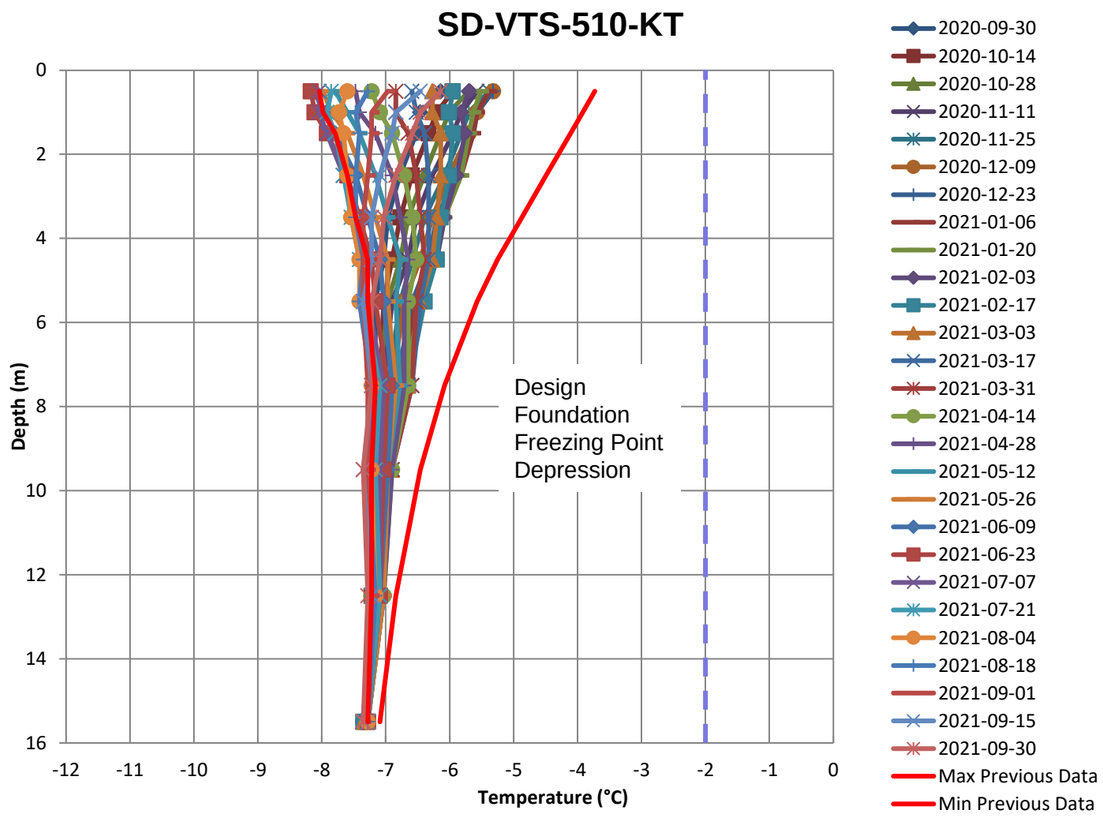
- Bead numbers increase from upstream to downstream (horizontal) and top to bottom (vertical)
- **(A)** Measurements collected between April and July 2018 were taken during construction
- **(B)** No measurements were collected between August 2018 to November 2018 as the GTC's were extended and repaired, and the data loggers were set up on site.
- **(C)** From November 2018 onwards, data loggers were installed to provide higher resolution and more frequent data transmissions
- **(D)** SD-HTS-510-US cable was damaged after construction but repaired, started transmitting in May 2019
- **(E)** Data collection gaps between August 7, 2020 and September 11, 2020

srk consulting	AGNICO EAGLE	2021 AGI – South Dam
Job No: 1CT022.077 Filename: 1_App_A_SD_GTC.pptx	DORIS TIA	**Station 5+10** **Ground Temperature Cable** **Temperature Vs. Time**
		Date: Nov. 2021 / Approved: PDL / Figure: **A.36**









Note:

- Previous Data was recorded between November 2018 and September 2020

srk consulting

Job No: 1CT022.077
Filename: 1_App_A_SD_GTC.pptx

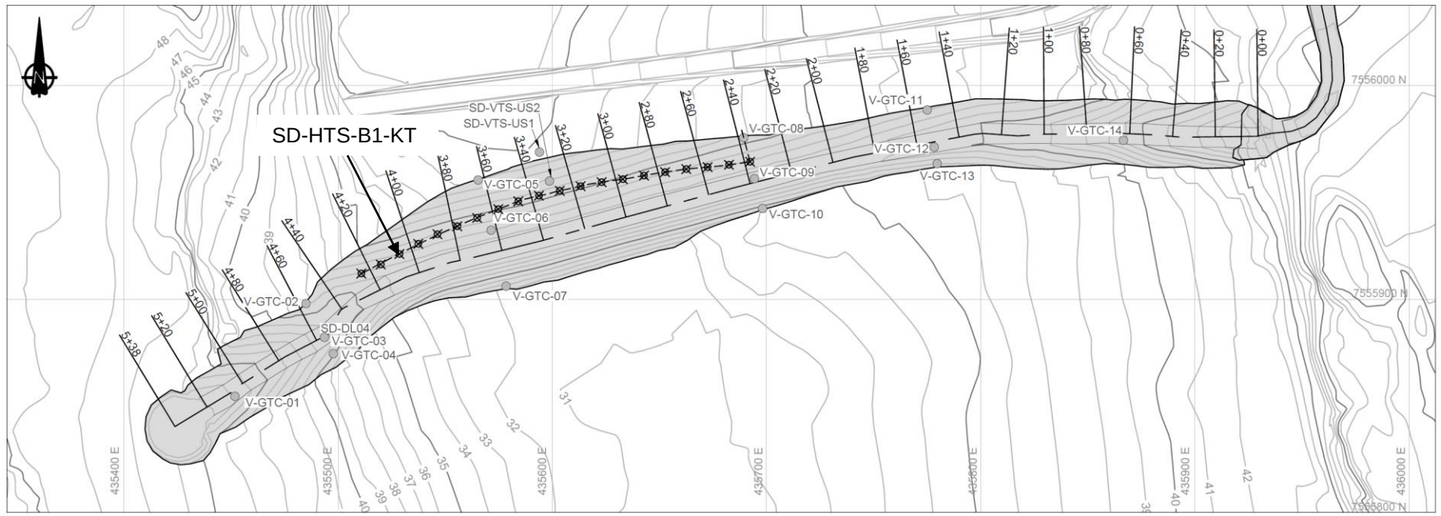
AGNICO EAGLE

DORIS TIA

2021 AGI – South Dam

Station 5+10
Ground Temperature Cable Readings by Location

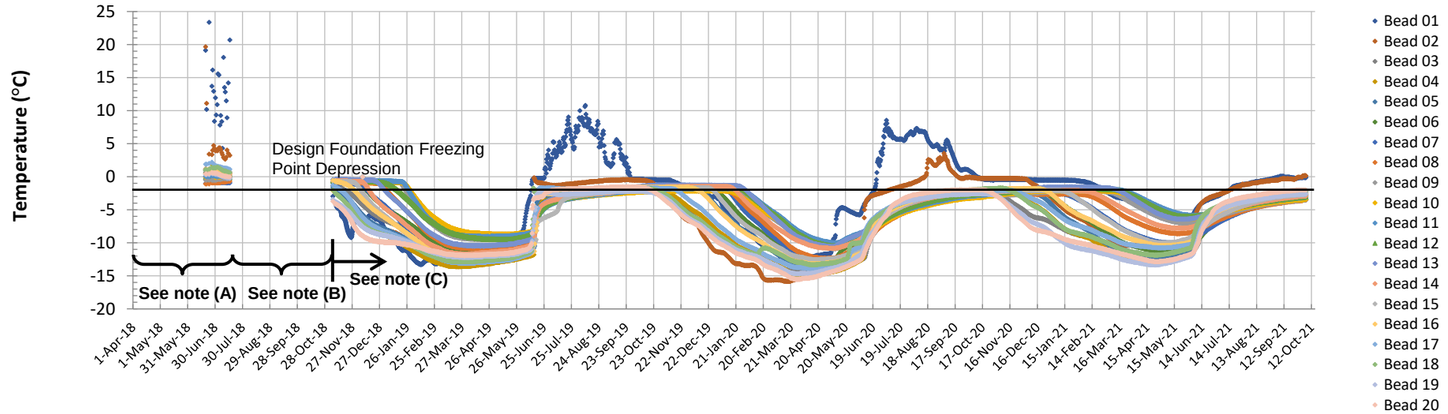
Date: Nov. 2021
Approved: PDL
Figure: **A.37**



Legend:

- GTC Status: Cable irreparably damaged
- GTC Status: Bead damaged or data missing

SD-HTS-B1-KT



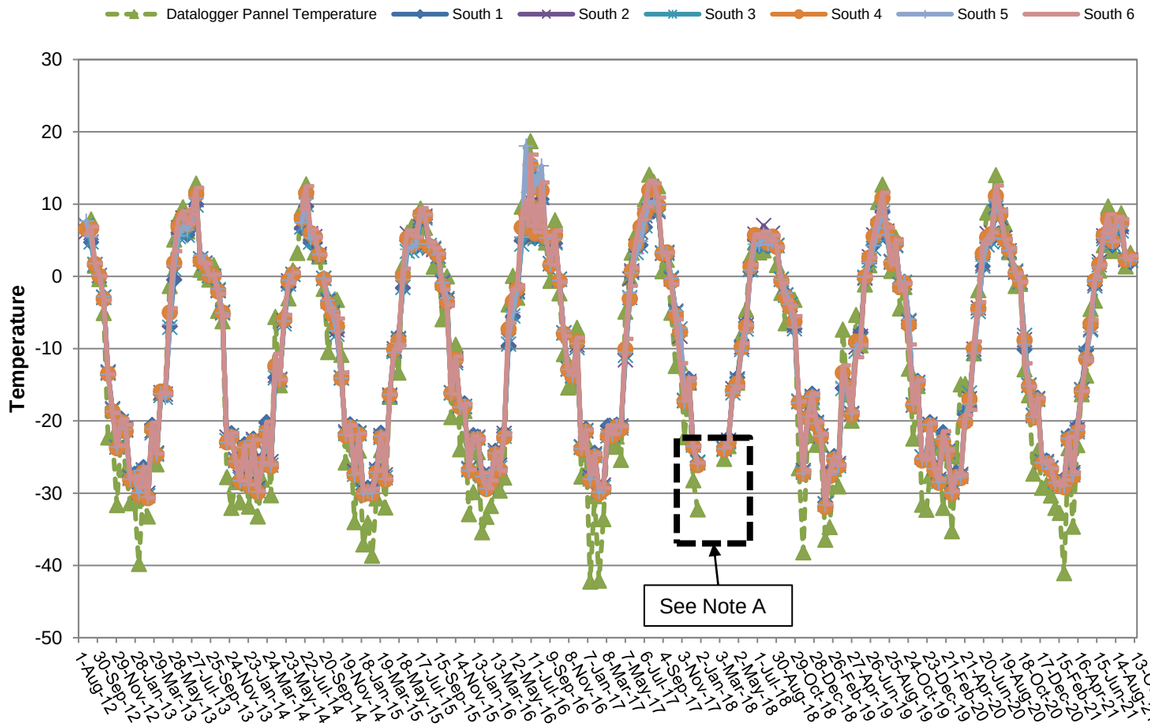
Notes:

- Bead numbers increase from East to West
- SD-HTS-B1-KT is located along upstream crest of key trench (not shown in drawing)
- **(A)** Measurements collected between April and July 2018 were taken during construction
- **(B)** No measurements were collected between August 2018 to November 2018 as the GTC's were extended and repaired, and the data loggers were set up on site.
- **(C)** From November 2018 onwards, data loggers were installed to provide higher resolution and more frequent data transmissions

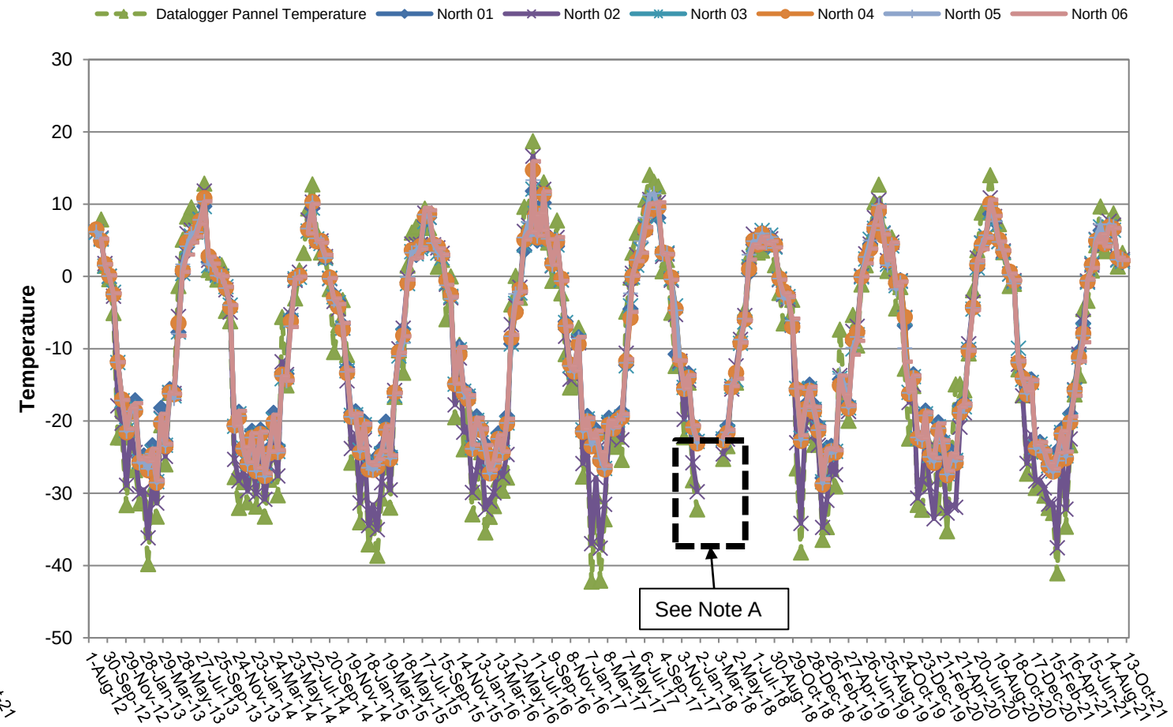
srk consulting	AGNICO EAGLE	2021 AGI – South Dam
		Key Trench Horizontal Temperature Cable Temperature Vs. Time
Job No: 1CT022.077 Filename: 1_App_A_SD_GTC.pptx	**DORIS TIA**	Date: Nov. 2021 / Approved: PDL / Figure: **A.38**

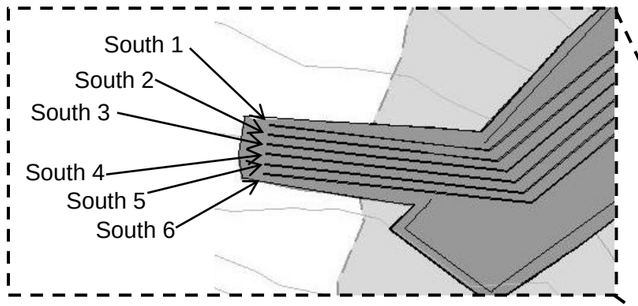
Appendix B – Thermosyphons

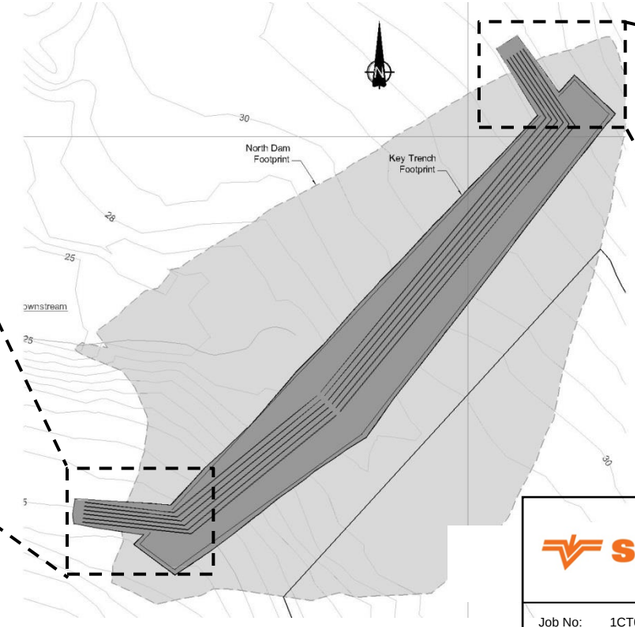
South Thermosyphon Monitoring

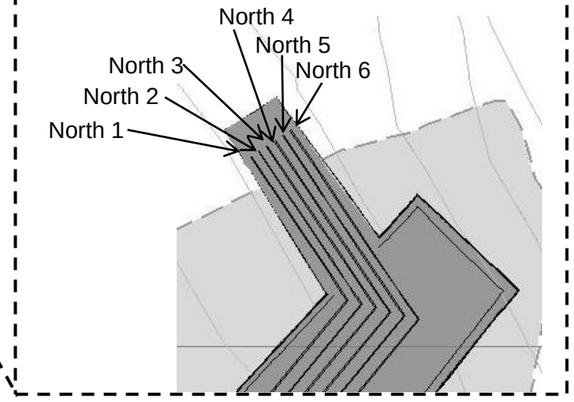


North Thermosyphon Monitoring







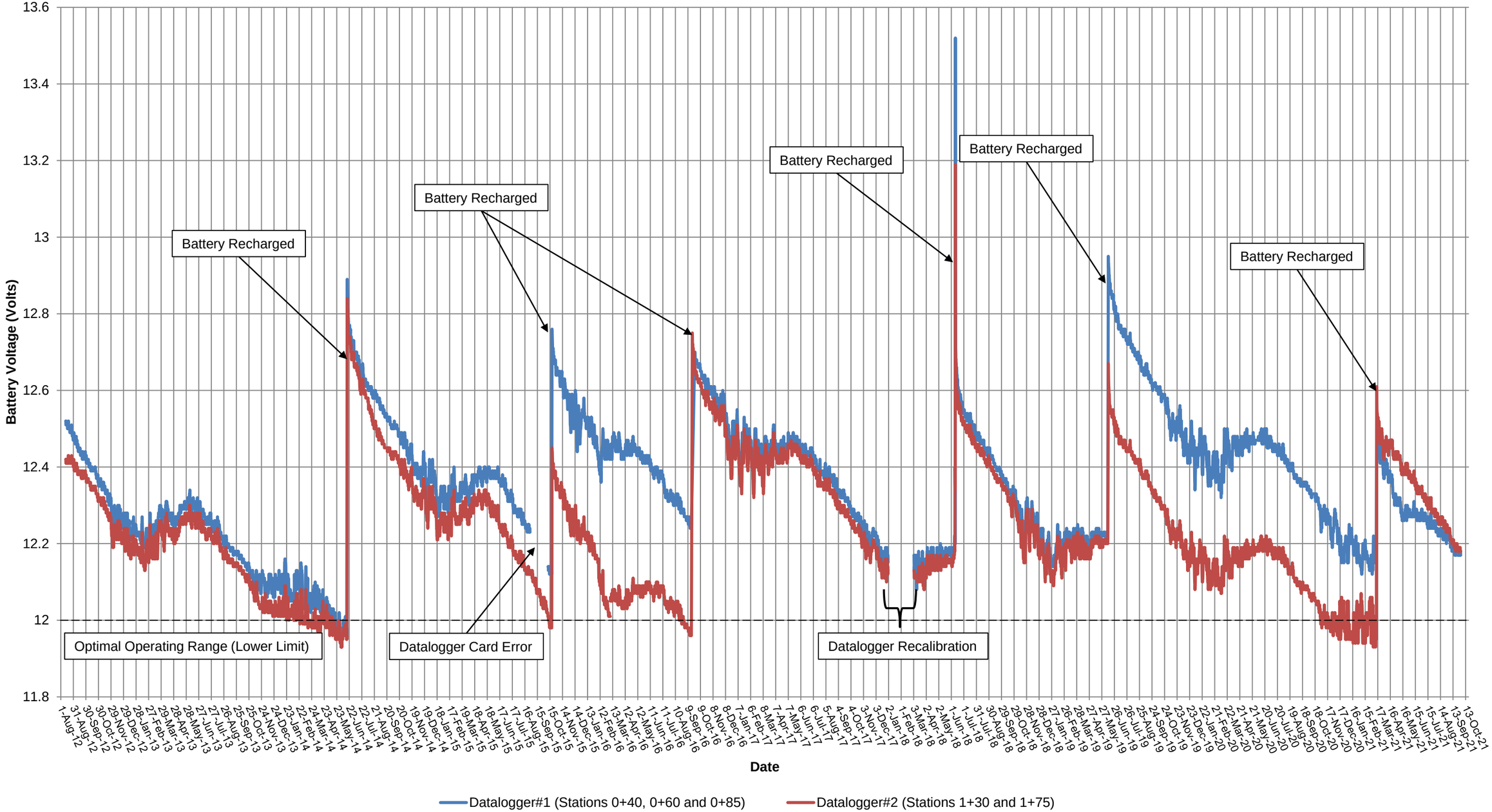


Notes:

- A) Datalogger was disconnected (Jan 1, 2018 – Mar 3, 2018) for recalibration

srk consulting	AGNICO EAGLE	2021 AGI – North Dam
		North Dam Thermosyphon Monitoring
Job No: 1CT022.077 Filename: App_E_Thermosyphons.pptx	**DORIS TIA**	Date: Oct. 2021 · Approved: PDL · Figure: **B.1**

Appendix C – Datalogger Battery Levels



Notes:

1. Operating voltage range is 9.6 to 16 V
2. Optimal operating voltage is 12 to 14 V
3. Data logger will shut down if voltage drops below 9.6 V

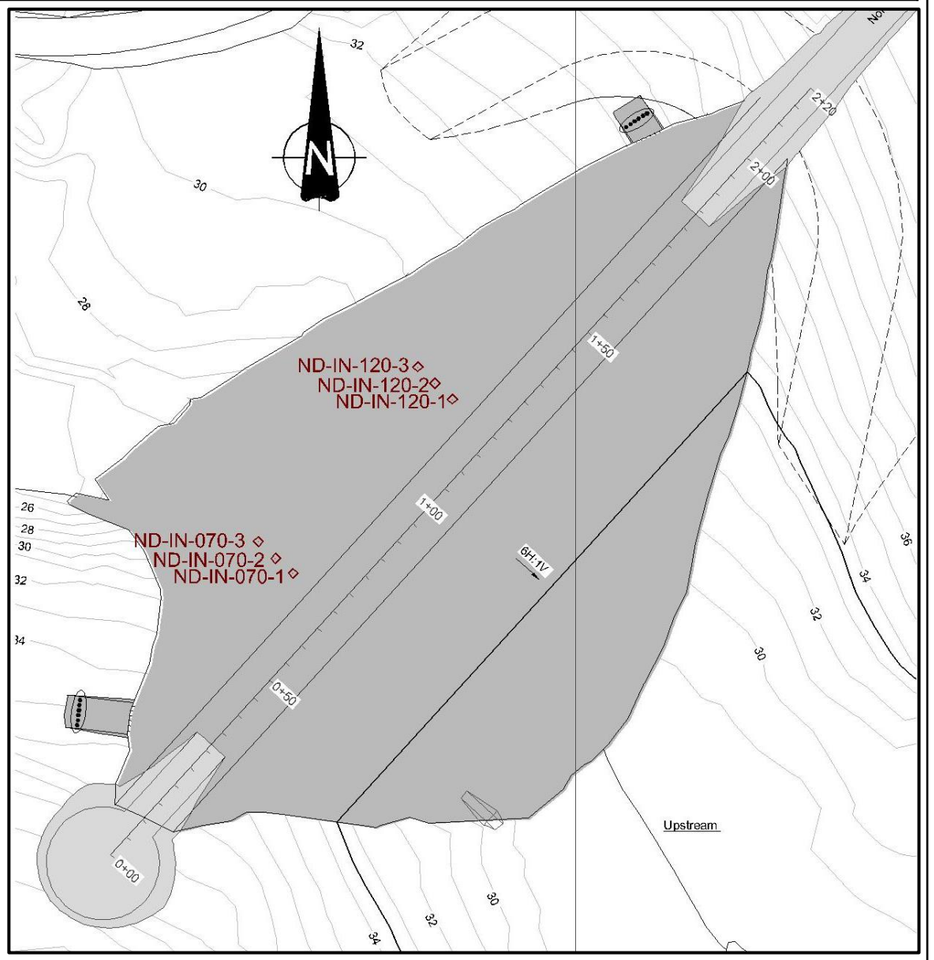
srk consulting	AGNICO EAGLE	2021 AGI – North Dam
		North Dam Datalogger Battery Voltage with Time
Job No: 1CT022.077 Filename: App_C_Batteries.pptx	**DORIS TIA**	Date: Oct. 2021 / Approved: PDL / Figure: **C.1**

Appendix D – Inclinometers

	Inclinometers Measured						
Date	**070-1**	**070-2**	**070-3**	**120-1**	**120-2**	**120-3**	**Comments**
20-Oct-2020	x	x	x	x	x	x	070-2 multiple duplicate readings, excluded from graph
19-Nov-2020	x	x	x	x	x	x	
23-Dec-2020	x	x	x	x	x	x	Survey performed over two days. 070-3 and 120-2 resurveyed on Dec 24, due to poor quality survey data
20-Jan-2021	x	x	x	x	x	x	
20-Feb-2021	x	x	x	x	x	x	
9-Jun-2021	x	x	x	x	x	x	070-1 and 120-3 multiple duplicate readings, excluded from graph
11-Jul-2021	x	x	x	x	x	x	070-1 multiple duplicate readings, excluded from graph
14-Aug-2021	x	x	x	x	x	x	070-1 multiple duplicate readings, excluded from graph
4-Sep-2021	x	x	x	x	x	x	070-2 readings for the top 1.5 m indicate checksum values between -100 and -50. The data is included in the graphs.
4-Oct-2021	x	x	x	x	x	x	Survey performed over three days (Oct 2 to Oct 4). 070-2 resurveyed on Oct 4, due to poor quality survey data

Notes:

1. Green marks good quality survey data
2. Orange marks poor quality survey data
3. No inclinometer data was collected during March to May, 2021 as the device was sent to DGSI for service and recalibration.



srk consulting

AGNICO EAGLE

2021 AGI – North Dam

Inclinometer Data Summary

Job No: 1CT022.077

Filename: App_D_Inclinometers.pptx

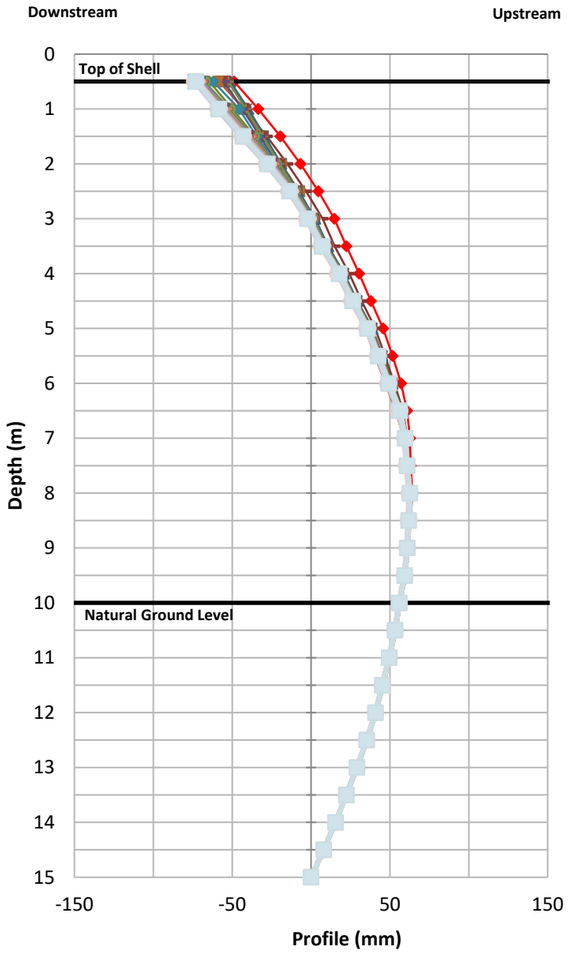
DORIS TIA

Date: Oct. 2021

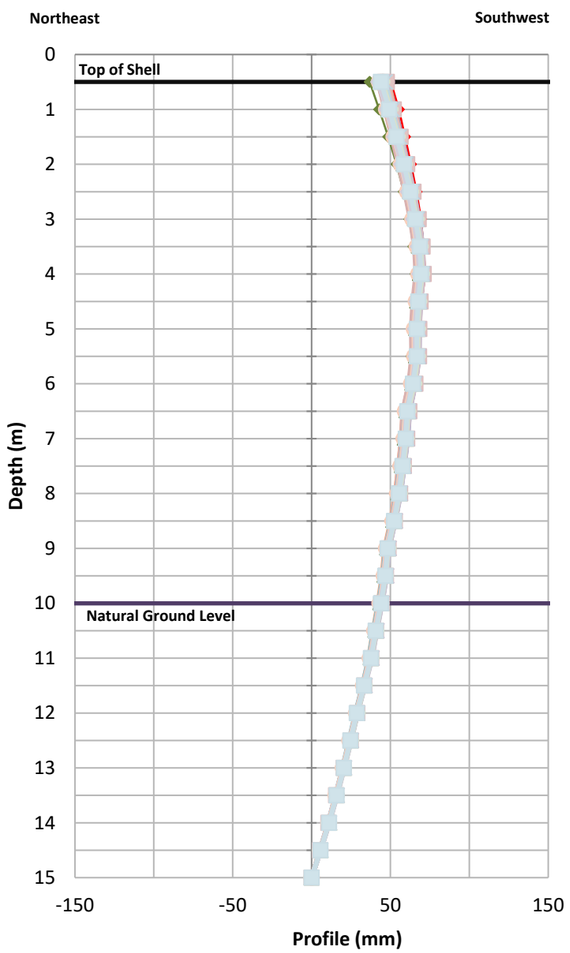
Approved: PDL

Figure: **D.1**

Profile Perpendicular to Centerline

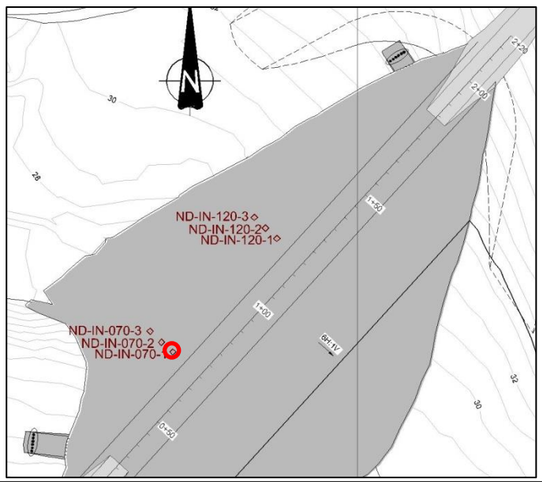


Profile Parallel to Centerline



LEGEND:

- Initial Reading (9/8/2012)
- 2013-07-26
- 2013-10-01
- 2014-05-18
- 2014-07-12
- 2014-08-08
- 2014-09-01
- 2014-10-01
- 2015-02-02
- 2015-03-21
- 2015-04-08
- 2015-04-16
- 2015-05-18
- 2015-06-25
- 2015-07-09
- 2015-08-02
- 2015-09-04
- 2015-10-09
- 2015-11-25
- 2015-12-30
- 2016-02-08
- 2016-03-07
- 2016-04-11
- 2016-07-02
- 2016-08-14
- 2016-09-25
- 2016-11-26
- 2016-12-24
- 2017-01-26
- 2017-02-23
- 2017-03-23
- 2017-04-15
- 2017-05-20
- 2017-06-25
- 2017-07-16
- 2017-08-09
- 2017-09-14
- 2017-10-14
- 2017-11-16
- 2017-12-16
- 2018-01-16
- 2018-02-16
- 2018-03-21
- 2018-04-20
- 2018-05-19
- 2018-06-08
- 2018-07-07
- 2018-08-03
- 2018-09-29
- 2018-10-21
- 2018-11-10
- 2019-01-01
- 2019-01-25
- 2019-02-14
- 2019-04-14
- 2019-05-10
- 2019-06-11
- 2019-07-27
- 2019-08-25
- 2019-09-28
- 2019-10-26
- 2019-11-23
- 2020-01-16
- 2020-02-18
- 2020-03-10
- 2020-06-06
- 2020-07-12
- 2020-08-08
- 2020-09-11
- 2020-10-20
- 2020-11-19
- 2020-12-23
- 2021-01-20
- 2021-02-20
- 2021-06-09
- 2021-07-11
- 2021-08-14
- 2021-09-04
- 2021-10-02

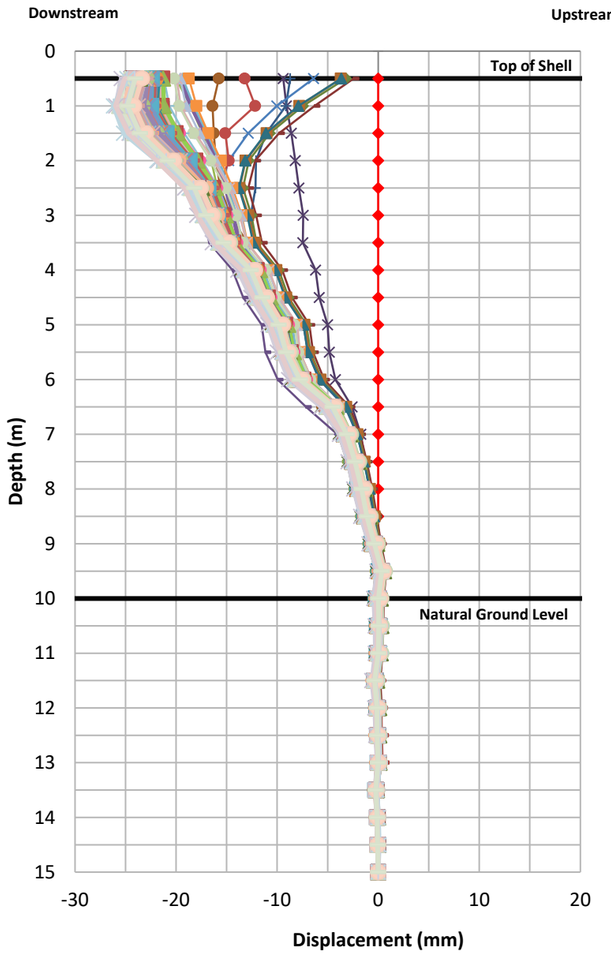


Notes:

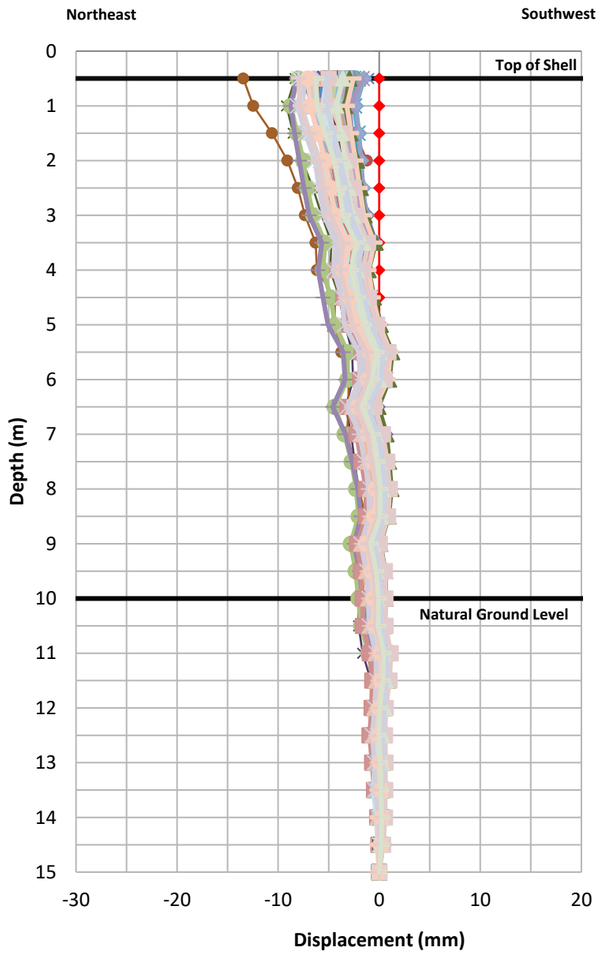
1. Manufacture's accuracy is +/- 0.25 mm per location
2. Survey data excluded from the charts is noted on Figure D.1

srk consulting	AGNICO EAGLE	2021 AGI – North Dam
Job No: 1CT022.077 Filename: App_D_Inclinometers.pptx	DORIS TIA	**Inclinometer 070-1 Profiles**
		Date: Oct. 2021 / Approved: PDL / Figure: **D.2**

Displacement Perpendicular to Centerline

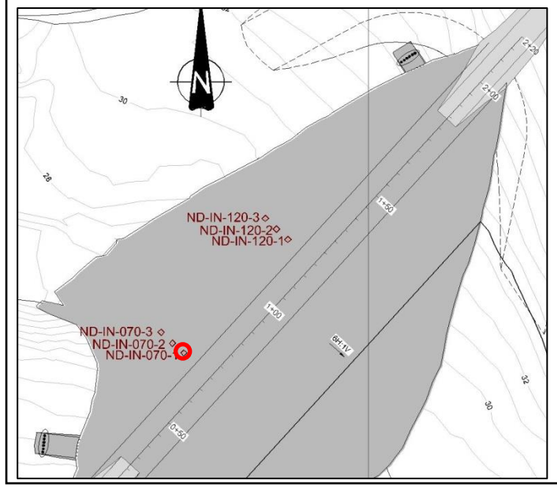


Displacement Parallel to Centerline



LEGEND:

- Initial Reading (9/8/2012)
- 2013-07-26
- 2013-10-01
- 2014-05-18
- 2014-07-12
- 2014-08-08
- 2014-09-01
- 2014-10-01
- 2015-02-02
- 2015-03-21
- 2015-04-08
- 2015-04-16
- 2015-05-18
- 2015-06-25
- 2015-07-09
- 2015-08-02
- 2015-09-04
- 2015-10-09
- 2015-11-25
- 2015-12-30
- 2016-02-08
- 2016-03-07
- 2016-04-11
- 2016-07-02
- 2016-08-14
- 2016-09-25
- 2016-11-26
- 2016-12-24
- 2017-01-26
- 2017-02-23
- 2017-03-23
- 2017-04-15
- 2017-05-20
- 2017-06-25
- 2017-07-16
- 2017-08-09
- 2017-09-14
- 2017-10-14
- 2017-11-16
- 2017-12-16
- 2018-01-16
- 2018-02-16
- 2018-03-21
- 2018-04-20
- 2018-05-19
- 2018-06-08
- 2018-07-07
- 2018-08-03
- 2018-09-29
- 2018-10-21
- 2018-11-10
- 1/1/2019
- 2019-01-25
- 2019-02-14
- 2019-04-14
- 2019-05-10
- 2019-06-11
- 2019-07-27
- 2019-08-25
- 2019-09-28
- 2019-10-26
- 2019-11-23
- 2020-01-16
- 2020-02-18
- 2020-03-10
- 2020-06-06
- 2020-07-12
- 2020-08-08
- 2020-09-11
- 2020-10-20
- 2020-11-19
- 2020-12-23
- 2021-01-20
- 2021-02-20
- 2021-06-09
- 2021-07-11
- 2021-08-14
- 2021-09-04
- 2021-10-02

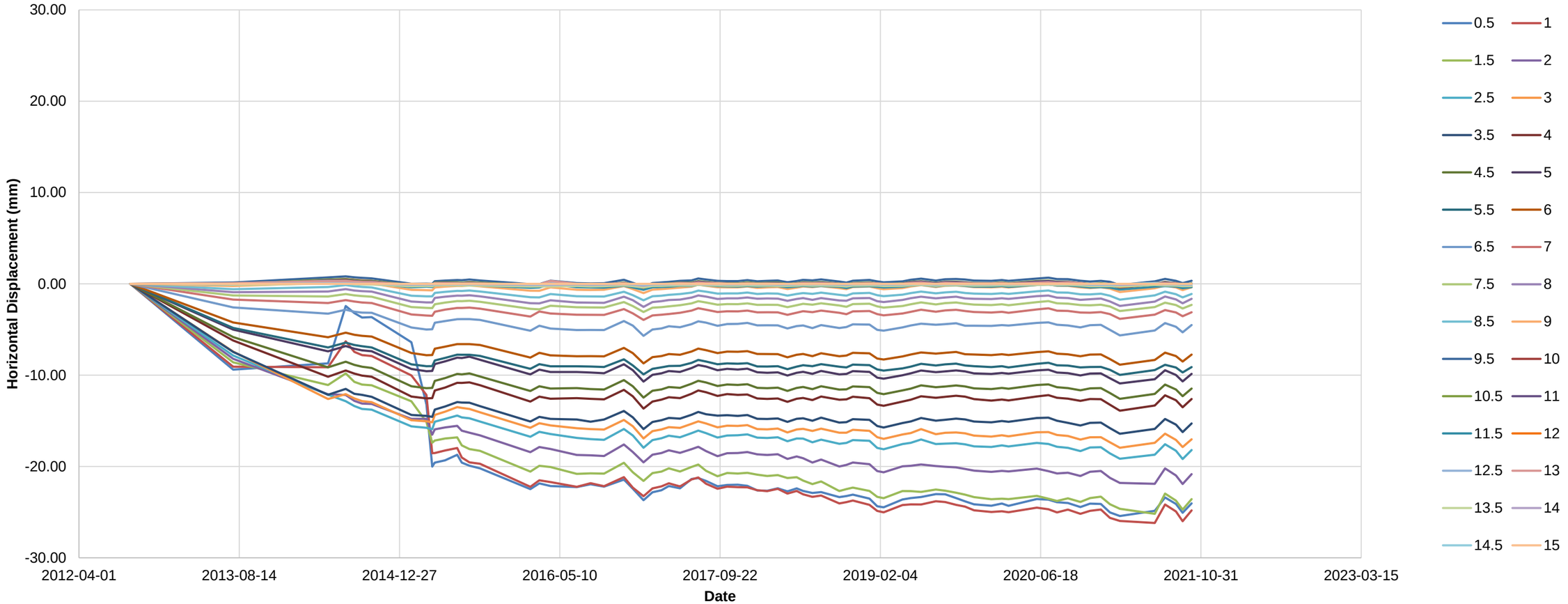


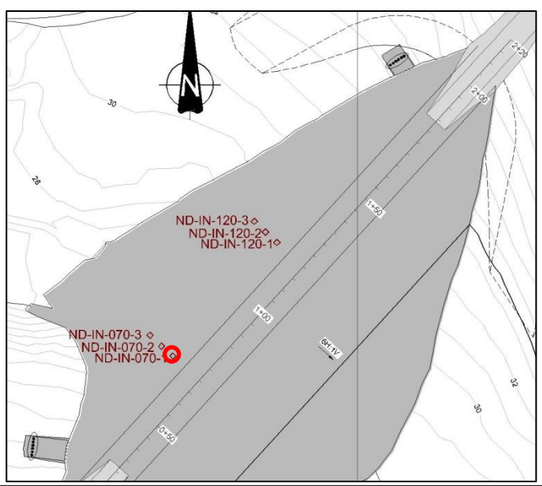
Notes:

1. Manufacture's accuracy is +/- 0.25 mm per location
2. Survey data excluded from the charts is noted on Figure D.1

srk consulting	AGNICO EAGLE	2021 AGI – North Dam
Job No: 1CT022.077 Filename: App_D_Inclinometers.pptx	DORIS TIA	**Inclinometer 070-1 Displacements** Date: Oct. 2021 / Approved: PDL / Figure: **D.3**

Inclinometer 070-1A Timeseries

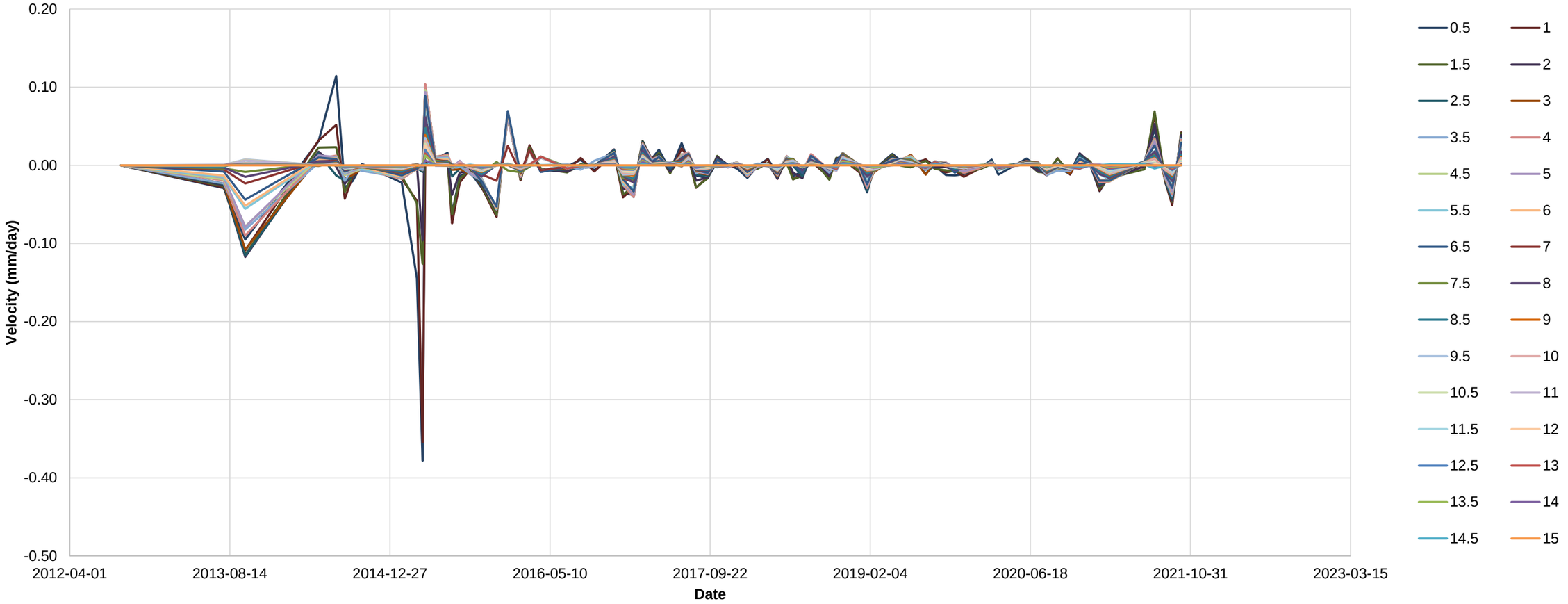


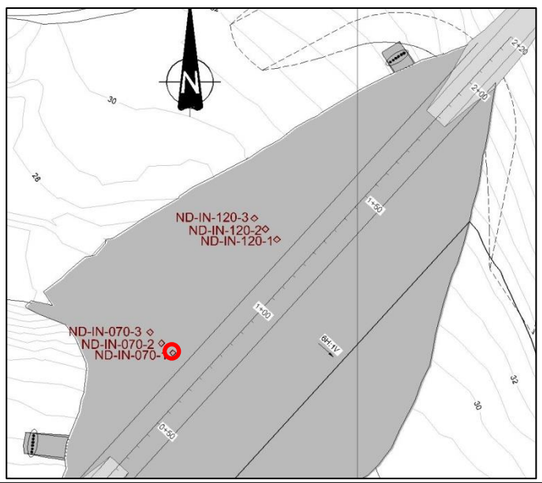


Notes:
1. Manufacture's accuracy is +/- 0.25 mm per location
2. Survey data excluded from the charts is noted on Figure D.1

srk consulting	AGNICO EAGLE	2021 AGI – North Dam
Job No: 1CT022.077 Filename: App_D_Inclinometers.pptx	DORIS TIA	**Inclinometer 070-1A Displacement Time Series** Date: Oct. 2021 | Approved: PDL | Figure: **D.4**

Inclinometer 070-1A Timeseries

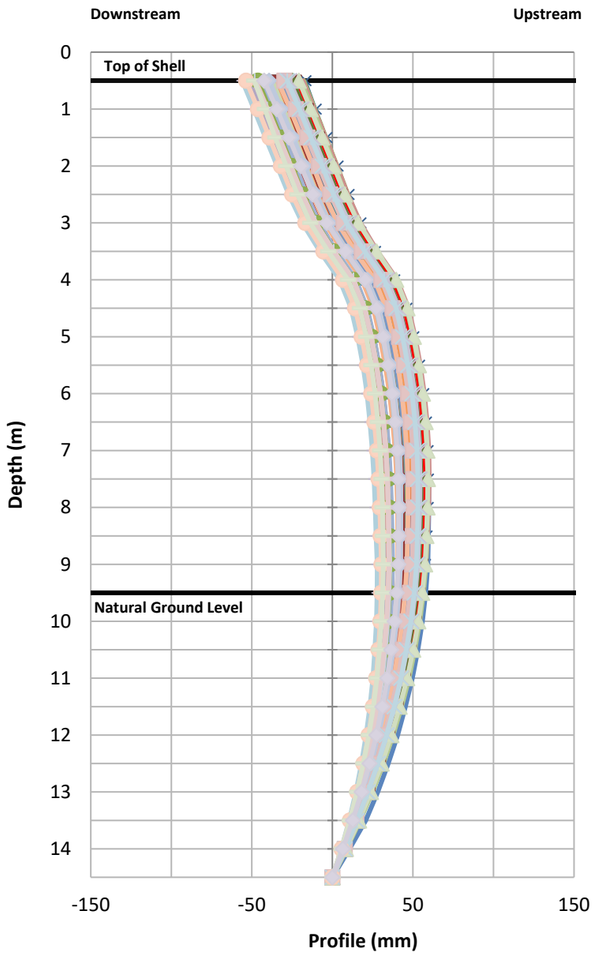




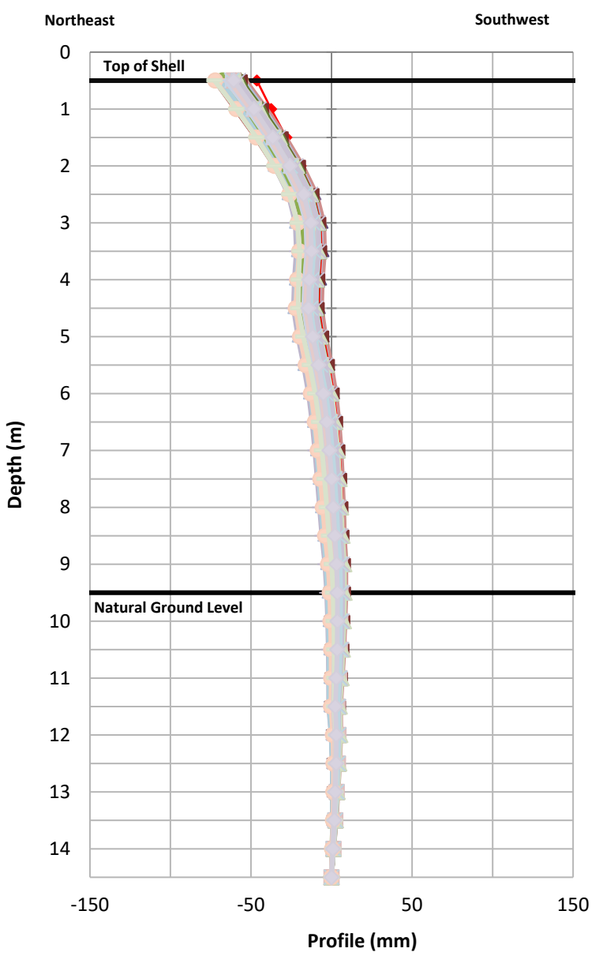
Notes:
1. Manufacture's accuracy is +/- 0.25 mm per location
2. Survey data excluded from the charts is noted on Figure D.1

srk consulting	AGNICO EAGLE	2021 AGI – North Dam
Job No: 1CT022.077 Filename: App_D_Inclinometers.pptx	DORIS TIA	**Inclinometer 070-1A Velocity Time Series**
		Date: Oct. 2021 | Approved: PDL | Figure: **D.5**

Profile Perpendicular to Centerline



Profile Parallel to Centerline



LEGEND:

- Initial Reading (9/8/2012)
- 2013-07-26
- 2013-10-01
- 2014-05-20
- 2014-07-12
- 2014-08-08
- 2014-09-01
- 2014-10-01
- 2015-02-01
- 2015-03-21
- 2015-04-16
- 2015-05-18
- 2015-06-25
- 2015-07-09
- 2015-08-02
- 2015-08-08
- 2015-09-04
- 2015-10-09
- 2015-11-25
- 2015-12-30
- 2016-02-08
- 2016-03-07
- 2016-04-11
- 2016-07-02
- 2016-08-14
- 2016-09-26
- 2016-11-26
- 2016-12-24
- 2017-02-23
- 2017-03-23
- 2017-04-15
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- 2017-09-14
- 2017-10-14
- 2017-11-16
- 2017-12-16
- 2018-01-16
- 2018-02-16
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- 2018-04-20
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- 2018-09-29
- 2018-10-21
- 2018-11-10
- 2019-01-01
- 2019-01-28
- 2019-02-14
- 2019-04-14
- 2019-05-10
- 2019-06-11
- 2019-07-27
- 2019-08-25
- 2019-09-28
- 2019-10-26
- 2019-11-23
- 2020-01-16
- 2020-02-18
- 2020-03-10
- 2020-06-06
- 2020-07-12
- 2020-08-08
- 2020-09-11
- 2020-10-20
- 2020-11-19
- 2020-12-23
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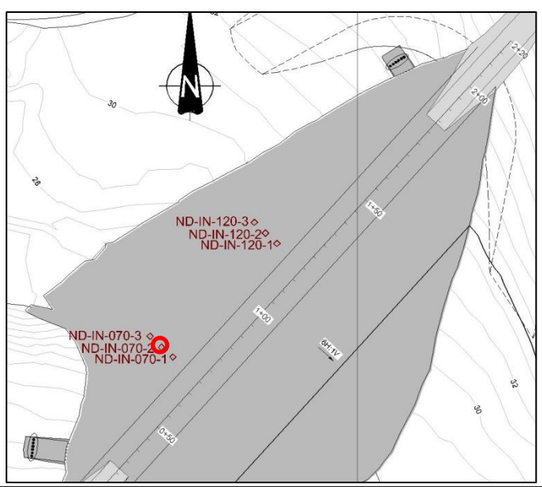
- 2021-07-11
- 2021-08-14
- 2021-09-04
- 2021-10-04

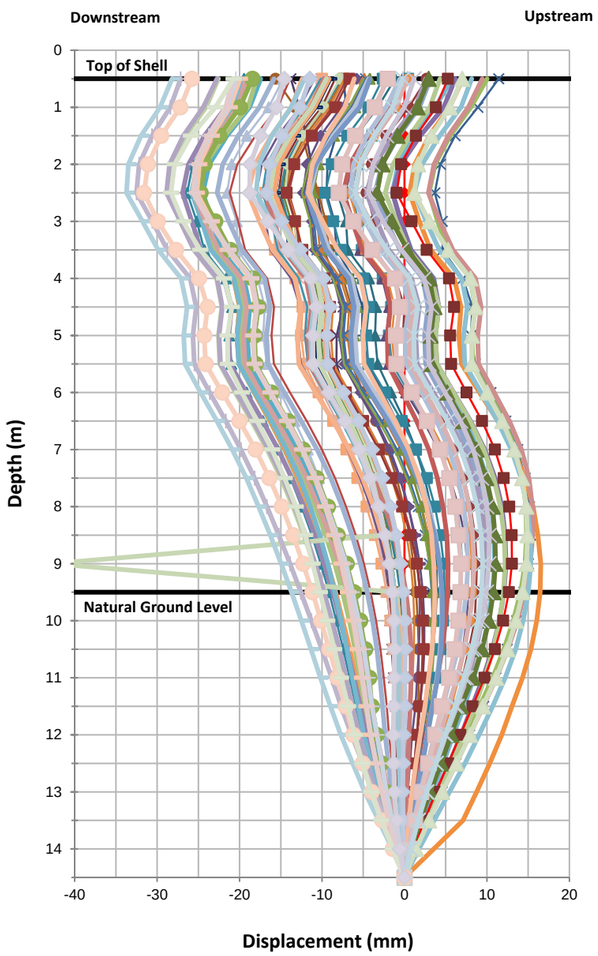


Notes:

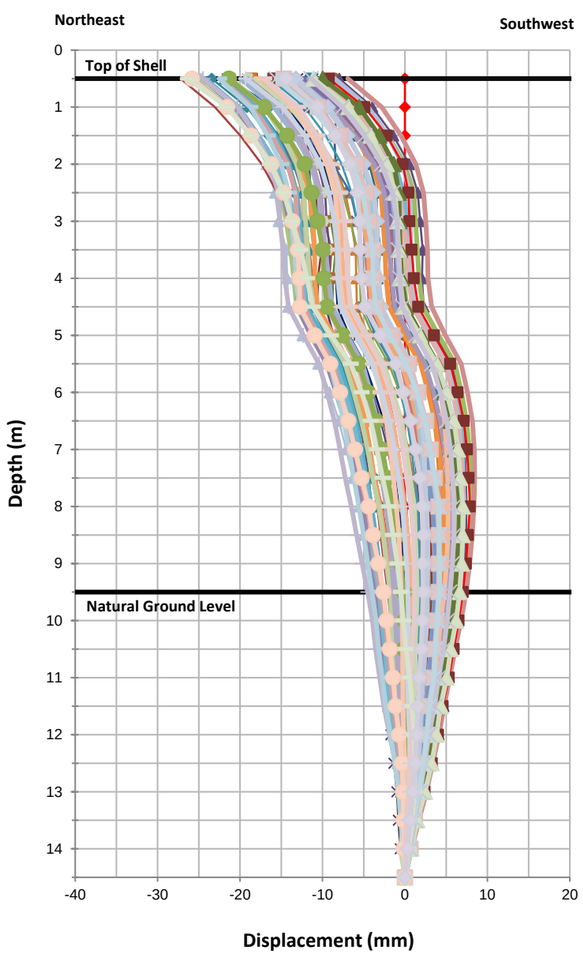
1. Manufacture's accuracy is +/- 0.25 mm per location
2. Survey data excluded from the charts is noted on Figure D.1

srk consulting	AGNICO EAGLE	2021 AGI – North Dam
Job No: 1CT022.077 Filename: App_D_Inclinometers.pptx	DORIS TIA	**Inclinometer 070-2 Profiles**
		Date: Oct. 2021 / Approved: PDL / Figure: **D.6**

Displacement Perpendicular to Centerline



Displacement Parallel to Centerline



LEGEND:

- Initial Reading (9/8/2012)
- 2013-07-26
- 2013-10-01
- 2014-05-20
- 2014-07-12
- 2014-08-08
- 2014-09-01
- 2014-10-01
- 2015-02-01
- 2015-03-21
- 2015-04-16
- 2015-05-18
- 2015-06-25
- 2015-07-09
- 2015-08-02
- 2015-08-08
- 2015-09-04
- 2015-10-09
- 2015-11-25
- 2015-12-30
- 2016-02-08
- 2016-03-07
- 2016-04-11
- 2016-07-02
- 2016-08-14
- 2016-09-26
- 2016-11-26
- 2016-12-24
- 2017-02-23
- 2017-03-23
- 2017-04-15
- 2017-05-20
- 2017-06-25
- 2017-07-16
- 2017-08-09
- 2017-09-14
- 2017-10-14
- 2017-11-16
- 2017-12-16
- 2018-01-16
- 2018-02-16
- 2018-03-21
- 2018-04-20
- 2018-05-19
- 2018-06-08
- 2018-07-07
- 2018-08-03
- 2018-09-29
- 2018-10-21
- 2018-11-10
- 2019-01-01
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- 2019-02-14
- 2019-04-14
- 2019-05-10
- 2019-06-11
- 2019-07-27
- 2019-08-25
- 2019-09-28
- 2019-10-26
- 2019-11-23
- 2020-01-16
- 2020-02-18
- 2020-03-10
- 2020-06-06
- 2020-07-12
- 2020-08-08
- 2020-09-11
- 2020-10-20
- 2020-11-19
- 2020-12-23
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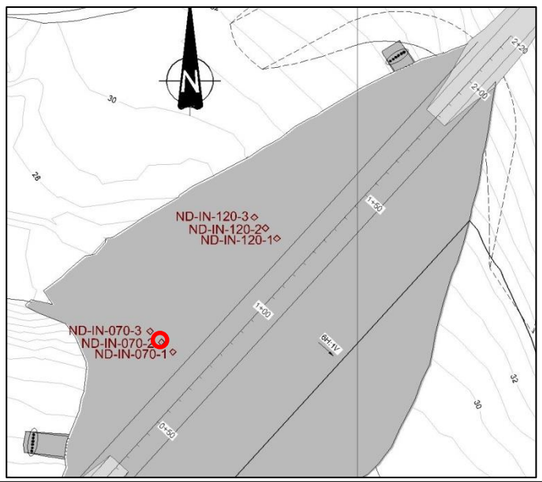
- 2021-07-11
- 2021-08-14
- 2021-09-04
- 2021-10-04

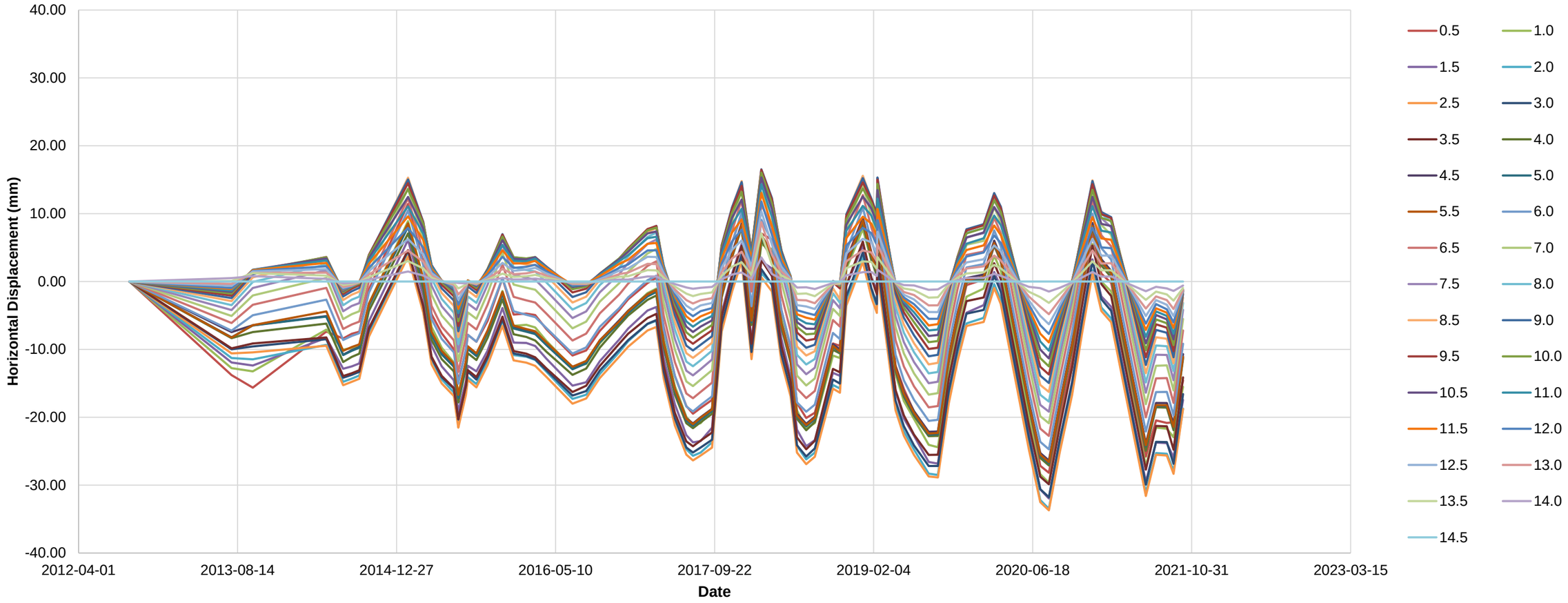


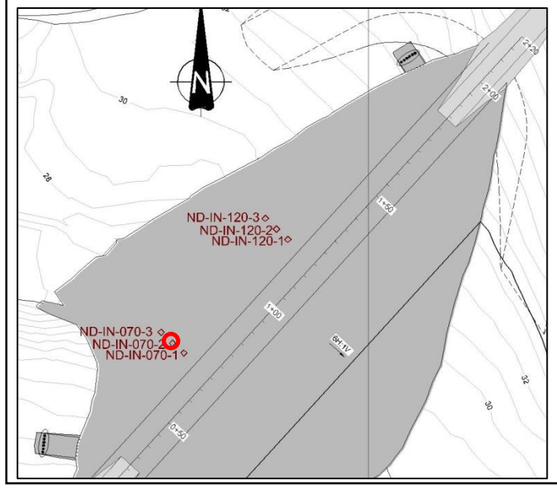
Notes:

1. Manufacture's accuracy is +/- 0.25 mm per location
2. Survey data excluded from the charts is noted on Figure D.1

srk consulting	AGNICO EAGLE	2021 AGI – North Dam
Job No: 1CT022.077 Filename: App_D_Inclinometers.pptx	DORIS TIA	**Inclinometer 070-2 Displacements** Date: Oct. 2021 · Approved: PDL · Figure: **D.7**

Inclinometer 070-2A Timeseries

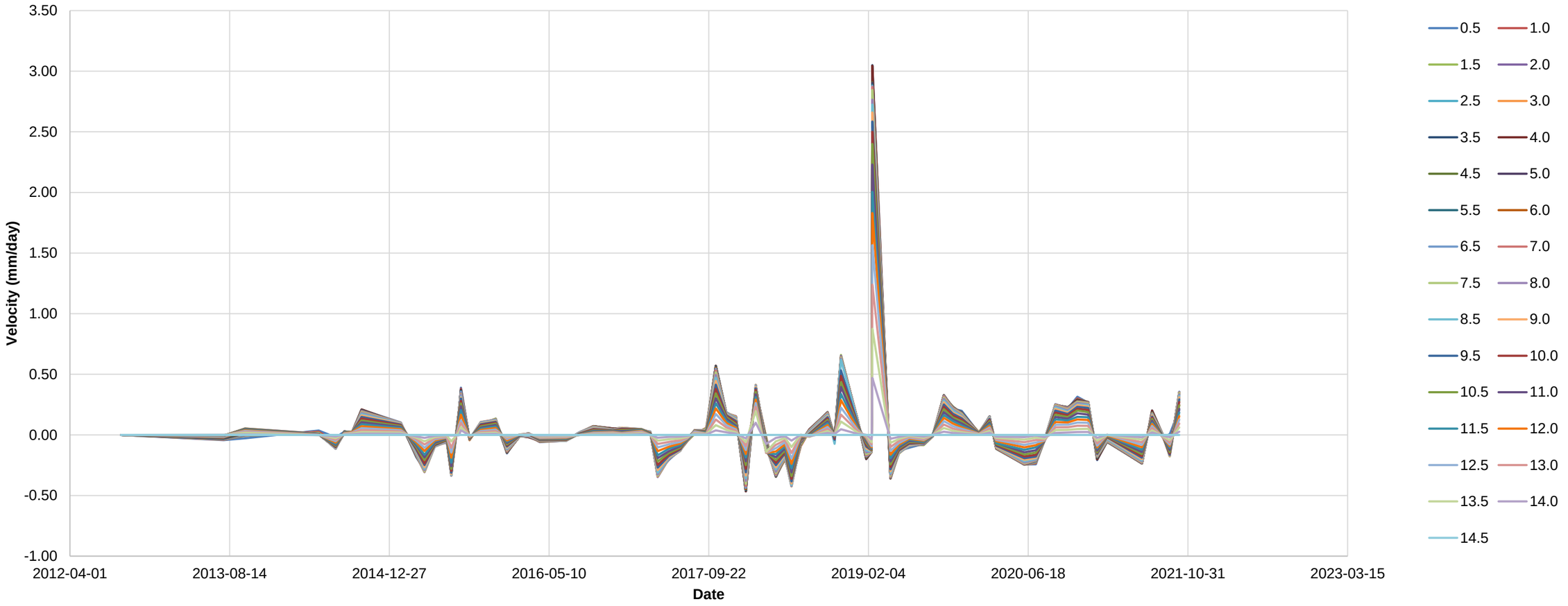


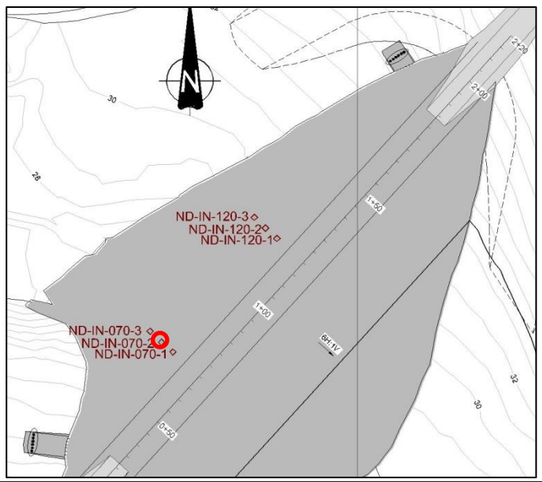


Notes:
1. Manufacture's accuracy is +/- 0.25 mm per location
2. Survey data excluded from the charts is noted on Figure D.1

srk consulting	AGNICO EAGLE	2021 AGI – North Dam
		Inclinometer 070-2A Displacement Time Series
Job No: 1CT022.077 Filename: App_D_Inclinometers.pptx	DORIS TIA	Date: Oct. 2021 / Approved: PDL / Figure: **D.8**

Inclinometer 070-2A Velocity Timeseries

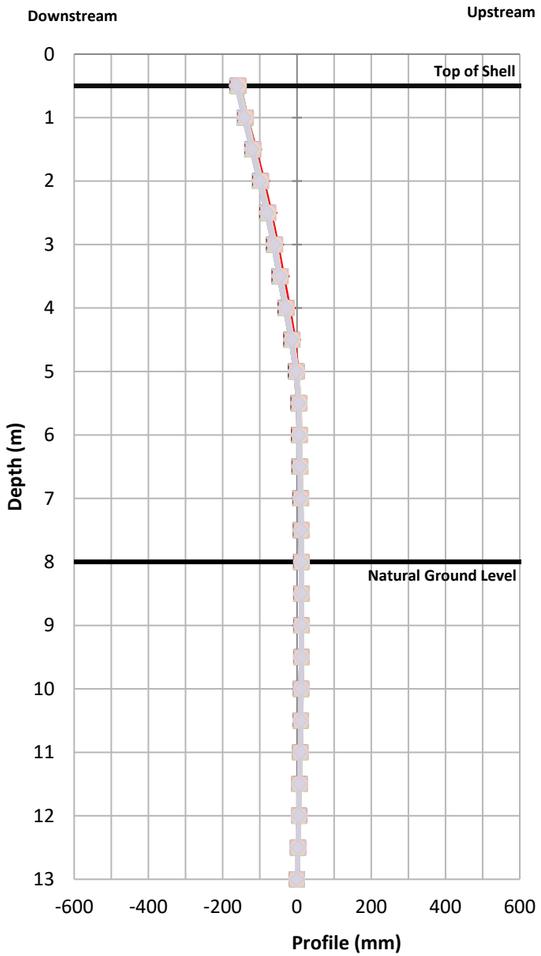




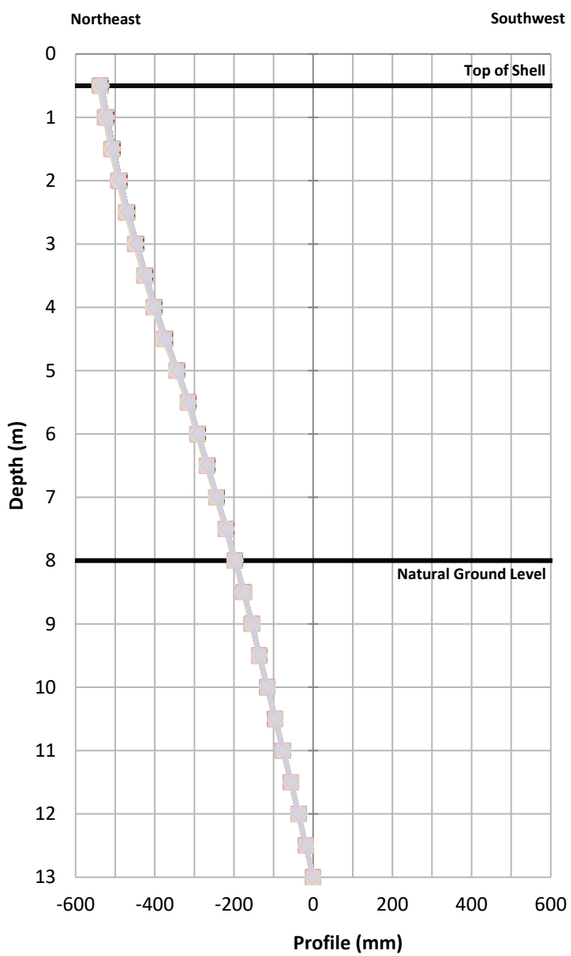
Notes:
1. Manufacture's accuracy is +/- 0.25 mm per location
2. Survey data excluded from the charts is noted on Figure D.1

srk consulting	AGNICO EAGLE	2021 AGI – North Dam
		Inclinometer 070-2A Velocity Time Series
Job No: 1CT022.077 Filename: App_D_Inclinometers.pptx	**DORIS TIA**	Date: Oct. 2021 / Approved: PDL / Figure: **D.9**

Profile Perpendicular to Centerline



Profile Parallel to Centerline



LEGEND:

- Initial Reading (9/9/2012)
- 2013-07-26
- 2013-10-01
- 2014-05-20
- 2014-07-12
- 2014-08-08
- 2014-09-01
- 2014-10-01
- 2015-02-01
- 2015-03-21
- 2015-04-16
- 2015-05-18
- 2015-06-25
- 2015-07-09
- 2015-08-02
- 2015-09-04
- 2015-10-09
- 2015-11-25
- 2015-12-30
- 2016-02-08
- 2016-03-07
- 2016-04-11
- 2016-07-02
- 2016-08-14
- 2016-09-25
- 2016-11-26
- 2016-12-24
- 2017-02-23
- 2017-03-23
- 2017-04-15
- 2017-05-20
- 2017-06-25
- 2017-07-16
- 2017-08-09
- 2017-09-14
- 2017-10-14
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- 2017-12-16
- 2018-01-16
- 2018-02-16
- 2018-03-21
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- 2018-05-19
- 2018-06-08
- 2018-07-07
- 2018-08-03
- 2018-09-29
- 2018-10-21
- 2018-11-10
- 2019-01-01
- 2019-01-25
- 2019-02-14
- 2019-04-15
- 2019-05-10
- 2019-06-12
- 2019-07-27
- 2019-08-25
- 2019-09-28
- 2019-10-26
- 2019-11-23
- 2020-01-16
- 2020-02-18
- 2020-03-10
- 2020-06-06
- 2020-07-12
- 2020-08-08
- 2020-09-11
- 2020-10-20
- 2020-11-19
- 2020-12-24
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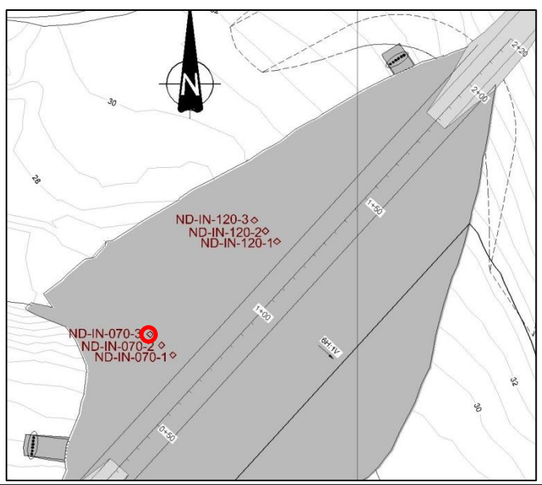
- 2021-10-03

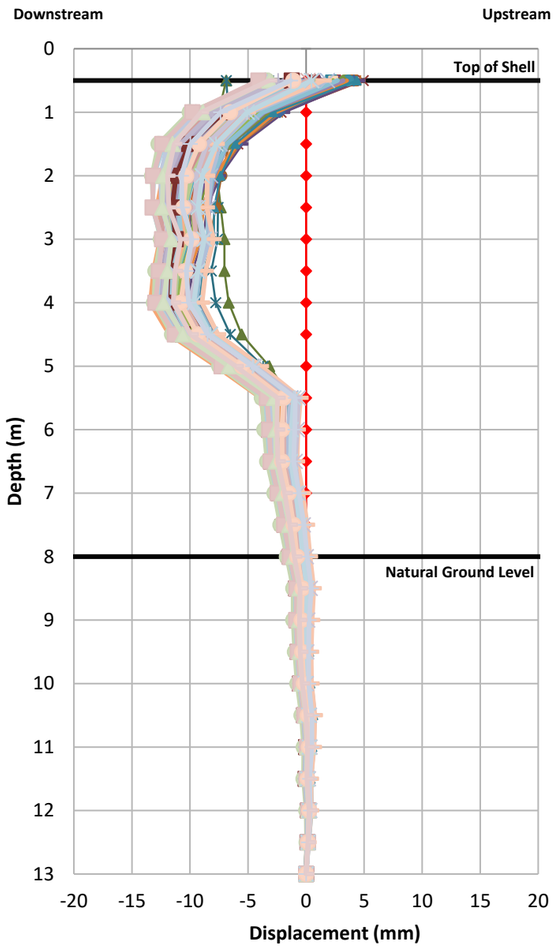


Notes:

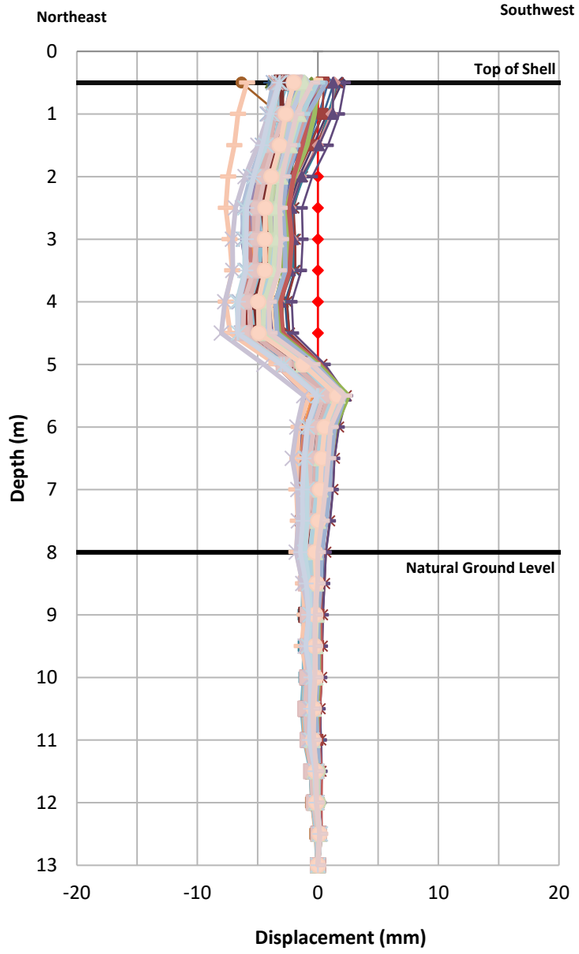
1. Manufacture's accuracy is +/- 0.25 mm per location
2. Survey data excluded from the charts is noted on Figure D.1

srk consulting	AGNICO EAGLE	2021 AGI – North Dam
Job No: 1CT022.077 Filename: App_D_Inclinometers.pptx	DORIS TIA	**Inclinometer 070-3 Profiles**
		Date: Oct. 2021 / Approved: PDL / Figure: **D.10**

Displacement Perpendicular to Centerline



Displacement Parallel to Centerline



LEGEND:

- Initial Reading (9/9/2012)
- 2013-07-26
- 2013-10-01
- 2014-05-20
- 2014-07-12
- 2014-08-08
- 2014-09-01
- 2014-10-01
- 2015-02-01
- 2015-03-21
- 2015-04-16
- 2015-05-18
- 2015-06-25
- 2015-07-09
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- 2017-08-09
- 2017-09-14
- 2017-10-14
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- 2018-08-03
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- 2018-11-10
- 2019-01-01
- 2019-01-25
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- 2019-04-15
- 2019-05-10
- 2019-06-12
- 2019-07-27
- 2019-08-25
- 2019-09-28
- 2019-10-26
- 2019-11-23
- 2020-01-16
- 2020-02-18
- 2020-03-10
- 2020-06-06
- 2020-07-12
- 2020-08-08
- 2020-09-11
- 2020-10-20
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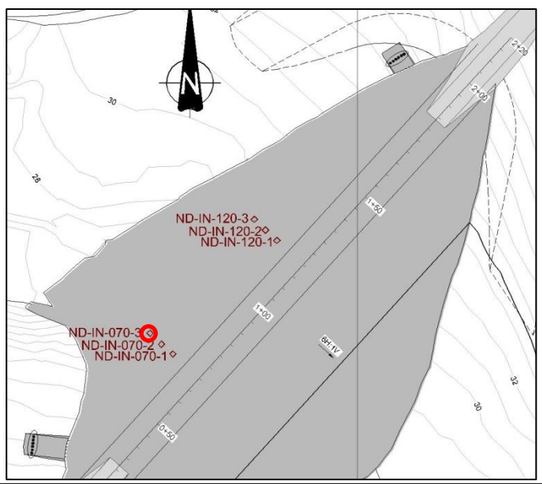
- 2021-10-03

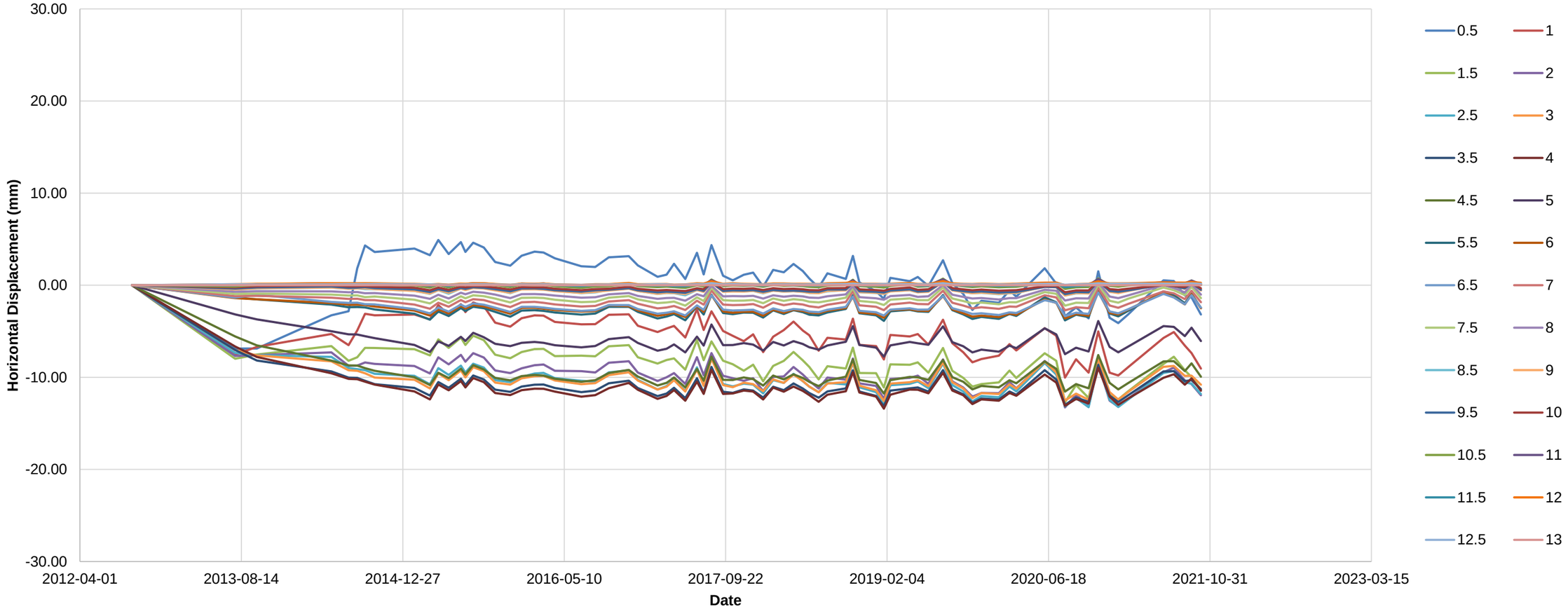


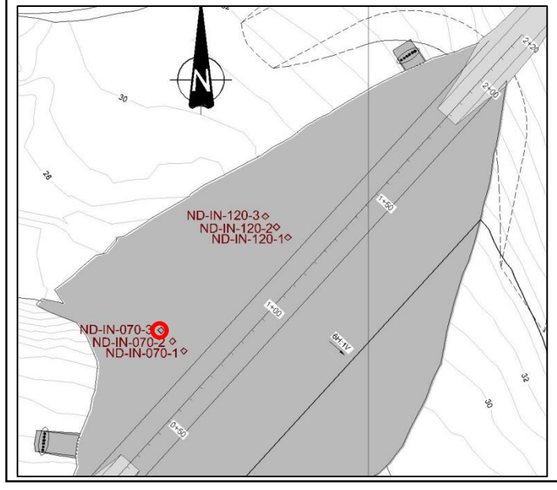
Notes:

1. Manufacture's accuracy is +/- 0.25 mm per location
2. Survey data excluded from the charts is noted on Figure D.1

srk consulting	AGNICO EAGLE	2021 AGI – North Dam
		Inclinometer 070-3 Displacements
Job No: 1CT022.077 Filename: App_D_Inclinometers.pptx	**DORIS TIA**	Date: Oct. 2021 / Approved: PDL / Figure: **D.11**

Inclinometer 070-3A Timeseries

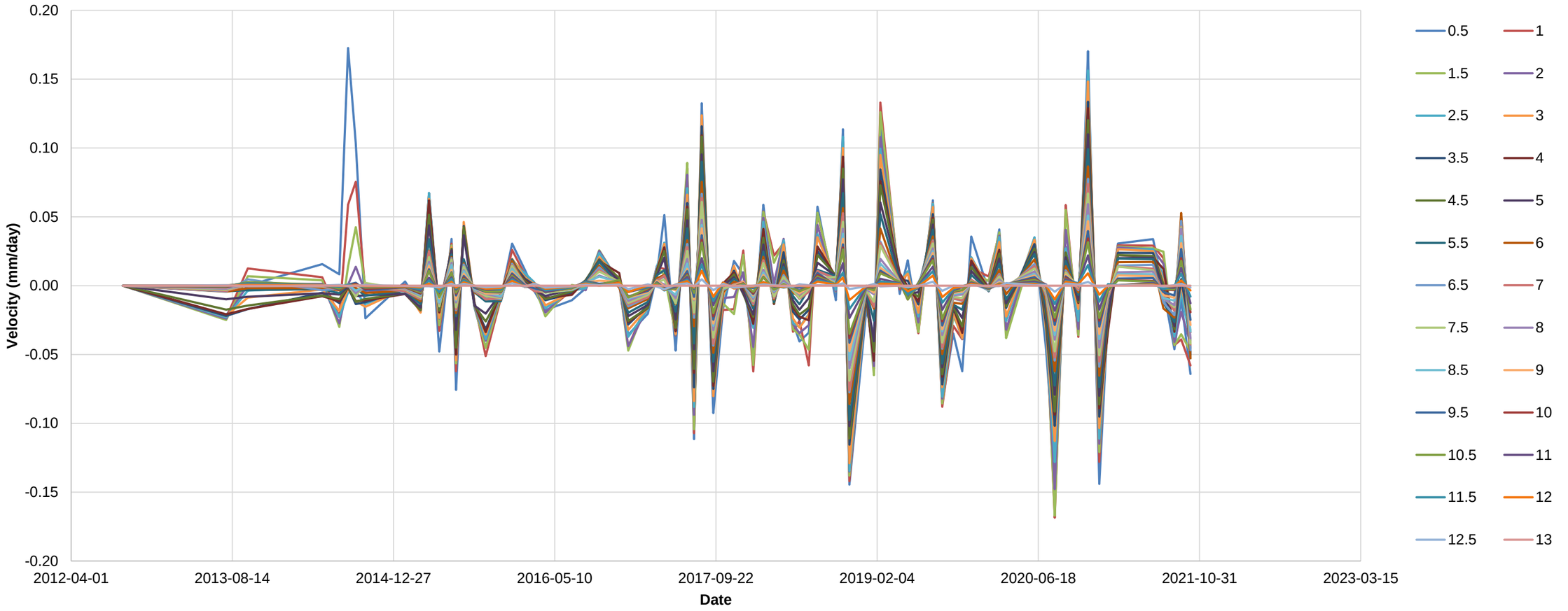


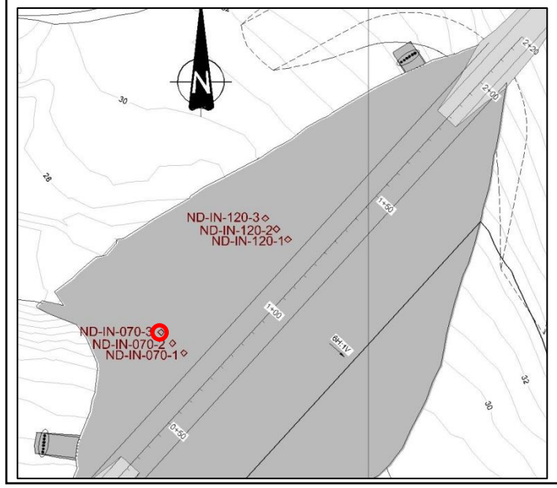


Notes:
1. Manufacture's accuracy is +/- 0.25 mm per location
2. Survey data excluded from the charts is noted on Figure D.1

srk consulting	AGNICO EAGLE	2021 AGI – North Dam
Job No: 1CT022.077 Filename: App_D_Inclinometers.pptx	DORIS TIA	**Inclinometer 070-3A Displacement Time Series**
		Date: Oct. 2021 / Approved: PDL / Figure: **D.12**

Inclinometer 070-3A Velocity Timeseries



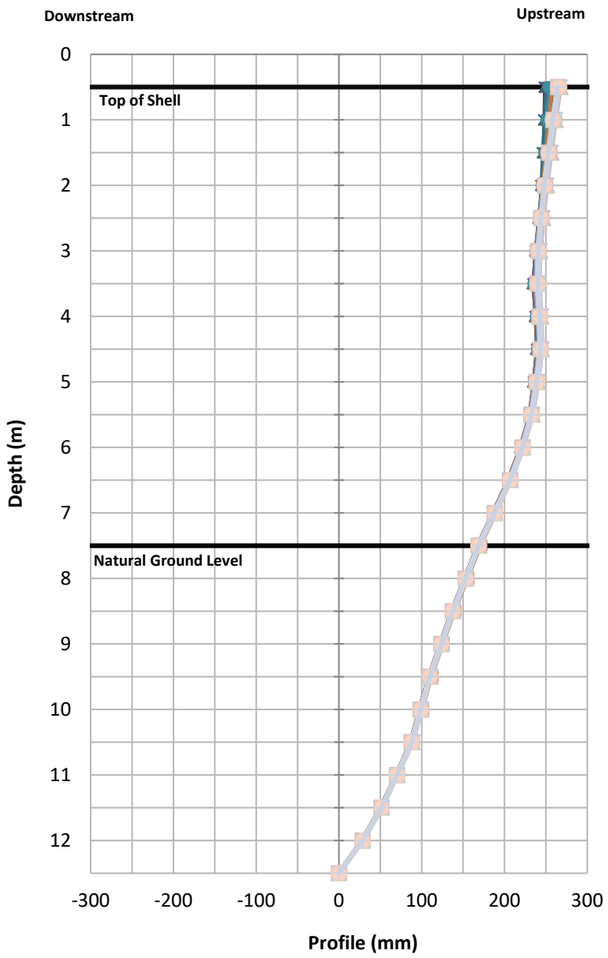


Notes:

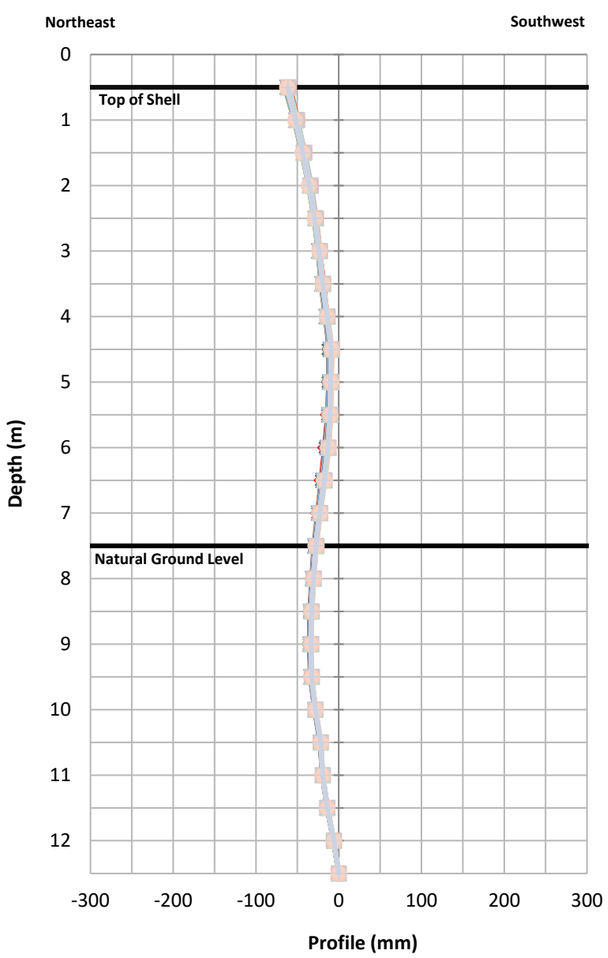
1. Manufacture's accuracy is +/- 0.25 mm per location
2. Survey data excluded from the charts is noted on Figure D.1

srk consulting	AGNICO EAGLE	2021 AGI – North Dam
Job No: 1CT022.077 Filename: App_D_Inclinometers.pptx	DORIS TIA	**Inclinometer 070-3A Velocity Time Series**
		Date: Oct. 2021 / Approved: PDL / Figure: **D.13**

Profile Perpendicular to Centerline



Profile Parallel to Centerline



LEGEND:

- Initial Reading (9/8/2012)
- 2013-07-26
- 2013-08-28
- 2013-10-01
- 2014-05-20
- 2014-07-12
- 2014-08-08
- 2014-09-01
- 2014-10-01
- 2015-02-02
- 2015-03-21
- 2015-04-16
- 2015-05-18
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- 2015-08-02
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- 2015-10-09
- 2015-11-25
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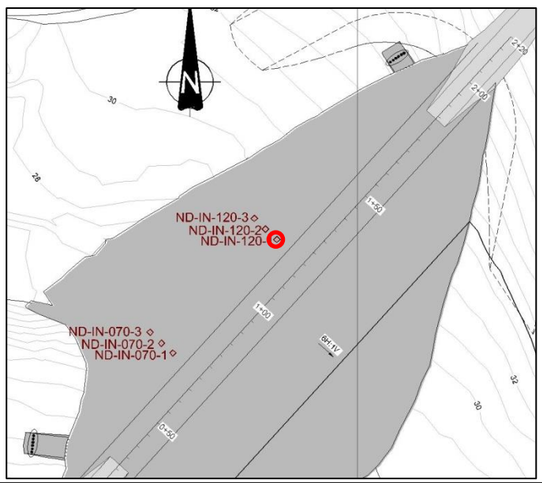
- 2021-09-04
- 2021-10-03

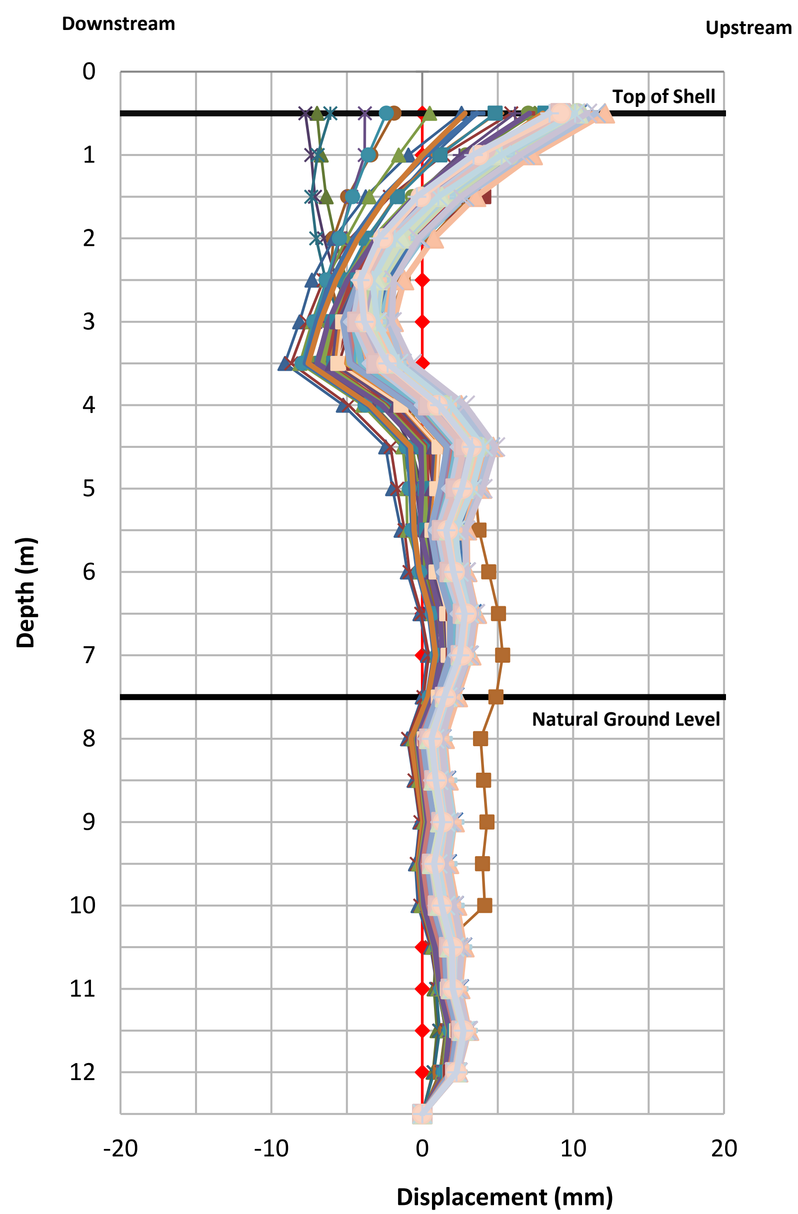


Notes:

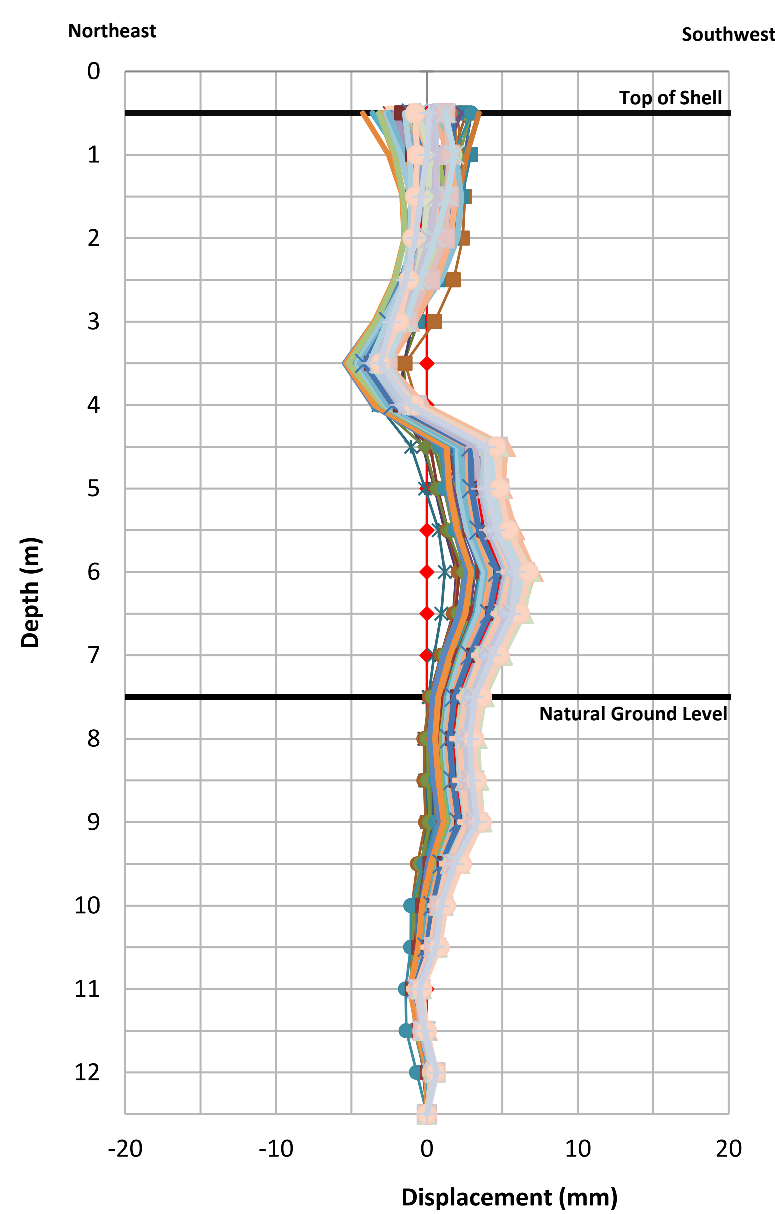
1. Manufacture's accuracy is +/- 0.25 mm per location
2. Survey data excluded from the charts is noted on Figure D.1

srk consulting	AGNICO EAGLE	2021 AGI – North Dam
		Inclinometer 120-1 Profiles
Job No: 1CT022.077 Filename: App_D_Inclinometers.pptx	**DORIS TIA**	Date: Oct. 2021 / Approved: PDL / Figure: **D.14**

Displacement Perpendicular to Centerline



Displacement Parallel to Centerline



LEGEND:

- Initial Reading (9/8/2012)
- 2013-07-26
- 2013-08-28
- 2013-10-01
- 2014-05-20
- 2014-07-12
- 2014-08-08
- 2014-09-01
- 2014-10-01
- 2015-02-02
- 2015-03-21
- 2015-04-16
- 2015-05-18
- 2015-06-25
- 2015-07-09
- 2015-08-02
- 2015-09-04
- 2015-10-09
- 2015-11-25
- 2015-12-30
- 2016-03-07
- 2016-04-11
- 2016-07-02
- 2016-08-14
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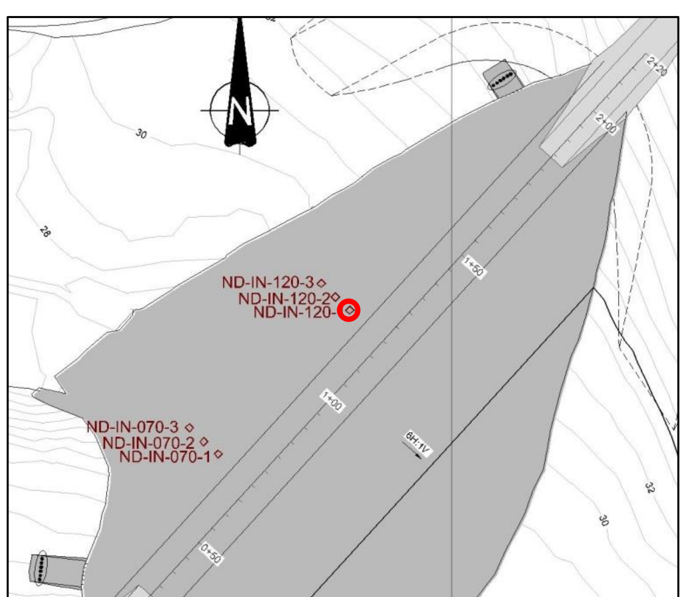
- 2021-10-03



Notes:
1. Manufacture's accuracy is +/- 0.25 mm per location
2. Survey data excluded from the charts is noted on Figure D.1

srk consulting | AGNICO EAGLE | 2021 AGI – North Dam

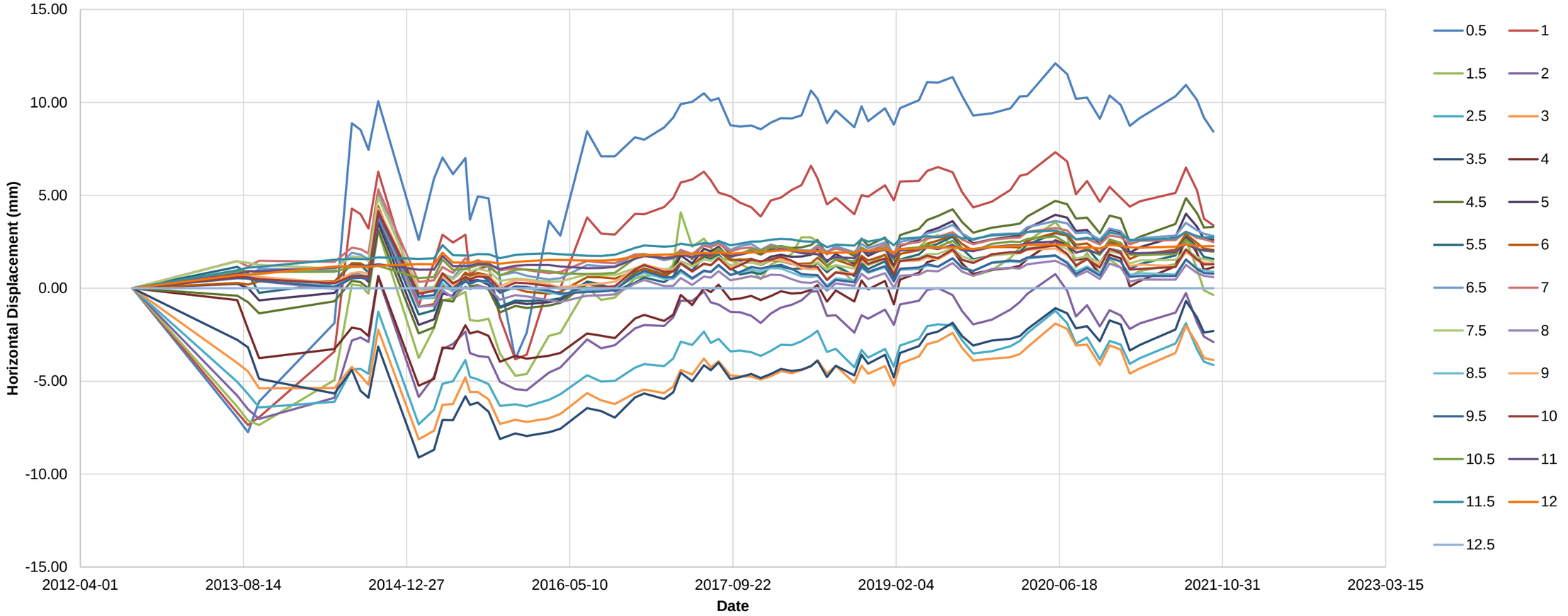
Inclinometer 120-1 Displacements

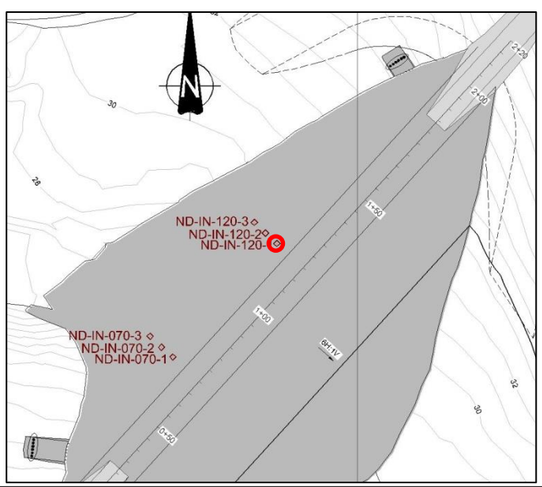
Job No: 1CT022.077
Filename: App_D_Inclinometers.pptx

DORIS TIA

Date: Oct. 2021 | Approved: PDL | Figure: **D.15**

Inclinometer 120-1A Timeseries

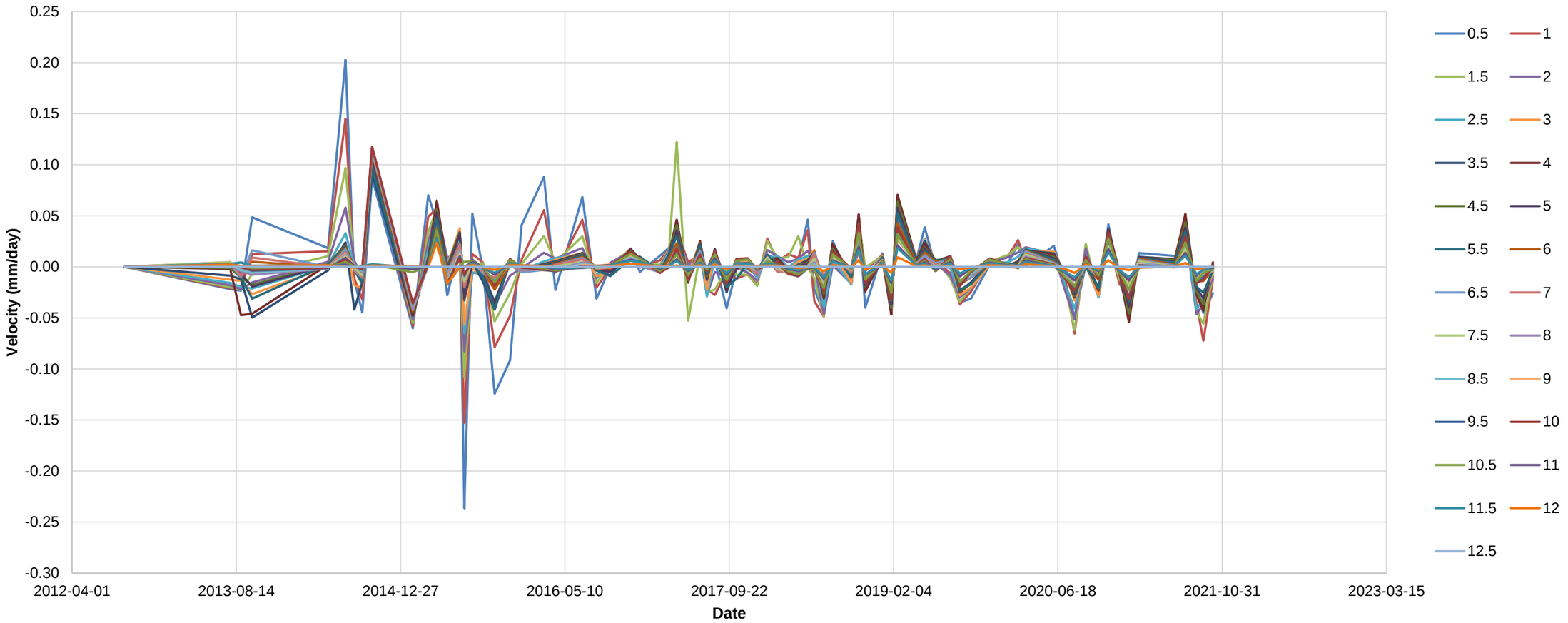


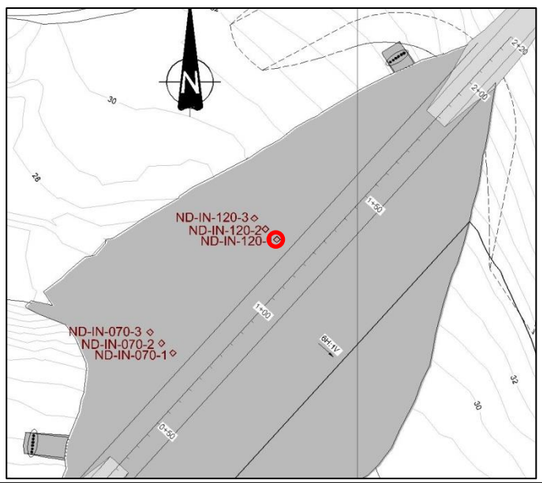


Notes:
1. Manufacture's accuracy is +/- 0.25 mm per location
2. Survey data excluded from the charts is noted on Figure D.1

srk consulting	AGNICO EAGLE	2021 AGI – North Dam
Job No: 1CT022.077 Filename: App_D_Inclinometers.pptx	DORIS TIA	**Inclinometer 120-1A Displacement Time Series**
		Date: Oct. 2021 / Approved: PDL / Figure: **D.16**

Inclinometer 120-1A Velocity Timeseries

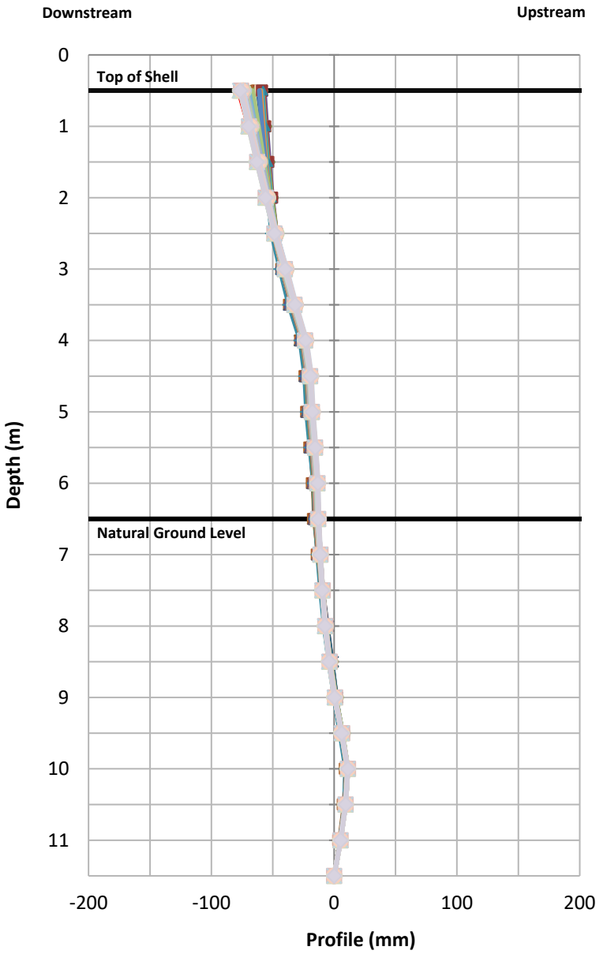




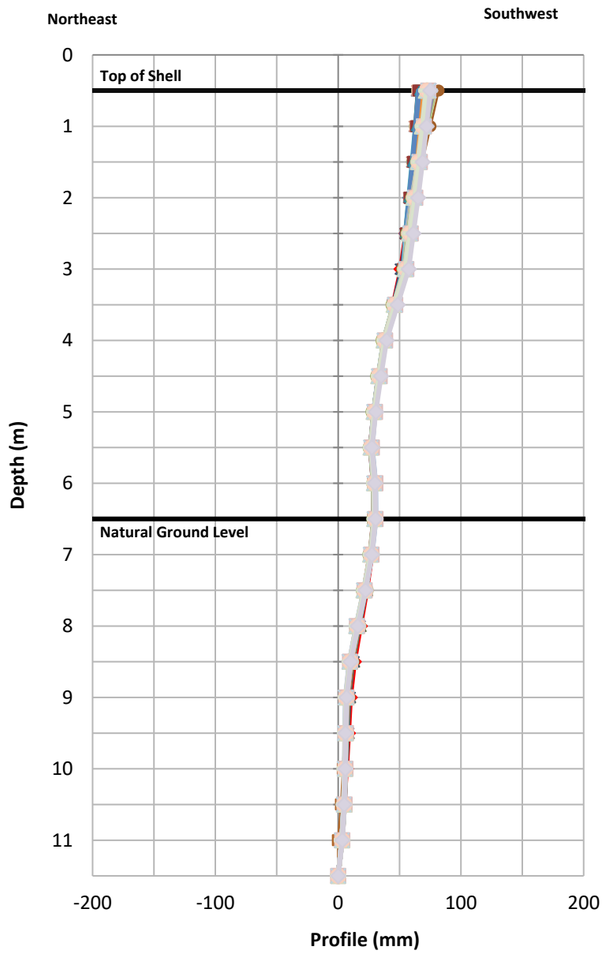
Notes:
1. Manufacture's accuracy is +/- 0.25 mm per location
2. Survey data excluded from the charts is noted on Figure D.1

srk consulting	AGNICO EAGLE	2021 AGI – North Dam
		Inclinometer 120-1A Velocity Time Series
Job No: 1CT022.077 Filename: App_D_Inclinometers.pptx	**DORIS TIA**	Date: Oct. 2021 | Approved: PDL | Figure: **D.17**

Profile Perpendicular to Centerline

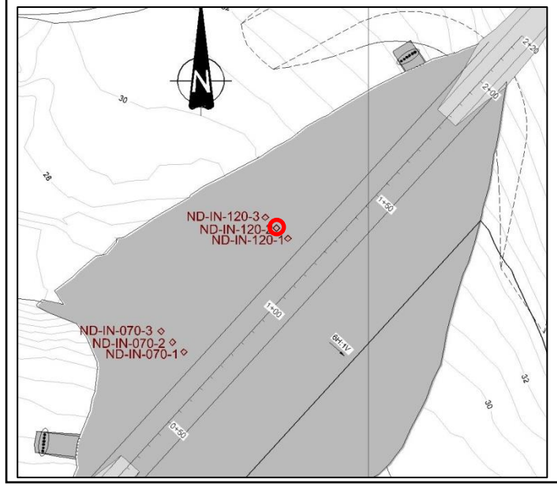


Profile Parallel to Centerline



LEGEND:

- Initial Reading (9/8/2012)
- 2013-08-28
- 2014-05-20
- 2014-08-08
- 2014-10-01
- 2015-03-21
- 2015-04-20
- 2015-06-26
- 2015-08-02
- 2015-10-09
- 2015-12-30
- 2016-03-07
- 2016-07-02
- 2016-09-25
- 2016-11-26
- 2017-03-23
- 2017-05-20
- 2017-07-16
- 2017-09-14
- 2017-11-17
- 2018-01-16
- 2018-03-21
- 2018-05-19
- 2018-07-07
- 2018-09-30
- 2018-11-10
- 2019-01-25
- 2019-05-10
- 2019-07-27
- 2019-09-28
- 2019-11-24
- 2020-02-18
- 2020-06-06
- 2020-08-08
- 2020-10-20
- 2020-12-24
- 2021-02-20
- 2021-07-11
- 2021-09-04
- 2013-07-26
- 2013-10-01
- 2014-07-12
- 2014-09-01
- 2015-02-02
- 2015-04-16
- 2015-05-19
- 2015-07-09
- 2015-09-04
- 2015-11-25
- 2016-02-08
- 2016-04-11
- 2016-08-14
- 2016-12-24
- 2017-02-23
- 2017-04-15
- 2017-06-25
- 2017-08-09
- 2017-10-14
- 2017-12-16
- 2018-02-17
- 2018-04-20
- 2018-06-08
- 2018-08-03
- 2018-10-21
- 2019-01-01
- 2019-04-15
- 2019-06-12
- 2019-08-25
- 2019-10-26
- 2020-01-20
- 2020-03-12
- 2020-07-12
- 2020-09-11
- 2020-11-19
- 2021-01-20
- 2021-06-09
- 2021-08-14
- 2021-10-03

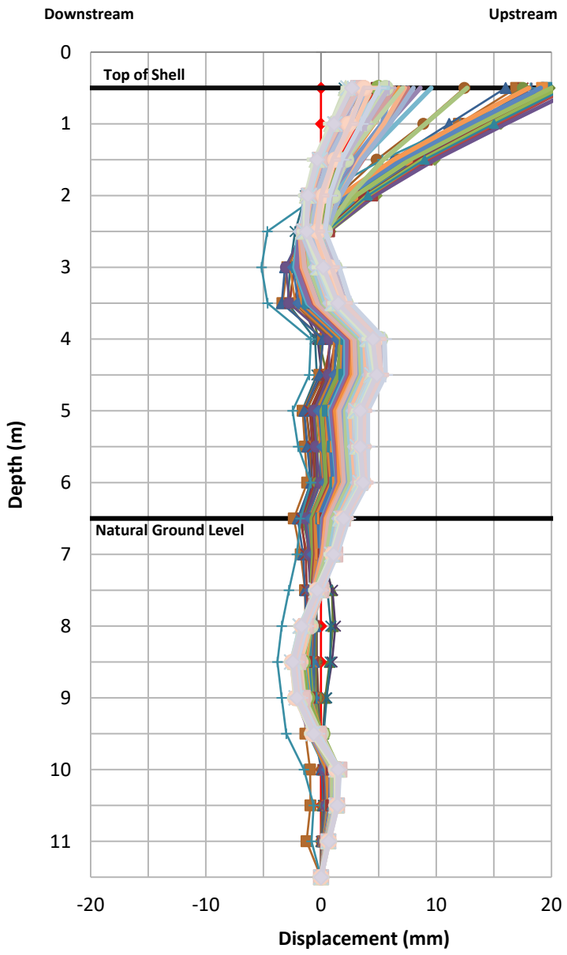


Notes:

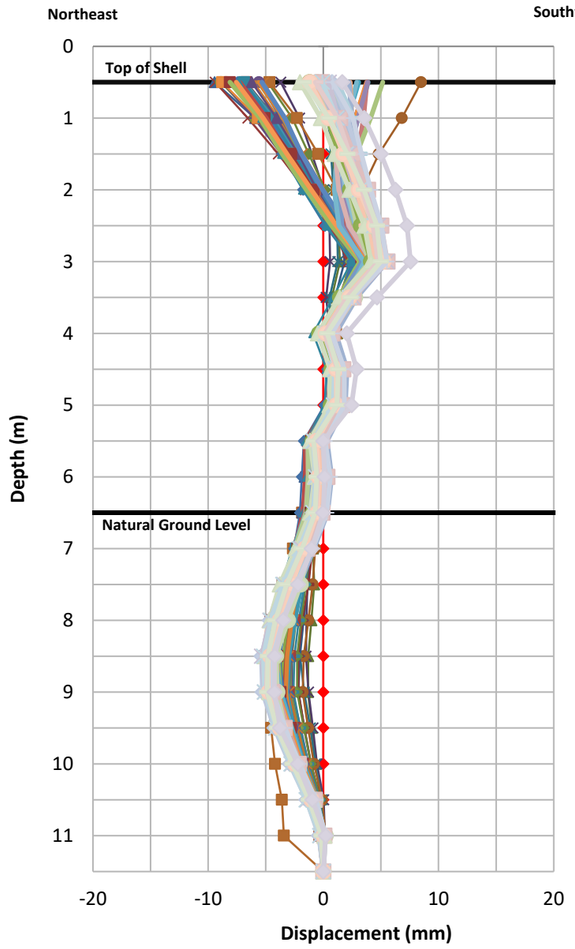
1. Manufacture's accuracy is +/- 0.25 mm per location
2. Survey data excluded from the charts is noted on Figure D.1

srk consulting	AGNICO EAGLE	2021 AGI – North Dam
		Inclinometer 120-2 Profiles
Job No: 1CT022.077 Filename: App_D_Inclinometers.pptx	**DORIS TIA**	Date: Oct. 2021 / Approved: PDL / Figure: **D.18**

Displacement Perpendicular to Centerline



Displacement Parallel to Centerline



LEGEND:

- Initial Reading (9/8/2012)
- 2013-07-26
- 2013-08-28
- 2013-10-01
- 2014-05-20
- 2014-07-12
- 2014-08-08
- 2014-09-01
- 2014-10-01
- 2015-02-02
- 2015-03-21
- 2015-04-16
- 2015-04-20
- 2015-05-19
- 2015-06-26
- 2015-07-09
- 2015-08-02
- 2015-09-04
- 2015-10-09
- 2015-11-25
- 2015-12-30
- 2016-02-08
- 2016-03-07
- 2016-04-11
- 2016-07-02
- 2016-08-14
- 2016-09-25
- 2016-11-26
- 2016-12-24
- 2017-02-23
- 2017-03-23
- 2017-04-15
- 2017-05-20
- 2017-06-25
- 2017-07-16
- 2017-08-09
- 2017-09-14
- 2017-10-14
- 2017-11-17
- 2017-12-16
- 2018-01-16
- 2018-02-17
- 2018-03-21
- 2018-04-20
- 2018-05-19
- 2018-06-08
- 2018-07-07
- 2018-08-03
- 2018-09-30
- 2018-10-21
- 2018-11-10
- 2019-01-01
- 2019-01-25
- 2019-04-15
- 2019-05-10
- 2019-06-12
- 2019-07-27
- 2019-08-25
- 2019-09-28
- 2019-10-26
- 2019-11-24
- 2020-01-20
- 2020-02-18
- 2020-03-12
- 2020-06-06
- 2020-07-12
- 2020-08-08
- 2020-09-11
- 2020-10-20
- 2020-11-19
- 2020-12-24
- 2021-01-20
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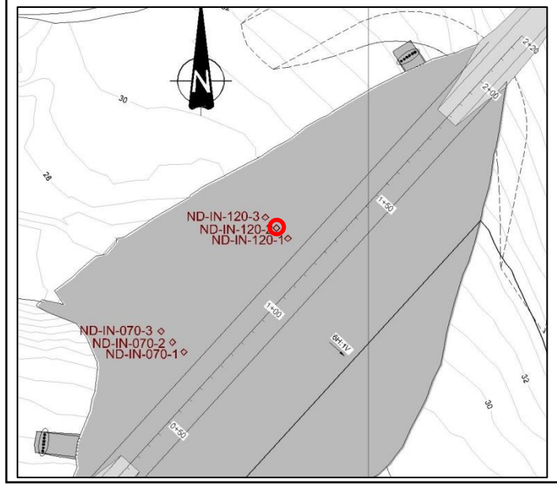
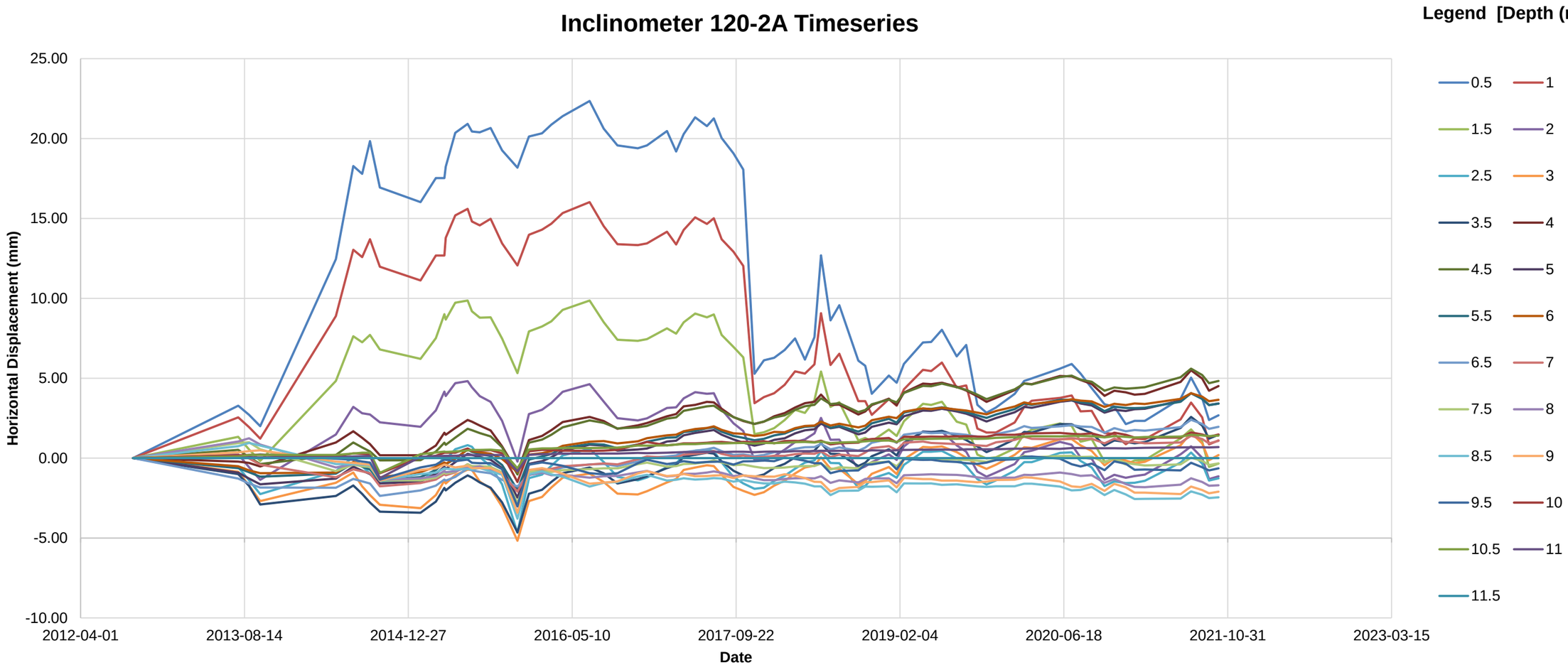
- 2021-07-11
- 2021-08-14
- 2021-09-04
- 2021-10-03

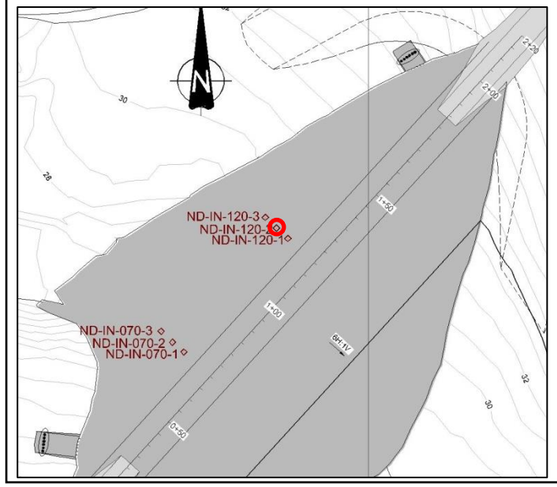


Notes:

1. Manufacture's accuracy is +/- 0.25 mm per location
2. Survey data excluded from the charts is noted on Figure D.1

srk consulting	AGNICO EAGLE	2021 AGI – North Dam
		Inclinometer 120-2 Displacements
Job No: 1CT022.077 Filename: App_D_Inclinometers.pptx	**DORIS TIA**	Date: Oct. 2021 · Approved: PDL · Figure: **D.19**



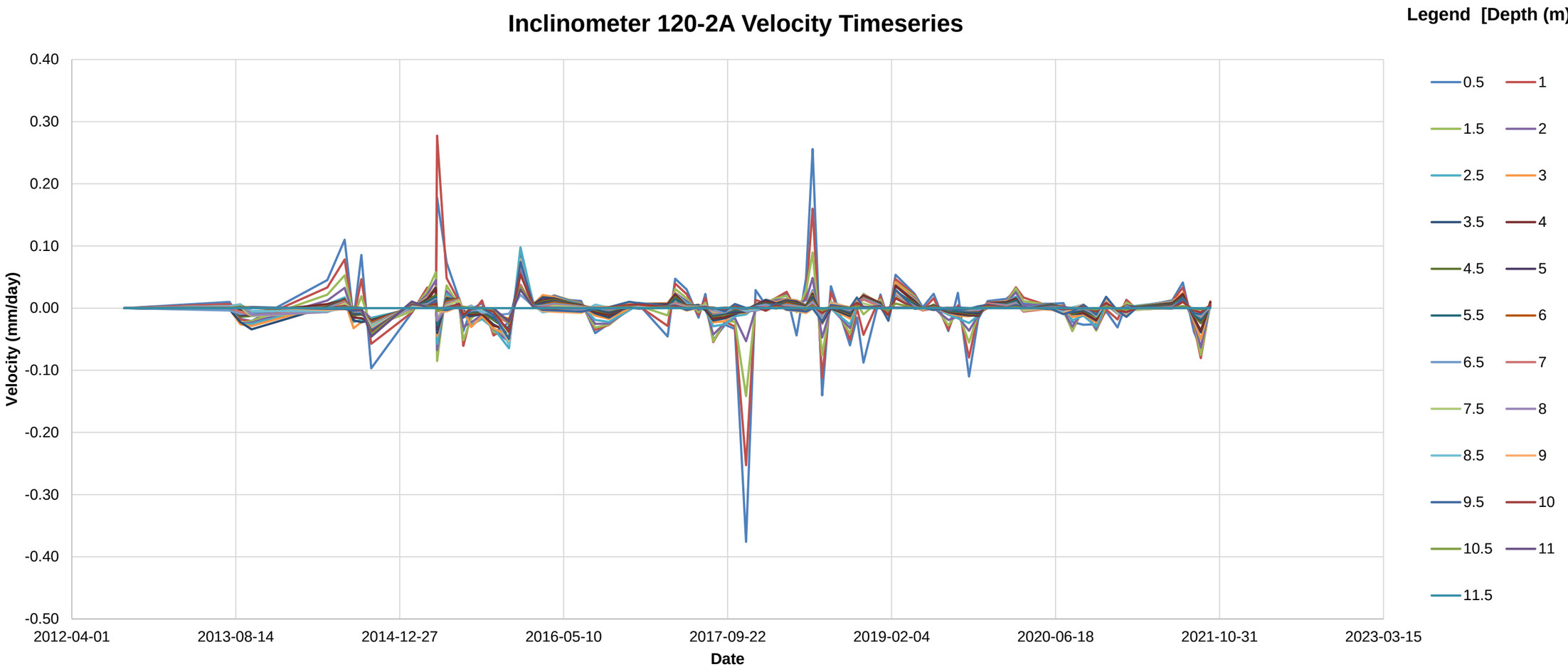


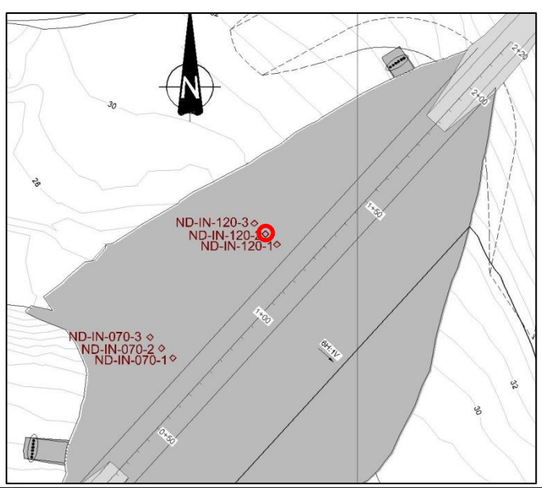
Notes:

1. Manufacture's accuracy is +/- 0.25 mm per location
2. Survey data excluded from the charts is noted on Figure D.1

srk consulting	AGNICO EAGLE	2021 AGI – North Dam
Job No: 1CT022.077 Filename: App_D_Inclinometers.pptx	DORIS TIA	**Inclinometer 120-2A Displacement Time Series**
		Date: Oct. 2021 / Approved: PDL / Figure: **D.20**

Inclinometer 120-2A Velocity Timeseries

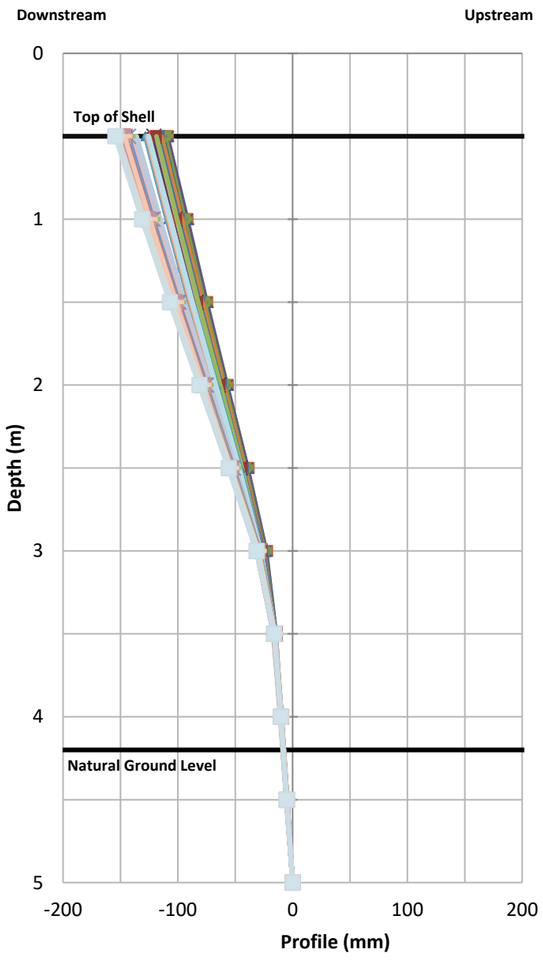




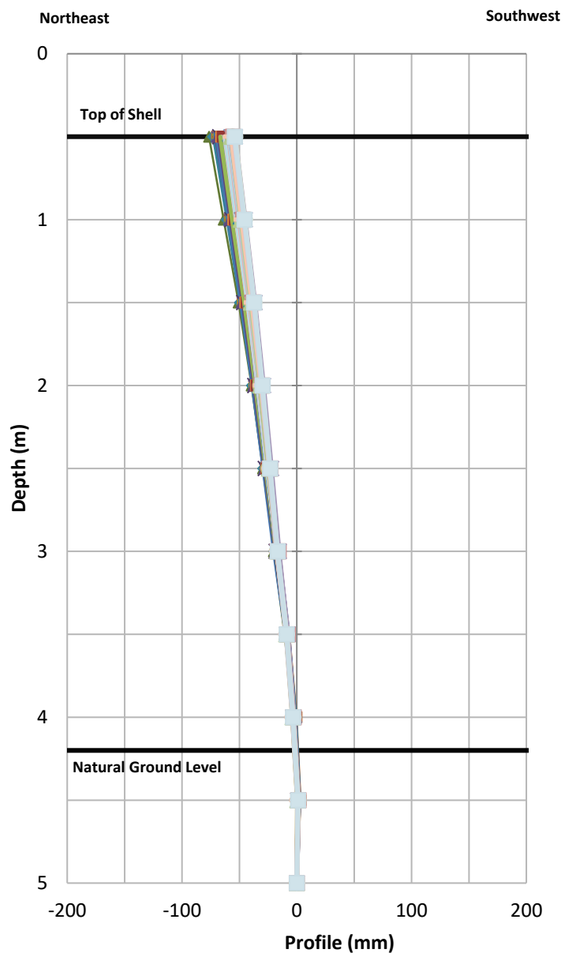
Notes:
1. Manufacture's accuracy is +/- 0.25 mm per location
2. Survey data excluded from the charts is noted on Figure D.1

srk consulting	AGNICO EAGLE	2021 AGI – North Dam
Job No: 1CT022.077 Filename: App_D_Inclinometers.pptx	DORIS TIA	**Inclinometer 120-2A Velocity Time Series**
		Date: Oct. 2021 / Approved: PDL / Figure: **D.21**

Profile Perpendicular to Centerline



Profile Parallel to Centerline



LEGEND:

- Initial Reading (9/8/2012)
- 2013-07-26
- 2014-05-20
- 2014-06-18
- 2014-07-06
- 2014-07-12
- 2014-08-08
- 2014-09-01
- 2014-10-01
- 2015-02-02
- 2015-03-21
- 2015-04-20
- 2015-05-20
- 2015-06-26
- 2015-07-09
- 2015-08-02
- 2015-08-28
- 2015-09-04
- 2015-10-09
- 2015-11-25
- 2015-12-30
- 2016-02-08
- 2016-03-07
- 2016-04-11
- 2016-07-02
- 2016-08-14
- 2016-09-25
- 2016-11-26
- 2017-01-03
- 2017-01-26
- 2017-02-23
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- 2017-04-15
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- 2017-06-25
- 2017-07-16
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- 2017-09-14
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- 2018-02-17
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- 2018-05-19
- 2018-06-08
- 2018-07-07
- 2018-08-03
- 2018-09-29
- 2018-10-21
- 2018-11-10
- 2019-01-01
- 2019-01-25
- 2019-04-15
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- 2019-07-27
- 2019-08-25
- 2019-09-28
- 2019-10-26
- 2019-11-24
- 2020-01-20
- 2020-02-18
- 2020-03-12
- 2020-06-06
- 2020-07-12
- 2020-08-08
- 2020-09-11
- 2020-10-20
- 2020-11-19
- 2020-12-23
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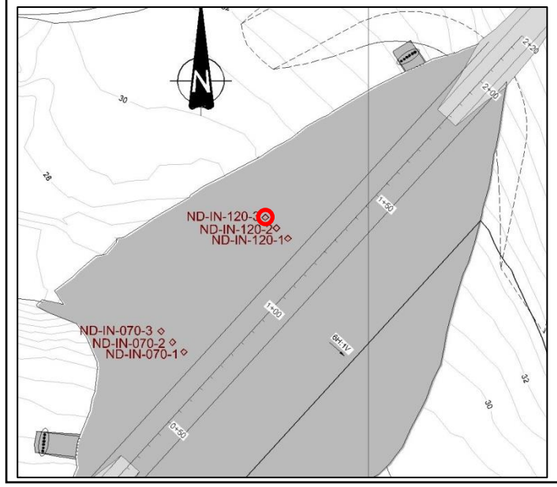
- 2021-09-04
- 2021-10-03

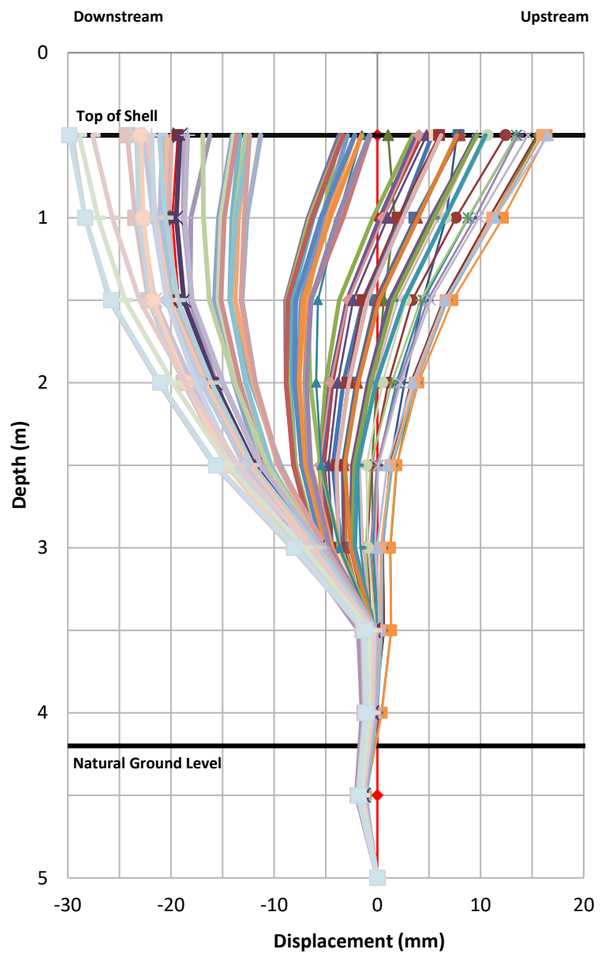


Notes:

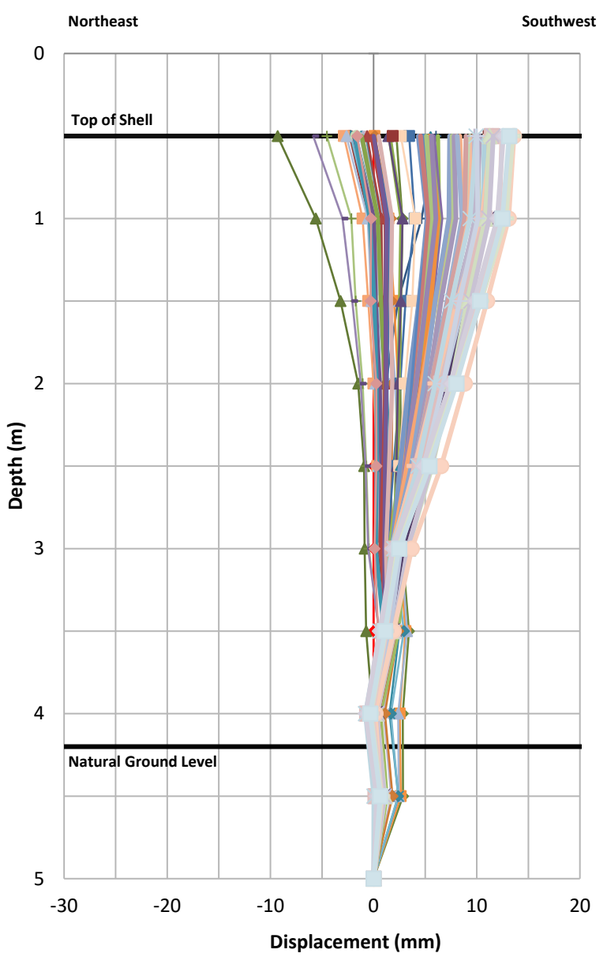
1. Manufacture's accuracy is +/- 0.25 mm per location
2. Survey data excluded from the charts is noted on Figure D.1

srk consulting	AGNICO EAGLE	2021 AGI – North Dam
Job No: 1CT022.077 Filename: App_D_Inclinometers.pptx	DORIS TIA	**Inclinometer 120-3 Profiles** Date: Oct. 2021 | Approved: PDL | Figure: **D.22**

Displacement Perpendicular to Centerline



Displacement Parallel to Centerline



LEGEND:

- Initial Reading (9/8/2012)
- 2013-07-26
- 2014-05-20
- 2014-06-18
- 2014-07-06
- 2014-07-12
- 2014-08-08
- 2014-09-01
- 2014-10-01
- 2015-02-02
- 2015-03-21
- 2015-04-20
- 2015-05-20
- 2015-06-26
- 2015-07-09
- 2015-08-02
- 2015-08-28
- 2015-09-04
- 2015-10-09
- 2015-11-25
- 2015-12-30
- 2016-02-08
- 2016-03-07
- 2016-04-11
- 2016-07-02
- 2016-08-14
- 2016-09-25
- 2016-11-26
- 2017-01-03
- 2017-01-26
- 2017-02-23
- 2017-03-23
- 2017-04-15
- 2017-05-20
- 2017-06-25
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- 2017-12-16
- 2018-01-17
- 2018-02-17
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- 2018-07-07
- 2018-08-03
- 2018-09-29
- 2018-10-21
- 2018-11-10
- 2019-01-01
- 2019-01-25
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- 2019-08-25
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- 2019-10-26
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- 2020-02-18
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- 2020-06-06
- 2020-07-12
- 2020-08-08
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- 2020-11-19
- 2020-12-23
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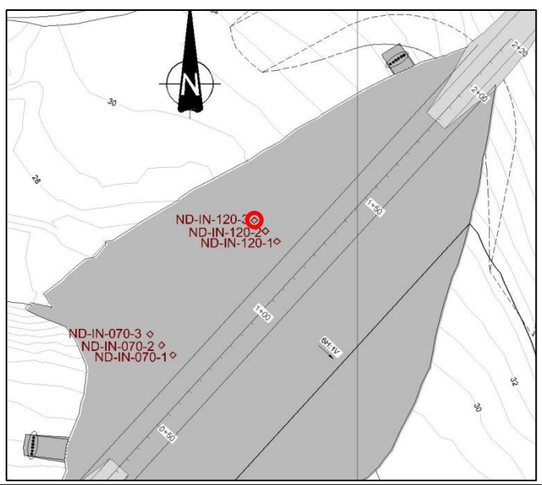
- 2021-09-04
- 2021-10-03

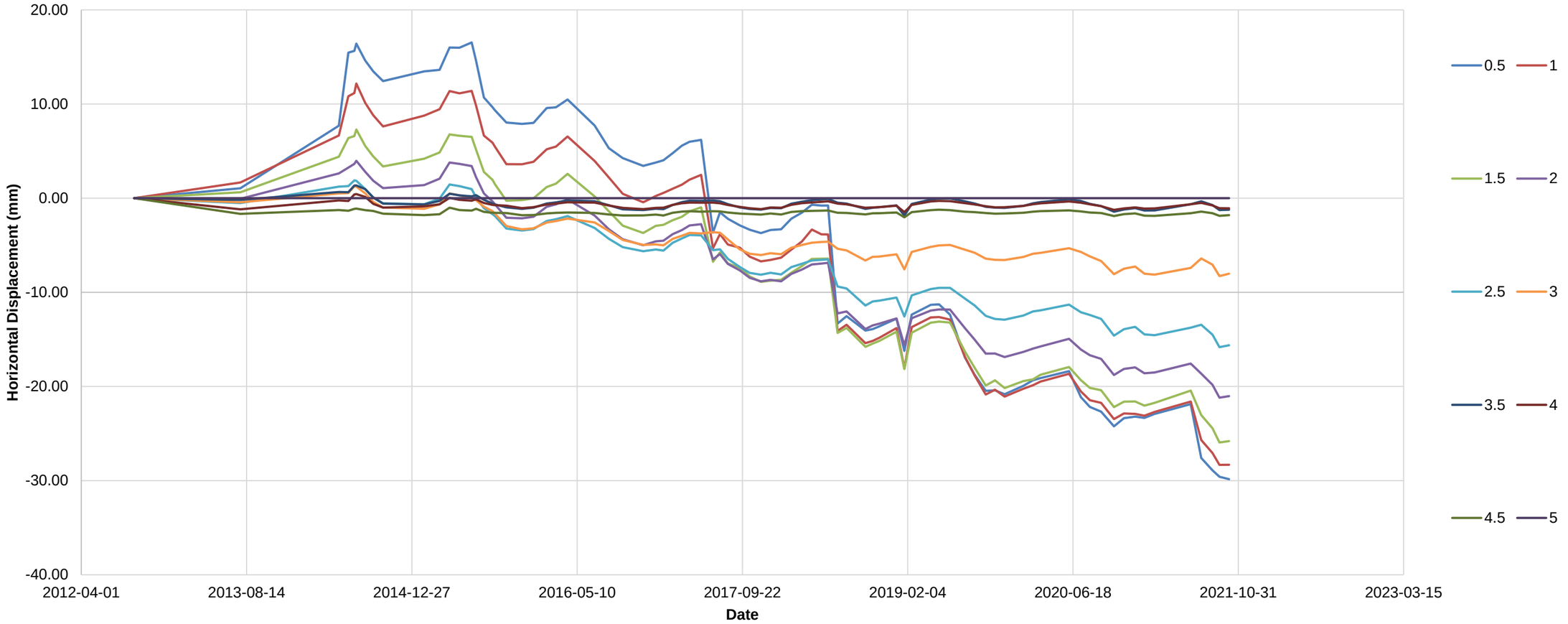


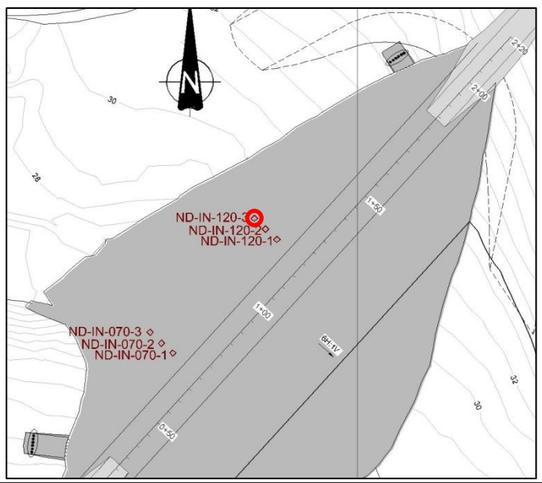
Notes:

1. Manufacture's accuracy is +/- 0.25 mm per location
2. Survey data excluded from the charts is noted on Figure D.1

srk consulting	AGNICO EAGLE	2021 AGI – North Dam
Job No: 1CT022.077 Filename: App_D_Inclinometers.pptx	DORIS TIA	**Inclinometer 120-3 Displacements** Date: Oct. 2021 | Approved: PDL | Figure: **D.23**

Inclinometer 120-3A Timeseries

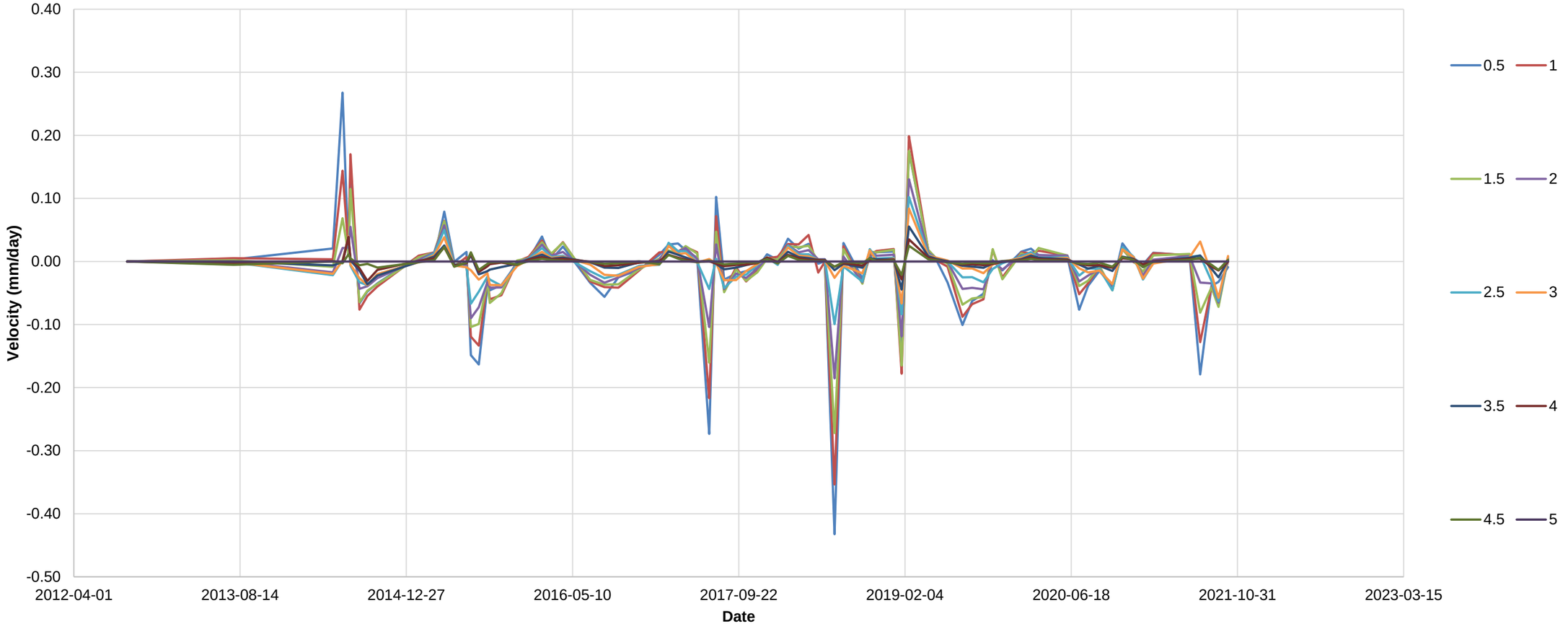


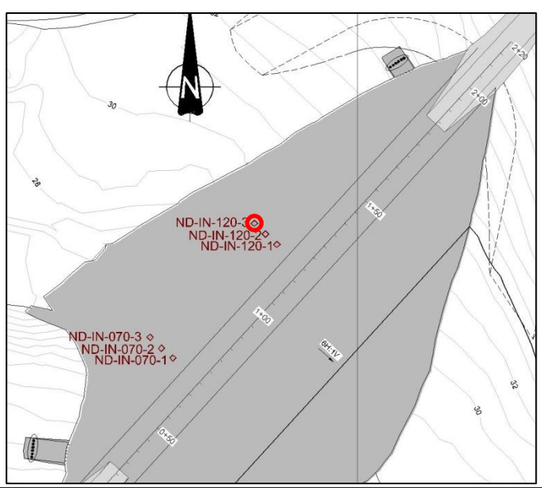


Notes:
1. Manufacture's accuracy is +/- 0.25 mm per location
2. Survey data excluded from the charts is noted on Figure D.1

srk consulting	AGNICO EAGLE	2021 AGI – North Dam
Job No: 1CT022.077 Filename: App_D_Inclinometers.pptx	DORIS TIA	**Inclinometer 120-3A Displacement Time Series**
		Date: Oct. 2021 / Approved: PDL / Figure: **D.24**

Inclinometer 120-3A Velocity Timeseries



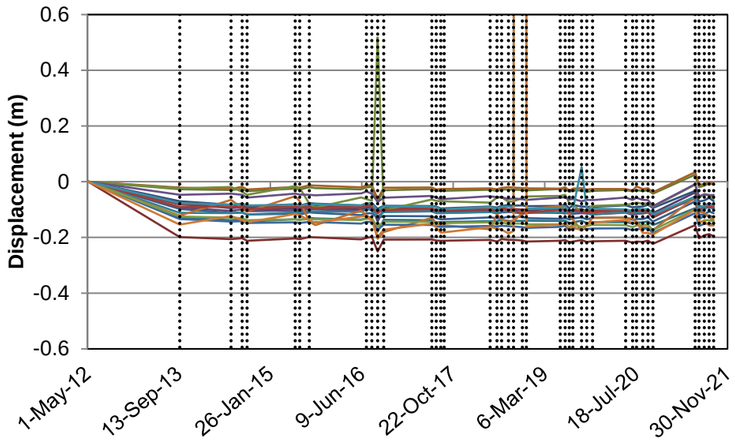


Notes:
1. Manufacture's accuracy is +/- 0.25 mm per location
2. Survey data excluded from the charts is noted on Figure D.1

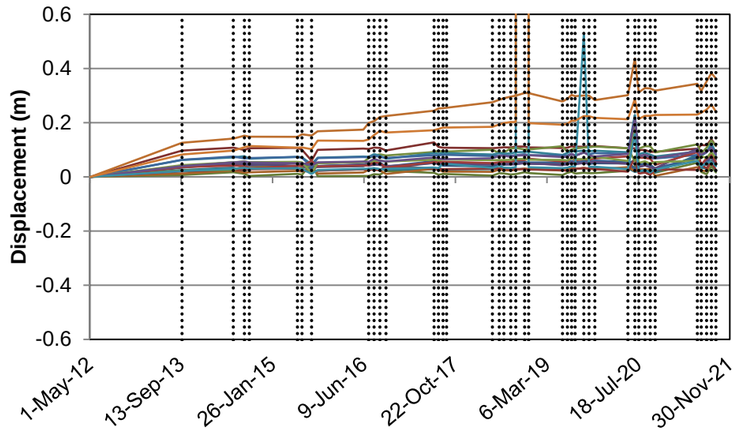
srk consulting	AGNICO EAGLE	2021 AGI – North Dam
Job No: 1CT022.077 Filename: App_D_Inclinometers.pptx	DORIS TIA	**Inclinometer 120-3A Velocity Time Series**
		Date: Oct. 2021 / Approved: PDL / Figure: **D.25**

Appendix E – Survey Monitoring

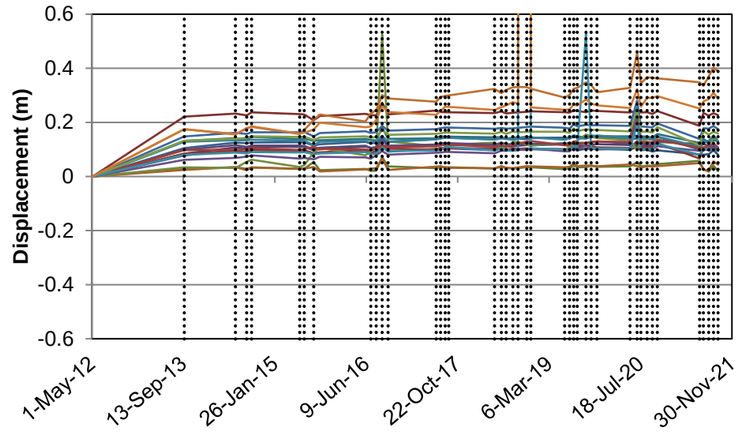
Vertical Displacement



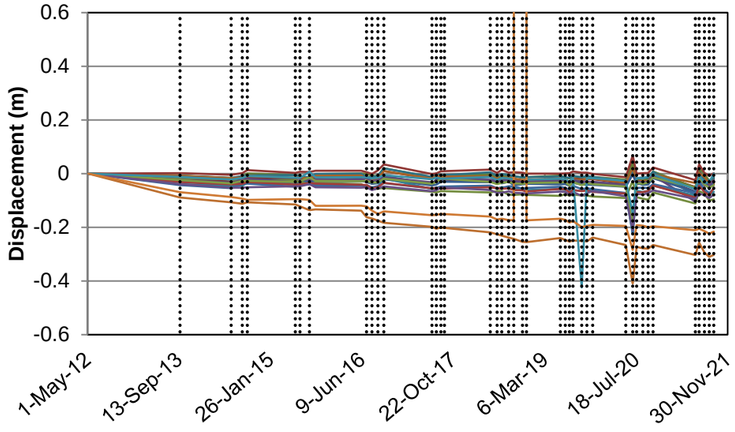
Horizontal Displacement



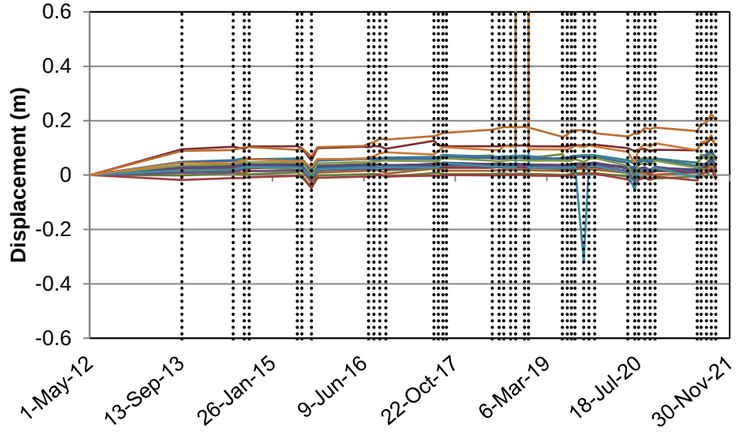
Total Displacement

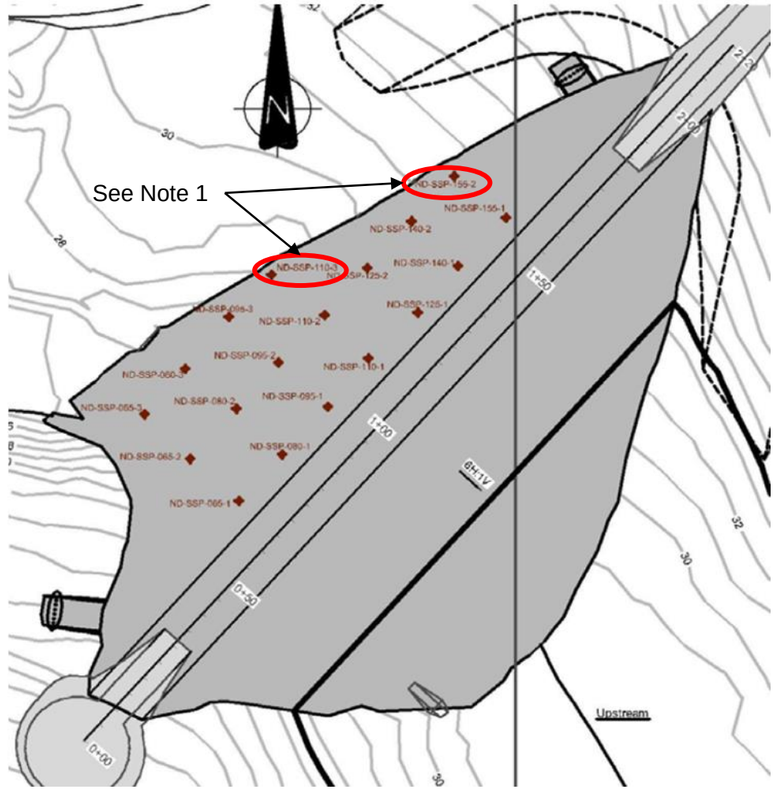


Change in Easting



Change in Northing





LEGEND:

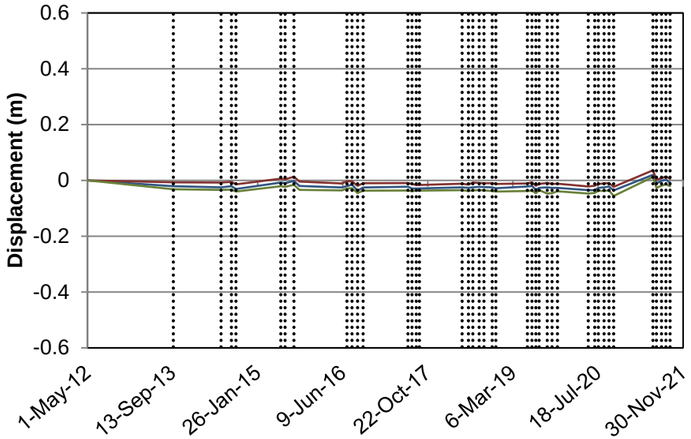
- ND-SSP-065-1
- ND-SSP-065-2
- ND-SSP-065-3
- ND-SSP-080-1
- ND-SSP-080-2
- ND-SSP-080-3
- ND-SSP-095-1
- ND-SSP-095-2
- ND-SSP-095-3
- ND-SSP-110-1
- ND-SSP-110-2
- ND-SSP-110-3
- ND-SSP-125-1
- ND-SSP-125-2
- ND-SSP-140-1
- ND-SSP-140-2
- ND-SSP-155-1
- ND-SSP-155-2
- Survey Date

NOTES:

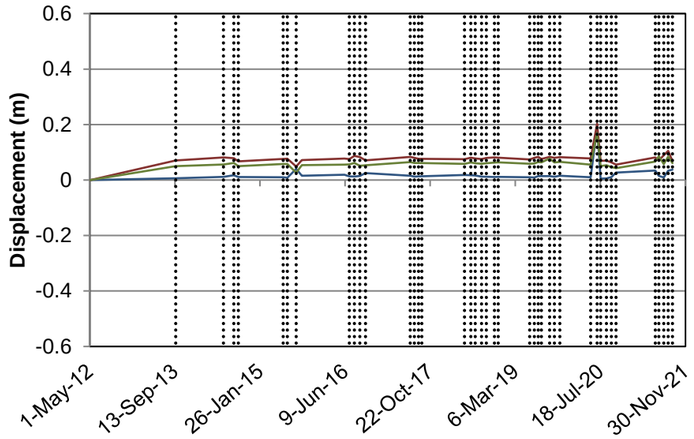
1. The anomalous increased horizontal displacement is observed at ND-SSP-110-3 and ND-SSP-115-2 near the downstream toe.

srk consulting	AGNICO EAGLE	2021 AGI – North Dam
Job No: 1CT022.077 Filename: App_E_SurveyMonitoring.pptx	DORIS TIA	**Surface Survey Monitoring Points Displacement Timeseries**
		Date: Oct. 2021 / Approved: PDL / Figure: **F.1**

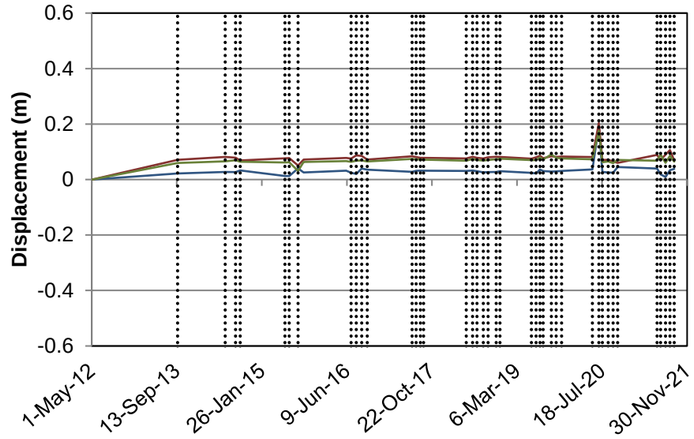
Vertical Displacement



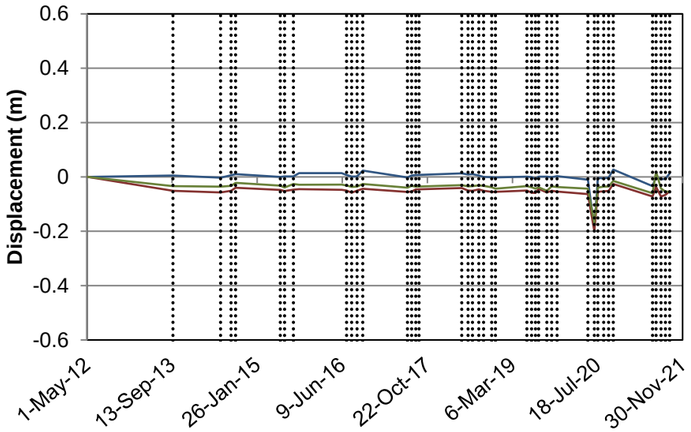
Horizontal Displacement



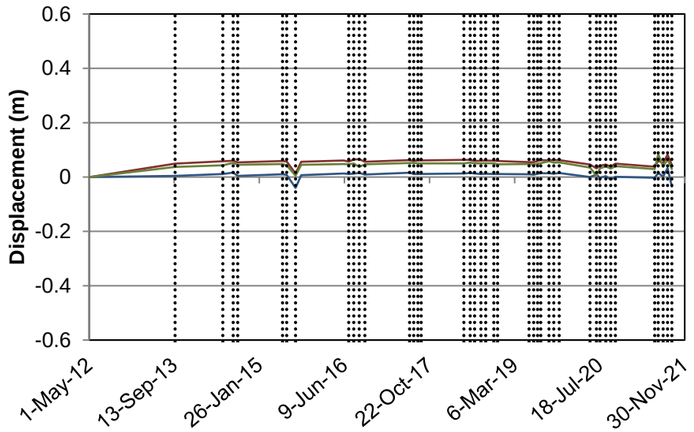
Total Displacement

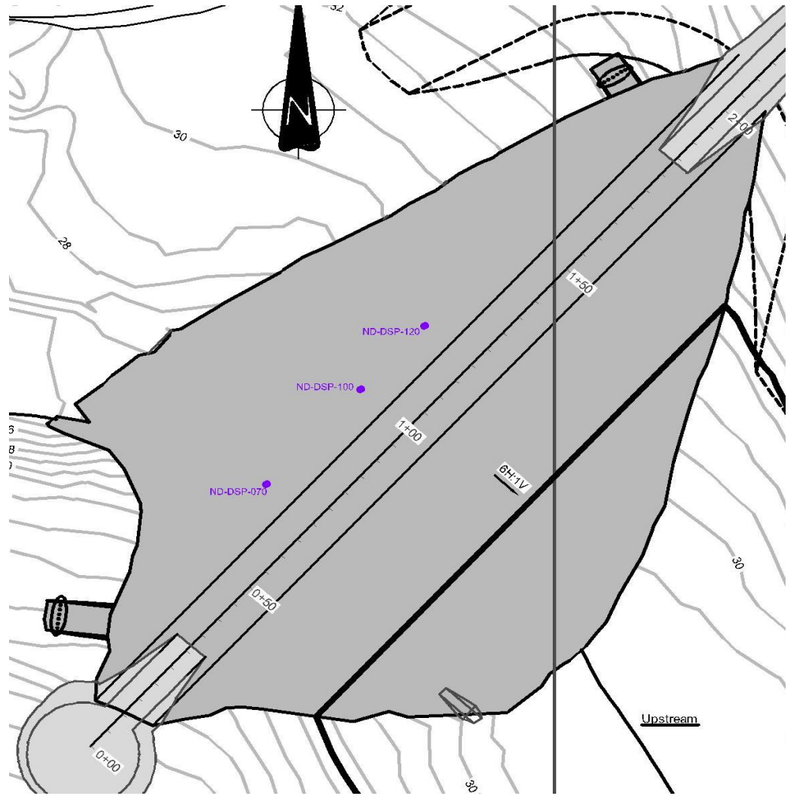


Change in Easting



Change in Northing





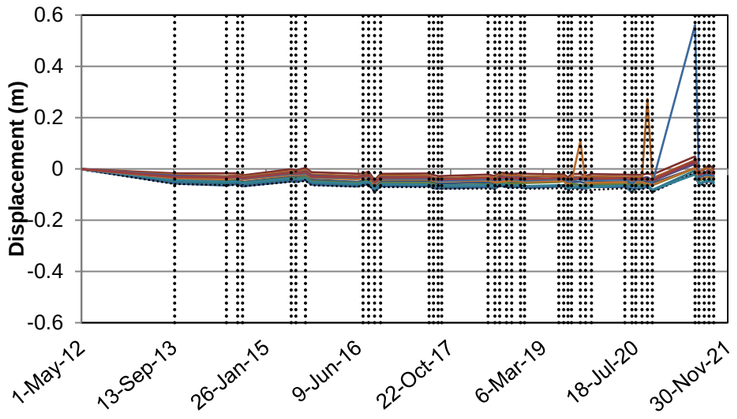
LEGEND:

- ND-DSP-070
- ND-DSP-100
- ND-DSP-120
- Survey Date

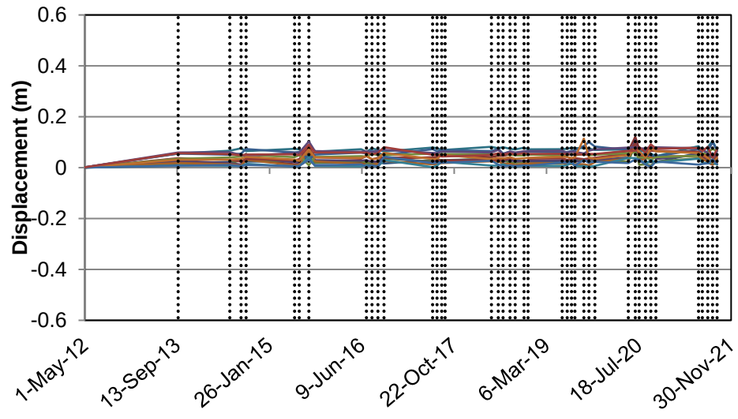
NOTES:

srk consulting	AGNICO EAGLE	2021 AGI – North Dam
Job No: 1CT022.077 Filename: App_E_SurveyMonitoring.pptx	DORIS TIA	**Deep Survey Monitoring Points Displacement Timeseries**
		Date: Oct. 2021 / Approved: PDL / Figure: **F.2**

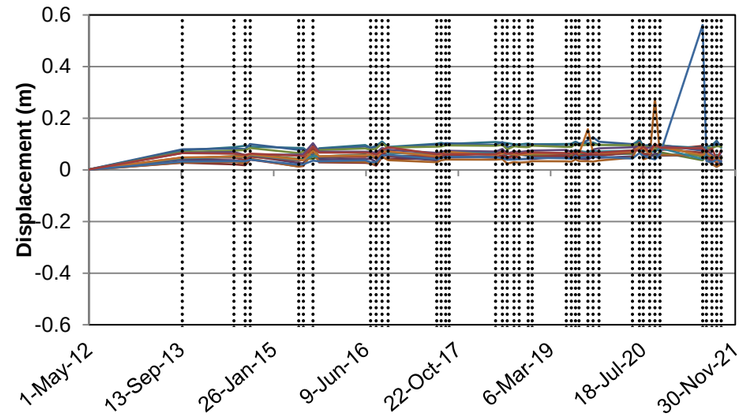
Vertical Displacement



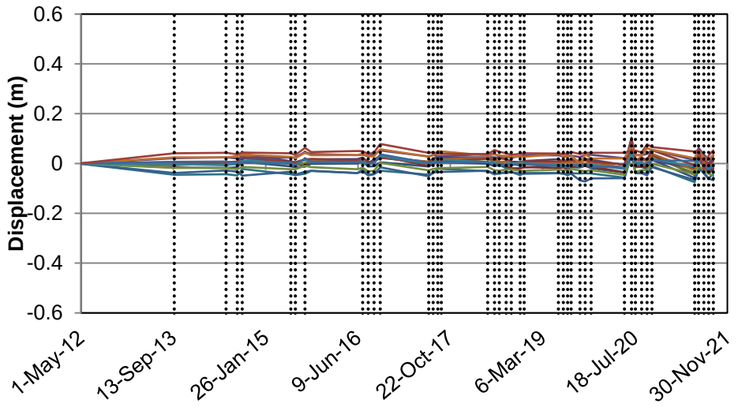
Horizontal Displacement



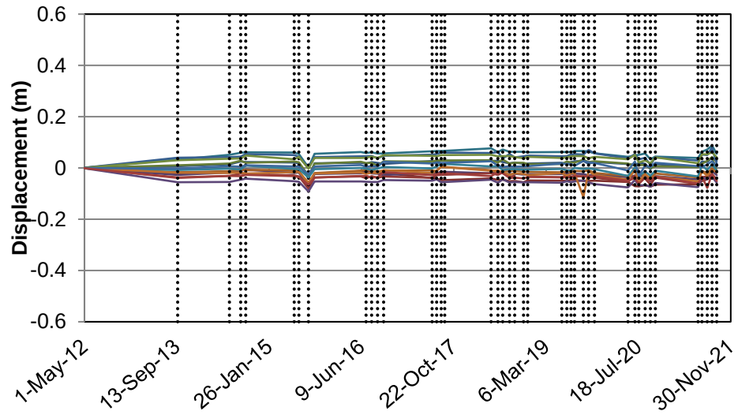
Total Displacement

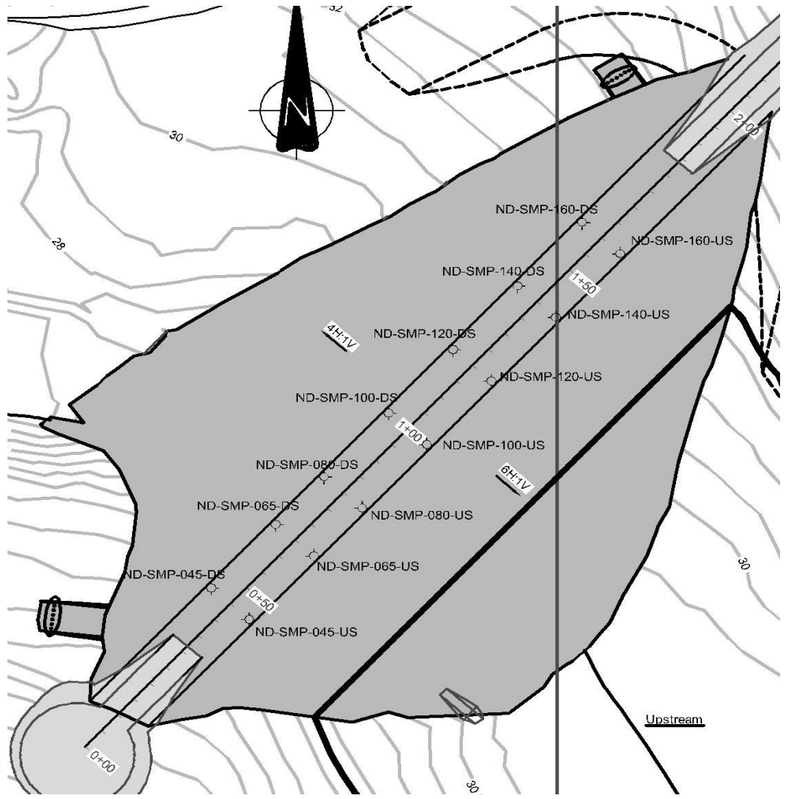


Change in Easting



Change in Northing





LEGEND:

- ND-SMP-045-DS
- ND-SMP-045-US
- ND-SMP-065-DS
- ND-SMP-065-US
- ND-SMP-080-DS
- ND-SMP-080-US
- ND-SMP-100-DS
- ND-SMP-100-US
- ND-SMP-120-DS
- ND-SMP-120-US
- ND-SMP-140-DS
- ND-SMP-140-US
- ND-SMP-160-DS
- ND-SMP-160-US
- Survey Date

NOTES:

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2021 AGI – North Dam

Crest Survey Monitoring Points Displacement Timeseries

Job No: 1CT022.077

Filename: App_E_SurveyMonitoring.pptx

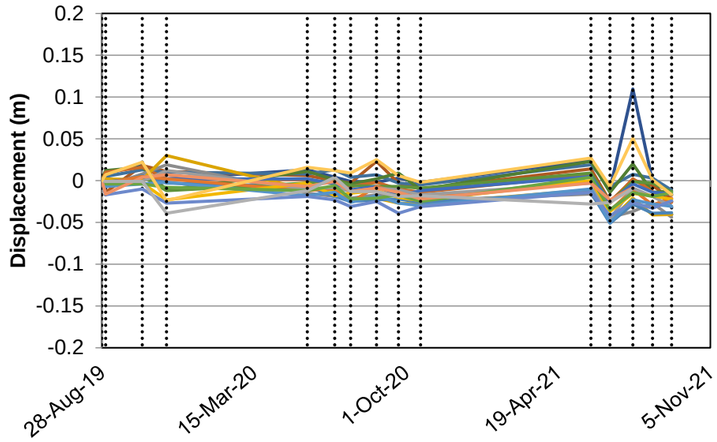
DORIS TIA

Date: Oct. 2021

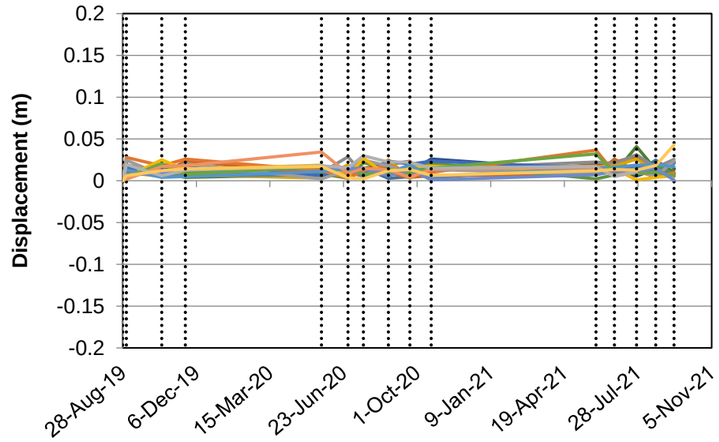
Approved: PDL

Figure: **F.3**

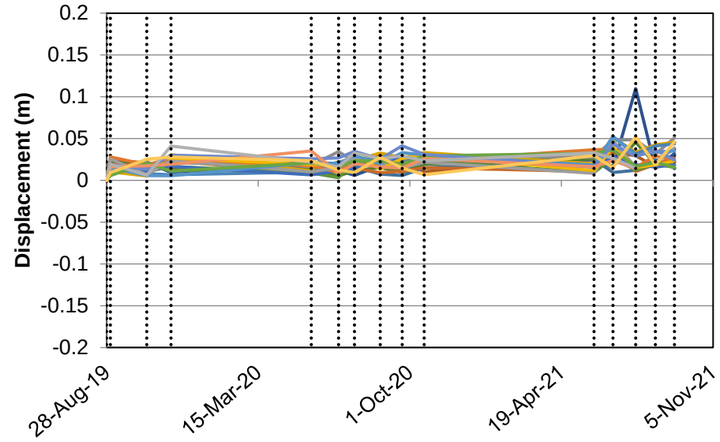
Vertical Displacement



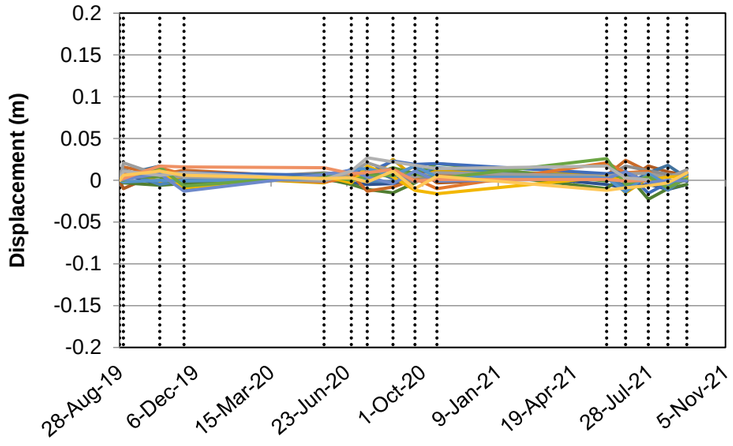
Horizontal Displacement



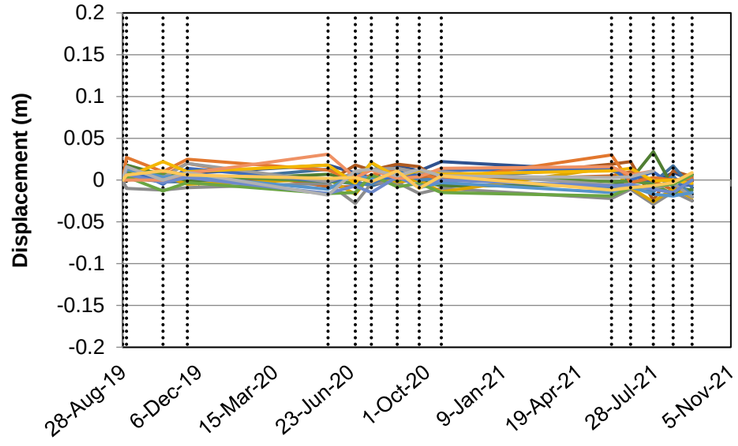
Total Displacement



Change in Easting



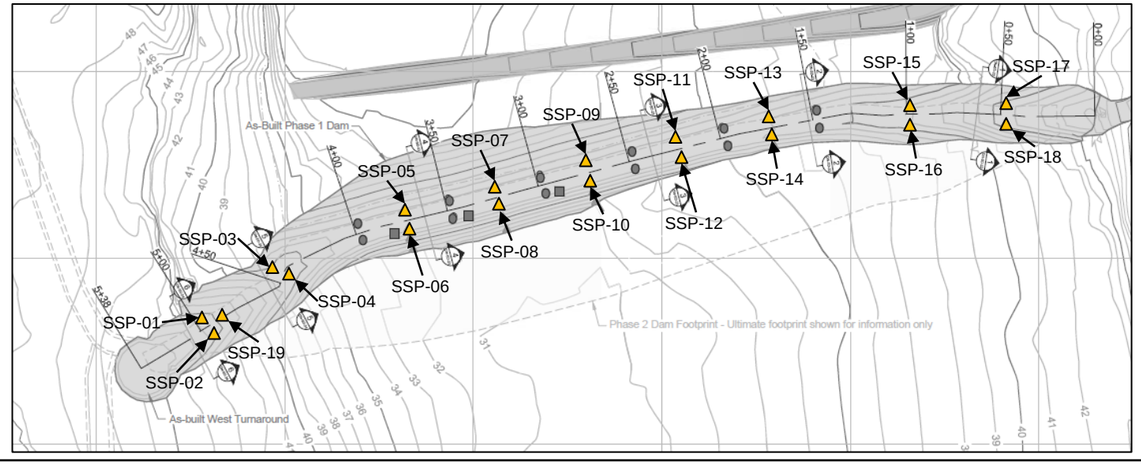
Change in Northing



LEGEND:

- SD-SSP-01
- SD-SSP-02
- SD-SSP-03
- SD-SSP-04
- SD-SSP-05
- SD-SSP-06
- SD-SSP-07
- SD-SSP-08
- SD-SSP-09
- SD-SSP-10
- SD-SSP-11
- SD-SSP-12
- SD-SSP-13
- SD-SSP-14
- SD-SSP-15
- SD-SSP-16
- SD-SSP-17
- SD-SSP-18
- SD-SSP-19

NOTES:



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2021 AGI – South Dam

Surficial Survey Monitoring Points Displacement Timeseries

Job No: 1CT022.077

Filename: App_E_SurveyMonitoring.pptx

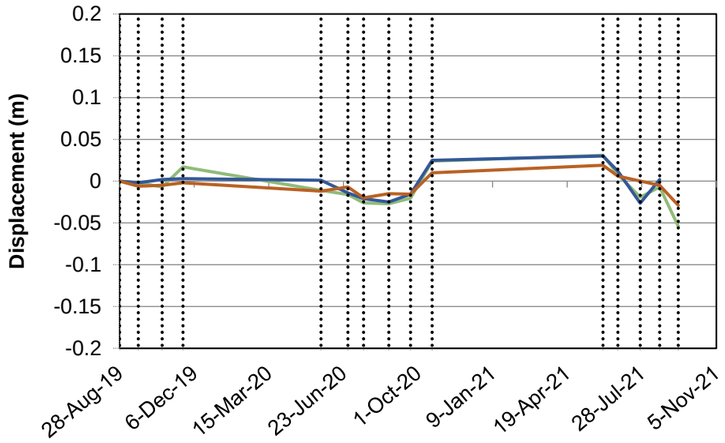
DORIS TIA

Date: Oct. 2021

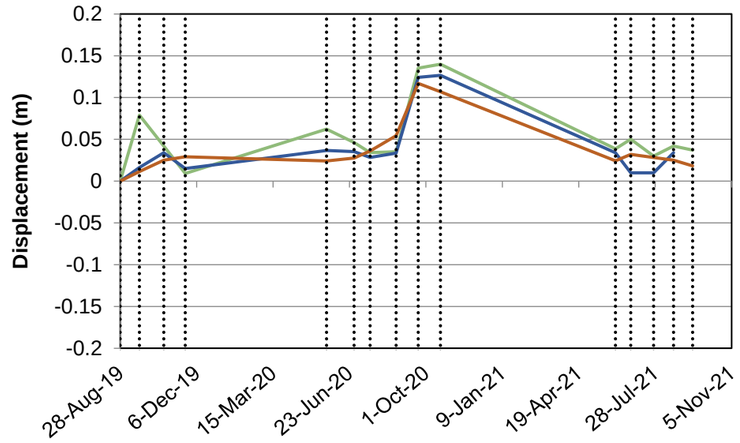
Approved: PDL

Figure: **F.4**

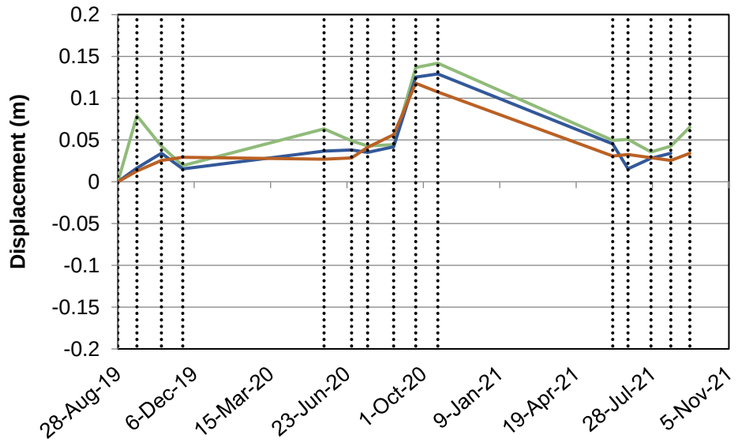
Vertical Displacement



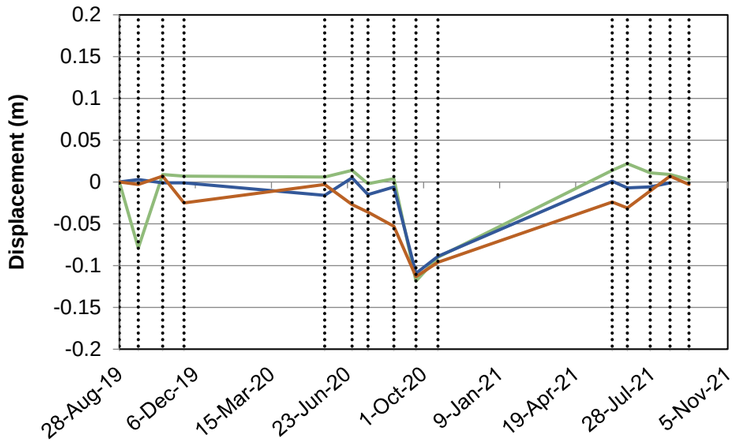
Horizontal Displacement



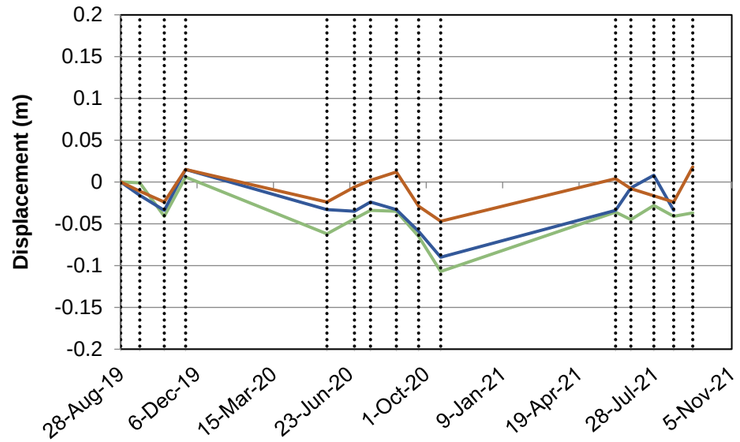
Total Displacement



Change in Easting



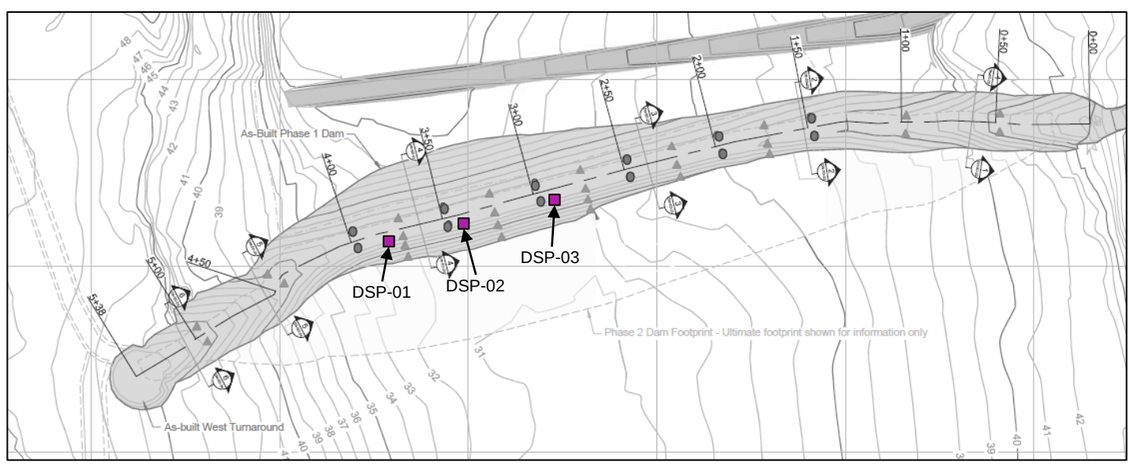
Change in Northing



LEGEND:

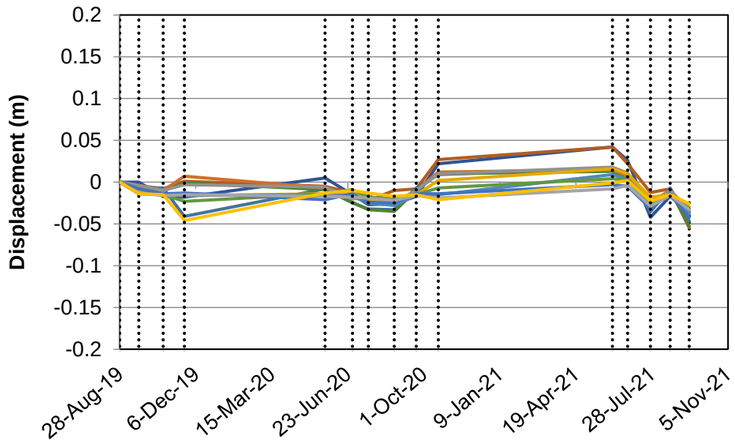
- SD-DSP-01
- SD-DSP-02
- SD-DSP-03

NOTES:

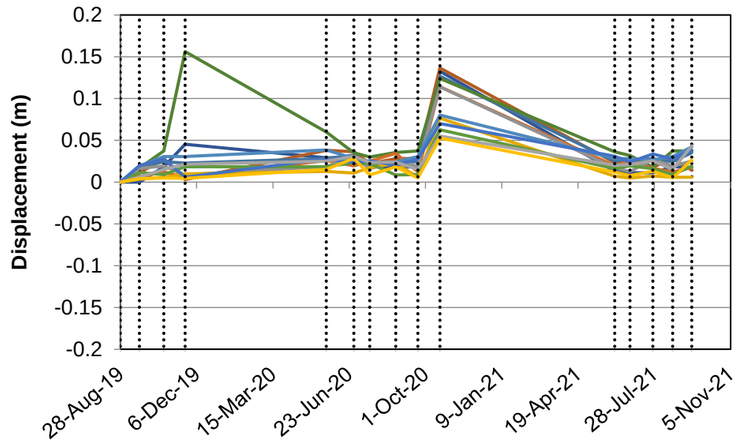


srk consulting	AGNICO EAGLE	2021 AGI – South Dam
Job No: 1CT022.077 Filename: App_E_SurveyMonitoring.pptx	DORIS TIA	**Deep Settlement Points Displacement Timeseries** Date: Oct. 2021 / Approved: PDL / Figure: **F.5**

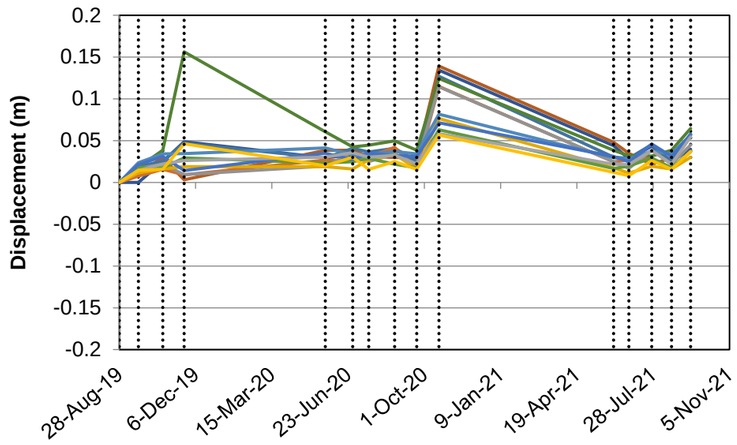
Vertical Displacement



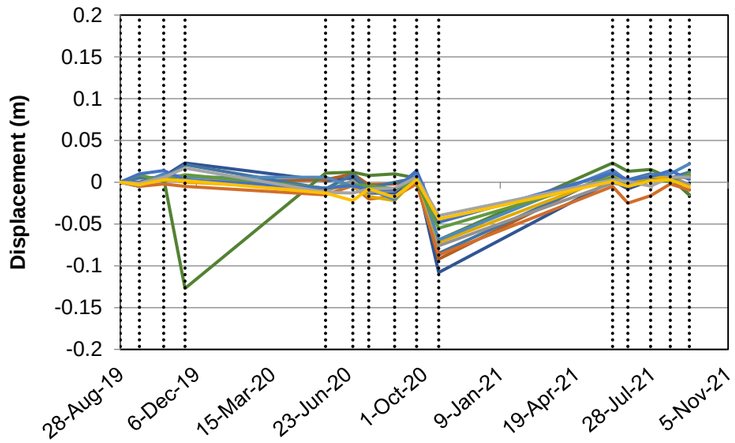
Horizontal Displacement



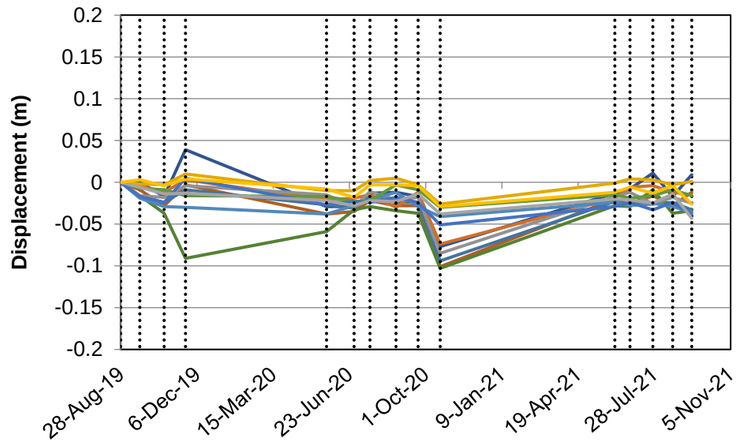
Total Displacement



Change in Easting



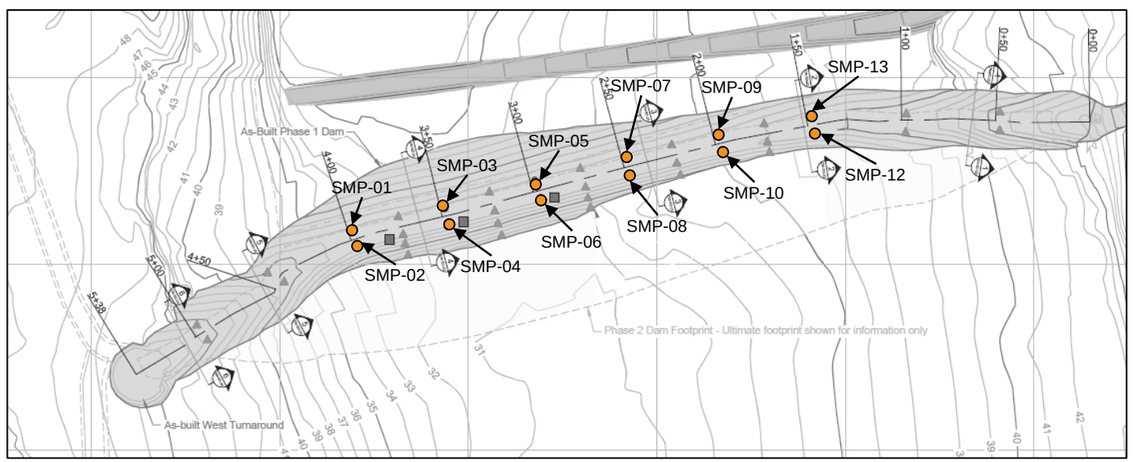
Change in Northing



LEGEND:

- SD-SMP-01
- SD-SMP-02
- SD-SMP-03
- SD-SMP-04
- SD-SMP-05
- SD-SMP-06
- SD-SMP-07
- SD-SMP-08
- SD-SMP-09
- SD-SMP-10
- SD-SMP-11
- SD-SMP-12
- SD-SMP-13

NOTES:



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Job No: 1CT022.077
Filename: App_E_SurveyMonitoring.pptx

AGNICO EAGLE

DORIS TIA

2021 AGI – South Dam

Crest Survey Monitoring Points Displacement Timeseries

Date:	Approved:	Figure:
Oct. 2021	PDL	**F.6**

Appendix F – Visual Inspection (Walk Over)

North Dam Weekly Walkover Survey Report

Date:	Oct 19, 2020
Inspected By:	Brett Kelly
Conditions:	(ie. snow on ground, clear) Overcast, -20 Deg.C

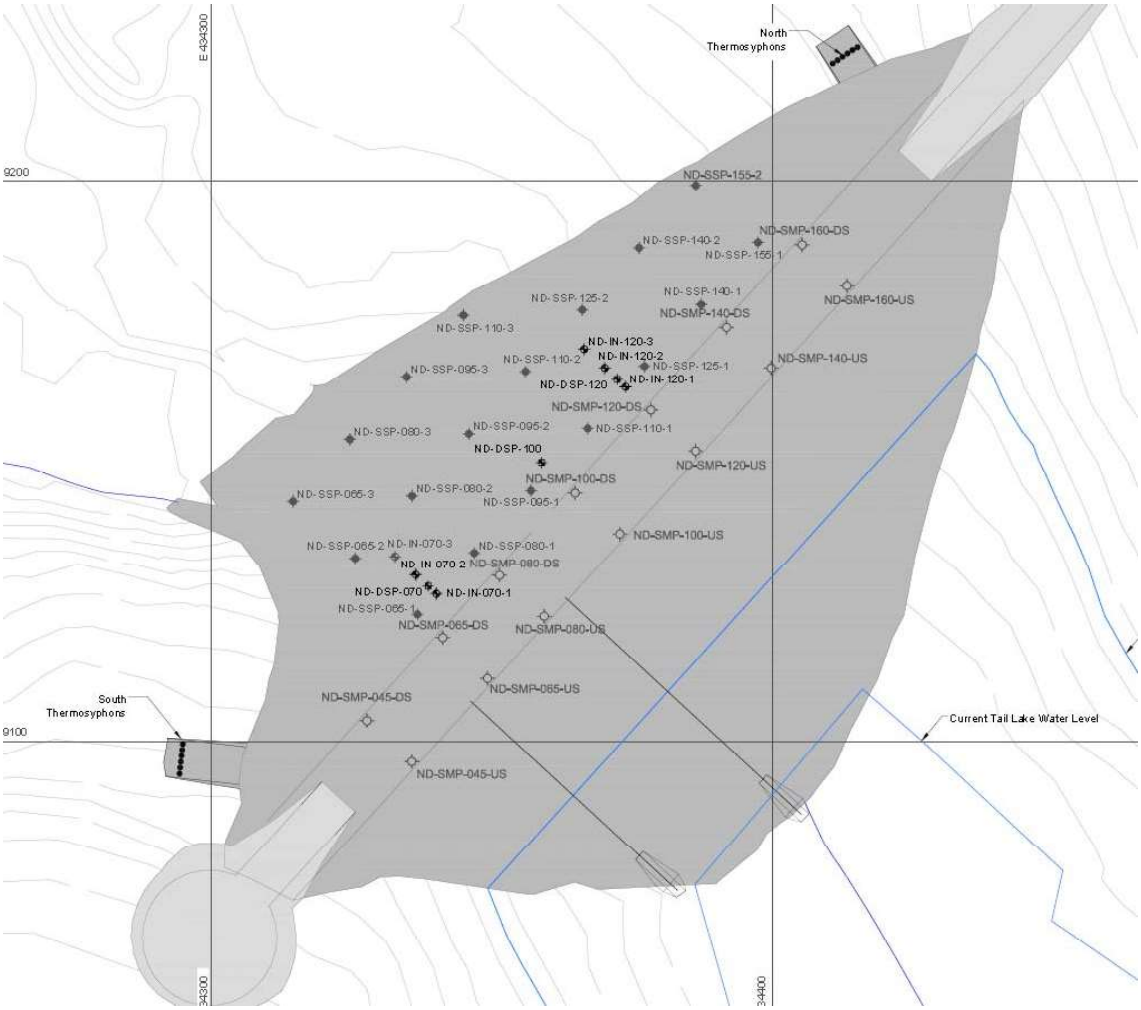
Visual Inspection:

This weekly walkover survey report is a means to track the condition on the North Dam, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	No
Downstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	No
Crest of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	No
Thermosyphons North Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	No
Thermosyphons South Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	No
Instrumentation (on crest and downstream side)		
Any visible concerns? (bent, rusted, cracked, etc.)	Yes	No
Thermistors and Dataloggers		
Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	No
Suspended Sediment in the TIA (When not frozen)		
Any suspended sediment visible in the reclaim pond?	Yes	No
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam?	Yes	No

If you answered yes to any of the questions above please provide details and photos. Observations can be sketched on the figure provided on the next page. If seepage has been noted please estimate the flow.

Please provide any other observations you have made



Photos:

Please collect the following photos:	
Photo from north end looking south along the dam	☐
Photo from south end looking north along the dam	☐
Other photos, please describe.	

North Dam Weekly Walkover Survey Report

Date:	Oct 25, 2020
Inspected By:	Brett Kelly
Conditions:	(ie. snow on ground, clear) Overcast, -16 Deg.C

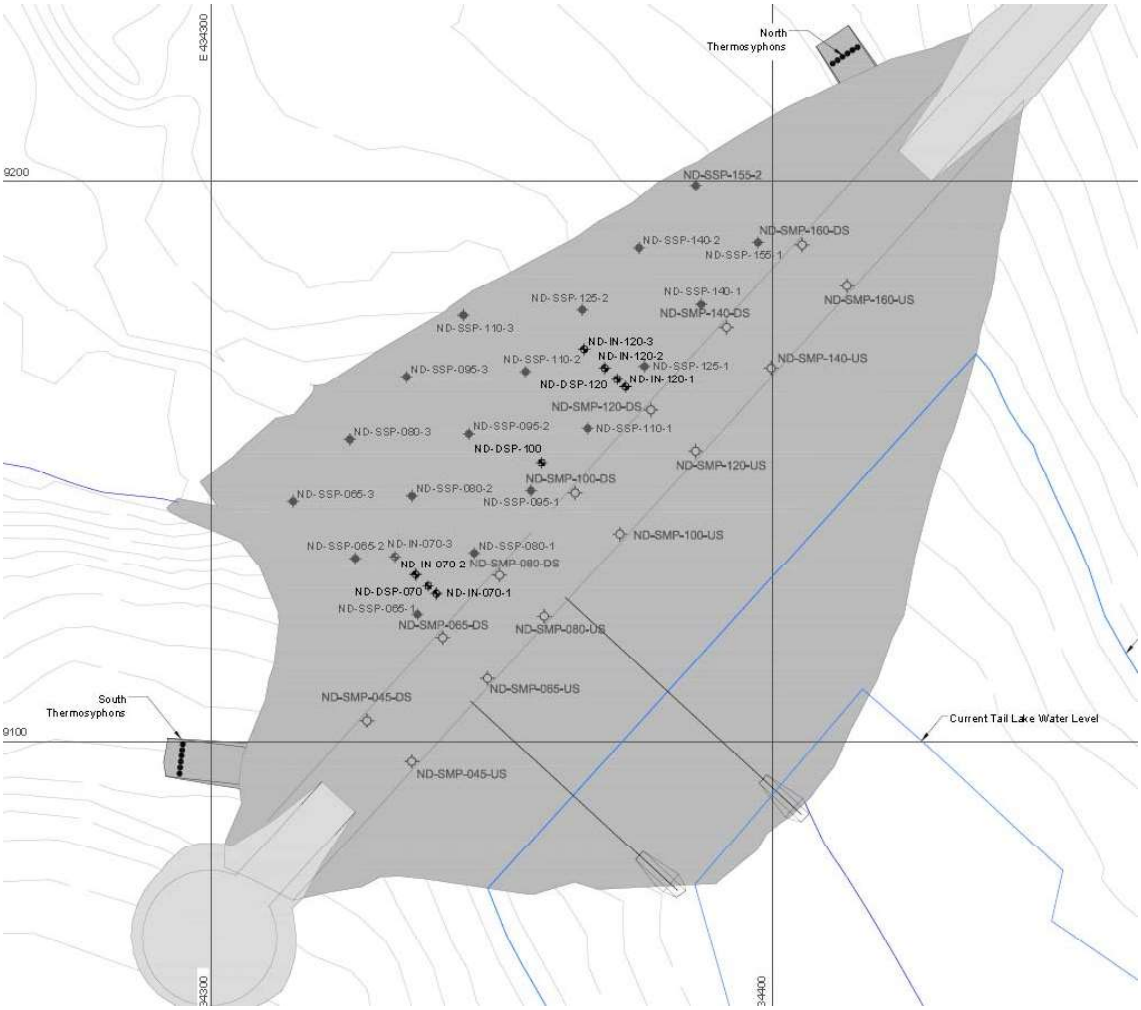
Visual Inspection:

This weekly walkover survey report is a means to track the condition on the North Dam, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	No
Downstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	No
Crest of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	No
Thermosyphons North Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	No
Thermosyphons South Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	No
Instrumentation (on crest and downstream side)		
Any visible concerns? (bent, rusted, cracked, etc.)	Yes	No
Thermistors and Dataloggers		
Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	No
Suspended Sediment in the TIA (When not frozen)		
Any suspended sediment visible in the reclaim pond?	Yes	No
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam?	Yes	No

If you answered yes to any of the questions above please provide details and photos. Observations can be sketched on the figure provided on the next page. If seepage has been noted please estimate the flow.

Please provide any other observations you have made



Photos:

Please collect the following photos:	
Photo from north end looking south along the dam	☐
Photo from south end looking north along the dam	☐
Other photos, please describe.	

North Dam Weekly Walkover Survey Report

Date:	Nov 1, 2020
Inspected By:	Brett Kelly
Conditions:	(ie. snow on ground, clear) Foggy, -26 Deg.C

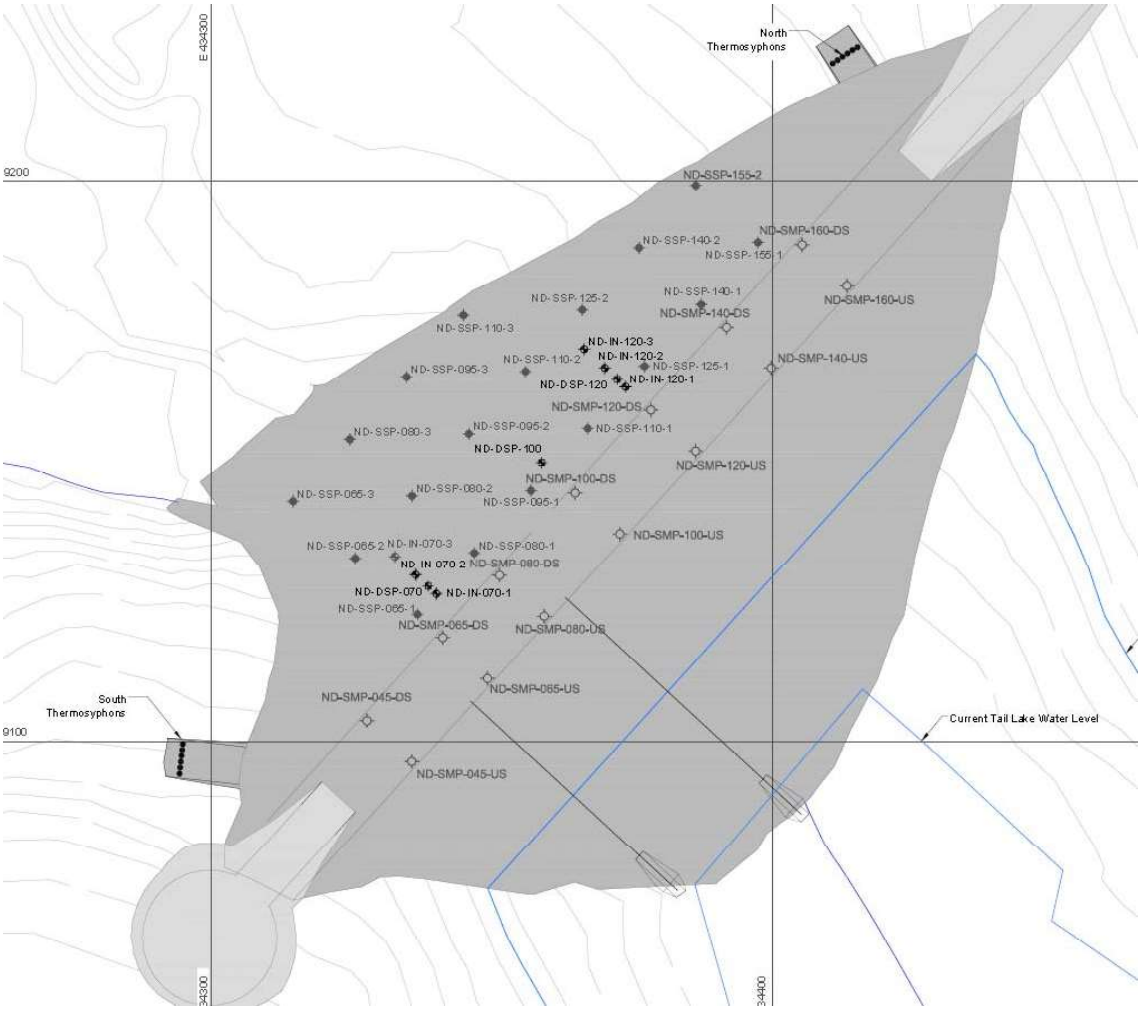
Visual Inspection:

This weekly walkover survey report is a means to track the condition on the North Dam, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	No
Downstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	No
Crest of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	No
Thermosyphons North Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	No
Thermosyphons South Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	No
Instrumentation (on crest and downstream side)		
Any visible concerns? (bent, rusted, cracked, etc.)	Yes	No
Thermistors and Dataloggers		
Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	No
Suspended Sediment in the TIA (When not frozen)		
Any suspended sediment visible in the reclaim pond?	Yes	No
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam?	Yes	No

If you answered yes to any of the questions above please provide details and photos. Observations can be sketched on the figure provided on the next page. If seepage has been noted please estimate the flow.

Please provide any other observations you have made



Photos:

Please collect the following photos:	
Photo from north end looking south along the dam	☐
Photo from south end looking north along the dam	☐
Other photos, please describe.	

North Dam Weekly Walkover Survey Report

Date:	Nov 7 / 2020
Inspected By:	Sarah Wannock
Conditions:	(ie. snow on ground, clear) Snow covered, no wind, clear sky, light flurries in past 24 hrs, ~-20°C

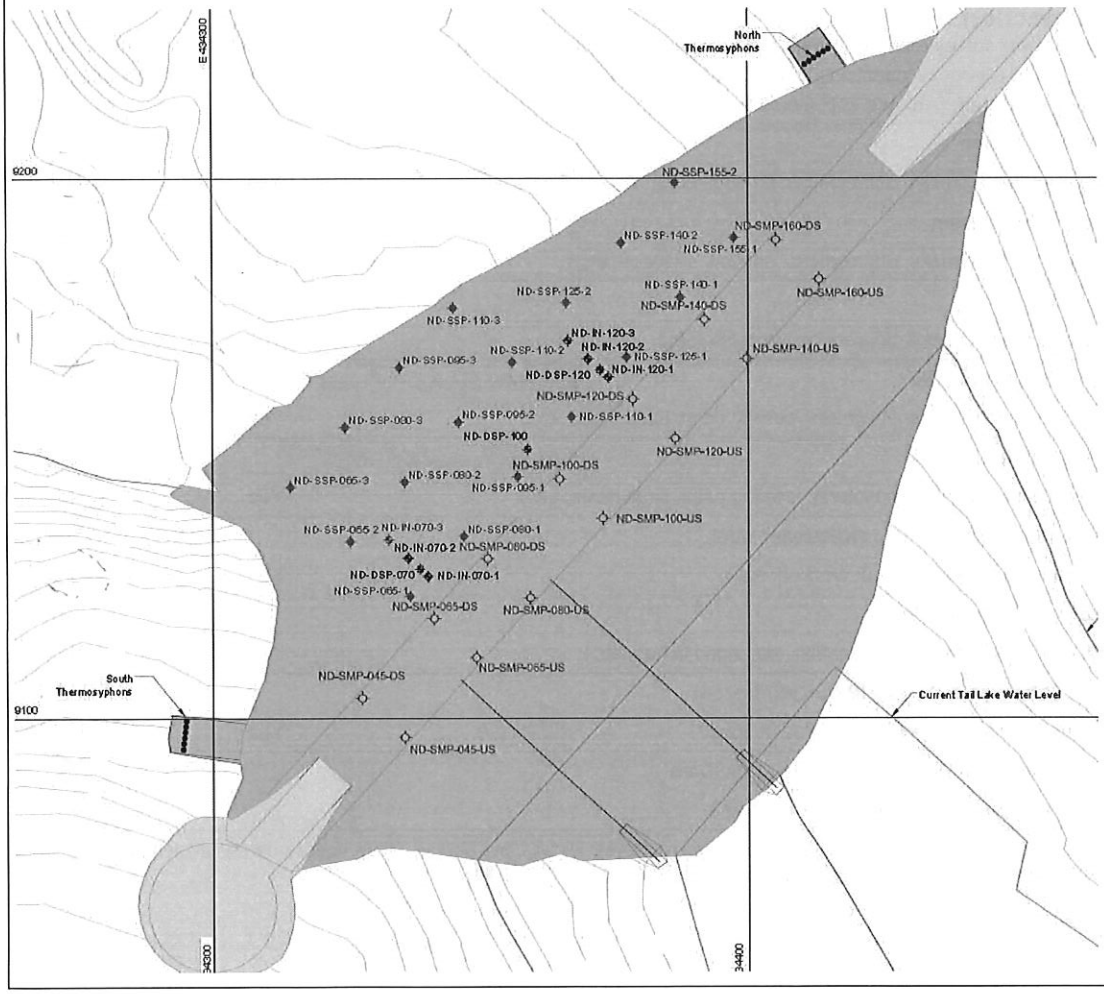
Visual Inspection:

This weekly walkover survey report is a means to track the condition on the North Dam, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.) Snow covered	Yes	(No)
Downstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Thermosyphons North Side previously noted rust		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	No
Thermosyphons South Side previously noted rust		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Instrumentation (on crest and downstream side)		
Any visible concerns? (bent, rusted, cracked, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	(No)
Suspended Sediment in the TIA (When not frozen)		
Any suspended sediment visible in the reclaim pond? Frozen	Yes	(No)
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam?	Yes	(No)

If you answered yes to any of the questions above please provide details and photos. Observations can be sketched on the figure provided on the next page. If seepage has been noted please estimate the flow.

Please provide any other observations you have made



Photos:

Please collect the following photos: Photo from north end looking south along the dam Photo from south end looking north along the dam	☑ ☑
Other photos, please describe.	

North Dam Weekly Walkover Survey Report

Date:	Nov 15/2020
Inspected By:	Sarah Wamock
Conditions:	(ie. snow on ground, clear) snow on ground, high winds, blowing snow

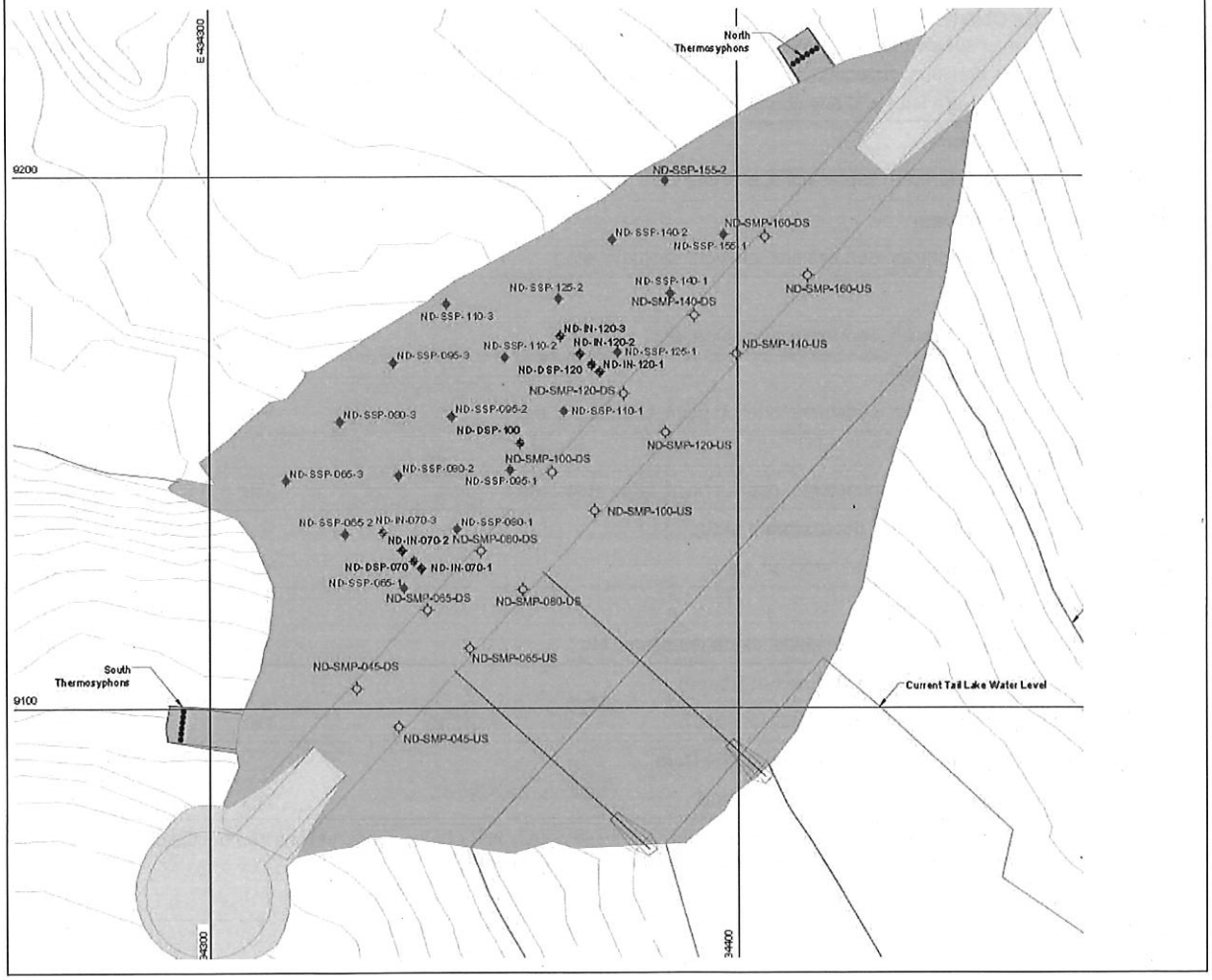
Visual Inspection:

This weekly walkover survey report is a means to track the condition on the North Dam, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam Any visible concerns? (cracks, depressions, erosion, etc.) Snow covered	Yes	(No)
Downstream Side of Dam Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Thermosyphons North Side Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.) rust noted previously	Yes	(No)
Thermosyphons South Side Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.) rust noted previously	Yes	(No)
Instrumentation (on crest and downstream side) Any visible concerns? (bent, rusted, cracked, etc.)	Yes	(No)
Thermistors and Dataloggers Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	(No)
Suspended Sediment in the TIA (When not frozen) Any suspended sediment visible in the reclaim pond? NA - Frozen	Yes	No
Water at the Toe of the Downstream Side of the Dam Is water visible on the downstream side of the dam? NA - Frozen.	Yes	No

If you answered yes to any of the questions above please provide details and photos. Observations can be sketched on the figure provided on the next page. If seepage has been noted please estimate the flow.

Please provide any other observations you have made



Photos:

Please collect the following photos: Photo from north end looking south along the dam Photo from south end looking north along the dam	☑ ☑
Other photos, please describe.	

North Dam Weekly Walkover Survey Report

Date:	Nov 21 / 2020
Inspected By:	Sarah Warnock
Conditions:	(ie. snow on ground, clear) Snow on ground

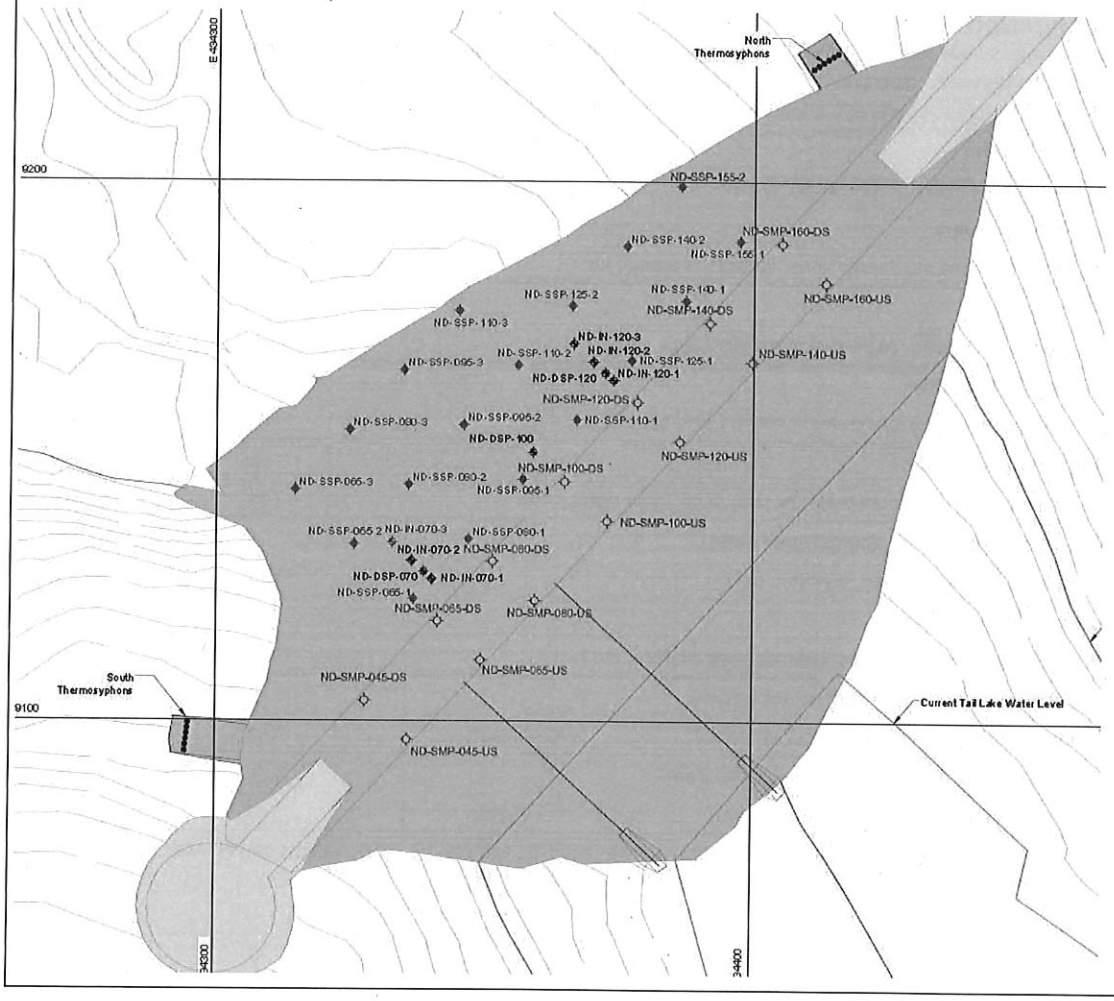
Visual Inspection:

This weekly walkover survey report is a means to track the condition on the North Dam, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam			
Any visible concerns? (cracks, depressions, erosion, etc.)	Snow covered	Yes	(No)
Downstream Side of Dam			
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)		Yes	(No)
Crest of Dam			
Any visible concerns? (cracks, depressions, erosion, etc.)		Yes	(No)
Thermosyphons North Side			
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)		Yes	(No)
Thermosyphons South Side			
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)		Yes	(No)
Instrumentation (on crest and downstream side)			
Any visible concerns? (bent, rusted, cracked, etc.)		Yes	(No)
Thermistors and Dataloggers			
Any visible concerns? (frayed or cut cables, damaged boxes, etc.)		Yes	No
Suspended Sediment in the TIA (When not frozen)			
Any suspended sediment visible in the reclaim pond?	Frozen	Yes	(No)
Water at the Toe of the Downstream Side of the Dam			
Is water visible on the downstream side of the dam?	Frozen	Yes	(No)

If you answered yes to any of the questions above please provide details and photos. Observations can be sketched on the figure provided on the next page. If seepage has been noted please estimate the flow.

Please provide any other observations you have made



Photos:

Please collect the following photos:	
Photo from north end looking south along the dam	☑ 1
Photo from south end looking north along the dam	☑ 2
Other photos, please describe.	

North Dam Weekly Walkover Survey Report

Date:	(SW) ~~Aug~~ Dec 19/2020
Inspected By:	Sarah Warnock
Conditions:	(ie. snow on ground, clear) Snow on ground

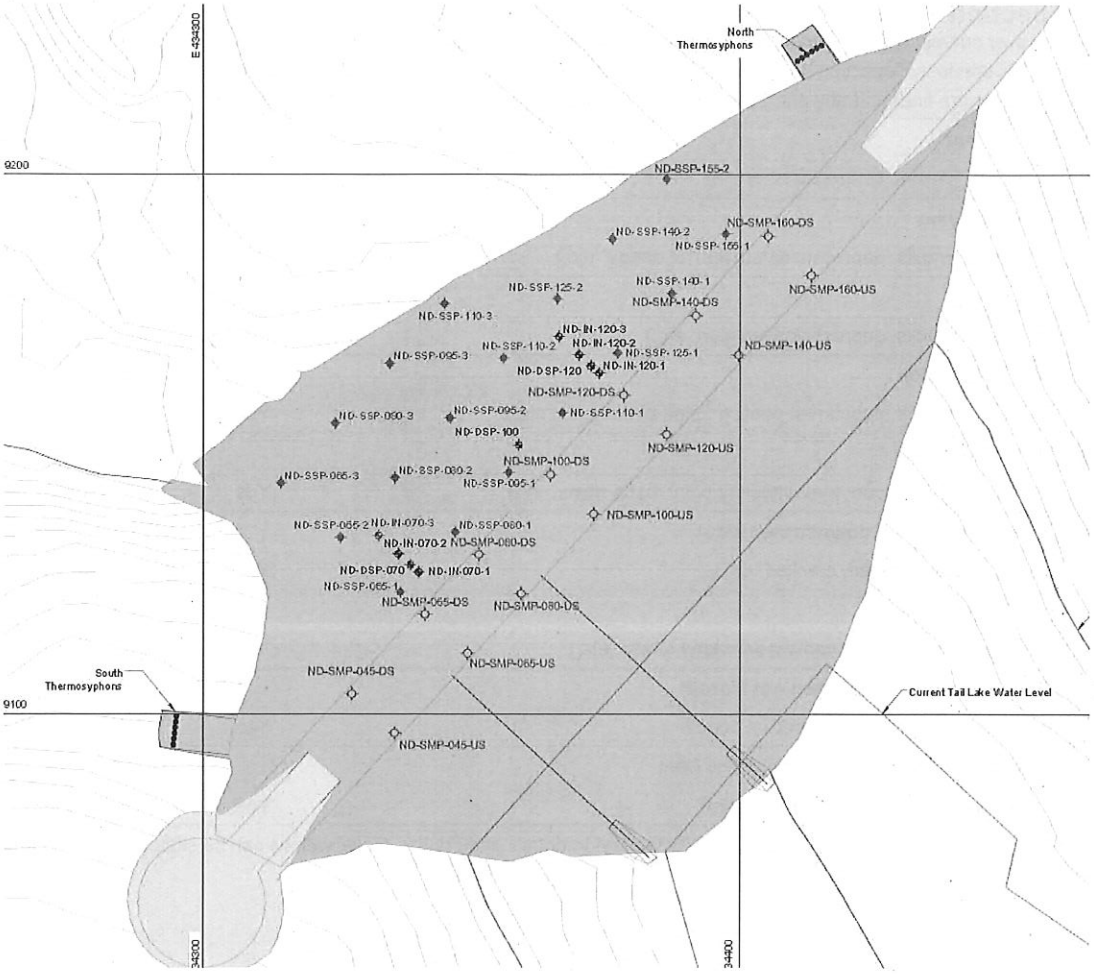
Visual Inspection:

This weekly walkover survey report is a means to track the condition on the North Dam, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam Any visible concerns? (cracks, depressions, erosion, etc.) Snow covered	Yes	(No)
Downstream Side of Dam Any visible concerns? (cracks, depressions, erosion, seepage, etc.) mostly snow covered	Yes	(No)
Crest of Dam Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Thermosyphons North Side Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.) rust previously noted	Yes	(No)
Thermosyphons South Side Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.) rust previously noted	Yes	(No)
Instrumentation (on crest and downstream side) Any visible concerns? (bent, rusted, cracked, etc.)	Yes	(No)
Thermistors and Dataloggers Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	(No)
Suspended Sediment in the TIA (When not frozen) Any suspended sediment visible in the reclaim pond? Frozen	Yes	(No)
Water at the Toe of the Downstream Side of the Dam Is water visible on the downstream side of the dam? Frozen	Yes	(No)

If you answered yes to any of the questions above please provide details and photos. Observations can be sketched on the figure provided on the next page. If seepage has been noted please estimate the flow.

Please provide any other observations you have made



Photos:

Please collect the following photos: Photo from north end looking south along the dam Photo from south end looking north along the dam	✓ ✓
Other photos, please describe. Snow cover on u/s and d/s slopes.	

North Dam Weekly Walkover Survey Report

Date:	Dec 26/2020
Inspected By:	Sarah Warnock
Conditions:	(ie. snow on ground, clear) Snow on ground

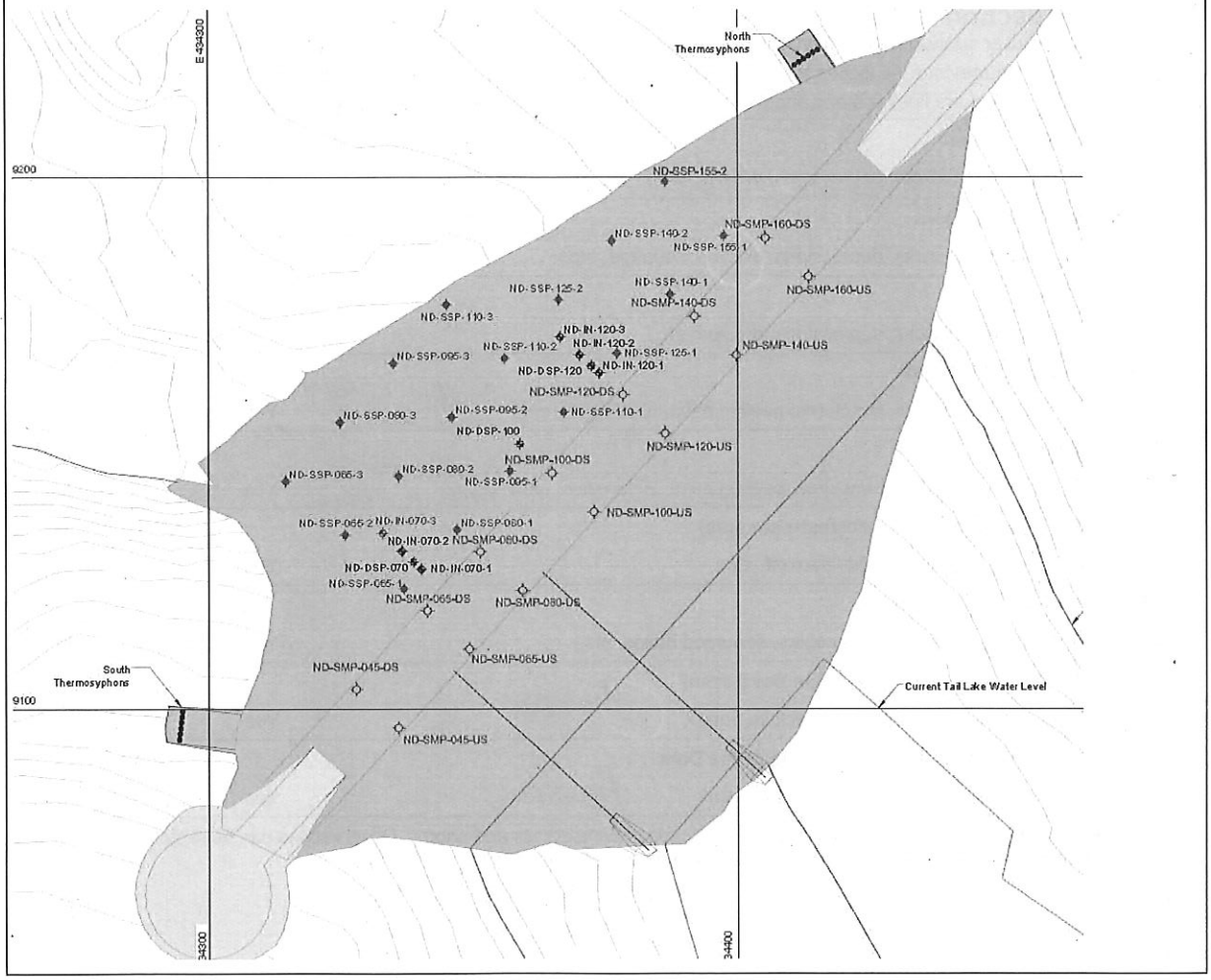
Visual Inspection:

This weekly walkover survey report is a means to track the condition on the North Dam, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Thermosyphons North Side Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.) no new issues rust noted	Yes	(No)
Thermosyphons South Side Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.) no new issues rust on risers.	Yes	(No)
Instrumentation (on crest and downstream side) Any visible concerns? (bent, rusted, cracked, etc.)	Yes	(No)
Thermistors and Dataloggers Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	(No)
Suspended Sediment in the TIA (When not frozen) Any suspended sediment visible in the reclaim pond? frozen	Yes	(No)
Water at the Toe of the Downstream Side of the Dam Is water visible on the downstream side of the dam? frozen	Yes	(No)

If you answered yes to any of the questions above please provide details and photos. Observations can be sketched on the figure provided on the next page. If seepage has been noted please estimate the flow.

Please provide any other observations you have made



Photos:

Please collect the following photos: Photo from north end looking south along the dam Photo from south end looking north along the dam ☑
Other photos, please describe.

North Dam Weekly Walkover Survey Report

Date:	January 2/2021
Inspected By:	Sarah Warnock
Conditions:	(ie. snow on ground, clear) snow on ground

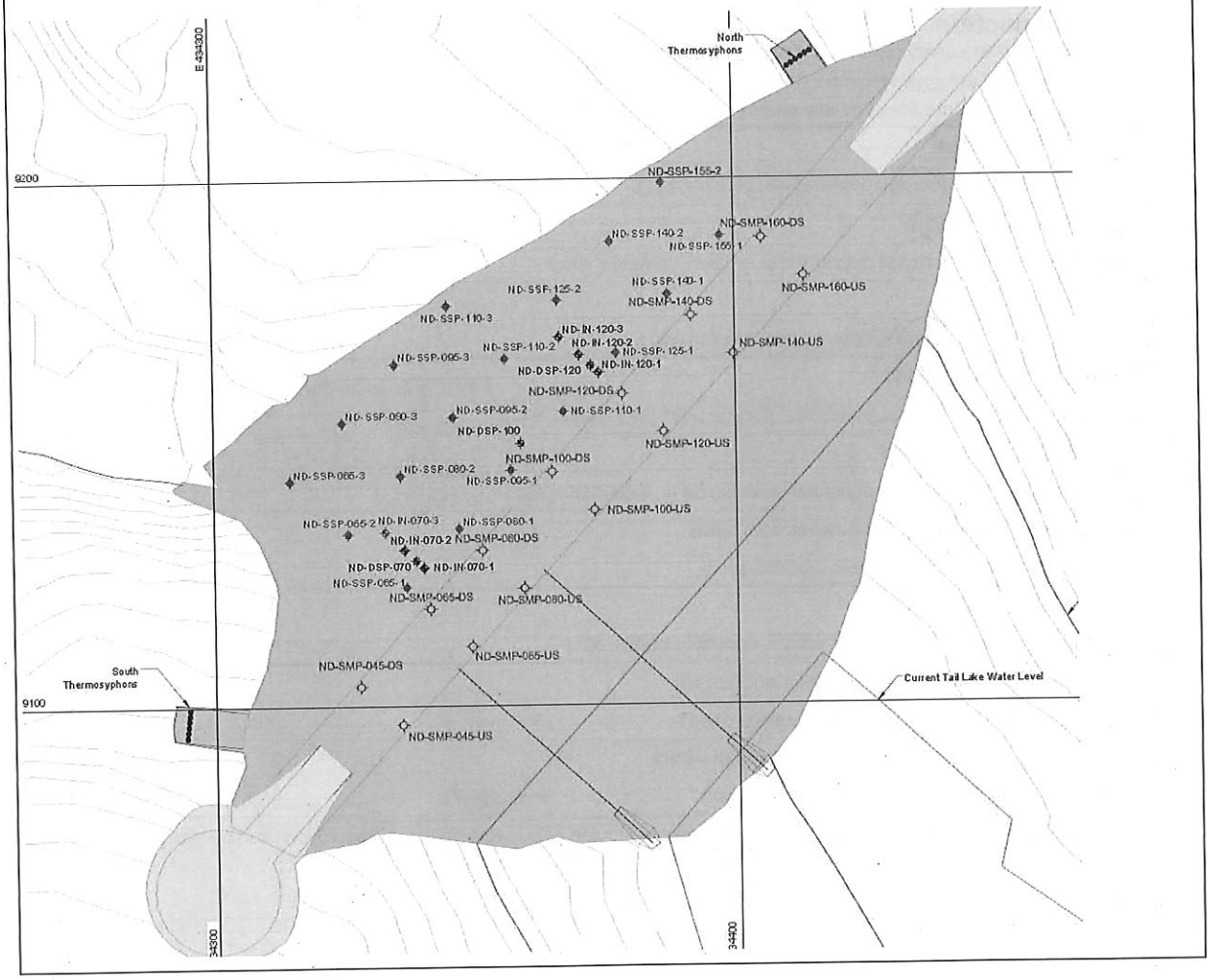
Visual Inspection:

This weekly walkover survey report is a means to track the condition on the North Dam, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Thermosyphons North Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.) rust previously noted	Yes	(No)
Thermosyphons South Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.) rust previously noted	Yes	(No)
Instrumentation (on crest and downstream side)		
Any visible concerns? (bent, rusted, cracked, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	(No)
Suspended Sediment in the TIA (When not frozen)		
Any suspended sediment visible in the reclaim pond? Frozen	Yes	(No)
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam? Frozen	Yes	(No)

If you answered yes to any of the questions above please provide details and photos. Observations can be sketched on the figure provided on the next page. If seepage has been noted please estimate the flow.

Please provide any other observations you have made



Photos:

Please collect the following photos: Photo from north end looking south along the dam Photo from south end looking north along the dam
Other photos, please describe.

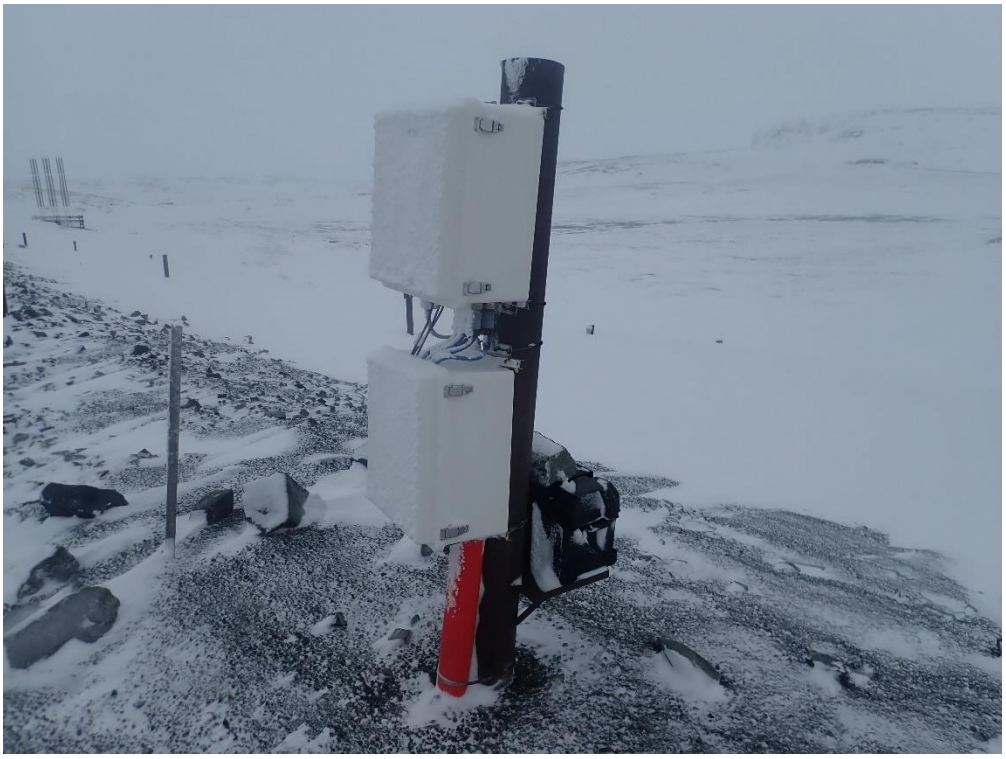
North Dam Weekly Walkover Survey Report

Date:	23 Jan 21
Inspected By:	PJ.
Conditions:	(ie. snow on ground, clear) snow on ground.

Visual Inspection:

This weekly walkover survey report is a means to track the condition on the North Dam, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Thermosyphons North Side Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Thermosyphons South Side Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Instrumentation (on crest and downstream side) Any visible concerns? (bent, rusted, cracked, etc.)	Yes	(No)
Thermistors and Dataloggers Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	(No)
Suspended Sediment in the TIA (When not frozen) Any suspended sediment visible in the reclaim pond? FROZEN	Yes	No
Water at the Toe of the Downstream Side of the Dam Is water visible on the downstream side of the dam?	Yes	(No)
If you answered yes to any of the questions above please provide details and photos. Observations can be sketched on the figure provided on the next page. If seepage has been noted please estimate the flow.		



North Dam Weekly Walkover Survey Report

Date:	5-Feb-2021
Inspected By:	AH/~~A~~SW
Conditions:	(ie. snow on ground, clear) Snow covered/windy.

Visual Inspection:

This weekly walkover survey report is a means to track the condition on the North Dam, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

	Upstream Side of Dam (inside)		
	Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
	Downstream Side of Dam (outside)		
	Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
	Crest of Dam		
	Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
(1)	**Thermosyphons North Side** (East)		
	Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
(2)	**Thermosyphons South Side** (West)		
	Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
	Instrumentation (on crest and downstream side)		
	Any visible concerns? (bent, rusted, cracked, etc.) Stage Intake Sediment	Yes	(No)
	Thermistors and Dataloggers		
	Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	(No)
	Suspended Sediment in the TIA (When not frozen)		
	Any suspended sediment visible in the reclaim pond? N/A	Yes	No
	Water at the Toe of the Downstream Side of the Dam		
	Is water visible on the downstream side of the dam? frozen snow cover	Yes	No

If you answered yes to any of the questions above please provide details and photos. Observations can be sketched on the figure provided on the next page. If seepage has been noted please estimate the flow.

North Dam Weekly Walkover Survey Report

Date:	Feb 12 / 2021 @ 1400hrs
Inspected By:	Andrea Hryniw
Conditions:	(ie. snow on ground, clear) snow cover / -28C

Visual Inspection:

This weekly walkover survey report is a means to track the condition on the North Dam, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.) frozen snow cover	Yes	No
Downstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.) frozen	Yes	No
Crest of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	No
Thermosyphons North Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	No
Thermosyphons South Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	No
Instrumentation (on crest and downstream side)		
Any visible concerns? (bent, rusted, cracked, etc.)	Yes	No
Thermistors and Dataloggers		
Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	No
Suspended Sediment in the TIA (When not frozen)		
Any suspended sediment visible in the reclaim pond? frozen N/A	Yes	No
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam? frozen / snow cover	Yes	No

If you answered yes to any of the questions above please provide details and photos. Observations can be sketched on the figure provided on the next page. If seepage has been noted please estimate the flow.

North Dam Weekly Walkover Survey Report

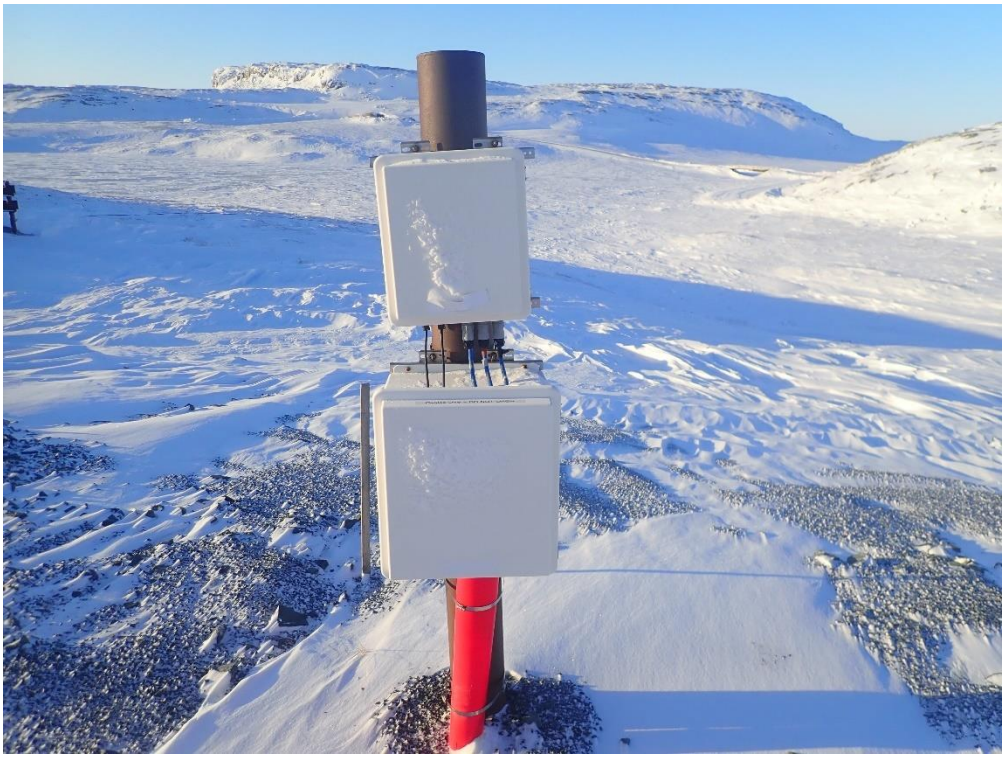
Date:	20 Feb 21
Inspected By:	PJ.
Conditions:	(ie. snow on ground, clear) SNOW ON GROUND, CLEAR SKY, -35°C

Visual Inspection:

This weekly walkover survey report is a means to track the condition on the North Dam, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Thermosyphons North Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Thermosyphons South Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Instrumentation (on crest and downstream side)		
Any visible concerns? (bent, rusted, cracked, etc.)	Yes	(No)
Thermistors and Dataloggers DOWNLOAD OF LOGGERS + SLOPE INDICATORS COMPLETED		
Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	(No)
Suspended Sediment in the TIA (When not frozen)		
Any suspended sediment visible in the reclaim pond?	Yes	No
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam?	Yes	(No)

If you answered yes to any of the questions above please provide details and photos. Observations can be sketched on the figure provided on the next page. If seepage has been noted please estimate the flow.



North Dam Weekly Walkover Survey Report

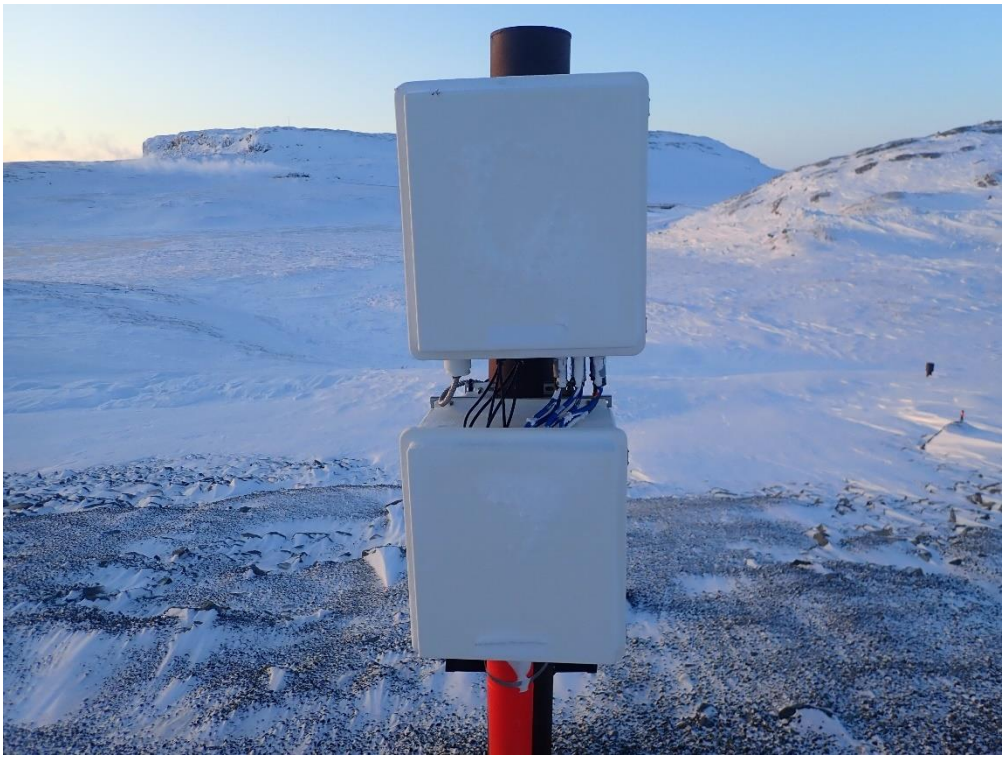
Date:	26 FEB 21
Inspected By:	PJ.
Conditions:	(ie. snow on ground, clear) Snow on ground, clear, -40 °C.

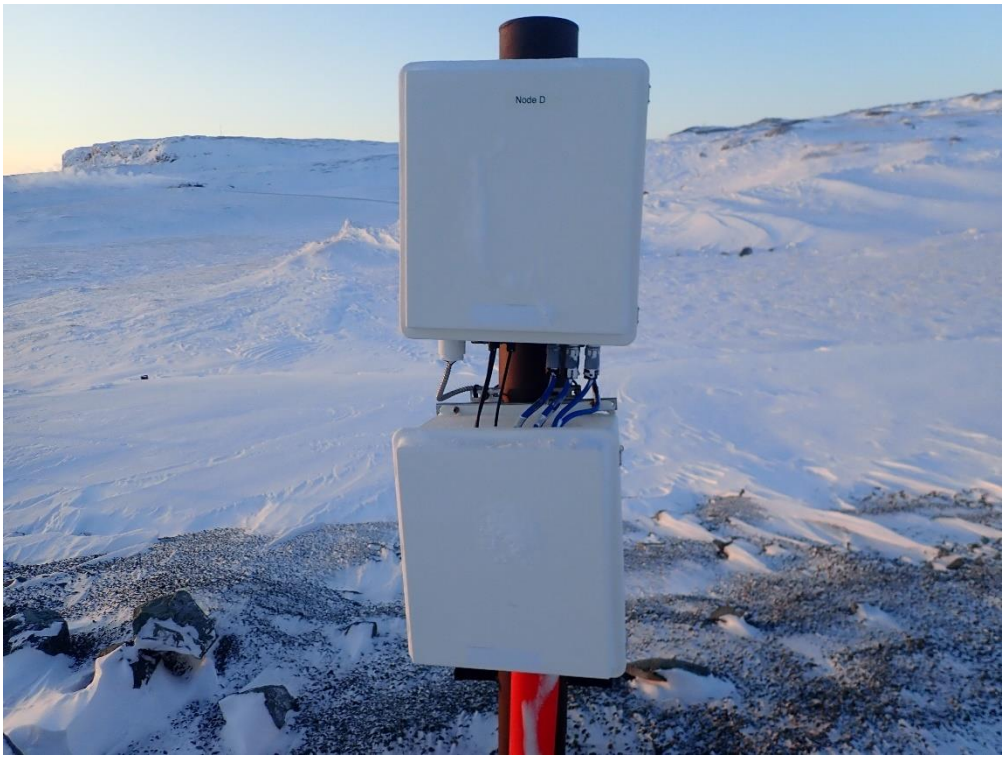
Visual Inspection:

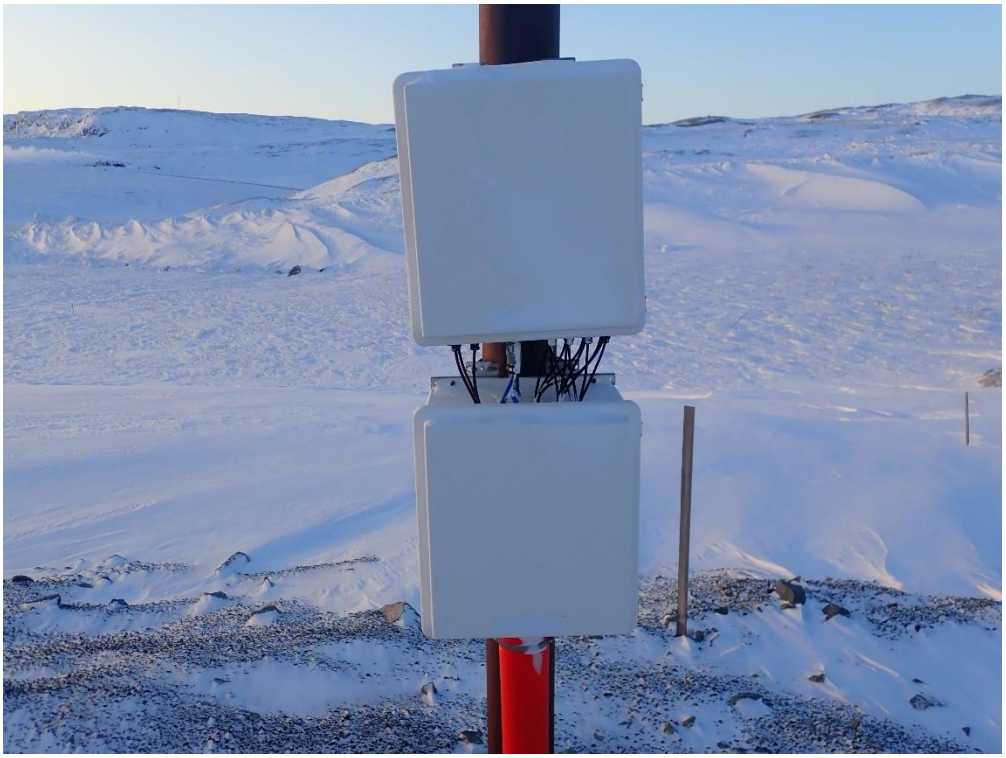
This weekly walkover survey report is a means to track the condition on the North Dam, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

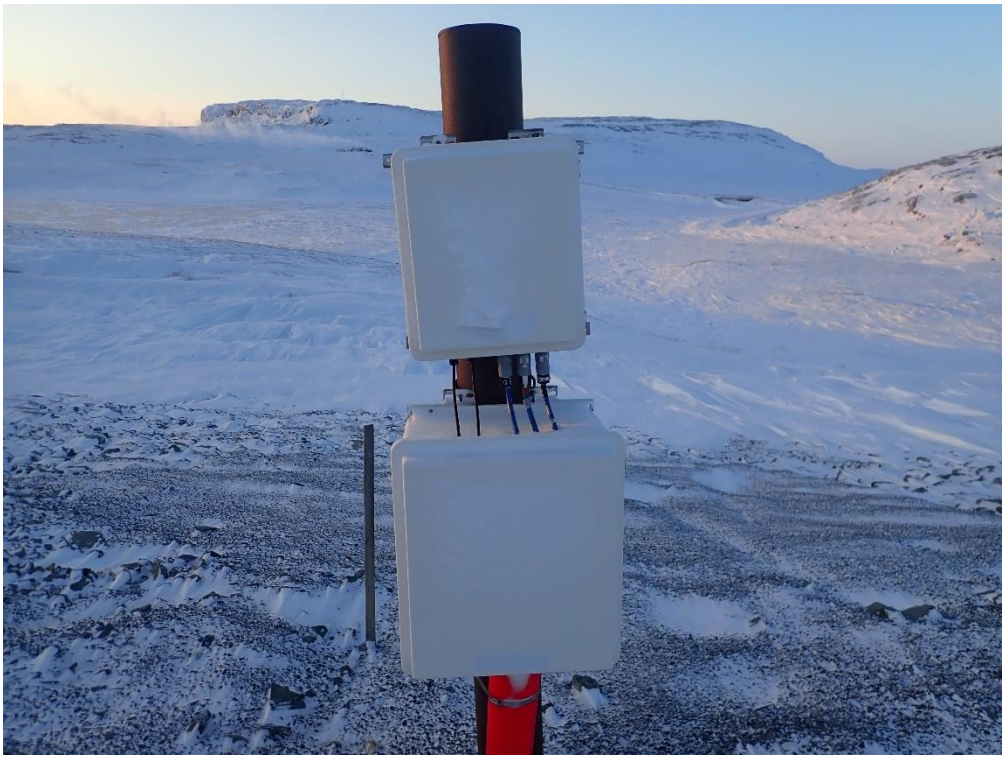
Upstream Side of Dam Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Thermosyphons North Side Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Thermosyphons South Side Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Instrumentation (on crest and downstream side) Any visible concerns? (bent, rusted, cracked, etc.)	Yes	(No)
Thermistors and Dataloggers Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	(No)
Suspended Sediment in the TIA (When not frozen) Any suspended sediment visible in the reclaim pond? FROZEN	Yes	No
Water at the Toe of the Downstream Side of the Dam Is water visible on the downstream side of the dam? SNW COVERED.	Yes	(No)

If you answered yes to any of the questions above please provide details and photos. Observations can be sketched on the figure provided on the next page. If seepage has been noted please estimate the flow.




Node D





North Dam Weekly Walkover Survey Report

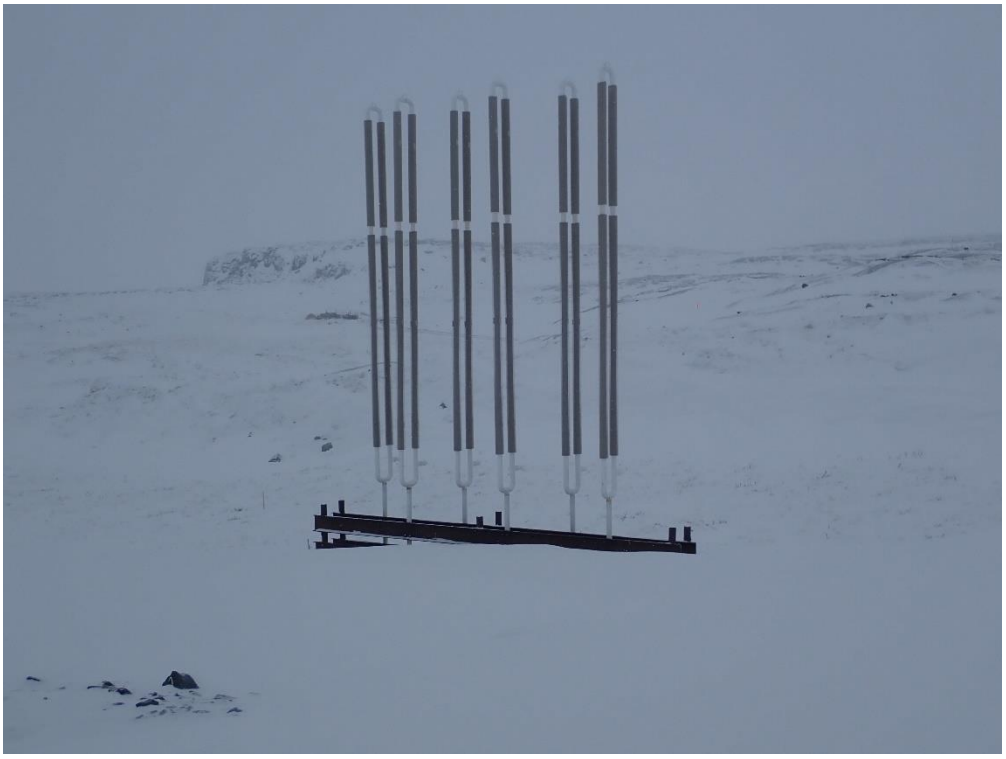
Date: 6 MAR 21	
Inspected By: PJ	
Conditions:	(ie. snow on ground, clear) SNOW ON GROUND, W BREEZE, -25°C

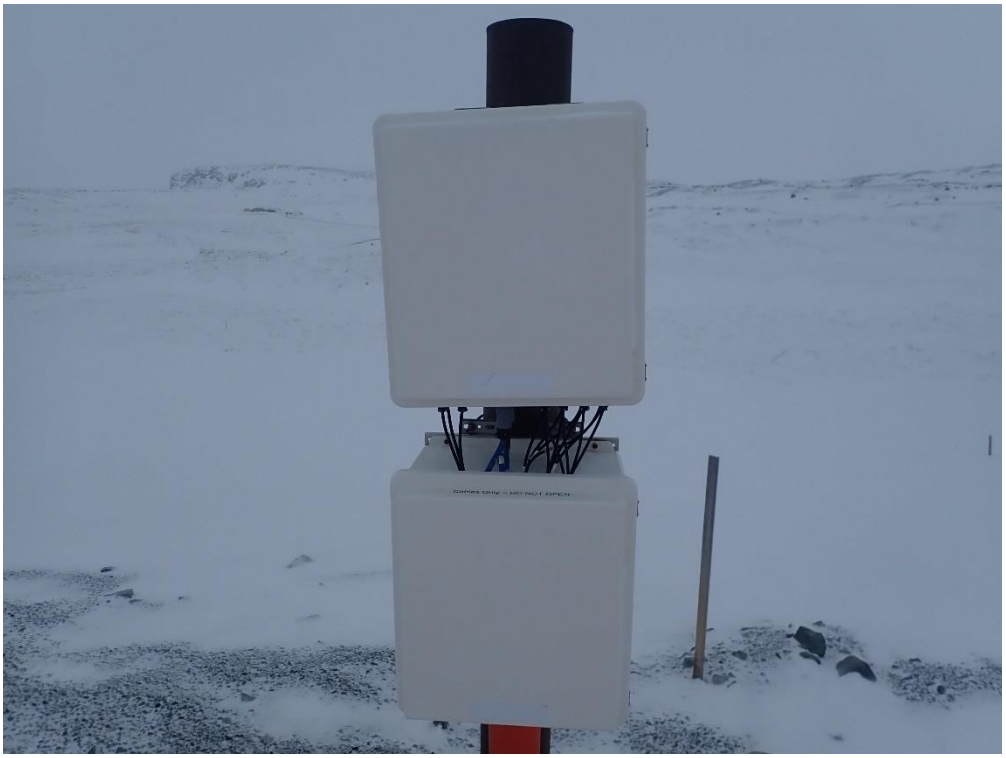
Visual Inspection:

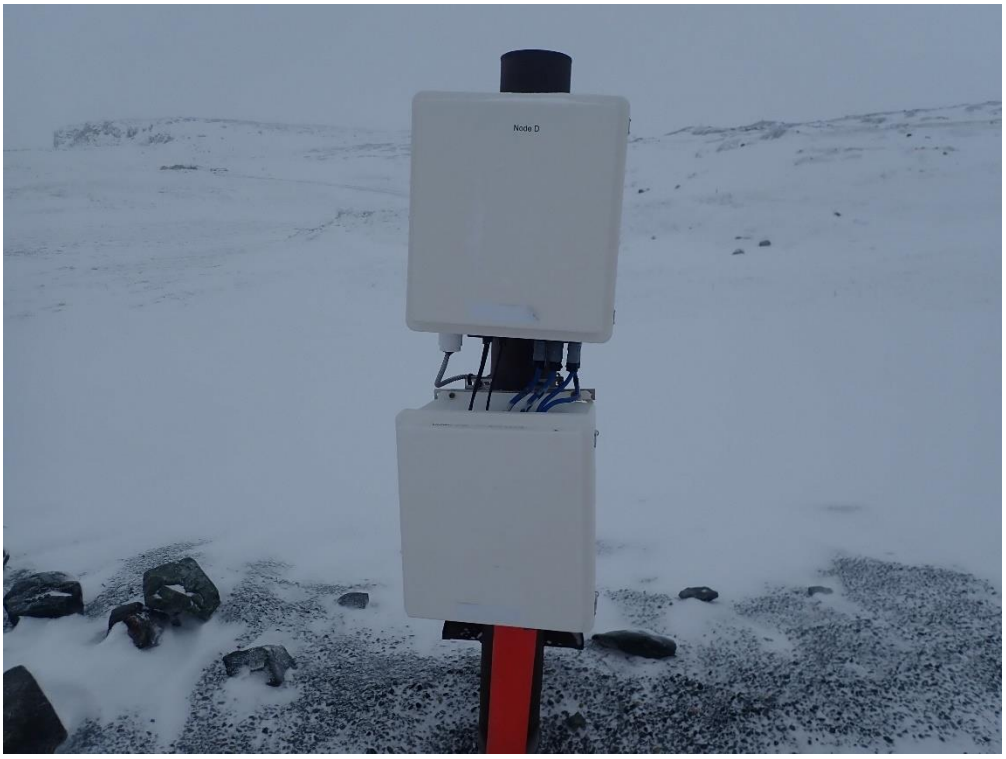
This weekly walkover survey report is a means to track the condition on the North Dam, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

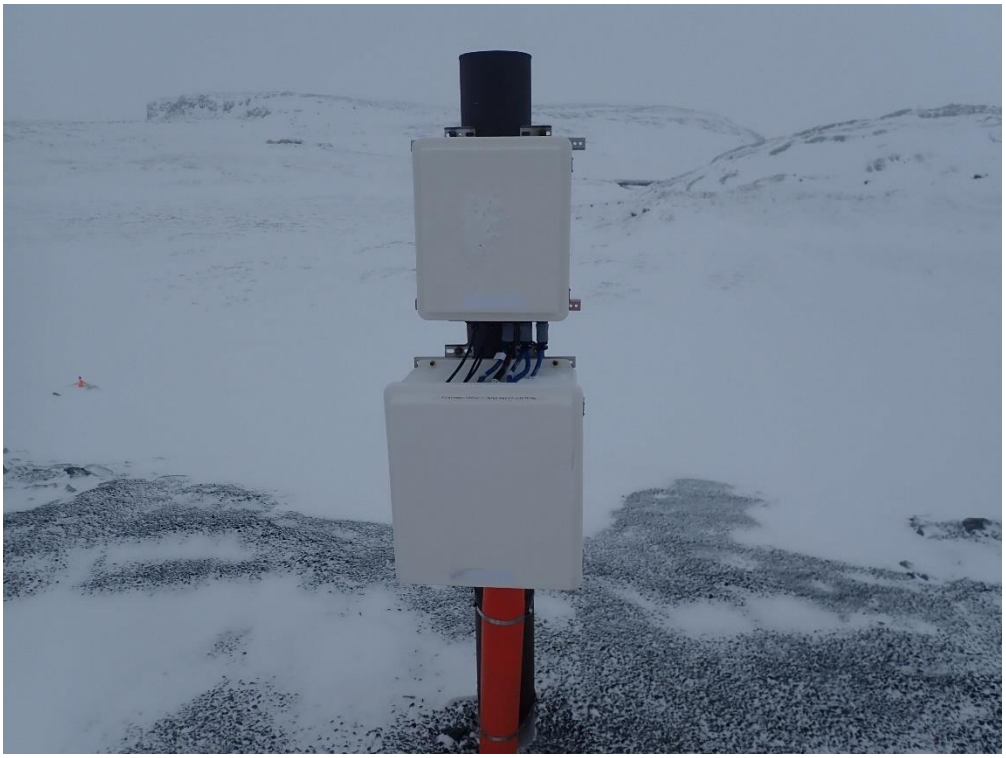
Upstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Thermosyphons North Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Thermosyphons South Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Instrumentation (on crest and downstream side)		
Any visible concerns? (bent, rusted, cracked, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	(No)
Suspended Sediment in the TIA (When not frozen)		
Any suspended sediment visible in the reclaim pond? FROZEN	Yes	No
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam? SNOW COVERED / FROZEN	Yes	No

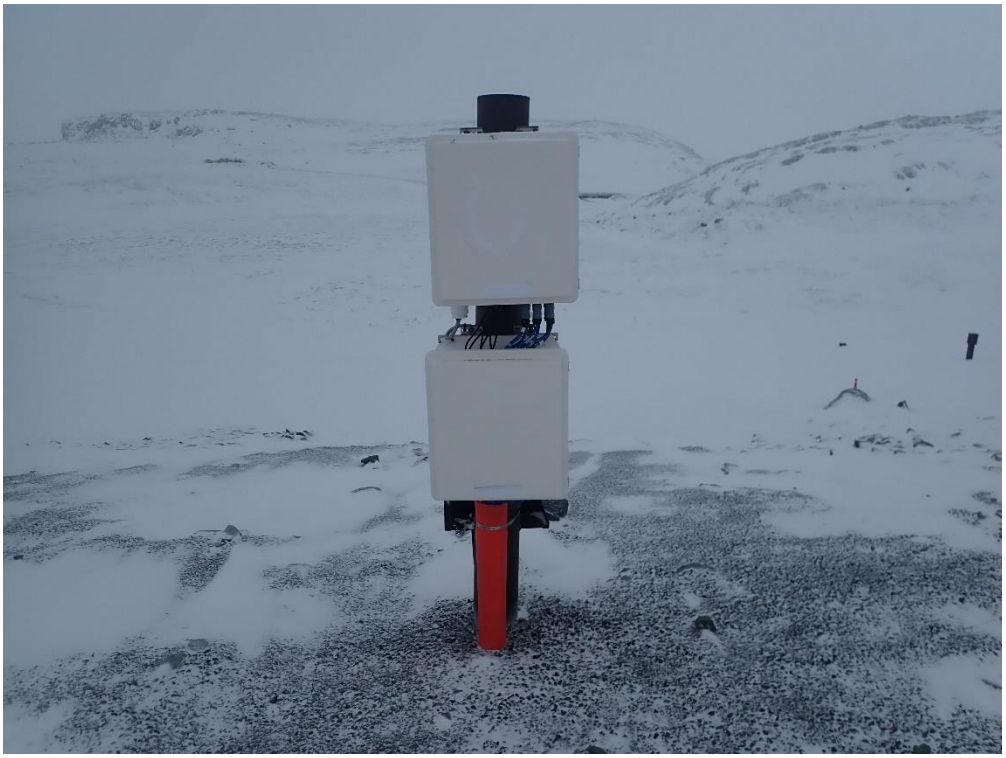
If you answered yes to any of the questions above please provide details and photos. Observations can be sketched on the figure provided on the next page. If seepage has been noted please estimate the flow.

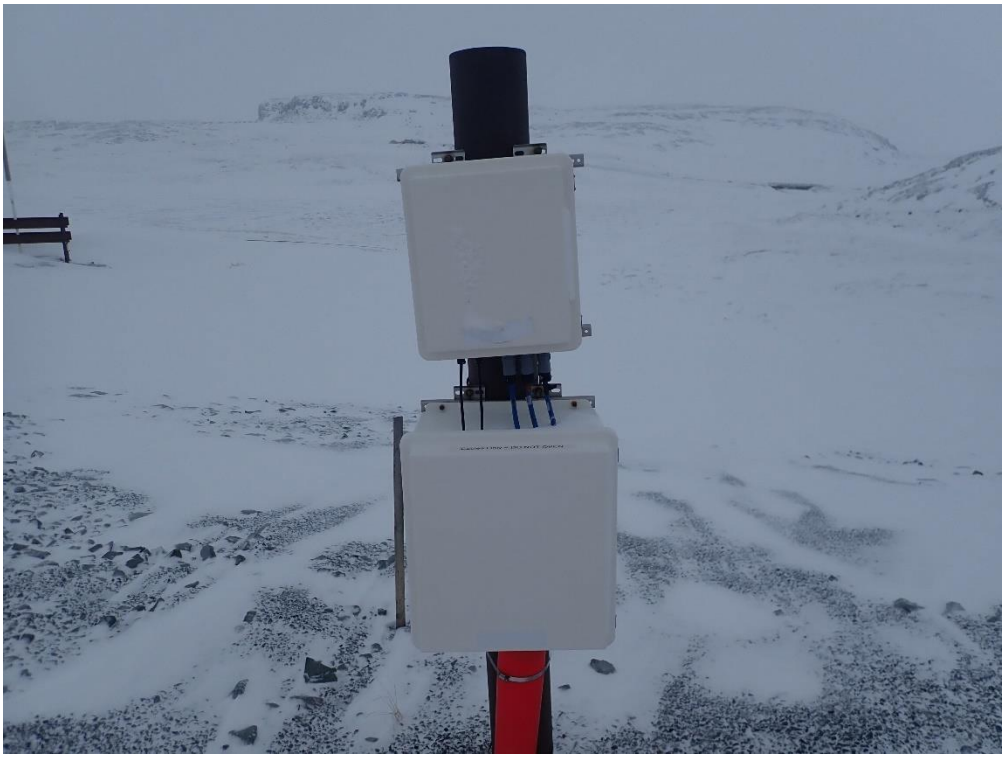





Node D







North Dam Weekly Walkover Survey Report

Date:	March 11/2021
Inspected By:	A. Hryniw
Conditions: (ie. snow on ground, clear)	@ 1424 hrs -23.9 C - Snow covered - clear + Sunny

Visual Inspection:

This weekly walkover survey report is a means to track the condition on the North Dam, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Thermosyphons North Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Thermosyphons South Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Instrumentation (on crest and downstream side)		
Any visible concerns? (bent, rusted, cracked, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	(No)
Suspended Sediment in the TIA (When not frozen)		
Any suspended sediment visible in the reclaim pond? Frozen	Yes	No
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam? Snow covered/frozen	Yes	No

If you answered yes to any of the questions above please provide details and photos. Observations can be sketched on the figure provided on the next page. If seepage has been noted please estimate the flow.

North Dam Weekly Walkover Survey Report

Date:	March 15/2021
Inspected By:	A. Hynkiw
Conditions:	(ie. snow on ground, clear) Snow cover / frozen -45 WC

Visual Inspection:

This weekly walkover survey report is a means to track the condition on the North Dam, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam Any visible concerns? (cracks, depressions, erosion, etc.) Frozen / Snow cover	Yes	No
Downstream Side of Dam Any visible concerns? (cracks, depressions, erosion, seepage, etc.) Frozen / Snow cover	Yes	No
Crest of Dam Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	No
Thermosyphons North Side Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	No
Thermosyphons South Side Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	No
Instrumentation (on crest and downstream side) Any visible concerns? (bent, rusted, cracked, etc.)	Yes	No
Thermistors and Dataloggers Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	No
Suspended Sediment in the TIA (When not frozen) Any suspended sediment visible in the reclaim pond? Frozen	Yes	No
Water at the Toe of the Downstream Side of the Dam Is water visible on the downstream side of the dam? Frozen	Yes	No

If you answered yes to any of the questions above please provide details and photos. Observations can be sketched on the figure provided on the next page. If seepage has been noted please estimate the flow.

North Dam Weekly Walkover Survey Report

Date:	21-March-21
Inspected By:	Andrea Hoyntzw.
Conditions:	(ie. snow on ground, clear) Snow cover / frozen conditions

Visual Inspection:

This weekly walkover survey report is a means to track the condition on the North Dam, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Thermosyphons North Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Thermosyphons South Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Instrumentation (on crest and downstream side)		
Any visible concerns? (bent, rusted, cracked, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	(No)
Suspended Sediment in the TIA (When not frozen) (N/A)		
Any suspended sediment visible in the reclaim pond?	Yes	No
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam?	Yes	(No)

If you answered yes to any of the questions above please provide details and photos. Observations can be sketched on the figure provided on the next page. If seepage has been noted please estimate the flow.

North Dam Weekly Walkover Survey Report

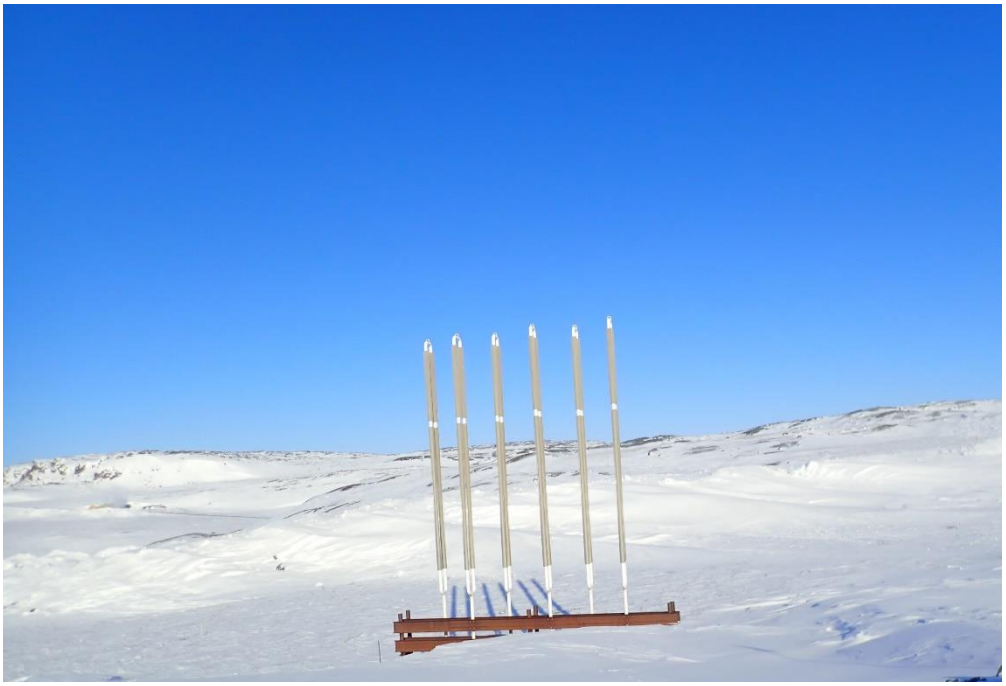
Date:	29-March-21 @ 1000hrs
Inspected By:	Andrea Hryniw
Conditions: (ie. snow on ground, clear)	snow cover/ice -30.5/53.2WC

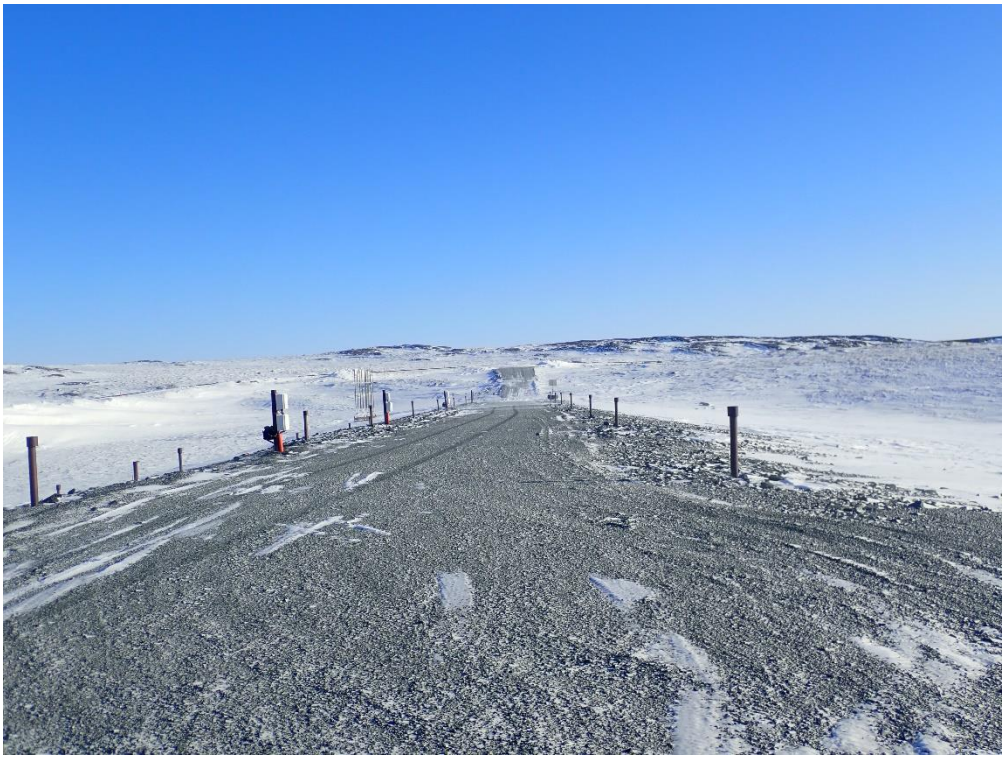
Visual Inspection:

This weekly walkover survey report is a means to track the condition on the North Dam, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam Any visible concerns? (cracks, depressions, erosion, etc.) snow cover	Yes	(No)
Downstream Side of Dam Any visible concerns? (cracks, depressions, erosion, seepage, etc.) snow cover	Yes	(No)
Crest of Dam Any visible concerns? (cracks, depressions, erosion, etc.) Snowcover	Yes	(No)
Thermosyphons North Side Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Thermosyphons South Side Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Instrumentation (on crest and downstream side) Any visible concerns? (bent, rusted, cracked, etc.)	Yes	(No)
Thermistors and Dataloggers Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	(No)
Suspended Sediment in the TIA (When not frozen) Any suspended sediment visible in the reclaim pond? frozen	Yes	No
Water at the Toe of the Downstream Side of the Dam Is water visible on the downstream side of the dam? frozen/snow	Yes	(No)

If you answered yes to any of the questions above please provide details and photos. Observations can be sketched on the figure provided on the next page. If seepage has been noted please estimate the flow.





North Dam Weekly Walkover Survey Report

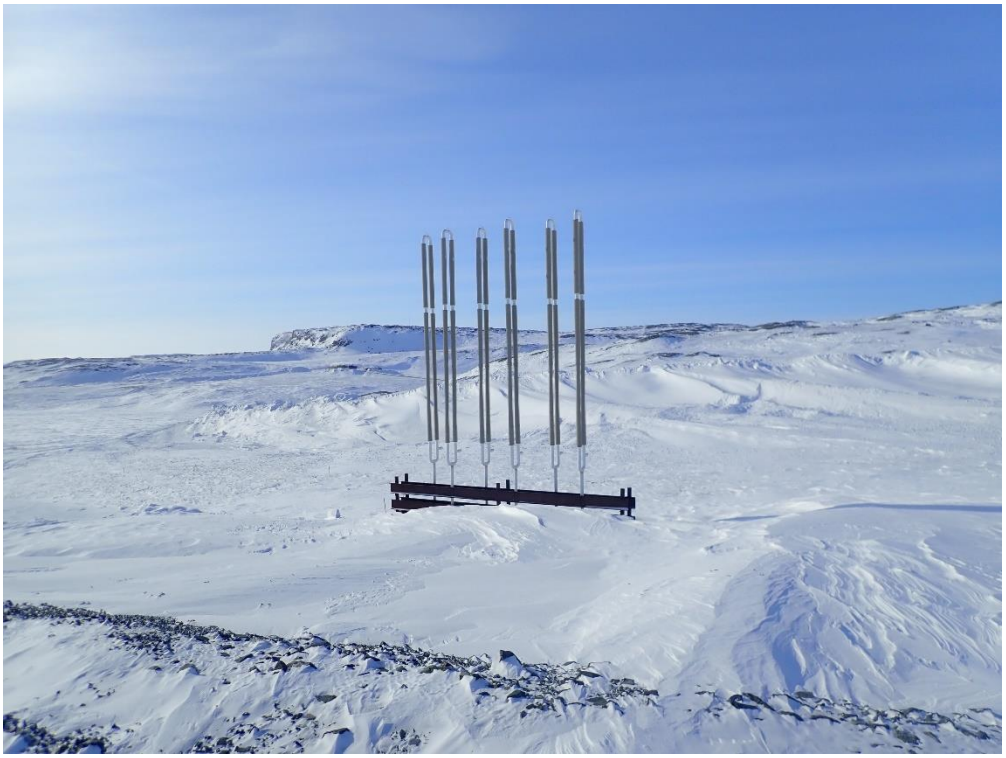
Date:	11 APR 21
Inspected By:	PJ.
Conditions:	(ie. snow on ground, clear) SNOW ON GROUND.

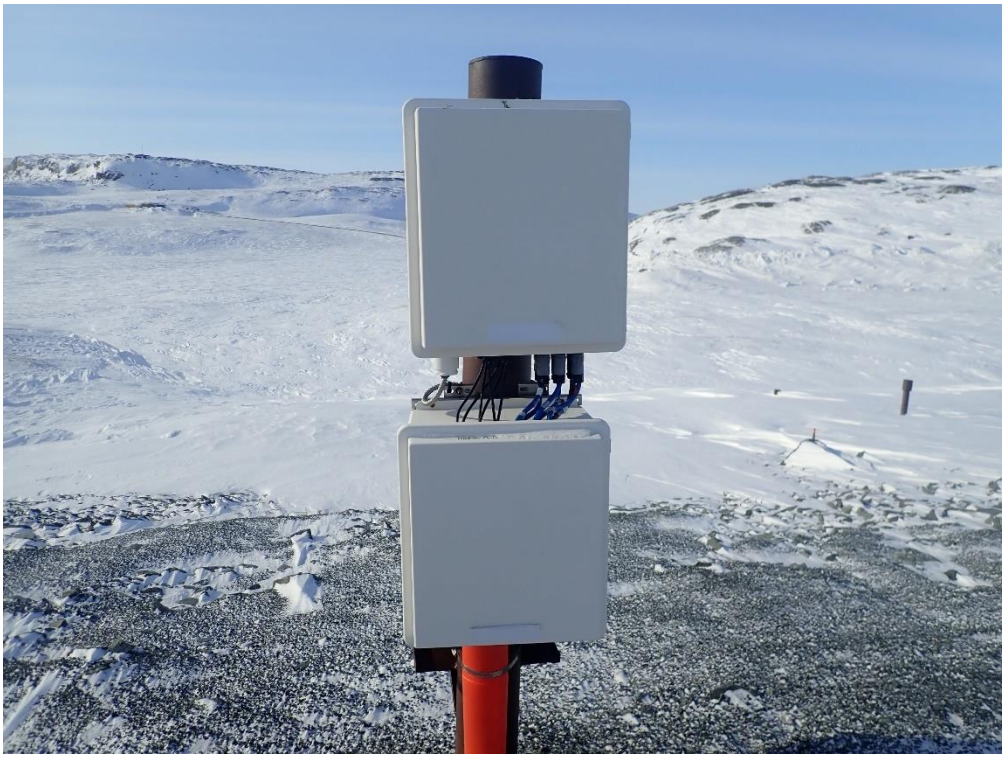
Visual Inspection:

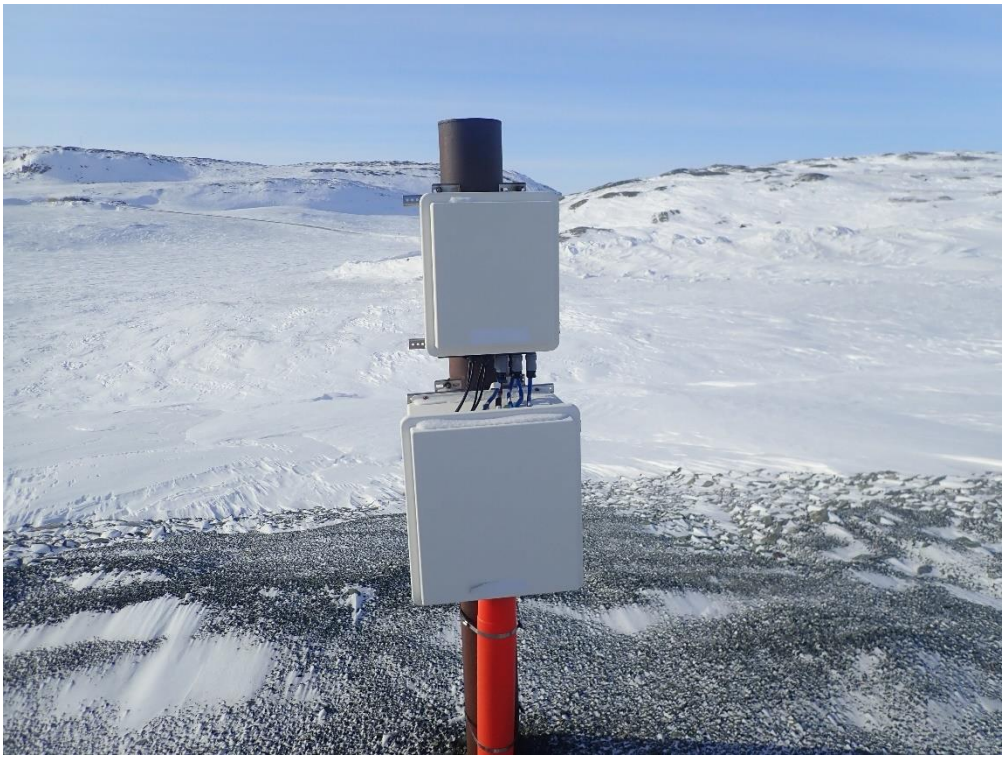
This weekly walkover survey report is a means to track the condition on the North Dam, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

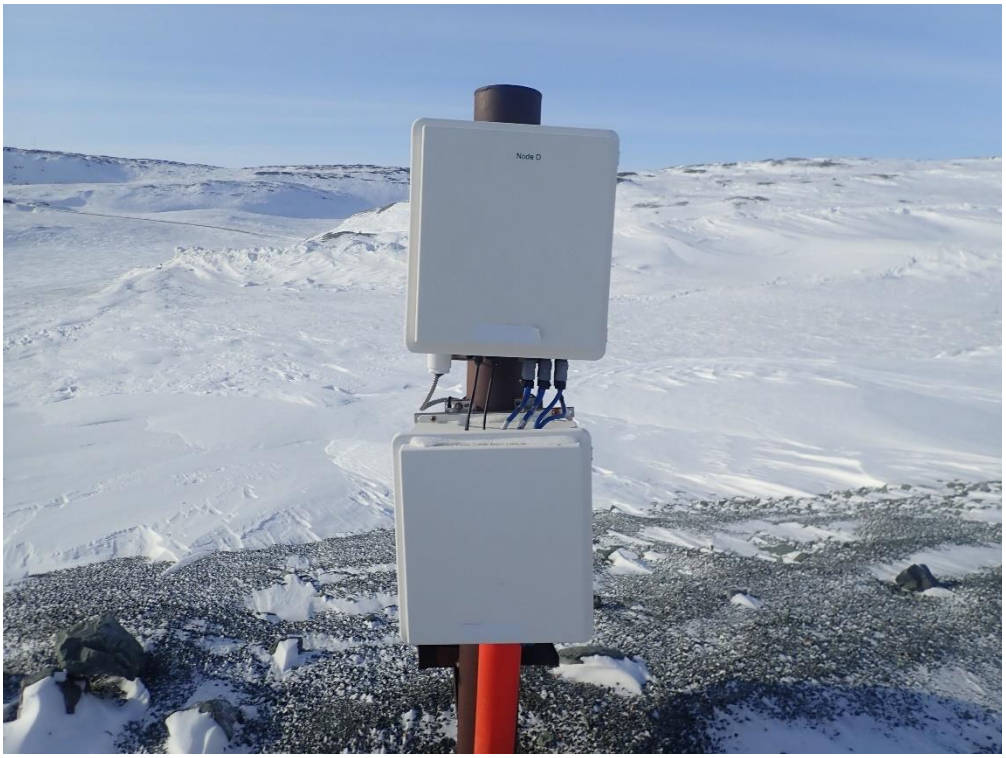
Upstream Side of Dam Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Thermosyphons North Side Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Thermosyphons South Side Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Instrumentation (on crest and downstream side) Any visible concerns? (bent, rusted, cracked, etc.)	Yes	(No)
Thermistors and Dataloggers Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	(No)
Suspended Sediment in the TIA (When not frozen) Any suspended sediment visible in the reclaim pond? FROZEN.	Yes	No
Water at the Toe of the Downstream Side of the Dam Is water visible on the downstream side of the dam? FROZEN.	Yes	No

If you answered yes to any of the questions above please provide details and photos. Observations can be sketched on the figure provided on the next page. If seepage has been noted please estimate the flow.





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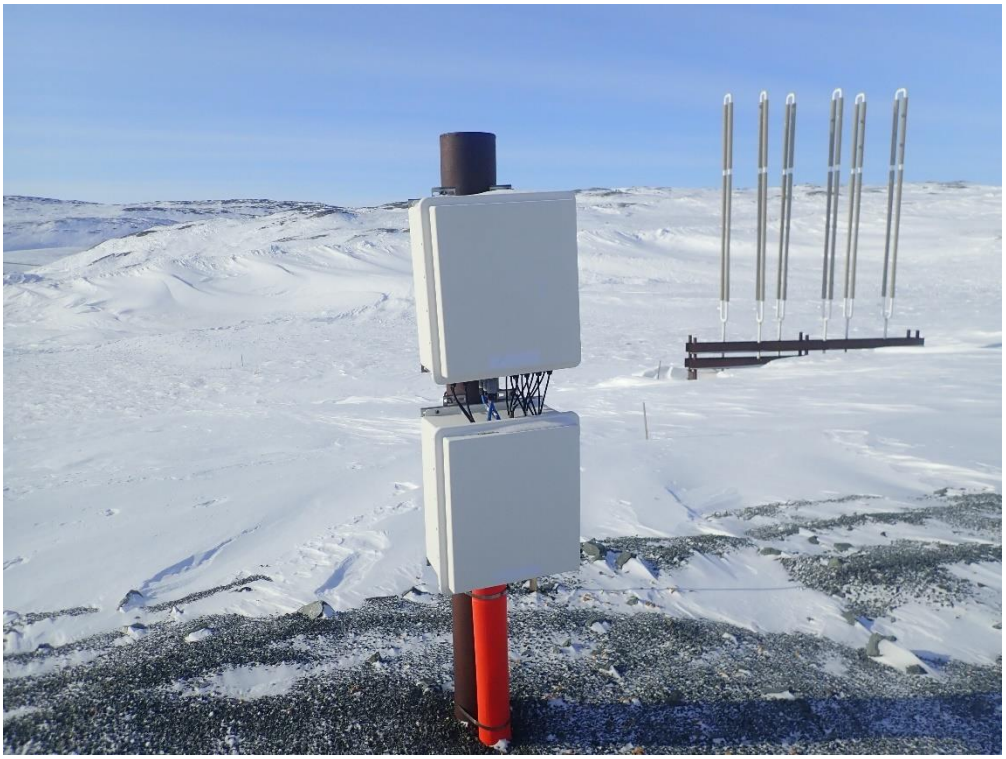
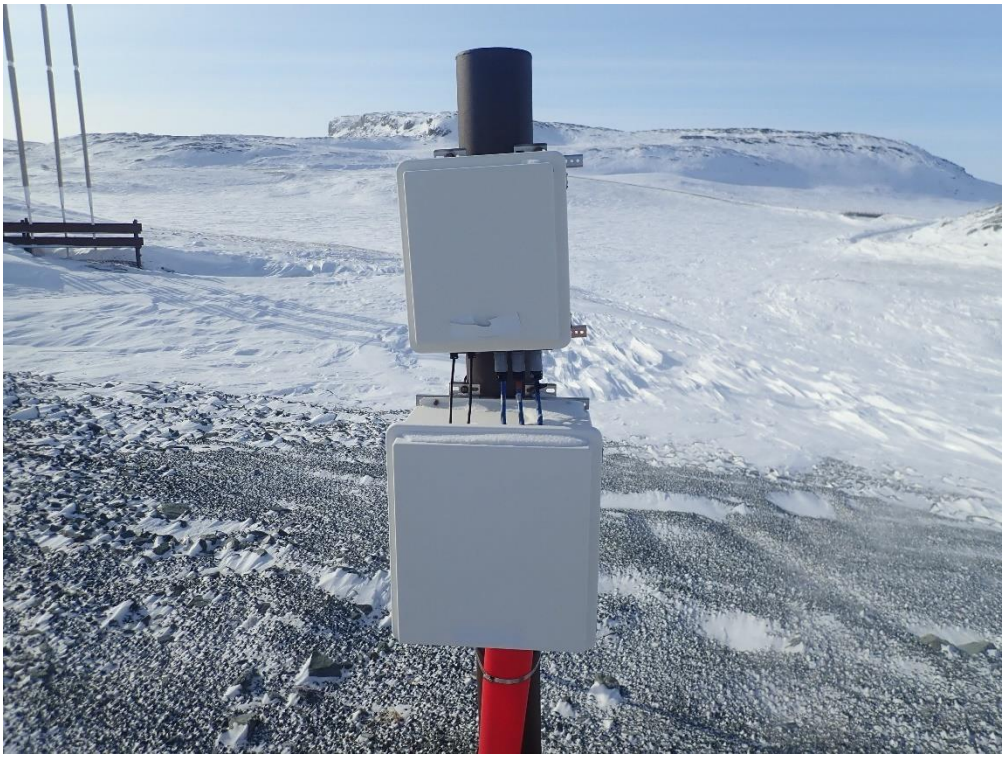




North Dam Weekly Walkover Survey Report

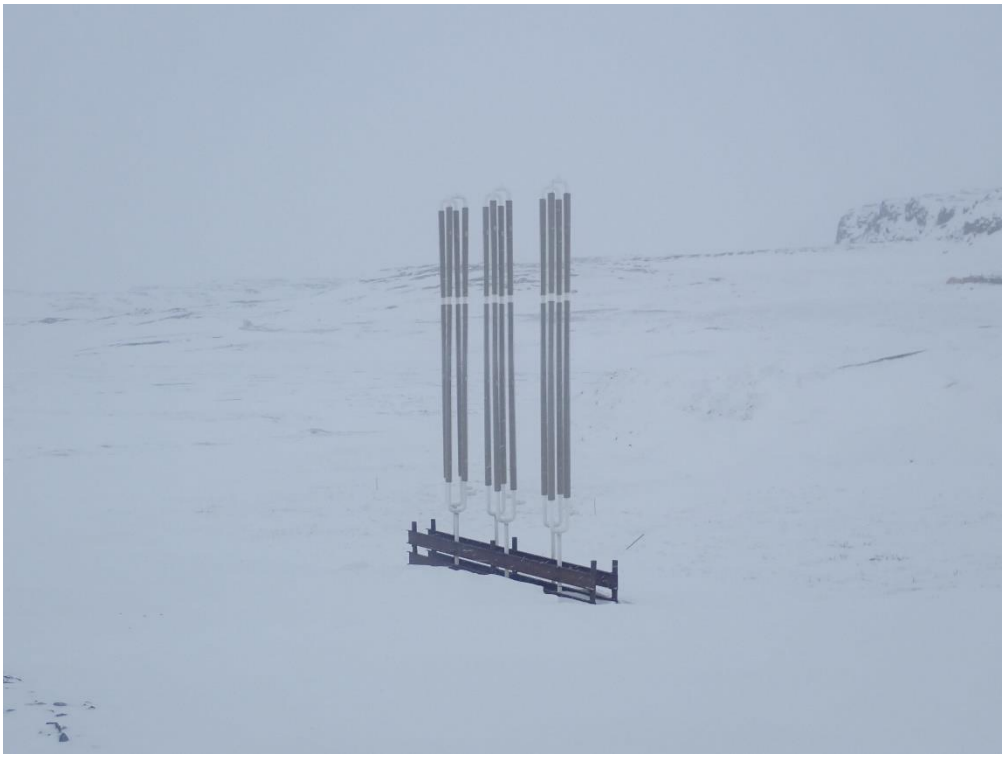
Date:	18 APR 21.
Inspected By:	AS.
Conditions:	(ie. snow on ground, clear) SNOW ON GROUND.

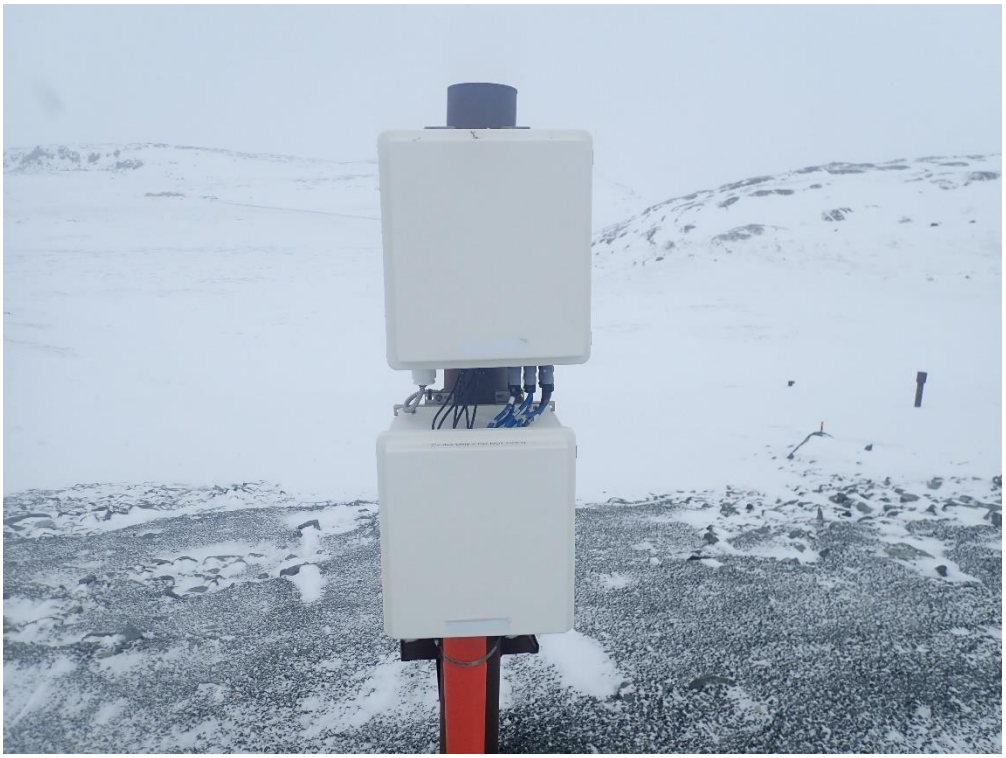
Visual Inspection:

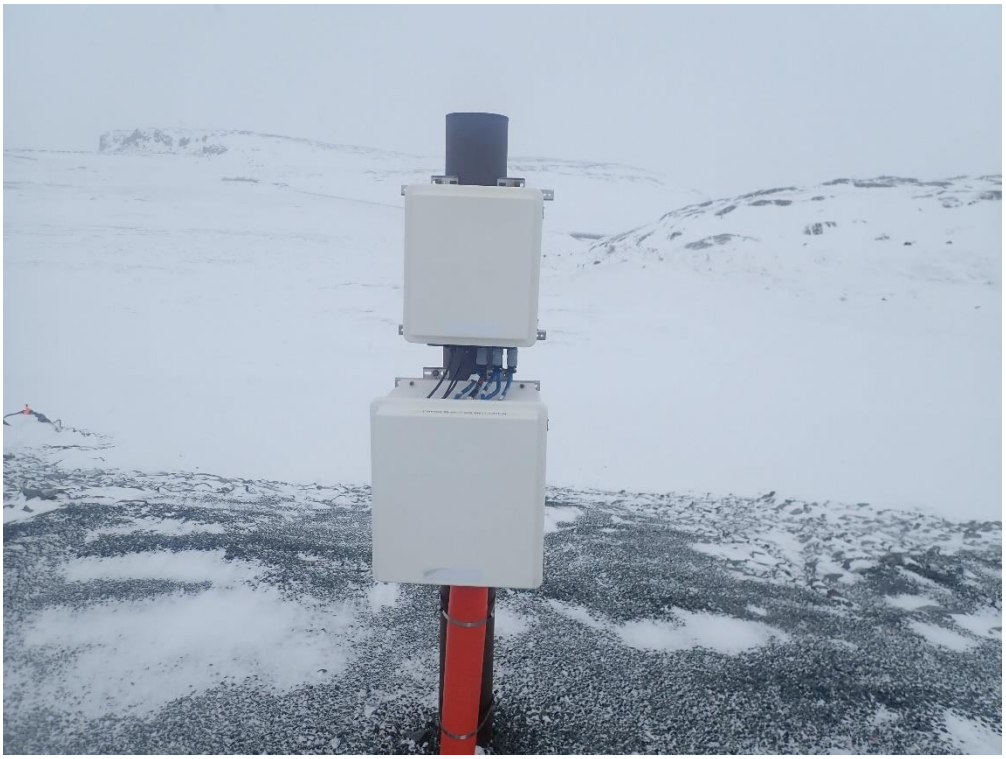
This weekly walkover survey report is a means to track the condition on the North Dam, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

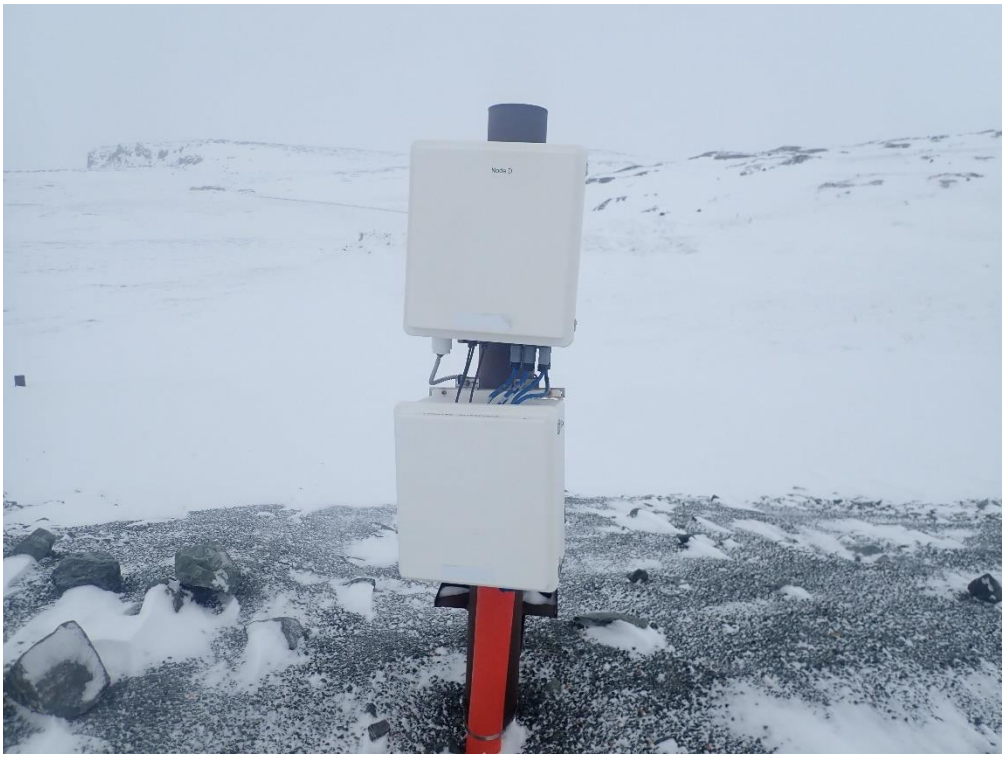
Upstream Side of Dam			
Any visible concerns? (cracks, depressions, erosion, etc.)		Yes	(No)
Downstream Side of Dam			
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)		Yes	(No)
Crest of Dam			
Any visible concerns? (cracks, depressions, erosion, etc.)		Yes	(No)
Thermosyphons North Side			
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)		Yes	(No)
Thermosyphons South Side			
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)		Yes	(No)
Instrumentation (on crest and downstream side)			
Any visible concerns? (bent, rusted, cracked, etc.)		Yes	(No)
Thermistors and Dataloggers			
Any visible concerns? (frayed or cut cables, damaged boxes, etc.)		Yes	(No)
Suspended Sediment in the TIA (When not frozen)			
Any suspended sediment visible in the reclaim pond?	FROZEN.	Yes	(No)
Water at the Toe of the Downstream Side of the Dam			
Is water visible on the downstream side of the dam?	FROZEN.	Yes	(No)

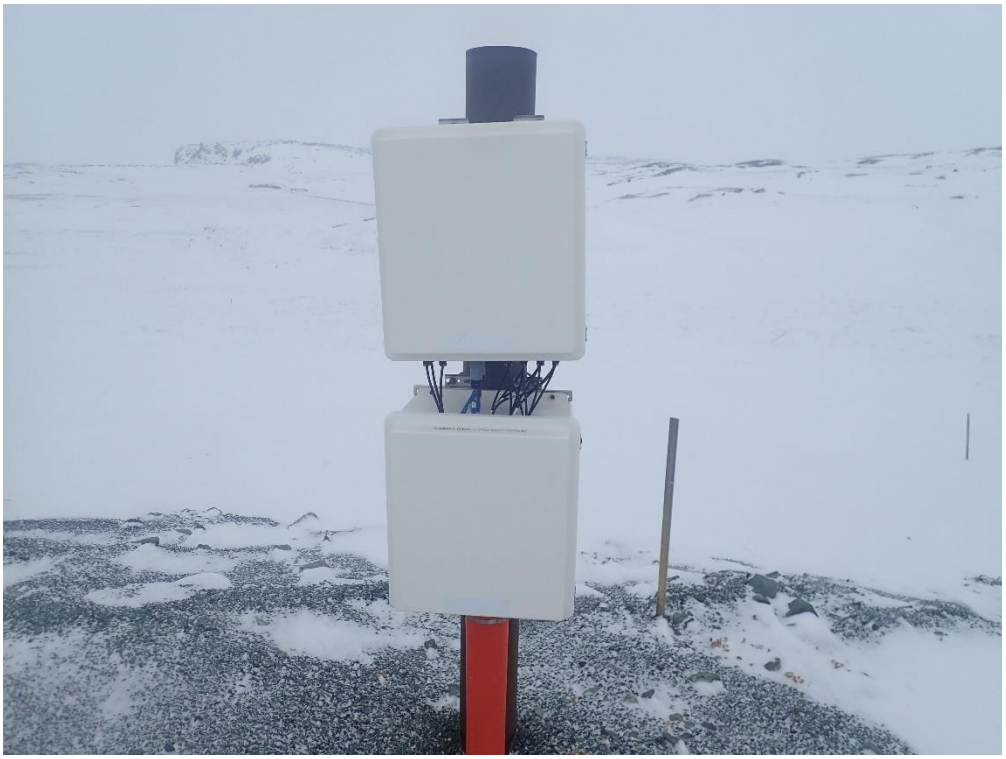
If you answered yes to any of the questions above please provide details and photos. Observations can be sketched on the figure provided on the next page. If seepage has been noted please estimate the flow.











North Dam Weekly Walkover Survey Report

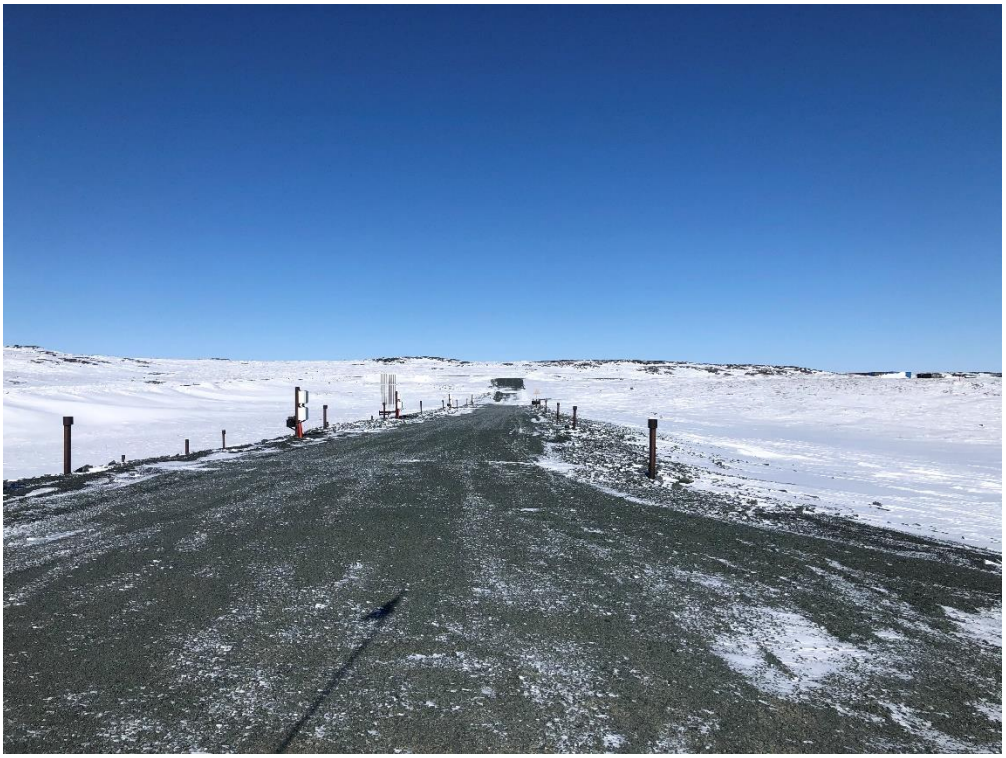
Date:	April 25/2021 @ 1440hrs
Inspected By:	Andrea Hrynkiw
Conditions:	(ie. snow on ground, clear) Snow Cover / frozen conditions

Visual Inspection:

This weekly walkover survey report is a means to track the condition on the North Dam, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam Any visible concerns? (cracks, depressions, erosion, etc.) Snow cover	Yes	(No)
Downstream Side of Dam Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Thermosyphons North Side Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Thermosyphons South Side Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Instrumentation (on crest and downstream side) Any visible concerns? (bent, rusted, cracked, etc.)	Yes	(No)
Thermistors and Dataloggers Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	(No)
Suspended Sediment in the TIA (When not frozen) Any suspended sediment visible in the reclaim pond? frozen N/A	Yes	No
Water at the Toe of the Downstream Side of the Dam Is water visible on the downstream side of the dam? frozen.	Yes	(No)

If you answered yes to any of the questions above please provide details and photos. Observations can be sketched on the figure provided on the next page. If seepage has been noted please estimate the flow.



North Dam Weekly Walkover Survey Report

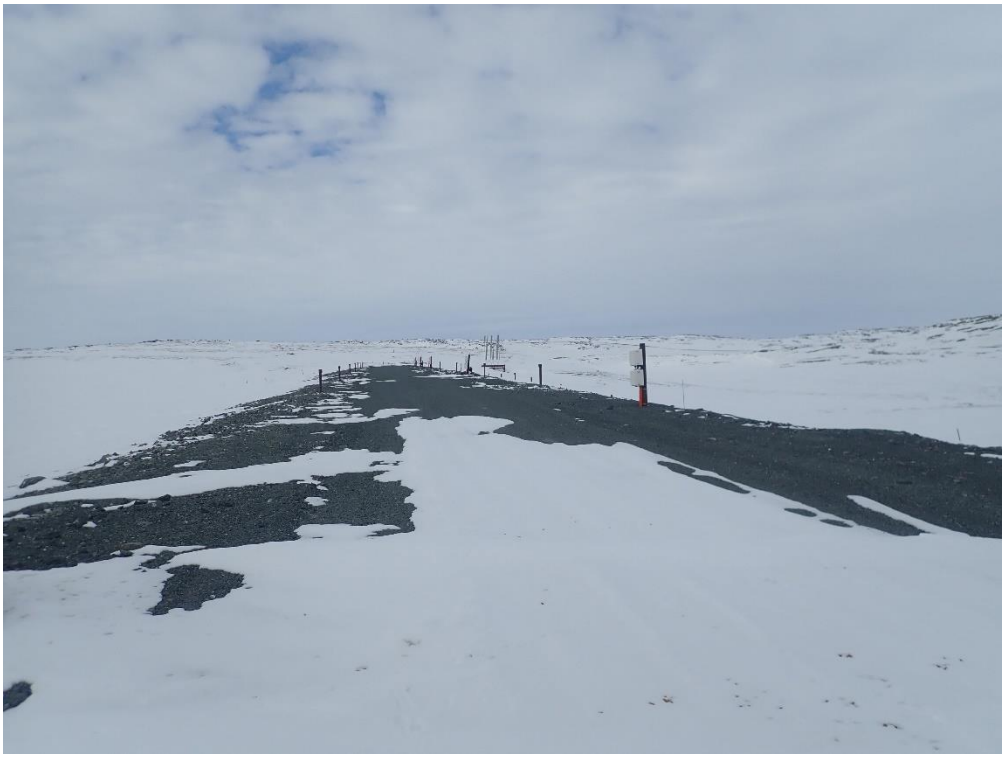
Date:	5-May-2021
Inspected By:	Andrea Hryniw
Conditions:	(ie. snow on ground, clear) Snow cover / ice

Visual Inspection:

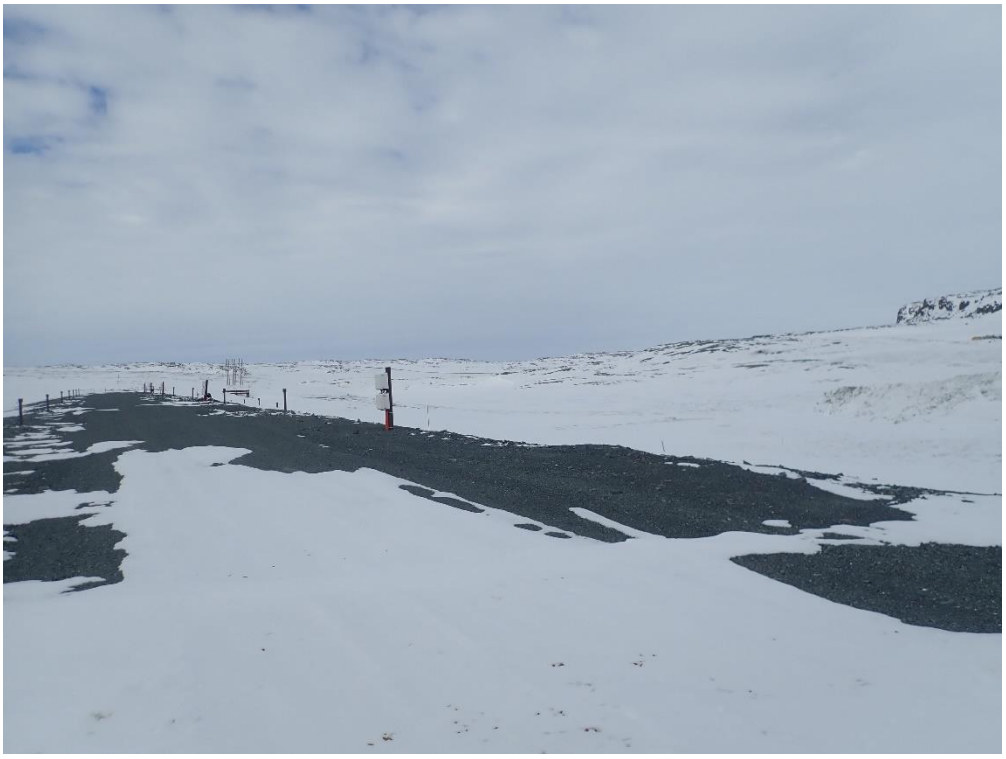
This weekly walkover survey report is a means to track the condition on the North Dam, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

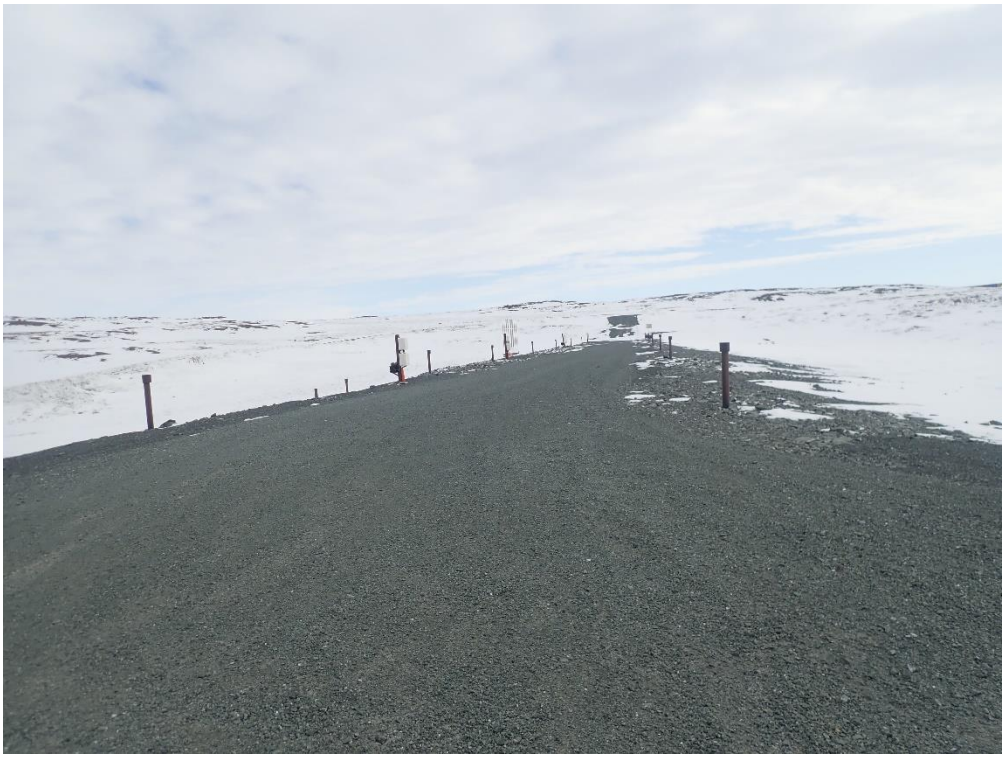
Upstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Thermosyphons North Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Thermosyphons South Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Instrumentation (on crest and downstream side)		
Any visible concerns? (bent, rusted, cracked, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	(No)
Suspended Sediment in the TIA (When not frozen)		
Any suspended sediment visible in the reclaim pond? frozen. N/A.	Yes	No
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam? Frozen N/A	Yes	No

If you answered yes to any of the questions above please provide details and photos. Observations can be sketched on the figure provided on the next page. If seepage has been noted please estimate the flow.



TMAC
Tailings Impoundment Area
Zone de retenue des résidus miniers





North Dam Weekly Walkover Survey Report

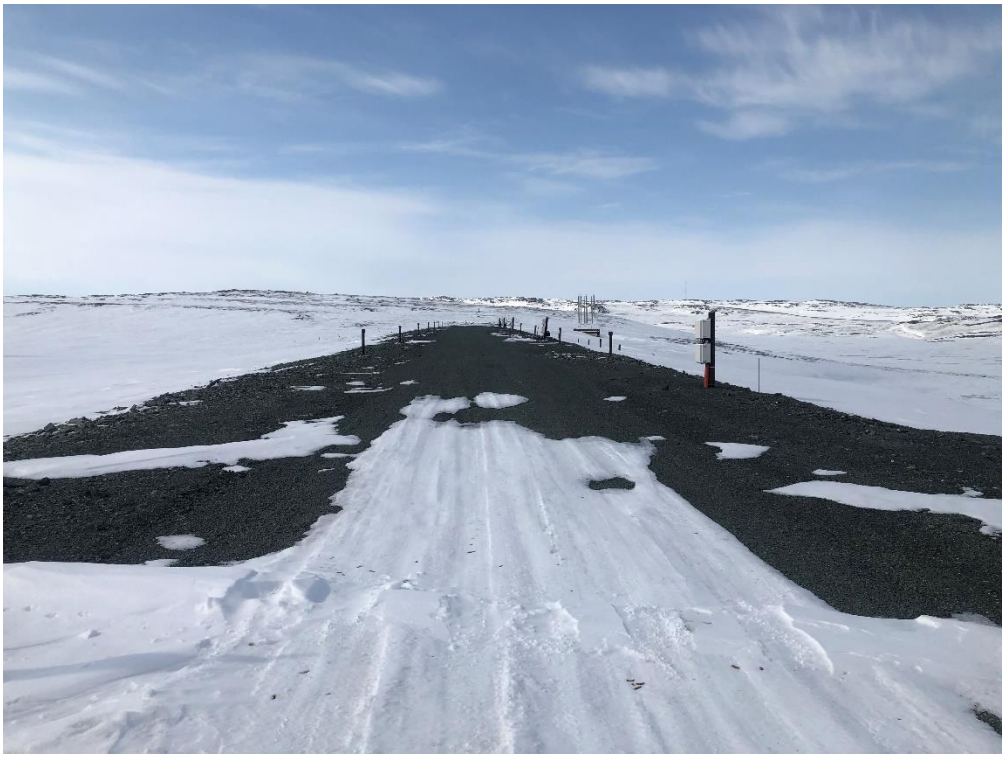
Date:	9-May-2021
Inspected By:	AH
Conditions:	(ie. snow on ground, clear) snow / starting to melt.

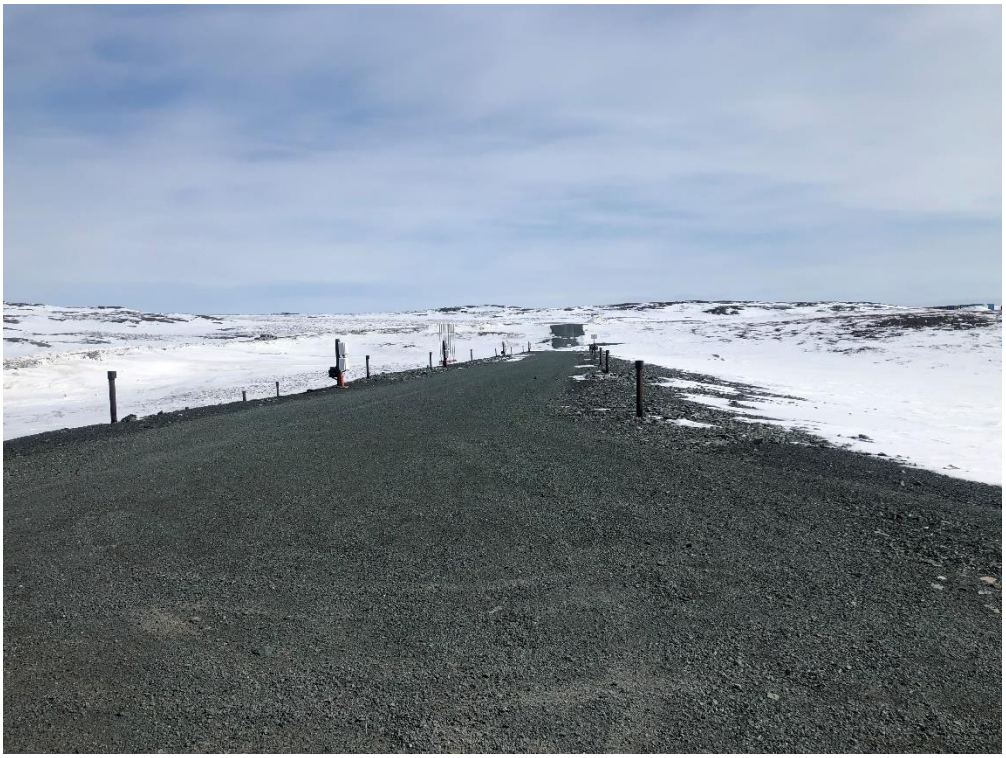
Visual Inspection:

This weekly walkover survey report is a means to track the condition on the North Dam, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Thermosyphons North Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Thermosyphons South Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Instrumentation (on crest and downstream side)		
Any visible concerns? (bent, rusted, cracked, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	(No)
Suspended Sediment in the TIA (When not frozen)		
Any suspended sediment visible in the reclaim pond? snow N/A	Yes	No
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam?	Yes	(No)

If you answered yes to any of the questions above please provide details and photos. Observations can be sketched on the figure provided on the next page. If seepage has been noted please estimate the flow.





North Dam Weekly Walkover Survey Report

Date:	MAY 16:21
Inspected By:	AH / GUW / WN
Conditions:	(ie. snow on ground, clear) SNOW ON GROUND, ROAD WAY MOSTLY CLEAR

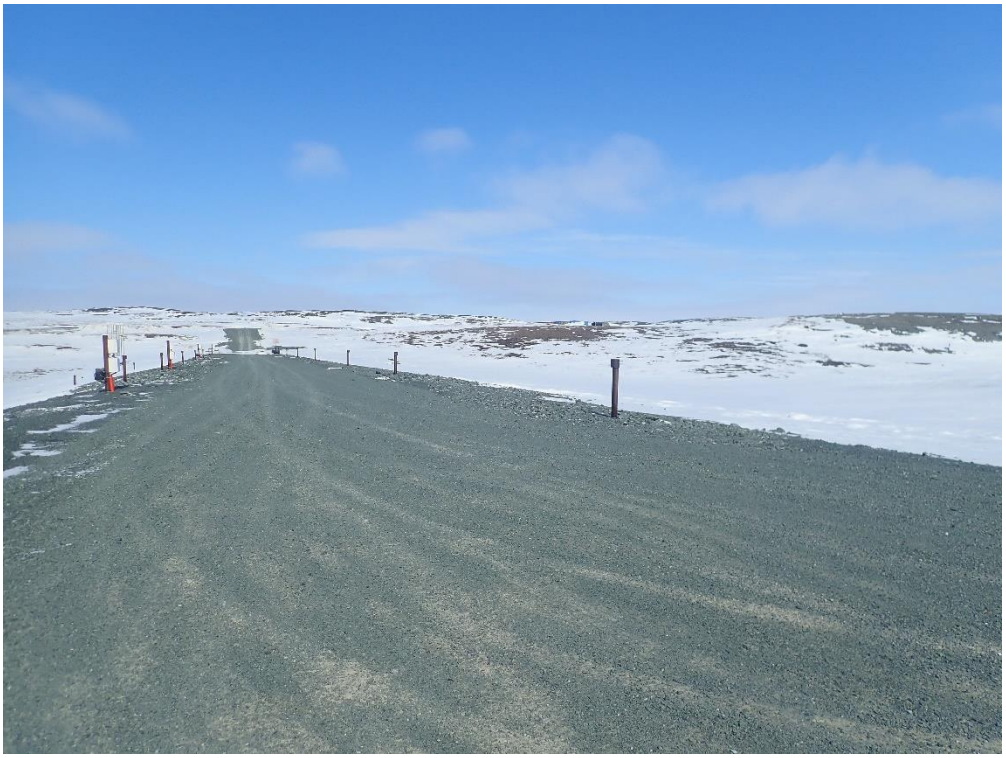
Visual Inspection:

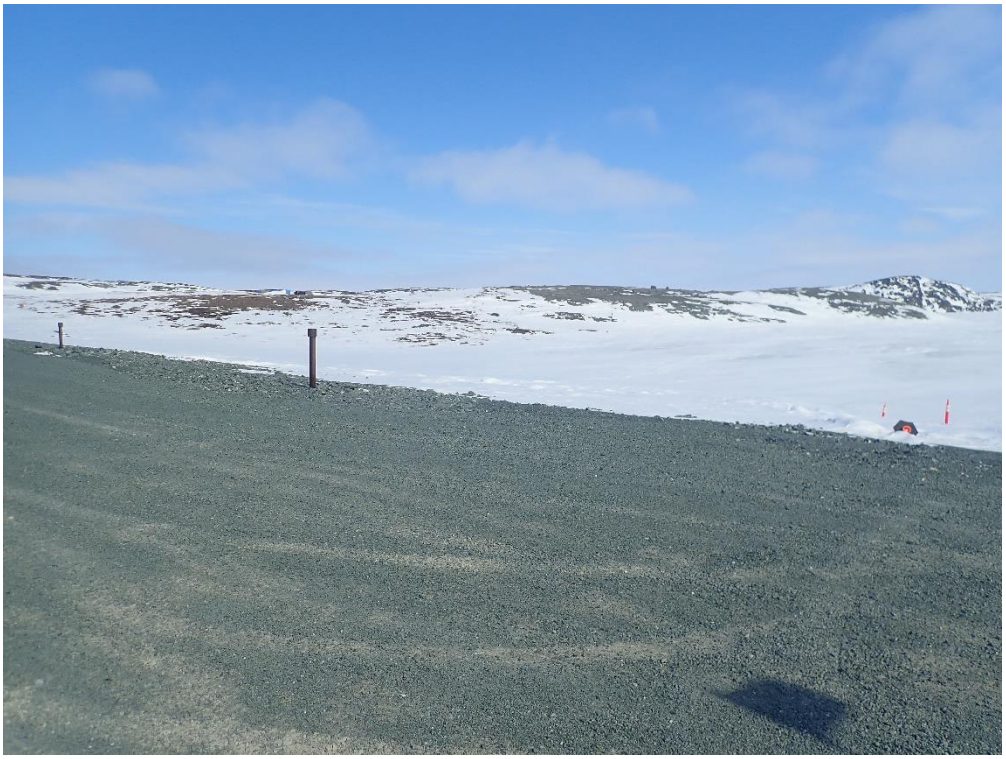
This weekly walkover survey report is a means to track the condition on the North Dam, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

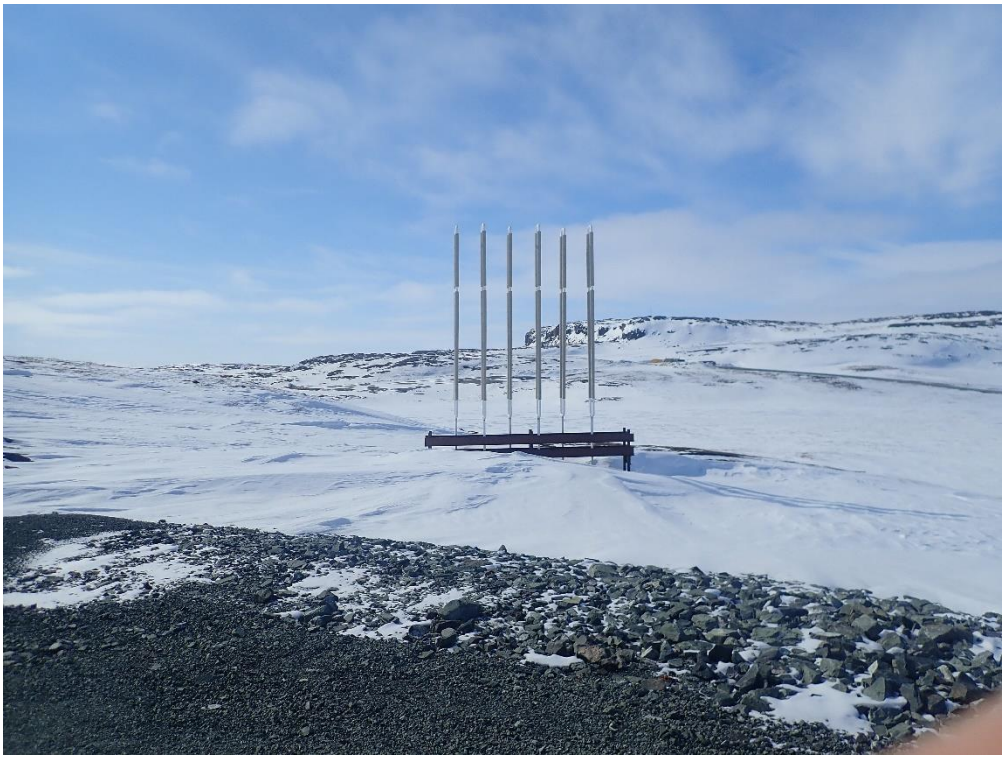
Upstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Thermosyphons North Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Thermosyphons South Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Instrumentation (on crest and downstream side)		
Any visible concerns? (bent, rusted, cracked, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	(No)
Suspended Sediment in the TIA (When not frozen)		
Any suspended sediment visible in the reclaim pond? N/A.	Yes	(No)
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam?	Yes	(No)

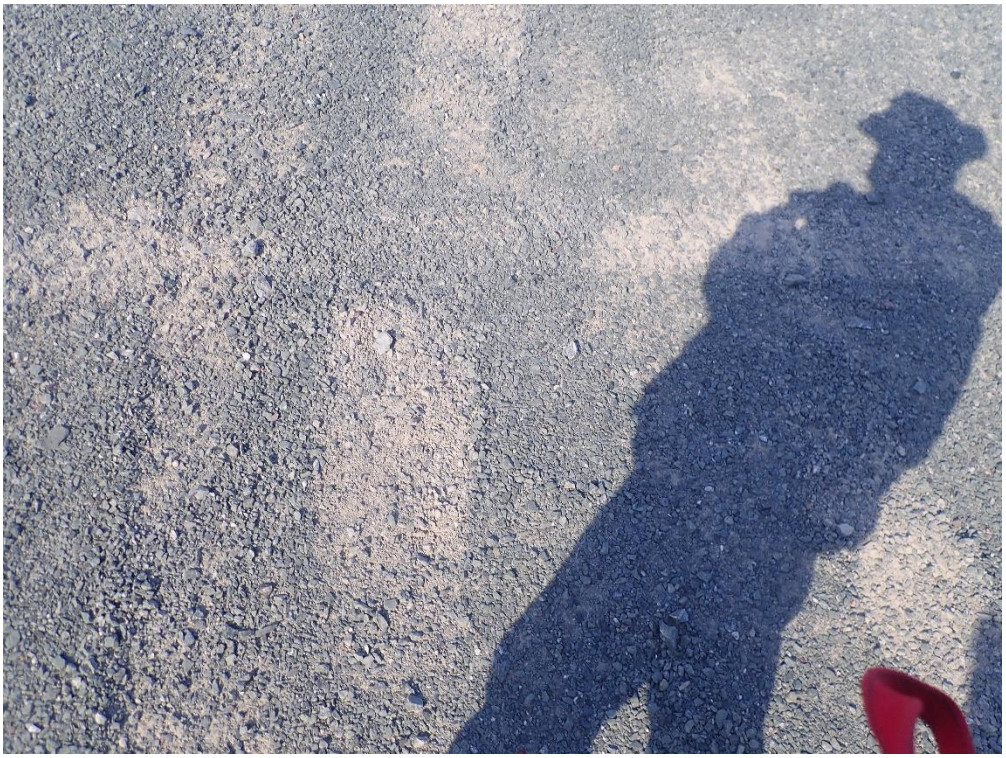
If you answered yes to any of the questions above please provide details and photos. Observations can be sketched on the figure provided on the next page. If seepage has been noted please estimate the flow.

STILL FROZEN AND SNOW COVERED.









North Dam Weekly Walkover Survey Report

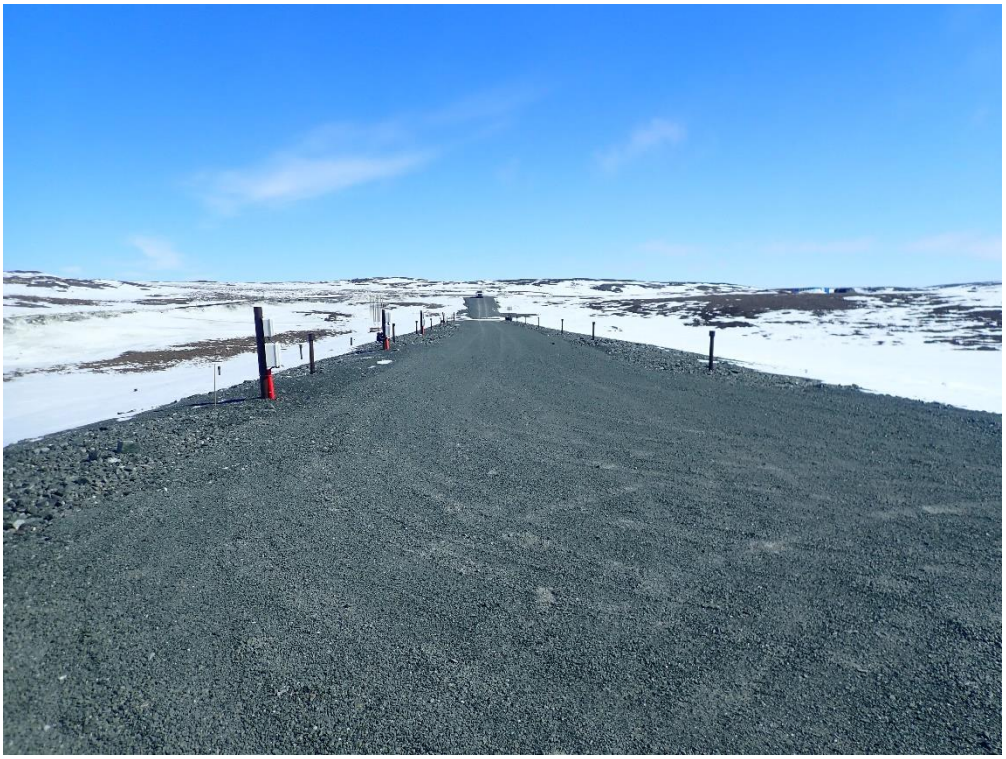
Date:	25 MAY 21
Inspected By:	DJ BC JM WN
Conditions:	(ie. snow on ground, clear) SNOW ON GROUND

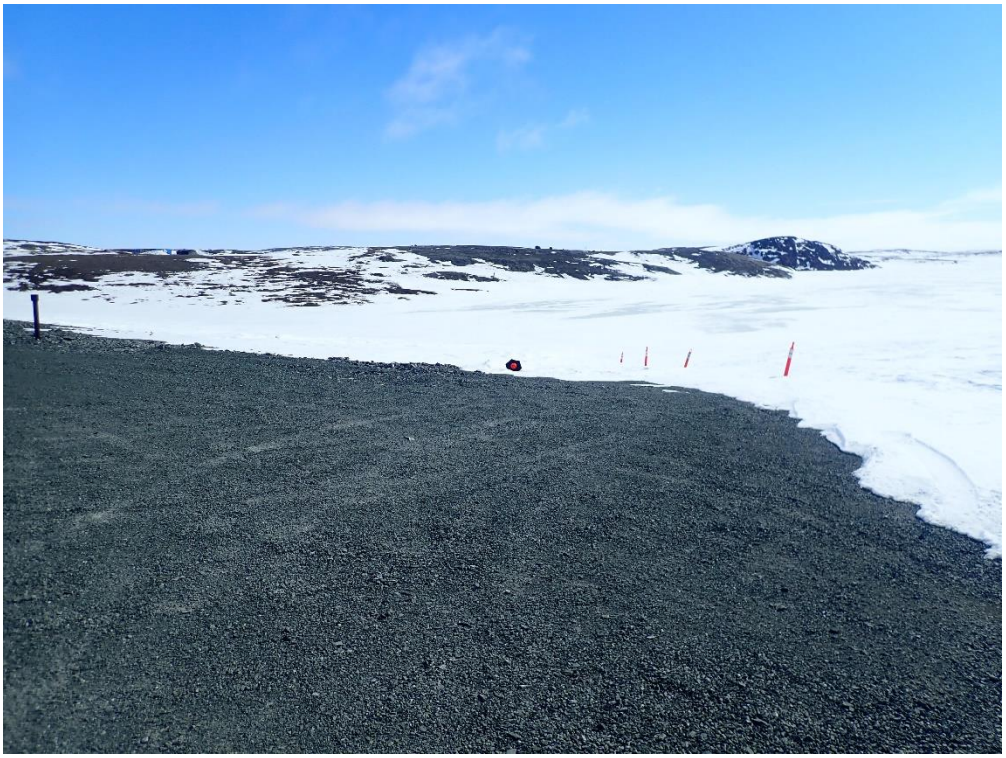
Visual Inspection:

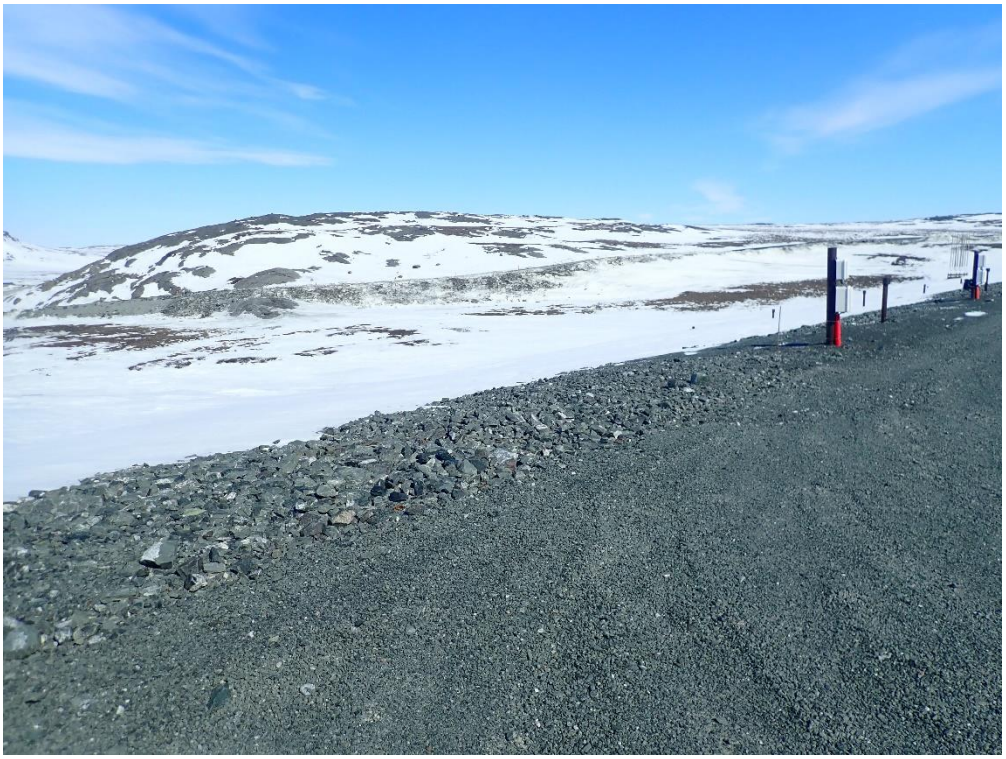
This weekly walkover survey report is a means to track the condition on the North Dam, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

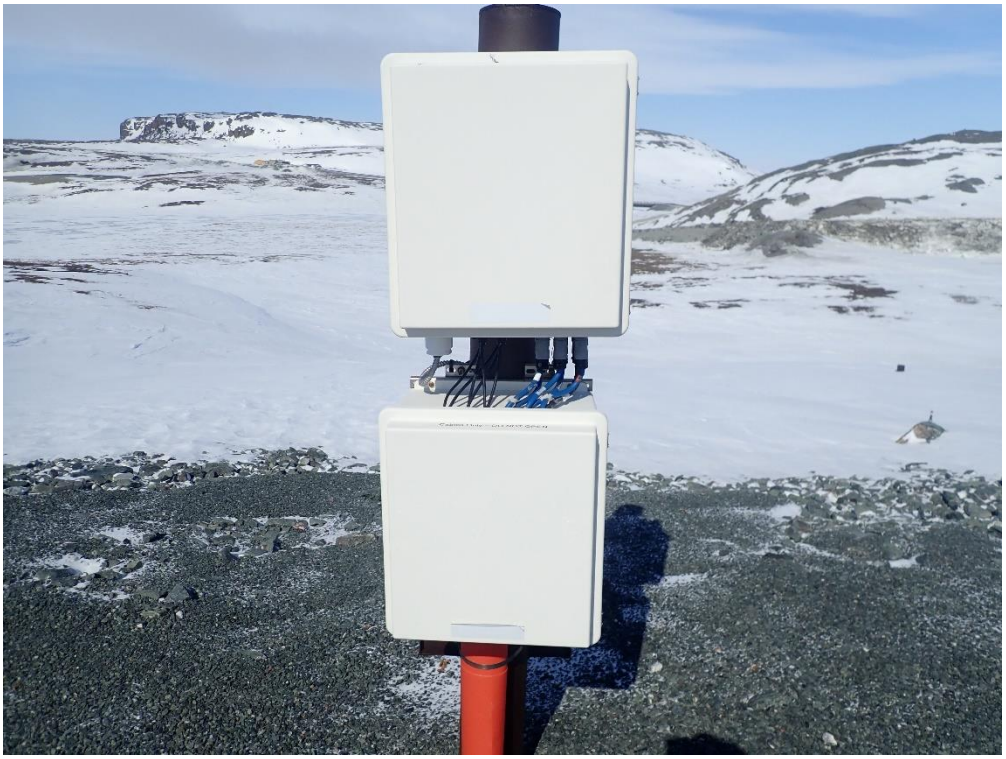
Upstream Side of Dam Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Thermosyphons North Side Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Thermosyphons South Side Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Instrumentation (on crest and downstream side) Any visible concerns? (bent, rusted, cracked, etc.)	Yes	(No)
Thermistors and Dataloggers Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	(No)
Suspended Sediment in the TIA (When not frozen) FROZEN. Any suspended sediment visible in the reclaim pond?	Yes	(No)
Water at the Toe of the Downstream Side of the Dam Is water visible on the downstream side of the dam? SNOW.	Yes	(No)

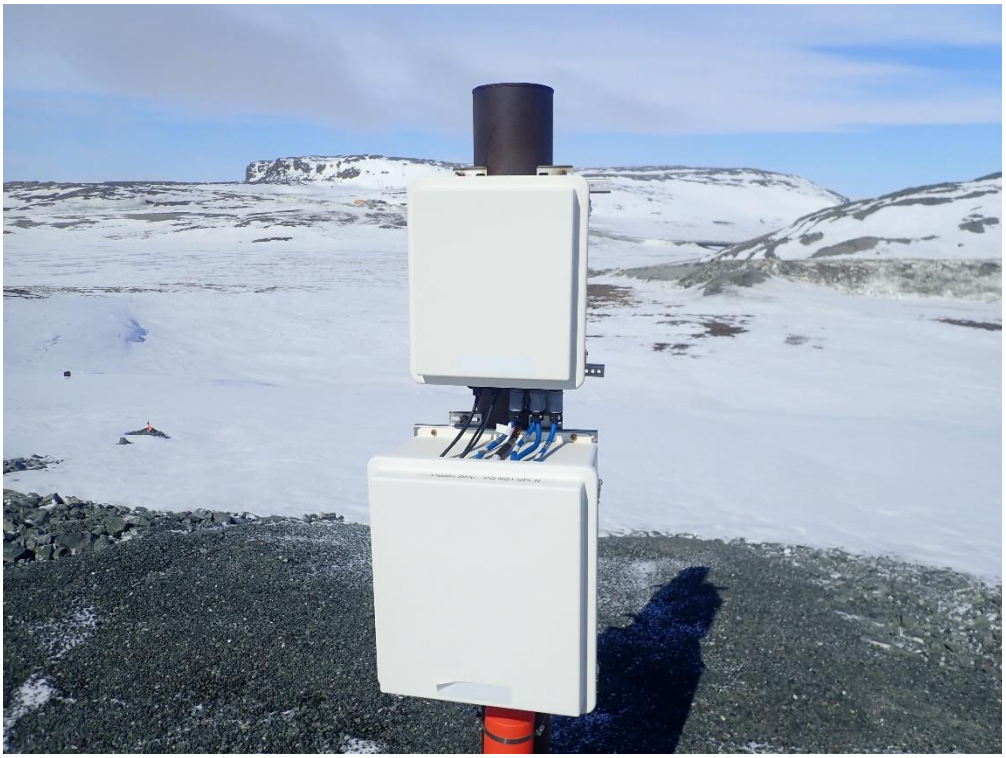
If you answered yes to any of the questions above please provide details and photos. Observations can be sketched on the figure provided on the next page. If seepage has been noted please estimate the flow.

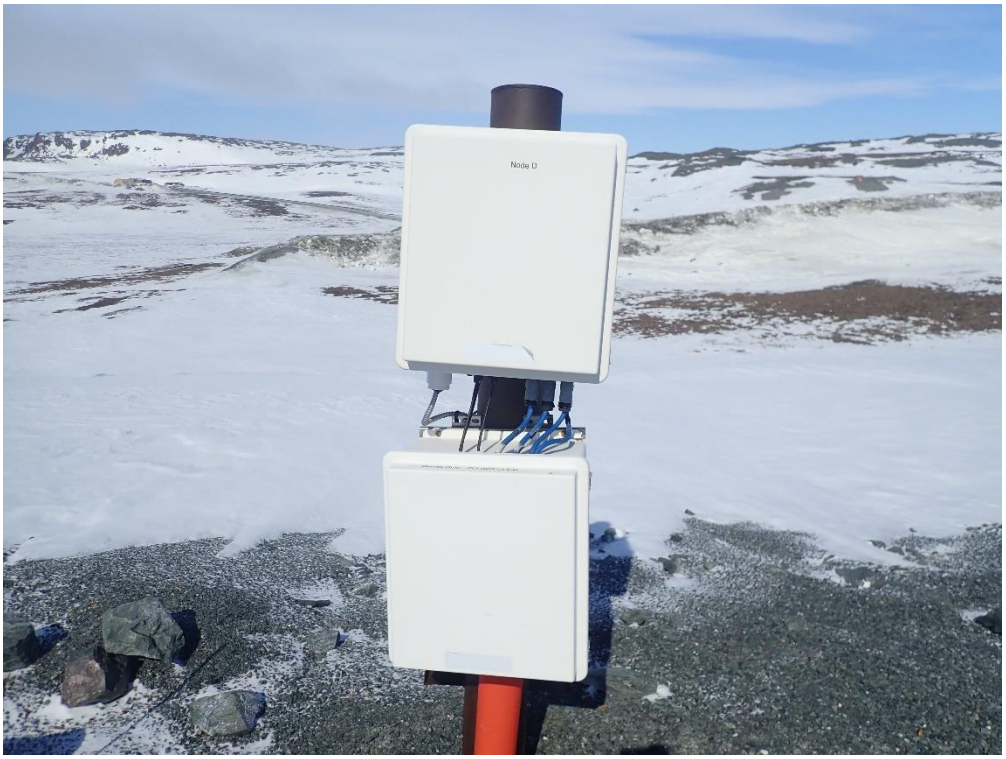


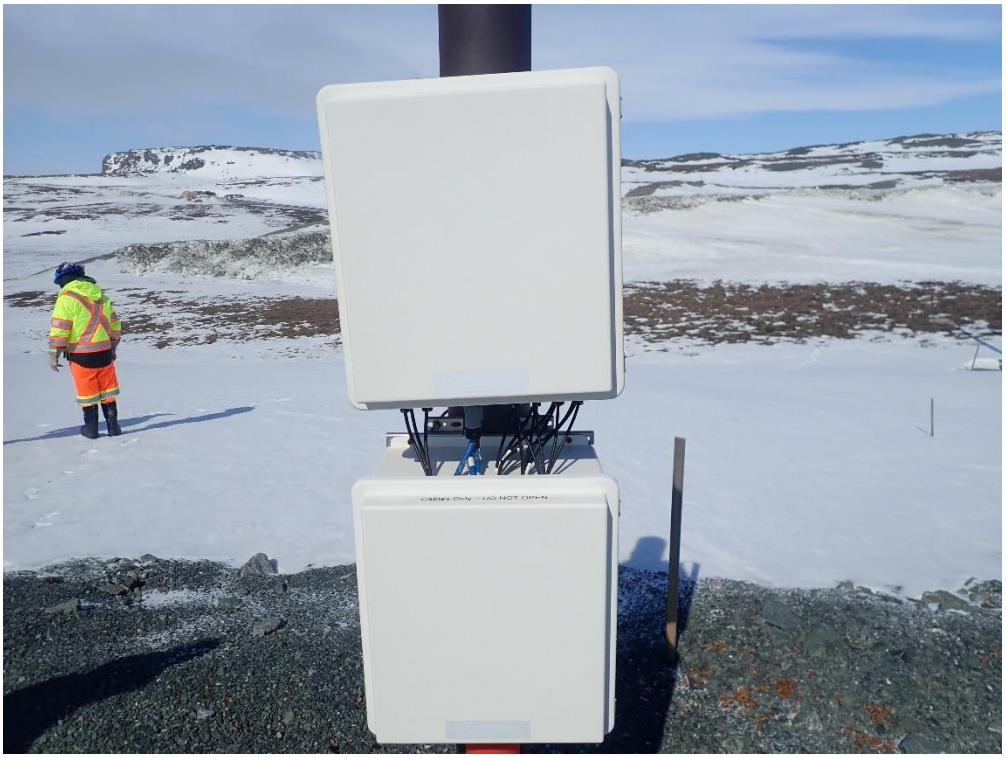












North Dam Weekly Walkover Survey Report

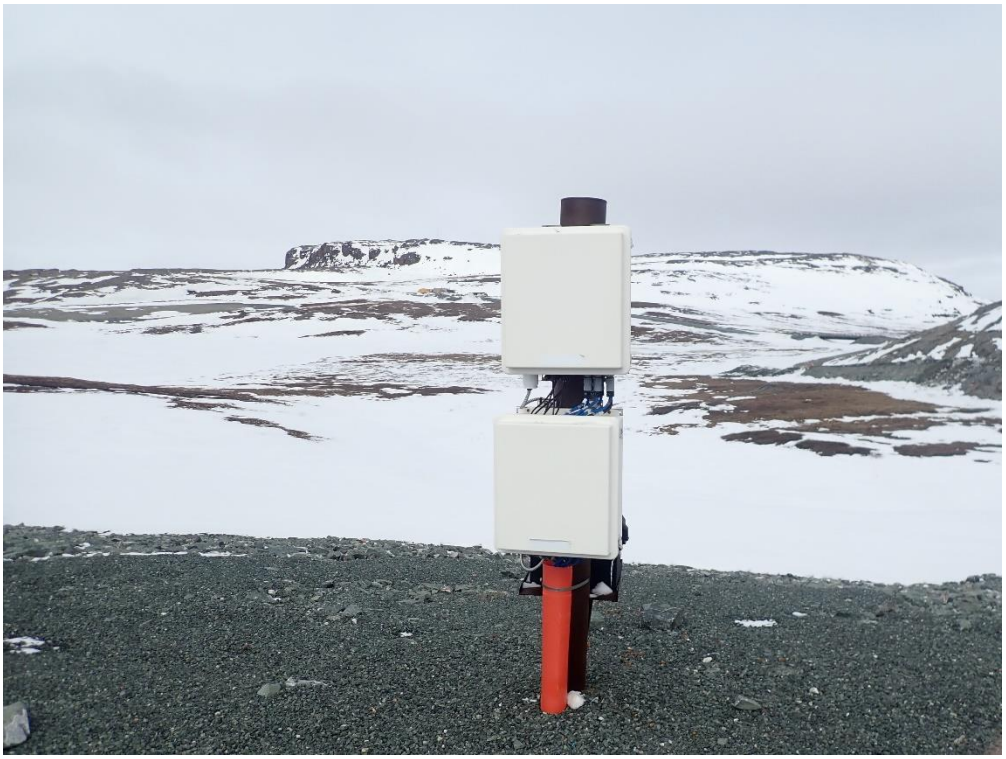
Date:	MAY 30, 21
Inspected By:	JM BC WW
Conditions: (ie. snow on ground, clear)	SNOW ON SLOPES, SURFACE MOSTLY SNOW FREE

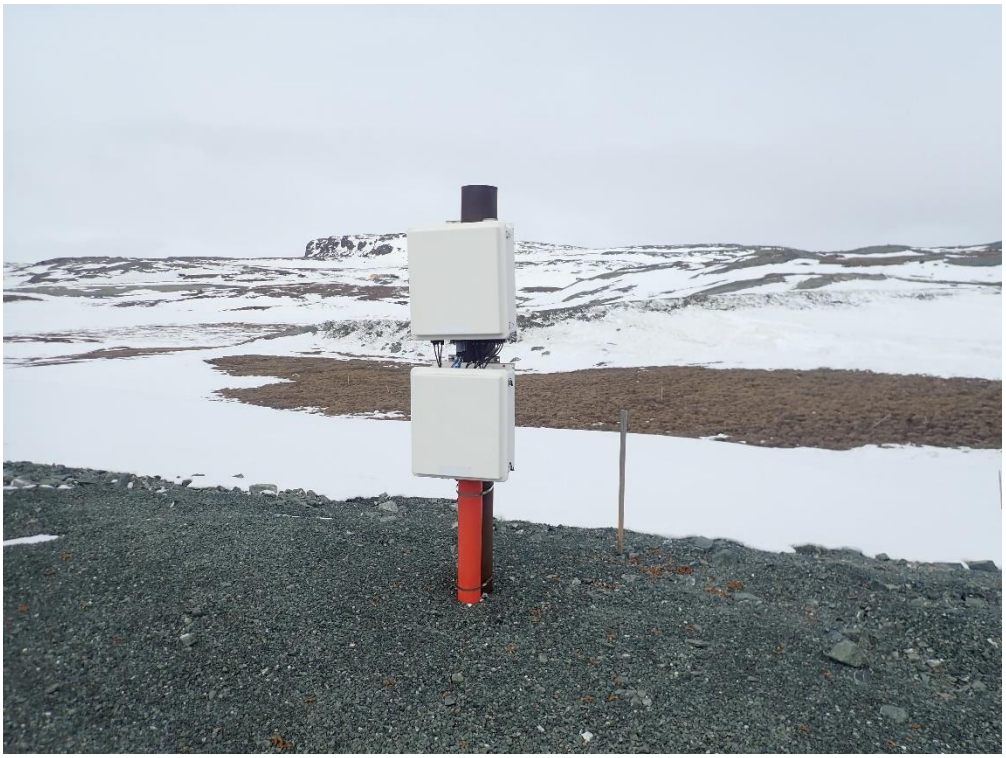
Visual Inspection:

This weekly walkover survey report is a means to track the condition on the North Dam, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Thermosyphons North Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Thermosyphons South Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Instrumentation (on crest and downstream side)		
Any visible concerns? (bent, rusted, cracked, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	(No)
Suspended Sediment in the TIA (When not frozen)		
Any suspended sediment visible in the reclaim pond? N/A (FROZEN)	Yes	No
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam?	Yes	(No)

If you answered yes to any of the questions above please provide details and photos. Observations can be sketched on the figure provided on the next page. If seepage has been noted please estimate the flow.





North Dam Weekly Walkover Survey Report

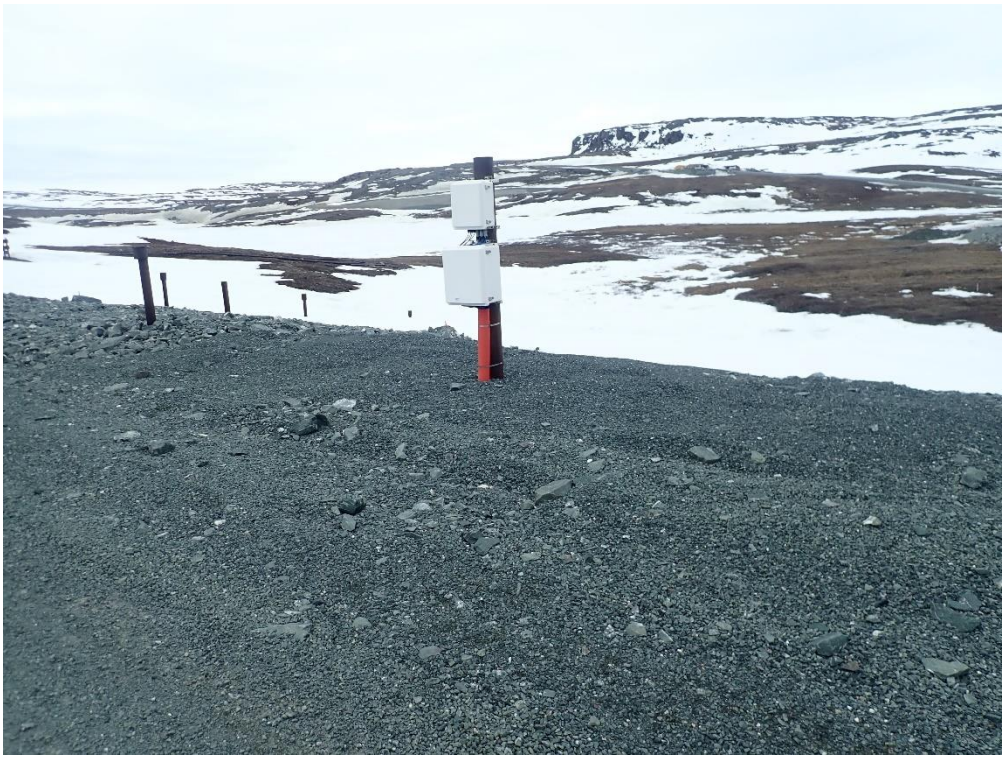
Date:	June 3, 2021
Inspected By:	GDV, AH, JM, BC
Conditions:	(ie. snow on ground, clear) Partly snow covered

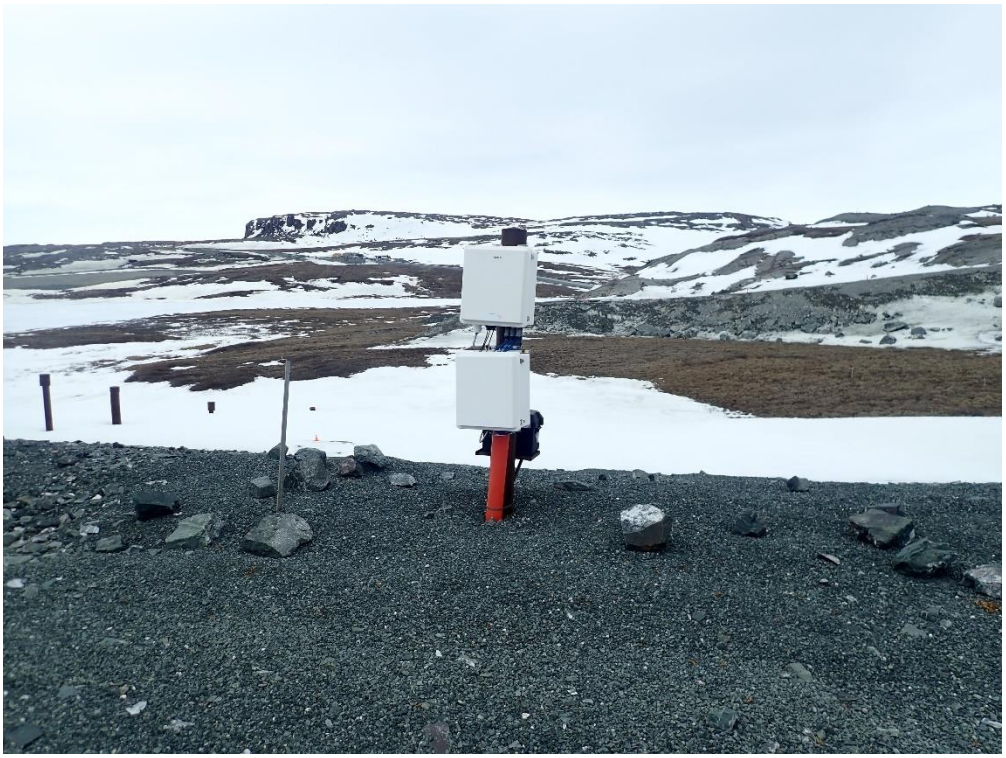
Visual Inspection:

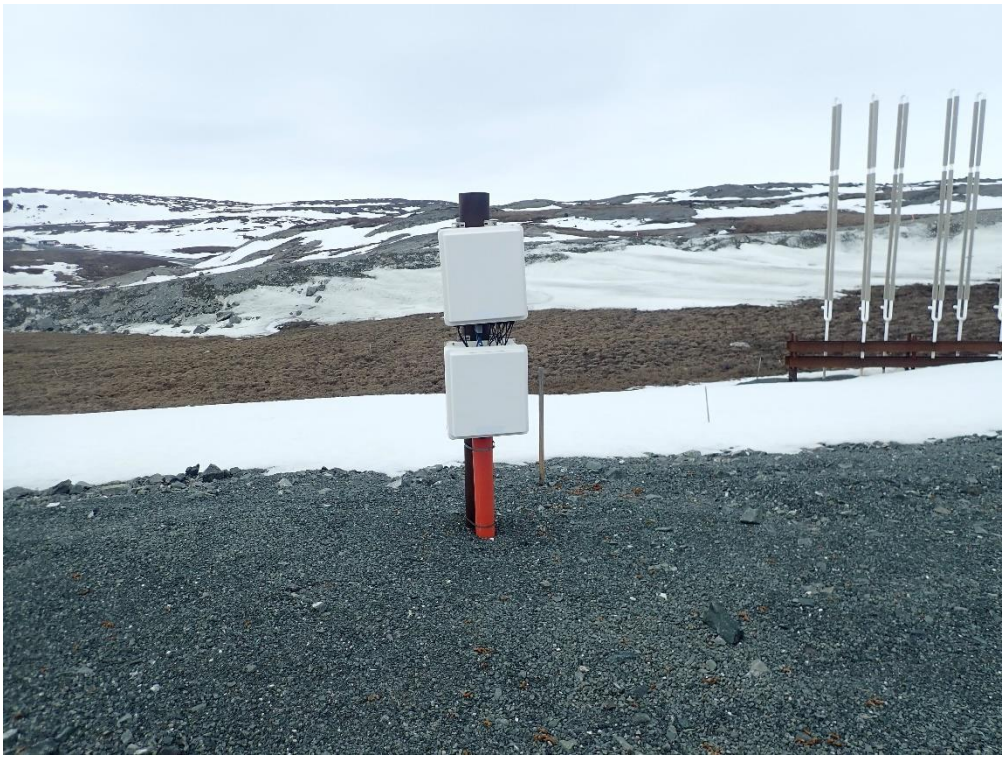
This weekly walkover survey report is a means to track the condition on the North Dam, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Thermosyphons North Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Thermosyphons South Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Instrumentation (on crest and downstream side)		
Any visible concerns? (bent, rusted, cracked, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	(No)
Suspended Sediment in the TIA (When not frozen) - N/A		
Any suspended sediment visible in the reclaim pond?	~~Yes~~ Frozen	~~No~~
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam?	Yes	(No)

If you answered yes to any of the questions above please provide details and photos. Observations can be sketched on the figure provided on the next page. If seepage has been noted please estimate the flow.







North Dam Weekly Walkover Survey Report

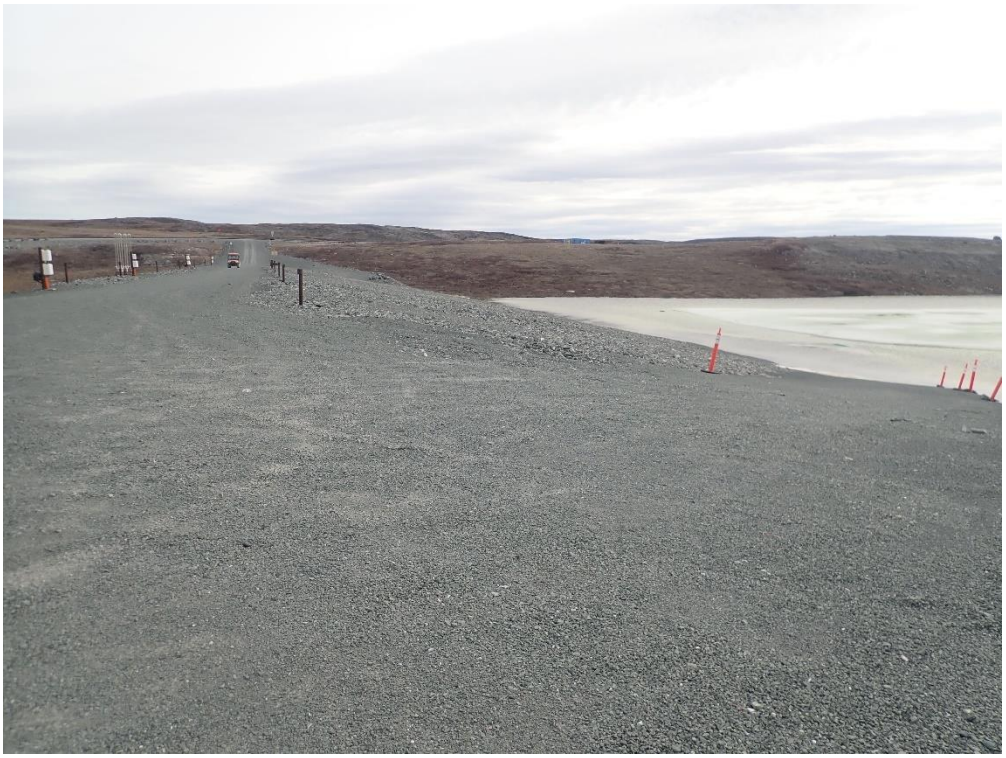
Date:	20/06/2021
Inspected By:	EF, BC
Conditions:	(ie. snow on ground, clear) Clear

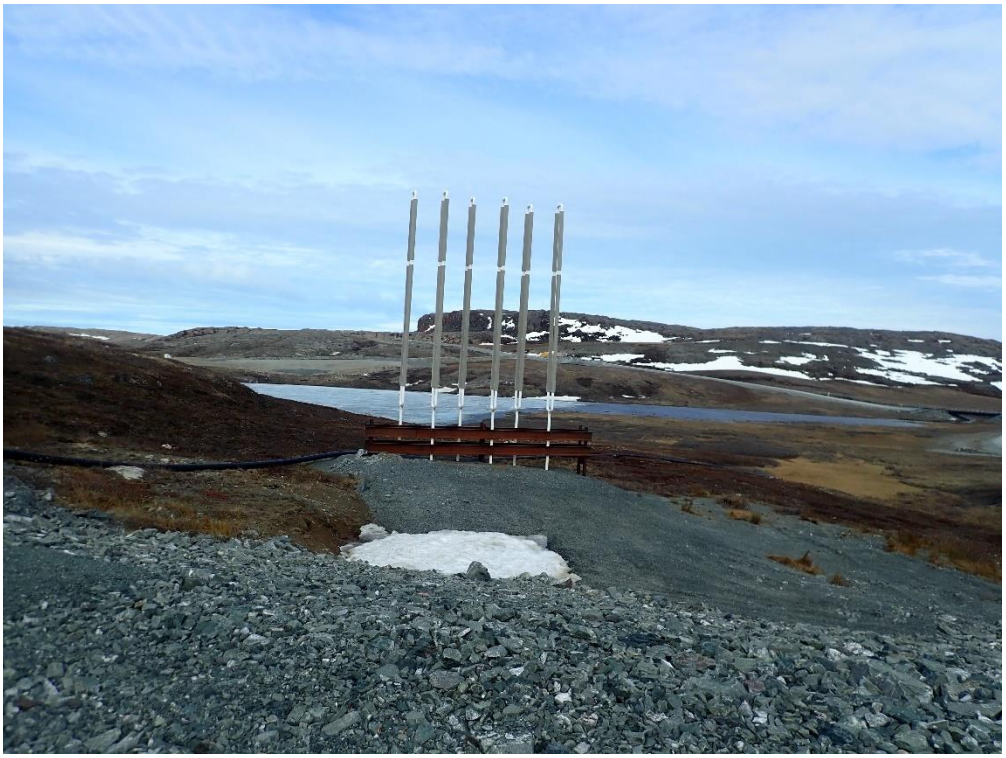
Visual Inspection:

This weekly walkover survey report is a means to track the condition on the North Dam, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Thermosyphons North Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Thermosyphons South Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Instrumentation (on crest and downstream side)		
Any visible concerns? (bent, rusted, cracked, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	(No)
Suspended Sediment in the TIA (When not frozen)		
Any suspended sediment visible in the reclaim pond?	Yes	(No)
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam?	Yes	(No)

If you answered yes to any of the questions above please provide details and photos. Observations can be sketched on the figure provided on the next page. If seepage has been noted please estimate the flow.





North Dam Weekly Walkover Survey Report

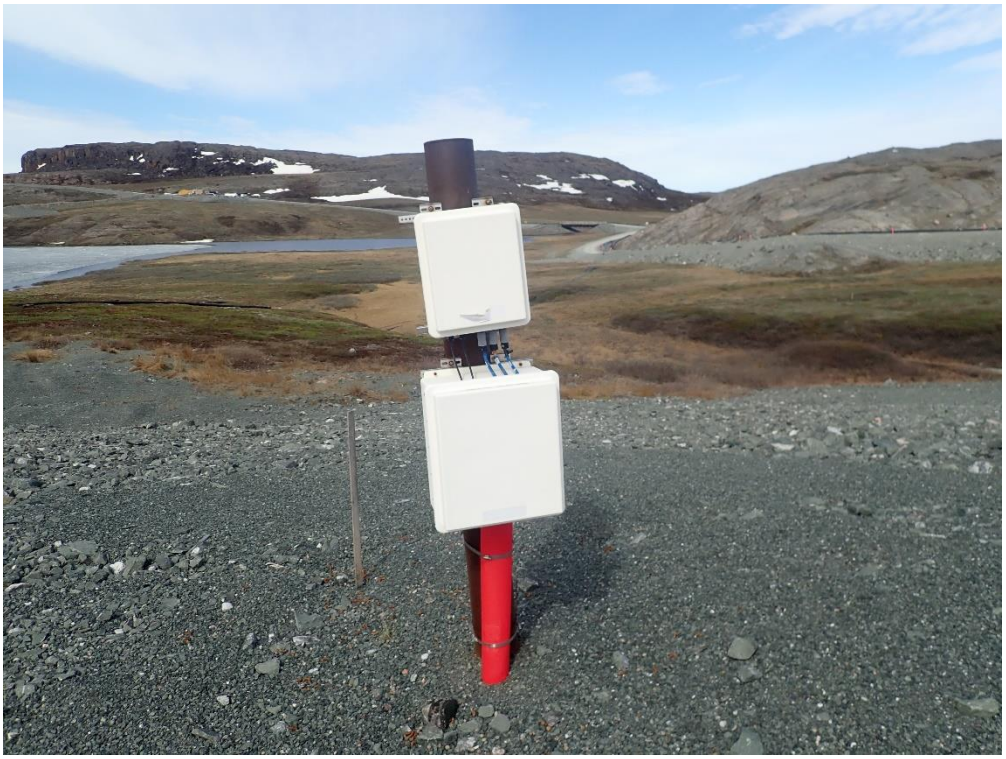
Date:	29 JUN 21
Inspected By:	PJ
Conditions:	(ie. snow on ground, clear) CLEAR, STRONG S. BREEZE, P. CLOUDY

Visual Inspection:

This weekly walkover survey report is a means to track the condition on the North Dam, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Thermosyphons North Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Thermosyphons South Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Instrumentation (on crest and downstream side)		
Any visible concerns? (bent, rusted, cracked, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	(No)
Suspended Sediment in the TIA (When not frozen)		
Any suspended sediment visible in the reclaim pond?	Yes	(No)
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam? MELT WATER FROM SNOW	(Yes)	No

If you answered yes to any of the questions above please provide details and photos. Observations can be sketched on the figure provided on the next page. If seepage has been noted please estimate the flow.



AGNICO EAGLE

Hope Bay - North Dam
Visual Inspection Form

Frequency: Weekly or as specified by EOR

Date:	26-07-2021
Inspected By:	BC, EF, GDV
Conditions:	(ie. snow on ground, clear) clear, SW and clouds

Visual Inspection:

This weekly visual inspection (walk over) report is a means to track the condition on the **North Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	No
Downstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	No
Crest of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	No
Thermosyphons North Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	No
Thermosyphons South Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	No
Instrumentation (on crest and downstream side)		
Any visible concerns? (bent, rusted, cracked, etc.)	Yes	No
Thermistors and Dataloggers		
Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	No
Suspended Sediment in the TIA (When not frozen)		
Any suspended sediment visible in the reclaim pond?	Yes	No
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam?	Yes	No
Is the water visibly flowing?	Yes	No

If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided on the next page.

If water flow near the dam toe been noted estimate the flow rate and report to the Environmental Supervisor:
High/Medium/Low:
Or, estimate a flow rate if possible:

AGNICO EAGLE

Hope Bay - North Dam
Visual Inspection Form

Frequency: Weekly or as specified by EOR

Date:	~~BL EF WN~~ 08/08/21
Inspected By:	BL EF WN
Conditions:	(ie. snow on ground, clear)

Visual Inspection:

This weekly visual inspection (walk over) report is a means to track the condition on the **North Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	(Yes)	No
Downstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Thermosyphons North Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Thermosyphons South Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Instrumentation (on crest and downstream side)		
Any visible concerns? (bent, rusted, cracked, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	(No)
Suspended Sediment in the TIA (When not frozen)		
Any suspended sediment visible in the reclaim pond?	Yes	(No)
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam?	(Yes)	No
Is the water visibly flowing?	(Yes)	No

If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided on the next page.

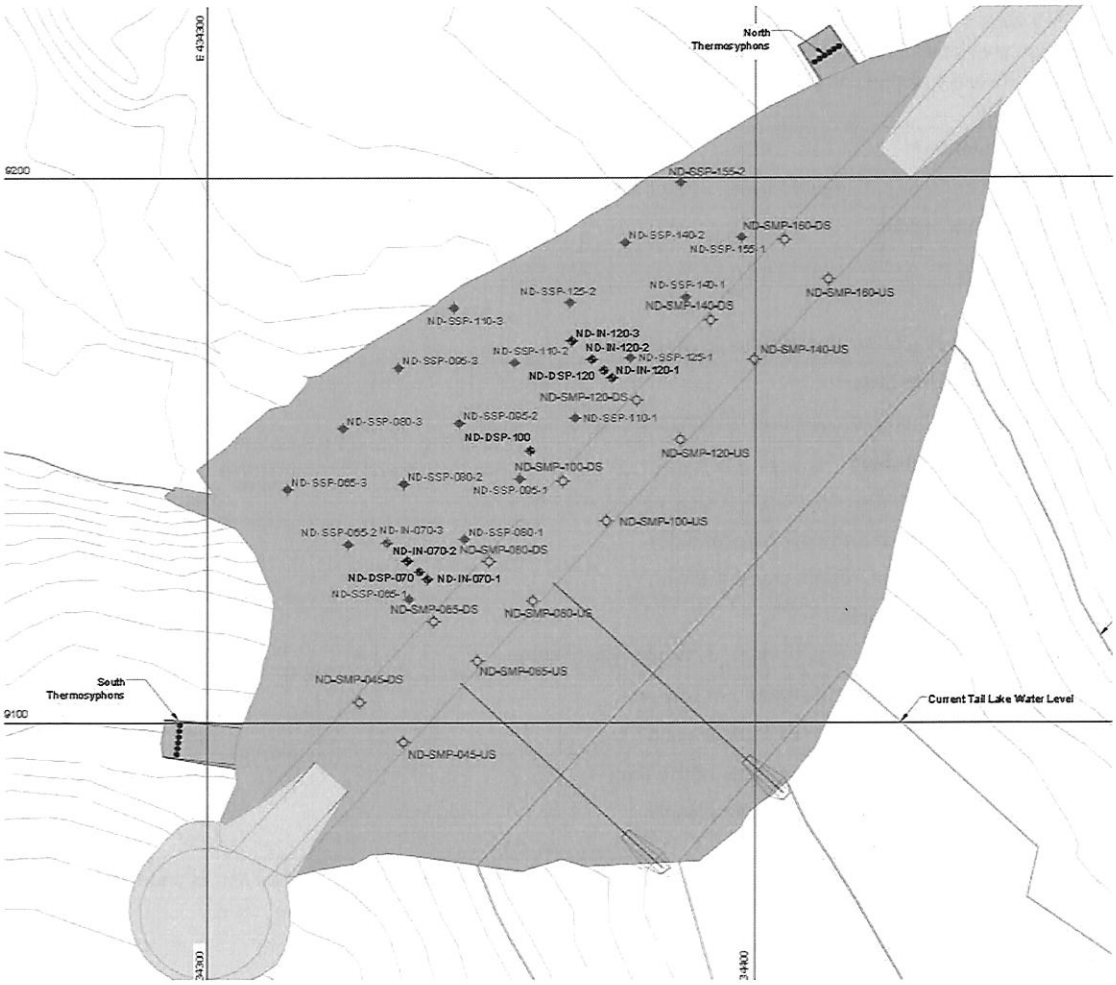
1 crack on upstream side.

Normal seep on downstream

Heavy rain on day of inspection

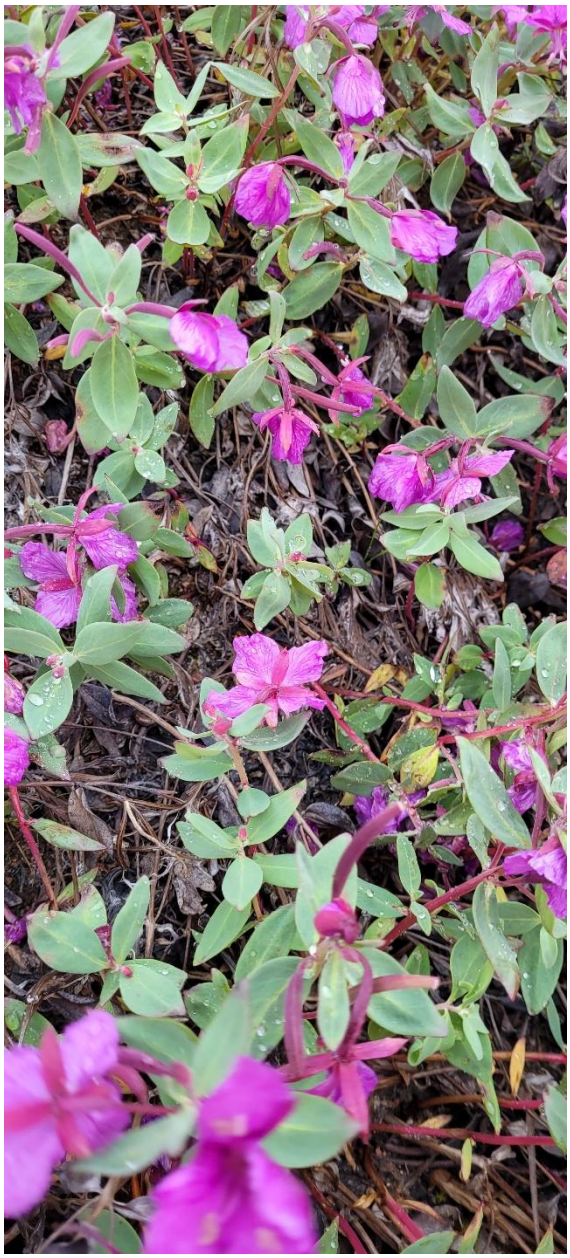
If water flow near the dam toe been noted estimate the flow rate and report to the Environmental Supervisor:
High/Medium/Low:
Or, estimate a flow rate if possible:

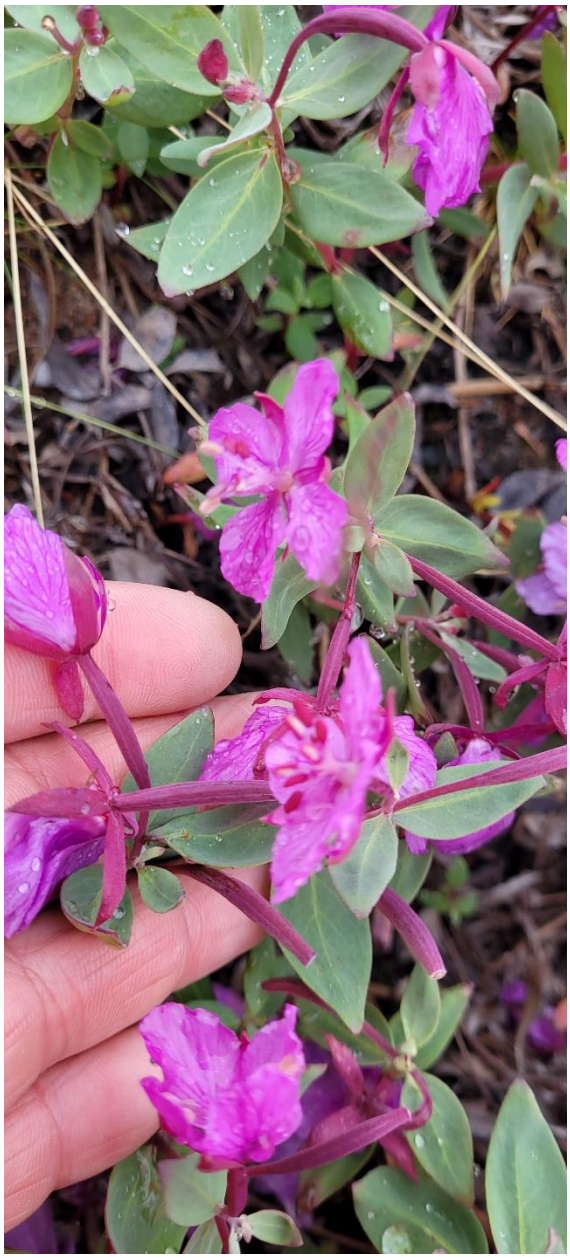
Please provide any other observations you have made:



Photos:

Please collect the following photos:	
Photo from north end looking south along the dam	☐
Photo from south end looking north along the dam	☐
Other photos, please describe. Photos on upstream toe all facing south. Photos on downstream toe all facing north	





AGNICO EAGLE

Hope Bay - North Dam
Visual Inspection Form

Frequency: Weekly or as specified by EOR

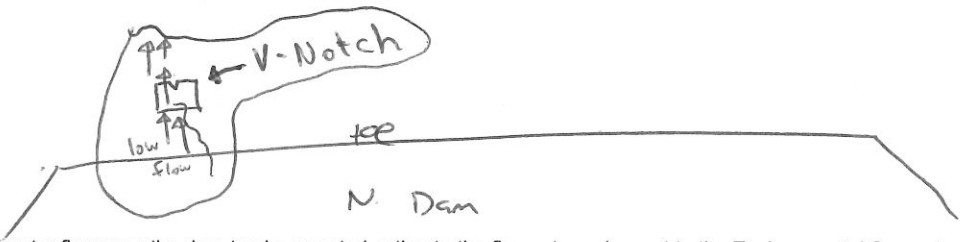
Date:	15 Aug 2021
Inspected By:	WN BC JM
Conditions:	(ie. snow on ground, ~~clear~~)

Visual Inspection:

This weekly visual inspection (walk over) report is a means to track the condition on the **North Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	~~No~~
Downstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	~~No~~
Crest of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	~~No~~
Thermosyphons North Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	~~No~~
Thermosyphons South Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	~~No~~
Instrumentation (on crest and downstream side)		
Any visible concerns? (bent, rusted, cracked, etc.)	Yes	~~No~~
Thermistors and Dataloggers		
Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	~~No~~
Suspended Sediment in the TIA (When not frozen)		
Any suspended sediment visible in the reclaim pond?	Yes	~~No~~
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam?	~~Yes~~	No
Is the water visibly flowing?	~~Yes~~	No

If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided on the next page.



If water flow near the dam toe been noted estimate the flow rate and report to the Environmental Supervisor:
High/Medium/Low:
Or, estimate a flow rate if possible: Cracking/erosion on ramp side of dam (see photos)

AGNICO EAGLE

Hope Bay - North Dam
Visual Inspection Form

Frequency: Weekly or as specified by EOR

Date:	25 Aug 21
Inspected By:	JM BC
Conditions:	(ie. snow on ground, clear)

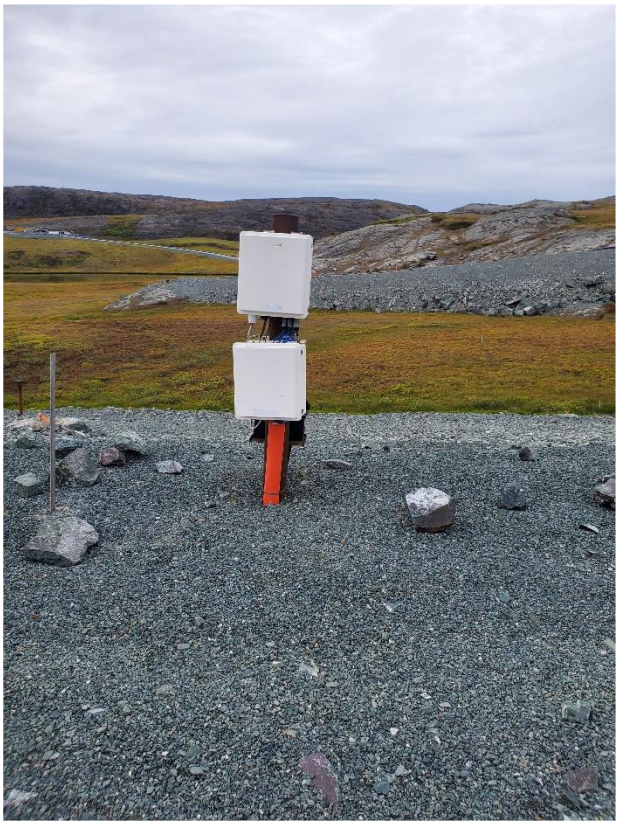
Visual Inspection:

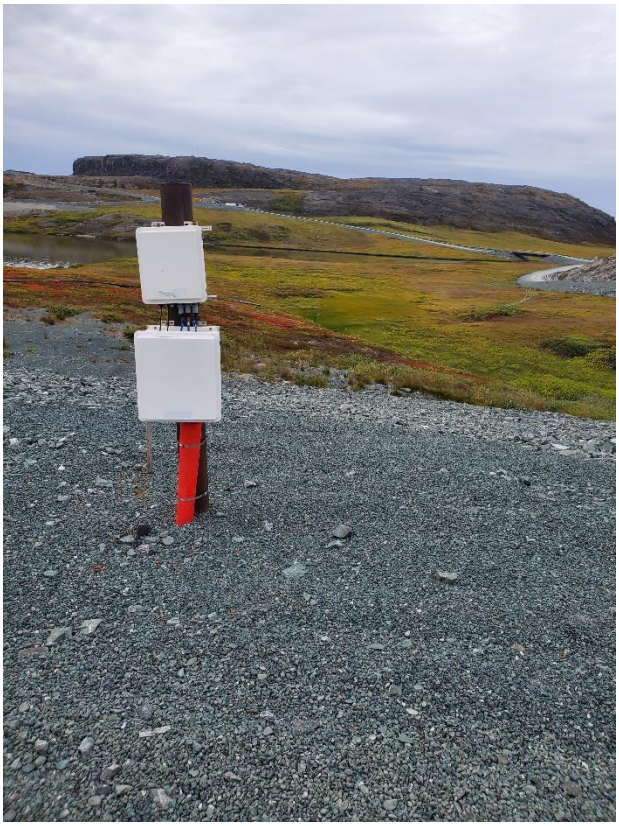
This weekly visual inspection (walk over) report is a means to track the condition on the **North Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Thermosyphons North Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Thermosyphons South Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Instrumentation (on crest and downstream side)		
Any visible concerns? (bent, rusted, cracked, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	(No)
Suspended Sediment in the TIA (When not frozen)		
Any suspended sediment visible in the reclaim pond?	Yes	(No)
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam?	(Yes)	No
Is the water visibly flowing? very slowly	(Yes)	No

If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided on the next page.

If water flow near the dam toe been noted estimate the flow rate and report to the Environmental Supervisor:
High/Medium/Low:
Or, estimate a flow rate if possible:





AGNICO EAGLE

Hope Bay - North Dam
Visual Inspection Form

Frequency: Weekly or as specified by EOR

Date:	29 Aug 21
Inspected By:	JM BC
Conditions:	(ie. snow on ground, clear)

Visual Inspection:

This weekly visual inspection (walk over) report is a means to track the condition on the **North Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Thermosyphons North Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Thermosyphons South Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Instrumentation (on crest and downstream side)		
Any visible concerns? (bent, rusted, cracked, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	(No)
Suspended Sediment in the TIA (When not frozen)		
Any suspended sediment visible in the reclaim pond?	Yes	(No)
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam?	(Yes)	No
Is the water visibly flowing?	(Yes)	No

If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided on the next page.

Slow water flow at V notch → see photos attached

- Evidence of heavy duty equipment on toe side of dam near East side → See photos

If water flow near the dam toe been noted estimate the flow rate and report to the Environmental Supervisor:
High/Medium/(Low):
Or, estimate a flow rate if possible:

AGNICO EAGLE

Hope Bay - North Dam
Visual Inspection Form

Frequency: Weekly or as specified by EOR

Date:	Sept 6 2021
Inspected By:	BC AH
Conditions:	(ie. snow on ground, clear)

Visual Inspection:

This weekly visual inspection (walk over) report is a means to track the condition on the **North Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Thermosyphons North Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Thermosyphons South Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Instrumentation (on crest and downstream side)		
Any visible concerns? (bent, rusted, cracked, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	(No)
Suspended Sediment in the TIA (When not frozen)		
Any suspended sediment visible in the reclaim pond?	Yes	(No)
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam?	(Yes)	No
Is the water visibly flowing?	(Yes)	No

If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided on the next page.

The normal NDSEEP is still seeping. Heavy rain causing other pooling.

If water flow near the dam toe been noted estimate the flow rate and report to the Environmental Supervisor:
High/Medium/Low:
Or, estimate a flow rate if possible:

AGNICO EAGLE

Hope Bay - North Dam
Visual Inspection Form

Frequency: Weekly or as specified by EOR

Date:	Sept 13 2021
Inspected By:	BL KK
Conditions:	(ie. snow on ground, clear)

Visual Inspection:

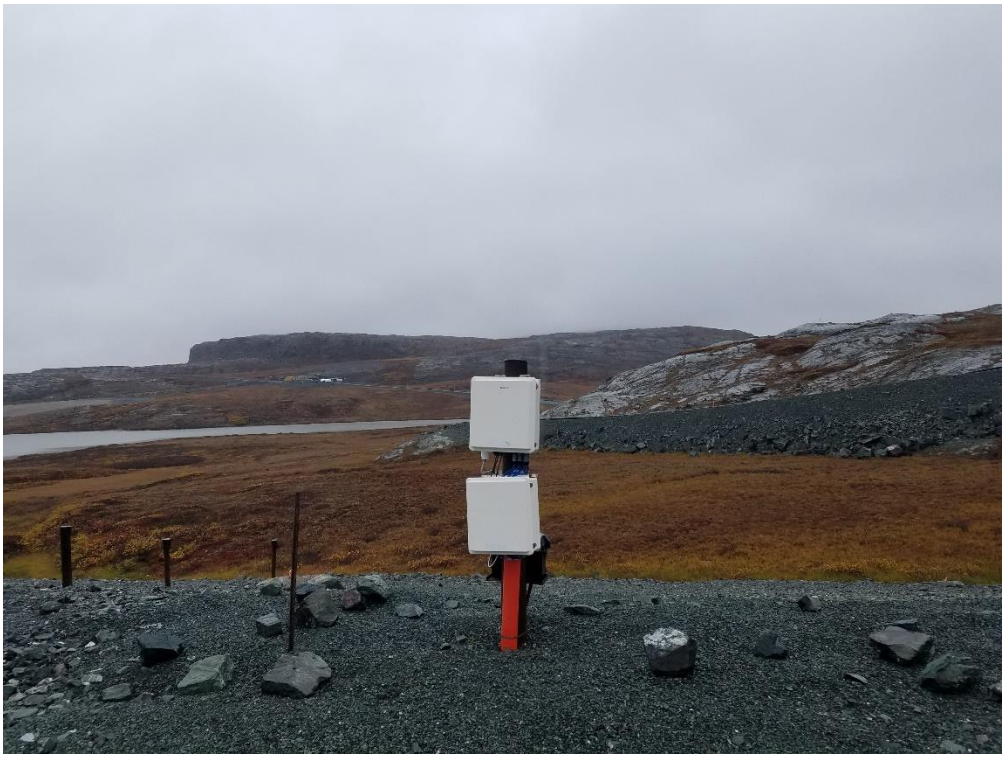
This weekly visual inspection (walk over) report is a means to track the condition on the **North Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

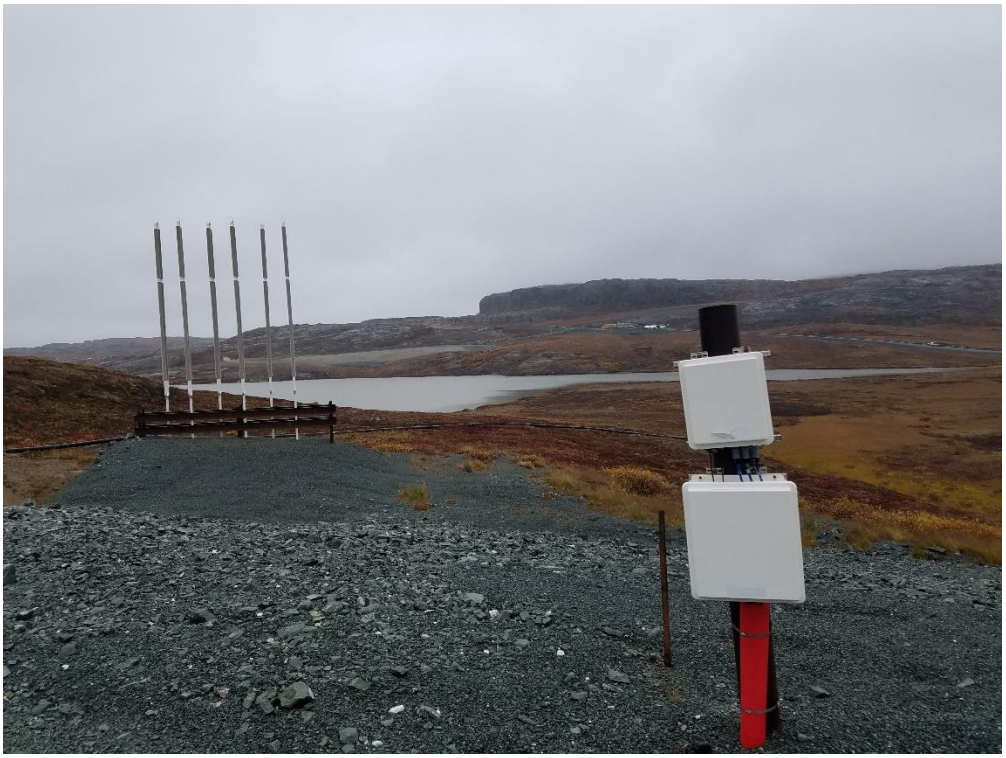
Upstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Thermosyphons North Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Thermosyphons South Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Instrumentation (on crest and downstream side)		
Any visible concerns? (bent, rusted, cracked, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	(No)
Suspended Sediment in the TIA (When not frozen)		
Any suspended sediment visible in the reclaim pond?	Yes	(No)
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam?	(Yes)	No
Is the water visibly flowing?	(Yes)	No

If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided on the next page.

Standard NDSEEP area

If water flow near the dam toe been noted estimate the flow rate and report to the Environmental Supervisor:
High/Medium/Low:
Or, estimate a flow rate if possible:





AGNICO EAGLE

Hope Bay - North Dam
Visual Inspection Form

Frequency: Weekly or as specified by EOR

Date:	Sept 19/21
Inspected By:	BL & DV
Conditions:	(ie. snow on ground, clear)

Visual Inspection:

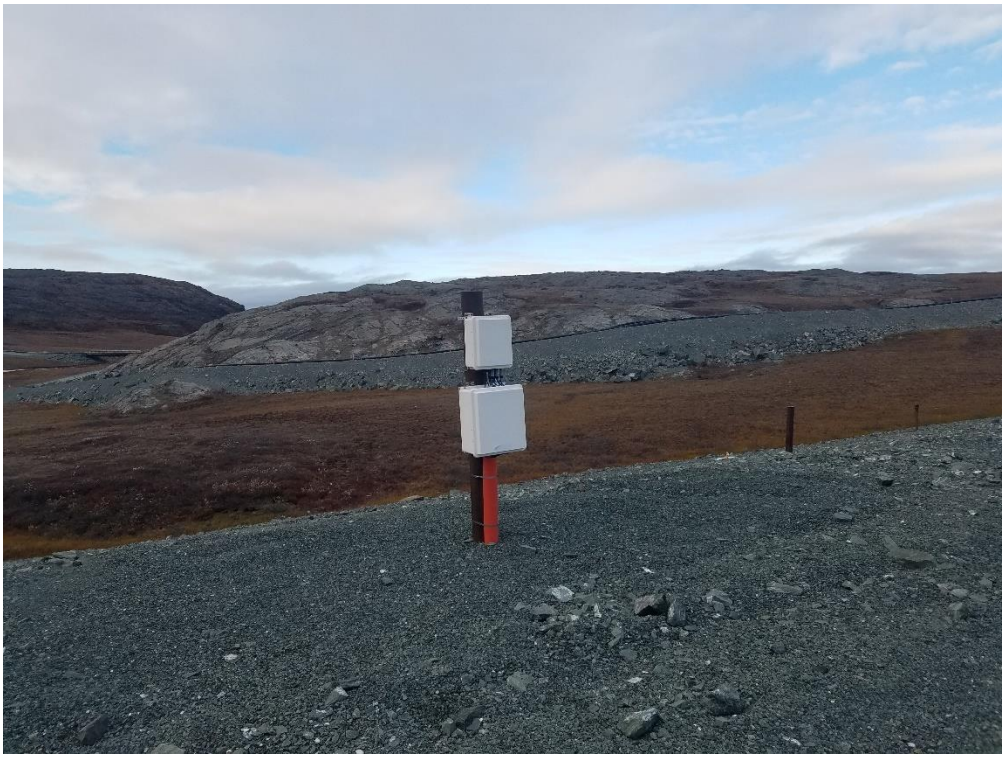
This weekly visual inspection (walk over) report is a means to track the condition on the **North Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

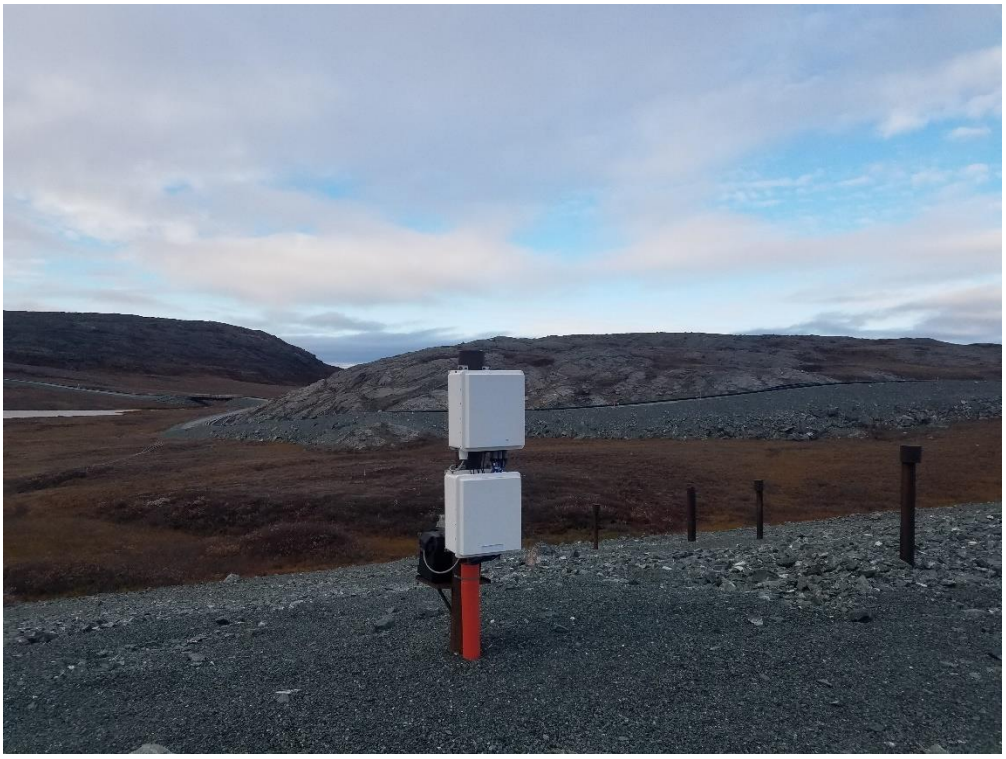
Upstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Thermosyphons North Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Thermosyphons South Side		
Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	(No)
Instrumentation (on crest and downstream side)		
Any visible concerns? (bent, rusted, cracked, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	(No)
Suspended Sediment in the TIA (When not frozen)		
Any suspended sediment visible in the reclaim pond?	Yes	(No)
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam? *	(Yes)	No
Is the water visibly flowing?	(Yes)	No

If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided on the next page.

* normal NDSEEP is flowing.

If water flow near the dam toe been noted estimate the flow rate and report to the Environmental Supervisor:
High/Medium/Low:
Or, estimate a flow rate if possible:





AGNICO EAGLE

Hope Bay - North Dam
Visual Inspection Form

Frequency: Weekly or as specified by EOR

Date:	SEPT 26-21
Inspected By:	GDV / WW
Conditions: (ie. snow on ground, clear)	CLEAR.

Visual Inspection:

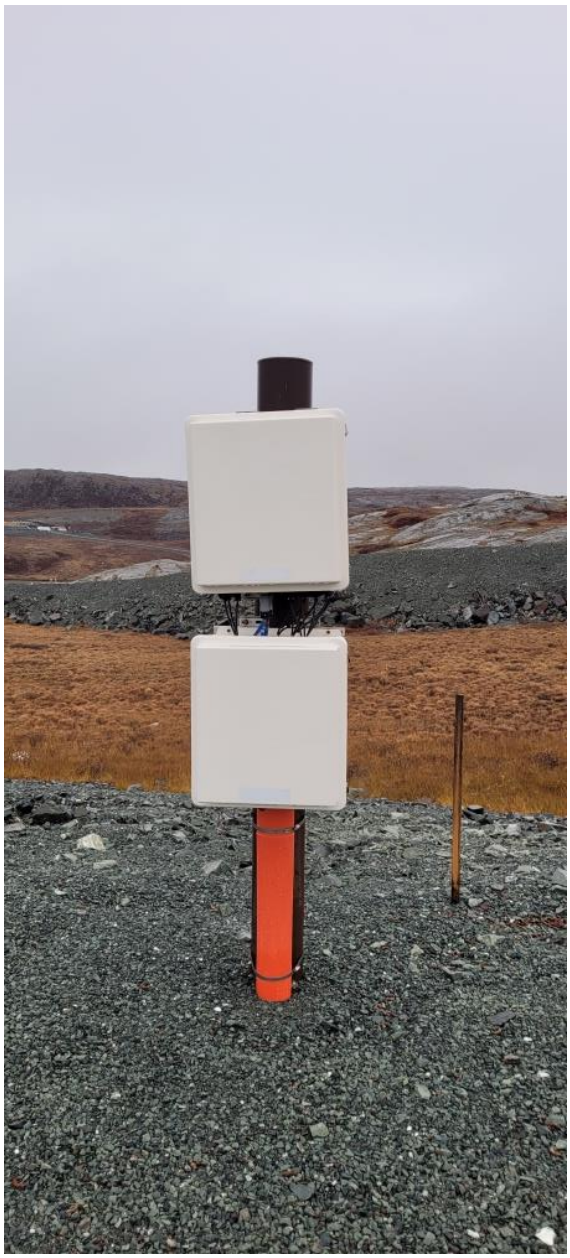
This weekly visual inspection (walk over) report is a means to track the condition on the **North Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam Any visible concerns? (cracks, depressions, erosion, etc.)	1 Yes	No
Downstream Side of Dam Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	No
Crest of Dam Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	No
Thermosyphons North Side Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	No
Thermosyphons South Side Any visible concerns? (cracks, punctures, peeling paint, birds nests, etc.)	Yes	No
Instrumentation (on crest and downstream side) Any visible concerns? (bent, rusted, cracked, etc.)	Yes	No
Thermistors and Dataloggers Any visible concerns? (frayed or cut cables, damaged boxes, etc.)	Yes	No
Suspended Sediment in the TIA (When not frozen) Any suspended sediment visible in the reclaim pond?	Yes	No
Water at the Toe of the Downstream Side of the Dam Is water visible on the downstream side of the dam? STEEP Is the water visibly flowing?	Yes Yes	No No

If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided on the next page.

1 - CRACKS EVIDENT NEAR TOE OF TIA (NORTH) SLOPE IN FINE MATERIAL

If water flow near the dam toe been noted estimate the flow rate and report to the Environmental Supervisor:
High/Medium/Low:
Or, estimate a flow rate if possible:



South Dam
Walkover Report

Frequency: Weekly or as specified by EOR

Date:	Oct 20, 2020
Inspected By:	Brett Kelly
Conditions:	(ie. snow on ground, clear) Overcast, -20 Deg.C

Visual Inspection:

This weekly walkover survey report is a means to track the condition on the **South Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	[No]
Downstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	[No]
Crest of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	[No]
Tailings Beach on the Upstream Side		
Is the beach within the operating limits? (Beach length of 100 meters, no water ponding or pooling near the dam etc.) * Use shoreline markers indicating 100 meters from the crest for visual reference*	[Yes]	No
Active Tailings Discharge Spigot		
Indicate the active discharge spigot location (Spigot number or (S) on the figure provided)	Varleys Corner	
Settlement Instrumentation (on crest and downstream side)		
Any visible concerns? (significantly rusted or otherwise damaged, etc.)	Yes	[No]
Thermistors and Dataloggers		
Any visible concerns? (cables frayed, disconnected or damaged, boxes cracked, etc.)	Yes	[No]
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam?	Yes	[No]
Is the water visibly flowing?	Yes	[No]
Walk over inspection of the downstream toe complete? (May to November)		
Inspector should walk the length of the downstream toe inspecting for seepage or slumping once most of the snow has melted (May to November)	Yes	[No]

If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided below.

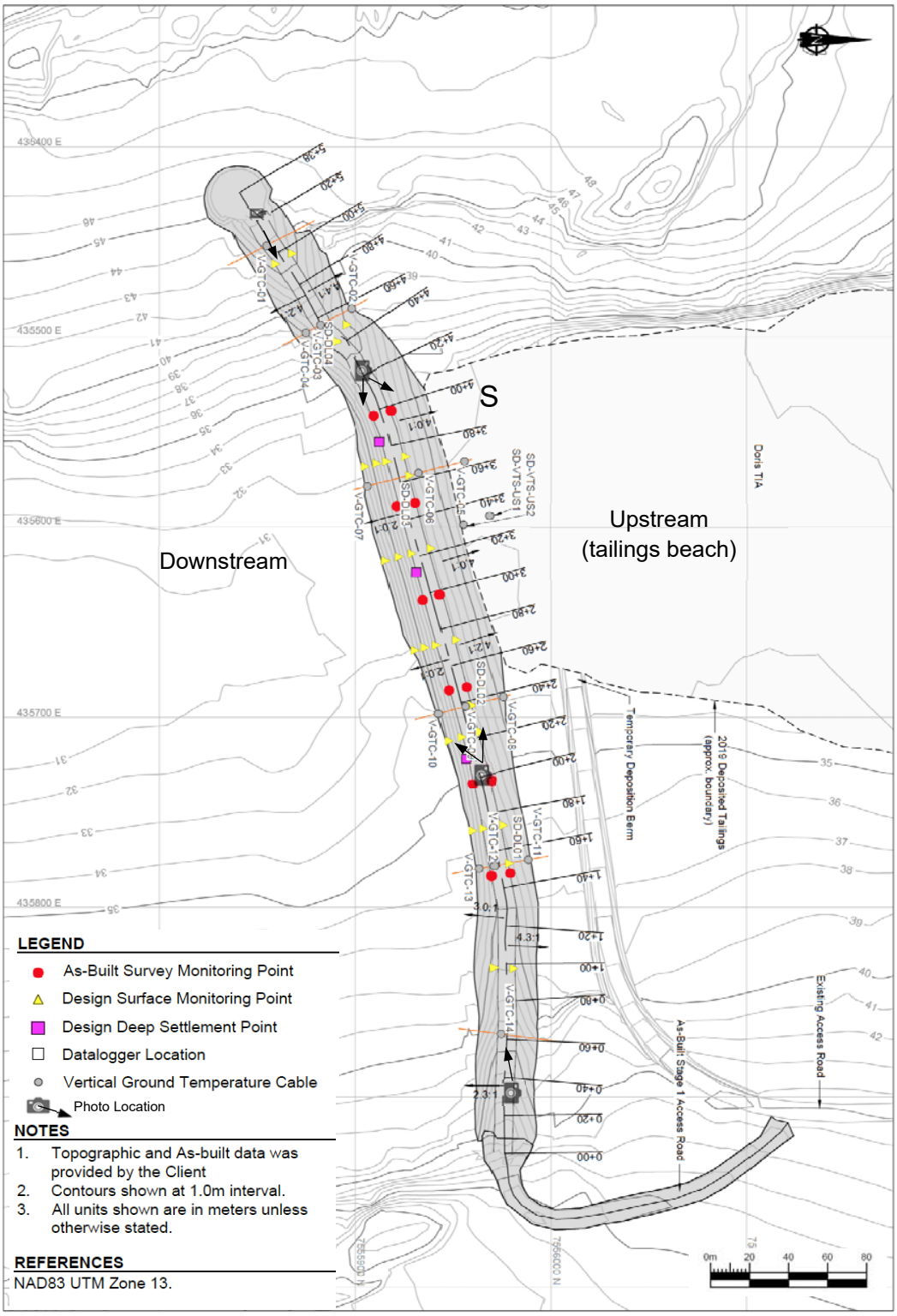
NOTES:

If seepage has been noted estimate the flow (high/medium/low) and report to TMAC Environmental Superintendent:

Photos:

Please collect the following photos:

- Photo from the crest looking W along the dam crest (Station 0+30) ☐
- Photo from the crest looking SW over the downstream toe along the dam (Station 2+00) ☐
- Photo from the crest looking W over the tailings beach (Station 2+00) ☐
- Photo from the crest looking NE over the tailings beach (Station 4+20) ☐
- Photo from the crest looking E over the downstream toe along the dam (Station 4+20) ☐
- Photo from west end looking E along the dam crest (Station 5+20) ☐



South Dam
Walkover Report

Frequency: Weekly or as specified by EOR

Date:	Nov 1, 2020
Inspected By:	Brett Kelly
Conditions:	(ie. snow on ground, clear) Foggy, -26 Deg.C

Visual Inspection:

This weekly walkover survey report is a means to track the condition on the **South Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	[No]
Downstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	[No]
Crest of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	[No]
Tailings Beach on the Upstream Side		
Is the beach within the operating limits? (Beach length of 100 meters, no water ponding or pooling near the dam etc.) * Use shoreline markers indicating 100 meters from the crest for visual reference*	[Yes]	No
Active Tailings Discharge Spigot		
Indicate the active discharge spigot location (Spigot number or (S) on the figure provided)	Varleys Corner (Spigot 1)	
Settlement Instrumentation (on crest and downstream side)		
Any visible concerns? (significantly rusted or otherwise damaged, etc.)	Yes	[No]
Thermistors and Dataloggers		
Any visible concerns? (cables frayed, disconnected or damaged, boxes cracked, etc.)	Yes	[No]
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam?	Yes	[No]
Is the water visibly flowing?	Yes	[No]
Walk over inspection of the downstream toe complete? (May to November)		
Inspector should walk the length of the downstream toe inspecting for seepage or slumping once most of the snow has melted (May to November)	Yes	[No]

If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided below.

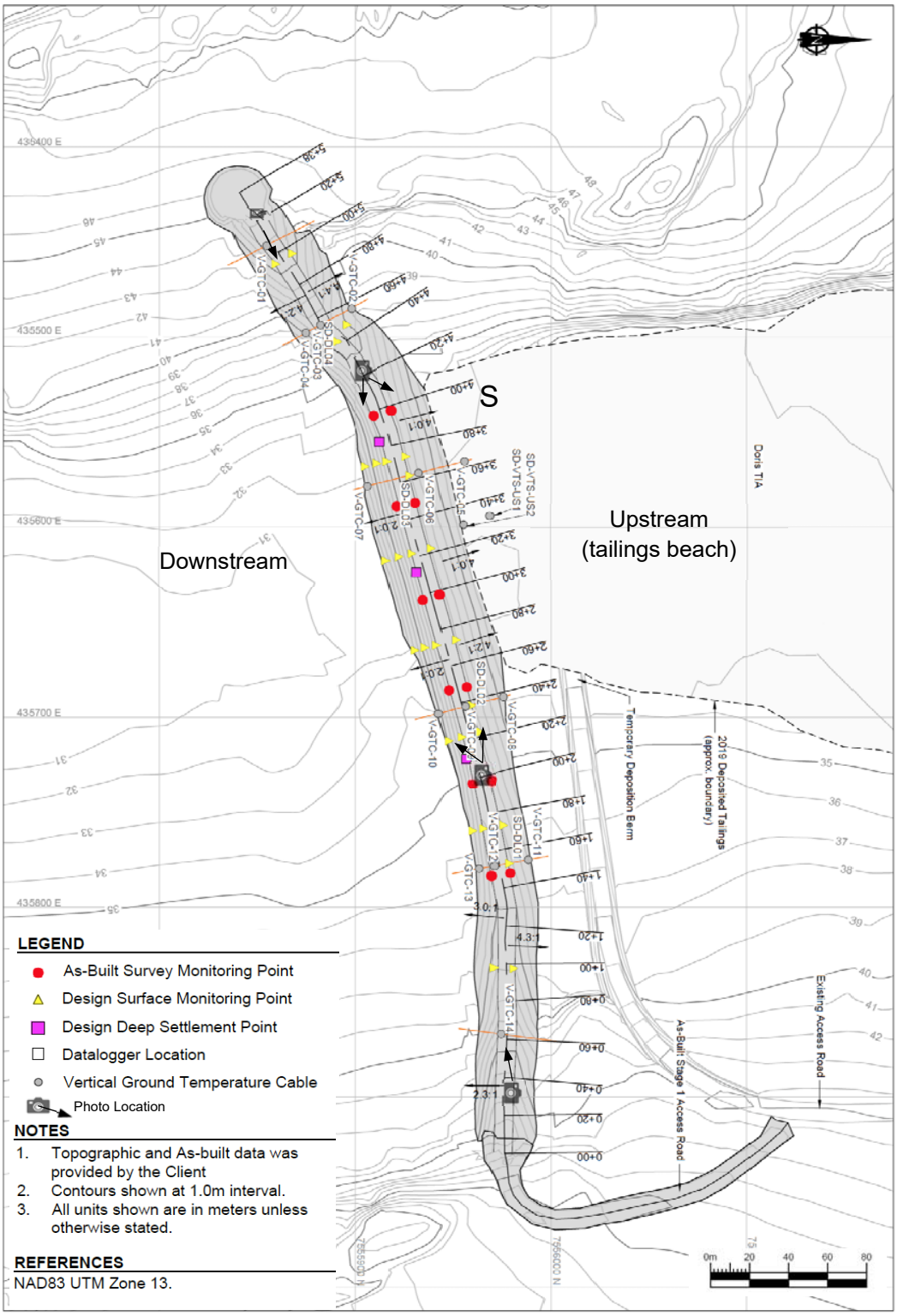
NOTES:

If seepage has been noted estimate the flow (high/medium/low) and report to TMAC Environmental Superintendent:

Photos:

Please collect the following photos:

- Photo from the crest looking W along the dam crest (Station 0+30) ☐
- Photo from the crest looking SW over the downstream toe along the dam (Station 2+00) ☐
- Photo from the crest looking W over the tailings beach (Station 2+00) ☐
- Photo from the crest looking NE over the tailings beach (Station 4+20) ☐
- Photo from the crest looking E over the downstream toe along the dam (Station 4+20) ☐
- Photo from west end looking E along the dam crest (Station 5+20) ☐



South Dam
Walkover Report

Frequency: Weekly or as specified by EOR

Date:	Nov 7/2020
Inspected By:	Sarah Warnock
Conditions: (ie. snow on ground, clear)	Snow covered ground, no wind, clear sky, light flurries in past 24 hrs. ~ -20°C

Visual Inspection:

This weekly walkover survey report is a means to track the condition on the **South Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam (Overall) Any visible concerns? (cracks, depressions, erosion, etc.) ~~Snow Covered~~ Snow covered	Yes	(No)
Downstream Side of Dam (Overall) Any visible concerns? (cracks, depressions, erosion, seepage, etc.) Snow covered.	Yes	(No)
Crest of Dam (Overall) Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Tailings Beach on the Upstream Side this is a confusing way to phrase this Is the beach within the operating limits? (Beach length of 100 meters, no water ponding or pooling near the dam etc.) * Use shoreline markers indicating 100 meters from the crest for visual reference*	(Yes)	No
Active Tailings Discharge Spigot Indicate the active discharge spigot location (Spigot number or (S) on the figure provided) #		changing to 4 scheduled today.
Settlement Instrumentation (on crest and downstream side) Any visible concerns? (significantly rusted or otherwise damaged, etc.)	Yes	(No)
Thermistors and Dataloggers Snow on solar panels cleared Any visible concerns? (cables frayed, disconnected or damaged, boxes cracked, etc.)	Yes	(No)
Water at the Toe of the Downstream Side of the Dam Is water visible on the downstream side of the dam? Frozen, snow covered Is the water visibly flowing?	Yes Yes	(No) (No)
Walk over inspection of the downstream toe complete? (May to November) Inspector should walk the length of the downstream toe inspecting for seepage or slumping once most of the snow has melted (May to November)	Yes	(No) Deep snow cover at toe

If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided below.

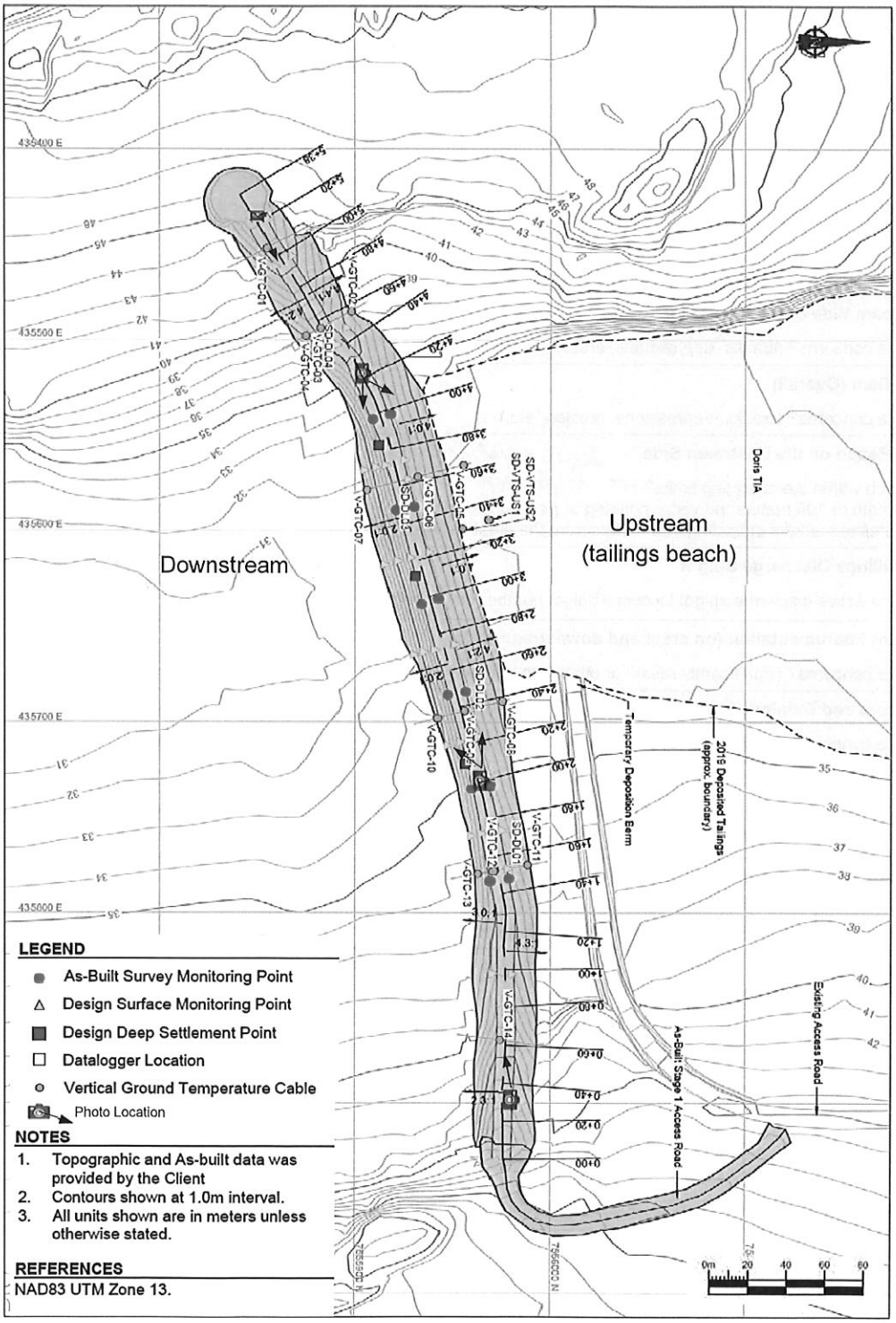
NOTES:

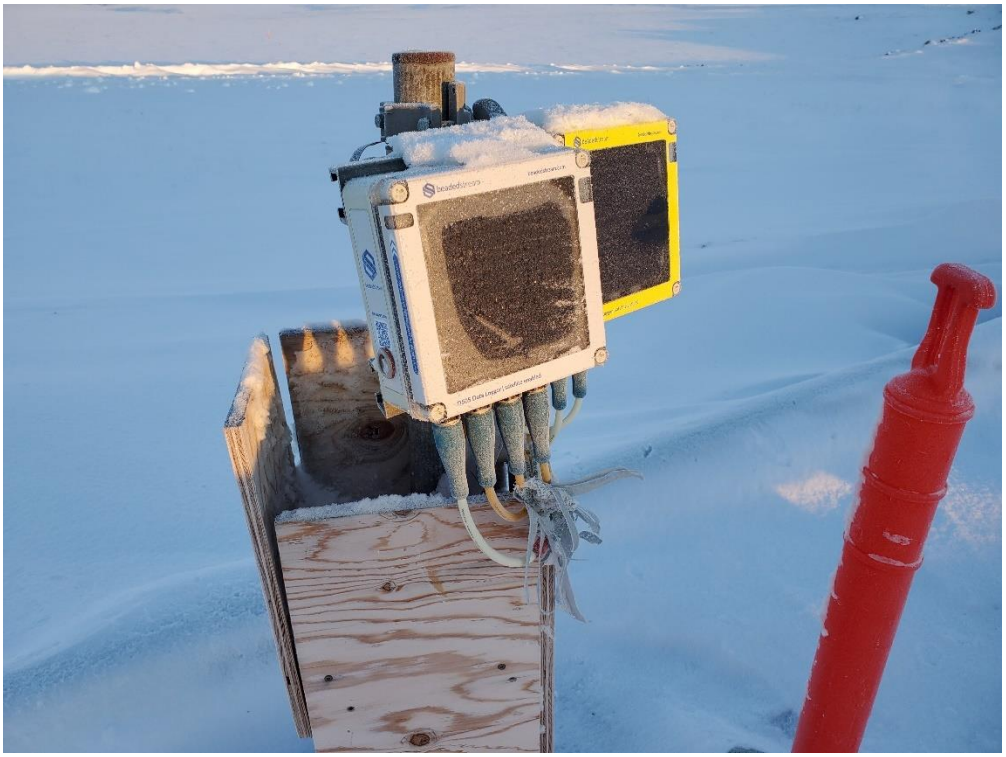
If seepage has been noted estimate the flow (high/medium/low) and report to TMAC Environmental Superintendent:

Photos:

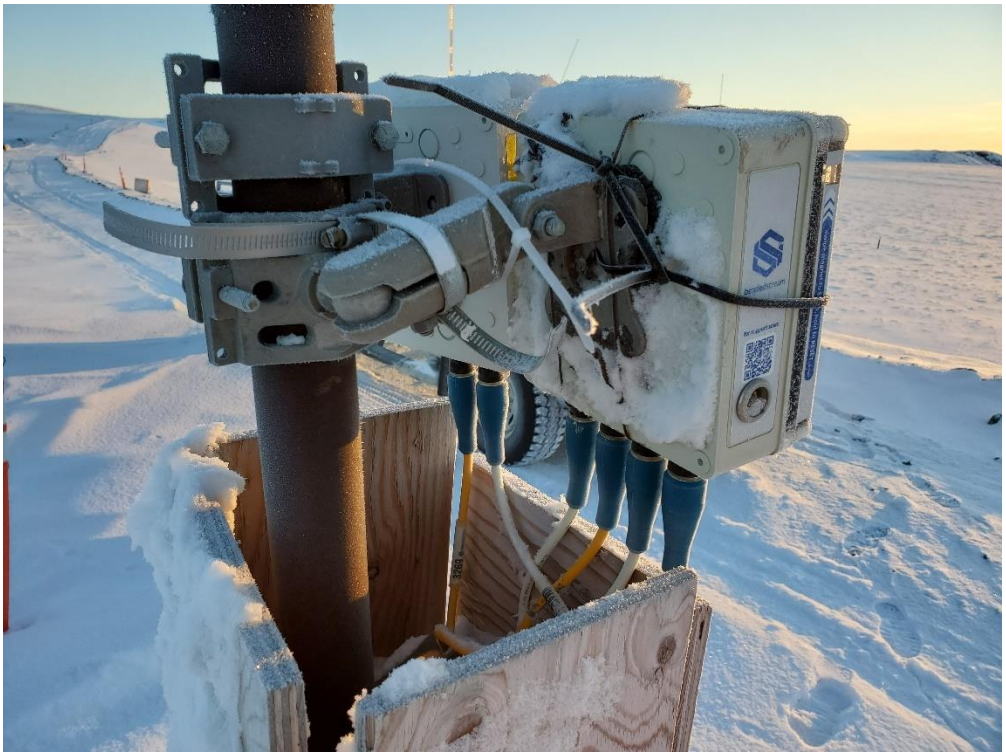
Please collect the following photos:

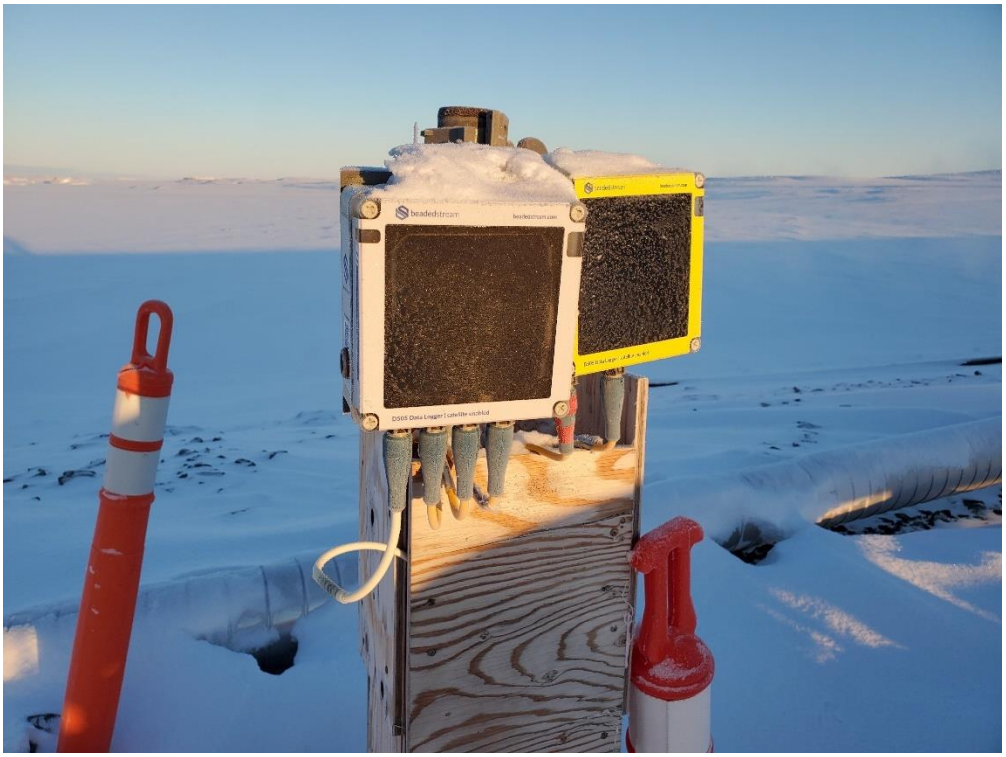
- Photo from the crest looking W along the dam crest (Station 0+30)
- Photo from the crest looking SW over the downstream toe along the dam (Station 2+00)
- Photo from the crest looking W over the tailings beach (Station 2+00)
- Photo from the crest looking NE over the tailings beach (Station 4+20)
- Photo from the crest looking E over the downstream toe along the dam (Station 4+20)
- Photo from west end looking E along the dam crest (Station 5+20)





LV007





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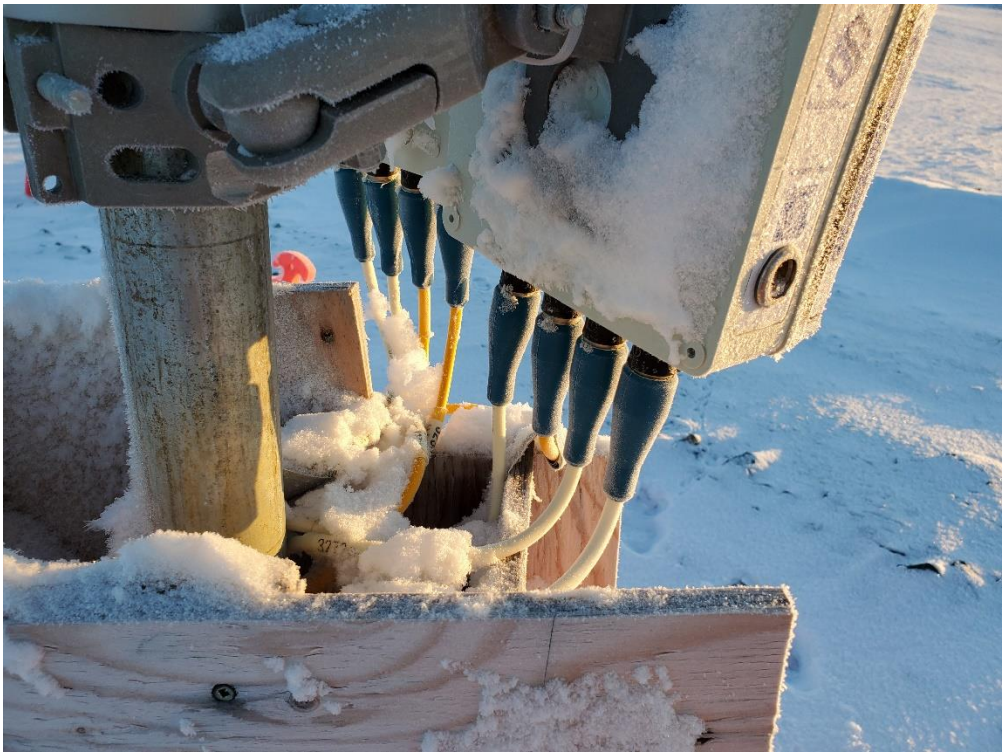
beadedstream
beadedstream.com
DS05 Data Logger | satellite enabled



South Dam
Walkover Report

Frequency: Weekly or as specified by EOR

Date:	Nov 15/2020
Inspected By:	Sarah Warnock
Conditions:	(ie. snow on ground, clear) Snow covered ground, high winds, blowing snow

Visual Inspection:

This weekly walkover survey report is a means to track the condition on the **South Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam (Overall) Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	No
Downstream Side of Dam (Overall) Any visible concerns? (cracks, depressions, erosion, seepage, etc.) Snow covered	Yes	(No)
Crest of Dam (Overall) Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Tailings Beach on the Upstream Side Is the beach within the operating limits? (Beach length of 100 meters, no water ponding or pooling near the dam etc.) * Use shoreline markers indicating 100 meters from the crest for visual reference*	(Yes)	No
Active Tailings Discharge Spigot Indicate the active discharge spigot location (Spigot number or (S) on the figure provided)	H - Starting Nov 15.	
Settlement Instrumentation (on crest and downstream side) Any visible concerns? (significantly rusted or otherwise damaged, etc.) Some snow covered	Yes	(No)
Thermistors and Dataloggers Any visible concerns? (cables frayed, disconnected or damaged, boxes cracked, etc.)	Yes	(No)
Water at the Toe of the Downstream Side of the Dam Is water visible on the downstream side of the dam? frozen ground. Is the water visibly flowing? Snow cover	Yes Yes	(No) (No)
Walk over inspection of the downstream toe complete? (May to November) Inspector should walk the length of the downstream toe inspecting for seepage or slumping once most of the snow has melted (May to November)	(Yes)	No

If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided below.

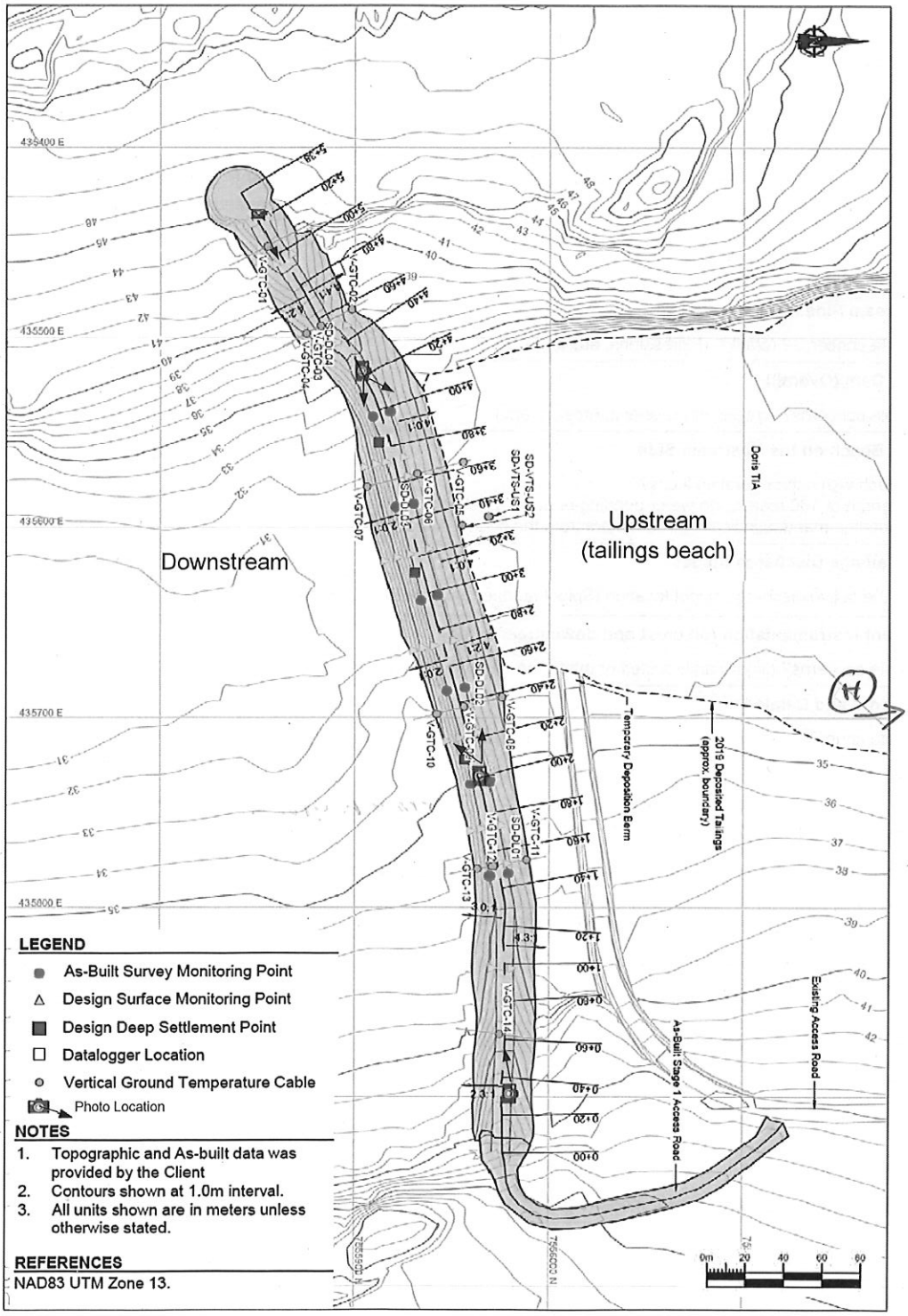
NOTES: Very low visibility during inspection.

If seepage has been noted estimate the flow (high/medium/low) and report to TMAC Environmental Superintendent:

Photos:

Please collect the following photos:

- Photo from the crest looking W along the dam crest (Station 0+30)
- Photo from the crest looking SW over the downstream toe along the dam (Station 2+00)
- Photo from the crest looking W over the tailings beach (Station 2+00)
- Photo from the crest looking NE over the tailings beach (Station 4+20)
- Photo from the crest looking E over the downstream toe along the dam (Station 4+20)
- Photo from west end looking E along the dam crest (Station 5+20)



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South Dam
Walkover Report

Frequency: Weekly or as specified by EOR

Date:	Nov 21/2020
Inspected By:	Sarah Wannock
Conditions:	(ie. snow on ground, clear) snow on ground

Visual Inspection:

This weekly walkover survey report is a means to track the condition on the **South Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.) snow covered	Yes	(No)
Crest of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Tailings Beach on the Upstream Side		
Is the beach within the operating limits? (Beach length of 100 meters, no water ponding or pooling near the dam etc.) * Use shoreline markers indicating 100 meters from the crest for visual reference*	(Yes)	No
Active Tailings Discharge Spigot		
Indicate the active discharge spigot location (Spigot number or (S) on the figure provided)	Spigot H	
Settlement Instrumentation (on crest and downstream side)		
Any visible concerns? (significantly rusted or otherwise damaged, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (cables frayed, disconnected or damaged, boxes cracked, etc.)	Yes	(No)
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam? Frozen, snow covered	Yes	(No)
Is the water visibly flowing?	Yes	(No)
Walk over inspection of the downstream toe complete? (May to November)		
Inspector should walk the length of the downstream toe inspecting for seepage or slumping once most of the snow has melted (May to November) Snow covered	Yes	No NA

If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided below.

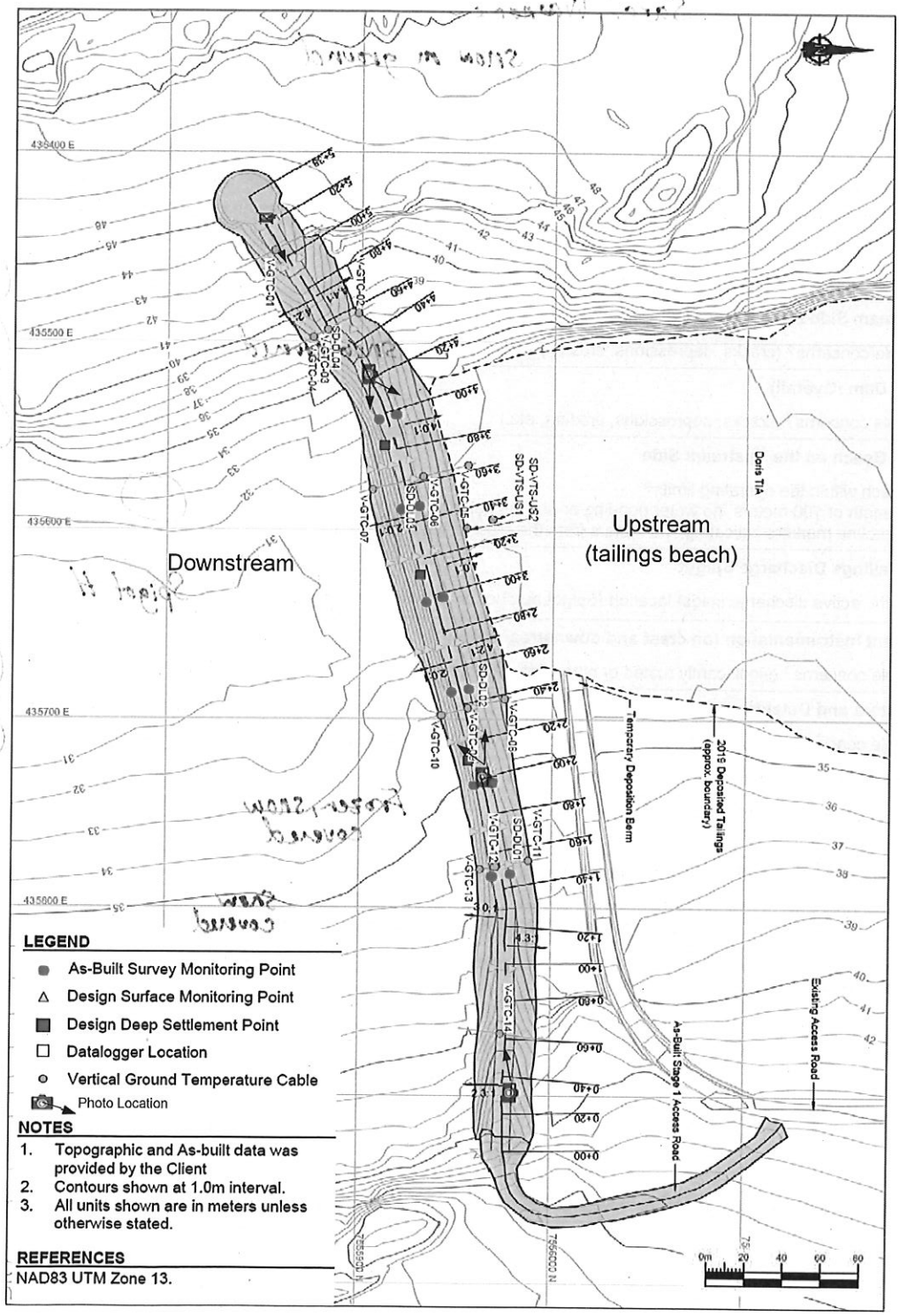
NOTES:

If seepage has been noted estimate the flow (high/medium/low) and report to TMAC Environmental Superintendent:

Photos:

Please collect the following photos:

- Photo from the crest looking W along the dam crest (Station 0+30) ✓
- Photo from the crest looking SW over the downstream toe along the dam (Station 2+00) ✓
- Photo from the crest looking W over the tailings beach (Station 2+00) ✓
- Photo from the crest looking NE over the tailings beach (Station 4+20) ✓
- Photo from the crest looking E over the downstream toe along the dam (Station 4+20) ✓
- Photo from west end looking E along the dam crest (Station 5+20) ✓



South Dam
Walkover Report

Frequency: Weekly or as specified by EOR

Date:	Dec 19/2020
Inspected By:	Sarah Wannock
Conditions:	(ie. snow on ground, clear) Snow covered

Visual Inspection:

This weekly walkover survey report is a means to track the condition on the **South Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.) Snow covered	Yes	(No)
Crest of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Tailings Beach on the Upstream Side		
Is the beach within the operating limits? (Beach length of 100 meters, no water ponding or pooling near the dam etc.) * Use shoreline markers indicating 100 meters from the crest for visual reference*	(Yes)	No
Active Tailings Discharge Spigot		
Indicate the active discharge spigot location (Spigot number or (s) on the figure provided)	Spigot H	
Settlement Instrumentation (on crest and downstream side)		
Any visible concerns? (significantly rusted or otherwise damaged, etc.) Snow covered on slope	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (cables frayed, disconnected or damaged, boxes cracked, etc.)	Yes	(No)
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam? Frozen - toe snow covered	Yes	(No)
Is the water visibly flowing? Frozen	Yes	(No)
Walk over inspection of the downstream toe complete? (May to November)		
Inspector should walk the length of the downstream toe inspecting for seepage or slumping once most of the snow has melted (May to November) NA	Yes	No

If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided below.

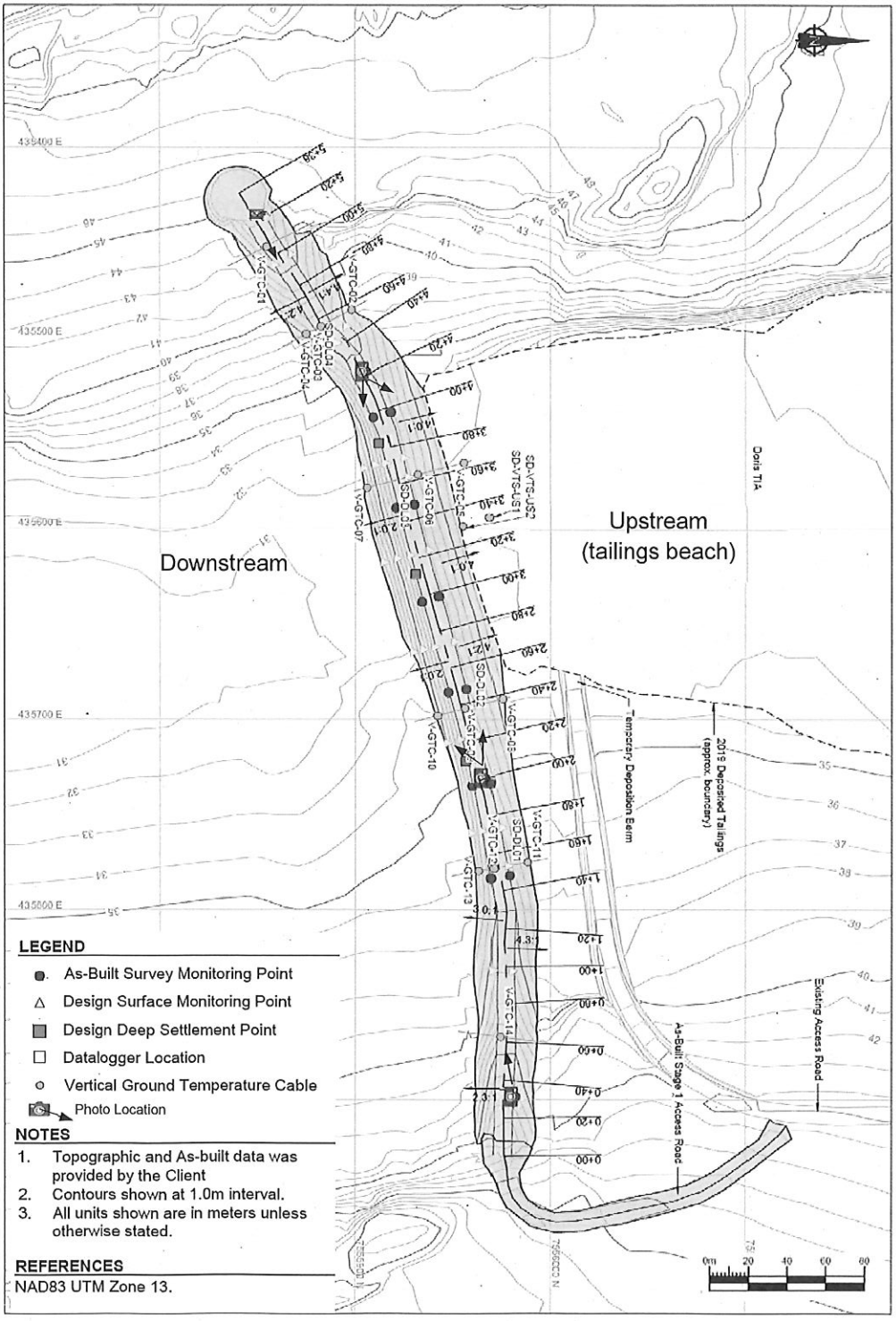
NOTES:

If seepage has been noted estimate the flow (high/medium/low) and report to TMAC Environmental Superintendent:

Photos:

Please collect the following photos:

- ☑ Photo from the crest looking W along the dam crest (Station 0+30)
- ☑ Photo from the crest looking SW over the downstream toe along the dam (Station 2+00)
- ☐ Photo from the crest looking W over the tailings beach (Station 2+00) Drone malfunctioned. Too cold temps
- ☑ Photo from the crest looking NE over the tailings beach (Station 4+20)
- ☑ Photo from the crest looking E over the downstream toe along the dam (Station 4+20)
- ☑ Photo from west end looking E along the dam crest (Station 5+20)



South Dam
Walkover Report

Frequency: Weekly or as specified by EOR

Date:	Dec 26/2020
Inspected By:	Sarah Wannvek
Conditions:	(ie. snow on ground, clear) Snow on ground.

Visual Inspection:

This weekly walkover survey report is a means to track the condition on the **South Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Tailings Beach on the Upstream Side		
Is the beach within the operating limits? (Beach length of 100 meters, no water ponding or pooling near the dam etc.) * Use shoreline markers indicating 100 meters from the crest for visual reference*	(Yes)	No
Active Tailings Discharge Spigot		
Indicate the active discharge spigot location (Spigot number or (s) on the figure provided)	H - water	
Settlement Instrumentation (on crest and downstream side)		
Any visible concerns? (significantly rusted or otherwise damaged, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (cables frayed, disconnected or damaged, boxes cracked, etc.)	Yes	(No)
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam? Frozen	Yes	(No)
Is the water visibly flowing?	Yes	(No)
Walk over inspection of the downstream toe complete? (May to November)		
Inspector should walk the length of the downstream toe inspecting for seepage or slumping once most of the snow has melted (May to November) NA	Yes	No

If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided below.

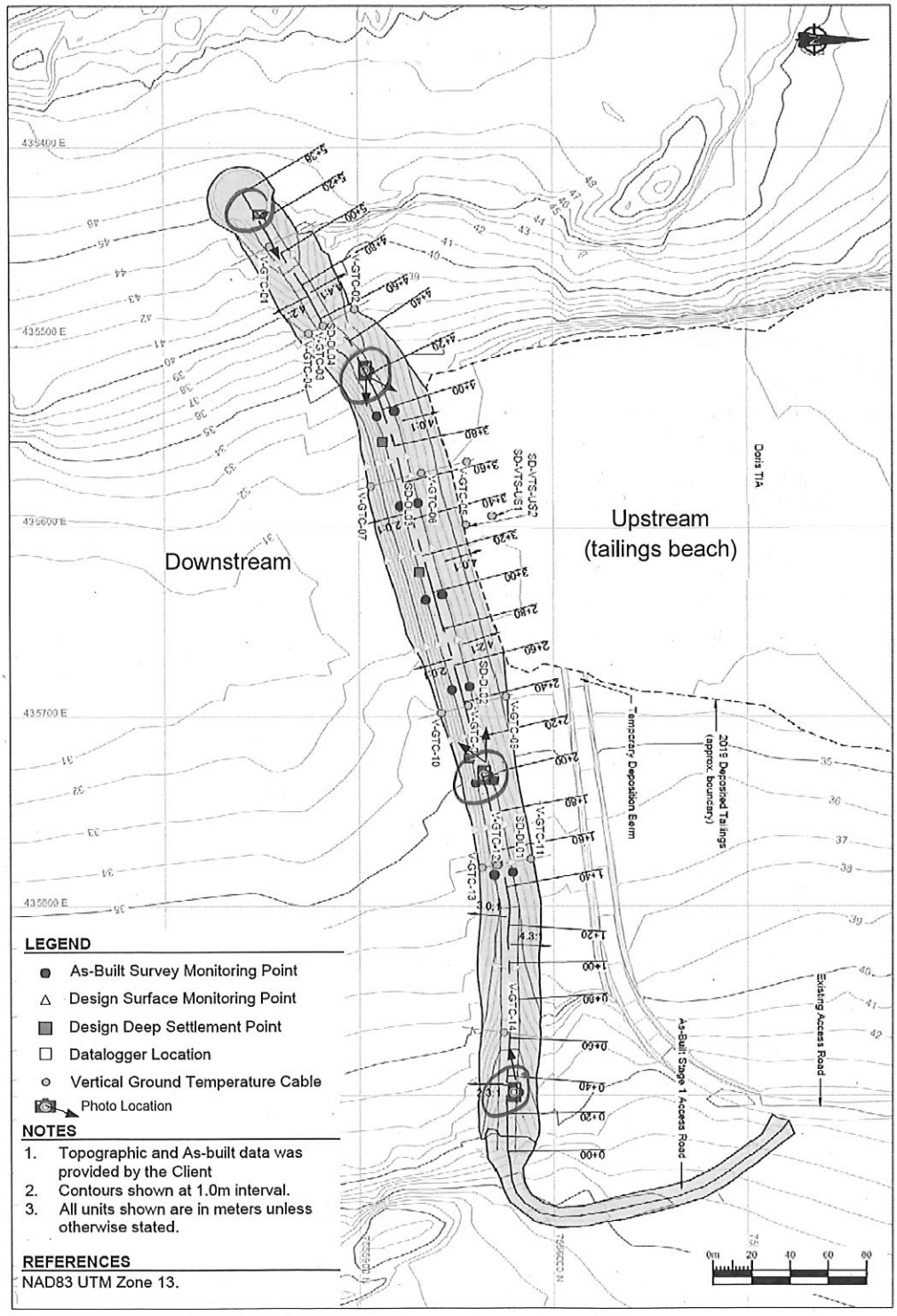
NOTES:

If seepage has been noted estimate the flow (high/medium/low) and report to TMAC Environmental Superintendent:

Photos:

Please collect the following photos:

- Photo from the crest looking W along the dam crest (Station 0+30)
- Photo from the crest looking SW over the downstream toe along the dam (Station 2+00)
- Photo from the crest looking W over the tailings beach (Station 2+00)
- Photo from the crest looking NE over the tailings beach (Station 4+20)
- Photo from the crest looking E over the downstream toe along the dam (Station 4+20)
- Photo from west end looking E along the dam crest (Station 5+20)



South Dam
Walkover Report

Frequency: Weekly or as specified by EOR

Date:	January 2/ 2021
Inspected By:	Sarah Warnock
Conditions:	(ie. snow on ground, clear) snow covered

Visual Inspection:

This weekly walkover survey report is a means to track the condition on the **South Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Tailings Beach on the Upstream Side		
Is the beach within the operating limits? (Beach length of 100 meters, no water ponding or pooling near the dam etc.) * Use shoreline markers indicating 100 meters from the crest for visual reference*	(Yes)	No
Active Tailings Discharge Spigot		
Indicate the active discharge spigot location (Spigot number or (S) on the figure provided)	H	
Settlement Instrumentation (on crest and downstream side)		
Any visible concerns? (significantly rusted or otherwise damaged, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (cables frayed, disconnected or damaged, boxes cracked, etc.)	Yes	(No)
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam? Frozen	Yes	(No)
Is the water visibly flowing?	Yes	(No)
Walk over inspection of the downstream toe complete? (May to November)		
Inspector should walk the length of the downstream toe inspecting for seepage or slumping once most of the snow has melted (May to November)	Yes	(No)

If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided below.

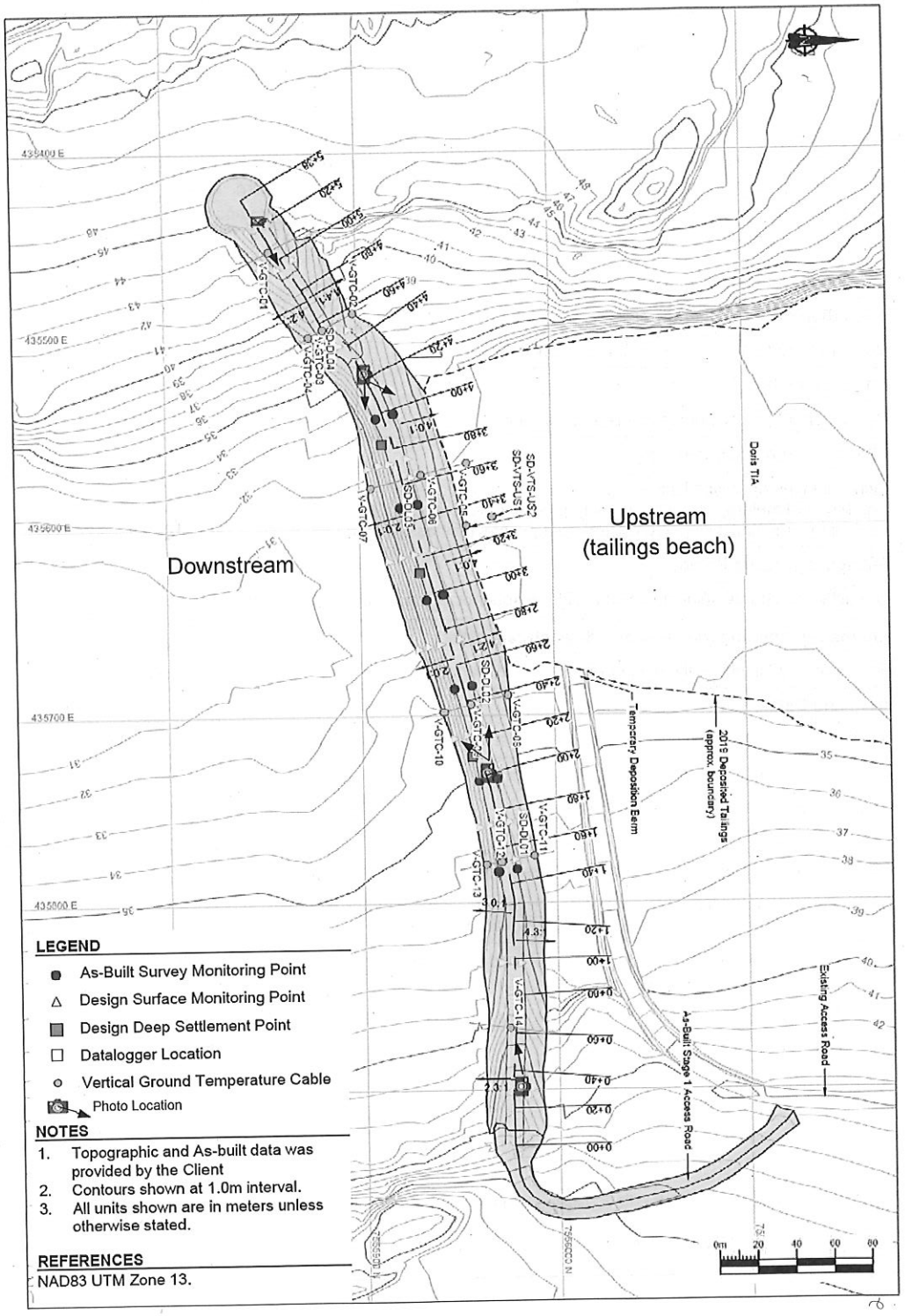
NOTES:

If seepage has been noted estimate the flow (high/medium/low) and report to TMAC Environmental Superintendent:

Photos:

Please collect the following photos:

- [x] Photo from the crest looking W along the dam crest (Station 0+30)
- [x] Photo from the crest looking SW over the downstream toe along the dam (Station 2+00)
- [x] Photo from the crest looking W over the tailings beach (Station 2+00)
- [ ] Photo from the crest looking NE over the tailings beach (Station 4+20)
- [ ] Photo from the crest looking E over the downstream toe along the dam (Station 4+20)
- [x] Photo from west end looking E along the dam crest (Station 5+20)



South Dam
Walkover Report

Frequency: Weekly or as specified by EOR

Date:	23 Jan 21
Inspected By:	PJ.
Conditions:	(ie. snow on ground, clear) snow on ground

Visual Inspection:

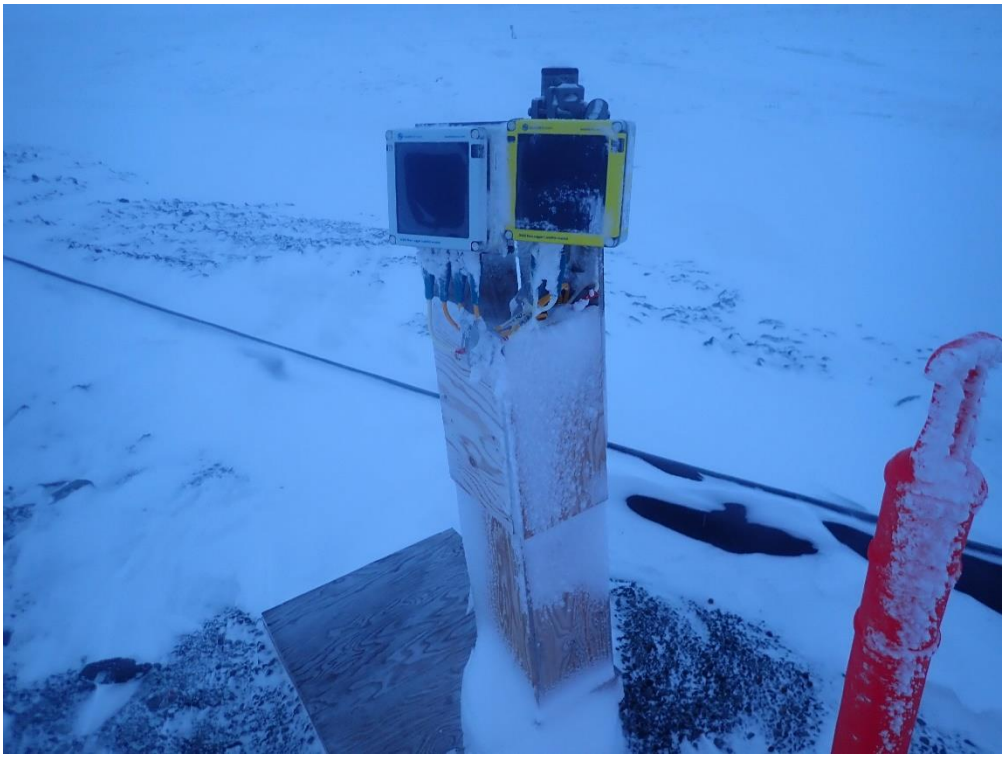
This weekly walkover survey report is a means to track the condition on the **South Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

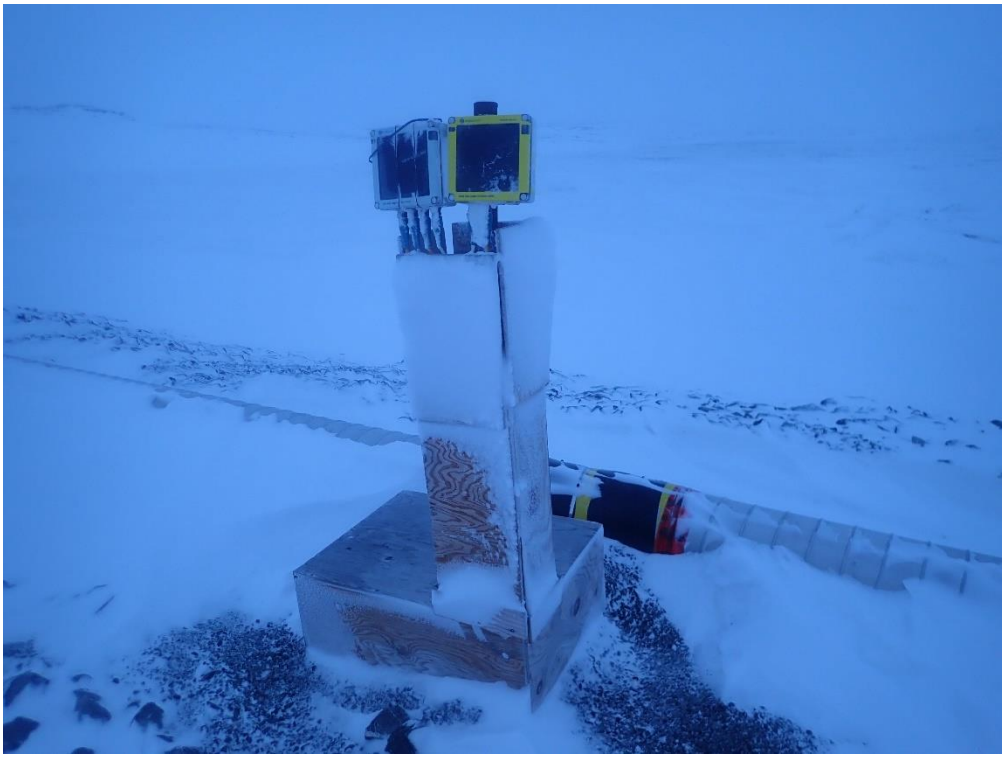
Upstream Side of Dam (Overall) Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam (Overall) Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam (Overall) Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Tailings Beach on the Upstream Side Is the beach within the operating limits? (Beach length of 100 meters, no water ponding or pooling near the dam etc.) * Use shoreline markers indicating 100 meters from the crest for visual reference*	(Yes)	No
Active Tailings Discharge Spigot Indicate the active discharge spigot location (Spigot number or (s) on the figure provided)	14	
Settlement Instrumentation (on crest and downstream side) Any visible concerns? (significantly rusted or otherwise damaged, etc.)	Yes	(No)
Thermistors and Dataloggers Any visible concerns? (cables frayed, disconnected or damaged, boxes cracked, etc.)	Yes	(No)
Water at the Toe of the Downstream Side of the Dam Is water visible on the downstream side of the dam? Is the water visibly flowing?	Yes Yes	(No) (No)
Walk over inspection of the downstream toe complete? (May to November) Inspector should walk the length of the downstream toe inspecting for seepage or slumping once most of the snow has melted (May to November)	Yes	No

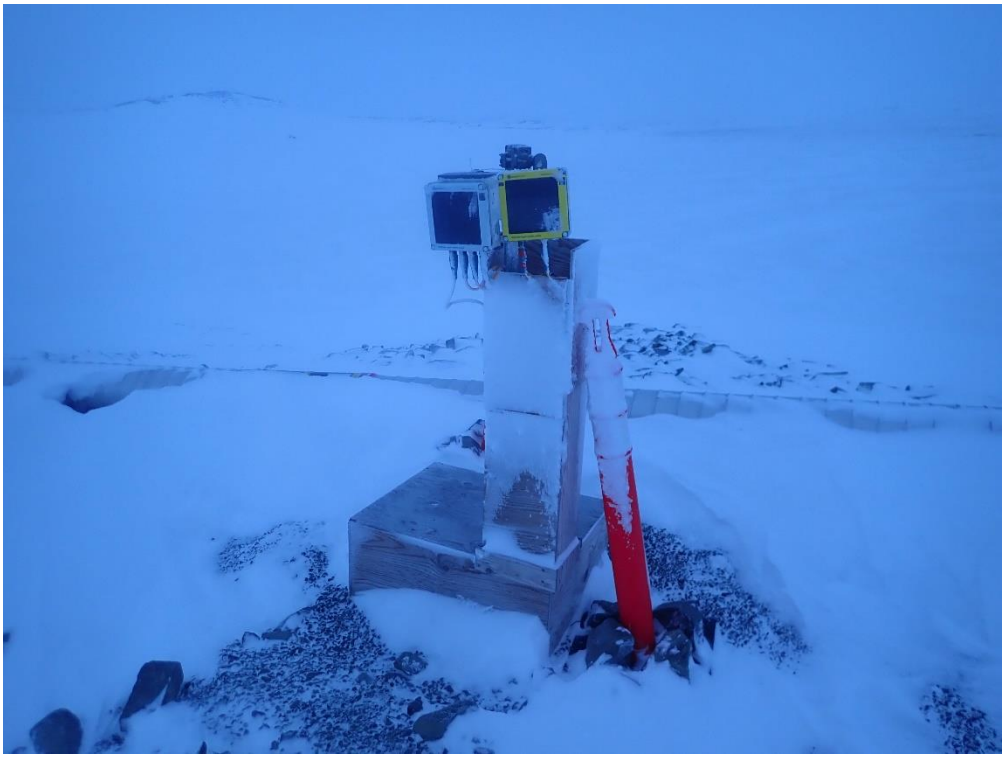
If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided below.

NOTES:

If seepage has been noted estimate the flow (high/medium/low) and report to TMAC Environmental Superintendent:







South Dam
Walkover Report

Frequency: Weekly or as specified by EOR

Date:	Feb 12/2021 @ 1435hrs.
Inspected By:	Attrynkiw
Conditions:	(ie. snow on ground, clear) snow cover / -28°C

Visual Inspection:

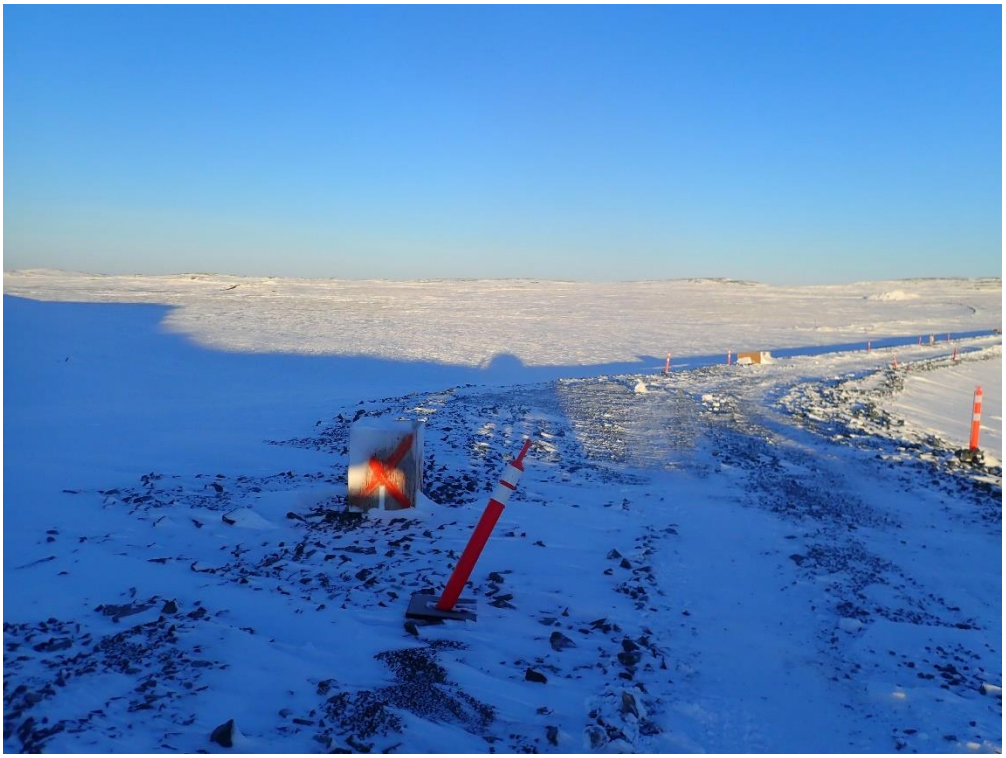
This weekly walkover survey report is a means to track the condition on the **South Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

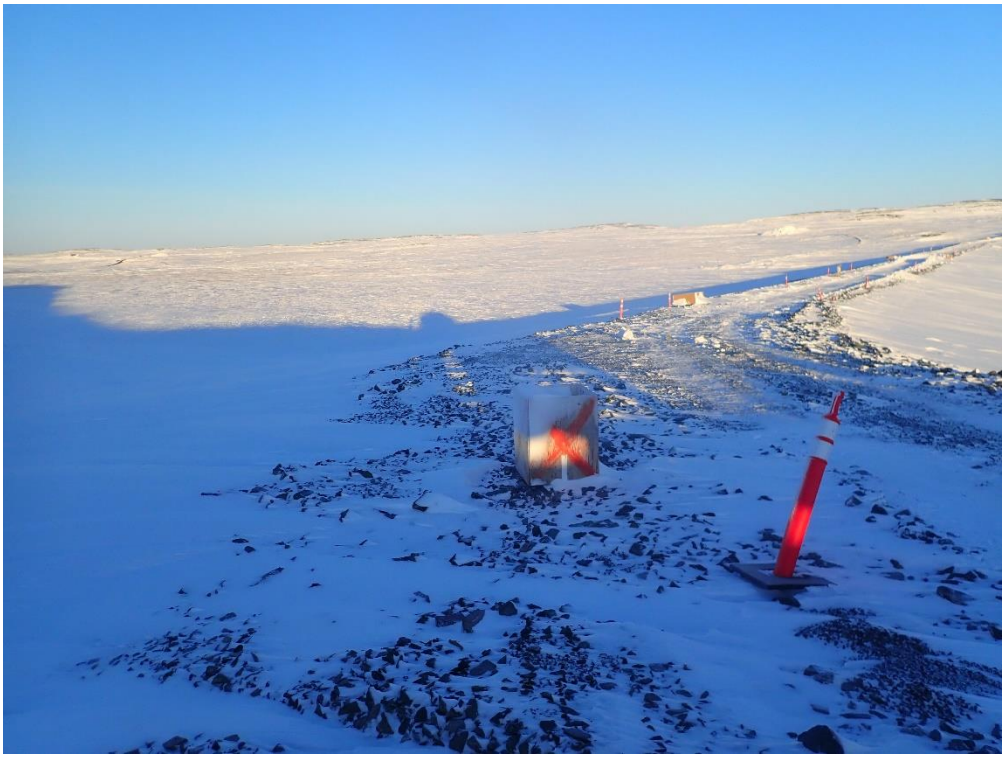
Upstream Side of Dam (Overall) Any visible concerns? (cracks, depressions, erosion, etc.) frozen snow cover	Yes	(No)
Downstream Side of Dam (Overall) Any visible concerns? (cracks, depressions, erosion, seepage, etc.) frozen snow cover	Yes	(No)
Crest of Dam (Overall) Any visible concerns? (cracks, depressions, erosion, etc.) frozen snow cover	Yes	(No)
Tailings Beach on the Upstream Side Is the beach within the operating limits? (Beach length of 100 meters, no water ponding or pooling near the dam etc.) * Use shoreline markers indicating 100 meters from the crest for visual reference* frozen snow cover	Yes	No
Active Tailings Discharge Spigot Indicate the active discharge spigot location (Spigot number or (S) on the figure provided)		
Settlement Instrumentation (on crest and downstream side) Any visible concerns? (significantly rusted or otherwise damaged, etc.) N/A.	Yes	(No)
Thermistors and Dataloggers Any visible concerns? (cables frayed, disconnected or damaged, boxes cracked, etc.)	Yes	(No)
Water at the Toe of the Downstream Side of the Dam Is water visible on the downstream side of the dam? Is the water visibly flowing?	Yes Yes	(No) (No)
Walk over inspection of the downstream toe complete? (May to November) Inspector should walk the length of the downstream toe inspecting for seepage or slumping once most of the snow has melted (May to November) N/A.	Yes	No

If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided below.

NOTES:

If seepage has been noted estimate the flow (high/medium/low) and report to TMAC Environmental Superintendent:





South Dam
Walkover Report

Frequency: Weekly or as specified by EOR

Date:	20 FEB 21
Inspected By:	PJ
Conditions:	(ie. snow on ground, clear) SNOW ON GROUND, CLEAR SKY, -35°C

Visual Inspection:

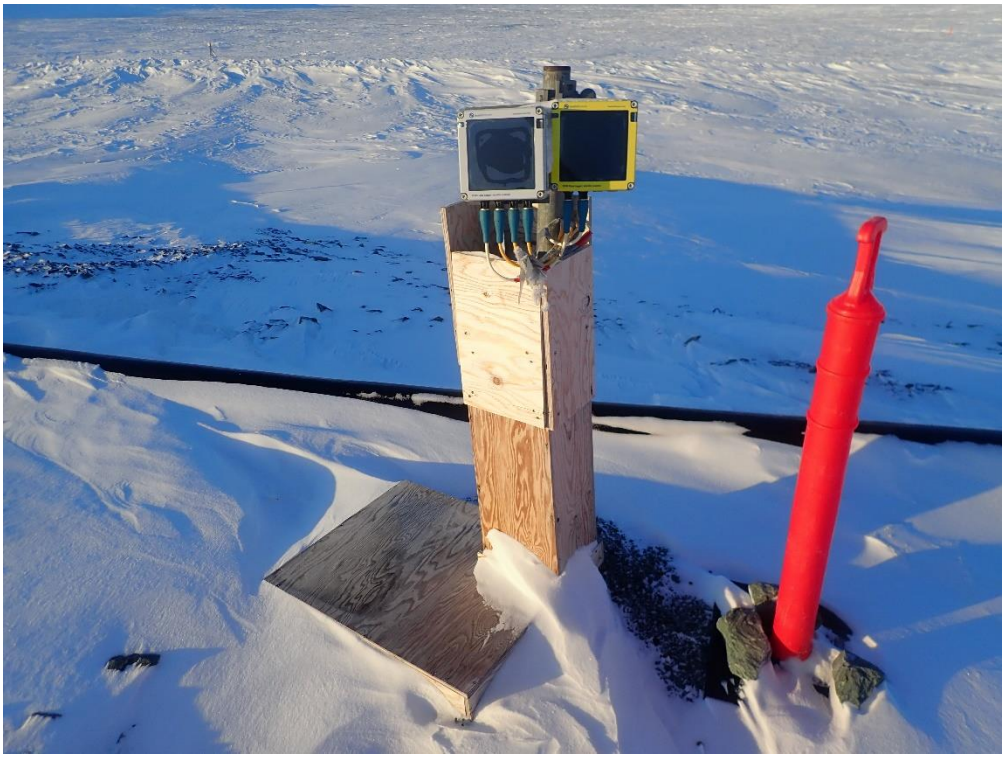
This weekly walkover survey report is a means to track the condition on the **South Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

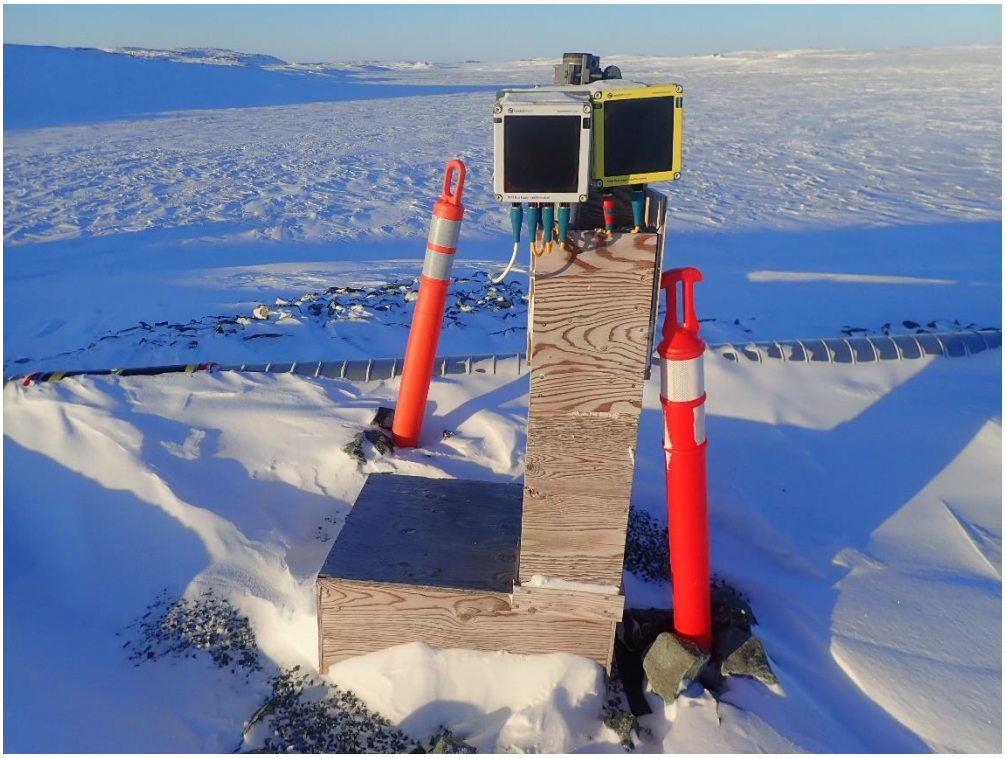
Upstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Tailings Beach on the Upstream Side		
Is the beach within the operating limits? (Beach length of 100 meters, no water ponding or pooling near the dam etc.) * Use shoreline markers indicating 100 meters from the crest for visual reference*	(Yes)	No
Active Tailings Discharge Spigot		
Indicate the active discharge spigot location (Spigot number or (S) on the figure provided)	H	
Settlement Instrumentation (on crest and downstream side)		
Any visible concerns? (significantly rusted or otherwise damaged, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (cables frayed, disconnected or damaged, boxes cracked, etc.)	Yes	(No)
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam? Is the water visibly flowing?	Yes Yes	(No) (No)
Walk over inspection of the downstream toe complete? (May to November)		
Inspector should walk the length of the downstream toe inspecting for seepage or slumping once most of the snow has melted (May to November)	Yes	No

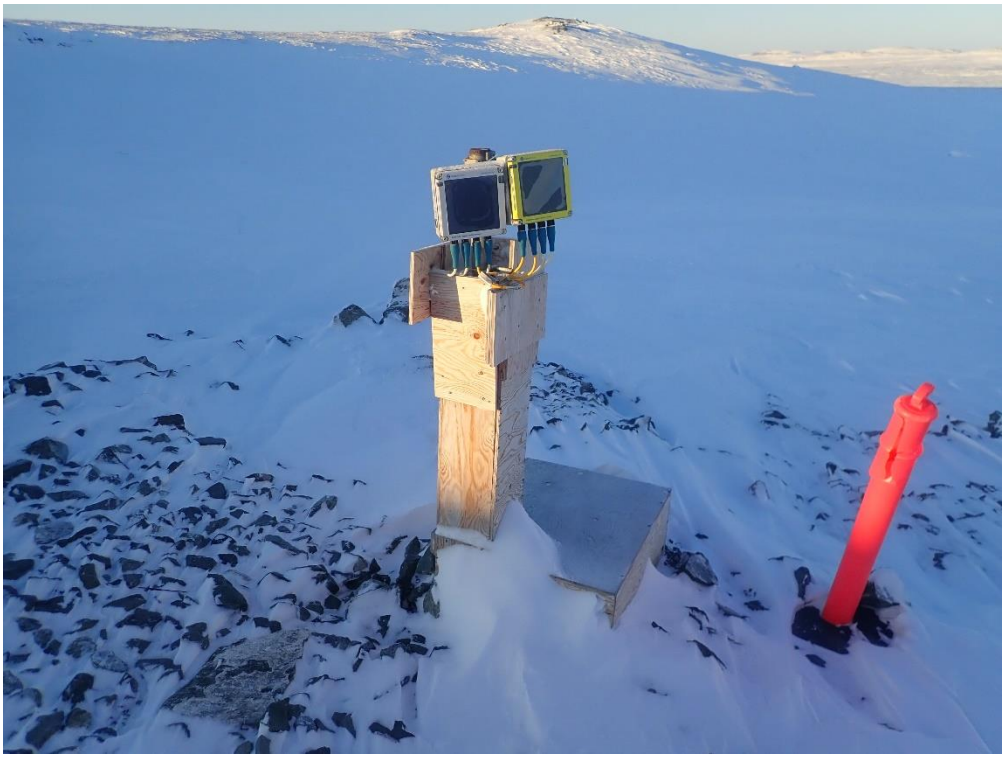
If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided below.

NOTES:

If seepage has been noted estimate the flow (high/medium/low) and report to TMAC Environmental Superintendent:







South Dam
Walkover Report

Frequency: Weekly or as specified by EOR

Date:	March 13/2021
Inspected By:	AH/MSW
Conditions:	(ie. snow on ground, clear) frozen/snow cover. access road inaccessible/Drone was used.

Visual Inspection:

This weekly walkover survey report is a means to track the condition on the **South Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam (Overall) Any visible concerns? (cracks, depressions, erosion, etc.) frozen/snow cover	Yes	(No)
Downstream Side of Dam (Overall) Any visible concerns? (cracks, depressions, erosion, seepage, etc.) frozen snow cover	Yes	(No)
Crest of Dam (Overall) Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Tailings Beach on the Upstream Side Is the beach within the operating limits? (Beach length of 100 meters, no water ponding or pooling near the dam etc.) * Use shoreline markers indicating 100 meters from the crest for visual reference*	(Yes)	No
Active Tailings Discharge Spigot Indicate the active discharge spigot location (Spigot number or (S) on the figure provided)		
Settlement Instrumentation (on crest and downstream side) Any visible concerns? (significantly rusted or otherwise damaged, etc.)	Yes	(No)
Thermistors and Dataloggers Any visible concerns? (cables frayed, disconnected or damaged, boxes cracked, etc.)	Yes	(No)
Water at the Toe of the Downstream Side of the Dam Is water visible on the downstream side of the dam? Frozen Is the water visibly flowing?	Yes Yes	(No) (No)
Walk over inspection of the downstream toe complete? (May to November) Inspector should walk the length of the downstream toe inspecting for seepage or slumping once most of the snow has melted (May to November)	Yes	No

If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided below.

NOTES:

If seepage has been noted estimate the flow (high/medium/low) and report to TMAC Environmental Superintendent:

South Dam
Walkover Report

Frequency: Weekly or as specified by EOR

Date:	March 15/2021
Inspected By:	A. Hrynkiw
Conditions:	(ie. snow on ground, clear) snow cover / frozen. -45 WC

Visual Inspection:

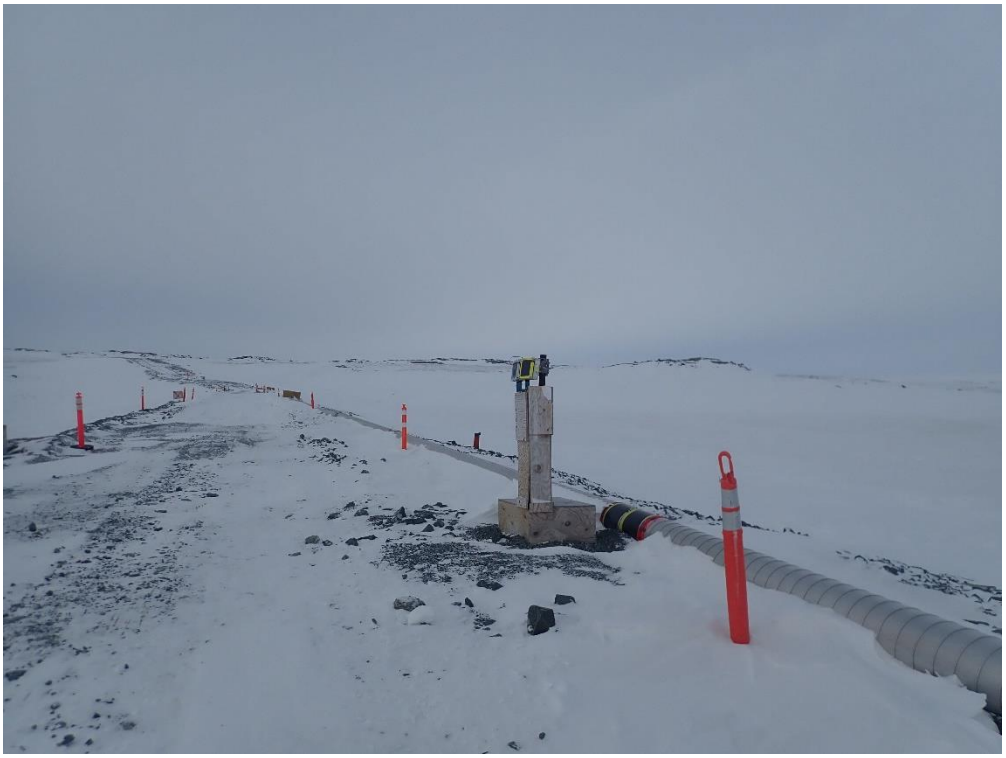
This weekly walkover survey report is a means to track the condition on the **South Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Tailings Beach on the Upstream Side		
Is the beach within the operating limits? (Beach length of 100 meters, no water ponding or pooling near the dam etc.) * Use shoreline markers indicating 100 meters from the crest for visual reference*	(Yes)	No
Active Tailings Discharge Spigot		
Indicate the active discharge spigot location (Spigot number or (S) on the figure provided)		
Settlement Instrumentation (on crest and downstream side)		
Any visible concerns? (significantly rusted or otherwise damaged, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (cables frayed, disconnected or damaged, boxes cracked, etc.)	Yes	(No)
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam? frozen.	Yes	(No)
Is the water visibly flowing?	Yes	No
Walk over inspection of the downstream toe complete? (May to November)		
Inspector should walk the length of the downstream toe inspecting for seepage or slumping once most of the snow has melted (May to November)	Yes	No

If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided below.

NOTES:

If seepage has been noted estimate the flow (high/medium/low) and report to TMAC Environmental Superintendent:



South Dam
Walkover Report

Frequency: Weekly or as specified by EOR

Date:	21-March-21
Inspected By:	Andrea Haynes
Conditions:	(ie. snow on ground, clear) snowcover / frozen winter conditions.

Visual Inspection:

This weekly walkover survey report is a means to track the condition on the **South Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Tailings Beach on the Upstream Side		
Is the beach within the operating limits? (Beach length of 100 meters, no water ponding or pooling near the dam etc.) * Use shoreline markers indicating 100 meters from the crest for visual reference*	(Yes)	No
Active Tailings Discharge Spigot		
Indicate the active discharge spigot location (Spigot number or (S) on the figure provided)		
Settlement Instrumentation (on crest and downstream side)		
Any visible concerns? (significantly rusted or otherwise damaged, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (cables frayed, disconnected or damaged, boxes cracked, etc.)	Yes	(No)
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam?	Yes	(No)
Is the water visibly flowing?	Yes	(No)
Walk over inspection of the downstream toe complete? (May to November)		
Inspector should walk the length of the downstream toe inspecting for seepage or slumping once most of the snow has melted (May to November) N/A.	Yes	No

If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided below.

NOTES:

If seepage has been noted estimate the flow (high/medium/low) and report to TMAC Environmental Superintendent:

South Dam
Walkover Report

Frequency: Weekly or as specified by EOR

Date:	2 APR 21
Inspected By:	PJ
Conditions:	(ie. snow on ground, clear) SNOW ON GROUND, CLEAR SKY, W Breeze, -40°C

Visual Inspection:

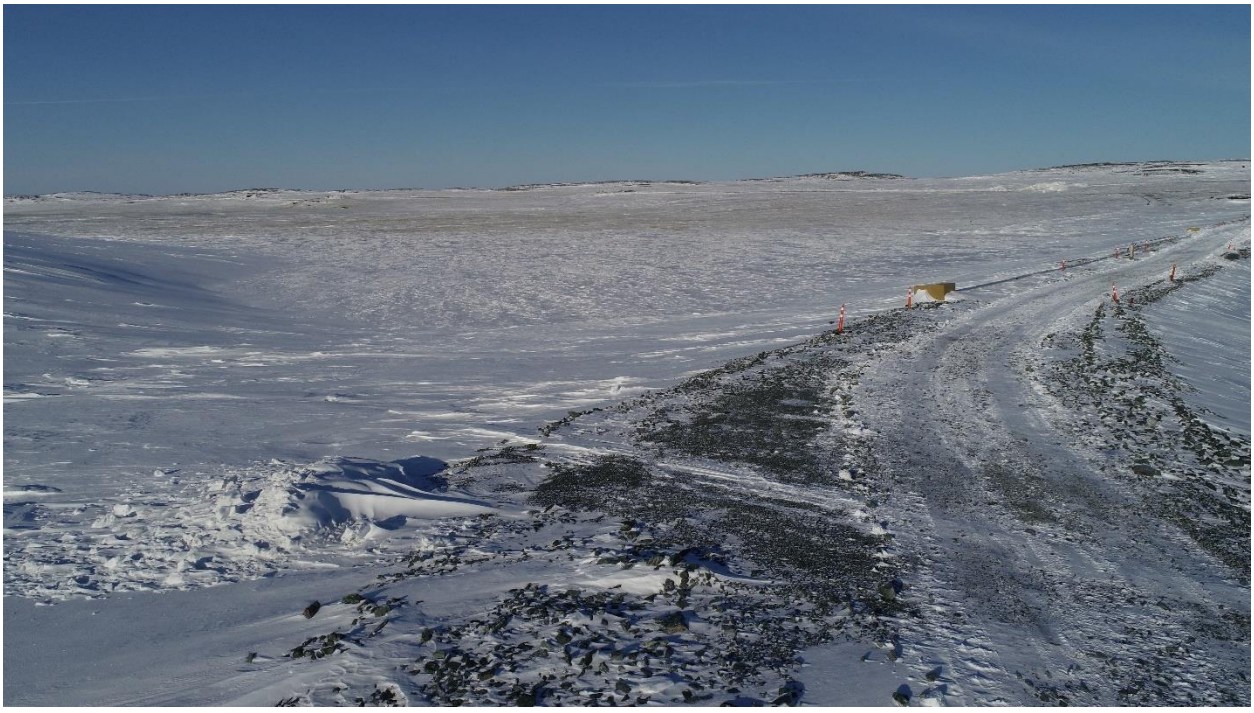
This weekly walkover survey report is a means to track the condition on the **South Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

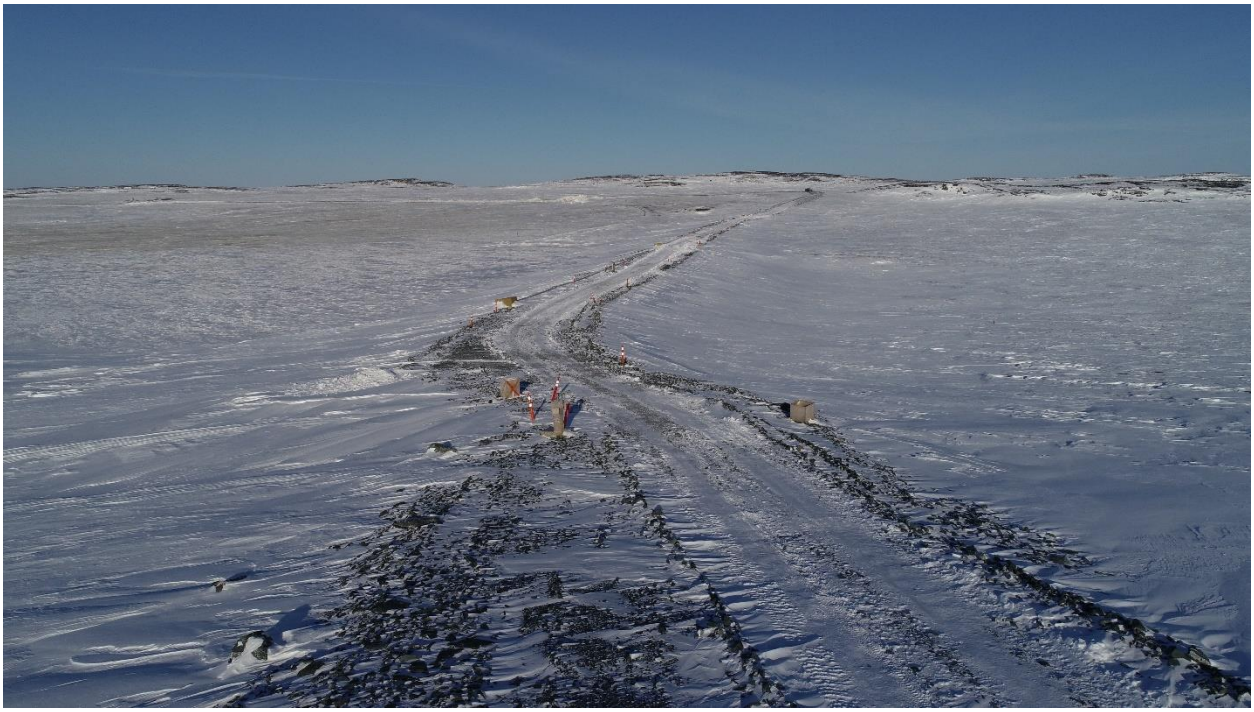
Upstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Tailings Beach on the Upstream Side		
Is the beach within the operating limits? (Beach length of 100 meters, no water ponding or pooling near the dam etc.) * Use shoreline markers indicating 100 meters from the crest for visual reference*	(Yes)	No
Active Tailings Discharge Spigot		
Indicate the active discharge spigot location (Spigot number or (S) on the figure provided)	H	
Settlement Instrumentation (on crest and downstream side)		
Any visible concerns? (significantly rusted or otherwise damaged, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (cables frayed, disconnected or damaged, boxes cracked, etc.)	Yes	(No)
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam?	Yes	(No)
Is the water visibly flowing? FROZEN	Yes	No
Walk over inspection of the downstream toe complete? (May to November)		
Inspector should walk the length of the downstream toe inspecting for seepage or slumping once most of the snow has melted (May to November) NA.	Yes	No

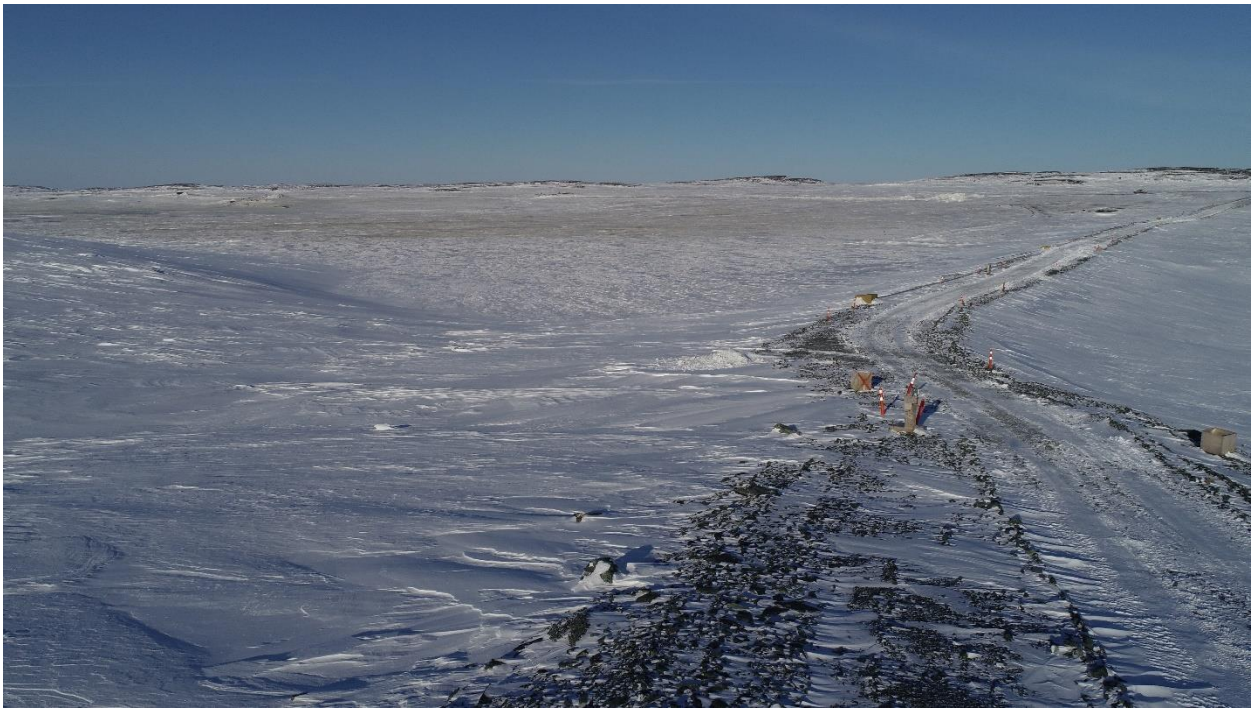
If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided below.

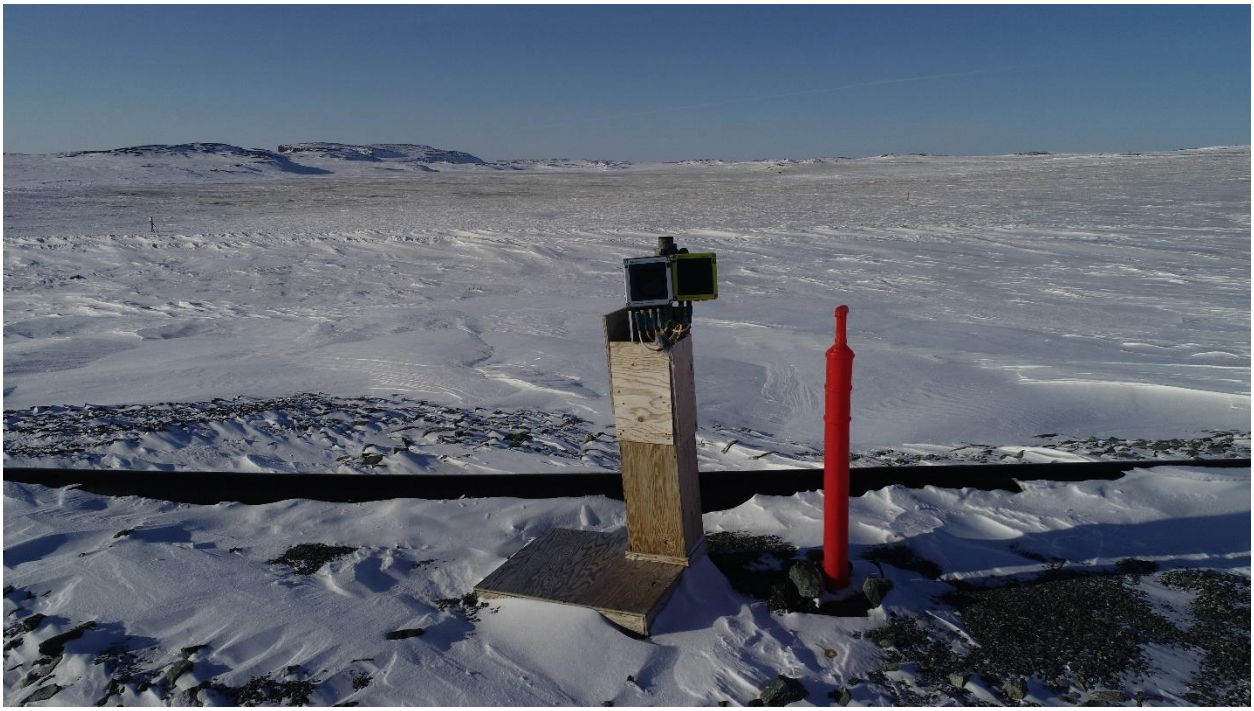
NOTES:

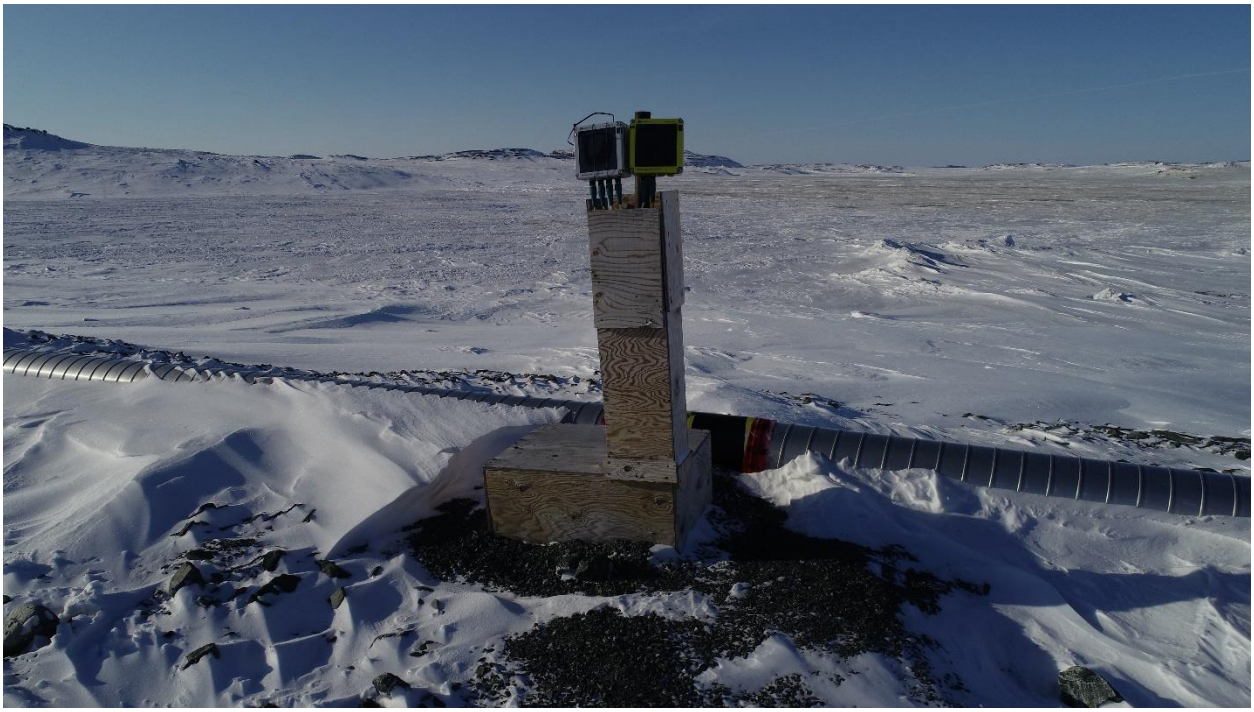
If seepage has been noted estimate the flow (high/medium/low) and report to TMAC Environmental Superintendent:

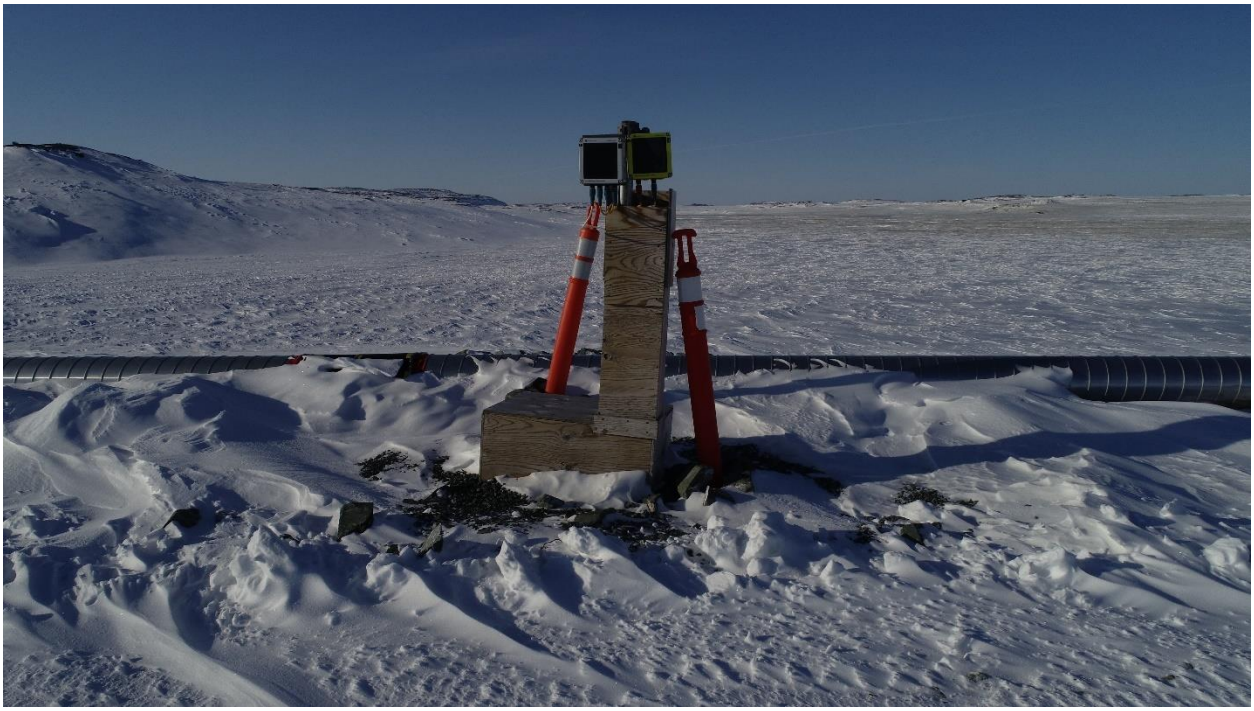


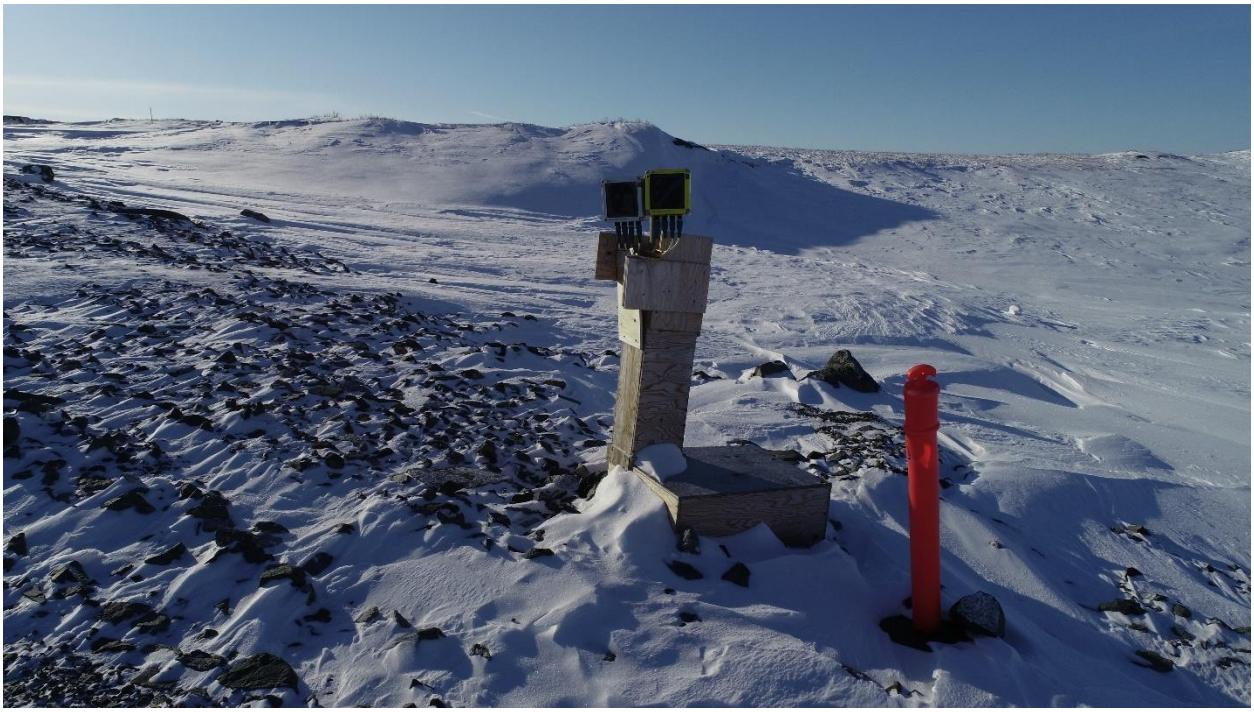












South Dam
Walkover Report

Frequency: Weekly or as specified by EOR

Date:	2-May-2021
Inspected By:	Andrea Hryniw
Conditions:	(ie. snow on ground, clear) snow cover / clear sky / 2knot wind. -6°C

Visual Inspection:

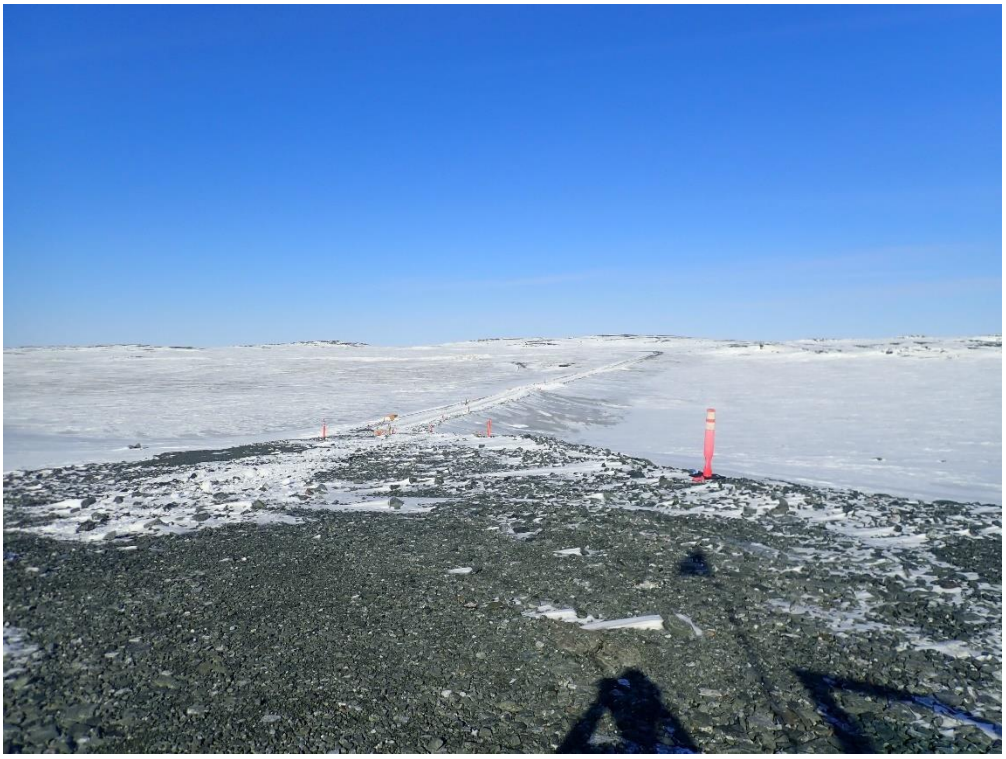
This weekly walkover survey report is a means to track the condition on the **South Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

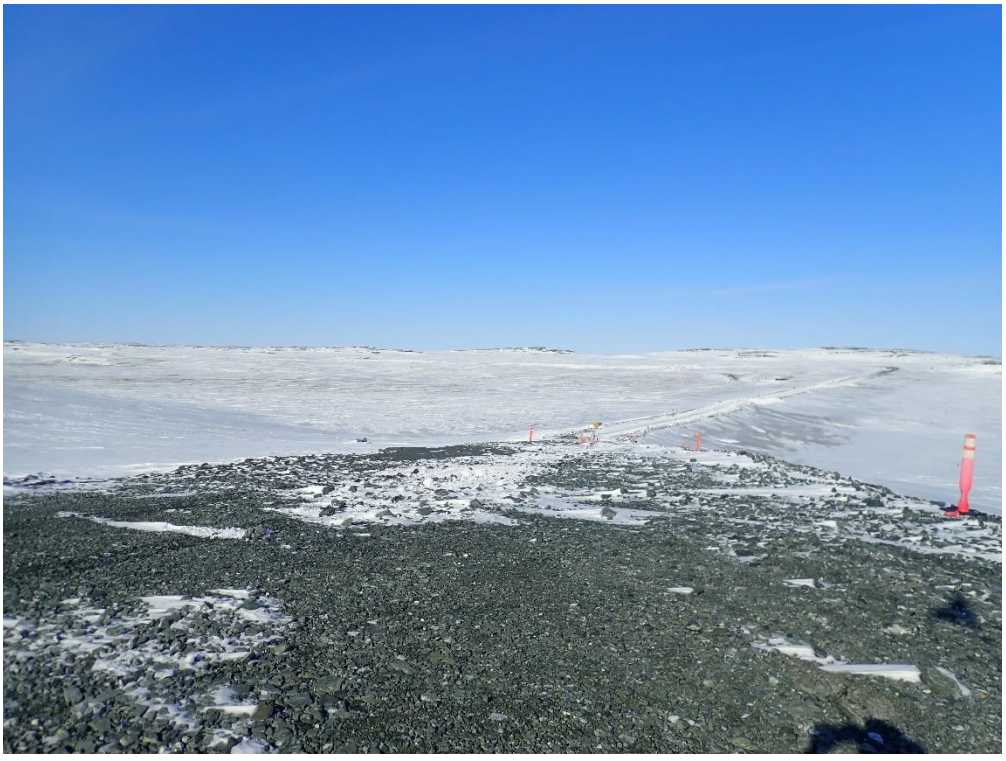
Upstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Tailings Beach on the Upstream Side		
Is the beach within the operating limits? (Beach length of 100 meters, no water ponding or pooling near the dam etc.) * Use shoreline markers indicating 100 meters from the crest for visual reference*	(Yes)	No
Active Tailings Discharge Spigot		
Indicate the active discharge spigot location (Spigot number or (s) on the figure provided)		
Settlement Instrumentation (on crest and downstream side)		
Any visible concerns? (significantly rusted or otherwise damaged, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (cables frayed, disconnected or damaged, boxes cracked, etc.)	Yes	(No)
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam?	Yes	(No)
Is the water visibly flowing? FROZEN	Yes	No
Walk over inspection of the downstream toe complete? (May to November)		
Inspector should walk the length of the downstream toe inspecting for seepage or slumping once most of the snow has melted (May to November) N/A.	Yes	No

If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided below.

NOTES:

If seepage has been noted estimate the flow (high/medium/low) and report to TMAC Environmental Superintendent:





South Dam
Walkover Report

Frequency: Weekly or as specified by EOR

Date:	9-May-2021
Inspected By:	AH.
Conditions:	(ie. snow on ground, clear) Snow cover / starting to melt.

Visual Inspection:

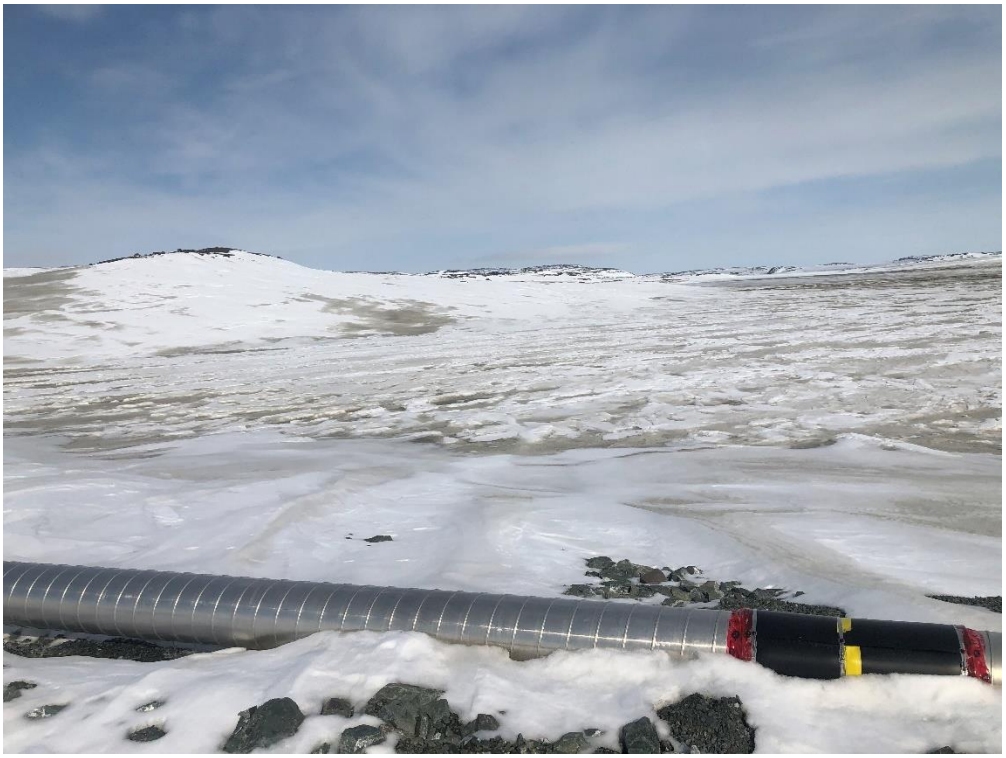
This weekly walkover survey report is a means to track the condition on the **South Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

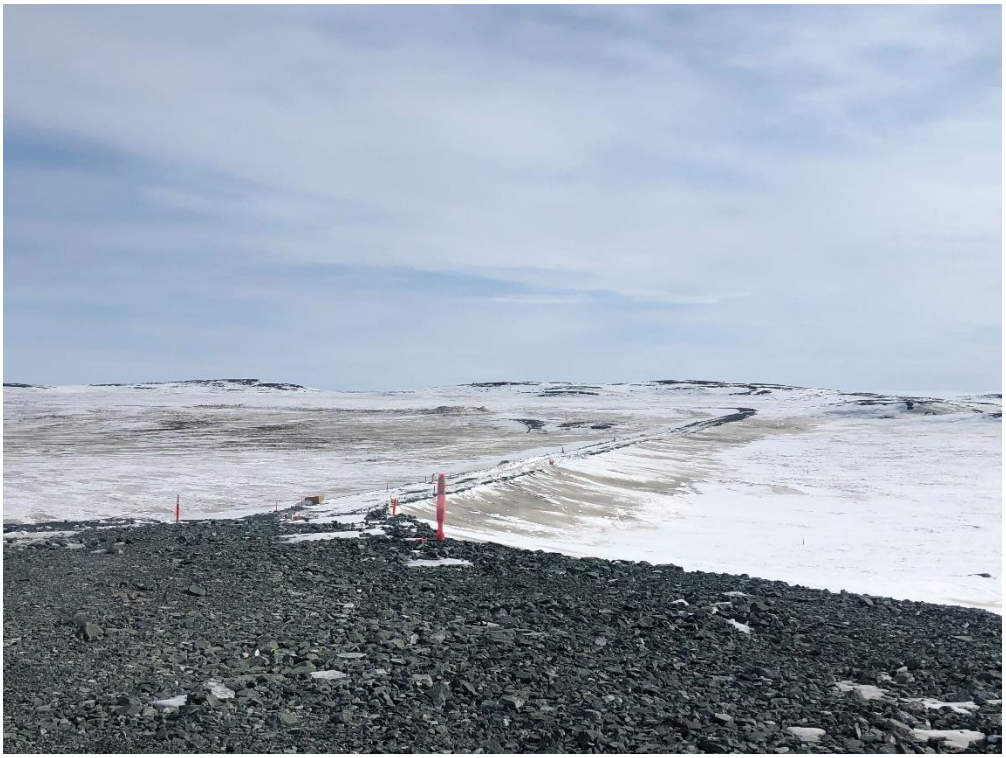
Upstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Tailings Beach on the Upstream Side		
Is the beach within the operating limits? (Beach length of 100 meters, no water ponding or pooling near the dam etc.) * Use shoreline markers indicating 100 meters from the crest for visual reference*	(Yes)	No
Active Tailings Discharge Spigot		
Indicate the active discharge spigot location (Spigot number or (s) on the figure provided)		
Settlement Instrumentation (on crest and downstream side)		
Any visible concerns? (significantly rusted or otherwise damaged, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (cables frayed, disconnected or damaged, boxes cracked, etc.)	Yes	(No)
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam?	Yes	(No)
Is the water visibly flowing?	Yes	(No)
Walk over inspection of the downstream toe complete? (May to November) Still snow + frozen.		
Inspector should walk the length of the downstream toe inspecting for seepage or slumping once most of the snow has melted (May to November)	Yes	No

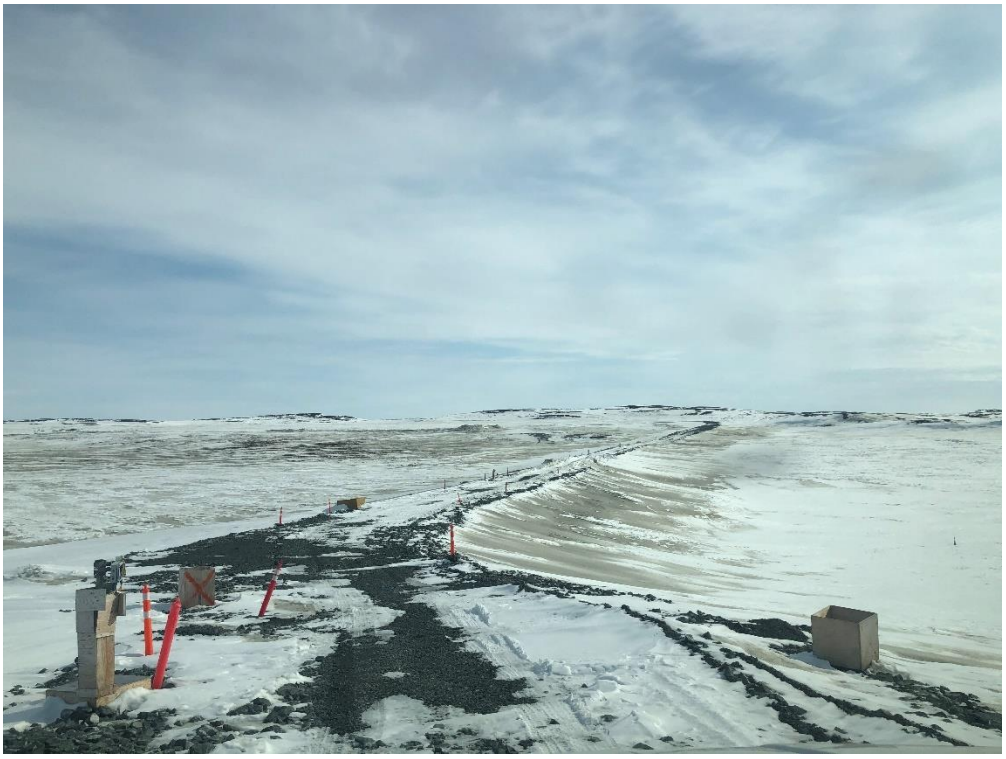
If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided below.

NOTES:

If seepage has been noted estimate the flow (high/medium/low) and report to TMAC Environmental Superintendent:







South Dam
Walkover Report

Frequency: Weekly or as specified by EOR

Date:	MAY 16-21
Inspected By:	WN / GVW / AM.
Conditions: (ie. snow on ground, clear)	SNOW ON GROUND - ROADWAY MOSTLY CLEAR.

Visual Inspection:

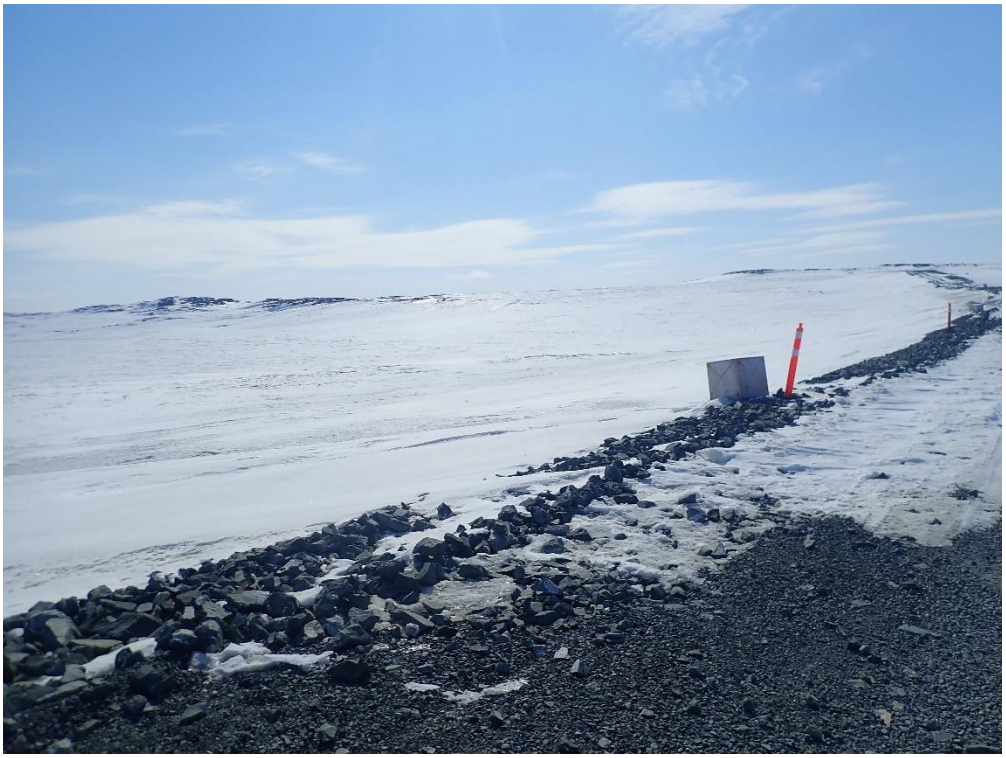
This weekly walkover survey report is a means to track the condition on the **South Dam**; please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

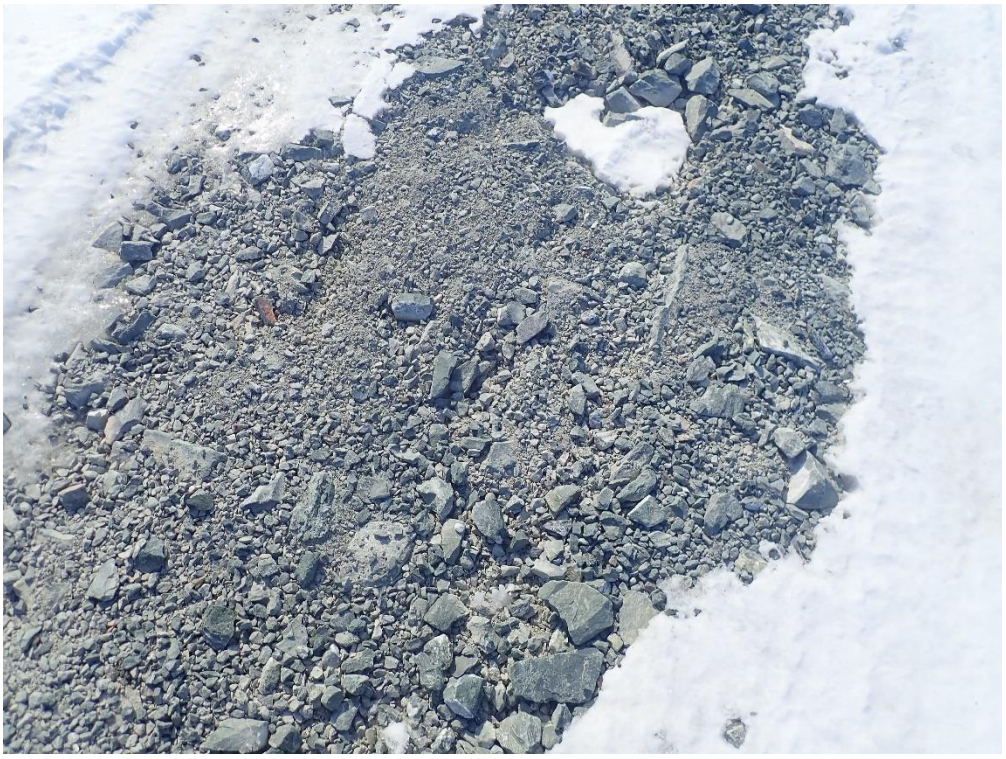
Upstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Tailings Beach on the Upstream Side		
Is the beach within the operating limits? (Beach length of 100 meters, no water ponding or pooling near the dam etc.) * Use shoreline markers indicating 100 meters from the crest for visual reference*	(Yes)	No
Active Tailings Discharge Spigot		
Indicate the active discharge spigot location (Spigot number or (s) on the figure provided)		
Settlement Instrumentation (on crest and downstream side)		
Any visible concerns? (significantly rusted or otherwise damaged, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (cables frayed, disconnected or damaged, boxes cracked, etc.)	Yes	(No)
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam?	Yes	(No)
Is the water visibly flowing?	Yes	(No)
Walk over inspection of the downstream toe complete? (May to November)		
Inspector should walk the length of the downstream toe inspecting for seepage or slumping once most of the snow has melted (May to November)	(Yes)	No

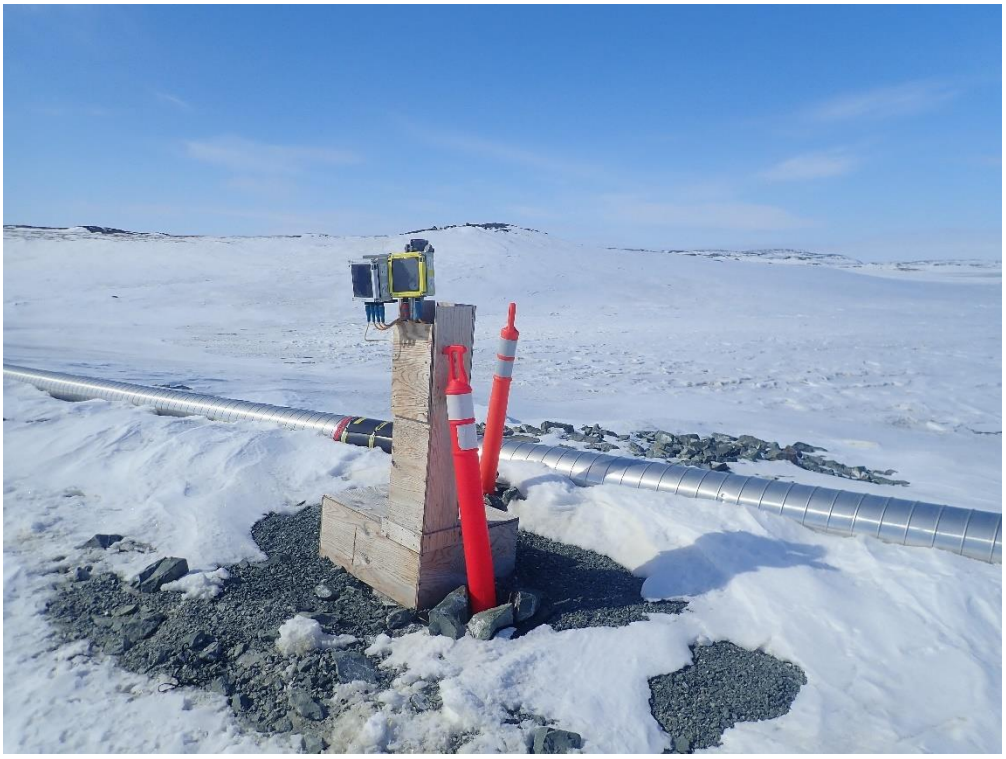
If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided below.

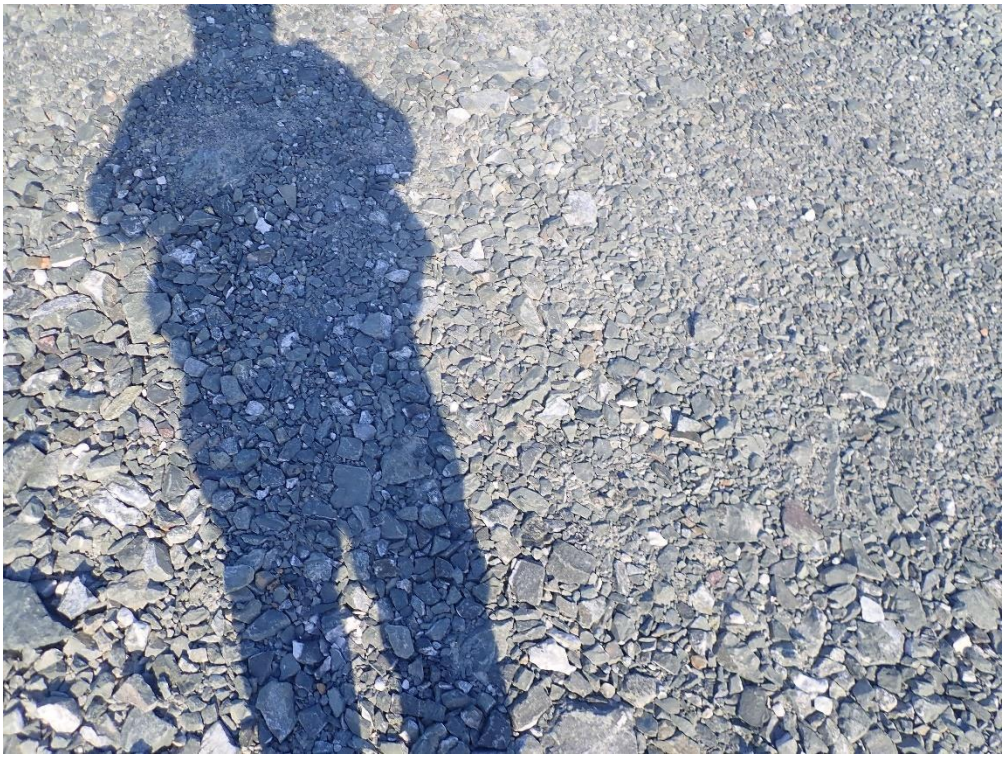
NOTES: STILL FROZEN AND SNOW COVERED

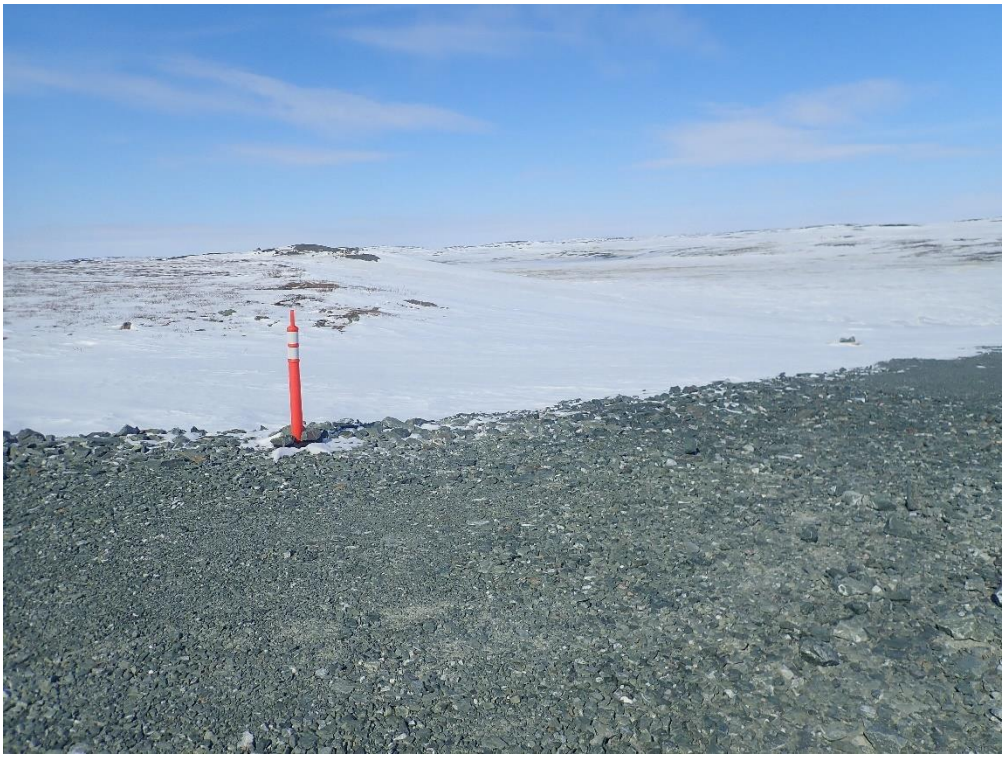
If seepage has been noted estimate the flow (high/medium/low) and report to TMAC Environmental Superintendent:

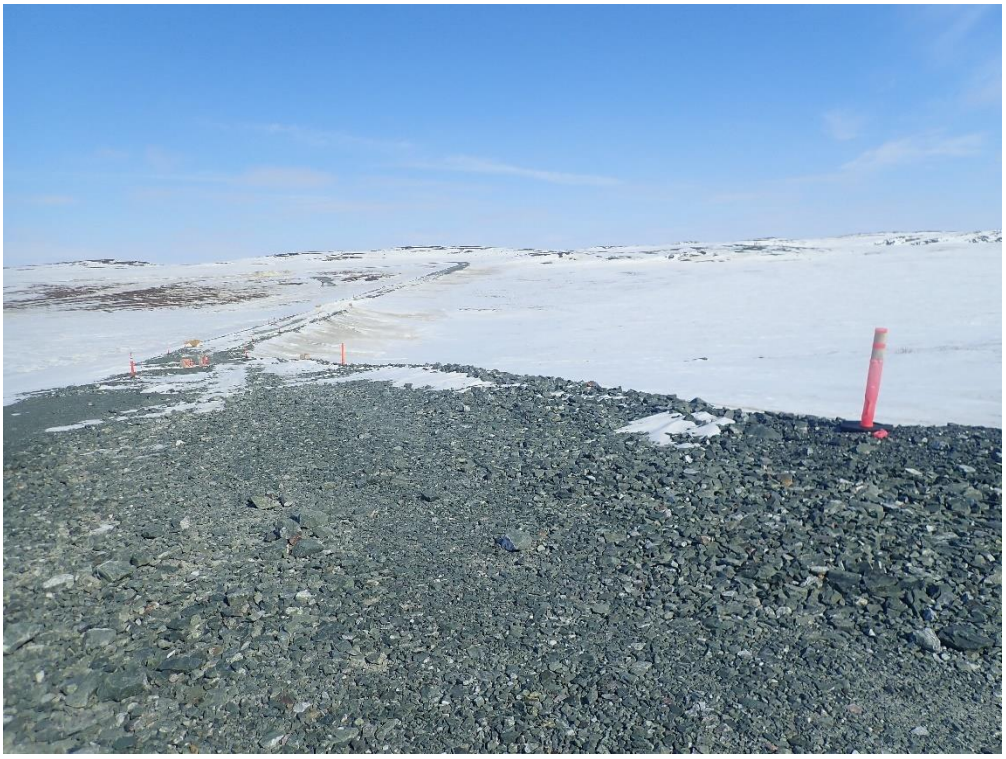


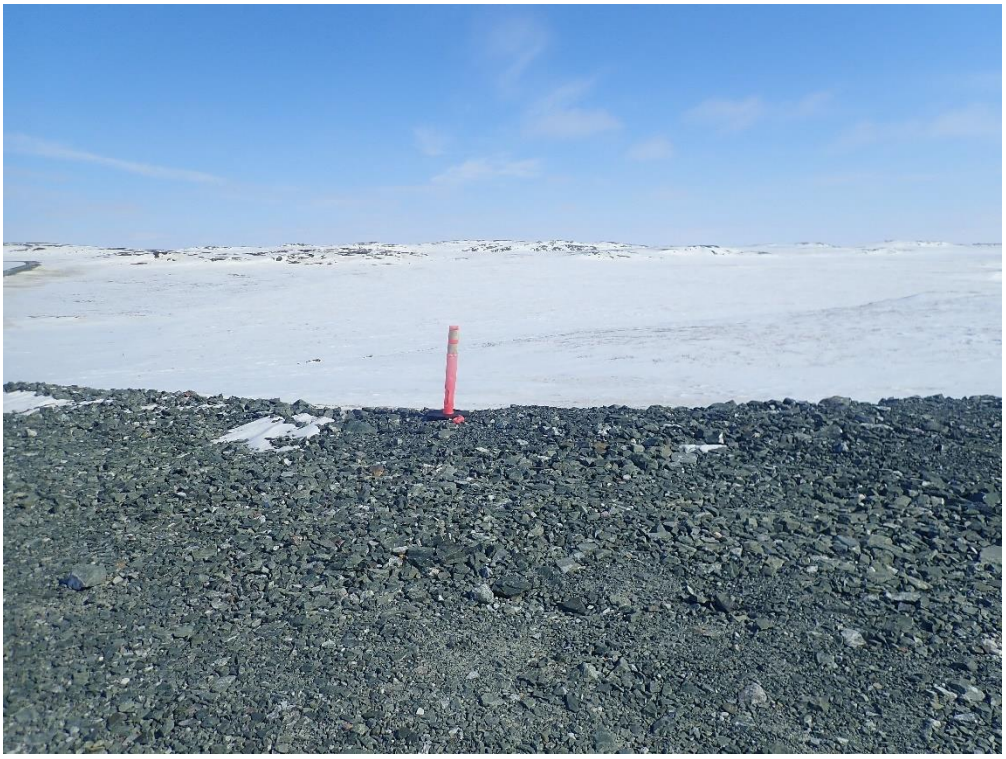


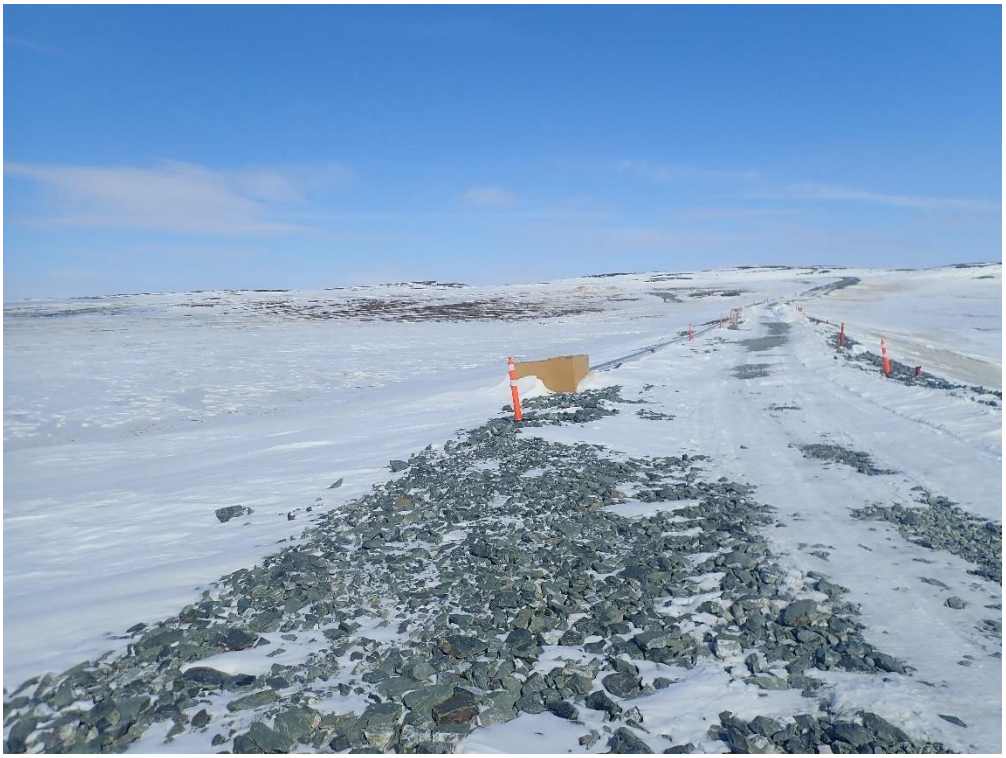












South Dam
Walkover Report

Frequency: Weekly or as specified by EOR

Date:	24 MAY 21
Inspected By:	PJ BC JM UN
Conditions:	(ie. snow on ground, clear) SNOW ON GROUND, NW BREEZE, -15°C

Visual Inspection:

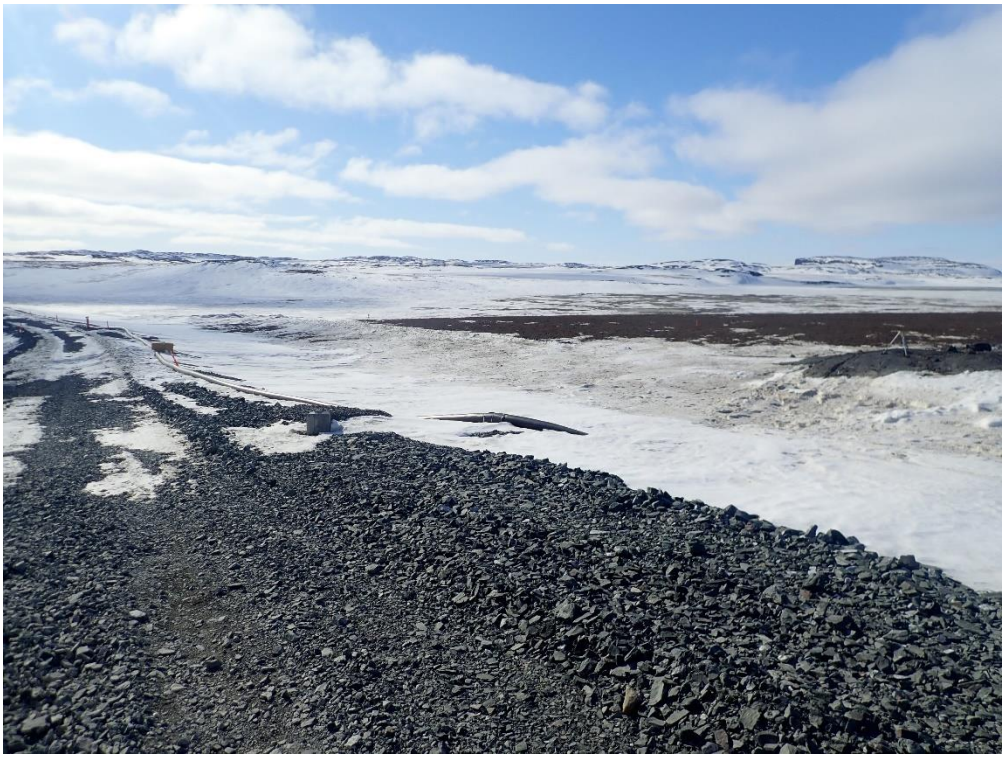
This weekly walkover survey report is a means to track the condition on the **South Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

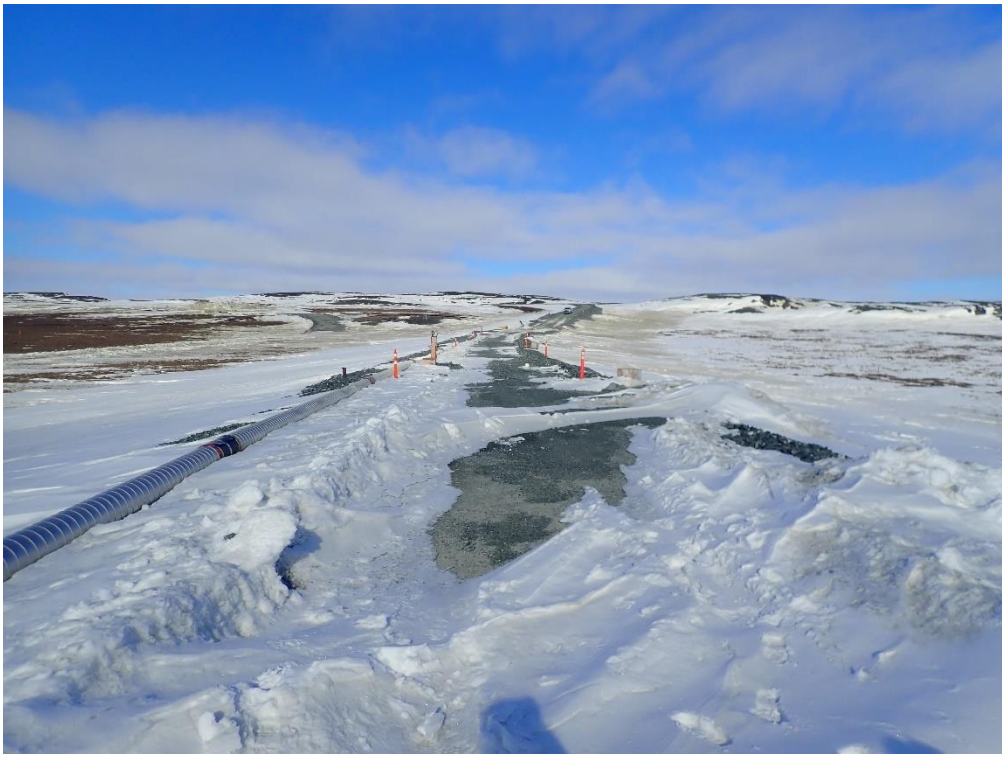
Upstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Tailings Beach on the Upstream Side		
Is the beach within the operating limits? (Beach length of 100 meters, no water ponding or pooling near the dam etc.) * Use shoreline markers indicating 100 meters from the crest for visual reference*	(Yes)	No
Active Tailings Discharge Spigot		
Indicate the active discharge spigot location (Spigot number or (S) on the figure provided)		
Settlement Instrumentation (on crest and downstream side)		
Any visible concerns? (significantly rusted or otherwise damaged, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (cables frayed, disconnected or damaged, boxes cracked, etc.)	Yes	(No)
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam?	Yes	(No)
Is the water visibly flowing?	Yes	(No)
Walk over inspection of the downstream toe complete? (May to November)		
Inspector should walk the length of the downstream toe inspecting for seepage or slumping once most of the snow has melted (May to November)	(Yes)	No

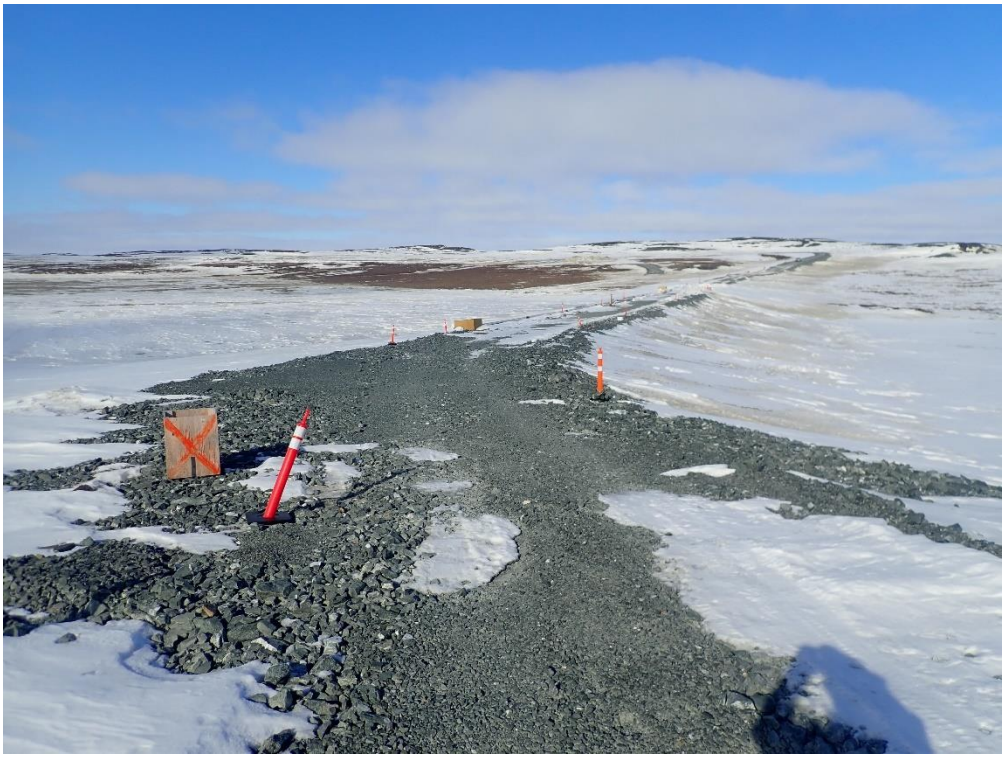
If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided below.

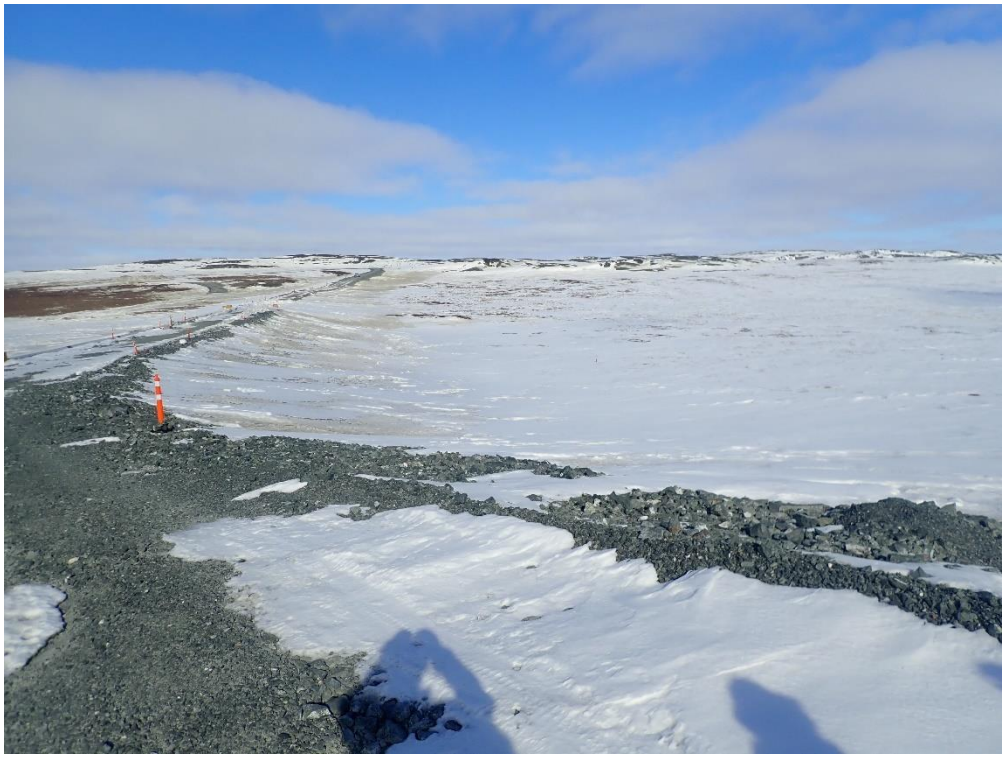
NOTES:

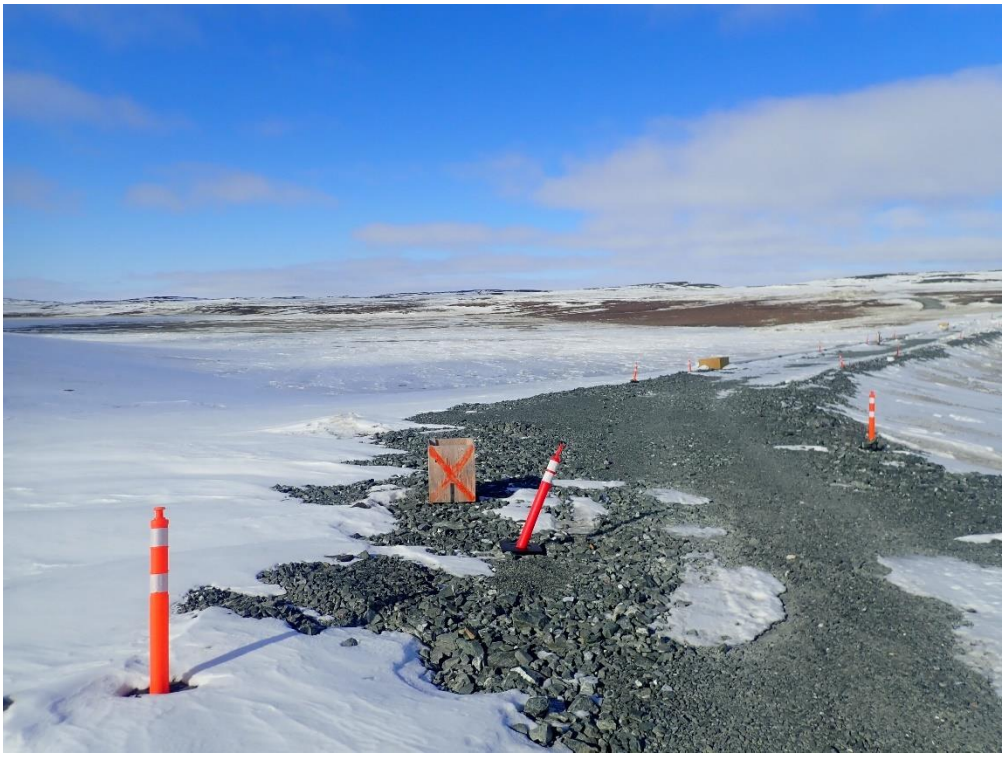
If seepage has been noted estimate the flow (high/medium/low) and report to TMAC Environmental Superintendent:











South Dam
Walkover Report

Frequency: Weekly or as specified by EOR

Date:	MAY 30·21
Inspected By:	JM BC WN
Conditions: (ie. snow on ground, clear)	MOSTLY CLEAR ON ROAD SURFACE.

Visual Inspection:

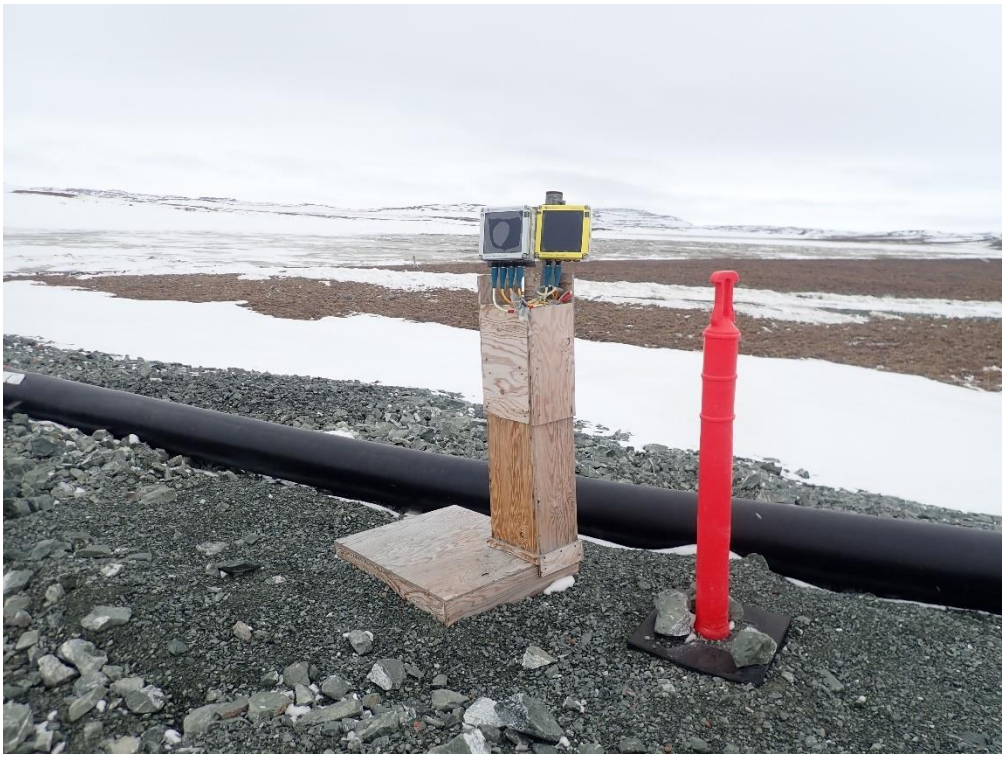
This weekly walkover survey report is a means to track the condition on the **South Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

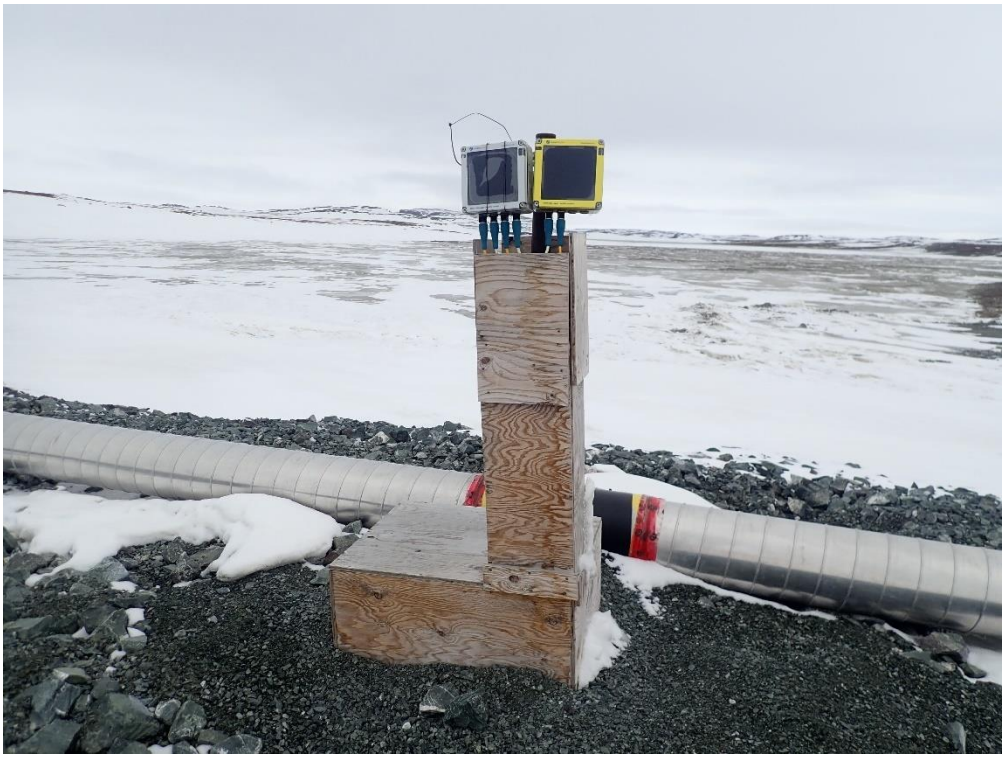
Upstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Tailings Beach on the Upstream Side		
Is the beach within the operating limits? (Beach length of 100 meters, no water ponding or pooling near the dam etc.) * Use shoreline markers indicating 100 meters from the crest for visual reference*	(Yes)	No
Active Tailings Discharge Spigot		
Indicate the active discharge spigot location (Spigot number or (S) on the figure provided)		
Settlement Instrumentation (on crest and downstream side)		
Any visible concerns? (significantly rusted or otherwise damaged, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (cables frayed, disconnected or damaged, boxes cracked, etc.)	Yes	(No)
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam?	Yes	(No)
Is the water visibly flowing?	Yes	(No)
Walk over inspection of the downstream toe complete? (May to November)		
Inspector should walk the length of the downstream toe inspecting for seepage or slumping once most of the snow has melted (May to November)	Yes	(No)

If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided below.

NOTES:

If seepage has been noted estimate the flow (high/medium/low) and report to TMAC Environmental Superintendent:





South Dam
Walkover Report

Frequency: Weekly or as specified by EOR

Date:	June 3, 2021
Inspected By:	BC, JM, AH, GDV
Conditions:	(ie. snow on ground, clear) Semi snow covered

Visual Inspection:

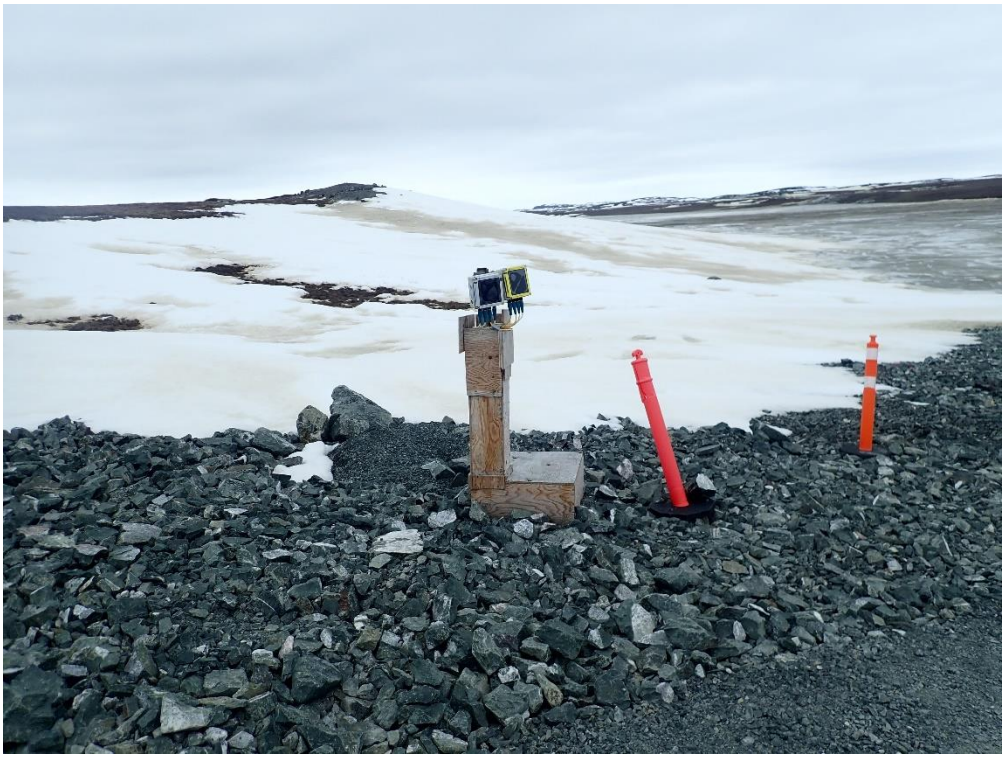
This weekly walkover survey report is a means to track the condition on the **South Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

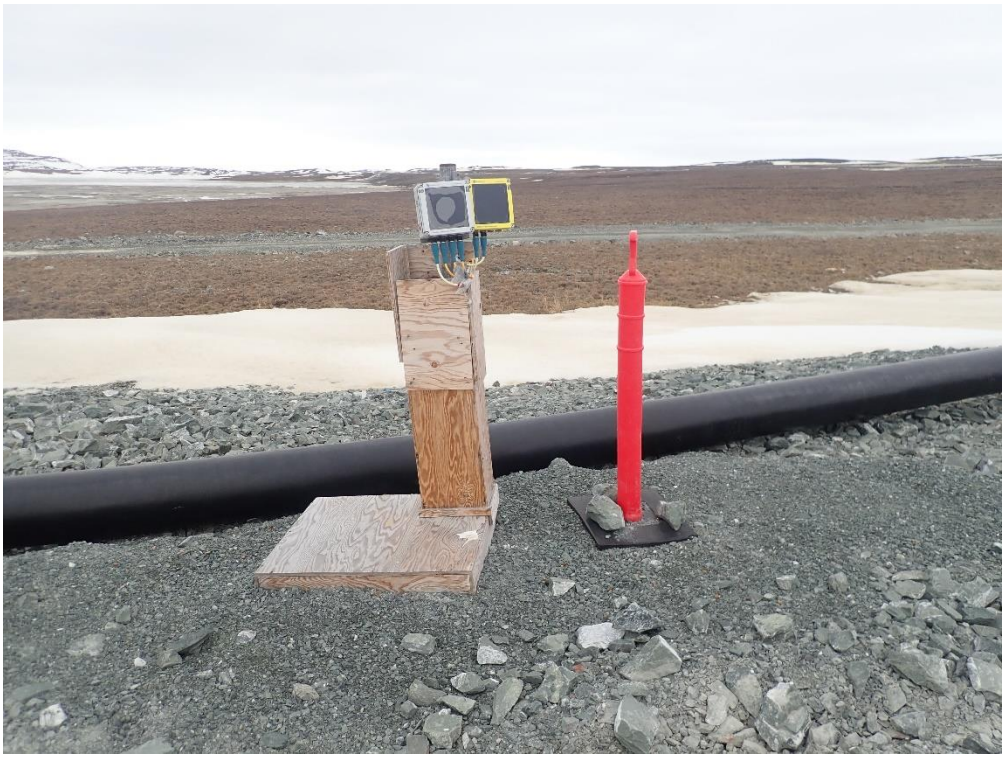
Upstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Tailings Beach on the Upstream Side		
Is the beach within the operating limits? (Beach length of 100 meters, no water ponding or pooling near the dam etc.) * Use shoreline markers indicating 100 meters from the crest for visual reference*	Yes	(No)
Active Tailings Discharge Spigot		
Indicate the active discharge spigot location (Spigot number or (S) on the figure provided)		
Settlement Instrumentation (on crest and downstream side)		
Any visible concerns? (significantly rusted or otherwise damaged, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (cables frayed, disconnected or damaged, boxes cracked, etc.)	Yes	(No)
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam?	Yes	(No)
Is the water visibly flowing?	Yes	(No)
Walk over inspection of the downstream toe complete? (May to November)		
Inspector should walk the length of the downstream toe inspecting for seepage or slumping once most of the snow has melted (May to November)	(Yes)	No

If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided below.

NOTES: Dam is in good condition

If seepage has been noted estimate the flow (high/medium/low) and report to TMAC Environmental Superintendent:





South Dam
Walkover Report

Frequency: Weekly or as specified by EOR

Date:	20/06/2021
Inspected By:	EF, BC
Conditions:	(ie. snow on ground, clear) a bit of snow, CLEAR path

Visual Inspection:

This weekly walkover survey report is a means to track the condition on the **South Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Tailings Beach on the Upstream Side		
Is the beach within the operating limits? (Beach length of 100 meters, no water ponding or pooling near the dam etc.) * Use shoreline markers indicating 100 meters from the crest for visual reference*	(Yes)	No
Active Tailings Discharge Spigot		
Indicate the active discharge spigot location (Spigot number or (S) on the figure provided) NA		
Settlement Instrumentation (on crest and downstream side)		
Any visible concerns? (significantly rusted or otherwise damaged, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (cables frayed, disconnected or damaged, boxes cracked, etc.)	Yes	(No)
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam? a bit Is the water visibly flowing?	(Yes) Yes	(No) (No)
Walk over inspection of the downstream toe complete? (May to November)		
Inspector should walk the length of the downstream toe inspecting for seepage or slumping once most of the snow has melted (May to November)	(Yes)	No

If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided below.

NOTES:

If seepage has been noted estimate the flow (high/medium/low) and report to TMAC Environmental Superintendent:

AGNICO EAGLE

Hope Bay - South Dam
Visual Inspection Form

Frequency: Weekly or as specified by EOR

Date:	26-07-2021
Inspected By:	BC, EF, GDV
Conditions:	(ie. snow on ground, clear) clear, windy

Visual Inspection:

This weekly visual inspection (walk over) report is a means to track the condition on the **South Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Tailings Beach on the Upstream Side of the Dam		
Is ponded water on the upstream side further than 100 meters from the dam? (Beach length of 100 meters or greater, no water ponding or pooling near the dam etc.) * Use shoreline markers indicating 100 meters from the crest for visual reference*	(Yes)	No
Active Tailings Discharge Spigot		
Indicate the active discharge spigot location (Spigot ID or identify with a Spigot ID and ● using Figure 2 as a guide)	no discharge	
Settlement Instrumentation (on crest and downstream side)		
Any visible concerns? (significantly rusted or otherwise damaged, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (cables frayed, disconnected or damaged, boxes cracked, etc.)	Yes	(No)
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam? minimal	Yes	(No)
Is the water visibly flowing?	Yes	(No)
Walk over inspection of the downstream toe complete? (May to November)		
Inspector should walk the length of the downstream toe inspecting for seepage or slumping once most of the snow has melted (May to November) ~~Not done~~	(Yes)	No

If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided below.

NOTES:

If water flow near the dam toe been noted estimate the flow and report to the Environmental Supervisor:
High/Medium/Low:
Estimate a flow rate if possible:

AGNICO EAGLE

Hope Bay - South Dam
Visual Inspection Form

Frequency: Weekly or as specified by EOR

Date:	08/08/21
Inspected By:	BL EF WN
Conditions:	(ie. snow on ground, clear)

Visual Inspection:

This weekly visual inspection (walk over) report is a means to track the condition on the **South Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam (Overall) Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam (Overall) Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam (Overall) Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Tailings Beach on the Upstream Side of the Dam Is ponded water on the upstream side further than 100 meters from the dam? (Beach length of 100 meters or greater, no water ponding or pooling near the dam etc.) * Use shoreline markers indicating 100 meters from the crest for visual reference*	(Yes)	No
Active Tailings Discharge Spigot Indicate the active discharge spigot location (Spigot ID or identify with a Spigot ID and ● using Figure 2 as a guide)		
Settlement Instrumentation (on crest and downstream side) Any visible concerns? (significantly rusted or otherwise damaged, etc.)	Yes	(No)
Thermistors and Dataloggers Any visible concerns? (cables frayed, disconnected or damaged, boxes cracked, etc.)	Yes	(No)
Water at the Toe of the Downstream Side of the Dam Is water visible on the downstream side of the dam? Is the water visibly flowing?	(Yes) Yes	No (No)
Walk over inspection of the downstream toe complete? (May to November) Inspector should walk the length of the downstream toe inspecting for seepage or slumping once most of the snow has melted (May to November)	(Yes)	No

If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided below.

NOTES: Tailings discharging from Spigot 1.

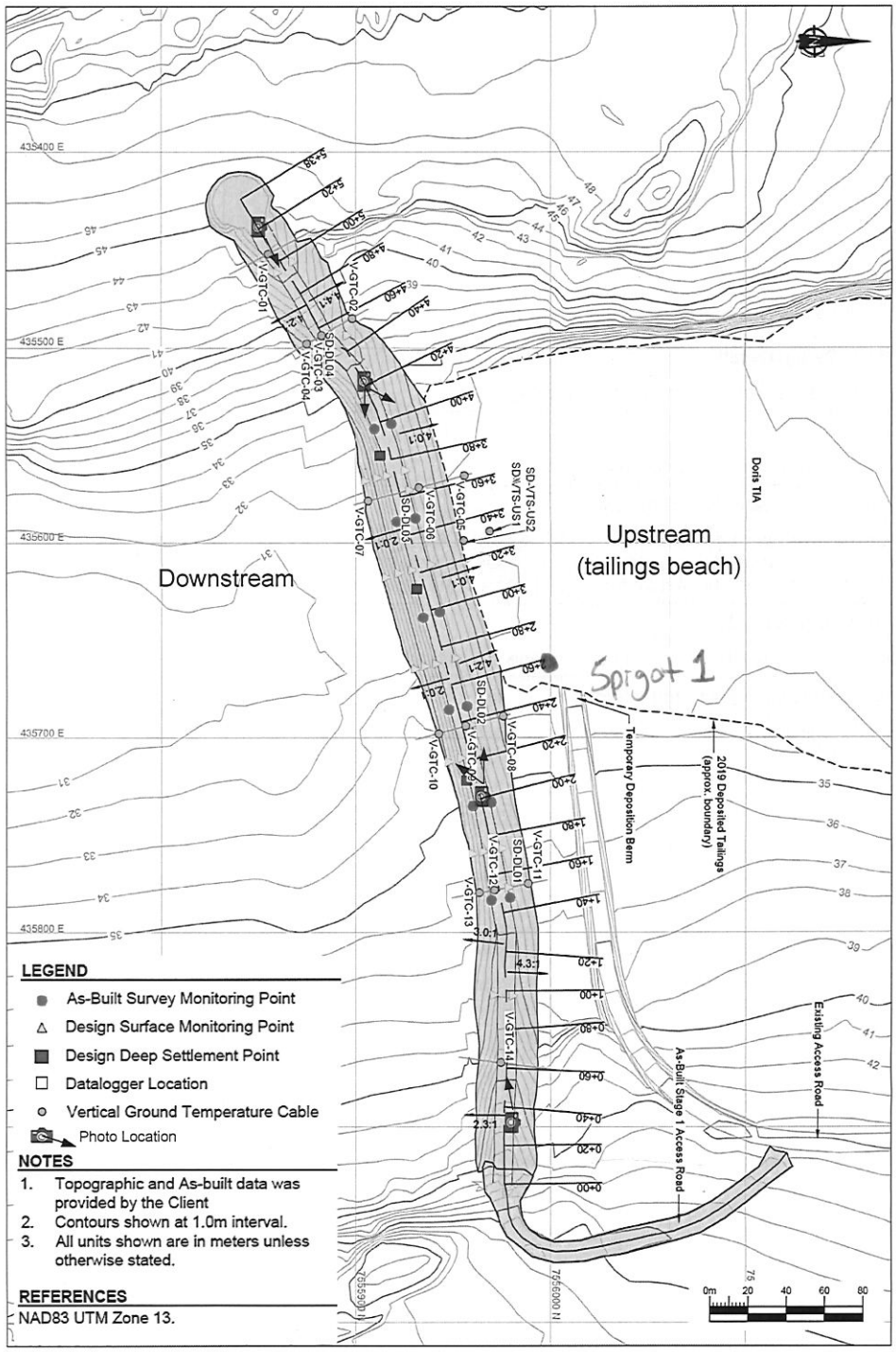
Heavy rain on day of ~~sampling~~ inspection, causing pooling at downstream toe. BL

If water flow near the dam toe been noted estimate the flow and report to the Environmental Supervisor:
High/Medium/Low:
Estimate a flow rate if possible:

Photos:

Please collect the following photos:

- Photo from the crest looking W along the dam crest (Station 0+30) ☐
- Photo from the crest looking SW over the downstream toe along the dam (Station 2+00) ☐
- Photo from the crest looking W over the tailings beach (Station 2+00) ☐
- Photo from the crest looking NE over the tailings beach (Station 4+20) ☐
- Photo from the crest looking E over the downstream toe along the dam (Station 4+20) ☐
- Photo from west end looking E along the dam crest (Station 5+20) ☐



Photos on downstream toe all facing west.

Photos on upstream toe all facing east.

Figure 1: Plan view and recommended locations for walkover photographs

AGNICO EAGLE

Hope Bay - South Dam
Visual Inspection Form

Frequency: Weekly or as specified by EOR

Date:	15 Aug 2021
Inspected By:	WN BC JM
Conditions:	(ie. snow on ground, clear)

Visual Inspection:

This weekly visual inspection (walk over) report is a means to track the condition on the **South Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	No
Downstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	No
Crest of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Tailings Beach on the Upstream Side of the Dam		
Is ponded water on the upstream side further than 100 meters from the dam? (Beach length of 100 meters or greater, no water ponding or pooling near the dam etc.) * Use shoreline markers indicating 100 meters from the crest for visual reference*	(Yes)	No
Active Tailings Discharge Spigot		
Indicate the active discharge spigot location (Spigot ID or identify with a Spigot ID and ● using Figure 2 as a guide)		
Settlement Instrumentation (on crest and downstream side)		
Any visible concerns? (significantly rusted or otherwise damaged, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (cables frayed, disconnected or damaged, boxes cracked, etc.)	Yes	(No)
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam?	(Yes)	No
Is the water visibly flowing?	Yes	(No)
Walk over inspection of the downstream toe complete? (May to November)		
Inspector should walk the length of the downstream toe inspecting for seepage or slumping once most of the snow has melted (May to November)	(Yes)	No

If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided below.

NOTES:

If water flow near the dam toe been noted estimate the flow and report to the Environmental Supervisor:
High/Medium/Low:
Estimate a flow rate if possible:

Photos:

Please collect the following photos:

Photo from the crest looking W along the dam crest (Station 0+30)	☐
Photo from the crest looking SW over the downstream toe along the dam (Station 2+00)	☐
Photo from the crest looking W over the tailings beach (Station 2+00)	☐
Photo from the crest looking NE over the tailings beach (Station 4+20)	☐
Photo from the crest looking E over the downstream toe along the dam (Station 4+20)	☐
Photo from west end looking E along the dam crest (Station 5+20)	☐

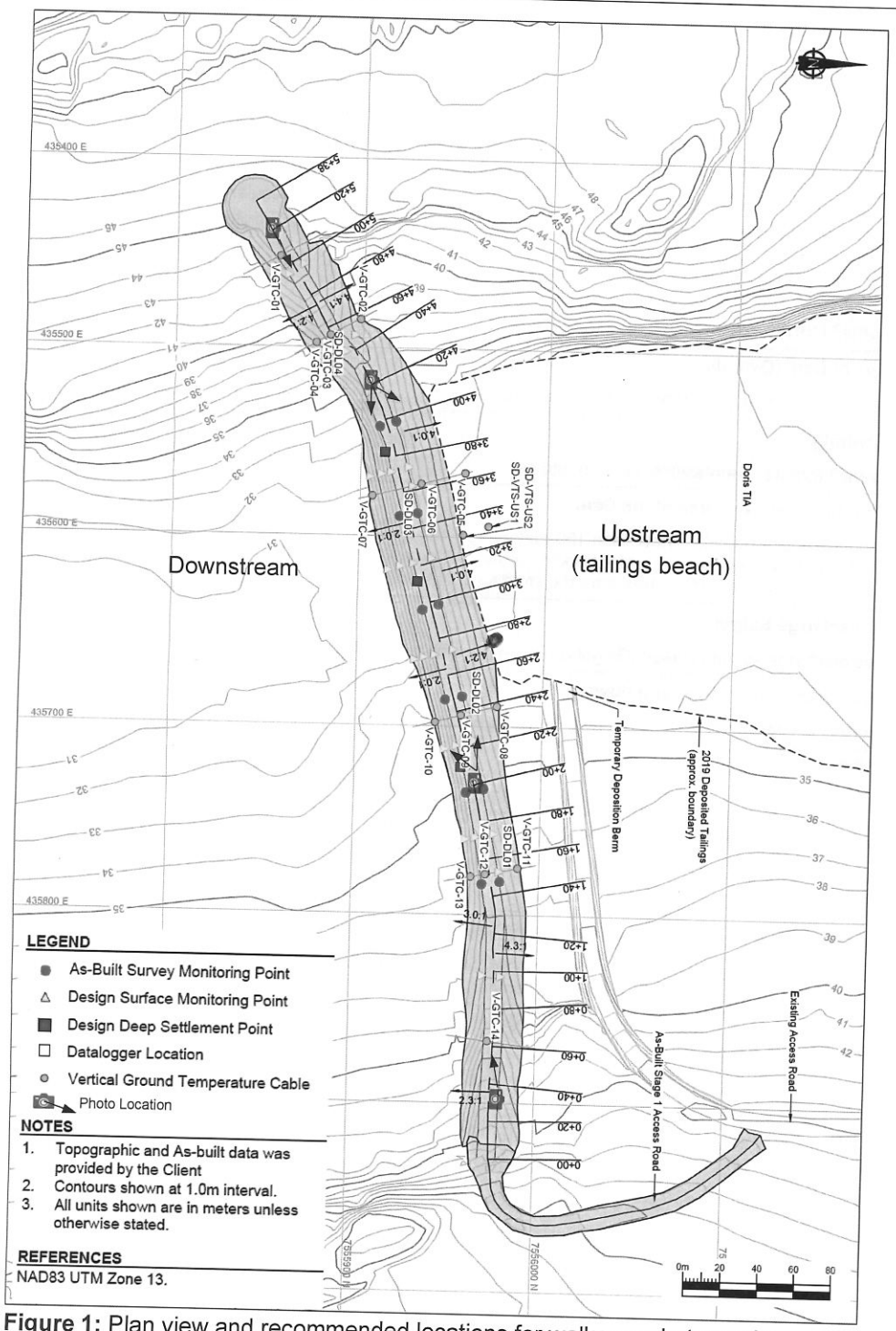


Figure 1: Plan view and recommended locations for walkover photographs

T3
T3

T1

AGNICO EAGLE

Hope Bay - South Dam
Visual Inspection Form

Frequency: Weekly or as specified by EOR

Date:	29 August 21
Inspected By:	JM, BC
Conditions:	(ie. snow on ground, (clear))

Visual Inspection:

This weekly visual inspection (walk over) report is a means to track the condition on the **South Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	No
Tailings Beach on the Upstream Side of the Dam		
Is ponded water on the upstream side further than 100 meters from the dam? (Beach length of 100 meters or greater, no water ponding or pooling near the dam etc.) * Use shoreline markers indicating 100 meters from the crest for visual reference*	(Yes)	No
Active Tailings Discharge Spigot		
Indicate the active discharge spigot location (Spigot ID or identify with a Spigot ID and ● using Figure 2 as a guide)		NC
Settlement Instrumentation (on crest and downstream side)		
Any visible concerns? (significantly rusted or otherwise damaged, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (cables frayed, disconnected or damaged, boxes cracked, etc.)	Yes	(No)
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam?	(Yes)	No
Is the water visibly flowing?	Yes	(No)
Walk over inspection of the downstream toe complete? (May to November)		
Inspector should walk the length of the downstream toe inspecting for seepage or slumping once most of the snow has melted (May to November)	(Yes)	No

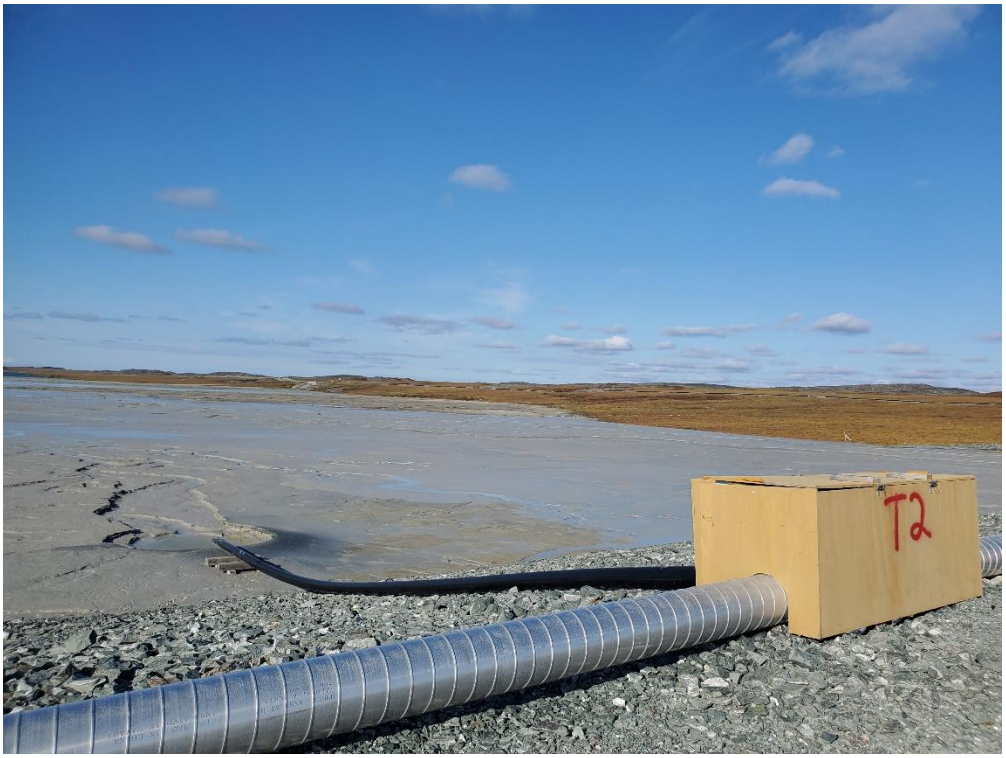
If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided below.

NOTES:

Some seeps at the toe (ponded, not flowing)

If water flow near the dam toe been noted estimate the flow and report to the Environmental Supervisor:
High/Medium/Low:
Estimate a flow rate if possible:

T1


T2

T3

AGNICO EAGLE

Hope Bay - South Dam
Visual Inspection Form

Frequency: Weekly or as specified by EOR

Date:	Sept 6 2021
Inspected By:	BC AH
Conditions:	(ie. snow on ground, clear)

Visual Inspection:

This weekly visual inspection (walk over) report is a means to track the condition on the **South Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Tailings Beach on the Upstream Side of the Dam		
Is ponded water on the upstream side further than 100 meters from the dam? (Beach length of 100 meters or greater, no water ponding or pooling near the dam etc.) * Use shoreline markers indicating 100 meters from the crest for visual reference*	(Yes)	No
Active Tailings Discharge Spigot		
Indicate the active discharge spigot location (Spigot ID or identify with a Spigot ID and ● using Figure 2 as a guide)	N/A	
Settlement Instrumentation (on crest and downstream side)		
Any visible concerns? (significantly rusted or otherwise damaged, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (cables frayed, disconnected or damaged, boxes cracked, etc.)	Yes	(No)
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam?	(Yes)	No
Is the water visibly flowing?	Yes	(No)
Walk over inspection of the downstream toe complete? (May to November)		
Inspector should walk the length of the downstream toe inspecting for seepage or slumping once most of the snow has melted (May to November)	(Yes)	No

If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided below.

NOTES: Raining heavily causing pooling water. No visible seepage

If water flow near the dam toe been noted estimate the flow and report to the Environmental Supervisor:
High/Medium/Low:
Estimate a flow rate if possible:

AGNICO EAGLE

Hope Bay - South Dam
Visual Inspection Form

Frequency: Weekly or as specified by EOR

Date:	Sept 13 2021
Inspected By:	BL KK
Conditions:	(ie. snow on ground, clear)

Visual Inspection:

This weekly visual inspection (walk over) report is a means to track the condition on the **South Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	(No)
Crest of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Tailings Beach on the Upstream Side of the Dam		
Is ponded water on the upstream side further than 100 meters from the dam? (Beach length of 100 meters or greater, no water ponding or pooling near the dam etc.) * Use shoreline markers indicating 100 meters from the crest for visual reference*	(Yes)	No
Active Tailings Discharge Spigot		
Indicate the active discharge spigot location (Spigot ID or identify with a Spigot ID and ● using Figure 2 as a guide)	NA	
Settlement Instrumentation (on crest and downstream side)		
Any visible concerns? (significantly rusted or otherwise damaged, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (cables frayed, disconnected or damaged, boxes cracked, etc.)	Yes	(No)
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam?	(Yes)	No
Is the water visibly flowing?	Yes	(No)
Walk over inspection of the downstream toe complete? (May to November)		
Inspector should walk the length of the downstream toe inspecting for seepage or slumping once most of the snow has melted (May to November)	(Yes)	No

If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided below.

NOTES:

Raining causing pooling water

If water flow near the dam toe been noted estimate the flow and report to the Environmental Supervisor:
High/Medium/Low:
Estimate a flow rate if possible:

AGNICO EAGLE

Hope Bay - South Dam
Visual Inspection Form

Frequency: Weekly or as specified by EOR

Date:	Sept 19/21
Inspected By:	BL GDV
Conditions:	(ie. snow on ground, clear) Clear

Visual Inspection:

This weekly visual inspection (walk over) report is a means to track the condition on the **South Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	(Yes)	No
Crest of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Tailings Beach on the Upstream Side of the Dam		
Is ponded water on the upstream side further than 100 meters from the dam? (Beach length of 100 meters or greater, no water ponding or pooling near the dam etc.) * Use shoreline markers indicating 100 meters from the crest for visual reference*	(Yes)	No
Active Tailings Discharge Spigot		
Indicate the active discharge spigot location (Spigot ID or identify with a Spigot ID and ● using Figure 2 as a guide)		
Settlement Instrumentation (on crest and downstream side)		
Any visible concerns? (significantly rusted or otherwise damaged, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (cables frayed, disconnected or damaged, boxes cracked, etc.)	Yes	(No)
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam?	Yes	(No)
Is the water visibly flowing?	Yes	(No)
Walk over inspection of the downstream toe complete? (May to November)		
Inspector should walk the length of the downstream toe inspecting for seepage or slumping once most of the snow has melted (May to November)	(Yes)	No

If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided below.

NOTES: Crack noted by engineer. See photos.

If water flow near the dam toe been noted estimate the flow and report to the Environmental Supervisor:
High/Medium/Low:
Estimate a flow rate if possible:

AGNICO EAGLE

Hope Bay - South Dam
Visual Inspection Form

Frequency: Weekly or as specified by EOR

Date:	26/09/2021
Inspected By:	C.D-V / W.N
Conditions:	(ie. snow on ground, (clear) Draining

Visual Inspection:

This weekly visual inspection (walk over) report is a means to track the condition on the **South Dam**, please provide details on changes that have developed since the previous inspection and/or any observations of particular concern. All photos are appreciated. Please send the completed form (scans are fine) and any photos to hopebaymonitoring@srk.com and pluedke@srk.com

Upstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Downstream Side of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, seepage, etc.)	Yes	No
Crest of Dam (Overall)		
Any visible concerns? (cracks, depressions, erosion, etc.)	Yes	(No)
Tailings Beach on the Upstream Side of the Dam		
Is ponded water on the upstream side further than 100 meters from the dam? (Beach length of 100 meters or greater, no water ponding or pooling near the dam etc.) * Use shoreline markers indicating 100 meters from the crest for visual reference*	(Yes)	No
Active Tailings Discharge Spigot		
Indicate the active discharge spigot location (Spigot ID or identify with a Spigot ID and ● using Figure 2 as a guide)		
Settlement Instrumentation (on crest and downstream side)		
Any visible concerns? (significantly rusted or otherwise damaged, etc.)	Yes	(No)
Thermistors and Dataloggers		
Any visible concerns? (cables frayed, disconnected or damaged, boxes cracked, etc.)	Yes	(No)
Water at the Toe of the Downstream Side of the Dam		
Is water visible on the downstream side of the dam? Is the water visibly flowing?	Yes Yes	(No) (No)
Walk over inspection of the downstream toe complete? (May to November)		
Inspector should walk the length of the downstream toe inspecting for seepage or slumping once most of the snow has melted (May to November)	(Yes)	No

If you answered yes to any of the questions above, or made other observations, please provide details and photos. Observations can be sketched on the figure provided below.
NOTES:

If water flow near the dam toe been noted estimate the flow and report to the Environmental Supervisor:
High/Medium/Low:
Estimate a flow rate if possible:

T1

T1

T2

Appendix G – 2021 Geochemical Source Investigation

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vancouver@srk.com
www.srk.com

FINAL

Technical Memo

March 30, 2022

To	John Kurylo, PEng, SRK
From	Lisa Barazzuol, PGeo and Kyle Jang, SRK
Cc	Nancy Duquet Harvey and Thomas Lepine, Agnico Eagle Mines Ltd.
Subject	2021 Geochemical Source Investigation of Water Downstream of North and South Dams, Hope Bay
Client	Agnico Eagle Mines Ltd.
Project	1CT022.073

1 Background

The scope of the geochemical source investigation is to determine if TIA Reclaim Pond water is present in water observed at the downstream toe of the North and/or South Dams and establish baseline water chemistry downstream of the South Dam.

The North Dam forms the northern boundary of the Doris TIA, within a narrow natural valley blocking the original Tail Lake outlet to Doris Lake. The structure impounds the Reclaim Pond and was designed as a water retaining structure. The dam has a central frozen core with a secondary upstream Geosynthetic Clay Liner (GCL). The dam is constructed from local quarry rock and consists of processed fines for the core, 150 mm nominal sized transition material, and a run of quarry (ROQ) outer shell. To ensure maintenance of frozen foundation conditions, the key trench of the dam is equipped with 12 horizontal thermosyphon evaporators. Flowing water has been observed each year along the downstream toe of the dam near the former outlet of Tail Lake since after the first winter of dam construction in 2011.

The South Dam is located at the southern end of the Doris TIA, on the watercourse to Ogama Lake. The South Dam is designed as a frozen foundation dam consisting of a compacted rock fill dam (sourced from a local quarry) with a GCL keyed into the permafrost overburden foundation for seepage control. The dam is designed to retain beached tailings as opposed to water. The dam is to be constructed in two phases, incorporating a single downstream raise. To date, the first phase of construction has been completed. Two ponds that were present prior to construction of the South Dam have been observed each year at the toe of the dam.

Key dates for North and South Dam construction and tailings impoundment area (TIA) operations are as follows:

- February 2011 – Initiation of North Dam construction (over two winter seasons).
- April 2012 – Completion of North Dam construction.
- February 2017 – Effective start of tailings slurry discharge to TIA at a temporary berm within the TIA.
- January 2018 – Initiation of South Dam construction.
- February 2018 – Mine water discharged to the Doris TIA.
- June 2018 – Completion of South Dam construction, deposition from the South Dam began in the same timeframe.
- February 2020 – Doris TIA discharge to Roberts Bay commenced.
- August 2020 – Doris TIA discharge to Roberts Bay offline.
- February 2021 – Agnico Eagle Mines (AEM) purchased the project and became responsible for the operation of the TIA.
- June 2021 – Doris TIA discharge to Roberts Bay re-initiated.

In 2017, based on a recommendation from the Engineer of Record (EOR), TMAC Resources Inc. initiated a monitoring program for flowing water at the toe of the North Dam (SRK 2018a). After completion of the South Dam, a similar monitoring program was initiated (SRK 2019a, 2019b) and both programs were updated in 2020 (SRK 2020d, 2020e) The water quality monitoring program at the toe of the dams includes the following:

- Inspections for flowing water at the toe of North and South Dams between approximately June and October, and opportunistic water quality sampling and analysis of flowing water at the toe where observed.
- Sample collection of TIA Reclaim Pond water at station TL-1 and process water from the tailings slurry pumped to the TIA at station TL-5. These stations are monitored as part of and in compliance with Water Licence 2AM-DOH1335 Amendment No. 2 (Nunavut Water Board 2018).
- Sample collection at pre-determined stations of ponded water downstream of the South Dam.

As a supplementary monitoring program at the recommendation of the EOR, three samples of tailings pore water at the tailings slurry discharge points at the South Dam were sampled in August 2019 to quantify pond water chemistry and freezing point depression of the TIA tailings as the chemical composition of porewater within the tailings beach will directly impact heat transfer and freeze-back of the tailings over time (SRK 2020a). Delayed freeze-back of the tailings beach could limit heat loss from the South Dam foundation immediately below the upstream toe.

The geochemical source investigation is a comparison of water quality between flowing water at the toe of the dams and stations representing TIA water quality (TL-1 and TL-5). Water at the toe of the North and South Dams and associated data analysis presented herein are not a compliance

requirement and is at the request of the EOR. This memo documents a geochemical source investigation of the aforementioned stations with the following objectives:

- Document the water quality results of the 2021 monitoring programs of water at the toes of the North and South Dams;
- Assess the major ion chemistry of water quality monitoring stations, including all samples from the TIA pond;
- Assess the geochemical sources of the water observed at the toe of the North and South Dams as an indicator of containment and thermal performance of the dams; and
- Establish baseline chemistry downstream of the South dam at the ponded water stations.

2 Methods

2.1 Monitoring of Flowing Water at the Toe of the North Dam

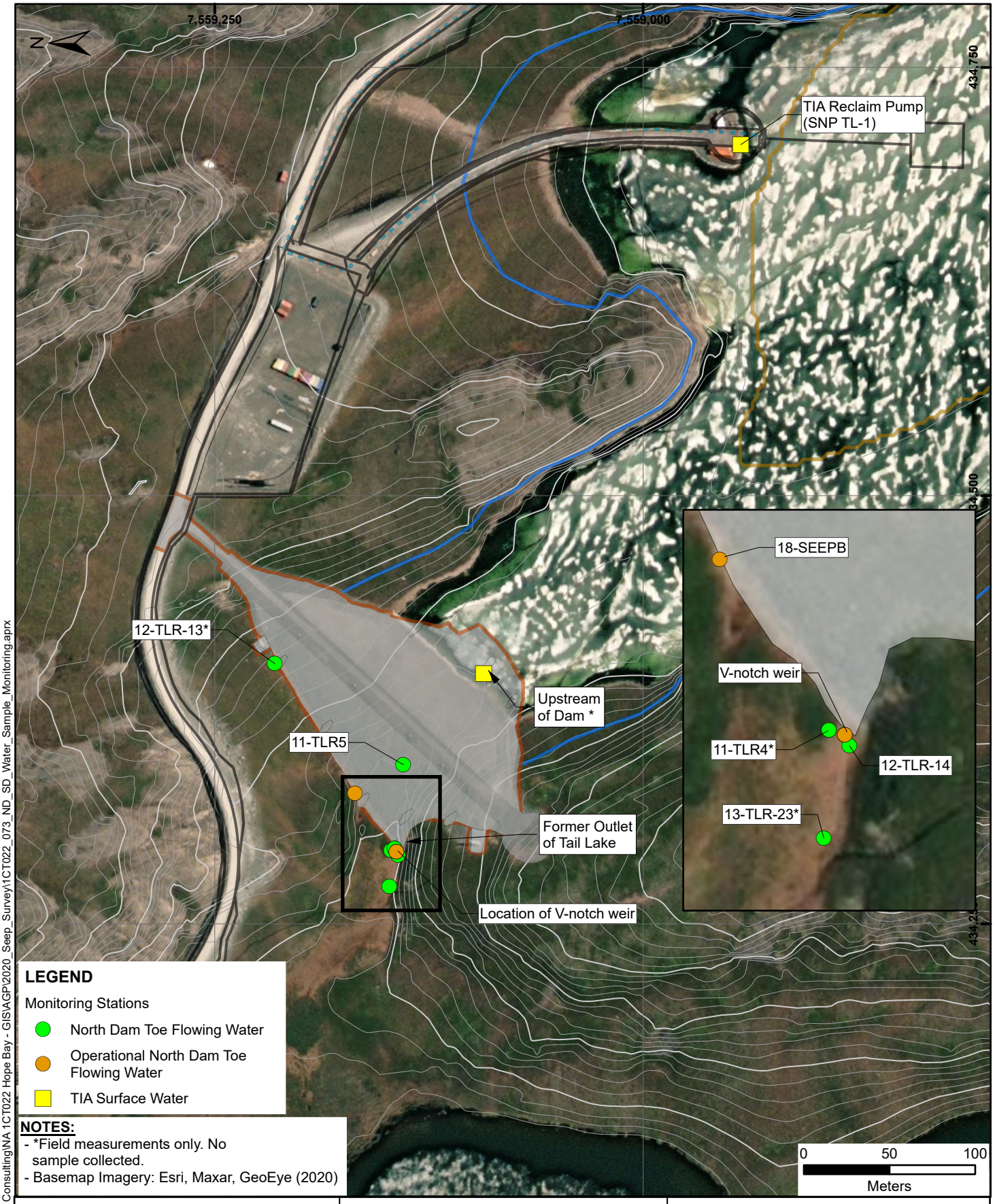
SRK Consulting (Canada) Inc. (2020d) outlines the North Dam toe flowing water inspection and water quality monitoring program. In summary, AEM conducted weekly inspections of the dam toe, including flow at the v-notch weir. If water was observed flowing at the dam toe, AEM collected the following samples at a maximum frequency of once per week (Figure 1):

- North Dam toe flowing water: field parameters and water quality samples for laboratory analysis are collected at all observed locations of flowing water.
- TL-1 (reclaim pump): field parameters and water quality samples for laboratory analysis.
- TIA Reclaim Pond water at upstream face of North Dam: field parameters only.

AEM shipped samples to ALS Environmental in Burnaby, BC for the analysis of pH, electrical conductivity (EC), total alkalinity, sulphate, chloride, nutrients (ammonia, nitrate, and nitrite), total cyanide, free cyanide, cyanate, and dissolved trace elements. At the time of sample collection, AEM measured the following field parameters: pH, EC, oxidation-reduction potential (ORP), chloride, temperature, salinity and flow rate (where possible).

In 2021, AEM collected 14 samples of flowing water at the toe of the North Dam and reclaim water from the V-notch weir (NDSP) over a 14-week period between July 6 and October 5, 2021. No flowing water was observed prior to July 6 and after October 5 due to sub zero temperatures (sample taken on October 12, 2021 was frozen). At TL-1, monitoring and sampling occurs year-round and samples are taken approximately once per week.

The sampling methods for supernatant solution (TL-5) are detailed in SRK (2020a) and briefly summarized herein. Year-round, AEM collects monthly samples of the process plant tailings supernatant (TL-5) from the flotation tailings thickener tank. The filtrate from the detox filter press (where detoxified tailings are dewatered) is pumped to the flotation tailings thickener tank prior to discharge to the TIA. This memo presents all available data from TL-1 and TL-5 between January and September 2021, which is the data that were available at the time of memo preparation.



LEGEND

Monitoring Stations

- North Dam Toe Flowing Water
- Operational North Dam Toe Flowing Water
- TIA Surface Water

NOTES:

- *Field measurements only. No sample collected.
- Basemap Imagery: Esri, Maxar, GeoEye (2020)

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srk consulting

AGNICO EAGLE

Geochemical Source Investigation - TIA

North Dam Toe Flowing Water Sample Monitoring Locations

SRK JOB NO: 1CT022.073

LAYOUT: 1CT022_073_fig_01_ND_Water_Sampling

Doris TIA

Date:	Approved:	Figure:
Dec 2021	LNB/KWJ	01

2.2 Monitoring of Water Downstream of the South Dam

SRK (2020e) outlines weekly inspections downstream of the South Dam and water quality monitoring program, the latter which includes collection of seepage samples if water is observed flowing from the toe of the dam and samples from two ponds downstream of the South Dam (Figure 2). If water is observed flowing at the dam toe, AEM collects the following samples at a maximum frequency of once per week:

- South Dam toe flowing water: field parameters and water quality samples for laboratory analysis at all observed locations of flowing water.
- TL-5 (tailings supernatant discharge from the mill): field parameters and water quality samples for laboratory analysis. The monitoring program for TL-5 is outlined in Section 2.1.
- TIA Reclaim Pond water at upstream face of South Dam: field parameters only when flowing water is observed and if water is ponded near or against the dam.

The water quality sample set for the South Dam included one sample each of the downstream ponds at stations SD Pond 1 and SD Pond 2 collected on July 21, 2021. Flowing water was not observed at the toe of the South Dam therefore no flowing water samples were collected in 2021. AEM shipped samples to ALS Environmental in Burnaby, BC for analysis of the parameters outlined in Section 2.1.

435000 435250 435500 435750 436000 436250

7556250 7556000 7555750

SRK19-SD-SPIGOT3
SRK19-SD-SPIGOT2
SRK19-SD-SPIGOT1
SDPOND1
SDPOND2
SDSP_6/22/2020

0 50 100 150 200
Meters

LEGEND

- 2019 Tailings WQ Sample
- 2021 Pond Samples
- 2020 Water Sample
- Camp Layout Infrasctructure

NOTES

1. Coordinates of 2020 Seepage Sample are approximate.

REFERENCES

NAD 1983 Zone UTM 13N
Basemap Imagery: Esri, Maxar, GeoEye (2020)

srk consulting

SRK JOB NO.: 1CT022.073

LAYOUT: 1CT022_073_fig_02_SD_Water_Sampling

AGNICO EAGLE

Doris TIA

Geochemical Source Investigation - TIA

South Dam Water Sample Monitoring Locations

DATE:	APPROVED:	FIGURE:
Dec 2021	LNB/KWJ	02

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2.3 Water Quality Database Compilation

SRK compiled 2021 data provided by AEM for the geochemical source investigation, with stations presented in Figure 1 and Figure 2 and described in Table 1. An overview of the water quality data included in this assessment is described as follows:

- North Dam toe flowing water:
  - 2011 to 2013: water quality monitoring of construction rock contact water (SRK 2012 to 2014).
  - 2017 to 2021: water monitoring program conducted as part of the North Dam monitoring program (SRK 2021).
- South Dam water quality monitoring program:
  - 2020 to 2021: South pond program (SRK 2020e)
- TL-1: samples of TIA Reclaim Pond water collected at the reclaim pump.
- TL-5: tailings supernatant samples collected within the mill prior to discharge to the TIA.

Table 1: Water Quality Data Sources

Station Description	Station Description	Years	Reference
North Dam	Downstream toe	2011 to 2014; 2017 to 2021	SRK (2012, 2013, 2014, 2018b, 2019b, 2020c, 2021)
North Dam Upstream	Upstream face of North Dam	2017 to 2021	SRK (2018b, 2019b, 2020c, 2021)
South Dam	Downstream toe	None observed	SRK (2021)
South Dam	Downstream Ponds	2020 to 2021	SRK (2021)
TL-1	Reclaim Pump	2011 to 2021	AEM monitoring program
TL-5	Tailings supernatant discharge to TIA	2017 to 2021	AEM monitoring program

2.4 Quality Control for 2021 Analytical Data

SRK reviewed all 2021 water quality data (stations TL-1, TL-5, V-notch weir (NDSP), SD Pond 1, and SD Pond 2) and conducted a geochemical quality control (QC) screening program to validate the data to ensure confidence in the data and data analysis. The outcomes of the QC program are summarized in Attachment 1. All samples passed except for one sample collected from TL-1 on August 10 that was not analyzed for total alkalinity and sulphate. As a result, the ion balance could not be calculated. All other data were deemed acceptable as received.

3 Results

The scope of the water chemistry assessment is to determine if TIA Reclaim Pond water is present in flowing water at the downstream toe of the North and/or South dams and establish baseline water chemistry downstream of the South Dam in the two ponds. This section discusses a subset of the water quality data, specifically EC, ammonia, nitrate, nitrite, chloride, sulphate, and other major ions, which were identified as geochemical tracers of TIA Reclaim Pond. Both sodium and potassium follow the major ion trend and were not discussed separately in this memo. For other parameters, there were no appreciable differences in concentration between flowing or ponded water at the toe samples and TL-1.

North Dam flowing water data and South Dam ponded water data from 2021 are summarized in Table 2 with full results presented in Attachment 2. Summary statistics for TL-1 and TL-5 are shown in Table 3 and Table 4, respectively.

Table 2: Summary of 2021 North and South Dam Water Monitoring Data

Location	Date	Field pH	Field EC uS/cm	Total Alkalinity mg/L as $CaCO_3$	SO_4 mg/L	Cl mg/L	Total Ammonia mg/L as N	NO_3 mg/L as N	NO_2 mg/L as N	Ca mg/L	Mg mg/L	K mg/L	Na mg/L	As mg/L	Co mg/L	Cu mg/L	Mn mg/L	Mo mg/L	Ni mg/L	Zn mg/L
V-Notch Weir (NDSP)	6-Jul-21	8.0	510	98	52	69	0.010	0.21	0.0010	47	12	2.5	36	0.00044	0.00020	0.0051	0.0089	0.00046	0.00080	0.0044
	12-Jul-21	7.6	620	100	71	89	0.011	0.31	0.0010	50	14	2.5	43	0.00094	0.00039	0.0034	0.037	0.00048	0.00070	0.0066
	21-Jul-21	7.1	670	90	73	84	0.0092	0.32	0.0010	52	15	3.2	46	0.00040	0.00017	0.0052	0.0051	0.00048	0.00068	0.0010
	31-Jul-21	7.1	800	110	86	110	0.0080	0.43	0.0010	55	16	3.2	53	0.00038	0.00014	0.0050	0.0044	0.00051	0.00050	0.0010
	3-Aug-21	7.3	780	120	77	100	0.0079	0.38	0.0010	56	17	3.2	56	0.00039	0.00016	0.0050	0.0063	0.00056	0.00063	0.0010
	10-Aug-21	7.4	700	110	91	91	0.0076	0.64	0.0010	51	16	3.2	55	0.00043	0.00016	0.0046	0.0052	0.00071	0.00060	0.0021
	17-Aug-21	7.4	690	120	91	95	0.0066	0.63	0.0020	52	16	3.5	54	0.00042	0.00016	0.0054	0.0051	0.00069	0.00062	0.0010
	24-Aug-21	7.5	770	120	95	100	0.0050	0.72	0.0050	53	19	3.5	56	0.00045	0.00018	0.0051	0.0080	0.00065	0.00062	0.0010
	31-Aug-21	7.6	670	130	87	79	0.023	0.57	0.0050	54	17	3.3	54	0.00052	0.00016	0.0053	0.0067	0.00090	0.00081	0.0010
	7-Sep-21	8.0	520	120	69	36	0.014	0.53	0.0010	42	12	2.9	35	0.0010	0.00014	0.0067	0.0052	0.0011	0.00080	0.0010
	14-Sep-21	8.3	6,800	130	23	21	0.014	0.15	0.0010	37	10	1.8	20	0.00076	0.00015	0.011	0.0040	0.00042	0.0015	0.0010
	21-Sep-21	7.8	370	130	32	23	0.013	0.29	0.0010	38	10	1.6	19	0.00060	0.00012	0.0089	0.0034	0.00038	0.0013	0.0010
	28-Sep-21	7.7	440	140	36	26	0.012	0.38	0.0010	42	10	1.6	22	0.00059	0.00014	0.0092	0.0044	0.00045	0.0013	0.0022
	5-Oct-21	8.2	360	110	29	17	0.0085	0.12	0.0010	34	9.5	1.5	17	0.00070	0.00010	0.0081	0.0020	0.00058	0.0012	0.0010
SD Pond 1	21-Jul-21	6.9	560	140	1.50	77	0.016	0.0050	0.0010	36	17	0.9	49	0.0012	0.00060	0.0011	0.048	0.00018	0.0037	0.0019
SD Pond 2	21-Jul-21	6.7	520	150	6.60	63	0.060	0.0050	0.0010	30	15	0.8	55	0.0013	0.00088	0.0013	0.12	0.00030	0.0027	0.0010

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Notes: Trace element for all samples is dissolved

Table 3: Statistical Summary of Monitoring Data for TL-1

Location	Year[1]	Statistic	Field pH	Field EC uS/cm	Total Alkalinity mg/L as $CaCO_3$	SO_4 mg/L	Cl mg/L	Total Ammonia mg/L as N	NO_3 mg/L as N	NO_2 mg/L as N	Ca mg/L	Mg mg/L	K mg/L	Na mg/L	As mg/L	Co mg/L	Cu mg/L	Mn mg/L	Mo mg/L	Ni mg/L	Zn mg/L
TL-1 (TIA Reclaim Pump)	2011-2016	Min	7.5	150	32	1	3.5	0.005	0.005	0.001	5.8	1.3	1.3	12	0.00017	0.0001	0.00072	0.0033	0.00053	0.0005	0.0013
		Median	7.5	150	35	2.4	39	0.05	0.05	0.05	12	5.7	1.6	14	0.0004	0.002	0.0013	0.005	0.005	0.002	0.002
		Max	7.5	150	45	5.7	63	0.26	1.2	0.05	21	9.7	2.6	24	0.0004	0.002	0.0014	0.018	0.005	0.002	0.012
		n	1	1	10	49	84	84	84	84	47	47	13	13	6	6	6	6	6	6	3
	2017	Min	7.5	340	75	81	60	0.21	0.085	0.0017	28	8.3	4.4	61	0.0004	0.0007	0.0067	0.054	0.00064	0.0016	0.0016
		Median	7.9	540	75	81	70	1.1	0.67	0.023	28	8.3	4.4	61	0.0004	0.0007	0.0067	0.054	0.00064	0.0016	0.0016
		Max	8.6	790	75	81	92	1.9	1.6	0.12	28	8.3	4.4	61	0.0004	0.0007	0.0067	0.054	0.00064	0.0016	0.0016
		n	14	13	1	1	17	30	19	19	1	1	1	1	1	1	1	1	1	1	1
	2018	Min	7.3	1,100	82	260	110	0.92	0.61	0.02	56	21	15	220	0.00054	0.0014	0.0076	0.16	0.0013	0.0039	0.001
		Median	7.9	1,900	93	300	380	2.7	1.1	0.2	67	30	18	300	0.00058	0.0015	0.013	0.31	0.0016	0.0042	0.002
		Max	10	2,700	110	380	660	9.8	2	0.3	100	50	27	510	0.00087	0.0027	0.029	0.4	0.0026	0.0081	0.005
		n	34	30	10	10	18	49	18	18	13	13	13	14	13	13	13	13	13	13	14
	2019	Min	7.2	39	110	65	38	3.5	2.3	0.12	12	6.4	3.1	6	0.00076	0.0028	0.024	0.36	0.0028	0.007	0.002
		Median	7.8	4,700	120	490	1,100	4.9	2.7	0.19	140	74	35	750	0.11	0.3	0.19	0.45	0.29	0.12	0.5
		Max	8.7	8,000	170	660	1,500	7.5	3.9	0.99	160	110	52	1,100	0.97	0.45	0.56	0.62	0.37	0.96	0.5
		n	50	50	18	19	21	46	19	19	46	46	46	46	46	46	46	46	46	46	46
	2020	Min	6.7	6,700	110	550	1,500	4.7	3.4	0.073	82	54	22	530	0.00069	0.0022	0.014	0.26	0.0043	0.0075	0.0020
		Median	7.5	11,000	180	760	2,300	9.4	4.7	0.16	220	150	55	1,400	0.0016	0.0042	0.034	0.62	0.010	0.013	0.0068
		Max	8.1	20,000	190	860	7,900	11	6.4	0.34	260	170	64	1,600	0.0030	0.0058	0.22	0.88	0.017	0.027	0.021
		n	50	49	21	21	39	49	22	21	49	49	49	49	49	49	49	49	49	49	49
	2021[2]	Min	7.0	1,500	130	620	1,900	4.4	3.5	0.050	150	110	43	1,100	0.0018	0.0034	0.020	0.37	0.0080	0.0069	0.0050
		Median	7.3	13,000	150	710	3,100	7.1	4.1	0.14	240	190	65	1,800	0.0021	0.0047	0.035	0.68	0.0093	0.014	0.010
		Max	8.6	18,000	190	930	3,600	9.3	4.6	0.20	290	230	78	2,100	0.0027	0.0051	0.090	0.77	0.011	0.015	0.022
		n	39	36	15	15	35	38	15	15	38	38	38	38	38	38	38	38	38	38	38

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Notes: All trace elements are dissolved

[1] Tailings deposition in the TIA commenced in 2017.

[2] 2021 data is until September 28, 2021, does not include October samples

Table 4:Statistical Summary of Monitoring Data for TL-5

Location	Year[1,2]	Statistic	Field pH	Field EC	Total Alkalinity	SO_4	Cl	Total Ammonia	NO_3	NO_2	Ca	Mg	K	Na	As	Co	Cu	Mn	Mo	Ni	Zn
				uS/cm	mg/L as $CaCO_3$	mg/L	mg/L	mg/L as N	mg/L as N	mg/L as N	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
TL-5 (Tailings Supernatant Slurry)	2017-2018	Min	--	--	--	--	--	--	--	--	51	22	39	510	0.001	0.0055	0.011	0.073	0.0033	0.017	0.0071
		Median	--	--	--	--	--	--	--	--	91	37	80	940	0.0042	0.013	0.11	0.16	0.0064	0.066	0.041
		Max	--	--	--	--	--	--	--	--	180	64	130	1500	0.04	0.037	0.71	0.91	0.011	0.12	0.43
		n	--	--	--	--	--	--	--	--	39	39	39	39	39	39	39	39	39	39	39
	2019	Min	6.1	7,100	66	6	1,200	11	0.1	0.02	110	76	62	1500	0.0014	0.007	0.0069	0.1	0.014	0.0069	0.005
		Median	8.2	8,300	290	1,900	1,500	23	13	0.45	130	89	79	1800	0.0021	0.01	0.2	0.18	0.042	0.077	0.005
		Max	8.4	10,000	350	2,900	1,800	61	40	1.2	160	110	100	2000	0.0063	0.025	150	1.3	0.11	3.5	0.26
		n	11	11	9	33	9	51	33	33	9	9	9	9	9	9	9	9	9	9	9
	2020	Min	7.9	11,000	270	1,400	1,800	28	5.8	0.39	120	110	74	1700	0.0016	0.0062	0.013	0.086	0.029	0.0088	0.01
		Median	8.3	13,000	310	1,800	2,500	38	17	0.87	170	150	110	2300	0.0041	0.0095	0.16	0.15	0.055	0.079	0.01
		Max	8.4	20,000	380	10,000	3,700	56	24	1.3	250	210	160	8000	0.014	0.047	2.2	0.62	0.1	0.57	0.05
		n	11	11	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
	2021[3]	Min	8.0	11	280	1,300	2,100	25	8.9	0.67	160	130	100	1600	0.0023	0.0053	0.0065	0.14	0.021	0.0063	0.0050
		Median	8.2	13,000	320	1,900	3,200	39	19	0.88	220	190	120	2400	0.0028	0.011	0.10	0.19	0.029	0.037	0.010
		Max	8.2	18,000	340	3,000	4,100	47	29	3.30	240	220	130	2900	0.0051	0.030	0.55	0.30	0.034	0.14	0.020
		n	10	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9

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Notes: All trace elements are dissolved except TL-5 monitoring data, as noted.

[1] Tailings deposition in the TIA commenced in 2017.

[2] Dissolved metals analysis at TL-5 commenced in 2019. Prior to 2019, data are total metals.

[3] 2021 data is until September 28, 2021, does not include October samples

3.1 Comparison of TIA Surface Water Measurements

For each sampling event, field measurements of EC and salinity were collected at TIA stations TL-1 and surface water immediately upstream of the North Dam (ND Upstream) to assess homogeneity of TIA pond water (Figure 3).

Salinity and EC values tended to be higher at TL-1 compared to the TIA water upstream of the dam face. The higher values at TL-1 are likely a result of periodic changes in site-wide water management of underground mine water.

The Doris mine intercepts naturally saline talik that interacts with drilling brines resulting in mine water flows characterized by elevated concentrations of magnesium, sodium, sulphate, chloride, and calcium[1]. In 2021, Doris mine water flows exceeding treatment plant capacity were typically pumped to the process plant pumpbox and then discharged to the TIA with the tailings slurry. During the open water season, this saline mine water was pumped to the TIA at a discharge location near the reclaim pump intake (TL-1). The higher field EC at TL-1 for samples in Figure 3 are likely a result of mine water input to the TIA. This trend was also observed in 2020 and 2019, and suggests a degree of heterogeneity in salinity between TL-1 and the TIA pond upstream of the North Dam.

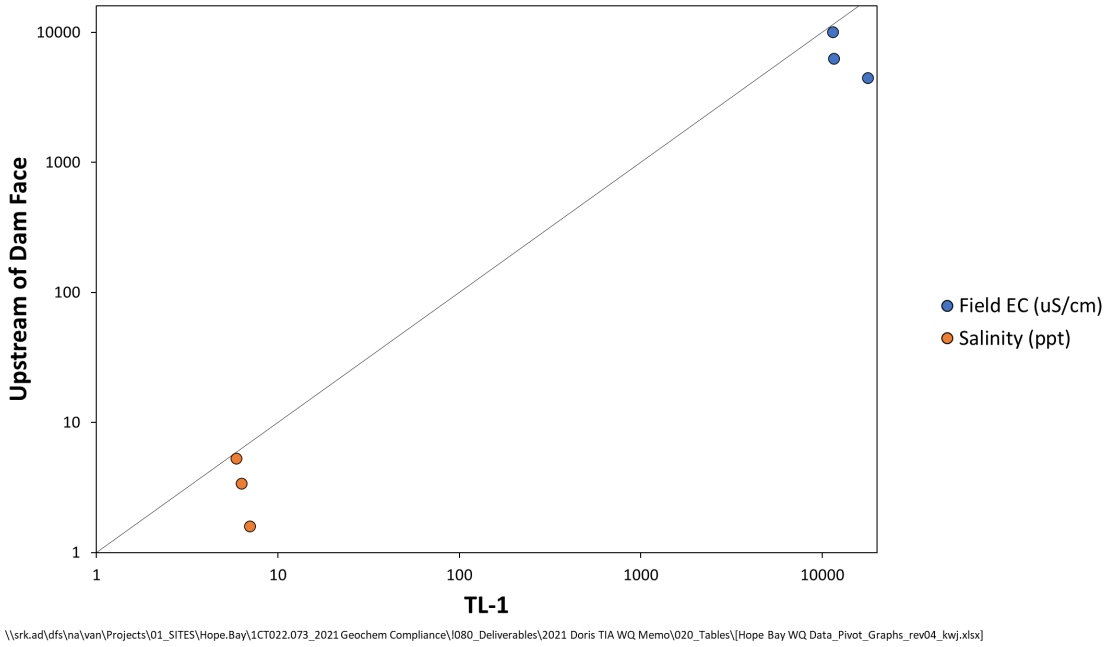


Figure 3: Comparison of Field EC and Salinity at TIA Surface Stations, 2021 Data

[1] From Doris Connector (TL-12a) and Doris North Ramp (level 4926 and TL-12)

3.2 Field pH and EC

Field pH data are presented in Figure 4 and are summarized as follows:

- Flowing water at the toe of the North Dam: Samples ranged from 7.1 and 8.3 in 2021 and have been stable since 2011.
- South Dam Ponds: Pond 1 and Pond 2 had values of 6.9 and 6.7, respectively.

Field EC data are presented in Figure 5 and are summarized as follows:

- TL-5: values in 2021 typically ranged from 8,700 to 18,000 µS/cm. The range of values in 2021 was equivalent to 2020.
- TL-1: Field EC indicated seasonal variation with an increasing trend from 11,000 to >18,000 µS/cm between January and July 2021 followed by a decreasing trend to a minimum of ~7,000 µS/cm in September. The range of values in 2021 were equivalent to 2020.
- Flowing water at the toe of the North Dam: Field EC was higher than the range of historical data (<600 µS/cm since 2011) and ranged from 370 to 800 µS/cm. One outlier measurement was taken on September 14, 2021 (6,800 µS/cm). In general, higher EC measurements were observed in late July to early September, similar to chloride trends (Figure 11).
- South Dam ponds: Values for field EC for Pond 1 and Pond 2 were was 563 and 518 µS/cm respectively and within the range of 2020 values (520 to 720 µS/cm).

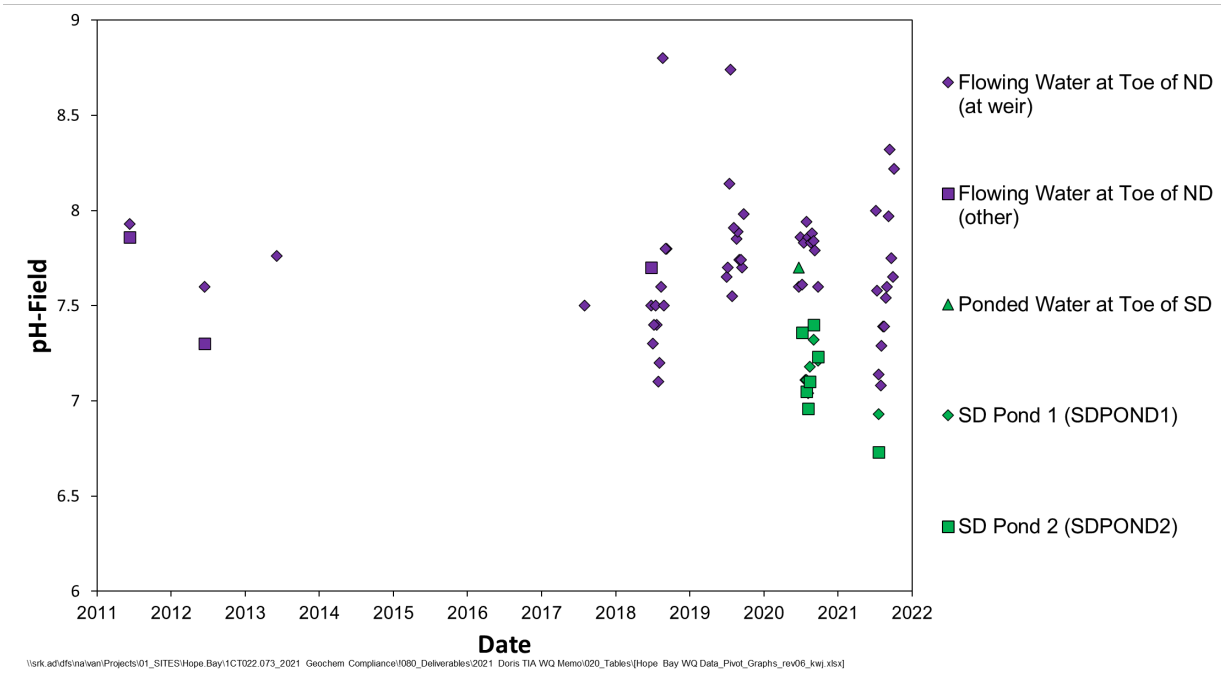


Figure 4: Field pH Monitoring Data

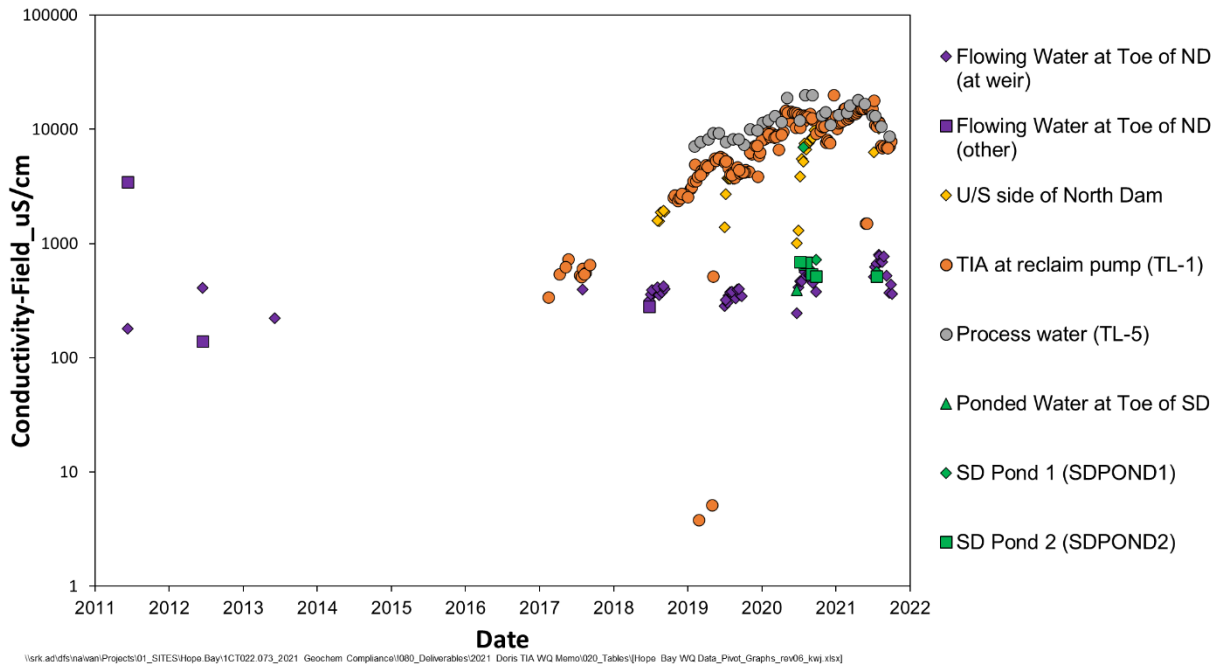


Figure 5: Field EC Monitoring Data

3.3 Ammonia, Nitrate, and Nitrite

Sources of ammonia, nitrate, and nitrite introduced to the TIA by tailings include i) blasting residues from milled ore and waste rock contact water, ii) byproducts of the cyanide destruction circuit in the process plant, and iii) biological degradation in the TIA of cyanate and thiocyanate, which are also by-products of cyanide destruction. Ammonia from the process plant represents approximately 80% of the source load to the TIA.

Ammonia data are summarized as follows (Figure 6):

- TL-5: Ammonia concentrations generally showed an increasing trend between 2017 and 2020. Concentrations since 2020 have been relatively stable and ranged from 25 to 47 mg/L in 2021. Concentrations remained higher than TL-1 by at least 2.5 times.
- TL-1: Ammonia concentrations in 2021 increased from 6.4 to 9.3 mg/L between January to early August, and decreased to 6.1 to 4.4 mg/L from mid-August and September. In 2021 and prior years, ammonia concentration showed an increasing trend with biologically mediated seasonal fluctuations, where maximum concentrations are exhibited around mid-late summer and minimum concentrations around September.
- Flowing water at the toe of the North Dam: Ammonia concentrations ranged from 0.0050 to 0.023 mg/L in 2021 and were generally lower than concentrations observed in 2020. Six samples in 2021 had concentrations below 0.01 mg/L. Consistent with SRK (2021), ammonia concentrations at TL-1 were more than 200 times higher than samples of flowing water at the toe of the North Dam.
- South Dam ponds: Ammonia concentrations were 0.016 and 0.060 mg/L for Pond 1 and Pond 2 samples, respectively.

Nitrate data are summarized as follows (Figure 7):

- TL-5: Nitrate concentrations were slightly higher than prior years and ranged from 8.9 to 29 mg/L in 2021. Minimum concentrations are approximately two times higher than TL-1, with peak concentrations less than four times higher than TL-1.
- TL-1: Nitrate concentrations show an increasing trend since 2017 but were lower than concentrations observed in 2020. Values ranged from 3.5 to 4.6 mg/L in 2021.
- Flowing water at the toe of the North Dam: Concentrations have remained stable since 2017 and ranged from 0.12 to 0.72 mg/L in 2021. Concentrations are more than five times lower than TL-1 concentrations.
- South Dam ponds: The Pond 1 sample was 0.005 mg/L and the Pond 2 sample was 0.005 mg/L.

Nitrite data are summarized as follows (Figure 8):

- TL-5: Nitrite concentrations at TL-5 have been slightly increasing since 2017 and ranged from 0.67 to 1.4 mg/L in 2021, with one over range outlier of 3.3 mg/L taken on July 12, 2021. Concentrations at TL-5 were consistently higher than TL-1.

- TL-1: Nitrite concentrations at TL-1 were roughly equivalent to 2020 and ranged from 0.050 to 0.20 mg/L. Previous seasonal trends of nitrite concentrations indicated a decrease during the spring melt, followed by an increase in summer (June to August), and stable concentrations during fall and winter. In 2021, the decrease in nitrite concentrations was in summer (late June to early July) rather than spring and was likely related to the full ice cover on the TIA as observed in satellite imagery dated June 11, 2021. Satellite imagery dated June 28, 2021 confirms the ice cover melting in the vicinity of TL-1. Nitrite concentrations remained variable through the remainder of 2021.
- Flowing water at the toe of the North Dam: Nitrite concentration in 2021 ranged from below the detection limit (0.001 mg/L as N) to 0.0050 mg/L as N and was within the range of historical concentrations observed since 2017. Concentrations of nitrite at TL-1 were more than 40 times greater than the samples of flowing water at the toe of the North Dam.
- South Dam ponds: Nitrite concentrations for Pond 1 and Pond to were 0.001 mg/L. All samples were over ten times lower than reclaim water concentrations.

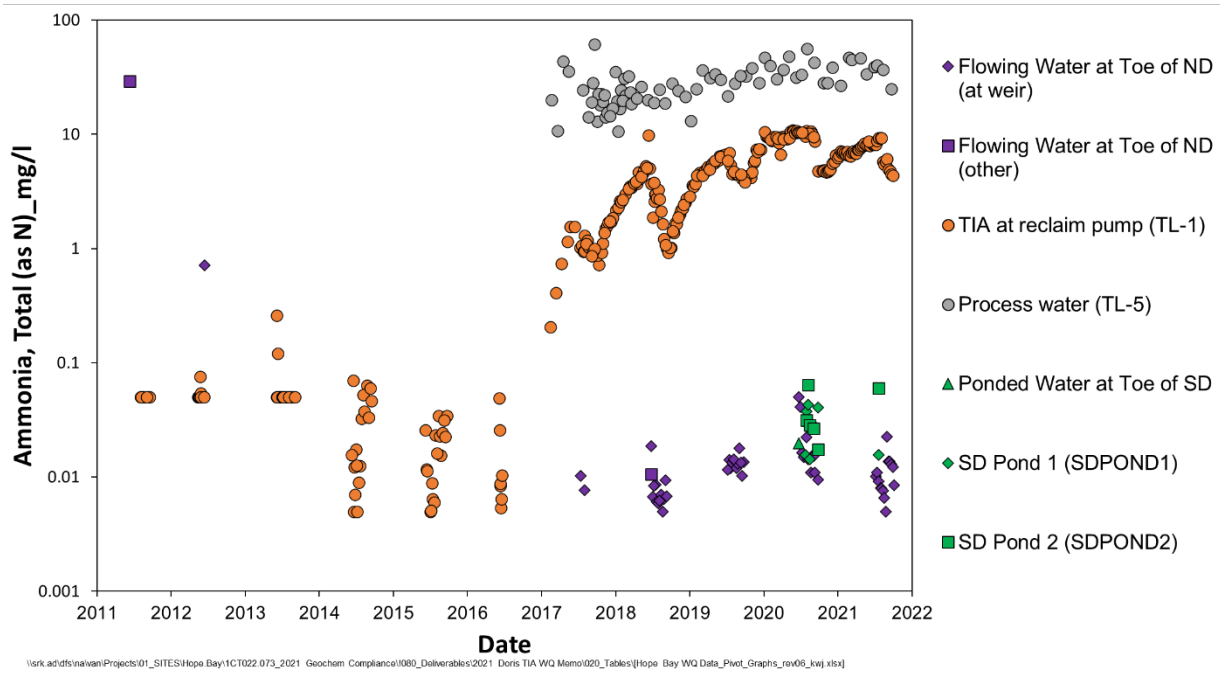


Figure 6: Ammonia Monitoring Data

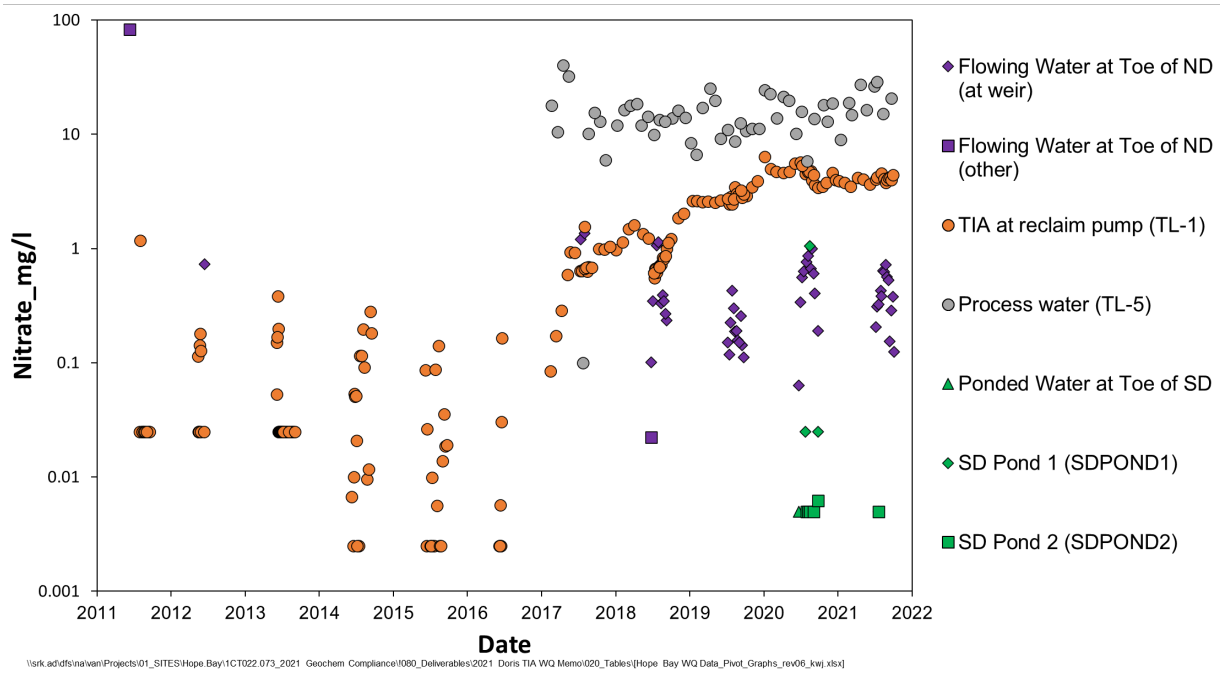


Figure 7: Nitrate Monitoring Data

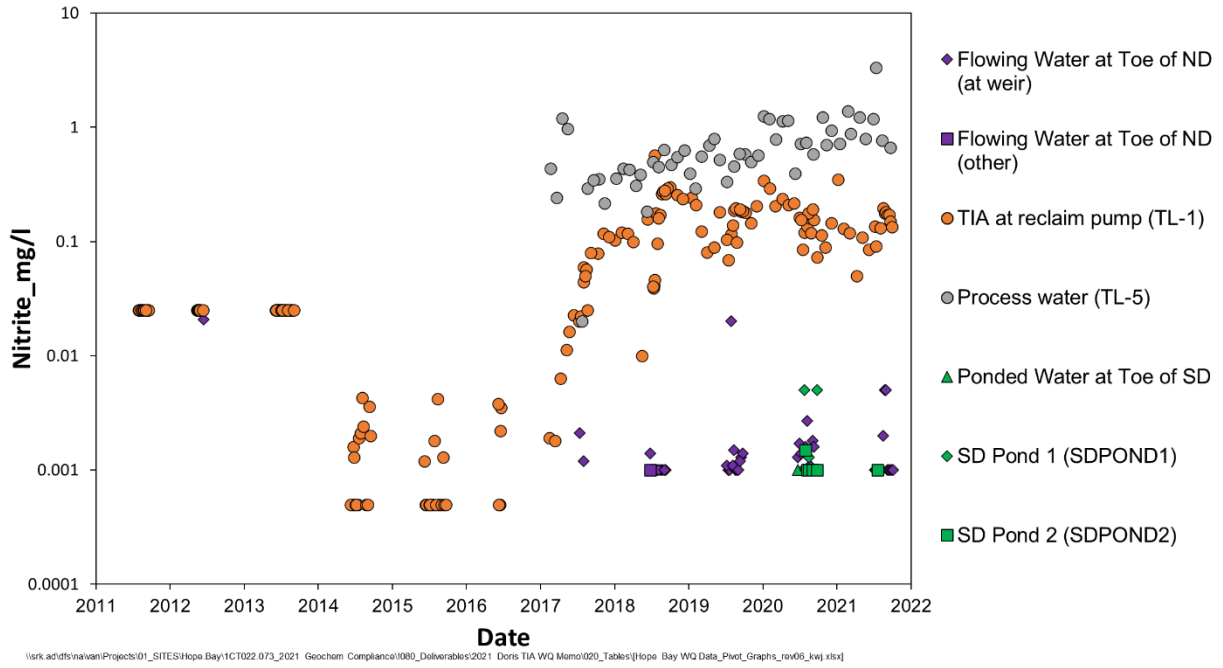


Figure 8: Nitrite Monitoring Data

3.4 Chloride and Sulfate

Calcium chloride drilling brines are used in the underground mine. As a result, the ore contains calcium chloride salts, which are processed in the process plant and subsequently discharged into the TIA. In addition, saline mine water containing calcium chloride is pumped to the TIA. Drilling brines are not used during quarry development; therefore, quarry rock used for construction does not contain calcium chloride drilling brines. Chloride data are summarized as follows (Figure 9):

- TL-5: Chloride concentrations in 2021 ranged from 2,100 to 4,100 mg/L with maximum values higher than previous years.
- TL-1: Chloride concentrations in 2021 were higher than 2020 and ranged from 1,900 to 3,600 mg/L. Overall chloride concentrations exhibit a seasonal trend related to cryoconcentration, e.g. seasonal decrease during the open water season and increase during winter.
- Flowing water at the toe of the North Dam: Chloride concentrations in 2021 ranged from 17 to 110 mg/L with highest concentrations in August (91 to 110 mg/L) and lowest concentrations in September (17 to 36 mg/L). Maximum concentrations of chloride were observed in 2021. Concentrations at TL-1 were more than 30 times higher than in samples of flowing water at the toe of the North Dam.
- South Dam ponds: Chloride concentration of the Pond 1 sample was 77 mg/L, while concentration of the Pond 2 sample was 63 mg/L. Concentrations at TL-1 were greater than 20 times higher than the pond samples.

The source of sulphate to the TIA is the processing of ore containing sulfide minerals and milling reagents. Sulfate data are summarized as follows (Figure 10):

- TL-5: Sulfate concentrations in 2021 ranged from 1,300 to 3,000 mg/L and were equivalent with previous years.
- TL-1: Sulfate concentrations ranged from 620 to 930 mg/L and have been increasing since 2017. Similar to chloride, sulfate concentrations appear to decrease seasonally during the open water season.
- Flowing water at the toe of the North Dam: sulphate concentrations ranged from 23 to 95 mg/L and had the same seasonal trend in 2021 as chloride with highest concentrations in August followed by lowest in September. Sulphate concentrations in 2021 were within the range of concentrations from previous years. Almost all concentrations at TL-1 were more than 10 times higher than in samples of flowing water at the toe of the North Dam.
- South Dam ponds: Sulfate concentrations for Pond 1 were 1.5 mg/L, while Pond 2 was 6.6 mg/L. Concentrations at TL-1 were greater than 90 times higher than the pond samples.

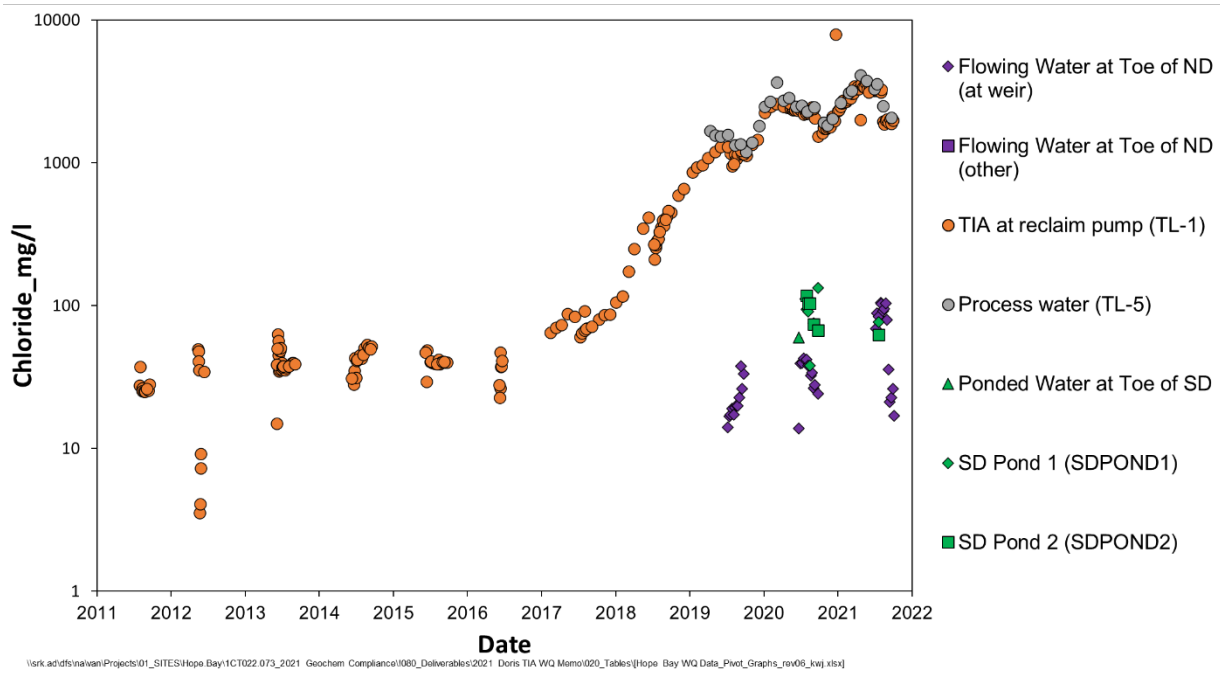


Figure 9: Chloride Monitoring Data

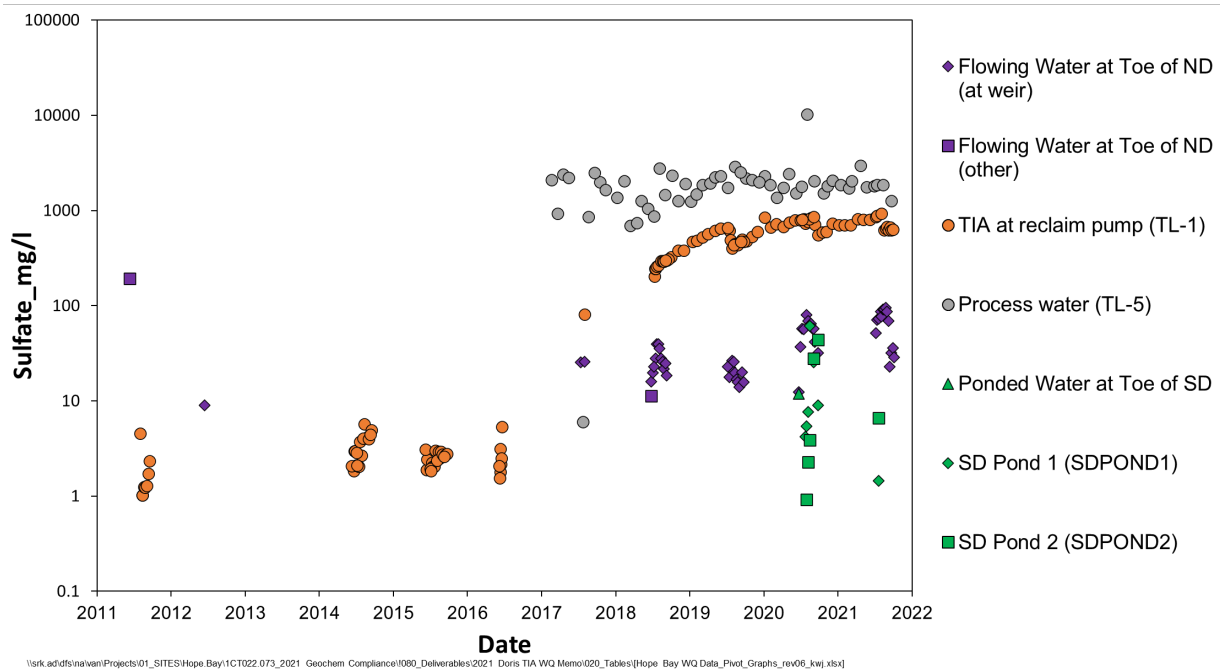


Figure 10: Sulfate Monitoring Data

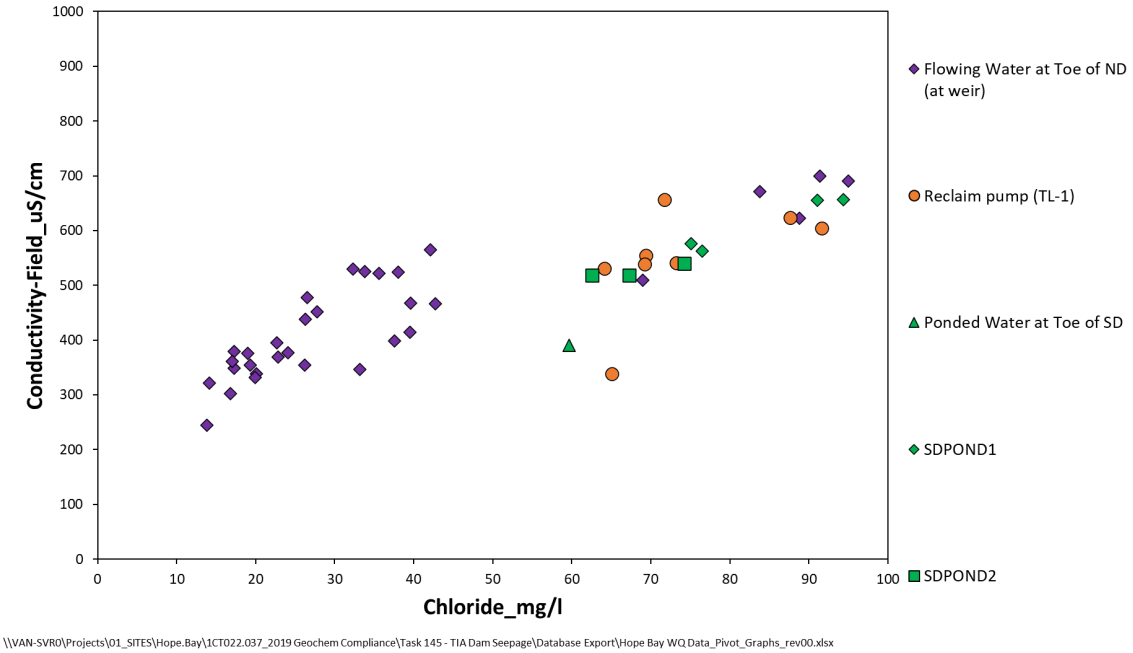


Figure 11: Field EC vs Lab Chloride

3.5 Major Ion Chemistry

Table 4 summarizes the major ion chemistry of the ponded water downstream of the South Dam, samples collected from the TIA pond (TL-1 and upstream of the South dam in 2019), flowing water at the downstream toe of the North Dam prior to tailings deposition (2011-13) and since tailings deposition (2017-21). Figure 12 presents a Piper diagram of the major ion chemistry for each sample.

Figure 12 indicates that samples can be categorized into the six following geochemical groups: i) TL-1 samples collected prior to tailings deposition (2011-16); ii) TL-1 in 2017 (one sample only); iii) TL-1 between 2018 and 2021; iv) all samples of flowing water at the toe of the North Dam (2011 to 2021); v) TIA pond water at the South Dam (2019); and vi) ponded water at the toe of the South Dam. Of note is that the major ion chemistry of the samples of flowing water at North Dam toe is geochemically distinct from TIA pond water at TL-1, both prior to and after tailings deposition. Each group is discussed as follows:

- TIA Pond Water at Reclaim Pump (TL-1):
  - 2011-16: Prior to tailings deposition, the major cations were characterized by sodium and calcium and the major anions by bicarbonate and chloride.
  - 2017: Tailings deposition commenced in January 2017. The data from the one sample collected in August indicated that the major cation chemistry continued to be dominated by sodium and calcium but at higher concentrations (61 and 28 mg/L, respectively) and major

anion chemistry shifted from bicarbonate-chloride to predominantly sulphate and to a lesser degree bicarbonate-chloride.

  - 2018-21: The major cation chemistry was dominated by sodium and calcium while the major anion chemistry wass dominated by chloride and to a lesser degree sulphate with chloride increasing and sulphate decreasing over time..

- TIA Pond Water at South Dam:
  - 2019: Samples from Spigot-1 and Spigot 2 (located at the tailings beach) were geochemically distinct from Spigot-3. At the time of sampling, tailings slurry had not yet been discharged from Spigot-3. The major cation chemistry was the same for all three samples and was dominated by sodium and calcium. Major anion chemistry varied and was dominated by chloride and sulphate for samples Spigot-1 and Spigot-2 and bicarbonate and chloride for Spigot-3. Notably, sulphate concentrations at Spigot-3 were low (3.5 mg/L). Lower anion concentrations may be linked to a flushing of this area with spring runoff.
- North dam toe flowing water: All samples are presented as one series in Figure 12 except the sample collected in 2011 (sample ID 11-TLR5). Major ion concentrations were higher for 11-TLR-15 compared to all other samples of flowing water at the toe of the North Dam, including sample 12-TLR-14. The higher ion concentrations may be attributable to the hypersaline pocket of groundwater that was intersected during the construction season prior to sample collection. The major ion chemistry of 12-TLR-14 and the 2017-2021 samples is summarized as follows:
  - 12-TLR-14 was collected at the same location as the v-notch weir with the major cation chemistry characterized by calcium and sodium (38 and 27 mg/L, respectively) and major anion chemistry characterized by alkalinity and chloride (150 mg/L as $CaCO_3$ and 30 mg/L, respectively).
  - 2017-21: Compared to 12-TLR-14, the major cation chemistry has been relatively uniform and dominated by calcium and to a lesser degree sodium. Major anion chemistry has been dominated by bicarbonate-alkalinity and to a lesser degree either chloride or sulphate. The major ion chemistry of 2021 samples is equivalent with seepage samples collected since 2011 from the downstream toe of the North Dam and is geochemically distinct from TIA pond samples.
- South Dam downstream ponds: The major ion composition of Pond 1 and Pond 2 was equivalent to baseline TL-1 samples (2011 to 2016) collected prior to tailings discharge. Major cations were characterized by sodium and calcium whereas major anions were bicarbonate-alkalinity and chloride.

Table 5: Summary of Major Ion Chemistry for North and South Dam Monitorin Stations

Station	Date Range	Statistic[1]	Cations[2]				Anions[2]		
			Ca	Mg	K	Na	Total Alkalinity[3]	Cl	SO_4
North Dam (Flowing water at toe)	2011-13	11-TLR5	73	62	34	460	230	690	190
		12-TLR-14	38	9.9	3.8	27	150	30	9
	2017-20	Median	41	9.2	2.0	24	130	24	26
		Count	39	39	39	39	39	39	39
	2021	Median	50	14	3.1	44	120	82	72
		Count	14	14	14	14	14	14	14
TL-1	2011-16	Median	7.5	5	1.6	14	35	26	1.5
		Count	10	10	10	10	10	10	10
	2017	August	28	8.3	4.4	61	75	67	81
	2018-20	Median	150	85	40	850	150	1300	530
		Count	50	50	50	50	50	50	50
	2021	Median	240	190	65	1800	150	3100	710
		Count	38	38	38	38	15	35	15
TIA Pond at South Dam	2019	SRK19-SD-SPIGOT1	97	78	63	1300	290	1300	1500
		SRK19-SD-SPIGOT2	60	73	58	1100	290	850	1300
		SRK19-SD-SPIGOT3	44	45	33	360	580	410	3.5
SD Pond 1	2020	Median	38	18	2.6	65	160	93	8.3
		Count	6	6	6	6	6	6	6
	2021		36	17	1	49	140	77	1
SD Pond 2	2020[4]	Median	32	19	2.8	63	140	89	7.9
		Count	6	6	6	6	6	6	6
	2021		30	15	0.76	55	150	63	6.6

Source: \\srk.ad\dfs\na\van\Projects\01_SITES\Hope.Bay\1CT022.073_2021 Geochem Compliance\!080_Deliverables\2021 Doris TIA WQ Memo\020_Tables\ Hope Bay WQ Data_Pivot_Graphs_rev04_kwj.xlsx

Notes:

1 Sample IDs presented for North Dam ponding (2011-2013), TIA pond water, and South Dam ponding samples

2 All units mg/L. Units for Alkalinity are mg/L as $CaCO_3$.

3 Alkalinity in Figure 11 plotted as bicarbonate

4 Includes 2020 sample was mislabeled as SDSP.

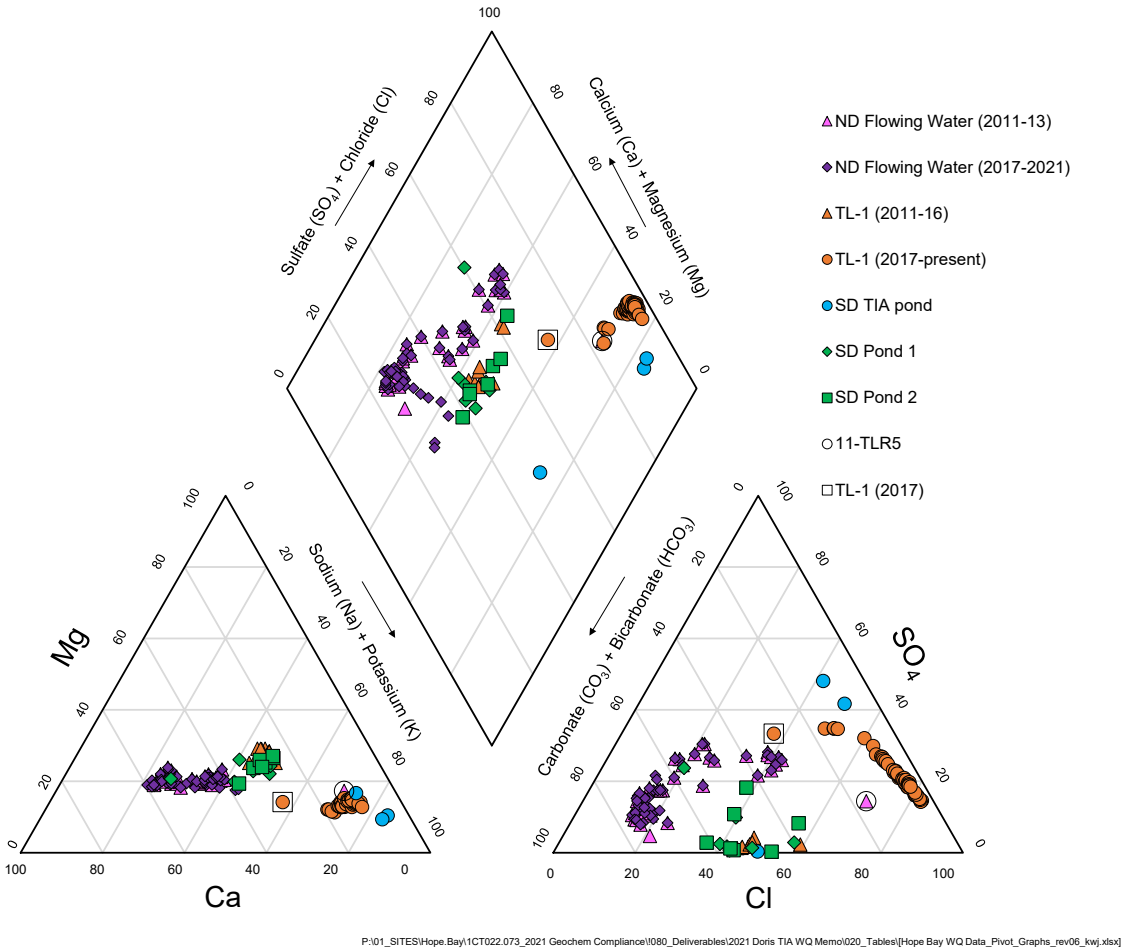


Figure 12: Piper Plot of TL-1, flowing water at the toe of the North Dam, flowing water at the toe of the South Dam, and South Dam Pond Samples

Sources: \\srk.ad\dfs\na\van\Projects\01_SITES\Hope.Bay\!Databases\Geochemistry\WQ Monitoring\[Hope Bay WQ Data_Pivot_Graphs_rev03.xlsb.xlsx]

Notes: Alkalinity plotted as bicarbonate.

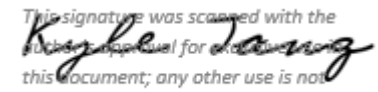
4 Conclusion and Recommendations

Since 2017 and at the request of the EOR, AEM has conducted a water quality monitoring program to compare the geochemistry waters flowing at the toe of the North and South dams to TIA pond water to demonstrate that the waters are geochemically distinct. This assessment is a line of evidence that supports the containment of water within the TIA. A secondary purpose of the monitoring program is to establish the baseline chemistry of two ponds of water downstream of the South dam.

The findings of the assessment are summarized as follows:

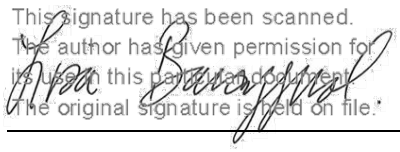
- EC, ammonia, nitrate, nitrite, chloride, and sulphate were identified as geochemical tracers of TIA pond water, with concentrations in TIA reclaim pond water uniformly higher than samples of flowing water at the toe of the North Dam. To date, no flowing water has been observed at the toe of the South Dam.
- Major ion concentrations and chemistry as assessed using a Piper diagram indicated that:
  - Major anion chemistry of TIA waters prior to tailings deposition was dominated by alkalinity and chloride. Since deposition of tailings TIA reclaim pond water has evolved to be dominated by chloride and sulphate.
  - Samples of flowing water at the toe of the North Dam are geochemically distinct from TIA Reclaim Pond water, prior to and after tailings deposition in the TIA.
  - Ponded water downstream of the the South Dam is geochemically equivalent to TIA baseline samples (prior to tailings deposition).
- No data suggest the presence of TIA Reclaim Pond water in the flowing water at the toe of the North Dam.
- If water is observed flowing at the dam toe, sample collection for laboratory water quality analysis can be reduced from a frequency of once per week to a frequency of once per year (typically in early August) with monthly measurements of field EC subject to the laboratory water quality sample being collected and analyzed as per the SOP. The North and South Dam monitoring SOPs will be updated to reflect this change.

Regards,
SRK Consulting (Canada) Inc.



Kyle Jang
Staff Consultant (Geochemistry)

Reviewed by:



Lisa Barazzuol, PGeo (NU/NT)
Principal Consultant (Geochemistry)

Attachments:

Attachment 1 2021 QA/QC Summary
Attachment 2 Water Quality Data, 2021 North and South Dam Samples

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Attachment 1 2021 QA/QC Summary

Table 6: Summary of QA/QC Assessment of 2021 Data for TL-1 Samples

QC Test	SRK QC Criteria	Results
Physical Test[1]		
Field Blank (n=2) for pH, TSS, and Turbidity	Minimum criteria is <2X DL, will accept <5X DL	All passed.
Method Blank (n=40) for TSS, (n=10) for TDS, (n=22) for EC, (n=38) for Turbidity, and (n=18) for Total Alkalinity	<2X DL	All passed.
Field Duplicate (n=1)	For samples >10X DL should be within +/-30% RPD	All passed.
Leachate Duplicate (n=28) for TSS, (n=34) for pH, (n=35) for Turbidity, (n=15) for EC, (n=15) for Total Alkalinity, (n=2) for ORP and (n=7) for TDS	For samples >10X DL should be within +/-20% RPD	All passed.
Field pH vs. Lab pH (n=37)	Difference should not be greater than 1 pH unit	1 sample failed: 05-Jan-2021 (YL2100011-001). The result has been confirmed by lab re-analysis and also verified by AEM. AEM also noted that the sensor for the probe was replaced the following week as they were having stability issues.
Field EC vs Lab EC (n=15)	For samples > 10X the detection limit (DL), % RPD should be within +/-30%	1 sample failed: (YL2100709-001) 06-Jul-2021. Lab EC were rechecked and confirmed, and Field EC were verified. Data accepted.
Laboratory Control Sample (n=17) for EC, (n=38) for Turbidity, (n=9) for TDS, (n=41) for TSS, and (n=17) for Total Alkalinity; Certified Reference Material (n=38) for pH; Reference Material Report (n=2) for ORP	Within specified tolerance ranges.	All passed.
Anions and Nutrients[2]		
Field Blank (n=2) for Total Ammonia, Cyanate, and Chloride	Minimum criteria is <2X DL, will accept <5X DL	All passed.
Method Blank (n=39) for Total Ammonia, (n=35) for Cl, (n=17) for Nitrate (as N), Nitrite (as N) and SO4, (n=8) for Total Phosphorus, (n=16) for Total N, (n=37) for Cyanate	<2X DL	All passed.
Field Duplicate (n=1)	For samples >10X DL should be within +/-30% RPD	All passed.
Leachate Duplicate (n=39) for Total Ammonia, (n=36) for Cl, (n=17) for Nitrate (as N), Nitrite (as N) and SO4, (n=8) for Total Phosphorus, (n=16) for Total N, (n=38) for Cyanate	For samples >10X DL should be within +/-20% RPD	All passed.
Ion Balance (n=38)	EC>100 uS/cm, % difference should be within +/-10%	8 samples failed. 15-Apr-2021 (YL2100271-001), 22-Apr-2021 (YL2100295-001), 15-Jun-2021 (YL2100564-001), 22-Jun-2021 (YL2100611-001), 29-Jun-2021 (YL2100671-001), 20-Jul-2021 (YL2100820-001), 31-Jul-2021 (YL2100908-001), 10-Aug-2021 (YL2101004-001). Ion imbalance - low anions due to lack of Total Alkalinity and Sulphate. As per Amanda, Total alkalinity and sulphate only analyzed once monthly. No need to request

QC Test	SRK QC Criteria	Results
		analysis from lab. Ion balance cannot be calculated.
Laboratory Control Sample (n=39) for Total Ammonia, (n=36) for Cl, (n=17) for Nitrate (as N), Nitrite (as N) and SO4, (n=8) for Total Phosphorus, (n=16) for Total N, (n=38) for Cyanate	Within specified tolerance ranges.	All passed.
Cyanides[3]		
Field Blank (n=2) for Cyanide, Free, Cyanide-WAD, Total Cyanide and Thiocyanate	Minimum criteria is <2X DL, will accept <5X DL	All passed.
Method Blank (n=37) for Cyanide-WAD, (n=39) for Total Cyanide and Thiocyanate, and (n=17) for Cyanide-Free	<2X DL	All passed.
Field Duplicate (n=1)	For samples >10X DL should be within +/-30% RPD	--
Leachate Duplicate (n=37) for Cyanide-WAD, (n=39) for Total Cyanide and Thiocyanate, and (n=17) for Cyanide-Free	For samples >10X DL should be within +/-20% RPD	All passed.
Laboratory Control Sample (n=37) for Cyanide-WAD, (n=39) for Total Cyanide and Thiocyanate, and (n=17) for Cyanide-Free	Within specified tolerance ranges.	All passed.
Trace Metals by ICP-MS and Hg-CVAAS		
Field Blank (n=2) for Total and Dissolved	Minimum criteria is <2X DL, will accept <5X DL	All passed.
Method Blank (n=38) for Total and Dissolved, (n=38) for Total-Hg, and (n=37) for Dissolved-Hg	<2X DL	All passed.
Field Duplicate (n=1) for Dissolved and Total	For samples >10X DL should be within +/-30% RPD	All passed.
Leachate Duplicate (n=38) for Total and Dissolved, (n=38) for Total-Hg, and (n=37) for Dissolved-Hg	For samples >10X DL should be within +/-20% RPD	All passed.
Total vs Dissolved Metals (n=38)	Total Metals>Dissolved metals. Total Metals should be greater than Dissolved Metals, if not the % difference should be within +/-20%. ALS would use 10X DL, Maxxam would use 5X DL	All passed.
Laboratory Control Sample (n=38) for Total and Dissolved, (n=38) for Total-Hg, and (n=37) for Dissolved-Hg	Within specified tolerance ranges.	All passed.

Sources: \\van-svr0.van.na.srk.ad\Projects\01_SITES\Hope.Bay\1CT022.073_2021 Geochem Compliance\!020_Project_Data\!2021_Raw_Lab_Files\!Hope Bay_TIA_SummaryQAQC_2021_rtc_mlt_rev02.xlsx

Notes:

[1] Conductivity (EC), pH, Total Suspended Solids (TSS)

[2] Total Alkalinity, Phenolphthalein Alkalinity, Total Ammonia, Unionized Ammonia, Cl, NO3, NO2, SO4

[3] Cyanide-WAD, Total CN, Cyanate, Thiocyanate (SCN), Cyanide-Free

[4] Benzene, Ethylbenzene, Methyl-Tert-Butyl-Ether(MTBE), Styrene, Toluene, Xylene (m+p, o).

Table 7: Summary of QA/QC Assessment of 2021 Data for V-Notch Weir (NDSP) Samples

QC Test	SRK QC Criteria	Results
Physical Test[1]		
Field Blank (n=0)	Minimum criteria is <2X DL, will accept <5X DL	--
Method Blank (n=15) for EC, (n=16) for TSS, (n=2) for TDS, (n=9) for Turbidity, and (n=15) for Total Alkalinity	<2X DL	All passed.
Field Duplicate (n=0)	For samples >10X DL should be within +/-30% RPD	--
Leachate Duplicate (n=15) for TSS, (n=16) for EC, (n=17) for pH, (n=3) for TDS, (n=11) for Turbidity, (n=1) for ORP and (n=16) for Total Alkalinity	For samples >10X DL should be within +/-20% RPD	All passed.
Field pH vs. Lab pH (n=14)	Difference should not be greater than 1 pH unit	1 sample failed. 21-Jul-2021 (YL2100833-001). Sample is no longer available for re-analysis, but the data entry and QC have been verified and there are no apparent errors, as per ALS.
Field EC vs Lab EC (n=14)	For samples > 10X the detection limit (DL), % RPD should be within +/-30%	2 samples failed: (YL2100775-001) 12-Jul-2021 and 31-Aug-2021 (YL2101168-001). Lab EC were rechecked and confirmed, and Field EC were verified. Data accepted.
Laboratory Control Samples (n=15) for EC and Total Alkalinity, (n=17) for TSS, (n=2) for TDS and (n=9) for Turbidity; Certified Reference Material (n=15) for pH	Within specified tolerance ranges.	All passed.
Anions and Nutrients[2]		
Field Blank (n=0)	Minimum criteria is <2X DL, will accept <5X DL	--
Method Blank (n=14) for Total Ammonia, (n=14) for Cl, Nitrate (as N), Nitrite (as N) and Total N, (n=13) for Sulfate, (n=1) for Total P and (n=13) for Cyanate	<2X DL	All passed.
Field Duplicate (n=0)	For samples >10X DL should be within +/-30% RPD	--
Leachate Duplicate (n=14) for Total Ammonia, (n=14) for Cl, Nitrate (asN), Nitrite (as N) and Total N, (n=13) for Sulfate, (n=1) for Total P and (n=13) for Cyanate	For samples >10X DL should be within +/-20% RPD	All passed.
Ion Balance (n=14)	EC>100 uS/cm, % difference should be within +/-10%	All passed.
Laboratory Control Sample (n=14) for Total Ammonia, (n=14) for Cl, Nitrate (asN), Nitrite (as N) and Total N, (n=13) for Sulfate, (n=1) for Total P and (n=13) for Cyanate	Within specified tolerance ranges.	All passed.

QC Test	SRK QC Criteria	Results
Cyanides[3]		
Field Blank (n=0)	Minimum criteria is <2X DL, will accept <5X DL	--
Method Blank (n=11) for Total Cyanide, (n=14) for Cyanide-Free, (n=12) for Weak Acid Diss., Cyanide and (n=14) for Thiocyanate	<2X DL	All passed.
Field Duplicate (n=0)	For samples >10X DL should be within +/-30% RPD	--
Leachate Duplicate (n=11) for Total Cyanide, (n=14) for Cyanide-Free, (n=12) for Weak Acid Diss., Cyanide and (n=14) for Thiocyanate.	For samples >10X DL should be within +/-20% RPD	All passed.
Laboratory Control Sample (n=11) for Total Cyanide, (n=14) for Cyanide-Free, (n=12) for Weak Acid Diss., Cyanide and (n=14) for Thiocyanate.	Within specified tolerance ranges.	All passed.
Trace Metals by ICP-MS and Hg-CVAAS		
Field Blank (n=0)	Minimum criteria is <2X DL, will accept <5X DL	--
Method Blank (n=14) for Total and Dissolved, (n=14) for Total-Hg, and (n=13) for Dissolved-Hg	<2X DL	All passed.
Field Duplicate (n=0)	For samples >10X DL should be within +/-30% RPD	--
Leachate Duplicate (n=14) for Total and Dissolved, (n=14) for Total-Hg, and (n=13) for Dissolved-Hg	For samples >10X DL should be within +/-20% RPD	All passed.
Total vs Dissolved Metals (n=14)	Total Metals>Dissolved metals. Total Metals should be greater than Dissolved Metals, if not the % difference should be within +/-20%. ALS would use 10X DL, Maxxam would use 5X DL	All passed.
Laboratory Control Sample (n=14) for Total and Dissolved, (n=14) for Total-Hg, and (n=13) for Dissolved-Hg	Within specified tolerance ranges.	All passed.

Sources: \\van-svr0.van.na.srk.ad\Projects\01_SITES\Hope.Bay\1CT022.073_2021 Geochem Compliance\!020_Project_Data\!2021_Raw_Lab_Files\!Hope Bay_TIA_SummaryQAQC_2021_rtc_mlt_rev02.xlsx

Notes:

[1] Conductivity (EC), pH, Total Suspended Solids (TSS)

[2] Total Alkalinity, Phenolphthalein Alkalinity, Total Ammonia, Unionized Ammonia, Cl, NO3, NO2, SO4

[3] Cyanide-WAD, Total CN, Cyanate, Thiocyanate (SCN), Cyanide-Free

Table 8: Summary of QA/QC Assessment of 2021 Data for South Dam Ponds 1 and 2 Samples

QC Test	SRK QC Criteria	Results
Physical Test[1]		
Field Blank (n=0)	Minimum criteria is <2X DL, will accept <5X DL	--
Method Blank (n=2) for TSS, EC, and Total Alkalinity	<2X DL	All passed.
Field Duplicate (n=0)	For samples >10X DL should be within +/-30% RPD	--
Leachate Duplicate (n=2) for EC, pH, and Total Alkalinity.	For samples >10X DL should be within +/-20% RPD	All passed.
Field pH vs. Lab pH (n=6)	Difference should not be greater than 1 pH unit	All failed: 2021-07-21 (YL2100833-002) 2021-07-21 (YL2100833-003) Samples were no longer available for re-analysis, but data entry and QC were verified and there were no apparent errors, as per ALS.
Field EC vs Lab EC (n=6)	For samples > 10X the detection limit (DL), % RPD should be within +/-30%	All passed.
Laboratory Control Samples (n=2) for EC, Total Alkalinity, pH, and TSS.	Within specified tolerance ranges.	All passed.
Anions and Nutrients[2]		
Field Blank (n=0)	Minimum criteria is <2X DL, will accept <5X DL	--
Method Blank (n=2) for Total Ammonia, Chloride, Nitrate (as N), Nitrite (as N), SO4, Total N, and Cyanate.	<2X DL	All passed.
Field Duplicate (n=0)	For samples >10X DL should be within +/-30% RPD	--
Leachate Duplicate (n=2) for Total Ammonia, Chloride, Nitrate (as N), Nitrite (as N), SO4, Total N, and Cyanate.	For samples >10X DL should be within +/-20% RPD	All passed.
Ion Balance (n=6)	EC>100 uS/cm, % difference should be within +/-10%	All passed.
Laboratory Control Sample (n=2) for Total Ammonia, Chloride, Nitrate (as N), Nitrite (as N), SO4, Total N, and Cyanate.	Within specified tolerance ranges.	All passed.

QC Test	SRK QC Criteria	Results
Cyanides[3]		
Field Blank (n=0)	Minimum criteria is <2X DL, will accept <5X DL	--
Method Blank (n=2) for Total Cyanide, Thiocyanate, Cyanide-Free, and Cyanide-WAD	<2X DL	All passed.
Field Duplicate (n=0)	For samples >10X DL should be within +/- 30% RPD	--
Leachate Duplicate (n=2) for Total Cyanide, Thiocyanate, Cyanide-Free, and Cyanide-WAD	For samples >10X DL should be within +/- 20% RPD	All passed.
Laboratory Control Sample (n=2) for Total Cyanide, Thiocyanate, Cyanide-Free, and Cyanide-WAD	Within specified tolerance ranges.	All passed.
Trace Metals by ICP-MS and Hg-CVAAS		
Field Blank (n=0)	Minimum criteria is <2X DL, will accept <5X DL	--
Method Blank (n=4) for Total and Dissolved	<2X DL	All passed.
Field Duplicate (n=0)	For samples >10X DL should be within +/- 30% RPD	--
Leachate Duplicate (n=4) for Total and Dissolved	For samples >10X DL should be within +/- 20% RPD	All passed.
Total vs Dissolved Metals (n=6)	Total Metals>Dissolved metals. Total Metals should be greater than Dissolved Metals, if not the % difference should be within +/-20%. ALS would use 10X DL, Maxxam would use 5X DL	All passed.
Laboratory Control Sample (n=4) for Total and Dissolved	Within specified tolerance ranges.	All passed.

Sources: Z:\01_SITES\Hope.Bay\1CT022.073_2021 Geochem Compliance\!020_Project_Data\!2021_Raw_Lab_Files\Tailings\TL-1\!1CT022.056_HopeBay_TailingsMonitoringData_2021_TL-1_Compiled Summary QAQC_mlt_Rev01.xlsx

Notes:

[1] Conductivity (EC), pH, Total Suspended Solids (TSS)

[2] Total Alkalinity, Phenolphthalein Alkalinity, Total Ammonia, Unionized Ammonia, Cl, NO3, NO2, SO4

[3] Cyanide-WAD, Total CN, Cyanate, Thiocyanate (SCN), Cyanide-Free

Attachment 2

Attachment 2 Water Quality Data, 2021 North and South Dam Samples

Station	Lab Sample ID	Sample Date	Field Measurements						Physical Parameters, Anions, and Nutrients									
			pH	EC	ORP	Temperature	Salinity	Chloride	pH	EC	Turbidity	Hardness (as CaCO3)	TSS	TDS	Total Alkalinity (as CaCO3)	Alkalinity, Bicarbonate (as CaCO3)	Alkalinity, Carbonate (as CaCO3)	Alkalinity, Hydroxide (as CaCO3)
			s.u.	µS/cm	mV	C	ppt	mg/L	s.u.	µS/cm	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
NDSP	YL2100709-002	6-Jul-21	8.0	509.0	-20	4.0	--	--	7.95	524	--	166	-3.0	--	98	--	--	--
	YL2100775-001	12-Jul-21	7.6	623.0	37	3.2	0.3	--	8.1	632	--	181	8.4	--	100	--	--	--
	YL2100833-001	21-Jul-21	7.1	671.0	11	25	0.3	--	8.16	598	--	193	10.9	--	90	--	--	--
	YL2100907-001	31-Jul-21	7.1	801.0	19	9.8	0.4	--	8.03	705	--	204	5.9	--	108	--	--	--
	YL2100933-001	3-Aug-21	7.3	784.0	43	4.3	0.3	--	7.94	701	--	211	-3.0	--	123	--	--	--
	YL2101001-001	10-Aug-21	7.4	700.0	23	4.1	0.3	--	8.1	700	--	190	-3.0	--	113	--	--	--
	YL2101064-001	17-Aug-21	7.4	690.0	110	4.6	0.4	--	7.99	748	--	197	-3.0	--	118	--	--	--
	YL2101117-001	24-Aug-21	7.5	767.0	29	5.5	0.4	--	7.92	749	--	212	6.9	--	123	--	--	--
	YL2101168-001	31-Aug-21	7.6	665.0	--	--	--	--	8.03	670	--	203	-3.0	--	131	--	--	--
	YL2101233-001	7-Sep-21	8.0	522.0	136	4.1	4.1	--	8.03	489	--	155	35.4	--	115	--	--	--
	YL2101307-001	14-Sep-21	8.3	6800.0	136	6.7	3.9	--	8.25	6810	--	134	-3.0	--	134	--	--	--
	YL2101369-001	21-Sep-21	7.8	369.0	123	1.9	0.2	--	8	352	--	135	-3.0	--	126	--	--	--
	YL2101438-001	28-Sep-21	7.7	438.0	62	1.9	0.2	--	8.01	372	--	146	-3.0	--	139	--	--	--
	YL2101469-001	5-Oct-21	8.2	361.0	216	1.7	0.1	--	7.87	317	--	124	-3.0	--	112	--	--	--
SDPOND1	YL2100833-002	21-Jul-21	6.9	563.0	131	21.1	0.2	--	8.32	509	--	160	6.3	--	143	--	--	--
SDPOND2	YL2100833-003	21-Jul-21	6.7	518.0	145	20.4	0.2	--	8.24	486	--	137	7.2	--	150	--	--	--

Station	Lab Sample ID	Sample Date	Alkalinity, Phenolphthalein (as CaCO3)	Ammonia, Total (as N)	Ammonia, Un-ionized (as N)	Nitrate	Nitrite	Sulphate	Chloride	Total Nitrogen	TKN	Cyanate	Cyanide, Free	Cyanide, Total	Cyanide, WAD	Thiocyanate	Orthophosphate
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
NDSP	YL2100709-002	6-Jul-21	--	0.010	0.00020	0.21	-0.0010	52	69	0.5	--	-0.20	0.0050	0.0050	--	-0.50	--
	YL2100775-001	12-Jul-21	--	0.011	--	0.31	-0.0010	71	89	0.6	--	-0.20	0.0050	0.0050	--	-0.50	--
	YL2100833-001	21-Jul-21	--	0.009	0.00007	0.32	-0.0010	73	84	0.6	--	-0.20	0.0050	0.0050	--	-0.50	--
	YL2100907-001	31-Jul-21	--	0.008	0.00002	0.43	-0.0010	86	105	0.6	--	-0.20	0.0050	0.0050	--	-0.50	--
	YL2100933-001	3-Aug-21	--	0.008	0.00002	0.38	-0.0010	77	103	0.6	--	-0.20	0.0050	0.0050	--	-0.50	--
	YL2101001-001	10-Aug-21	--	0.008	0.00002	0.64	-0.0010	91	91	0.8	--	-0.20	0.0050	0.0050	--	-0.50	--
	YL2101064-001	17-Aug-21	--	0.007	0.00002	0.63	0.0020	91	95	0.9	--	-1.0	0.0050	0.0050	--	-0.50	--
	YL2101117-001	24-Aug-21	--	0.005	--	0.72	0.0050	95	104	1.0	--	-0.20	0.0050	0.0050	--	-0.50	--
	YL2101168-001	31-Aug-21	--	0.023	0.00010	0.57	0.0050	87	79	0.9	--	-0.20	0.0050	0.0050	--	-0.50	--
	YL2101233-001	7-Sep-21	--	0.014	0.00010	0.53	-0.0010	69	36	--	--	-0.20	0.0050	0.0050	--	-0.50	--
	YL2101307-001	14-Sep-21	--	0.014	0.00008	0.15	-0.0010	23	21	--	--	-0.20	0.0050	0.0050	--	0.53	--
	YL2101369-001	21-Sep-21	--	0.013	0.00007	0.29	-0.0010	32	23	--	--	0.23	0.0050	0.0050	--	-0.50	--
	YL2101438-001	28-Sep-21	--	0.012	0.00005	0.38	-0.0010	36	26	--	--	-0.20	0.0050	0.0087	--	-0.50	--
	YL2101469-001	5-Oct-21	--	0.009	0.00010	0.12	-0.0010	29	17	0.7	--	-0.20	0.0050	0.0050	--	-0.50	--
SDPOND1	YL2100833-002	21-Jul-21	--	0.016	0.00006	0.0050	-0.0010	1	77	1.3	--	0.22	0.0050	0.0050	--	0.54	--
SDPOND2	YL2100833-003	21-Jul-21	--	0.060	0.00010	0.0050	-0.0010	7	63	1.5	--	0.23	0.0050	0.0050	--	0.58	--

Station	Lab Sample ID	Sample Date					Dissolved Metals											
			Phosphorus, Dissolved	Phosphorus, Total (ICP)	Phosphorus , Total	BOD	Al	Sb	As	Ba	Be	Bi	B	Cd	Ca	Cs	Cr	Co	Cu
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
NDSP	YL2100709-002	6-Jul-21	-0.050	--	-0.050	--	0.016	0.0001	0.0004	0.009	0.0001	0.0001	0.041	0.0000050	46.7	0.00001	-0.00050	0.00020	0.00510
	YL2100775-001	12-Jul-21	-0.050	--	-0.050	--	0.018	0.0001	0.0009	0.011	0.0001	0.0001	0.053	0.0000050	49.9	0.00001	-0.00050	0.00039	0.00339
	YL2100833-001	21-Jul-21	-0.050	--	-0.050	--	0.022	0.0001	0.0004	0.012	0.0001	0.0001	0.057	0.0000050	52.2	0.00001	-0.00050	0.00017	0.00519
	YL2100907-001	31-Jul-21	-0.050	--	-0.050	--	0.015	0.0001	0.0004	0.012	0.0001	0.0001	0.062	0.0000050	55.3	0.00001	-0.00050	0.00014	0.00496
	YL2100933-001	3-Aug-21	-0.050	--	-0.050	--	0.018	0.0001	0.0004	0.012	0.0001	0.0001	0.070	0.0000050	56.3	0.00001	-0.00050	0.00016	0.00501
	YL2101001-001	10-Aug-21	-0.050	--	-0.050	--	0.019	0.0001	0.0004	0.011	0.0001	0.0001	0.074	0.0000050	50.5	0.00001	-0.00050	0.00016	0.00458
	YL2101064-001	17-Aug-21	-0.050	--	-0.050	--	0.021	0.0001	0.0004	0.012	0.0001	0.0001	0.078	0.0000050	51.8	0.00001	-0.00050	0.00016	0.00539
	YL2101117-001	24-Aug-21	-0.050	--	-0.050	--	0.022	0.0001	0.0005	0.012	0.0001	0.0001	0.076	0.0000050	53.3	0.00001	-0.00050	0.00018	0.00505
	YL2101168-001	31-Aug-21	-0.050	--	0.162	--	0.016	0.0001	0.0005	0.011	0.0001	0.0001	0.081	0.0000050	53.7	0.00001	-0.00050	0.00016	0.00526
	YL2101233-001	7-Sep-21	-0.050	--	0.073	--	0.014	0.0001	0.0010	0.009	0.0001	0.0001	0.071	0.0000050	41.8	0.00001	-0.00050	0.00014	0.00672
	YL2101307-001	14-Sep-21	-0.050	--	-0.050	--	0.028	0.0001	0.0008	0.007	0.0001	0.0001	0.042	0.0000050	37.1	0.00001	-0.00050	0.00015	0.01070
	YL2101369-001	21-Sep-21	-0.050	--	-0.050	--	0.033	0.0001	0.0006	0.007	0.0001	0.0001	0.028	0.0000050	37.6	0.00001	-0.00050	0.00012	0.00888
	YL2101438-001	28-Sep-21	-0.050	--	-0.050	--	0.036	0.0001	0.0006	0.007	0.0001	0.0001	0.035	0.0000050	42.2	0.00001	-0.00050	0.00014	0.00923
	YL2101469-001	5-Oct-21	-0.050	--	-0.050	--	0.025	0.0001	0.0007	0.006	0.0001	0.0001	0.032	0.0000050	34.2	0.00001	-0.00050	0.00010	0.00808
SDPOND1	YL2100833-002	21-Jul-21	-0.050	--	-0.050	--	0.028	0.0001	0.0012	0.007	0.0001	0.0001	0.021	0.0000050	36.2	0.00001	0.00074	0.00060	0.00112
SDPOND2	YL2100833-003	21-Jul-21	0.07	--	0.112	--	0.036	0.0001	0.0013	0.012	0.0001	0.0001	0.041	0.0000050	30.0	0.00001	0.00089	0.00088	0.00134

Station	Lab Sample ID	Sample Date	Fe	Pb	Li	Mg	Mn	Hg	Mo	Ni	K	Rb	Se	Si	Ag	Na	Sr	S	Te	Tl
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
NDSP	YL2100709-002	6-Jul-21	0.10	0.0001	0.0028	12.0	0.00889	0.00001	0.00046	0.00080	2.5	0.0011	0.0002	2.9	0.00001	36.1	0.1	17	0.0002	0.0000
	YL2100775-001	12-Jul-21	2.26	0.0001	0.0029	13.6	0.03680	0.00001	0.00048	0.00070	2.5	0.0012	0.0002	3.0	0.00001	42.7	0.1	22	0.0002	0.0000
	YL2100833-001	21-Jul-21	0.10	0.0001	0.0025	15.2	0.00505	0.00001	0.00048	0.00068	3.2	0.0013	0.0002	2.8	0.00001	46.2	0.1	27	0.0002	0.0000
	YL2100907-001	31-Jul-21	0.08	0.0001	0.0026	16.1	0.00442	0.00001	0.00051	-0.00050	3.2	0.0013	0.0002	3.0	0.00001	52.5	0.1	29	0.0002	0.0000
	YL2100933-001	3-Aug-21	0.07	0.0001	0.0028	17.2	0.00629	0.00001	0.00056	0.00063	3.2	0.0013	0.0002	2.9	0.00001	55.5	0.1	27	0.0002	0.0000
	YL2101001-001	10-Aug-21	0.08	0.0001	0.0028	15.6	0.00523	0.00001	0.00071	0.00060	3.2	0.0013	0.0003	2.6	0.00001	55.3	0.1	30	0.0002	0.0000
	YL2101064-001	17-Aug-21	0.10	0.0001	0.0027	16.4	0.00511	0.00001	0.00069	0.00062	3.5	0.0014	0.0003	2.8	0.00001	54.0	0.1	33	0.0002	0.0000
	YL2101117-001	24-Aug-21	0.19	0.0001	0.0027	19.2	0.00803	0.00001	0.00065	0.00062	3.5	0.0014	0.0003	2.8	0.00001	56.4	0.1	33	0.0002	0.0000
	YL2101168-001	31-Aug-21	0.12	0.0001	0.0031	16.8	0.00674	0.00001	0.00090	0.00081	3.3	0.0014	0.0003	3.3	0.00001	53.9	0.1	30	0.0002	0.0000
	YL2101233-001	7-Sep-21	0.05	0.0001	0.0030	12.2	0.00515	0.00001	0.00106	0.00080	2.9	0.0011	0.0004	3.4	0.00001	35.4	0.1	26	0.0002	0.0000
	YL2101307-001	14-Sep-21	0.08	0.0001	0.0033	10.0	0.00395	0.00001	0.00042	0.00146	1.8	0.0007	0.0002	4.4	0.00001	19.7	0.1	9	0.0002	0.0000
	YL2101369-001	21-Sep-21	0.11	0.0001	0.0027	10.1	0.00336	0.00001	0.00038	0.00131	1.6	0.0007	0.0002	4.3	0.00001	19.1	0.1	10	0.0002	0.0000
	YL2101438-001	28-Sep-21	0.16	0.0001	0.0028	10.0	0.00442	0.00001	0.00045	0.00125	1.6	0.0006	0.0001	4.2	0.00001	22.3	0.1	13	0.0002	0.0000
	YL2101469-001	5-Oct-21	0.06	0.0001	0.0031	9.5	0.00200	0.00001	0.00058	0.00117	1.5	0.0006	0.0002	4.5	0.00001	17.2	0.1	11	0.0002	0.0000
SDPOND1	YL2100833-002	21-Jul-21	1.07	0.0001	0.0065	17.0	0.04810	0.00001	0.00018	0.00368	0.9	0.0010	0.0001	1.4	0.00001	49.4	0.1	1	0.0002	0.0000
SDPOND2	YL2100833-003	21-Jul-21	1.26	0.0001	0.0053	15.0	0.11800	0.00001	0.00030	0.00270	0.8	0.0007	0.0001	0.9	0.00001	55.0	0.1	3	0.0002	0.0000

Station	Lab Sample ID	Sample Date								Total Metals									
			Th	Sn	Ti	W	U	V	Zn	Zr	Al	Sb	As	Ba	Be	Bi	B	Cd	Ca	Cs
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
NDSP	YL2100709-002	6-Jul-21	0.0001	0.0001	0.0004	0.0001	0.0002	-0.0005	0.0044	0.0002	0.08	0.0001	0.0005	0.0096	0.0001	0.0001	0.045	0.000005	47.5	0.00001
	YL2100775-001	12-Jul-21	0.0001	0.0001	0.0005	0.0001	0.0002	-0.0005	0.0066	0.0002	0.18	0.0001	0.0009	0.0116	0.0001	0.0001	0.1	0.000006	56.4	0.00001
	YL2100833-001	21-Jul-21	0.0001	0.0001	0.0004	0.0001	0.0002	-0.0005	-0.0010	0.0002	0.24	0.0001	0.0005	0.0123	0.0001	0.0001	0.1	0.000005	52.6	0.00001
	YL2100907-001	31-Jul-21	0.0001	0.0001	0.0004	0.0001	0.0003	-0.0005	-0.0010	0.0002	0.13	0.0001	0.0005	0.0130	0.0001	0.0001	0.1	0.000005	59.1	0.00001
	YL2100933-001	3-Aug-21	0.0001	0.0001	0.0003	0.0001	0.0002	-0.0005	-0.0010	0.0002	0.10	0.0001	0.0005	0.0114	0.0001	0.0001	0.1	0.000005	55.4	0.00001
	YL2101001-001	10-Aug-21	0.0001	0.0001	0.0004	0.0001	0.0002	-0.0005	0.0021	0.0002	0.06	0.0001	0.0005	0.0117	0.0001	0.0001	0.1	0.000005	50.3	0.00001
	YL2101064-001	17-Aug-21	0.0001	0.0001	0.0005	0.0001	0.0003	-0.0005	-0.0010	0.0002	0.09	0.0001	0.0005	0.0118	0.0001	0.0001	0.1	0.000005	52.6	0.00001
	YL2101117-001	24-Aug-21	0.0001	0.0001	0.0004	0.0001	0.0003	-0.0005	-0.0010	0.0002	0.08	0.0001	0.0004	0.0127	0.0001	0.0001	0.1	0.000005	58.2	0.00001
	YL2101168-001	31-Aug-21	0.0001	0.0001	0.0004	0.0001	0.0003	-0.0005	-0.0010	0.0002	2.08	0.0001	0.0043	0.0235	0.0001	0.0001	0.1	0.000013	64.3	0.00008
	YL2101233-001	7-Sep-21	0.0001	0.0001	0.0004	0.0001	0.0003	-0.0005	-0.0010	0.0002	1.61	0.0001	0.0023	0.0139	0.0001	0.0001	0.1	0.000009	42.8	0.00007
	YL2101307-001	14-Sep-21	0.0001	0.0001	0.0008	0.0001	0.0001	-0.0005	-0.0010	0.0003	0.07	0.0001	0.0008	0.0068	0.0001	0.0001	0.0	0.000005	35.1	0.00001
	YL2101369-001	21-Sep-21	0.0001	0.0001	0.0008	0.0001	0.0002	-0.0005	-0.0010	0.0002	0.10	0.0001	0.0006	0.0071	0.0001	0.0001	0.0	0.000005	40.6	0.00001
	YL2101438-001	28-Sep-21	0.0001	0.0001	0.0010	0.0001	0.0002	-0.0005	0.0022	0.0003	0.09	0.0001	0.0006	0.0070	0.0001	0.0001	0.0	0.000005	41.5	0.00001
	YL2101469-001	5-Oct-21	0.0001	0.0001	0.0007	0.0001	0.0001	-0.0005	-0.0010	0.0002	0.07	0.0001	0.0007	0.0065	0.0001	0.0001	0.0	0.000005	34.1	0.00001
SDPOND1	YL2100833-002	21-Jul-21	0.0002	0.0001	0.0012	0.0001	0.0001	-0.0005	0.0019	0.0006	0.04	0.0001	0.0013	0.0072	0.0001	0.0001	0.0	0.000005	34.2	0.00001
SDPOND2	YL2100833-003	21-Jul-21	0.0002	0.0001	0.0016	0.0004	0.0001	0.0006	-0.0010	0.0006	0.05	0.0001	0.0013	0.0122	0.0001	0.0001	0.0	0.000005	29.8	0.00001

Station	Lab Sample ID	Sample Date	Cr	Co	Cu	Fe	Pb	Li	Mg	Mn	Hg	Mo	Ni	K	Rb	Se	Si	Ag	Na	Sr
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
NDSP	YL2100709-002	6-Jul-21	-0.0005	0.0003	0.0059	0.2	0.0001	0.0029	12.3	0.010	0.00001	0.00050	0.00091	2.5	0.0011	0.0002	3.2	0.00001	35.0	0.078
	YL2100775-001	12-Jul-21	0.0009	0.0005	0.0056	1.5	0.0001	0.0032	14.7	0.024	0.00001	0.00053	0.00106	2.8	0.0014	0.0002	3.1	0.00001	46.7	0.090
	YL2100833-001	21-Jul-21	0.0010	0.0004	0.0062	0.4	0.0001	0.0027	15.4	0.010	0.00001	0.00043	0.00114	3.2	0.0016	0.0002	3.2	0.00001	46.9	0.104
	YL2100907-001	31-Jul-21	0.0006	0.0003	0.0060	0.3	0.0001	0.0027	17.2	0.007	0.00001	0.00046	0.00089	3.2	0.0015	0.0002	3.2	0.00001	53.9	0.117
	YL2100933-001	3-Aug-21	-0.0005	0.0003	0.0048	0.4	0.0001	0.0032	15.5	0.014	0.00001	0.00058	0.00081	3.0	0.0015	0.0002	3.1	0.00001	56.8	0.092
	YL2101001-001	10-Aug-21	-0.0005	0.0002	0.0052	0.2	0.0001	0.0028	15.4	0.006	0.00001	0.00070	0.00076	3.2	0.0014	0.0003	2.8	0.00001	52.3	0.101
	YL2101064-001	17-Aug-21	-0.0005	0.0002	0.0059	0.2	0.0001	0.0028	17.3	0.006	0.00001	0.00070	0.00074	3.5	0.0016	0.0003	3.2	0.00001	55.6	0.108
	YL2101117-001	24-Aug-21	-0.0005	0.0002	0.0057	0.2	0.0001	0.0028	18.5	0.008	0.00001	0.00070	0.00080	3.6	0.0016	0.0003	3.0	0.00001	59.2	0.118
	YL2101168-001	31-Aug-21	0.0100	0.0025	0.0161	15.1	0.0007	0.0055	20.8	0.070	0.00001	0.00089	0.00665	3.7	0.0035	0.0004	6.9	0.00001	62.8	0.101
	YL2101233-001	7-Sep-21	0.0085	0.0021	0.0154	3.7	0.0007	0.0048	12.5	0.067	0.00001	0.00101	0.00581	2.8	0.0023	0.0005	6.2	0.00001	32.4	0.074
	YL2101307-001	14-Sep-21	-0.0005	0.0002	0.0103	0.1	0.0001	0.0036	9.1	0.004	0.00001	0.00041	0.00141	1.5	0.0006	0.0001	4.6	0.00001	17.3	0.052
	YL2101369-001	21-Sep-21	0.0005	0.0002	0.0095	0.2	0.0001	0.0030	10.6	0.005	0.00001	0.00038	0.00146	1.7	0.0008	0.0001	4.7	0.00001	20.0	0.063
	YL2101438-001	28-Sep-21	-0.0005	0.0002	0.0098	0.2	0.0001	0.0028	9.9	0.005	0.00001	0.00048	0.00135	1.5	0.0007	0.0001	4.4	0.00001	19.2	0.069
	YL2101469-001	5-Oct-21	-0.0005	0.0001	0.0085	0.1	0.0001	0.0029	9.1	0.003	0.00001	0.00055	0.00142	1.5	0.0006	0.0002	4.7	0.00001	18.1	0.047
SDPOND1	YL2100833-002	21-Jul-21	0.0008	0.0006	0.0012	1.5	0.0001	0.0067	15.3	0.047	0.00001	0.00019	0.00372	0.8	0.0009	0.0001	1.4	0.00001	49.3	0.090
SDPOND2	YL2100833-003	21-Jul-21	0.0009	0.0010	0.0015	1.7	0.0001	0.0054	14.0	0.130	0.00001	0.00030	0.00276	0.8	0.0007	0.0001	1.0	0.00001	53.5	0.090

Station	Lab Sample ID	Sample Date	S	Te	Tl	Th	Sn	Ti	W	U	V	Zn	Zr
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
NDSP	YL2100709-002	6-Jul-21	19.3	0.0002	0.00001	0.0001	0.0001	0.0030	0.0001	0.0002	-0.0005	0.0033	0.0002
	YL2100775-001	12-Jul-21	24.2	0.0002	0.00001	0.0001	0.0001	0.0061	0.0001	0.0002	0.0010	0.0041	0.0002
	YL2100833-001	21-Jul-21	25.9	0.0002	0.00001	0.0001	0.0001	0.0114	0.0001	0.0002	0.0008	-0.0030	0.0002
	YL2100907-001	31-Jul-21	28.2	0.0002	0.00001	0.0001	0.0001	0.0046	0.0001	0.0003	0.0005	-0.0030	0.0002
	YL2100933-001	3-Aug-21	27.3	0.0002	0.00001	0.0001	0.0001	0.0036	0.0001	0.0002	-0.0005	-0.0030	0.0002
	YL2101001-001	10-Aug-21	30.4	0.0002	0.00001	0.0001	0.0001	0.0020	0.0001	0.0003	-0.0005	-0.0030	0.0002
	YL2101064-001	17-Aug-21	34.6	0.0002	0.00001	0.0001	0.0001	0.0031	0.0001	0.0003	-0.0005	-0.0030	0.0002
	YL2101117-001	24-Aug-21	33.9	0.0002	0.00001	0.0001	0.0001	0.0026	0.0001	0.0003	-0.0005	-0.0030	0.0002
	YL2101168-001	31-Aug-21	32.0	0.0002	0.00001	0.0005	0.0001	0.0797	0.0001	0.0003	0.0077	0.0066	0.0005
	YL2101233-001	7-Sep-21	25.4	0.0002	0.00001	0.0003	0.0001	0.0572	0.0001	0.0004	0.0058	0.0051	0.0003
	YL2101307-001	14-Sep-21	8.2	0.0002	0.00001	0.0001	0.0001	-0.0024	0.0001	0.0001	-0.0005	-0.0030	0.0002
	YL2101369-001	21-Sep-21	11.4	0.0002	0.00001	0.0001	0.0001	0.0033	0.0001	0.0002	-0.0005	0.0032	0.0003
	YL2101438-001	28-Sep-21	12.9	0.0002	0.00001	0.0001	0.0001	0.0026	0.0001	0.0002	-0.0005	-0.0030	0.0003
	YL2101469-001	5-Oct-21	10.6	0.0002	0.00001	0.0001	0.0001	0.0025	0.0001	0.0001	-0.0005	-0.0030	0.0002
SDPOND1	YL2100833-002	21-Jul-21	1.0	0.0002	0.00001	0.0002	0.0001	0.0015	0.0001	0.0001	-0.0005	-0.0030	0.0005
SDPOND2	YL2100833-003	21-Jul-21	2.9	0.0002	0.00001	0.0002	0.0001	0.0019	0.0005	0.0001	0.0006	-0.0030	0.0005

Station	Lab Sample ID	Sample Date	Field Measurements						Physical Parameters, Anions, and Nutients									
			pH	EC	ORP	Temperature	Salinity	Chloride	pH	EC	Turbidity	Hardness (as CaCO3)	TSS	TDS	Total Alkalinity (as CaCO3)	Alkalinity, Bicarbonate (as CaCO3)	Alkalinity, Carbonate (as CaCO3)	Alkalinity, Hydroxide (as CaCO3)
			s.u.	µS/cm	mV	C	ppt	mg/L	s.u.	µS/cm	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
TL-1	YL2100036-001	13-Jan-21	7.0	11330.0	117	4	5.0	--	7.76	--	14.8	1170	9.1	--	--	--	--	--
	YL2100052-001	20-Jan-21	7.4	--	--	--	--	--	7.85	--	16.8	1290	11.1	--	--	--	--	--
	YL2100062-001	26-Jan-21	7.0	11650.0	140	3	6.0	--	7.98	--	20.8	1210	16.5	--	--	--	--	--
	YL2100074-001	3-Feb-21	7.0	11830.0	224	3	5.0	--	8.09	9060	14.6	1260	16.5	5430.0	146	--	--	--
	YL2100092-001	10-Feb-21	7.0	15090.0	238	4	5.0	--	8.02	--	9.11	1330	6.0	--	--	--	--	--
	YL2100103-001	16-Feb-21	7.0	15390.0	227	2	6.0	--	7.82	--	16.3	1310	13.8	--	--	--	--	--
	YL2100122-001	24-Feb-21	7.0	12300.0	131	4	6.0	--	7.63	--	12.3	1320	8.0	--	--	--	--	--
	YL2100139-001	3-Mar-21	8.0	12560.0	88	3	6.0	--	7.61	9570	14.5	1370	21.9	5930.0	151	--	--	--
	YL2100158-001	9-Mar-21	7.0	13150.0	96	4	6.0	--	7.76	--	22.8	1400	17.9	--	--	--	--	--
	YL2100179-001	17-Mar-21	7.0	13330.0	218	4	4.0	--	7.8	--	15.5	1400	12.6	--	--	--	--	--
	YL2100197-001	24-Mar-21	8.0	13560.0	90	4	6.0	--	8.09	--	15.5	1410	15.1	--	--	--	--	--
	YL2100216-001	30-Mar-21	7.5	13850.0	168	2.4	6.1	--	7.59	--	10.4	1370	14.0	--	--	--	--	--
	YL2100249-001	7-Apr-21	7.6	13670.0	158	2.6	6.3	--	7.92	10700	13.8	1650	12.7	6860.0	160	--	--	--
	YL2100271-001	15-Apr-21	7.6	14170.0	159	2.6	6.5	--	7.88	--	14.5	1620	15.7	--	--	--	--	--
	--	21-Apr-21	7.5	14600.0	247	5.1	6.8	--	--	--	--	--	--	--	--	--	--	--
	YL2100295-001	22-Apr-21	7.5	--	--	--	--	--	7.48	--	12.6	1490	7.9	--	--	--	--	--
	YL2100320-001	28-Apr-21	7.5	15120.0	239	4.1	7.0	--	8	--	13.5	1430	13.4	--	--	--	--	--
	YL2100352-001	5-May-21	7.0	15200.0	208	4	7.0	--	8	11100	10.9	1510	14.3	6820.0	186	--	--	--
	YL2100379-001	11-May-21	7.0	15150.0	180	4	7.0	--	7.44	--	10.2	1520	9.9	--	--	--	--	--
	YL2100397-001	20-May-21	7.0	15170.0	92	3	7.0	--	7.75	--	10.8	1490	11.2	--	--	--	--	--
	YL2100429-001	26-May-21	7.0	1495.0	191	3	7.0	--	8.03	--	20.9	1470	16.0	--	--	--	--	--
	YL2100465-001	1-Jun-21	7.4	1497.0	137	2.4	6.5	--	8.06	11500	17.4	1500	21.8	--	--	--	--	--
	YL2100511-001	8-Jun-21	7.0	15100.0	170	3	7.0	--	7.82	11100	13.6	1580	16.2	6870.0	174	--	--	--
	YL2100564-001	15-Jun-21	7.0	14990.0	223	4	6.0	--	7.79	--	13.1	1410	12.4	--	--	--	--	--
	YL2100611-001	22-Jun-21	7.0	14880.0	165	2	6.0	--	7.89	--	15.5	1480	4.7	--	--	--	--	--
	YL2100671-001	29-Jun-21	7.0	15080.0	118	2	7.0	--	7.91	--	18.1	1500	13.2	--	--	--	--	--
	YL2100709-001	6-Jul-21	7.0	17790.0	84	2	7.0	--	7.7	11200	20.2	1400	15.7	7340.0	181	--	--	--
	YL2100775-002	13-Jul-21	7.3	11010.0	132	3.9	6.1	--	8.09	11000	21.4	1350	14.8	--	184	--	--	--
	YL2100820-001	20-Jul-21	7.2	10630.0	188	3.7	6.1	--	8	--	12.4	1300	19.0	--	--	--	--	--
	YL2100908-001	31-Jul-21	7.3	11540.0	128	5.7	6.3	--	7.97	--	10.6	1360	13.0	--	--	--	--	--
	YL2100930-001	3-Aug-21	7.3	11400.0	165	4	5.9	--	7.94	10200	13.5	1360	11.5	6660.0	189	--	--	--
	YL2101004-001	10-Aug-21	8.0	7170.0	169	8.5	3.9	--	8.18	--	10.2	926	16.0	--	--	--	--	--
	YL2101064-002	17-Aug-21	8.6	6850.0	176	11.3	3.8	--	8.23	7060	8.85	832	15.3	--	125	--	--	--
	YL2101117-002	24-Aug-21	8.4	7120.0	145	10.6	4.4	--	8.11	7110	14.4	905	16.3	--	127	--	--	--
	YL2101168-002	31-Aug-21	8.1	7090.0	--	--	--	--	8.08	7370	10.1	902	14.1	--	134	--	--	--
	YL2101233-002	7-Sep-21	8.3	6930.0	134	10	3.8	--	8.24	7320	7.1	866	15.0	--	130	--	--	--
	YL2101307-002	16-Sep-21	8.4	--	--	--	--	--	8.22	7130	6.11	928	19.1	--	137	--	--	--
	YL2101369-002	21-Sep-21	8.5	7150.0	128	6.8	4.0	--	8.3	6920	7.6	870	16.8	--	131	--	--	--
	YL2101438-002	28-Sep-21	8.5	7820.0	91	8	3.8	--	8.31	6890	7.32	878	21.7	4470.0	128	--	--	--
TL-5	YL2100037-001	13-Jan-21	8.2	13330.0	81	12.1	6.3	--	8.26	11000	--	1120	17.7	--	296	296	-1.0	-1.0
	YL2100125-001	24-Feb-21	8.2	14030.0	29	9.8	5.6	--	8.41	12600	--	1320	10.4	--	329	306	22.6	-1.0
	YL2100160-001	9-Mar-21	8.2	16200.0	121	10.3	7.8	--	8.19	12700	--	1330	228.0	--	295	295	-1.0	-1.0
	--	20-Apr-21	8.2	18150.0	156	13.1	8.4	--	--	--	--	--	--	--	--	--	--	--
	YL2100292-001	21-Apr-21	8.2	--	--	--	--	--	8.21	14300	--	1380	16.0	--	342	--	--	--
	YL2100435-001	22-May-21	8.0	16730.0	83	13	8.0	--	8.34	13100	--	1500	6.6	--	318	310	8.2	-1.0
	YL2100680-001	30-Jun-21	8.0	13230.0	203	16	8.0	--	8.11	13000	--	1470	111.0	--	292	292	-1.0	-1.0
	YL2100774-001	12-Jul-21	8.0	13110.0	111	15.3	7.9	--	8.16	13500	--	1380	257.0	--	334	--	--	--
	YL2101008-001	10-Aug-21	8.1	10.6	92	15.7	6.1	--	8.34	11000	--	1030	14.1	--	336	325	11.6	-1.0
	YL2101368-001	20-Sep-21	8.2	8700.0	67	15.5	5.0	--	8.25	8830	--	907	34.1	--	284	284	-1.0	-1.0

Station	Lab Sample ID	Sample Date	Alkalinity, Phenolphthalein (as CaCO3)	Ammonia, Total (as N)	Ammonia, Un-ionized (as N)	Nitrate	Nitrite	Sulphate	Chloride	Total Nitrogen	TKN	Cyanate	Cyanide, Free	Cyanide, Total	Cyanide, WAD	Thiocyanate	Orthophosphate
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
TL-1	YL2100036-001	13-Jan-21	--	7.1	0.022	--	--	--	2490	--	--	4.7	--	0.061	0.005	0.82	--
	YL2100052-001	20-Jan-21	--	6.9	0.016	--	--	--	2610	--	--	2.9	--	0.095	0.020	0.75	--
	YL2100062-001	26-Jan-21	--	7.0	0.022	--	--	--	2730	--	--	5.0	--	0.080	0.005	0.67	--
	YL2100074-001	3-Feb-21	--	6.9	0.021	3.8	0.13	706	2660	12.0	8.0	3.5	0.0050	0.064	0.005	-0.50	-0.0010
	YL2100092-001	10-Feb-21	--	6.7	0.015	--	--	--	2690	--	--	4.1	--	0.067	0.005	-0.50	--
	YL2100103-001	16-Feb-21	--	7.0	0.010	--	--	--	2770	--	--	3.3	--	0.067	0.005	-0.50	--
	YL2100122-001	24-Feb-21	--	6.5	0.019	--	--	--	2900	--	--	7.8	--	0.062	0.005	-2.50	--
	YL2100139-001	3-Mar-21	--	6.4	0.021	3.5	0.12	705	2830	11.1	7.6	6.8	0.0050	0.068	0.005	-2.50	-0.0010
	YL2100158-001	9-Mar-21	--	6.9	0.021	--	--	--	3070	--	--	3.4	--	0.081	0.005	-0.50	--
	YL2100179-001	17-Mar-21	--	7.1	0.025	--	--	--	3080	--	--	2.9	--	0.063	0.005	-0.50	--
	YL2100197-001	24-Mar-21	--	6.9	0.025	--	--	--	3440	--	--	6.4	--	0.063	0.005	-0.50	--
	YL2100216-001	30-Mar-21	--	6.8	0.028	--	--	--	3290	--	--	6.5	--	0.066	-0.025	-0.50	--
	YL2100249-001	7-Apr-21	--	7.4	0.027	4.2	-0.050	812	3400	12.3	7.7	4.8	0.0050	0.070	0.005	-0.50	0.0017
	YL2100271-001	15-Apr-21	--	7.4	0.027	--	--	--	3300	--	--	7.6	--	0.077	0.005	-0.50	--
	--	21-Apr-21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	YL2100295-001	22-Apr-21	--	7.6	0.027	--	--	--	2010	--	--	7.3	--	0.072	0.005	-0.50	--
	YL2100320-001	28-Apr-21	--	7.9	0.026	--	--	--	3590	--	--	7.0	--	0.076	0.005	-2.50	--
	YL2100352-001	5-May-21	--	8.0	0.020	4.1	0.11	798	3420	12.7	7.6	4.3	0.0050	0.079	0.005	-0.50	0.0012
	YL2100379-001	11-May-21	--	8.3	0.025	--	--	--	3390	--	--	4.4	--	0.077	0.005	-0.50	--
	YL2100397-001	20-May-21	--	8.1	0.026	--	--	--	3600	--	--	4.7	--	0.056	0.005	-0.50	--
	YL2100429-001	26-May-21	--	8.0	0.021	--	--	--	3290	--	--	4.2	--	0.071	0.005	-0.50	--
	YL2100465-001	1-Jun-21	--	8.7	0.021	--	--	--	3130	--	--	3.9	--	0.074	0.005	--	--
	YL2100511-001	8-Jun-21	--	7.9	0.017	3.7	0.09	802	3300	12.9	9.3	4.7	0.0050	0.071	0.005	1.3	0.0014
	YL2100564-001	15-Jun-21	--	8.4	0.020	--	--	--	--	--	--	2.8	--	0.065	0.005	-2.50	--
	YL2100611-001	22-Jun-21	--	8.2	0.015	--	--	--	--	--	--	5.5	--	0.065	0.005	-0.50	--
	YL2100671-001	29-Jun-21	--	8.1	0.023	--	--	--	3200	--	--	4.1	--	0.035	0.005	-0.50	--
	YL2100709-001	6-Jul-21	--	8.1	0.012	4.0	0.14	859	3450	13.2	8.9	3.2	0.0050	0.055	0.005	-0.50	-0.0010
	YL2100775-002	13-Jul-21	--	8.8	--	4.2	0.09	877	3210	14.1	--	3.7	0.0060	0.094	0.005	-5.00	--
	YL2100820-001	20-Jul-21	--	9.3	0.016	--	--	--	--	--	--	2.7	--	0.103	0.010	-0.50	--
	YL2100908-001	31-Jul-21	--	9.3	0.037	--	--	--	3130	--	--	4.9	--	0.093	0.005	-0.50	--
	YL2100930-001	3-Aug-21	--	9.2	0.019	4.6	0.13	928	3260	13.9	--	3.2	0.0050	0.087	0.005	-2.50	0.0016
	YL2101004-001	10-Aug-21	--	5.8	0.1	--	--	--	1950	--	--	3.9	--	0.040	0.005	-5.00	--
	YL2101064-002	17-Aug-21	--	5.4	0.4	4.1	0.20	619	1860	10.4	--	3.8	0.0050	0.022	0.005	-0.50	--
	YL2101117-002	24-Aug-21	--	5.8	0.2	3.8	0.18	648	1990	10.6	--	3.3	0.0050	0.025	0.005	-0.50	--
	YL2101168-002	31-Aug-21	--	6.1	0.2	4.0	0.18	678	2020	11.5	--	4.5	0.0050	0.022	0.005	-5.00	--
	YL2101233-002	7-Sep-21	--	5.0	0.2	4.2	0.17	627	1920	--	--	3.5	0.0050	0.011	0.005	-0.50	--
	YL2101307-002	16-Sep-21	--	4.8	0.2	4.2	0.17	663	2020	--	--	2.9	0.0050	0.012	0.005	-0.50	--
	YL2101369-002	21-Sep-21	--	4.5	0.2	4.0	0.15	620	1890	--	--	2.0	0.0050	0.014	0.005	-0.50	--
	YL2101438-002	28-Sep-21	--	4.4	0.2	4.4	0.14	635	1980	--	5.3	2.4	0.0050	0.015	--	-0.50	-0.0010
TL-5	YL2100037-001	13-Jan-21	-1.0	26.7	0.9	8.9	0.72	1860	2640	--	--	47.4	0.41	3.9	0.731	18.7	--
	YL2100125-001	24-Feb-21	11.3	47.2	1.1	19.0	1.38	1720	3100	--	--	130.0	0.44	4.7	0.492	36.2	--
	YL2100160-001	9-Mar-21	-1.0	44.9	1.3	14.8	0.88	2040	3200	--	--	97.2	0.04	3.0	0.127	51.4	--
	--	20-Apr-21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	YL2100292-001	21-Apr-21	--	46.4	1.6	27.4	1.22	2960	4110	--	--	74.1	0.11	1.6	0.121	20.6	--
	YL2100435-001	22-May-21	4.1	33.6	1.2	16.3	0.79	1770	3780	--	--	64.2	0.03	1.4	0.035	24.2	--
	YL2100680-001	30-Jun-21	-1.0	39.1	1.7	26.5	1.19	1800	3290	--	--	63.0	0.04	0.9	0.082	11.8	--
	YL2100774-001	12-Jul-21	--	40.1	--	28.8	3.34	1860	3580	--	--	60.9	0.06	1.1	0.128	23.2	--
	YL2101008-001	10-Aug-21	5.8	37.0	1.3	15.1	0.77	1870	2510	--	--	75.3	0.05	0.9	0.070	40.4	--
	YL2101368-001	20-Sep-21	-1.0	25.0	1.0	20.6	0.67	1270	2070	--	--	41.1	0.04	1.1	0.040	32.8	--

Station	Lab Sample ID	Sample Date					Dissolved Metals												
			Phosphorus, Dissolved	Phosphorus, Total (ICP)	Phosphorus, Total	BOD	Al	Sb	As	Ba	Be	Bi	B	Cd	Ca	Cs	Cr	Co	Cu
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
TL-1	YL2100036-001	13-Jan-21	-0.25	--	-0.250	--	0.008	0.0006	0.0024	0.034	-0.0005	-0.0003	0.803	0.0000250	208.0	0.00005	-0.00050	0.00458	0.04330
	YL2100052-001	20-Jan-21	-0.25	--	-0.250	--	0.011	0.0008	0.0022	0.033	-0.0005	-0.0003	0.849	0.0000250	235.0	0.00005	-0.00050	0.00485	0.04080
	YL2100062-001	26-Jan-21	-0.25	--	-0.250	--	0.007	0.0007	0.0022	0.033	-0.0005	-0.0003	0.733	0.0000298	216.0	0.00007	-0.00050	0.00494	0.04070
	YL2100074-001	3-Feb-21	-0.25	--	-0.250	--	0.008	0.0006	0.0019	0.033	-0.0005	-0.0003	0.775	0.0000250	233.0	0.00005	-0.00050	0.00438	0.03540
	YL2100092-001	10-Feb-21	0.25	--	-0.250	--	0.008	0.0006	0.0024	0.038	0.0005	0.0003	0.817	0.0000250	244.0	0.00005	0.00050	0.00464	0.03800
	YL2100103-001	16-Feb-21	-0.25	--	-0.250	--	0.009	0.0006	0.0022	0.036	-0.0005	-0.0003	0.794	0.0000282	237.0	0.00005	-0.00050	0.00443	0.03420
	YL2100122-001	24-Feb-21	-0.25	--	-0.250	--	0.005	0.0006	0.0019	0.036	-0.0005	-0.0003	0.855	0.0000250	224.0	0.00005	-0.00050	0.00432	0.04520
	YL2100139-001	3-Mar-21	-0.25	--	-0.250	--	0.005	0.0006	0.0020	0.038	-0.0005	-0.0003	0.766	0.0000250	239.0	0.00005	-0.00050	0.00428	0.07610
	YL2100158-001	9-Mar-21	-0.25	--	-0.250	--	0.007	0.0006	0.0018	0.037	-0.0005	-0.0003	0.893	0.0000250	250.0	0.00005	-0.00050	0.00448	0.08950
	YL2100179-001	17-Mar-21	-0.25	--	-0.250	--	0.009	0.0006	0.0019	0.036	-0.0005	-0.0003	0.898	0.0000321	238.0	0.00005	-0.00050	0.00477	0.03530
	YL2100197-001	24-Mar-21	-0.25	--	-0.250	--	0.006	0.0006	0.0022	0.038	-0.0005	-0.0003	0.965	0.0000250	240.0	0.00005	-0.00050	0.00465	0.04210
	YL2100216-001	30-Mar-21	-0.50	--	-0.250	--	0.010	-0.0010	0.0021	0.038	-0.0010	-0.0005	0.875	0.0000500	231.0	0.00010	-0.00100	0.00453	0.03710
	YL2100249-001	7-Apr-21	-0.25	--	-0.500	--	0.015	0.0006	0.0022	0.040	-0.0005	-0.0003	0.972	0.0000309	287.0	0.00005	-0.00050	0.00514	0.04530
	YL2100271-001	15-Apr-21	-0.50	--	-0.500	--	0.012	-0.0010	0.0024	0.045	-0.0010	-0.0005	1.090	0.0000500	278.0	0.00010	-0.00100	0.00500	0.04290
	--	21-Apr-21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	YL2100295-001	22-Apr-21	-0.50	--	-0.250	--	0.012	-0.0010	0.0021	0.042	-0.0010	-0.0005	0.938	0.0000500	254.0	0.00010	0.00500	0.00483	0.03980
	YL2100320-001	28-Apr-21	-0.50	--	-0.250	--	0.010	-0.0010	0.0024	0.039	-0.0010	-0.0005	0.944	0.0000500	237.0	0.00010	0.00500	0.00480	0.03890
	YL2100352-001	5-May-21	-0.50	--	-0.500	--	0.010	-0.0010	0.0020	0.043	-0.0010	-0.0005	0.931	0.0000500	254.0	0.00010	0.00500	0.00446	0.03720
	YL2100379-001	11-May-21	-0.25	--	-0.250	--	0.008	0.0006	0.0020	0.044	-0.0005	-0.0003	0.998	0.0000250	268.0	0.00005	0.00250	0.00434	0.03310
	YL2100397-001	20-May-21	-0.10	--	-0.250	--	0.006	0.0006	0.0022	0.042	0.0002	0.0001	0.958	0.0000245	248.0	0.00002	-0.00100	0.00478	0.03740
	YL2100429-001	26-May-21	-0.50	--	-0.250	--	0.010	-0.0010	0.0019	0.042	-0.0010	-0.0005	0.835	0.0000500	237.0	0.00010	0.00500	0.00472	0.03290
	YL2100465-001	1-Jun-21	-0.50	--	-0.500	--	0.010	-0.0010	0.0023	0.042	-0.0010	-0.0005	1.000	0.0000500	246.0	0.00010	0.00500	0.00470	0.03280
	YL2100511-001	8-Jun-21	-0.50	--	-0.250	--	0.012	-0.0010	0.0021	0.044	-0.0010	-0.0005	1.040	0.0000500	268.0	0.00010	0.00500	0.00511	0.03460
	YL2100564-001	15-Jun-21	-0.50	--	-0.500	--	0.010	-0.0010	0.0020	0.042	-0.0010	-0.0005	0.854	0.0000500	236.0	0.00010	0.00500	0.00479	0.03360
	YL2100611-001	22-Jun-21	-0.50	--	-0.500	--	0.010	-0.0010	0.0027	0.043	-0.0010	-0.0005	0.913	0.0000500	242.0	0.00010	0.00500	0.00488	0.03070
	YL2100671-001	29-Jun-21	-0.50	--	-0.500	--	0.012	-0.0010	0.0023	0.044	-0.0010	-0.0005	0.955	0.0000500	247.0	0.00010	0.00500	0.00467	0.03970
	YL2100709-001	6-Jul-21	-0.50	--	-0.500	--	0.010	-0.0010	0.0020	0.043	-0.0010	-0.0005	0.882	0.0000500	251.0	0.00010	0.00500	0.00467	0.02990
	YL2100775-002	13-Jul-21	-0.50	--	-0.500	--	0.010	-0.0010	0.0020	0.041	-0.0010	-0.0005	0.864	0.0000500	231.0	0.00010	0.00500	0.00485	0.03520
	YL2100820-001	20-Jul-21	-0.50	--	-0.500	--	0.010	-0.0010	0.0022	0.041	-0.0010	-0.0005	0.775	0.0000500	215.0	0.00010	0.00500	0.00479	0.03330
	YL2100908-001	31-Jul-21	-0.50	--	-0.500	--	0.010	-0.0010	0.0022	0.043	-0.0010	-0.0005	0.854	0.0000500	234.0	0.00010	0.00500	0.00508	0.03450
	YL2100930-001	3-Aug-21	-0.50	--	-0.500	3.0	0.010	-0.0010	0.0021	0.042	-0.0010	-0.0005	0.832	0.0000500	235.0	0.00010	0.00500	0.00468	0.03350
	YL2101004-001	10-Aug-21	-0.25	--	-0.250	--	0.011	0.0006	0.0020	0.029	-0.0005	-0.0003	0.558	0.0000250	158.0	0.00005	0.00250	0.00377	0.02680
	YL2101064-002	17-Aug-21	-0.25	--	-0.250	--	0.011	0.0006	0.0018	0.027	-0.0005	-0.0003	0.537	0.0000250	147.0	0.00005	0.00250	0.00363	0.02590
	YL2101117-002	24-Aug-21	-0.25	--	-0.250	--	0.013	0.0006	0.0020	0.027	-0.0005	-0.0003	0.553	0.0000250	158.0	0.00005	0.00250	0.00340	0.02390
	YL2101168-002	31-Aug-21	-0.25	--	-0.250	--	0.011	0.0007	0.0023	0.029	-0.0005	-0.0003	0.526	0.0000250	160.0	0.00005	0.00250	0.00388	0.02560
	YL2101233-002	7-Sep-21	-0.25	--	-0.250	--	0.011	0.0005	0.0019	0.026	-0.0005	-0.0003	0.544	0.0000250	154.0	0.00005	0.00250	0.00336	0.02080
	YL2101307-002	16-Sep-21	-0.50	--	-0.250	--	0.012	-0.0010	0.0018	0.029	-0.0010	-0.0005	0.607	0.0000500	154.0	0.00010	0.00500	0.00375	0.02310
	YL2101369-002	21-Sep-21	-0.25	--	-0.250	--	0.016	0.0006	0.0020	0.029	-0.0005	-0.0003	0.532	0.0000250	152.0	0.00005	0.00250	0.00350	0.02070
	YL2101438-002	28-Sep-21	-0.25	--	-0.250	--	0.011	0.0006	0.0022	0.029	-0.0005	-0.0003	0.561	0.0000250	157.0	0.00005	0.00250	0.00365	0.02020
TL-5	YL2100037-001	13-Jan-21	0.51	--	-0.500	--	0.093	0.0028	0.0038	0.036	-0.0010	-0.0005	0.944	0.0000500	188.0	0.00012	-0.00100	0.01170	0.42100
	YL2100125-001	24-Feb-21	0.86	--	1.0	--	0.075	0.0041	0.0027	0.045	-0.0010	-0.0005	1.180	0.0000500	215.0	0.00064	-0.00100	0.01410	0.54800
	YL2100160-001	9-Mar-21	0.88	--	1.1	--	0.064	0.0036	0.0025	0.043	-0.0010	-0.0005	1.130	0.0000500	208.0	0.00038	-0.00100	0.02950	0.12700
	--	20-Apr-21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	YL2100292-001	21-Apr-21	-0.50	--	-0.5	--	0.052	0.0043	0.0028	0.050	-0.0010	-0.0005	1.520	0.0000500	236.0	0.00012	0.00500	0.00770	0.04440
	YL2100435-001	22-May-21	0.7	--	0.8	--	0.076	0.0032	0.0029	0.049	-0.0010	-0.0005	1.220	0.0000500	243.0	0.00075	0.00500	0.01510	0.03160
	YL2100680-001	30-Jun-21	1.1	--	0.9	--	0.079	0.0036	0.0038	0.048	-0.0020	-0.0010	1.300	0.0001000	226.0	0.00109	0.01000	0.00531	0.10400
	YL2100774-001	12-Jul-21	0.5	--	0.6	--	0.033	0.0030	0.0023	0.052	-0.0010	-0.0005	1.290	0.0000500	223.0	0.00066	0.00500	0.01060	0.10100
	YL2101008-001	10-Aug-21	0.9	--	1.2	--	0.063	0.0030	0.0051	0.048	-0.0010	-0.0005	0.984	0.0000500	156.0	0.00022	0.00500	0.00785	0.02850
	YL2101368-001	20-Sep-21	0.6	--	0.6	--	0.064	0.0017	0.0027	0.032	-0.0005	-0.0003	1.150	0.0000250	157.0	0.00027	0.00250	0.00964	0.00651

Station	Lab Sample ID	Sample Date	Fe	Pb	Li	Mg	Mn	Hg	Mo	Ni	K	Rb	Se	Si	Ag	Na	Sr	S	Te	Tl
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
TL-1	YL2100036-001	13-Jan-21	0.11	-0.0003	0.0325	158.0	0.57400	0.00001	0.01000	0.01360	56.6	0.0174	0.0004	2.9	0.00005	1470.0	2.0	275	-0.0010	0.0001
	YL2100052-001	20-Jan-21	0.12	-0.0003	0.0357	170.0	0.56700	0.00001	0.01050	0.01480	56.3	0.0189	0.0004	2.8	0.00005	1520.0	2.2	283	-0.0010	0.0001
	YL2100062-001	26-Jan-21	0.14	-0.0003	0.0365	163.0	0.58200	0.00001	0.01040	0.01500	58.8	0.0200	0.0005	2.9	0.00005	1550.0	2.3	273	-0.0010	0.0001
	YL2100074-001	3-Feb-21	0.11	-0.0003	0.0369	164.0	0.53700	0.00001	0.00979	0.01350	58.2	0.0208	0.0005	2.8	0.00005	1510.0	2.3	274	-0.0010	0.0001
	YL2100092-001	10-Feb-21	0.34	0.0003	0.0369	176.0	0.64500	0.00001	0.00996	0.01470	64.4	0.0201	0.0008	3.2	0.00005	1650.0	2.2	290	0.0010	0.0001
	YL2100103-001	16-Feb-21	0.28	-0.0003	0.0346	174.0	0.58400	0.00001	0.00922	0.01240	61.7	0.0200	0.0005	3.1	0.00005	1610.0	2.3	277	-0.0010	0.0001
	YL2100122-001	24-Feb-21	0.10	-0.0003	0.0376	186.0	0.61500	0.00001	0.00933	0.01310	62.8	0.0199	0.0005	3.1	0.00005	1650.0	2.4	272	-0.0010	0.0001
	YL2100139-001	3-Mar-21	0.11	-0.0003	0.0367	187.0	0.59500	0.00001	0.00936	0.01290	61.9	0.0202	0.0003	3.0	0.00005	1660.0	2.3	272	-0.0010	0.0001
	YL2100158-001	9-Mar-21	0.12	-0.0003	0.0410	188.0	0.63400	0.00001	0.00908	0.01270	72.0	0.0222	0.0003	3.5	0.00005	1900.0	2.7	303	-0.0010	0.0001
	YL2100179-001	17-Mar-21	0.21	-0.0003	0.0385	197.0	0.67600	0.00001	0.00951	0.01410	64.9	0.0219	0.0005	3.3	0.00005	1800.0	2.5	267	-0.0010	0.0001
	YL2100197-001	24-Mar-21	0.19	-0.0003	0.0391	198.0	0.67800	0.00001	0.00924	0.01360	65.7	0.0223	0.0005	3.2	0.00005	1820.0	2.6	270	-0.0010	0.0001
	YL2100216-001	30-Mar-21	0.39	-0.0005	0.0420	192.0	0.69400	0.00001	0.00876	0.01370	64.7	0.0220	-0.0005	3.2	0.00010	1750.0	2.4	282	-0.0020	0.0001
	YL2100249-001	7-Apr-21	0.09	-0.0003	0.0447	226.0	0.71600	0.00001	0.01030	0.01430	75.3	0.0240	0.0003	3.8	0.00005	2040.0	2.9	315	-0.0010	0.0001
	YL2100271-001	15-Apr-21	-0.10	-0.0005	0.0456	226.0	0.77400	0.00001	0.01030	0.01460	78.4	0.0250	0.0005	3.8	0.00010	2080.0	2.9	322	-0.0020	0.0001
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	YL2100295-001	22-Apr-21	0.28	-0.0005	0.0398	207.0	0.72000	0.00001	0.00911	0.01420	67.4	0.0239	-0.0005	3.7	0.00010	1860.0	2.7	301	-0.0020	0.0001
	YL2100320-001	28-Apr-21	0.24	-0.0005	0.0401	203.0	0.70900	0.00001	0.00883	0.01370	65.8	0.0230	0.0006	3.1	0.00010	1930.0	2.8	287	-0.0020	0.0001
	YL2100352-001	5-May-21	0.18	-0.0005	0.0390	212.0	0.74600	0.00001	0.00957	0.01360	68.6	0.0258	-0.0005	3.6	0.00010	1860.0	2.8	293	-0.0020	0.0001
	YL2100379-001	11-May-21	0.18	-0.0003	0.0423	207.0	0.73000	0.00001	0.00942	0.01260	68.8	0.0231	0.0005	3.6	0.00005	1800.0	2.9	284	-0.0010	0.0001
	YL2100397-001	20-May-21	0.13	0.0001	0.0401	211.0	0.71800	0.00001	0.00919	0.01390	67.9	0.0235	0.0005	3.7	0.00003	1960.0	2.8	301	0.0004	0.0000
	YL2100429-001	26-May-21	-0.10	-0.0005	0.0369	213.0	0.71300	0.00001	0.00887	0.01370	64.6	0.0226	-0.0005	3.4	0.00010	2010.0	2.7	276	-0.0020	0.0001
	YL2100465-001	1-Jun-21	0.10	-0.0005	0.0400	214.0	0.73400	0.00001	0.00911	0.01410	70.3	0.0237	-0.0005	3.8	0.00010	1930.0	2.7	298	-0.0020	0.0001
	YL2100511-001	8-Jun-21	0.13	-0.0005	0.0439	222.0	0.75500	0.00001	0.01010	0.01410	71.7	0.0247	0.0007	3.6	0.00010	2000.0	2.9	287	-0.0020	0.0001
	YL2100564-001	15-Jun-21	0.36	-0.0005	0.0400	199.0	0.71800	0.00001	0.00875	0.01380	67.9	0.0229	0.0005	3.6	0.00010	1880.0	2.6	285	-0.0020	0.0001
	YL2100611-001	22-Jun-21	-0.10	-0.0005	0.0402	213.0	0.69800	0.00001	0.00964	0.01390	67.0	0.0200	-0.0005	3.7	0.00010	1880.0	2.7	286	-0.0020	0.0001
	YL2100671-001	29-Jun-21	0.15	-0.0005	0.0401	215.0	0.73800	0.00001	0.00914	0.01460	65.6	0.0230	-0.0005	3.6	0.00010	1900.0	2.6	287	-0.0020	0.0001
	YL2100709-001	6-Jul-21	0.14	-0.0005	0.0419	188.0	0.72400	0.00001	0.00891	0.01430	65.4	0.0216	0.0007	3.6	0.00010	1850.0	2.6	289	-0.0020	0.0001
	YL2100775-002	13-Jul-21	0.12	-0.0005	0.0382	187.0	0.70400	0.00001	0.01030	0.01370	63.9	0.0202	-0.0005	3.3	0.00010	1720.0	2.5	310	-0.0020	0.0001
	YL2100820-001	20-Jul-21	0.11	-0.0005	0.0317	186.0	0.68200	0.00001	0.01070	0.01380	64.6	0.0204	0.0005	3.4	0.00010	1770.0	2.4	296	-0.0020	0.0001
	YL2100908-001	31-Jul-21	0.20	-0.0005	0.0386	189.0	0.70000	0.00001	0.01030	0.01440	69.8	0.0214	-0.0005	3.6	0.00010	1870.0	2.5	310	-0.0020	0.0001
	YL2100930-001	3-Aug-21	-0.10	-0.0005	0.0387	189.0	0.67200	0.00001	0.01120	0.01320	62.4	0.0204	0.0007	3.4	0.00010	1680.0	2.5	305	-0.0020	0.0001
	YL2101004-001	10-Aug-21	0.05	-0.0003	0.0263	129.0	0.49900	0.00001	0.00918	0.00998	48.5	0.0153	-0.0003	2.5	0.00005	1250.0	1.6	249	-0.0010	0.0001
	YL2101064-002	17-Aug-21	-0.05	-0.0003	0.0240	113.0	0.44900	0.00001	0.00824	0.00866	43.0	0.0144	0.0003	2.2	0.00005	1080.0	1.4	241	-0.0010	0.0001
	YL2101117-002	24-Aug-21	0.07	-0.0003	0.0260	124.0	0.43000	0.00001	0.00863	0.00809	43.3	0.0141	-0.0003	2.1	0.00005	1110.0	1.6	228	-0.0010	0.0001
	YL2101168-002	31-Aug-21	-0.05	-0.0003	0.0254	122.0	0.45000	0.00001	0.00927	0.01020	50.6	0.0154	0.0004	2.2	0.00005	1230.0	1.6	247	-0.0010	0.0001
	YL2101233-002	7-Sep-21	0.06	-0.0003	0.0270	117.0	0.37000	0.00001	0.00824	0.00819	42.5	0.0132	0.0003	2.2	0.00005	1080.0	1.5	234	-0.0010	0.0001
	YL2101307-002	16-Sep-21	-0.10	-0.0005	0.0264	132.0	0.42300	0.00001	0.00836	0.00688	48.6	0.0144	-0.0005	2.2	0.00010	1310.0	1.5	242	-0.0020	0.0001
	YL2101369-002	21-Sep-21	-0.05	-0.0003	0.0242	119.0	0.39800	0.00001	0.00836	0.00852	46.3	0.0144	0.0003	2.3	0.00005	1210.0	1.6	238	-0.0010	0.0001
	YL2101438-002	28-Sep-21	-0.05	-0.0003	0.0254	118.0	0.39900	0.00001	0.00798	0.00804	46.0	0.0139	-0.0003	2.3	0.00005	1320.0	1.5	254	-0.0010	0.0001
TL-5	YL2100037-001	13-Jan-21	1.27	-0.0005	0.0377	159.0	0.14200	0.00001	0.02910	0.14400	113.0	0.0278	0.0028	1.2	0.00014	2100.0	1.6	701	-0.0020	0.0001
	YL2100125-001	24-Feb-21	1.69	-0.0005	0.0425	189.0	0.19200	0.00001	0.02860	0.10500	125.0	0.0565	0.0047	1.1	0.00010	2390.0	2.0	711	-0.0020	0.0001
	YL2100160-001	9-Mar-21	1.08	-0.0005	0.0398	198.0	0.17900	0.00005	0.02710	0.08640	127.0	0.0327	0.0047	1.2	0.00032	2720.0	2.1	832	-0.0020	0.0001
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	YL2100292-001	21-Apr-21	0.64	-0.0005	0.0558	193.0	0.28900	0.00001	0.03290	0.01260	103.0	0.0440	0.0050	1.7	0.00010	2900.0	2.2	965	-0.0020	0.0001
	YL2100435-001	22-May-21	0.57	-0.0005	0.0445	216.0	0.22700	0.00005	0.02510	0.02750	120.0	0.0496	0.0020	1.4	0.00010	2700.0	2.2	656	-0.0020	0.0001
	YL2100680-001	30-Jun-21	0.46	-0.0010	0.0417	221.0	0.21500	0.00001	0.02440	0.03710	119.0	0.0730	0.0032	1.5	0.00020	2570.0	2.1	719	-0.0040	0.0002
	YL2100774-001	12-Jul-21	0.55	-0.0005	0.0533	200.0	0.29800	0.00001	0.03430	0.06620	122.0	0.0527	0.0030	2.2	0.00010	2390.0	2.2	697	-0.0020	0.0001
	YL2101008-001	10-Aug-21	0.42	-0.0005	0.0459	156.0	0.18000	0.00003	0.02890	0.02740	118.0	0.0515	0.0016	1.9	0.00012	2210.0	1.5	746	-0.0020	0.0001
	YL2101368-001	20-Sep-21	0.35	-0.0003	0.0304	125.0	0.15700	0.00003	0.02050	0.00633	104.0	0.0479	0.0015	1.7	0.00005	1620.0	1.3	515	-0.0010	0.0001

Station	Lab Sample ID	Sample Date	Total Metals																	
			Th	Sn	Ti	W	U	V	Zn	Zr	Al	Sb	As	Ba	Be	Bi	B	Cd	Ca	Cs
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
TL-1	YL2100036-001	13-Jan-21	-0.0005	-0.0005	-0.0015	0.0015	0.0003	0.0025	0.0054	-0.0010	0.08	0.0007	0.0032	0.0322	-0.0005	-0.0003	0.7	0.000025	203.0	0.00005
	YL2100052-001	20-Jan-21	-0.0005	-0.0005	-0.0015	0.0020	0.0003	0.0025	0.0064	-0.0010	0.15	0.0007	0.0032	0.0359	-0.0005	-0.0003	0.8	0.000025	231.0	0.00005
	YL2100062-001	26-Jan-21	-0.0005	-0.0005	-0.0015	0.0023	0.0003	0.0025	0.0062	-0.0010	0.17	0.0008	0.0034	0.0371	-0.0005	-0.0003	0.7	0.000025	240.0	0.00010
	YL2100074-001	3-Feb-21	-0.0005	-0.0005	-0.0015	0.0020	0.0003	0.0025	0.0053	-0.0010	0.09	0.0006	0.0025	0.0351	-0.0005	-0.0003	0.8	0.000025	238.0	0.00005
	YL2100092-001	10-Feb-21	0.0005	0.0005	0.0015	0.0020	0.0003	0.0025	0.0098	0.0010	0.10	0.0006	0.0028	0.0352	-0.0005	-0.0003	0.8	0.000025	248.0	0.00005
	YL2100103-001	16-Feb-21	-0.0005	-0.0005	-0.0015	0.0023	0.0002	0.0025	0.0224	-0.0010	0.24	0.0006	0.0036	0.0389	-0.0005	-0.0003	0.8	0.000028	236.0	0.00005
	YL2100122-001	24-Feb-21	-0.0005	-0.0005	-0.0015	0.0021	0.0002	0.0025	0.0060	-0.0010	0.14	0.0006	0.0029	0.0369	-0.0005	-0.0003	0.9	0.000025	225.0	0.00005
	YL2100139-001	3-Mar-21	-0.0005	-0.0005	-0.0015	0.0025	0.0002	0.0025	0.0083	-0.0010	0.30	0.0006	0.0034	0.0390	-0.0005	-0.0003	0.9	0.000030	249.0	0.00005
	YL2100158-001	9-Mar-21	-0.0005	-0.0005	-0.0015	0.0026	0.0003	0.0025	0.0101	-0.0010	0.22	0.0006	0.0030	0.0367	-0.0005	-0.0003	1.0	0.000025	255.0	0.00005
	YL2100179-001	17-Mar-21	-0.0005	-0.0005	-0.0015	0.0023	0.0002	0.0025	0.0182	-0.0010	0.22	0.0006	0.0028	0.0385	-0.0005	-0.0003	0.9	0.000025	225.0	0.00005
	YL2100197-001	24-Mar-21	-0.0005	-0.0005	-0.0015	0.0023	0.0002	0.0025	0.0093	-0.0010	0.23	0.0006	0.0028	0.0373	-0.0005	-0.0003	0.9	0.000027	228.0	0.00005
	YL2100216-001	30-Mar-21	-0.0010	-0.0010	-0.0030	0.0022	0.0002	0.0050	0.0199	-0.0020	0.25	0.0006	0.0029	0.0379	-0.0005	-0.0003	0.9	0.000025	260.0	0.00005
	YL2100249-001	7-Apr-21	-0.0005	-0.0005	-0.0015	0.0025	0.0002	0.0025	0.0087	-0.0010	0.17	-0.0010	0.0027	0.0374	-0.0010	-0.0005	0.9	0.000050	218.0	0.00010
	YL2100271-001	15-Apr-21	-0.0010	-0.0010	-0.0030	0.0035	0.0003	0.0050	0.0100	-0.0020	0.37	-0.0010	0.0032	0.0438	-0.0010	-0.0005	0.9	0.000050	233.0	0.00010
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	YL2100295-001	22-Apr-21	-0.0010	-0.0010	-0.0030	0.0028	0.0003	0.0050	0.0169	-0.0020	0.12	0.0007	0.0030	0.0437	-0.0005	-0.0003	1.0	0.000025	257.0	0.00005
	YL2100320-001	28-Apr-21	-0.0010	-0.0010	-0.0030	0.0032	0.0002	0.0050	0.0164	-0.0020	0.37	0.0006	0.0029	0.0386	-0.0005	-0.0003	0.9	0.000026	251.0	0.00006
	YL2100352-001	5-May-21	-0.0010	-0.0010	-0.0030	0.0030	0.0002	0.0050	0.0103	-0.0020	0.17	-0.0010	0.0032	0.0460	-0.0010	-0.0005	1.1	0.000050	282.0	0.00010
	YL2100379-001	11-May-21	-0.0005	-0.0005	-0.0015	0.0032	0.0002	0.0025	0.0086	-0.0010	0.11	0.0006	0.0028	0.0442	-0.0005	-0.0003	1.1	0.000025	264.0	0.00007
	YL2100397-001	20-May-21	0.0002	0.0002	-0.0006	0.0033	0.0002	-0.0010	0.0091	0.0004	0.11	0.0007	0.0027	0.0465	-0.0005	-0.0003	0.9	0.000033	254.0	0.00005
	YL2100429-001	26-May-21	-0.0010	-0.0010	-0.0030	0.0032	0.0002	0.0050	0.0100	-0.0020	0.20	0.0007	0.0028	0.0429	-0.0005	-0.0003	1.0	0.000025	235.0	0.00005
	YL2100465-001	1-Jun-21	-0.0010	-0.0010	-0.0030	0.0032	0.0002	0.0050	0.0149	-0.0020	0.31	-0.0010	0.0028	0.0422	-0.0010	-0.0005	1.0	0.000050	250.0	0.00010
	YL2100511-001	8-Jun-21	-0.0010	-0.0010	-0.0030	0.0035	0.0003	0.0050	0.0100	-0.0020	0.29	0.0007	0.0031	0.0473	-0.0005	-0.0003	1.1	0.000025	272.0	0.00006
	YL2100564-001	15-Jun-21	-0.0010	-0.0010	-0.0030	0.0031	0.0002	0.0050	0.0121	-0.0020	0.17	-0.0010	0.0027	0.0464	-0.0010	-0.0005	0.9	0.000050	248.0	0.00010
	YL2100611-001	22-Jun-21	-0.0010	-0.0010	-0.0030	0.0031	0.0002	0.0050	0.0117	-0.0020	0.13	-0.0010	0.0028	0.0441	-0.0010	-0.0005	1.1	0.000050	264.0	0.00010
	YL2100671-001	29-Jun-21	-0.0010	-0.0010	-0.0030	0.0030	0.0002	0.0050	0.0159	-0.0020	0.23	-0.0010	0.0028	0.0456	-0.0010	-0.0005	1.0	0.000050	259.0	0.00010
	YL2100709-001	6-Jul-21	-0.0010	-0.0010	-0.0030	0.0028	0.0002	0.0050	0.0150	-0.0020	0.16	-0.0010	0.0024	0.0442	-0.0010	-0.0005	1.0	0.000050	259.0	0.00010
	YL2100775-002	13-Jul-21	-0.0010	-0.0010	-0.0030	0.0024	0.0003	0.0050	0.0100	-0.0020	0.19	-0.0010	0.0029	0.0435	-0.0010	-0.0005	0.9	0.000050	251.0	0.00010
	YL2100820-001	20-Jul-21	-0.0010	-0.0010	-0.0030	0.0022	0.0002	0.0050	0.0100	-0.0020	0.25	-0.0010	0.0026	0.0450	-0.0010	-0.0005	0.8	0.000050	235.0	0.00010
	YL2100908-001	31-Jul-21	-0.0010	-0.0010	-0.0030	0.0022	0.0002	0.0050	0.0100	-0.0020	0.40	-0.0010	0.0030	0.0433	-0.0010	-0.0005	0.9	0.000050	242.0	0.00010
	YL2100930-001	3-Aug-21	-0.0010	-0.0010	-0.0030	0.0018	0.0003	0.0050	0.0100	-0.0020	0.17	-0.0010	0.0026	0.0399	-0.0010	-0.0005	0.8	0.000050	225.0	0.00010
	YL2101004-001	10-Aug-21	-0.0005	-0.0005	-0.0015	0.0012	0.0002	0.0025	0.0050	-0.0010	0.18	0.0006	0.0022	0.0299	-0.0005	-0.0003	0.6	0.000025	164.0	0.00005
	YL2101064-002	17-Aug-21	-0.0005	-0.0005	-0.0015	0.0011	0.0002	0.0025	0.0050	-0.0010	0.13	0.0006	0.0022	0.0274	-0.0005	-0.0003	0.5	0.000025	152.0	0.00005
	YL2101117-002	24-Aug-21	-0.0005	-0.0005	-0.0015	0.0014	0.0002	0.0025	0.0050	-0.0010	0.33	0.0006	0.0022	0.0290	-0.0005	-0.0003	0.6	0.000025	159.0	0.00005
	YL2101168-002	31-Aug-21	-0.0005	-0.0005	-0.0015	0.0015	0.0002	0.0025	0.0050	-0.0010	0.11	0.0007	0.0024	0.0295	-0.0005	-0.0003	0.6	0.000025	190.0	0.00005
	YL2101233-002	7-Sep-21	-0.0005	-0.0005	-0.0015	0.0012	0.0002	0.0025	0.0050	-0.0010	0.08	0.0006	0.0022	0.0268	-0.0005	-0.0003	0.6	0.000025	154.0	0.00005
	YL2101307-002	16-Sep-21	-0.0010	-0.0010	-0.0030	0.0013	0.0002	0.0050	0.0100	-0.0020	0.07	0.0006	0.0022	0.0281	-0.0005	-0.0003	0.5	0.000025	149.0	0.00005
	YL2101369-002	21-Sep-21	-0.0005	-0.0005	-0.0015	0.0013	0.0002	0.0025	0.0051	-0.0010	0.07	0.0006	0.0023	0.0280	-0.0005	-0.0003	0.5	0.000025	155.0	0.00005
	YL2101438-002	28-Sep-21	-0.0005	-0.0005	-0.0015	0.0014	0.0002	0.0025	0.0050	-0.0010	0.04	0.0006	0.0020	0.0268	-0.0005	-0.0003	0.6	0.000025	160.0	0.00005
TL-5	YL2100037-001	13-Jan-21	-0.0010	-0.0010	-0.0030	0.0039	0.0007	0.0050	0.0100	-0.0020	0.13	0.0028	0.0052	0.0360	-0.0010	-0.0005	0.9	0.000050	177.0	0.00010
	YL2100125-001	24-Feb-21	-0.0010	-0.0010	-0.0030	0.0058	0.0003	0.0050	0.0100	-0.0020	6.32	0.0041	0.0115	0.0520	-0.0010	-0.0005	1.1	0.000063	248.0	0.00073
	YL2100160-001	9-Mar-21	-0.0010	-0.0010	-0.0030	0.0040	0.0007	0.0050	0.0100	-0.0020	0.33	0.0036	0.0207	0.0474	-0.0010	-0.0005	1.3	0.000050	231.0	0.00035
	--	20-Apr-21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	YL2100292-001	21-Apr-21	-0.0010	-0.0010	-0.0030	0.0050	0.0004	0.0050	0.0100	-0.0020	0.87	0.0050	0.0122	0.0608	-0.0010	-0.0005	1.4	0.000066	264.0	0.00030
	YL2100435-001	22-May-21	-0.0010	-0.0010	-0.0030	0.0066	0.0003	0.0050	0.0100	-0.0020	0.13	0.0031	0.0055	0.0495	-0.0010	-0.0005	1.3	0.000050	226.0	0.00068
	YL2100680-001	30-Jun-21	-0.0020	-0.0020	-0.0060	0.0032	0.0003	0.0100	0.0200	-0.0040	0.72	0.0040	0.0050	0.0520	-0.0010	-0.0005	1.4	0.000050	237.0	0.00116
	YL2100774-001	12-Jul-21	-0.0010	-0.0010	-0.0030	0.0023	0.0004	0.0050	0.0100	-0.0020	0.84	0.0034	0.0228	0.0543	-0.0010	-0.0005	1.4	-0.000130	239.0	0.00070
	YL2101008-001	10-Aug-21	-0.0010	-0.0010	-0.0030	0.0036	0.0003	0.0050	0.0100	-0.0020	0.28	0.0040	0.0315	0.0472	-0.0010	-0.0005	0.9	0.000086	149.0	0.00042
	YL2101368-001	20-Sep-21	-0.0005	-0.0005	-0.0015	0.0019	0.0002	0.0025	0.0050	-0.0010	1.34	0.0029	0.0281	0.0337	-0.0005	0.0003	1.1	0.000127	161.0	0.00067

Station	Lab Sample ID	Sample Date	Cr	Co	Cu	Fe	Pb	Li	Mg	Mn	Hg	Mo	Ni	K	Rb	Se	Si	Ag	Na	Sr
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
TL-1	YL2100036-001	13-Jan-21	0.0006	0.0050	0.0878	0.7	-0.0003	0.0302	157.0	0.578	0.00001	0.01040	0.01550	55.2	0.0192	0.0005	3.0	0.00010	1370.0	2.1
	YL2100052-001	20-Jan-21	0.0005	0.0053	0.0953	0.9	0.0003	0.0373	178.0	0.653	0.00001	0.01040	0.01650	65.4	0.0200	0.0006	3.2	0.00009	1560.0	2.3
	YL2100062-001	26-Jan-21	0.0009	0.0055	0.0901	1.1	0.0003	0.0402	180.0	0.641	0.00001	0.01170	0.01810	63.8	0.0214	0.0007	3.5	0.00009	1680.0	2.5
	YL2100074-001	3-Feb-21	-0.0005	0.0046	0.0650	0.7	-0.0003	0.0384	178.0	0.619	0.00001	0.01050	0.01490	60.8	0.0208	0.0005	3.4	0.00005	1630.0	2.4
	YL2100092-001	10-Feb-21	0.0007	0.0049	0.0719	0.7	-0.0003	0.0375	178.0	0.657	0.00001	0.00996	0.01520	68.1	0.0207	0.0005	3.4	0.00009	1650.0	2.4
	YL2100103-001	16-Feb-21	0.0008	0.0051	0.0942	1.1	0.0003	0.0376	188.0	0.620	0.00001	0.01050	0.01490	62.8	0.0217	0.0004	3.9	0.00014	1780.0	2.5
	YL2100122-001	24-Feb-21	0.0008	0.0046	0.0977	0.9	0.0003	0.0381	185.0	0.640	0.00001	0.00968	0.01450	63.0	0.0210	0.0004	3.5	0.00010	1630.0	2.6
	YL2100139-001	3-Mar-21	0.0012	0.0051	0.1830	1.8	0.0005	0.0397	193.0	0.646	0.00001	0.00979	0.01550	64.3	0.0206	0.0006	3.8	0.00012	1640.0	2.5
	YL2100158-001	9-Mar-21	0.0009	0.0049	0.1680	1.1	0.0003	0.0421	203.0	0.670	0.00001	0.01070	0.01420	73.2	0.0247	0.0005	3.5	0.00012	1920.0	2.7
	YL2100179-001	17-Mar-21	0.0006	0.0051	0.1060	1.1	-0.0003	0.0389	185.0	0.654	0.00001	0.00948	0.01430	61.0	0.0218	0.0003	3.8	0.00008	1680.0	2.6
	YL2100197-001	24-Mar-21	-0.0005	0.0048	0.0900	1.2	0.0003	0.0366	187.0	0.669	0.00001	0.00901	0.01440	63.4	0.0229	0.0005	3.7	0.00007	1750.0	2.6
	YL2100216-001	30-Mar-21	0.0007	0.0048	0.0903	1.0	-0.0003	0.0422	202.0	0.685	0.00001	0.01010	0.01430	67.1	0.0240	0.0005	3.7	0.00008	1820.0	2.7
	YL2100249-001	7-Apr-21	-0.0010	0.0046	0.0879	0.8	-0.0005	0.0409	187.0	0.658	0.00001	0.00881	0.01400	63.4	0.0216	-0.0005	3.7	0.00010	1830.0	2.5
	YL2100271-001	15-Apr-21	0.0010	0.0057	0.1040	1.3	0.0005	0.0421	203.0	0.715	0.00001	0.00960	0.01500	70.5	0.0248	0.0007	4.0	0.00013	2030.0	2.4
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	YL2100295-001	22-Apr-21	0.0025	0.0050	0.0860	0.9	0.0003	0.0437	205.0	0.734	0.00001	0.00995	0.01500	68.6	0.0241	0.0005	3.9	0.00009	1950.0	2.9
	YL2100320-001	28-Apr-21	0.0025	0.0051	0.0860	1.5	0.0003	0.0414	212.0	0.713	0.00001	0.00910	0.01480	64.0	0.0236	0.0006	4.1	0.00012	1870.0	2.7
	YL2100352-001	5-May-21	0.0050	0.0050	0.0799	1.0	-0.0005	0.0491	240.0	0.807	0.00001	0.01000	0.01530	82.3	0.0265	0.0005	4.8	0.00010	2260.0	3.0
	YL2100379-001	11-May-21	0.0025	0.0049	0.0780	0.9	-0.0003	0.0446	224.0	0.787	0.00001	0.00960	0.01460	74.6	0.0256	0.0004	4.2	0.00007	2060.0	3.0
	YL2100397-001	20-May-21	0.0025	0.0049	0.0787	0.8	-0.0003	0.0388	222.0	0.749	0.00001	0.00990	0.01420	72.9	0.0244	0.0005	4.1	0.00006	1950.0	3.0
	YL2100429-001	26-May-21	0.0025	0.0049	0.0778	1.2	-0.0003	0.0380	199.0	0.723	0.00001	0.00961	0.01440	67.0	0.0222	0.0005	3.8	0.00009	1850.0	2.8
	YL2100465-001	1-Jun-21	0.0050	0.0049	0.0779	1.4	-0.0005	0.0437	198.0	0.710	0.00001	0.00911	0.01400	63.5	0.0238	-0.0005	4.1	0.00010	1810.0	2.8
	YL2100511-001	8-Jun-21	0.0025	0.0054	0.0794	1.1	-0.0003	0.0452	225.0	0.786	0.00001	0.01080	0.01540	77.2	0.0251	0.0004	4.5	0.00010	2060.0	3.1
	YL2100564-001	15-Jun-21	0.0050	0.0050	0.0700	1.1	-0.0005	0.0404	201.0	0.751	0.00001	0.00942	0.01480	71.6	0.0229	-0.0005	4.2	0.00010	1920.0	2.8
	YL2100611-001	22-Jun-21	0.0050	0.0053	0.0688	1.0	-0.0005	0.0465	224.0	0.782	0.00001	0.01050	0.01550	75.0	0.0235	0.0007	4.4	0.00010	2100.0	2.9
	YL2100671-001	29-Jun-21	0.0050	0.0052	0.0725	1.1	-0.0005	0.0411	211.0	0.753	0.00001	0.00993	0.01480	66.9	0.0231	-0.0005	4.1	0.00010	1920.0	3.0
	YL2100709-001	6-Jul-21	0.0050	0.0048	0.0653	1.1	-0.0005	0.0417	198.0	0.736	0.00001	0.00928	0.01450	66.3	0.0227	-0.0005	4.3	0.00010	1840.0	2.7
	YL2100775-002	13-Jul-21	0.0050	0.0057	0.0892	1.2	-0.0005	0.0409	196.0	0.740	0.00001	0.01030	0.01540	73.0	0.0225	-0.0005	3.9	0.00010	1800.0	2.6
	YL2100820-001	20-Jul-21	0.0050	0.0055	0.0855	0.9	-0.0005	0.0337	192.0	0.727	0.00001	0.01120	0.01580	71.7	0.0220	0.0009	3.6	0.00010	1820.0	2.5
	YL2100908-001	31-Jul-21	0.0050	0.0056	0.0842	1.1	-0.0005	0.0402	202.0	0.750	0.00001	0.01040	0.01610	69.9	0.0224	-0.0005	4.2	0.00010	1820.0	2.5
	YL2100930-001	3-Aug-21	0.0050	0.0049	0.0805	0.9	-0.0005	0.0382	182.0	0.708	0.00001	0.01030	0.01500	63.8	0.0209	-0.0005	3.8	0.00010	1690.0	2.3
	YL2101004-001	10-Aug-21	0.0025	0.0039	0.0561	0.6	-0.0003	0.0263	124.0	0.495	0.00001	0.00866	0.01120	46.0	0.0148	0.0004	2.7	0.00005	1200.0	1.6
	YL2101064-002	17-Aug-21	0.0025	0.0036	0.0469	0.4	-0.0003	0.0244	117.0	0.479	0.00001	0.00843	0.00965	44.2	0.0141	0.0004	2.4	0.00005	1090.0	1.5
	YL2101117-002	24-Aug-21	0.0025	0.0039	0.0464	0.8	0.0003	0.0260	122.0	0.487	0.00001	0.00879	0.01020	47.1	0.0153	0.0003	2.8	0.00005	1190.0	1.6
	YL2101168-002	31-Aug-21	0.0025	0.0041	0.0483	0.4	-0.0003	0.0274	133.0	0.498	0.00001	0.00916	0.01160	53.8	0.0163	0.0004	2.5	0.00005	1320.0	1.7
	YL2101233-002	7-Sep-21	0.0025	0.0037	0.0426	1.6	-0.0003	0.0266	114.0	0.453	0.00001	0.00851	0.01080	44.9	0.0144	0.0003	2.5	0.00005	1170.0	1.6
	YL2101307-002	16-Sep-21	0.0025	0.0036	0.0386	0.3	-0.0003	0.0243	116.0	0.448	0.00001	0.00784	0.00942	41.3	0.0143	0.0004	2.4	0.00005	1100.0	1.5
	YL2101369-002	21-Sep-21	0.0025	0.0038	0.0369	0.3	-0.0003	0.0246	124.0	0.469	0.00001	0.00819	0.00997	49.9	0.0155	0.0003	2.6	0.00005	1240.0	1.5
	YL2101438-002	28-Sep-21	0.0025	0.0038	0.0326	0.2	-0.0003	0.0258	116.0	0.445	0.00001	0.00847	0.00964	44.2	0.0141	0.0003	2.5	0.00005	1160.0	1.5
TL-5	YL2100037-001	13-Jan-21	-0.0010	0.0127	0.5550	1.6	-0.0005	0.0340	152.0	0.138	0.00005	0.03060	0.14100	111.0	0.0254	0.0035	1.4	0.00083	1940.0	1.6
	YL2100125-001	24-Feb-21	0.0199	0.0232	0.6170	43.2	0.0011	0.0500	204.0	1.250	0.00005	0.03070	0.12700	128.0	0.0583	0.0055	7.3	0.00080	2420.0	2.1
	YL2100160-001	9-Mar-21	0.0025	0.0367	0.1120	5.9	0.0007	0.0435	203.0	0.237	0.00005	0.02770	0.09540	129.0	0.0351	0.0055	1.5	0.00039	2790.0	2.1
	--	20-Apr-21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	YL2100292-001	21-Apr-21	0.0050	0.0130	0.1760	9.0	0.0013	0.0579	239.0	0.509	0.00001	0.03550	0.01870	124.0	0.0541	0.0045	3.7	0.00033	3340.0	2.6
	YL2100435-001	22-May-21	0.0050	0.0155	0.0314	1.4	-0.0005	0.0431	209.0	0.221	0.00001	0.02520	0.02820	116.0	0.0444	0.0019	1.4	0.00010	2510.0	2.2
	YL2100680-001	30-Jun-21	0.0050	0.0069	0.1040	4.8	-0.0005	0.0423	216.0	0.316	0.00001	0.02610	0.03820	121.0	0.0759	0.0034	2.3	0.00012	2680.0	2.3
	YL2100774-001	12-Jul-21	0.0056	0.0187	0.1300	8.8	0.0012	0.0585	205.0	0.397	0.00001	0.03480	0.07790	135.0	0.0542	0.0032	3.2	0.00032	2550.0	2.4
	YL2101008-001	10-Aug-21	0.0050	0.0134	0.1030	5.4	0.0006	0.0442	146.0	0.198	0.00005	0.02940	0.03820	107.0	0.0473	0.0027	2.5	0.00057	2030.0	1.5
	YL2101368-001	20-Sep-21	0.0111	0.0219	0.1370	16.5	0.0014	0.0314	132.0	0.428	0.00010	0.02150	0.01660	112.0	0.0502	0.0027	3.5	0.00061	1740.0	1.3

Station	Lab Sample ID	Sample Date	S	Te	Tl	Th	Sn	Ti	W	U	V	Zn	Zr
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
TL-1	YL2100036-001	13-Jan-21	274.0	-0.0010	0.0001	-0.0005	-0.0005	0.0019	0.0016	0.0002	0.0025	0.0150	-0.0010
	YL2100052-001	20-Jan-21	291.0	-0.0010	0.0001	-0.0005	-0.0005	-0.0015	0.0022	0.0002	0.0025	0.0150	-0.0010
	YL2100062-001	26-Jan-21	314.0	-0.0010	0.0001	-0.0005	-0.0005	-0.0015	0.0026	0.0003	0.0025	0.0150	-0.0010
	YL2100074-001	3-Feb-21	294.0	-0.0010	0.0001	-0.0005	-0.0005	-0.0015	0.0020	0.0003	0.0025	0.0150	-0.0010
	YL2100092-001	10-Feb-21	287.0	-0.0010	0.0001	-0.0005	-0.0005	-0.0015	0.0023	0.0002	0.0025	0.0150	-0.0010
	YL2100103-001	16-Feb-21	285.0	-0.0010	0.0001	-0.0005	-0.0005	0.0046	0.0028	0.0003	0.0025	0.0150	-0.0010
	YL2100122-001	24-Feb-21	284.0	-0.0010	0.0001	-0.0005	-0.0005	0.0024	0.0023	0.0003	0.0025	0.0150	-0.0010
	YL2100139-001	3-Mar-21	266.0	-0.0010	0.0001	-0.0005	-0.0005	-0.0057	0.0026	0.0002	0.0025	0.0175	-0.0010
	YL2100158-001	9-Mar-21	304.0	-0.0010	0.0001	-0.0005	-0.0005	0.0028	0.0027	0.0002	0.0025	0.0150	-0.0010
	YL2100179-001	17-Mar-21	276.0	-0.0010	0.0001	-0.0005	-0.0005	0.0022	0.0025	0.0003	0.0025	0.0150	-0.0010
	YL2100197-001	24-Mar-21	271.0	-0.0010	0.0001	-0.0005	-0.0005	0.0036	0.0025	0.0002	0.0025	0.0150	-0.0010
	YL2100216-001	30-Mar-21	293.0	-0.0010	0.0001	-0.0005	-0.0005	0.0045	0.0024	0.0003	0.0025	0.0150	-0.0010
	YL2100249-001	7-Apr-21	262.0	-0.0020	0.0001	-0.0010	-0.0010	-0.0030	0.0024	0.0002	0.0050	0.0300	-0.0020
	YL2100271-001	15-Apr-21	284.0	-0.0020	0.0001	-0.0010	-0.0010	0.0039	0.0030	0.0003	0.0050	0.0300	-0.0020
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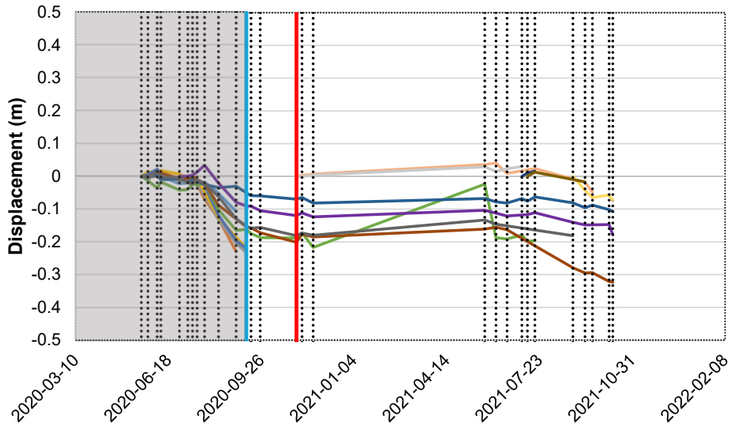
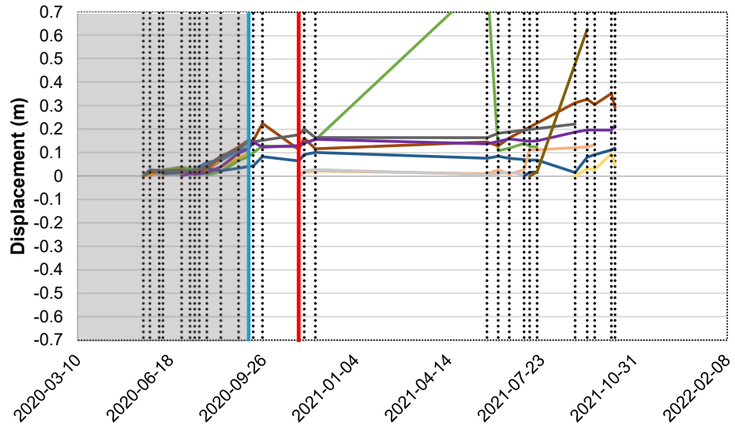
	YL2100295-001	22-Apr-21	296.0	-0.0010	0.0001	-0.0005	-0.0005	-0.0015	0.0032	0.0003	0.0025	0.0150	-0.0010
	YL2100320-001	28-Apr-21	304.0	-0.0010	0.0001	-0.0005	-0.0005	0.0052	0.0033	0.0002	0.0025	0.0150	-0.0010
	YL2100352-001	5-May-21	355.0	-0.0020	0.0001	-0.0010	-0.0010	-0.0030	0.0032	0.0003	0.0050	0.0300	-0.0020
	YL2100379-001	11-May-21	316.0	-0.0010	0.0001	-0.0005	-0.0005	-0.0015	0.0034	0.0003	0.0025	0.0150	-0.0010
	YL2100397-001	20-May-21	315.0	-0.0010	0.0001	-0.0005	-0.0005	0.0017	0.0038	0.0003	0.0025	0.0185	-0.0010
	YL2100429-001	26-May-21	308.0	-0.0010	0.0001	-0.0005	-0.0005	0.0023	0.0036	0.0002	0.0025	0.0150	-0.0010
	YL2100465-001	1-Jun-21	283.0	-0.0020	0.0001	-0.0010	-0.0010	-0.0030	0.0035	0.0003	0.0050	0.0300	-0.0020
	YL2100511-001	8-Jun-21	314.0	-0.0010	0.0001	-0.0005	-0.0005	0.0032	0.0037	0.0003	0.0025	0.0150	-0.0010
	YL2100564-001	15-Jun-21	297.0	-0.0020	0.0001	-0.0010	-0.0010	-0.0030	0.0033	0.0003	0.0050	0.0300	-0.0020
	YL2100611-001	22-Jun-21	343.0	-0.0020	0.0001	-0.0010	-0.0010	-0.0030	0.0033	0.0003	0.0050	0.0300	-0.0020
	YL2100671-001	29-Jun-21	304.0	-0.0020	0.0001	-0.0010	-0.0010	-0.0030	0.0032	0.0003	0.0050	0.0300	-0.0020
	YL2100709-001	6-Jul-21	308.0	-0.0020	0.0001	-0.0010	-0.0010	-0.0030	0.0032	0.0002	0.0050	0.0300	-0.0020
	YL2100775-002	13-Jul-21	320.0	-0.0020	0.0001	-0.0010	-0.0010	0.0037	0.0027	0.0003	0.0050	0.0300	-0.0020
	YL2100820-001	20-Jul-21	322.0	-0.0020	0.0001	-0.0010	-0.0010	0.0034	0.0024	0.0003	0.0050	0.0300	-0.0020
	YL2100908-001	31-Jul-21	321.0	-0.0020	0.0001	-0.0010	-0.0010	0.0041	0.0023	0.0003	0.0050	0.0300	-0.0020
	YL2100930-001	3-Aug-21	314.0	-0.0020	0.0001	-0.0010	-0.0010	-0.0030	0.0022	0.0003	0.0050	0.0300	-0.0020
	YL2101004-001	10-Aug-21	246.0	-0.0010	0.0001	-0.0005	-0.0005	0.0041	0.0013	0.0002	0.0025	0.0150	-0.0010
	YL2101064-002	17-Aug-21	248.0	-0.0010	0.0001	-0.0005	-0.0005	0.0030	0.0012	0.0002	0.0025	0.0150	-0.0010
	YL2101117-002	24-Aug-21	240.0	-0.0010	0.0001	-0.0005	-0.0005	-0.0087	0.0016	0.0002	0.0025	0.0150	-0.0010
	YL2101168-002	31-Aug-21	253.0	-0.0010	0.0001	-0.0005	-0.0005	0.0025	0.0015	0.0002	0.0025	0.0150	-0.0010
	YL2101233-002	7-Sep-21	248.0	-0.0010	0.0001	-0.0005	-0.0005	0.0019	0.0012	0.0002	0.0025	0.0150	-0.0010
	YL2101307-002	16-Sep-21	221.0	-0.0010	0.0001	-0.0005	-0.0005	-0.0015	0.0013	0.0002	0.0025	0.0150	-0.0010
	YL2101369-002	21-Sep-21	247.0	-0.0010	0.0001	-0.0005	-0.0005	-0.0015	0.0013	0.0002	0.0025	0.0150	-0.0010
	YL2101438-002	28-Sep-21	241.0	-0.0010	0.0001	-0.0005	-0.0005	-0.0015	0.0013	0.0002	0.0025	0.0150	-0.0010
TL-5	YL2100037-001	13-Jan-21	729.0	-0.0020	0.0001	-0.0010	-0.0010	-0.0030	0.0040	0.0007	0.0050	0.0300	-0.0020
	YL2100125-001	24-Feb-21	784.0	-0.0020	0.0001	-0.0010	-0.0010	0.0332	0.0067	0.0003	0.0182	0.0420	-0.0020
	YL2100160-001	9-Mar-21	887.0	-0.0020	0.0001	-0.0010	-0.0010	0.0032	0.0042	0.0007	0.0050	0.0300	-0.0020
	--	20-Apr-21	--	--	--	--	--	--	--	--	--	--	--
	YL2100292-001	21-Apr-21	1090.0	-0.0020	0.0001	-0.0010	-0.0010	-0.0225	0.0055	0.0004	0.0050	0.0300	-0.0020
	YL2100435-001	22-May-21	660.0	-0.0020	0.0001	-0.0010	-0.0010	-0.0030	0.0067	0.0003	0.0050	0.0300	-0.0020
	YL2100680-001	30-Jun-21	741.0	-0.0020	0.0001	-0.0010	-0.0010	0.0038	0.0034	0.0004	0.0050	0.0300	-0.0020
	YL2100774-001	12-Jul-21	704.0	-0.0020	0.0001	-0.0010	-0.0010	0.0159	0.0029	0.0005	0.0050	0.0403	-0.0020
	YL2101008-001	10-Aug-21	719.0	-0.0020	0.0001	-0.0010	-0.0010	-0.0030	0.0035	0.0003	0.0050	0.0300	-0.0020
	YL2101368-001	20-Sep-21	530.0	-0.0010	0.0001	-0.0005	-0.0005	-0.0096	0.0026	0.0002	0.0044	0.0446	-0.0010

Appendix H – Reclaim Jetty Survey Monitoring

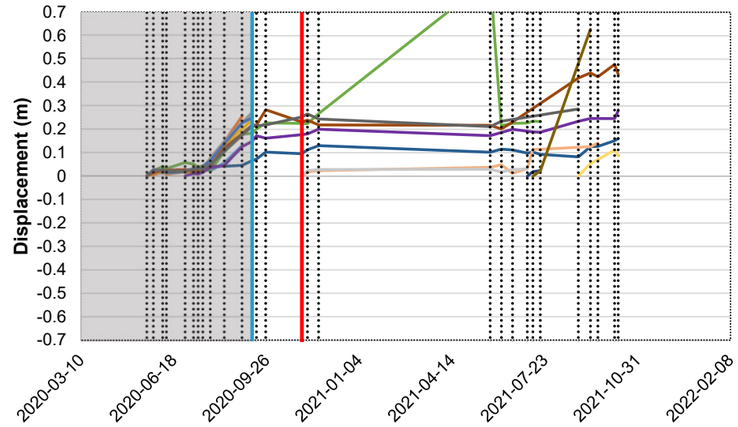
Vertical Displacement



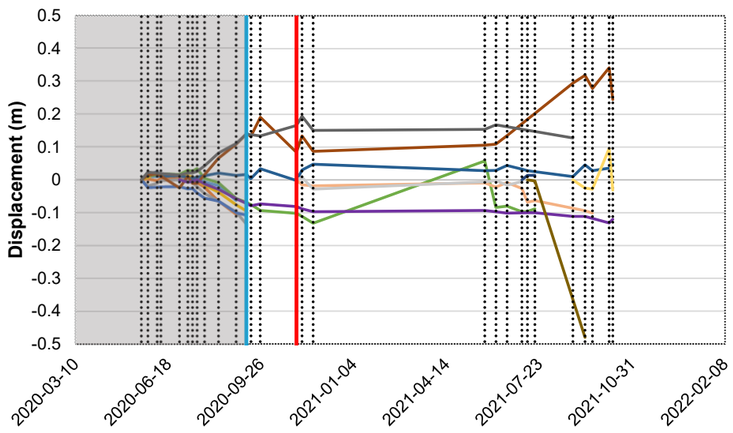
Horizontal Displacement



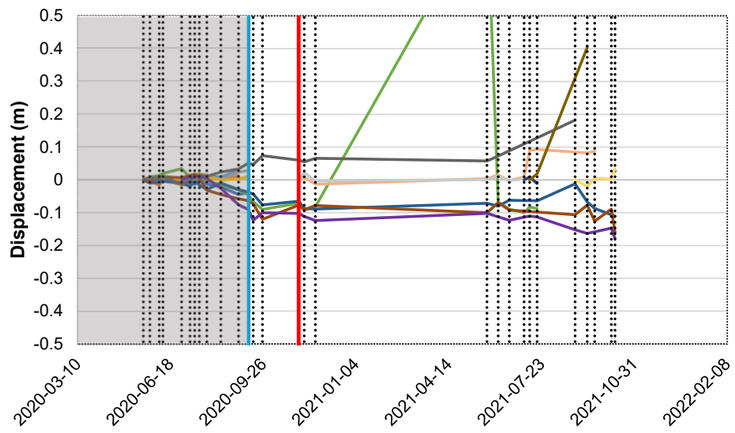
Total Displacement

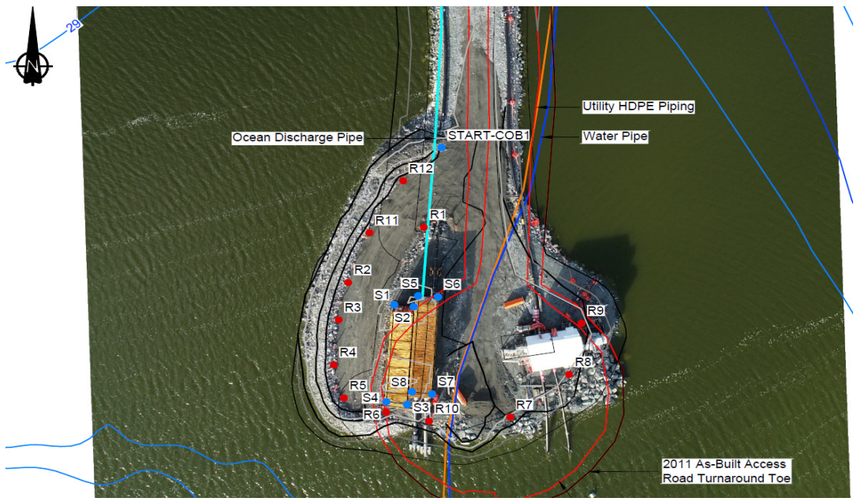


Change in Easting



Change in Northing





LEGEND:

- RJ-SSM-R1
- RJ-SSM-R1-New
- RJ-SSM-R2
- RJ-SSM-R3
- RJ-SSM-R3-New
- RJ-SSM-R4
- RJ-SSM-R4-New
- RJ-SSM-R5
- RJ-SSM-R5-New
- RJ-SSM-R6
- RJ-SSM-R7
- RJ-SSM-R8
- RJ-SSM-R9
- RJ-SSM-R10
- RJ-SSM-R12
- Survey Date
- Approximate Start of Jetty Repairs
- New Monument Installation

NOTES:

1. RJ-SSM-R1 and RJ-SSM-R2 have not been surveyed since Aug 30. Either buried or destroyed during remediation works.

2. RJ-SSM-R3, RJ-SSM-R4 and RJ-SSM-R5 have not been surveyed since Sep 10. Moved out to facilitate remediation works.

srk consulting

Job No: 1CT022.077
Filename: RJ_SurveyMonitoringData.xlsx

AGNICO EAGLE

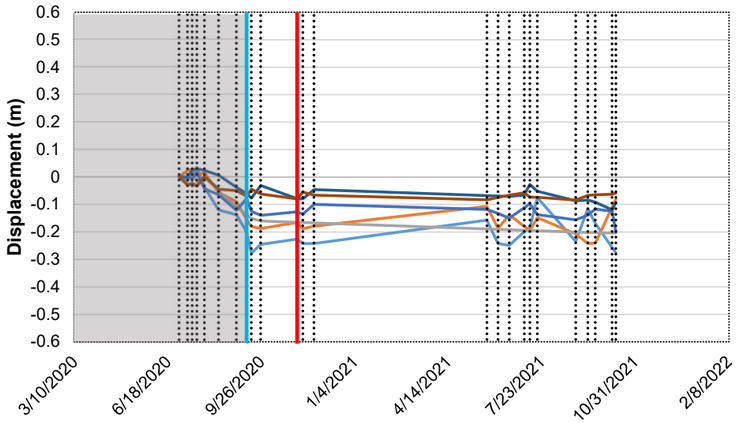
Doris TIA

TIA Annual Geotechnical Inspection

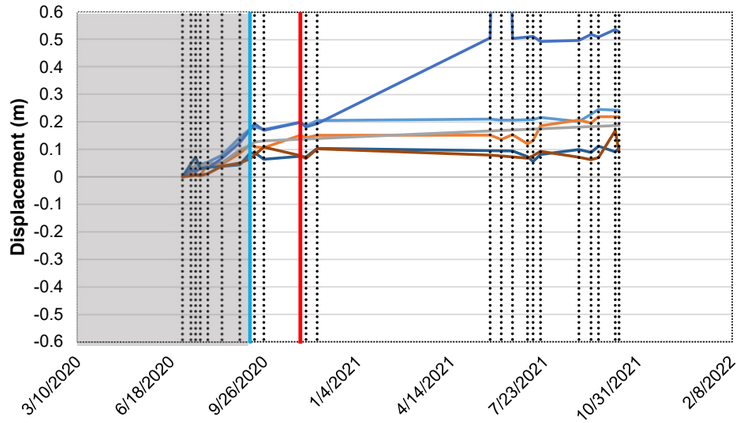
Surficial Settlement Monitoring Point (Rock Bolt) Displacement Timeseries

Date:	Approved:	Figure:
October 2021	PL	1

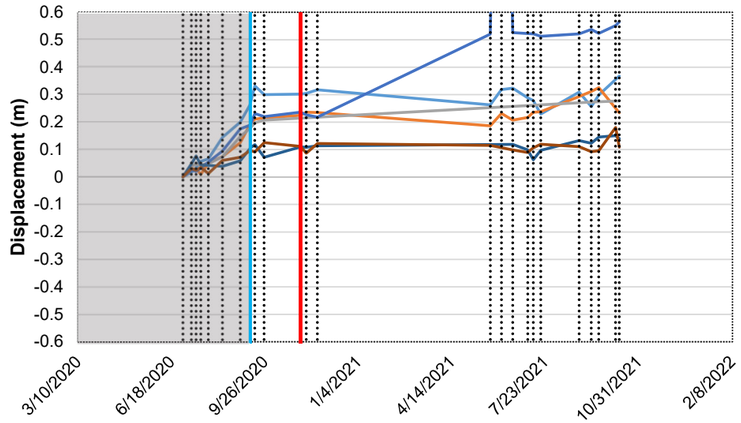
Vertical Displacement



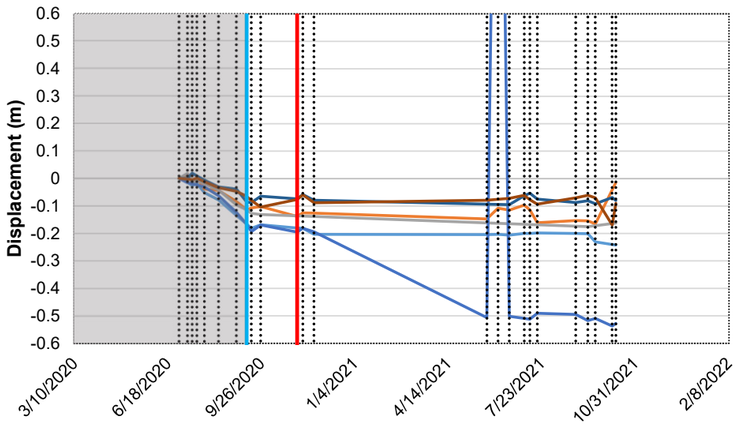
Horizontal Displacement



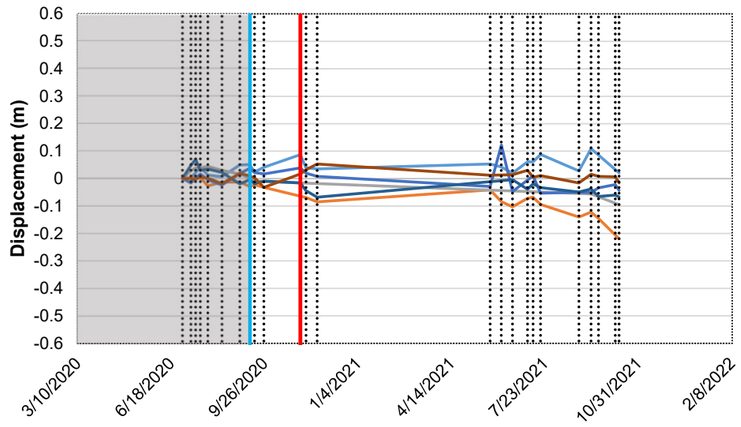
Total Displacement

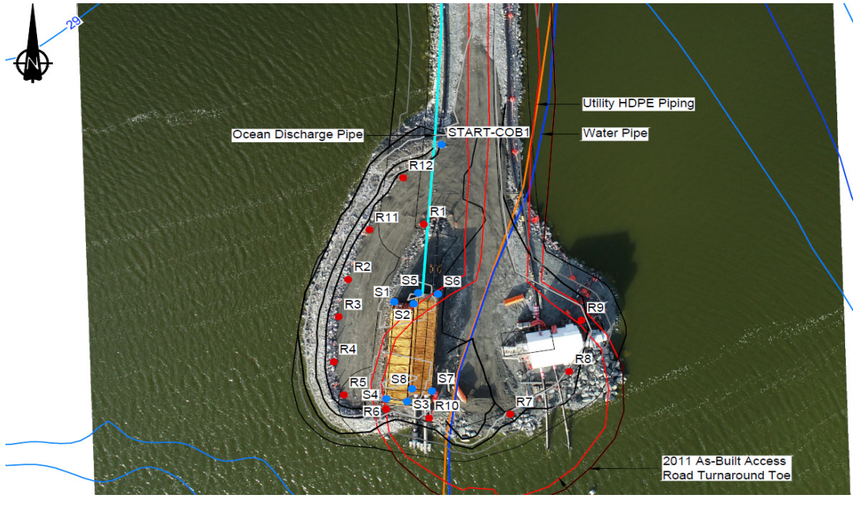


Change in Easting



Change in Northing





LEGEND:

- RJ-SSM-S1
- RJ-SSM-S2
- RJ-SSM-S3
- RJ-SSM-S4
- RJ-SSM-S5
- RJ-SSM-S7
- RJ-SSM-S8
- Survey Date
- Approximate Start of Jetty Repairs
- New Monument Installation

NOTES:

1. June 30, 2020 survey is set as the baseline.
2. No new monuments were installed on seacan locations.
3. RJ-SSM-S5 was moved during winter 2021 snow clearance actitivites.

srk consulting

Job No: 1CT022.077
Filename: RJ_SurveyMonitoringData.xlsx

AGNICO EAGLE

Doris TIA

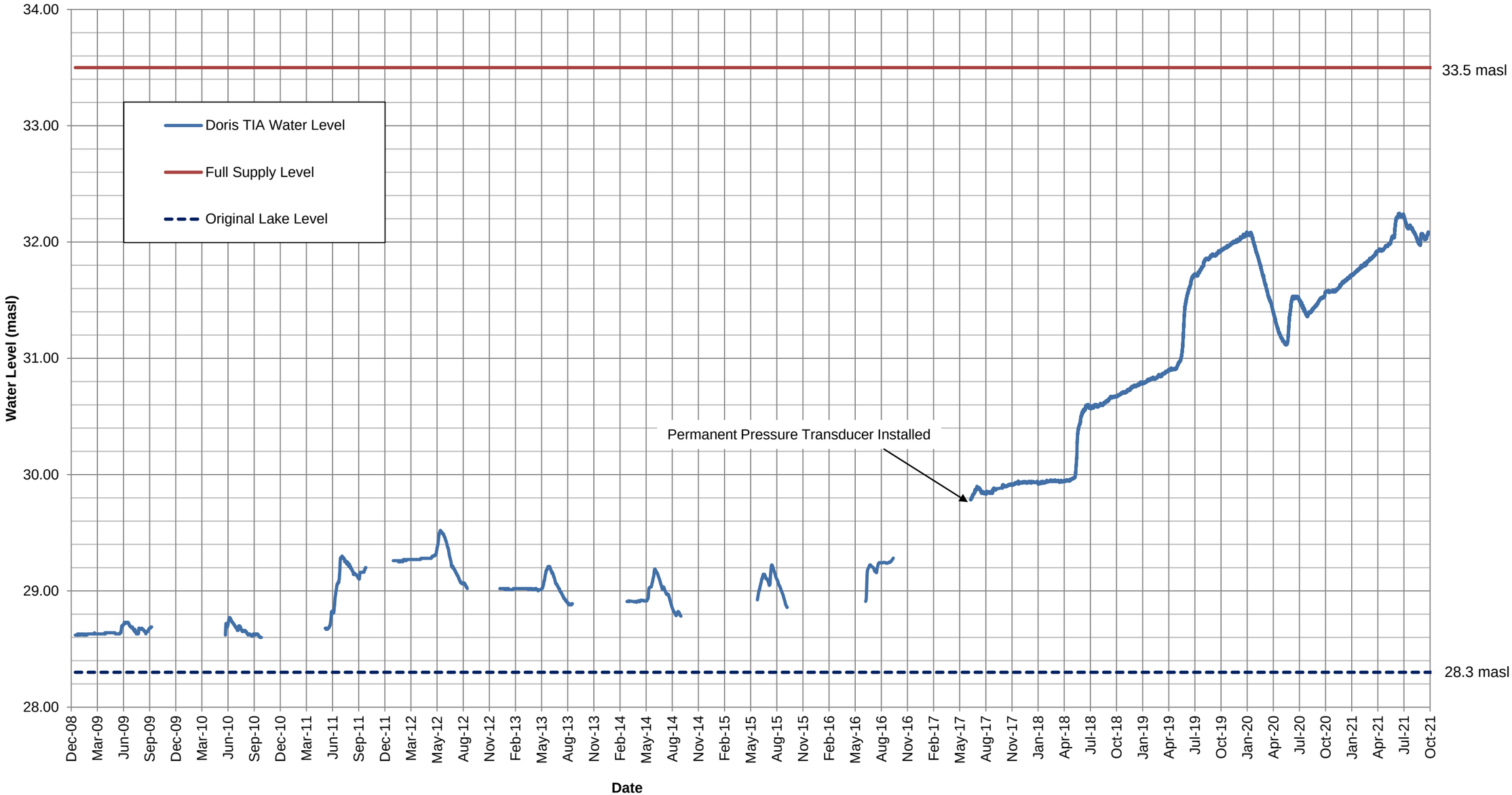
TIA Annual Geotechnical Inspection

Surficial Settlement Monitoring Point (Seacan) Displacement Timeseries

Date:	Approved:	Figure:
October 2021	PL	2

Appendix I – TIA Reclaim Pond Water Levels

Doris TIA Water Level (masl)

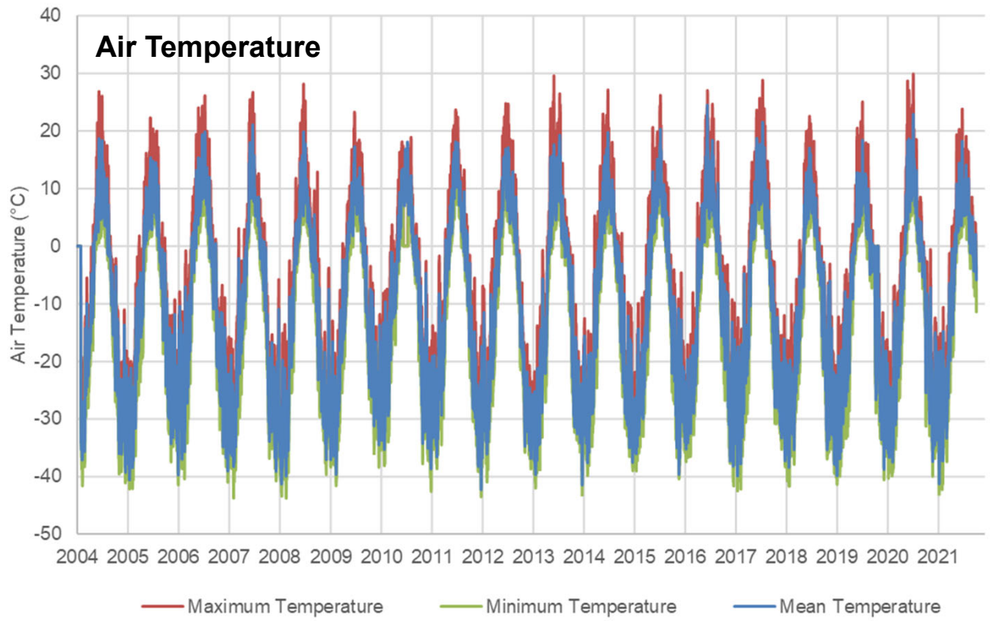


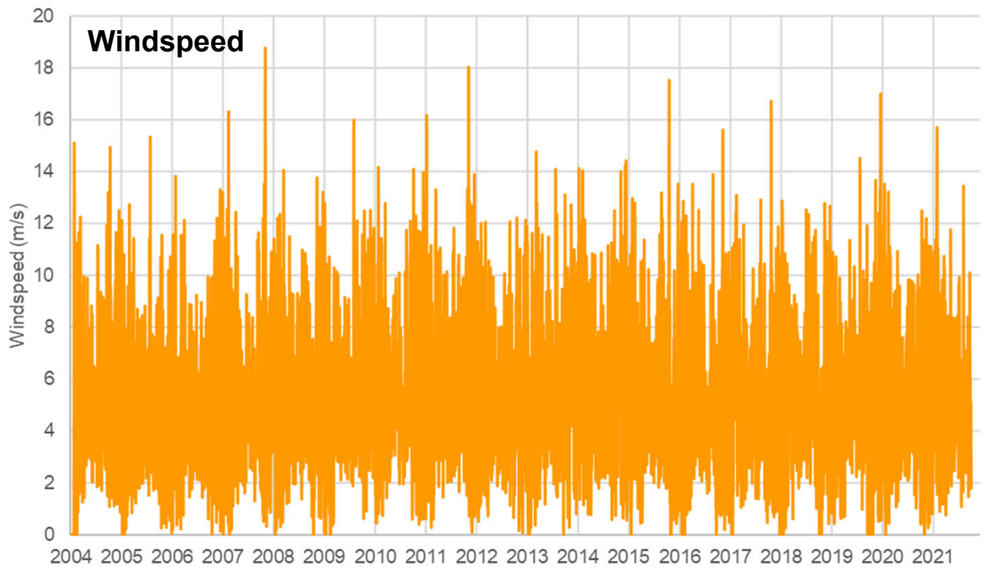
Notes:

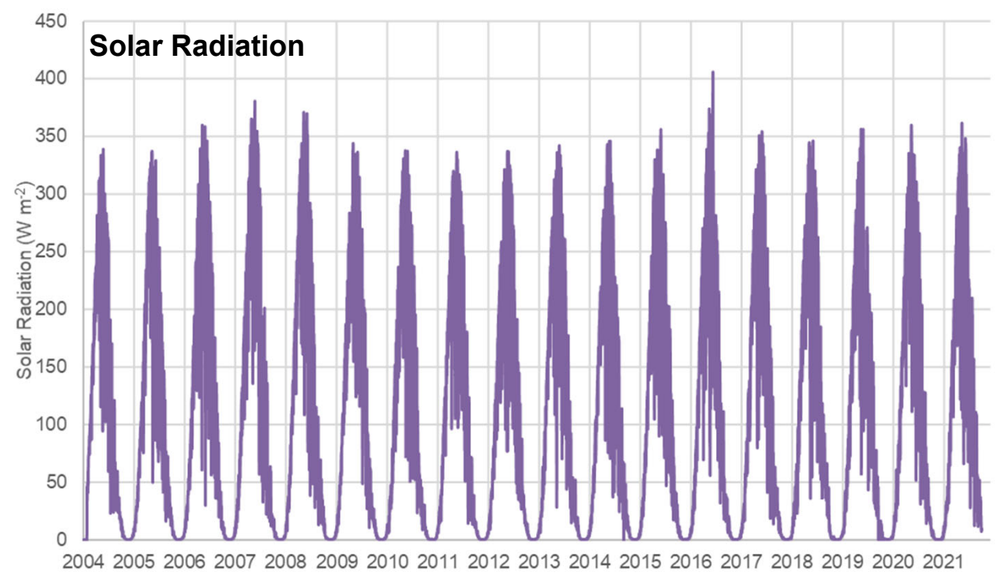
- Water level collected by permanent pressure transducer installed Summer 2017

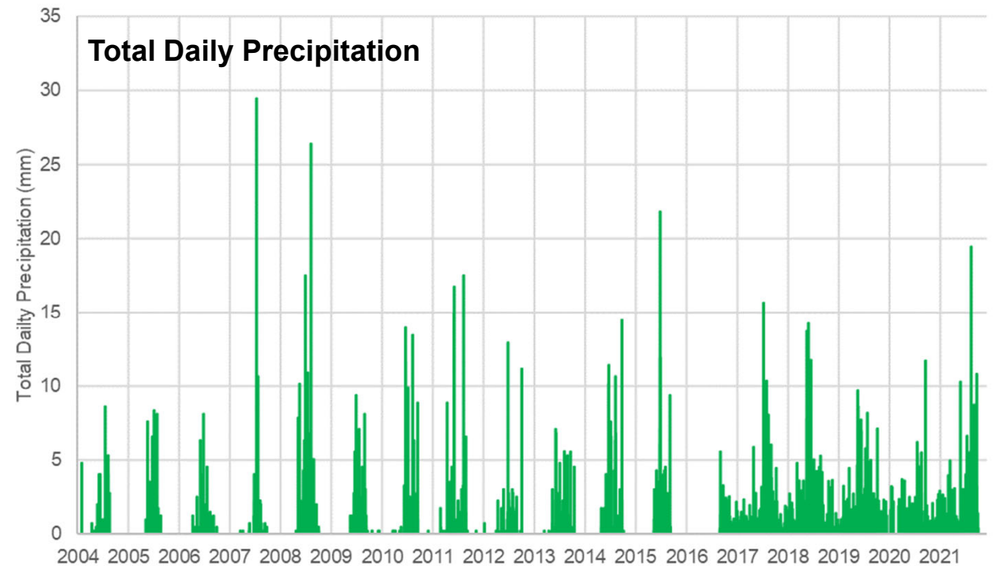
srk consulting	AGNICO EAGLE	2021 AGI
Job No: 1CT022.077 Filename: App_G_WaterLevel.pptx	DORIS TIA	TIA Reclaim Pond Water Level
		Date: Oct. 2021 / Approved: PDL / Figure: G.1

Appendix J – Climate Data



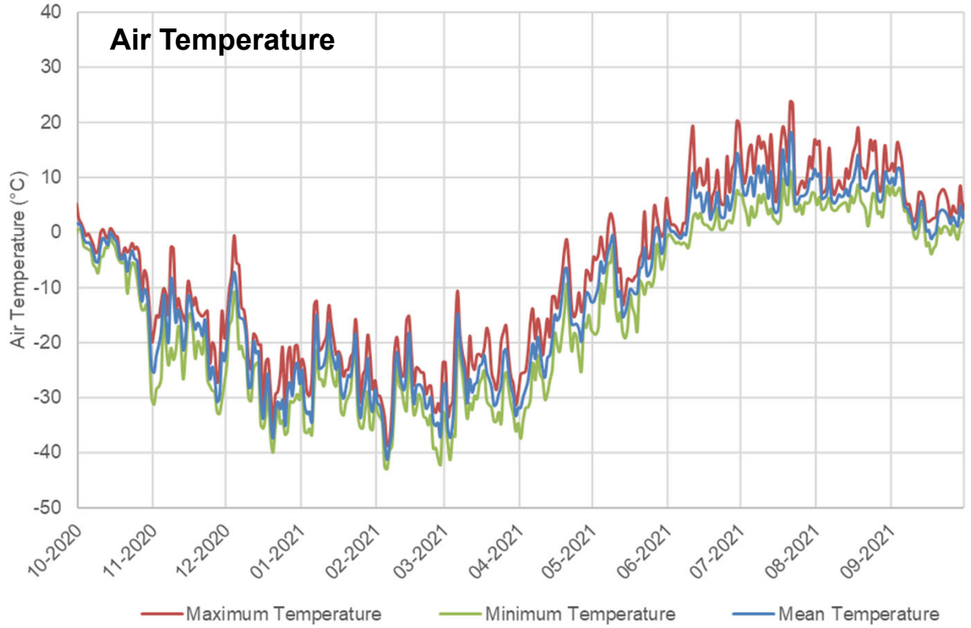


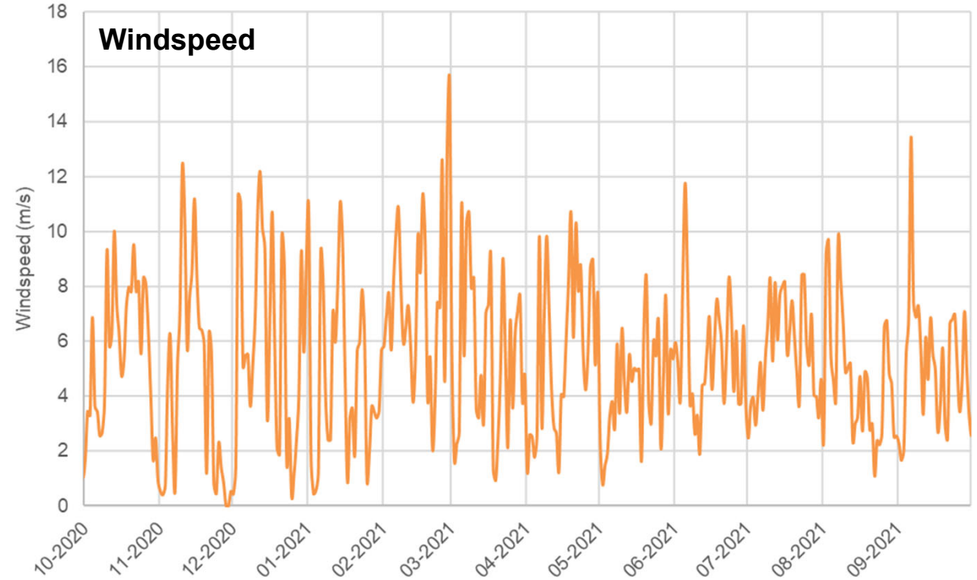


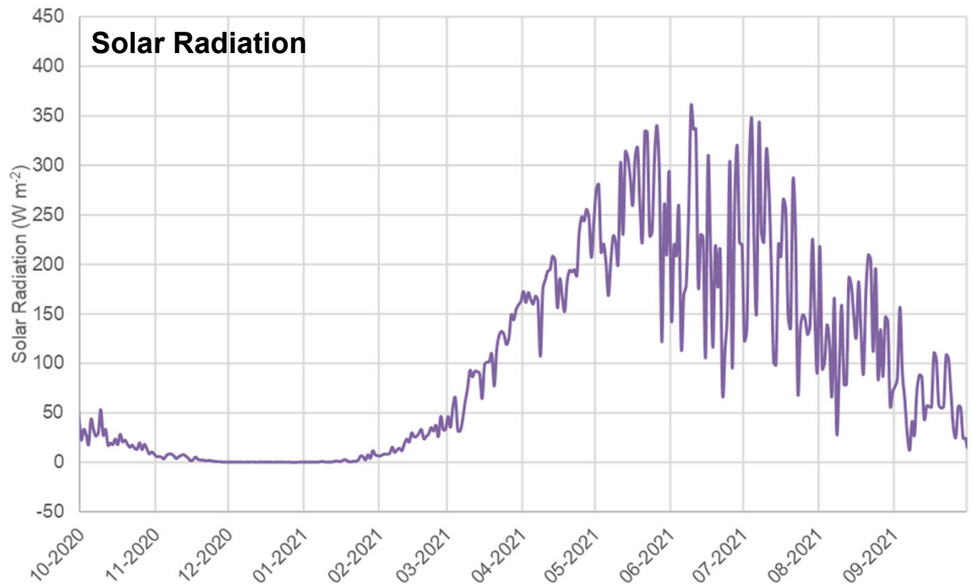


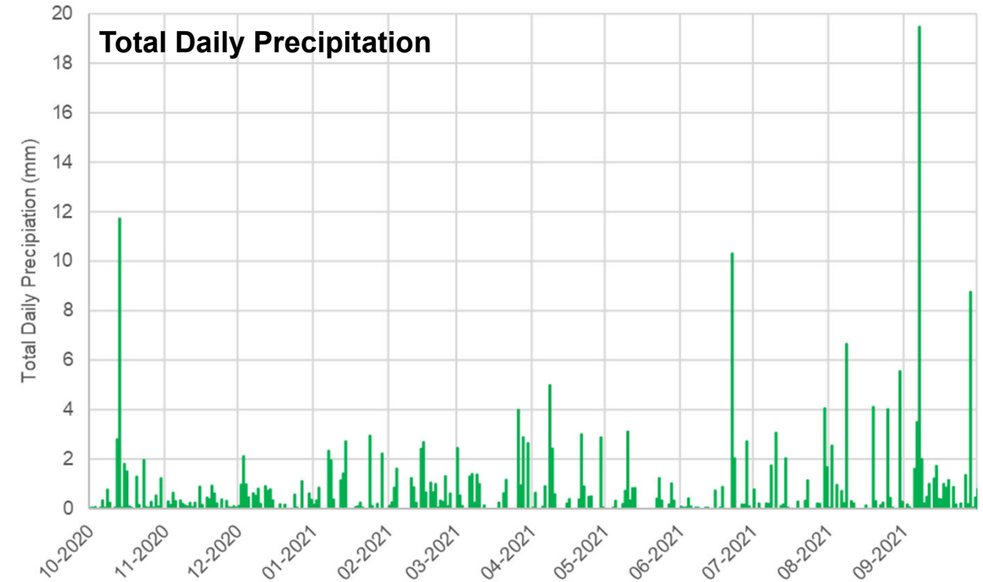
Notes:
1. Doris meteorological data from Stantec, select parameters shown
2. Total daily precipitation from mid-2016 to present includes snow water equivalent measurement during snowfall periods

srk consulting	AGNICO EAGLE	2021 Annual Geotechnical Inspection
		Doris Meteorological Station Historical Climate Record
Job No: 1CT022.077 Filename: ClimateData_2021_AGI	Doris TIA	Date: Nov. 2021 / Approved: CWS / Figure: **H.1**









Notes:
1. Doris meteorological data from Stantec, select parameters shown from October 1, 2020 to September 30, 2021
2. Total daily precipitation from mid-2016 to present includes snow water equivalent measurement during snowfall periods

srk consulting	AGNICO EAGLE	2021 Annual Geotechnical Inspection
		Doris Meteorological Station – October 1 to September 30
Job No: 1CT022.077 Filename: ClimateData_2021_AGI	Doris TIA	Date: Nov. 2021 / Approved: CWS / Figure: **H.2**

Appendix K – Dam Ground Temperature Cable Review

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Technical Memo

March 16, 2022

To	File
From	Christopher Stevens, PhD
Reviewed by:	John Kurylo, MSc, PEng. Peter Luedke, PEng
Subject	North Dam and South Dam – Thermal Performance Review 2021
Client	Agnico Eagle Mines Limited
Project	1CT022.077

1 Introduction

The tailings management system (TMS) at the Hope Bay mine includes sub-aerial tailings deposition into the Doris tailings impoundment area (TIA). Two retention structures provide current containment of the TIA: a water retaining frozen core North Dam commissioned in 2012 and frozen foundation tailings retaining South Dam commissioned in 2018.

The North and South Dams are routinely inspected by Hope Bay staff during operation and included annual inspection completed by the Engineer of Record and completion of a dam safety review (DSR) in 2021. A monitoring system has been installed as part of the design to evaluate deformation and thermal performance of the dam and foundation. This monitoring system has been developed to allow for evaluation of dam performance over the life of the structure and implementation of mitigation measures, if required. Ground temperature cables (GTCs) were installed within the foundation and above and below grade fill at representative monitoring sections of the North and South Dam to inform thermal performance of the structures (Figures 1 through 4).

This memo reviews the thermal performance of the North Dam and South Dam using ground temperature monitoring data collected to September 30, 2021. Summary information on foundation conditions, design and construction, and thermal design is provided to support understanding of the ground thermal conditions observed at each dam.

2 Data Review

Ground temperature data collected as part of the North Dam and South Dam monitoring systems were reviewed to the end of September 2021. Annual values reported herein were calculated for a thermal year extending from October 1 to September 30 of each year. The thermal year approach aligns with

the end of the thawing season and onset of the freezing season and avoids combining measurements collected within the same calendar year for different winter periods. In this way, the thermal year approach ensures that winter atmospheric conditions and ground thermal performance of the system are adequately assessed on a seasonal basis.

The available data was assessed to determine if:

- Site climate remains similar to inputs previously used for modeling dam thermal performance;
- Ground temperature instrumentation remains adequate for monitoring thermal conditions;
- Operation of the dams align with the thermal design criteria; and
- Dam thermal performance is similar to previously completed thermal model predictions.

3 Climate Conditions

The Doris Meteorological Station provides site climate measurements for understanding deviations in weather conditions and long-term climate that could impact thermal performance of the dams. The period of record extends from 2004 to present (Figure 5).

The mean annual air temperature for the period of record is -10.6°C. Year-over-year comparison of air temperature for the period of record shows a similar range in seasonal air temperature for 2021 when compared to previous years. The average windspeed over the period of record is 5.5 m/s which is consistent with average conditions measured in 2021.

The cumulative freezing and thawing degree days is shown in Figure 6. Average freezing and thawing degree days over the period of record is -4789 °C d and +888 °C d, respectively. The indices show a minor decrease in the freezing degree days and increase in thawing degree days suggesting longer-term change in seasonal air temperature (Figure 6).

The climate parameters measured in 2021 are consistent with average conditions used for thermal design of the North and South Dam, including average air temperature, wind speed, and solar radiation. Snow depth was not available for review but would be useful information for evaluating the impact of local snow condition on the ground thermal conditions. Thermal design of the dams has considered climate change.

4 North Dam

4.1 Foundation

The North Dam is located across the former Tail Lake outlet and extends over overburden soils that are locally up to 20 m thick at the base of the valley which decreases toward the dam abutments (Figure 1). About two-thirds of the dam longitudinal section is characterized by ice-saturated sand of approximately 10 m to 15 m thick. The sand deposit is overlain by a silt and clay layer that is less than 3 m thick. The remaining one-third portion of the dam alignment is characterized by marine clayey silt

that is up to 15 m thick. The fine-grained materials are also ice-saturated and contain excess ground ice. At the North Dam, the average porewater salinity is 39 ppt, with a freezing point depression of -2.2°C (Geometric mean of 30 ppt. and -1.7°C). The average site-wide freezing point depression is -0.8°C for sand and -2.2°C for silt and clay, with an average of -2.1°C for all samples collected at the Project site (SRK 2016). Bedrock within the foundation is generally competent basalt.

4.2 Design and Construction

The North Dam is approximately 200 m long and 10 m high, with upstream and downstream slopes of 6H:1V and 4H:1V, respectively (Figure 1). The dam relies on a frozen ice-saturated core and foundation to achieve the required water retention properties. A geosynthetic clay liner (GCL) was installed along the upstream side of the frozen core to provide secondary water-retaining capability in case cracks develop in the core caused by thermal expansion or creep deformation. In order to ensure adequate performance of the dam, it is imperative to maintain the frozen state of the core and foundation over the design life.

The original design life of the North Dam was 25 years (SRK 2007). As part of Phase 2 tailings deposition, the North Dam design life was extended to 2041 (30 years from 2011). This timeline assumes a period of nominal water impoundment prior to start of tailings deposition in 2017 and a five-year post closure period prior to breaching of the dam in 2041.

The North Dam was constructed over two winters (2011 and 2012) and has impounded water since 2011. The dam as-built report, drawings, and quality control and quality assurance documentation is provided in SRK (2012). The key trench was excavated in 2011 using drill and blast methods to an average depth of 2 to 3 m. A hyper-saline zone comprised of clayey silt with an average porewater salinity of 45 ppt. and a freezing point of -2.6°C was encountered between key trench Station 1+00 and Station 1+20. The trench was over-excavated to remove as much hyper-saline material as practical. Further detail of key trench excavation, testing, and conditioning of the surface for material placement is provided in SRK (2012).

The central frozen ice-saturated core was constructed of a 2:3 blend of 20 mm minus material to fines (SRK 2012). This blend was tested on-site to obtain the moisture retention required for placement during construction. The blend material was moisture conditioned in the frozen core mixing plant using freshwater sourced from Doris Lake, with routine testing to ensure no elements in the water would affect the frozen material. A Geosynthetic Clay Liner (GCL) was installed over the upstream side of the frozen core to function as a secondary water retention system.

The transition zone was constructed of 150 mm (6 inch) minus crushed material and placed over the top of the frozen core and GCL (SRK 2012). The transition material was observed to be clean with little fines and no sand and gravel. The external dam shell (Shell) was constructed of run-of-quarry (ROQ) material. Finer crushed rock transition material was placed over a portion of the dam crest to serve as an access road.

Thermosyphon evaporator pipes located at the base of the key trench provide passive cooling during the winter to ensure that the core and foundation remain frozen throughout the year. The North Dam

thermosyphons were procured and installed by Arctic Foundations of Canada Inc. Thermosyphon installation included one series of six evaporator pipes installed from the north end of the key trench (North Panel) and another six installed from the south end (South Panel). The evaporator pipes extend to Section 0+85 which is the lowest point of the key trench. The north and south evaporator pipes are sloped at 4.6° and 8°, respectively. Two thermosyphon radiators were attached to each evaporator pipe, with a total radiator surface area of 39 m^2.

Previous reviews have determined that all thermosyphons were seasonally functioning since installation with exception of the North 2 evaporator pipe. The North 2 is the second pipe from the downstream side of the core along the north panel of thermosyphons. In 2019, Arctic Foundations Canada (AFC) inspected the North 2 evaporator pipe to identify the issue and make repair of the unit. No issues were identified during the field inspection which included visual assessment and working fluid discharge and recharge of the North 2 thermosyphon (SRK 2020). Monitoring data has confirmed continued malfunction of the North 2 thermosyphon. Adequate cooling capacity over the long-term is expected to be achieve despite malfunction of the North 2 thermosyphon which is based on previous thermal modeling (SRK 2016).

4.3 Thermal Design Criteria

The thermal criteria for the design life require:

- Top of the frozen core remains higher than the maximum operating level of the water;
- Frozen core maintains a temperature at or below -2°C with a width that is at least twice the head of water impounded against the dam. For the Phase 2 tailings deposition a maximum head is approximately 7.9 m, resulting in a required frozen core width of 15.8 m for the thickest section of the dam; and
- The frozen foundation maintains a temperature at or below -8°C for a width equal to the required width of the frozen core (15.8 m) and extend to the base of the overburden soil (i.e. top of bedrock).

4.4 Thermal Modeling

Thermal modeling was previously completed for the North Dam along two critical cross sections; Section 0+85, located at the thickest section of the dam, and Section 0+40 near one of the thinnest sections of the dam (see Figure 1 for location) (SRK 2016). For conservatism, thermal modeling was completed for a 40-year period, which is 10 years greater than the actual planned design life of 30 years. The model was validated with North Dam temperature measurements collected at the time of modeling, and long-term performance modeling was completed with consideration for climate change using conservative inputs.

The model results indicated that the frozen core would remain below -2°C. Towards the end of the 40-year period, the foundation over a portion of the critical section was expected to exceed the -8°C beneath the thinnest sections of the dam (approximately 8% of the foundation exceeding the criteria, with 92% of the area below -8°C). As the foundation warms, higher fraction of unfrozen water in the

overburden soils can be expected and a greater potential for creep deformation may occur over time. The previous thermal modeling predicted that the thermal criteria would be met over the 40-year design life for the thickest section of the dam which impounds the greatest head of water.

4.5 Water Level

TIA water elevation is shown in Figure 7. The water level change over time provides context for relative thermal forces imposed on the water retaining North Dam. A greater amount of water maintained immediately upstream of the North Dam is expected to induce more heat into the dam core and foundation.

The water elevation prior to 2011 represents the natural water level of former Tail Lake (Figure 7). From 2012-2016, the water elevation at the toe of the North Dam was at a nominal level below 29.5 m. Water level has generally increased since 2017 with active tailings deposition and water management. In 2021, the maximum water elevation to the end of September was 32.2 m. The monitoring data confirms that the TIA water level has remained below the FSL (33.5 m). The FSL has been set to ensure the water level is maintained below the top of the frozen core in case of a flood event.

The calculated water depth for the monitoring Sections 0+60, 0+85, and 1+30 are shown in Figure 8. The water depth has been calculated from water elevation measurements made at Station TIA-2 and corrected for as-built surface elevation at the upstream toe and the position immediately above upstream foundation GTC. The difference in local surface elevation at the toe consequently impacts the water depth and duration of time water has been impounded at each monitoring section (Figure 8). This has important implications for understanding the thermal response of the upstream foundation over time, as further discussed in Section 4.7.

4.6 Instrument Layout

A total of 24 GTCs were installed at five representative section along the dam during construction. The instrumented sections include Stations 0+40, 0+60, 0+85, 1+30, 1+75 (Figure 1). The GTCs consist of a series of analog thermistors attached to data loggers that measure and record temperature every six hours. The data loggers are manually downloaded on a quarterly basis.

The general arrangement of the GTCs include vertical cables (VTS) installed beneath the upstream, downstream, and key trench (Figure 2). Horizontal cables (HTS) have also been installed during construction in the upper, middle, and lower portion of the frozen core.

4.7 Thermal Review

Instrument Function

The current status of GTC installed at the North Dam is summarized in Table 1. A total of 22 of the 24 GTCs are functioning. GTCs at ND-VTS-060-US and ND-HTS-085-33.5 are damaged beyond report

and classified as inactive. Two of the twenty-two active GTCs have one or two beads (sensors) that are not functioning. The two cables are listed as Active (Partial) in Table 1.

Table 1: North Dam Ground Temperature Cable Status

Station ID	GTC ID	# of Sensors (Functional / As-built)	Status
0+40	ND-VTS-040-KT	11/11	Active
0+40	ND-HTS-040-31.5	10/10	Active
0+40	ND-HTS-040-33.5	8/8	Active
0+60	ND-VTS-060-DS	11/11	Active
0+60	ND-VTS-060-KT	11/11	Active
0+60	**ND-VTS-060-US**	**Damaged**	**Inactive**
0+60	ND-HTS-060-28.8	8/10	Active (Partial)
0+60	ND-HTS-060-31.0	8/8	Active
0+60	ND-HTS-060-33.5	8/8	Active
0+85	ND-VTS-085-DS	11/11	Active
0+85	ND-VTS-085-KT	11/11	Active
0+85	ND-VTS-085-US	11/11	Active
0+85	ND-HTS-085-25.3	15/15	Active
0+85	ND-HTS-085-29.4	10/10	Active
0+85	**ND-HTS-085-33.5**	**Damaged**	**Inactive**
1+30	ND-VTS-130-DS	11/11	Active
1+30	ND-VTS-130-KT	11/11	Active
1+30	ND-VTS-130-US	10/11	Active (Partial)
1+30	ND-HTS-130-28.8	10/10	Active
1+30	ND-HTS-130-31.0	8/8	Active
1+30	ND-HTS-130-33.5	8/8	Active
1+75	ND-VTS-175-KT	11/11	Active
1+75	ND-HTS-175-32.5	9/9	Active
1+75	ND-HTS-175-33.5	8/8	Active

Notes:

1. Number of functional GTC cables as of 09/30/2021
2. Partial indicates one or more sensors are not functioning on the GTC

Upstream and Downstream Toe

The annual minimum, maximum, and average foundation temperature for each monitoring section is shown in Figures 9 through 13. The ground temperature profiles are provided for two subset periods of

the full dataset; 2013 measurements representing early-on foundation temperatures following commissioning of the North Dam and 2021 measurement representing the most recent period of reporting. SRK (2021) provides graphical representation of the ground temperature measurements for the full dataset.

Upstream foundation ground temperatures are currently monitored at Sections 0+85 and 1+30 (Figures 11 and 12). At both locations, permafrost temperatures in the upstream foundation have increased in response to thermal forcing from water impounded along the upstream face of the dam. Figure 14 shows the annual warming in the foundation beneath the upstream toe at Section 0+85 since commissioning of the dam.

A larger amount of foundation warming has been observed at Section 0+85 when compared to Section 1+30 (Figure 14). For example, the ground temperature within permafrost at Section 0+85 has increased by 2.5°C at a depth of 5 m below original ground surface since 2012. Whereas ground temperature at an equivalent depth measured at Section 1+30 has increased by 1.3°C over the same period of time. At Section 0+85, the thermal loading on the foundation has been greater due to the greater duration and depth of impounded water depth (Figure 8).

In addition to the increase in foundation ground temperature beneath the upstream at Section 0+85, the measured seasonal ground cooling (heat loss) has been reduced due to the rise in water depth (Figure 14, see ground temperature time series for select sensors). The reduced heat loss from the foundation is a direct response of liquid water beneath floating ice and likely from initial saturation of the rock shell which both can act to limit conductive heat loss with the atmosphere.

Thermal response of the upstream foundation from impounded water can be expected to be non-linear due, in part, to differences in toe elevation which increase toward the East and West abutments of the dam. For example, Section 0+85 is at the lowest upstream toe elevation with a longer duration and depth of water when compared to Sections 0+60 and 1+30 which are located at higher elevation along the dam alignment (Figure 7). Water depth is also greater immediately above the upstream toe when compared to position of the upstream vertical GTC installed within the foundation (Figure 8 comparison of light blue versus dark blue arrows). The spatial and temporal difference in water conditions for each monitoring section are important considerations to understand the observed thermal response of the upstream foundation over time. Foundation response outside of the influence of impounded water is largely controlled by atmosphere to surface heat transfer.

A comparison of the downstream foundation ground temperature in 2013 and 2021 is shown in Figures 10 through 12. The maximum annual temperature has remained below 0°C for the uppermost bead (Bead 1) immediately below the rockfill, including measurements made in 2021. The average temperature for the uppermost bead (Bead 1) from 2013 to 2021 has been -7.2°C, -5.9°C, -8.2°C at sections 0+60, 0+85, and 1+30, respectively. In 2021, the ground temperature at this depth was several tenths of a degree Celsius colder than the average.

Permafrost foundation ground temperature beneath the downstream toe has decreased at Section 0+60 and 0+85 and has remained similar over the period of record at Section 1+30 (Figures 10 through 12). The average permafrost temperate at a depth of 5 m below original ground surface from 2013 to 2021 has been -7.3°C, -5.9°C, -7.5°C at sections 0+60, 0+85, and 1+30, respectively.

Key Trench and Frozen Core

The maximum ground temperature measured at the base of the key trench from 2012 to 2021 is shown in Table 2. Over this period, the maximum key trench temperature at each monitoring section has remained below the frozen core thermal design criteria of -2°C. The key trench temperature at this monitoring location has generally decreased since 2012 (Figure 16). At Section 0+40 (ND-VTS-040-KT), the maximum annual key trench temperature has decreased by 0.6°C over the 10-year period of record. Over this same period, the maximum annual key trench temperature at Section 0+85 (ND-VTS-085-KT) has decreased by 1.5°C.

Table 2: North Dam Maximum Annual Key Trench Ground Temperature

Station	GTC ID	Ground Temperature (°C)[1]									
		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
0+40	ND-VTS-040-KT	-8.3	-7.5	-8.4	-8.9	-9.0	-8.7	-8.6	-9.1	-8.9	-8.9
0+60	ND-VTS-060-KT	-10.5	-9.9	-11.3	-11.7	-11.8	-11.4	-11.4	-11.8	-11.7	-11.9
0+85	ND-VTS-085-KT	-10.3	-9.9	-11.4	-11.9	-	-12.1	-11.6	-11.9	-11.7	-11.9
1+30	ND-VTS-130-KT	-10.6	-10.0	-10.8	-11.0	-11.3	-10.8	-10.9	-11.1	-11.3	-11.6
1+75	ND-VTS-175-KT	-6.3	-5.7	-6.7	-7.0	-7.1	-6.9	-6.7	-7.2	-7.1	-7.0

Notes:

1. Maximum annual temperature at base of key trench based on Bead 1 of vertical foundation ground temperature cable

Thermal regime of the frozen core is monitored with horizontal GTC installed within the upper, middle, and lower region of the core. It is imperative that the core remain frozen for primary containment. Table 2 shows the maximum annual ground temperature for the warmest location of each instrumented elevation within the frozen core. The warmest location is presented for clarity of tracking temporal changes. SRK (2021) provides the full ground temperature database for all sensor measurement within the frozen core.

Frozen core temperatures remain below the thermal design criteria temperature of -2°C (Table 3, Figure 16). The core temperature shows an overall cooling trend since 2013, with the exception of Section 0+40 (ND-040-HTS-33.5), Section 0+85 (ND-085-HTS-29.4 and ND-085-HTS-25.3) and Section 1+30 (ND-130-HTS-31.0). The most notable warming has been recorded at Section 0+85 (ND-085-HTS-29.4 and ND-085-HTS-25.3) between 2019 and 2020. The warming is inferred to be caused by the increase in TIA water level over this period. The frozen core temperatures at this location remained below the thermal design criteria of -2°C during the noted period of warming. In 2021, ground temperature at this location was observed to be colder compared to the two previous years. This may indicate the initial thermal loading from the rise in TIA water level was accommodated by thermosyphon heat extraction, as anticipated for by the thermal design.

Figure 17 provides a comparison of measured and previously modeled key trench temperature at Sections 0+40 and 0+85. For Section 0+40, the measured maximum annual key trench temperature is similar to the maximum annual predicted temperature in the key trench. Several years with actual

temperature warmer than predicted temperature are attributed to interannual variability in climate conditions which impose greater thermal forcing on the dam. For Section 0+85, the maximum key trench temperature is colder than predicted by the model.

Table 3: North Dam Core Maximum Annual Ground Temperature

Station	GTC ID	Ground Temperature (°C)[1]									
		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
0+40	ND-040-HTS-33.5	-	-5.6	-5.4	-5.3	-5.4	-	-5.8	-5.8	-5.6	-5.5
	ND-040-HTS-31.5	-	-5.7	-5.5	-5.6	-5.8	-	-6.2	-6.1	-5.9	-5.8
0+60	ND-060-HTS-33.5	-	-6.6	-6.5	-7.0	-7.1	-	-8.4	-7.6	-7.2	-7.5
	ND-060-HTS-31.0	-	-6.7	-6.4	-7.0	-7.1	-	-8.3	-7.6	-7.2	-7.5
	ND-060-HTS-28.8	-	-6.6	-6.5	-7.0	-7.1	-	-8.4	-7.6	-7.2	-7.5
0+85	ND-085-HTS-29.4	-	-7.4	-7.5	-8.0	-7.6	-	-9.2	-5.4	-5.4	-7.2
	ND-085-HTS-25.3	-	-7.2	-7.2	-7.7	-7.3	-	-8.8	-5.2	-4.8	-6.7
1+30	ND-130-HTS-33.5	-5.2	-4.7	-5.8	-5.7	-5.4	-5.2	-6.2	-6.1	-5.9	-5.8
	ND-130-HTS-31.0	-8.4	-6.9	-7.4	-7.7	-8.1	-7.9	-7.7	-8.2	-7.9	-8.1
	ND-130-HTS-28.8	-9.9	-9.2	-10.1	-10.6	-10.8	-10.4	-10.6	-10.9	-10.9	-11.2
1+75	ND-175-HTS-32.5	-4.1	-3.9	-4.9	-5.2	-5.3	-5.0	-4.9	-5.4	-5.4	-5.3

Notes:

1. Maximum annual temperature within frozen core at warmest location

5 South Dam

5.1 Foundation

The South Dam is located on the south end of the former Tail Lake on the watershed boundary that separates the TIA from Ogama Lake. The dam alignment extends across a local valley, with slightly higher surface elevation on either side of the valley. Geotechnical programs were completed under four separate investigations to inform design of the dam. The investigations included recovery of frozen soil core and cuttings, the logging and sampling of the soil and rock, laboratory testing of soil index properties, percolation testing of the foundation, and installation of ground temperature cables in select boreholes.

The cross-valley dam alignment is characterized by a thin veneer of hummocky organic soil underlain by saline marine silty clay and clayey silt which transitions to sand and gravel till over bedrock. Overburden thickness generally decreases toward the east and west abutments and increase in thickness toward two central gullies that are separated by a bedrock outcrop (Figure 3). The average permafrost temperature within the dam footprint prior to construction was -8°C.

Frozen soil cores were used to visually estimated excess ground ice. The excess ground ice was up to approximately 90%, with some discrete bodies of nearly pure massive ground near 100%. Additional observations of ground ice were based on cuttings, gravimetric moisture content results, and visual inspection of the excavated key-trench during construction. Ice-wedges have been inferred from airphoto interpretations and were visually confirmed during key trench excavation.

Soil porewater samples recovered using brine drilling in the summer of 2003 and winter of 2006 were found to average 36 ppt (n=12) which is equivalent to a freezing point depression of approximately -2°C. The soil porewater freezing point depression used in the design was based on these measurements. More recent sonic drilling completed in the winter of 2018 indicated an average porewater salinity of 3.1 ppt (n=55) from recovered samples, resulting in an estimated freezing point depression of -0.2°C (maximum value of 8.5 ppt, estimated freezing point depression of -0.5°C). Air-hammer drillholes completed with a rock quarry drill rig prior to dam construction also indicated an average porewater salinity of 4.5 ppt (n=55) resulting in an estimated freezing point depression of -0.2°C (maximum value of 11.7 ppt, freezing point depression of 0.6°C). The higher salinity values from 2003 and 2006 are likely caused by brine contamination of the sample during drilling.

5.2 Design and Construction

Construction of the Phase 1 dam was undertaken between January 2018 and mid-July 2018. Mean daily air temperatures over the construction period ranged from a minimum of -42°C on February 17, 2018 to a maximum of +13°C on July 11, 2018. Civil earthwork included key trench excavation, sub-grade preparation, GCL installation in the lower portion of the key trench, below ground backfill of the key trench, placement of above ground downstream and upstream dam fill. Ground temperature cables were installed at selection monitoring locations (Figures 3 and 4).

Key trench drill and blast was followed by excavation and surface preparation, and below ground backfill of the key trench between April and June. Downstream dam fill was placed between early May and early June, followed by GCL installation and above ground placement of dam fill between early June and mid-July. In May 2018, a previously constructed temporary deposition berm was raised to limit surface water flooding of the construction areas.

5.3 Thermal Design Criteria

The thermal design of the South Dam has allowed for sufficient rockfill cover to limit warming and thaw of the permafrost foundation. The effectiveness of the thermal cover decreases as the width and height of the structure decreases toward the eastern and western abutments, and seasonal heat loss and gain are more pronounced within the embankment and key trench. The thermal regime of the dam is controlled largely by atmosphere-to-surface heat exchange, thermal and physical conditions along the upstream face of the dam, and heat transfer through the fill material.

The design does not consider the affects of heat advected by surface water infiltration (snowmelt or precipitation) or water seepage from the facility. The latter is mitigated by the fine-grained, low permeability tailings beach developed immediately upstream and GCL installed within the upstream face and keyed into the permafrost foundation.

5.4 Thermal Modeling

Thermal modeling was previously completed for the South Dam to determine if the design was suitable to maintain the liner within a frozen key-in trench. The foundation was considered valid if the temperature within the dam key-in trench remained colder than -2°C. The model considered the maximum and minimum sections of fill thickness under conditions with active tailings deposition over the first seven years (Phase 1 dam geometry for first 3.7 years, followed by Phase 2) and a subaerially exposed tailings beach from the end of year seven through to year 25.

The model is conservative since it did not account for freezing season heat loss during the period of tailings deposition. A stable subaerial tailings beach was specified in the model after the period of active deposition is complete at the end of Year-7.

The model results indicated that the thickness of the bulk run-of-quarry rock, acting as thermal protection over the key-in trench, was adequate to maintain the base of the key-in trench and liner below -2°C over the 25-year design life.

5.5 Tailings Deposition

The South Dam was designed as a tailings solid retaining structure and thermal performance is contingent on maintaining an exposed tailings beach along the upstream face. To achieve these conditions, tailings deposition has been monitored to ensure the ponding of supernatant water does not occur along the face of the dam. A minimum distance of 100 m has been set between the upstream South Dam crest and the waterline.

Deposition 2017 through 2019

Phase 1 tailings deposition at the TIA began in January 2017 at two spigot locations on the east side of the TIA. In August 2017 the deposition was switched a temporary deposition berm to develop a tailings beach and minimize the risk of the TIA pond encroaching on the South Dam footprint prior to construction. Over the winter of 2018, the tailings deposition was moved to east side of the TIA until late June of 2019. Deposition commenced from the upstream face of the South Dam from June of 2019 to October 2019. Tailings deposition again switched to the east side of the TIA in October of 2019 to allow for winter heat loss from the South Dam tailings beach and to limit ice entrapment in this area.

Deposition 2020 through September 2021

In the spring of 2020, the deposition was shifted back to the South Dam to allow addition aggradation of the tailings beach in this area. Due to reduced mill throughput, the active tailings discharge spigot was occasionally switched to an eastern spigot located further north to allow water discharge from the discharge line. In the late fall of 2020 and the early part of the winter of 2021, tailings discharge has remained active on the eastern flank of the TIA well north (upstream) of the South Dam. The active spigot was transferred back to the South Dam in the summer of 2021 through to the end of September.

In 2021, the maximum South Dam tailings beach elevation was higher than the maximum annual water level in the TIA. The higher tailings beach elevation limits ponding of water immediately upstream of the South Dam and additional thermal forcing from water over time.

5.6 Instrument Layout

Digital GTCs and data loggers manufactured by BeadedStream were installed at six representative monitoring sections along the dam alignment during construction. The instrumented sections include Stations 0+065, 0+155, 0+240, 0+365, 0+460, 0+510 (Figure 2). Temperature is recorded every four hours using the datalogger and transmitted every twelve hours via Iridium satellite to allow for near real-time monitoring of the South Dam thermal conditions.

The general arrangement of the GTCs include vertical cables (VTS) installed beneath the upstream, downstream, and key trench (Figure 4). Horizontal cables (HTS) have also been installed along the upstream slope of the key trench and the above ground portion of the GCL. One GTC (SD-HST-B1-KT) was installed on top of the lower/upper GCL overlap near the upstream crest of the key trench.

Two additional ground temperature cables (SD-VTS-US1 and SD-VTS-US2) were installed to monitor conditions within an area susceptible to melting of massive ground ice. These locations are near the lowest elevation of the dam alignment where ice wedges form a polygonal network and surface water was expected to pond prior to tailings beach development. The two cables also provide long-term temperatures beneath the tailing beach.

Active tailings deposition from the South Dam has extended across monitoring Sections 3+65 and 2+40. The additional monitoring section were outside of the thermal influence of the tailings beach at the end of 2021.

5.7 Thermal Review

Instrument Function

A total of twenty-seven GTCs were installed during Phase 1 construction (SRK 2019b). Twenty of the GTCs were functioning at the end of September 2021 (Table 4). Of the seven inactive GTCs, three were damaged throughout or immediately following Phase 1 construction. Attempts were made to repair these cables. Currently, five vertical and two horizontal GTCs are inactive (Table 4). Two additional cables (SD-VTS-US1 and SD-VTS-US2) have partial damage with one or two functioning sensors. The cause(s) of some of the inactive cables has not been determined and warrants further onsite investigation. It is speculated that there has been some downhole tensional pulling on these cables, and as the South Dam ground temperature cables are wired in series, has resulted in the loss of some of the lower elevation temperature measurements / beads.

Table 4: South Dam Ground Temperature Cable Status

Station ID	GTC ID	# of Sensors (Functional / As-built)	Status
0+65	SD-VTS-065-KT	11 / 11	Active
0+65	SD-HTS-065-US	5 / 5	Active
1+55	SD-VTS-155-KT	11 / 11	Active
1+55	SD-HTS-155-US	5 / 5	Active
1+55	SD-VTS-155-US	0 / 11	Inactive
1+55	SD-VTS-155-DS	11 / 11	Active
1+55	SD-HTS-155-KT	0 / 11	Inactive
2+40	SD-HTS-240-KT	0 / 11	Active
2+40	SD-VTS-240-KT	11 / 11	Active
2+40	SD-HTS-240-US	7 / 7	Active
2+40	SD-VTS-240-US	0 / 11	Inactive
2+40	SD-VTS-240-DS	0 / 11	Inactive
3+65	SD-VTS-365-KT	0 / 11	Inactive
3+65	SD-HTS-365-KT	11 / 11	Active
3+65	SD-HTS-365-US	11 / 11	Active
3+65	SD-VTS-365-US	11 / 11	Active
3+65	SD-VTS-365-DS	0/ 11	Inactive
3+65	SD-VTS-US1	2 / 13	Active (Partial)
3+65	SD-VTS-US2	1 / 15	Active (Partial)
4+60	SD-VTS-460-KT	11 / 11	Active
4+60	SD-HTS-460-KT	11 / 11	Active
4+60	SD-VTS-460-US	11 / 11	Active
4+60	SD-VTS-460-DS	11 / 11	Active
4+60	SD-HTS-460-US	0 / 5	Inactive
5+10	SD-VTS-510-KT	11 / 11	Active
5+10	SD-HTS-510-US	5 / 5	Active
NA	SD-HTS-B1-KT	20 / 20	Active

Notes:

1. Number of functional GTC cables as of 09/30/2021
2. Partial indicates a limited number of sensors are functioning on the GTC

Base of Tailings

Ground temperature near the base of tailings beach is monitored immediately upstream of the toe at SD-VTS-US-2 (Figure 18). Ground temperature measured 0.5 m below the base of tailings beach has shown seasonal variation since late 2019. The minimum and maximum ground temperature varied from -0.3°C to -7.2°C in 2019 (Figure 18). Ground temperature at the same depth varied from -2.1°C to -10°C in 2020. In 2021, the minimum ground temperature was less than the previous two years, and the maximum temperature has not yet been reached for comparison (Figure 18).

Over the same period, ground temperature measured at a similar depth beneath the upstream toe at SD-VTS-US-1 has shown a similar cooling, with a maximum temperature of -0.1°C in 2019 to -2.5°C at

the start of 2021. The maximum temperature at the start of 2022 is expected to be approximately -3.0°C.

The measurements suggest that heat sourced from the tailings is seasonally lost during winter periods of non-deposition immediately upstream of the South Dam, and extensive thaw of the upstream foundation is not occurring beneath the tailings at SD-VTS-US-2. The tailings beach can be inferred to be frozen back based on thermal behavior of measurements made at SD-VTS-US-2. The cooling trend observed over the three years is expected to continue (Figure 18).

Upstream and Downstream Toe

The minimum, maximum, and average foundation ground temperature for 2020 and 2021 is shown in Figures 19 through 24. At most sites, ground temperature within the depth of seasonal variation have remained similar or slightly colder when compared to the previous year. Table 5 shows the average ground temperature and seasonal active thaw depth beneath the upstream and downstream toe for 2021. The average ground temperature is provided for the uppermost sensor located 0.5 m below grade for locations with active GTCs.

The average ground temperature beneath the upstream and downstream toe was measured to be -4.6°C to -5.6°C for sites with active GTC in 2021 (Table 5). The variability in average ground temperature at these sites is mainly a function of the fill thickness and related geometric effects of the various dam section and thermal influence of the tailings beach for some locations. The most notable change in ground temperature was measured SD-VTS-365-US, where previously warmer temperatures (average of -0.7°C in 2019) has subsequently cooled to the current average temperature of -4.5°C in 2021 (Figure 22). The relatively warm ground temperatures previously measured at SD-VTS-365-US were due to active tailings deposition. More recently exposure of the tailings beach in the winter has resulted in ground cooling of the foundation at this location.

The reported thaw depth for the upstream and downstream toe is based on the 0°C and the -2°C isotherm (Table 5). The -2°C isotherm represents the South Dam design freezing point depression for saline overburden soil. As previously noted, the porewater salinity collected immediately prior to dam construction indicate salinity values were significantly less than those collected with brine drilling. The brine drillhole samples are inferred to be contaminated by drill fluid and not representative of the in-situ conditions.

In 2021, the active layer thaw beneath the upstream toe ranged from 0 to 1.1 m based on the 0°C isotherm and 0 to 1.9 m with consideration of the -2°C freezing point depression. Thaw for 2020 are similar to 2021 (Table 5). The observed thaw is seasonal, and measurements suggest complete freezeback occurs each winter. The loss of GTC function limits monitoring of these conditions at some monitoring sections, as indicated with a hyphen in Table 5.

Table 5: Average Ground Temperature and Thaw Depth for Upstream and Downstream Toe

Station	GTC ID	Location	Average Ground Temperature[1], 2021 (°C)	Thaw Depth, 0°C Isotherm (m)		Thaw Depth, -2°C Isotherm[2] (m)	
				2020	2021	2020	2021
0+155	SD-VTS-155-US	Upstream Toe	-	-	-	-	
	SD-VTS-155-DS	Downstream Toe	-3.8	0.0	0.0	0.6	0.7
0+240	SD-VTS-240-US	Upstream Toe	-	-	-	-	-
	SD-VTS-240-DS	Downstream Toe	-	-	-	-	-
0+365	SD-VTS-365-US	Upstream Toe	-4.6	-	0.0	2.2	0.0
	SD-VTS-365-DS	Downstream Toe	-	-	-	-	-
0+460	SD-VTS-460-US	Upstream Toe	-5.4	1.0	0.9	1.8	1.8
	SD-VTS-460-DS	Downstream Toe	-4.2	1.1	1.1	1.8	1.9

Notes:

1. Average ground temperature based on uppermost sensors
2. Thaw depth based on the -2°C isothermal represents the design freezing point depression for soil porewater
3. Hyphen indicates incomplete measurements due to GTC failure.

Key Trench

The maximum ground temperature measured at the base of the key trench for 2018 through 2021 is shown in Table 6. The maximum annual key trench temperature for the thickest fill sections ranged from -7.3°C to -6.0°C at Station 0+240 and 0+365, respectively. At Station 0+155, the maximum key trench temperature was -5.9°C. These maximum key trench temperatures are colder compared with those measured in 2020 (Table 6). Measured key trench temperatures are also below the modeled estimates for each of the three monitoring sections (Figure 25).

At the thinnest fill sections (Stations 0+65, 0+460, and 0+510), the maximum temperature ranged from -5.3°C to -5,4°C in 2021. There has been a cooling of the key trench at all three monitoring sections since 2018 (Table 6). Thaw defined by the 0°C or -2°C isotherms has not observed beneath the key trench and it can be inferred that the liner has remained frozen to the foundation. Measured key trench temperatures are within the modeled estimates for each of the three monitoring sections (Figure 26).

The relatively warmer key trench temperature measured at Stations 0+65, 0+460, and 0+510 result from reduced fill over the key trench compared to thicker fill sections (Stations 0+240 and 0+365). The foundation at the thinner fill section also consists of bedrock or thin overburden soil over bedrock which results in greater seasonal heat gain to the foundation. Whereas the relatively colder key trench temperatures are measured at sections with greater fill thickness founded on ice-rich soil with a higher heat capacity and latent heat requirements.

Seasonal variations in ground temperature due to heat gain and loss from the ground were also measured beneath the key trench (Figures 19 through 24). The greatest variation in temperature were at sections with the minimum fill thickness and decrease as fill thickness increase, as expected.

Table 6: South Dam Maximum Key Trench Ground Temperature

Station	GTC ID	Ground Temperature (°C)[1]			
		2018	2019	2020	2021
0+65	SD-VTS-065-KT	-4.7	-4.7	-4.7	-5.4
0+155	SD-VTS-155-KT	-	-5.9	-5.4	-5.9
0+240	SD-VTS-240-KT	-6.6	-7.3	-7.3	-7.3
0+365	SD-VTS-365-KT	-6.9[2]	-6.0[3]	-5.9[3]	-6.0[3]
0+460	SD-VTS-460-KT	-3.9	-4.0	-4.8	-5.4
0+510	SD-VTS-510-KT	-3.2	-3.6	-4.8	-5.3

Notes:
1. Maximum temperature at base of key trench
2. Ground temperature for 0+365 based mid-April to mid-July data
3. Measurement from Sensor 7 of SD-HTS-365-KT supplemented due to missing data for from SD-VTS-365-KT

6 Conclusions

The North and South dam designs are based on frozen components to ensure primary containment and physical stability of the structure over the design life. Safe operation of these dams require careful consideration of thermal performance of the structures. The following conclusions are reached based on our review of available climate data, ground temperature data, and TIA water and tailings beach elevations

- The frozen core North Dam and frozen foundation South dams are thermally performing within the intended operational limits of the structures.
  - Current thermal performance of the structures is in general agreement with previously completed thermal model predictions for key trench location of the dams.
  - Climate design parameters used in the thermal design of the structures are in general agreement with the current climate conditions at the site, including measurements made in 2021.
  - TIA water and tailings beach elevations are within the expected operating conditions specified in the thermal designs.
  - Tailings beach development immediately upstream of the South Dam has effectively limited the ponding of surface water immediately adjacent to the dam to limit heat transfer with the permafrost foundation.
- Ground thermal monitoring data collected at the North Dam indicates:
  - Maximum annual temperature of the frozen core has been maintained below the thermal design criteria of -2°C. The frozen core temperature has decreased at most monitoring section since 2013. Notable warming of the frozen core, however, was recorded at Section 0+85

(ND-085-HTS-29.4 and ND-085-HTS-25.3) between 2019 and 2020. The warming is inferred to be caused by the increase in TIA water level over this period. In 2021, the maximum core temperature at this location has decreased and remains within the expected operation conditions.

- Upstream foundation ground temperatures have increased at Sections 0+85 and 1+30 in response to thermal forcing from water impounded along the upstream face of the dam. The thermal response at Section 0+85 has included reduction in freezing season (winter) heat loss from the foundation and continued warming has occurred. Upstream thaw settlement of the foundation can be expected to occur under these conditions.
- Permafrost foundation ground temperatures beneath the downstream toe has decreased at Section 0+60 and 0+85, while conditions at Section 1+30 have remained similar over the period of record.
- Thermal evidence of water seepage was not observed in the ground temperature data. Comprehensive review of the data for evidence of water seepage should continue to take place to ensure safe operating conditions.
- At this time, the currently functioning GTCs are adequate for monitoring thermal performance of the North Dam.

- Ground thermal monitoring data collected at the South Dam indicates:
  - Key trench temperatures at the GCL liner tie-in continued to decrease due to passive heat transfer with the atmosphere and adjustment to post-construction conditions. The coldest key trench temperatures have been maintained beneath the maximum fill section due to the added thermal protection of the overlying material.
  - The GCL liner at the key trench tie-in has remained continuously frozen, as inferred from temperature, to provide primary containment. The permafrost foundation beneath the key trench and upstream and downstream toe has also been maintained.
  - Thermal evidence of water seepage at the base of the GCL tie-in and within the permafrost foundation has not observed and is not expected under the current operation conditions.
  - Upstream foundation warming caused by deposition of relatively warm tailings has decreased at SD-VTS-365-US due to continued freezeback of the tailings beach. The frozen tailings beach currently allows for seasonal heat loss within the foundation to promote a frozen foundation.
  - In 2021, active layer thaw beneath the upstream and downstream toe was similar or slightly greater (increase of 0.1 m) than the previous year. Thaw in this region of the foundation can be expected over the life of the structure and should be monitored to ensure conditions remain within the design limits. Current monitoring of the upstream and downstream foundation is limited by GTC failure and replacement is recommended in Section 7.

7 Recommendations

- At the North Dam, the observed foundation warming beneath the upstream toe of the dam from thermal forcing of the impounded water may cause thaw consolidation and settlement over time. Surface monument should be installed along the upstream face of dam as a proactive measure to monitoring for deformation. A minimum of eight additional surface monuments that meet the specifications of the previously installed monuments are recommend along the upstream face at the five previously established monitoring section (Sections 0+40, 0+60, 0+85, 1+30, 1+75). Figure 27 shows the recommended location for installation of upstream surface monuments to improve understanding of deformation of the dam over time.
- At the South Dam GTCs provide thermal monitoring to ensure conditions remain within the intended design for safe operation and tailings containment.
- If repair is determined to not be possible, South Dam GTC replacement is recommended at select locations where failure has occurred. Figure 28 shows the recommended location for installation of four replacement GTCs to maintain a high integrity of the monitoring system. Each cable would be vertically installed to monitor foundation conditions. Winter drilling is likely required to safely access some locations that extend beneath the tailings beach.

Attachments:

Attachment 1 Figures

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The opinions expressed in this document have been based on the information available to SRK at the time of preparation. SRK has exercised all due care in reviewing information supplied by others for use on this project. While SRK has compared key supplied data with expected values, the accuracy of the results and conclusions from the review are entirely reliant on the accuracy and completeness of the supplied data. SRK does not accept responsibility for any errors or omissions in the supplied information, except to the extent that SRK was hired to verify the data.

References

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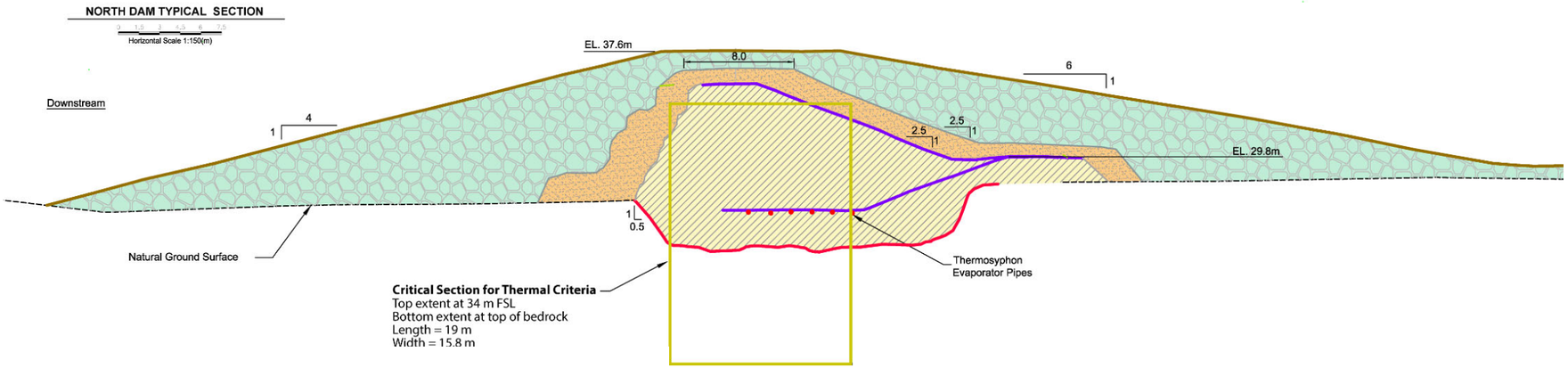
SRK Consulting (Canada) Inc., 2021. 2021 Annual Geotechnical Inspection Tailings Impoundment Area Hope Bay Project, Hope Bay, Nunavut. Submitted to Agnico Eagle Mines Ltd.

Attachment 1 Figures

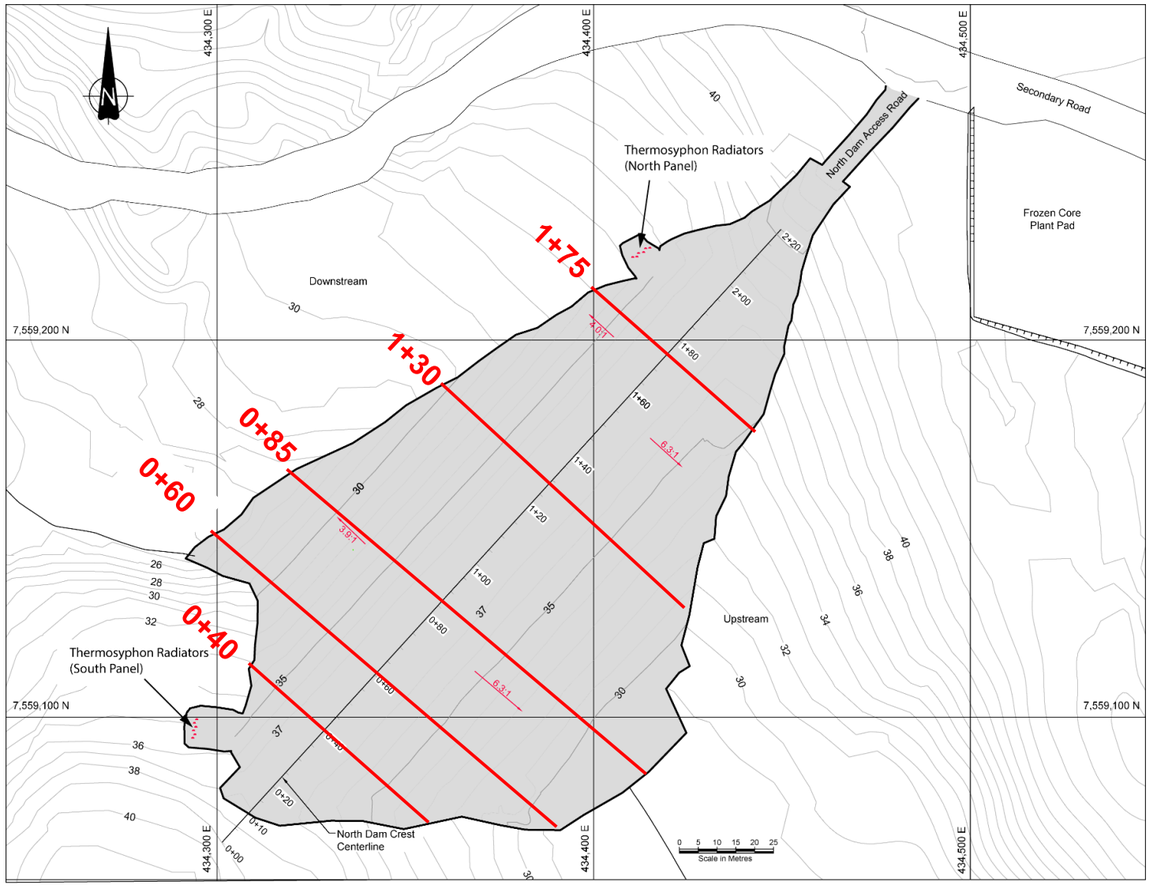
North Dam (Simplified Cross Section)



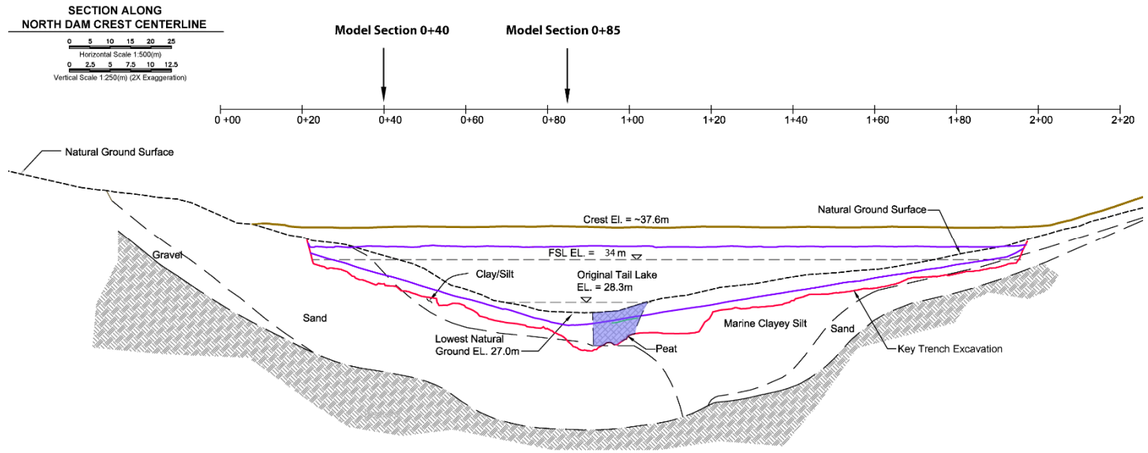
LEGEND

- Natural Ground
- Stratigraphic Boundary
- Core Material
- Transition Material
- Run of Quarry (ROQ)
- Bedrock
- Peat
- Critical Section
- Thermosyphon Evaporator Pipe
- Geosynthetic Clay Liner (GCL)
- Base of Key Trench
- Top of Bedrock

As-built – Plan View

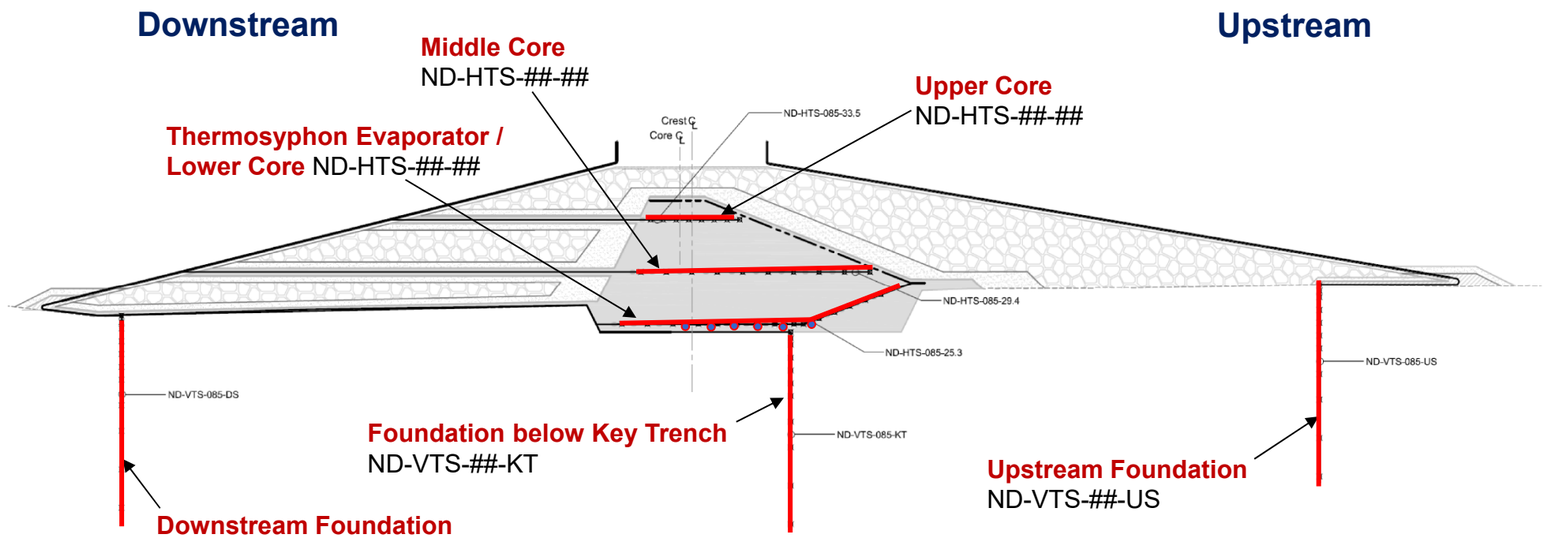


Foundation Materials (Simplified Cross Section)



srk consulting	AGNICO EAGLE	North Dam and South Dam – Thermal Performance Review 2021
		North Dam Cross Section and Plan View
Job No: 1CT022.077 Filename: North_South Dam Thermal Review2021	DORIS TIA	Date: Oct. 2021 / Approved: CWS / Figure: **1**

Ground Temperature Cable (GTC) Configuration



— Ground Temperature Cable (GTC)

Notes:
1. ND – North Dam
2. HTS – Horizontal Temperature String
3. US – Upstream
4. DS – Downstream
5. KT – Key Trench

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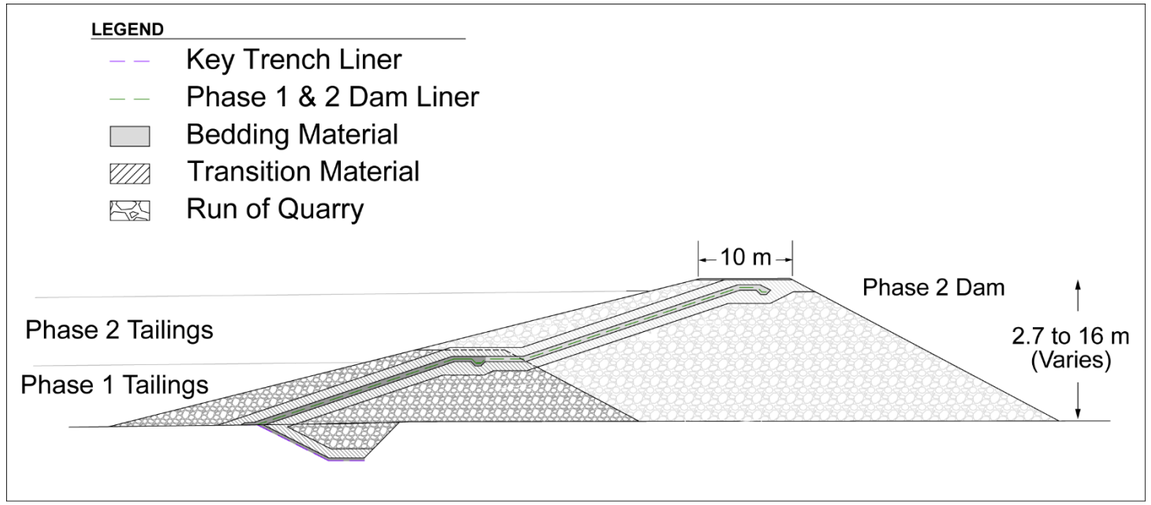
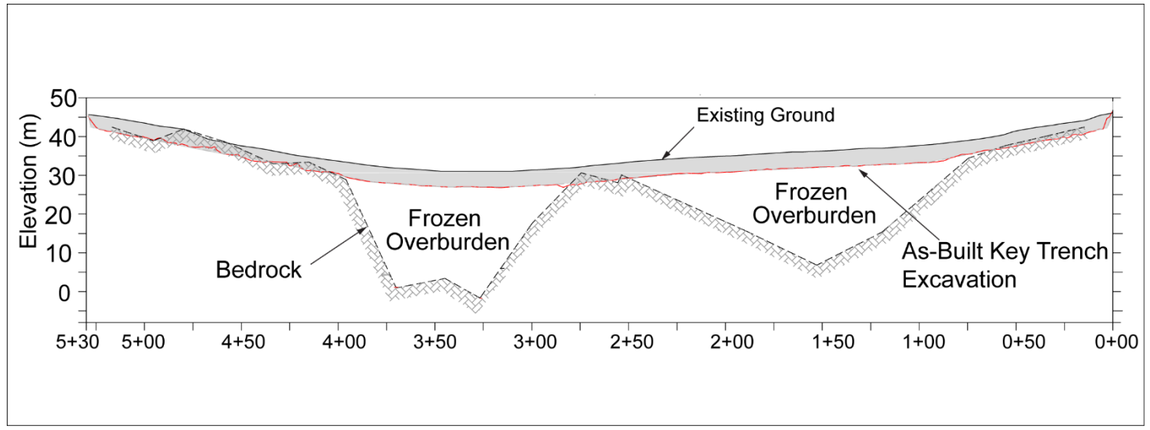
		North Dam – Typical Configuration of Ground Temperature Cables
Job No: 1CT022.077 Filename: North_South Dam Thermal Review2021	DORIS TIA	Date: Oct. 2021 / Approved: CWS / Figure: **2**

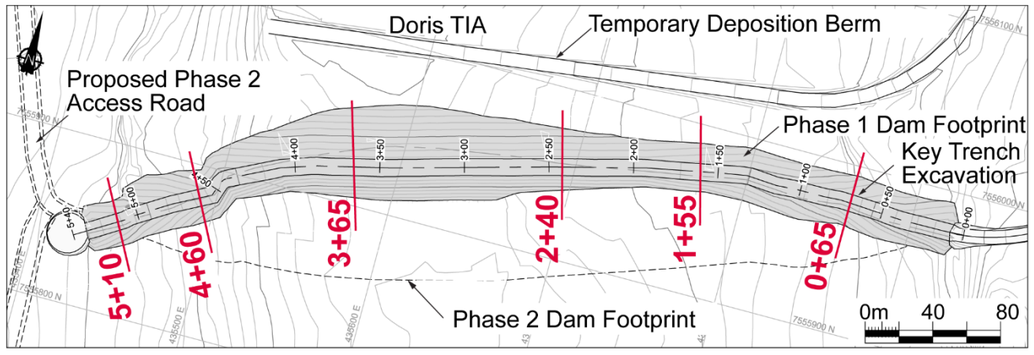
South Dam Phase 1 and Phase 2 (Simplified Cross Section)



As-built Phase 1 – Key Trench



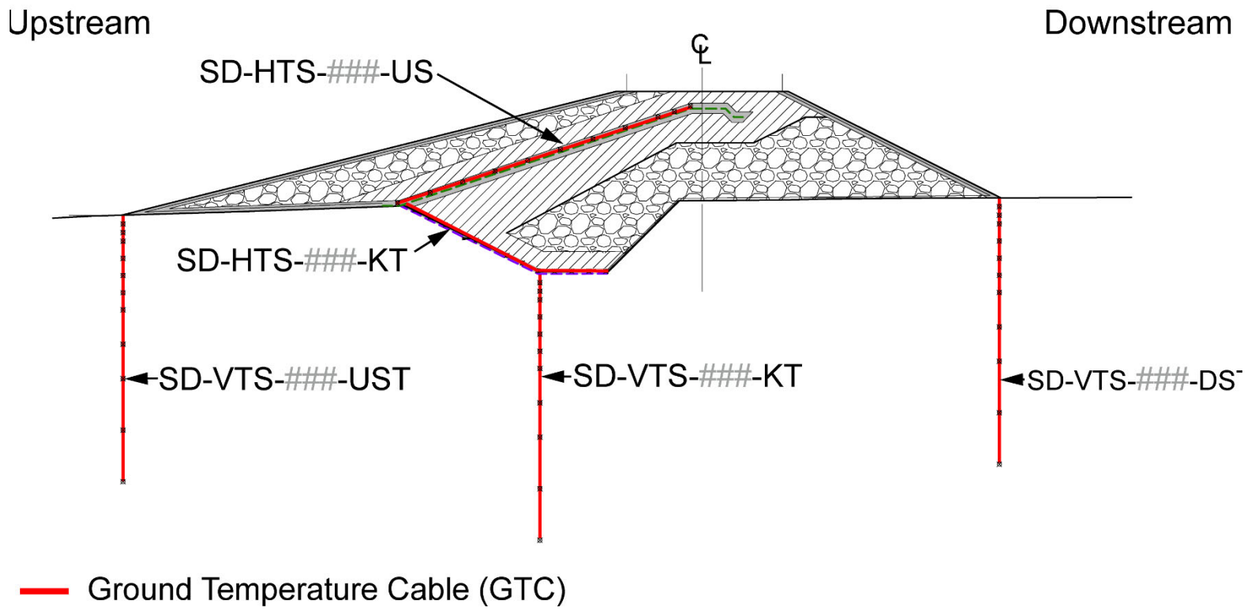
As-built Phase 1 – Plan View



Notes:
1. Red lines and section numbers represent ground temperature cables (GTC) monitoring sections

srk consulting	AGNICO EAGLE	North Dam and South Dam – Thermal Performance Review 2021
		South Dam Cross Section and Plan View
Job No: 1CT022.077 Filename: North_South Dam Thermal Review2021	DORIS TIA	Date: Oct. 2021 / Approved: CWS / Figure: **3**

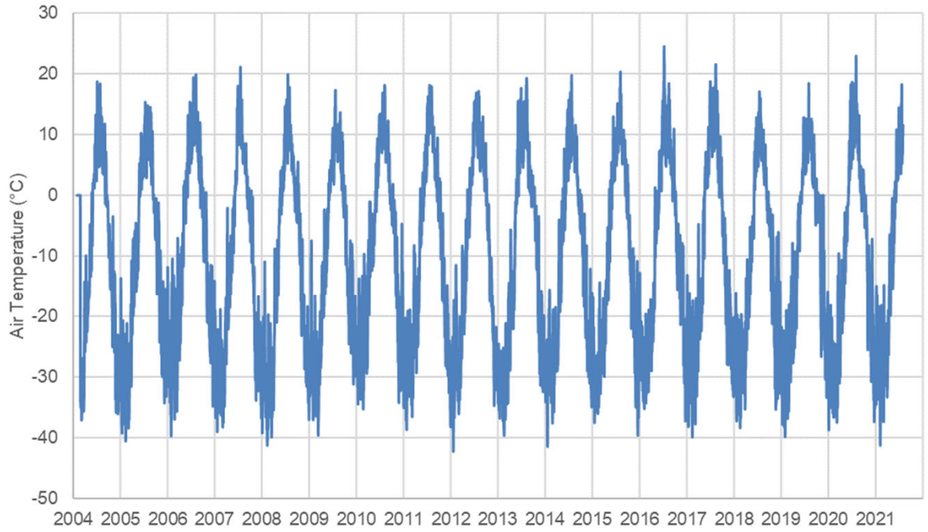
Ground Temperature Cable (GTC) Configuration



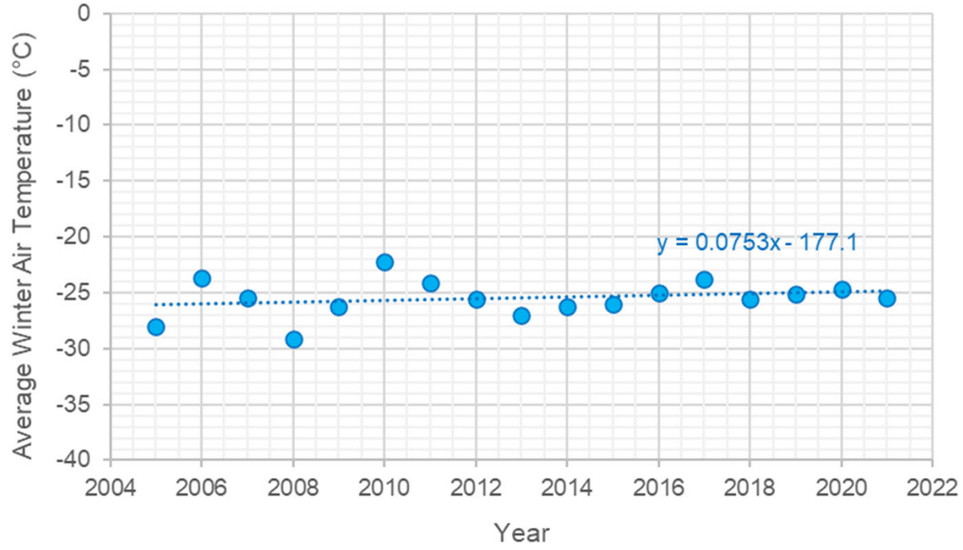
Notes:
1. SD – South Dam
2. HTS – Horizontal Temperature String
3. US – Upstream
4. DS – Downstream
5. KT – Key Trench

srk consulting	AGNICO EAGLE	North Dam and South Dam – Thermal Performance Review 2021
Job No: 1CT022.077 Filename: North_South Dam Thermal Review2021	DORIS TIA	**South Dam – Typical Configuration of Ground Temperature Cables**
		Date: Oct. 2021 / Approved: CWS / Figure: **4**

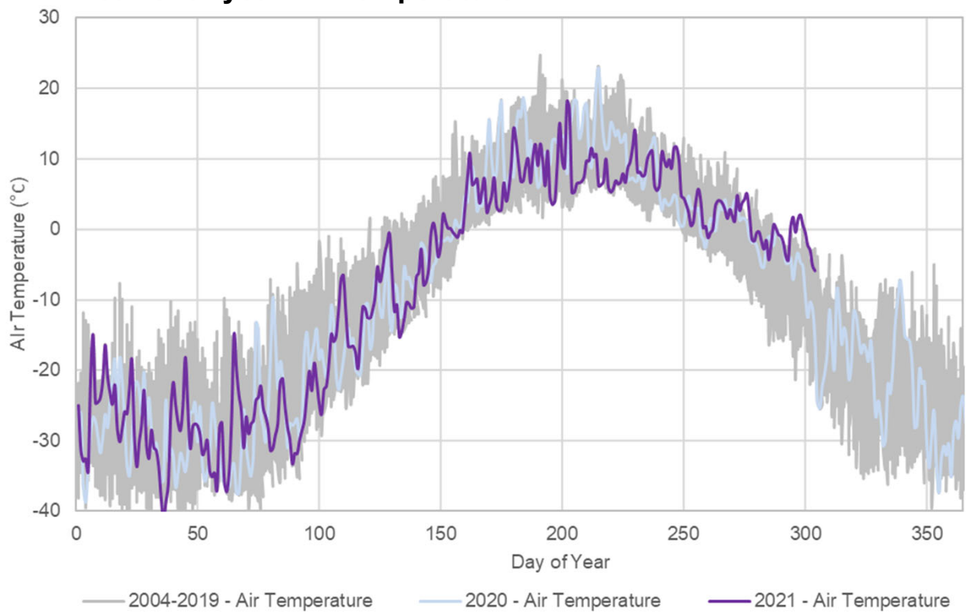
Mean Daily Air Temperature



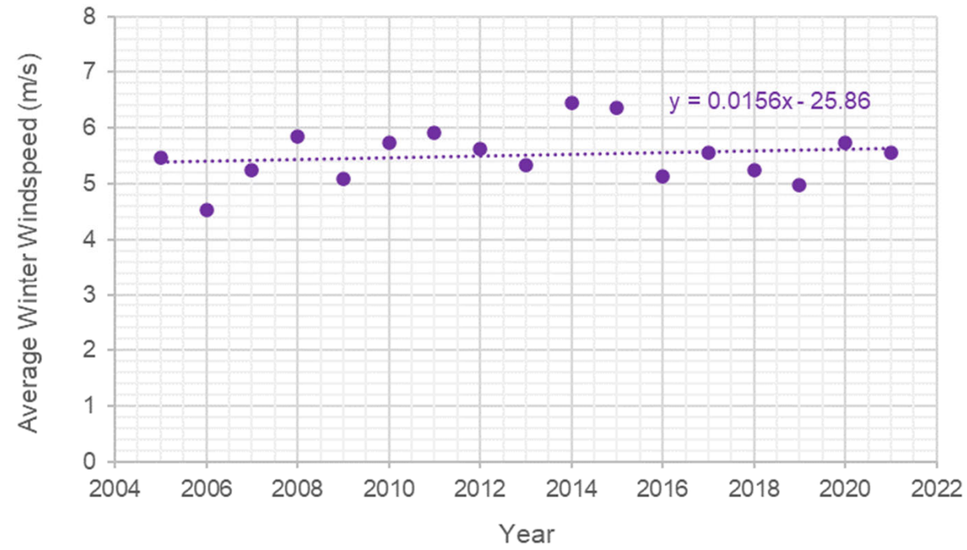
Average Winter Air Temperature



Year-over-year Air Temperature

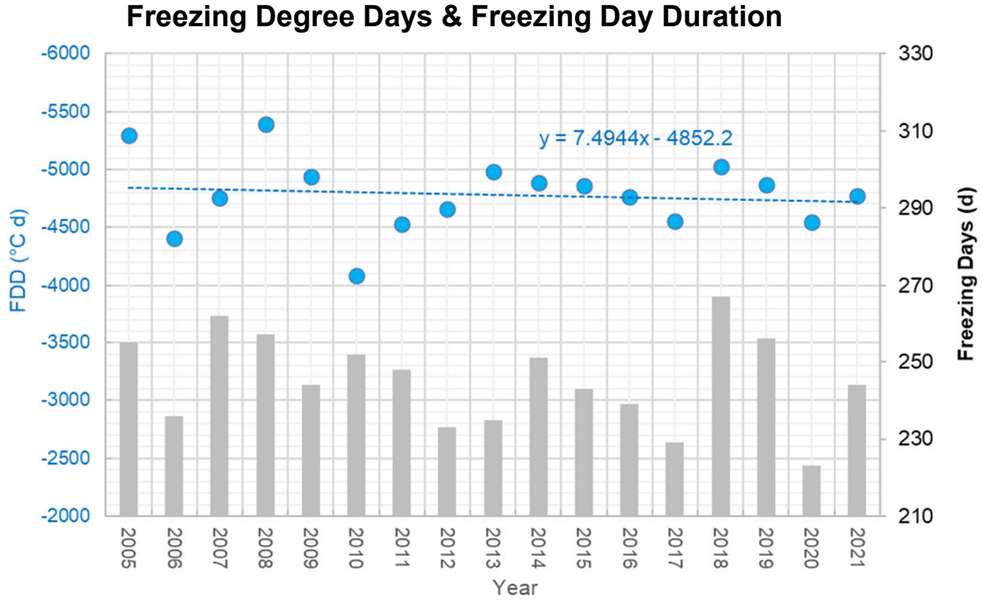


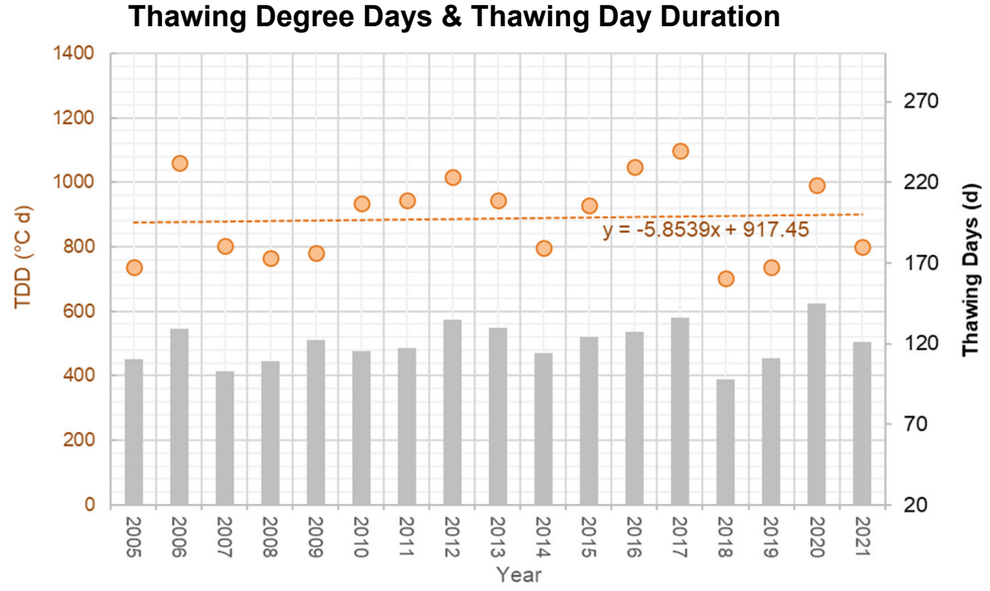
Average Winter Windspeed



Notes:
1. Mean winter values are calculated from November to March which excludes months in early and late winter

srk consulting	AGNICO EAGLE	North Dam and South Dam – Thermal Performance Review 2021
Job No: 1CT022.077 Filename: North_South Dam Thermal Review2021	DORIS TIA	**Doris Meteorological Station – Air Temperature**
		Date: Oct. 2021 / Approved: CWS / Figure: **5**

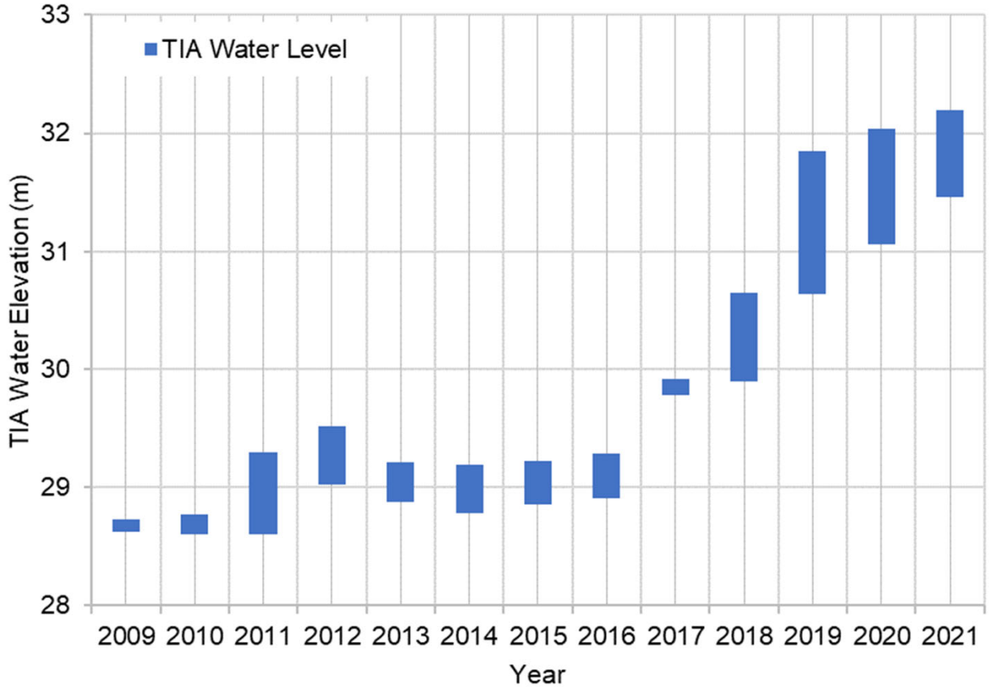




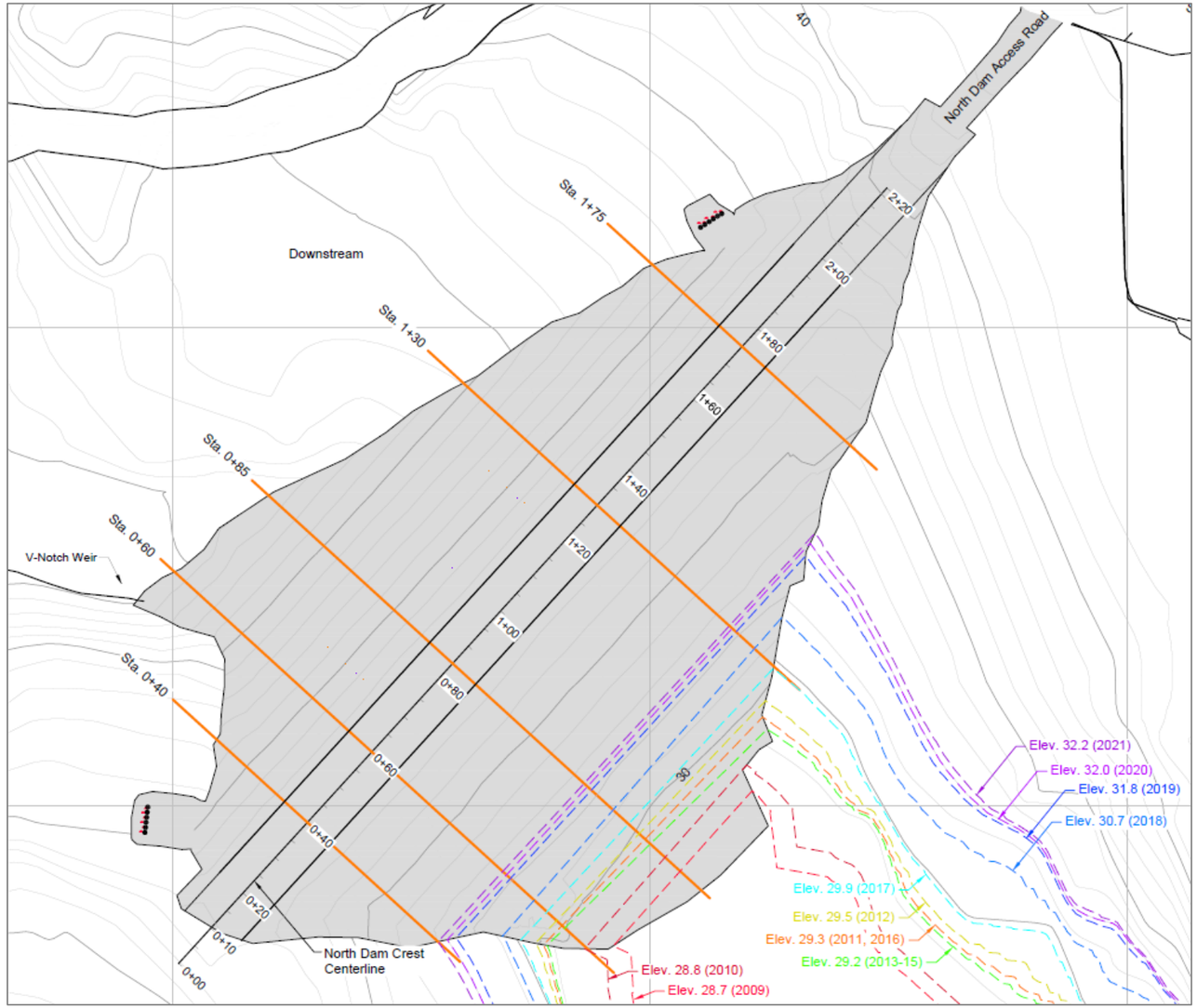
Notes:
1. Mean winter air temperature calculated from November to March which excludes months in early and late winter

srk consulting	AGNICO EAGLE	North Dam and South Dam – Thermal Performance Review 2021
		Doris Meteorological Station – Freezing and Thawing Indices
Job No: 1CT022.077 Filename: North_South Dam Thermal Review2021	DORIS TIA	Date: Oct. 2021 | Approved: CWS | Figure: **6**

Annual Water Level Range

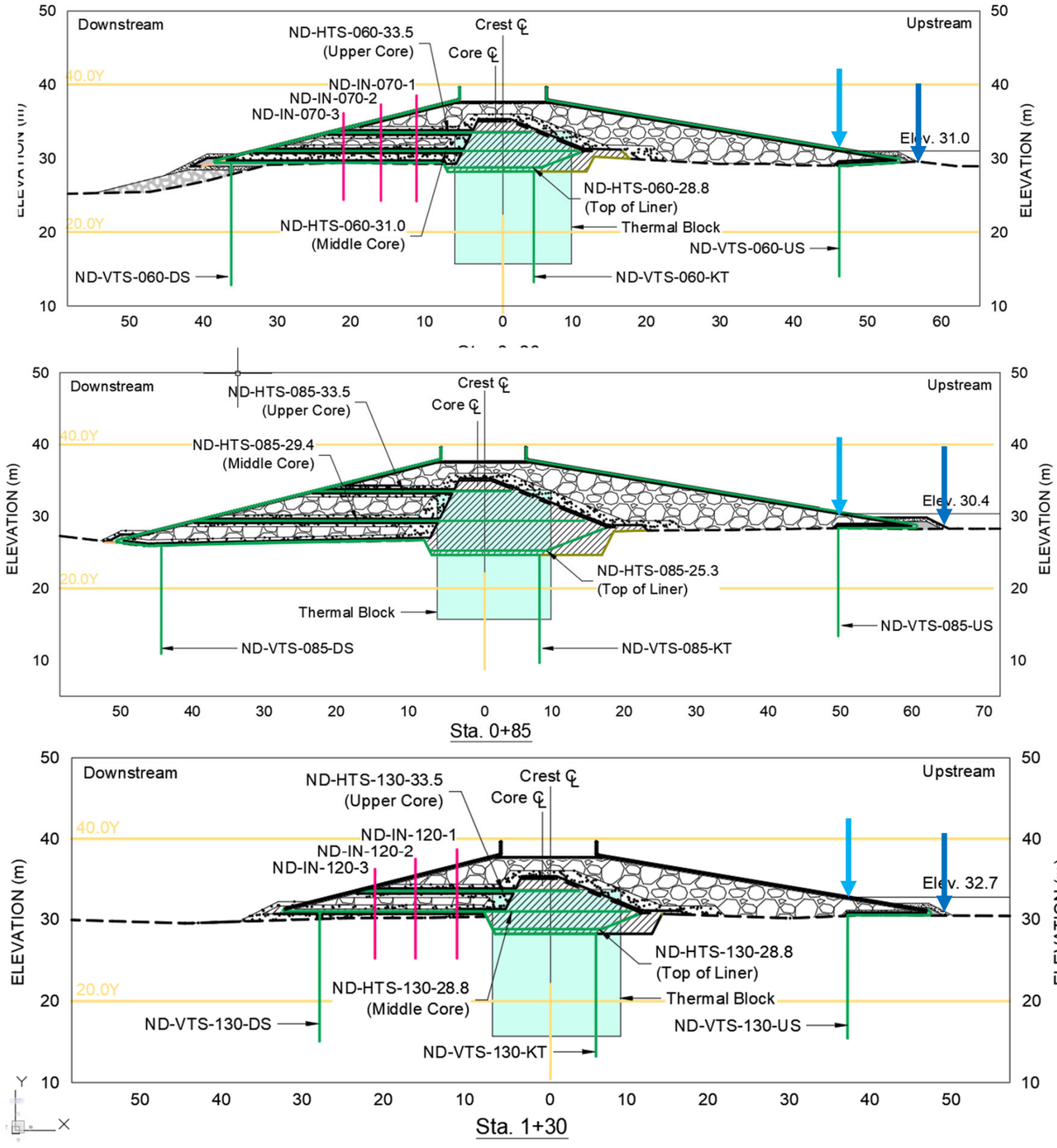


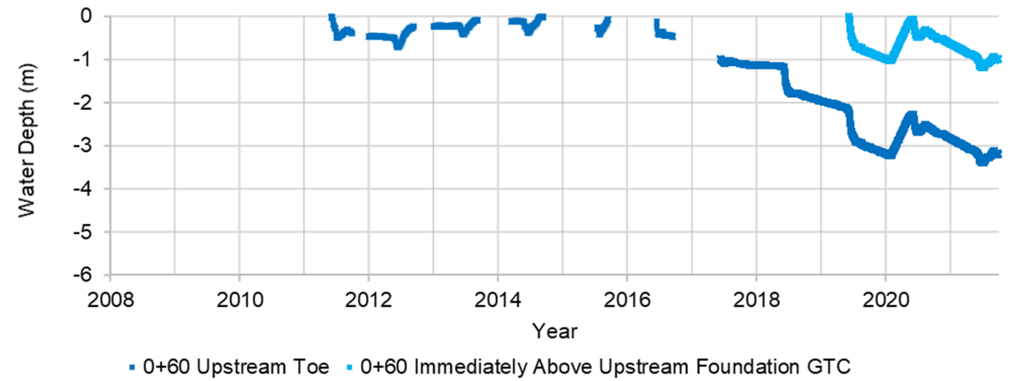
Approximate Position of Maximum Annual Water Level

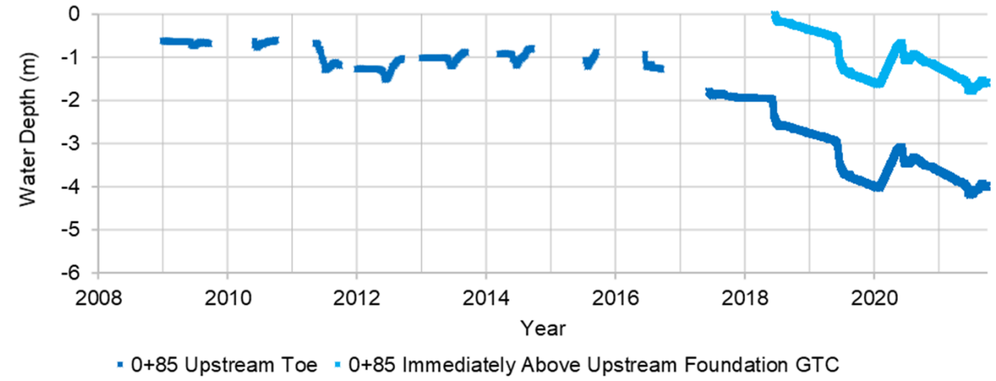


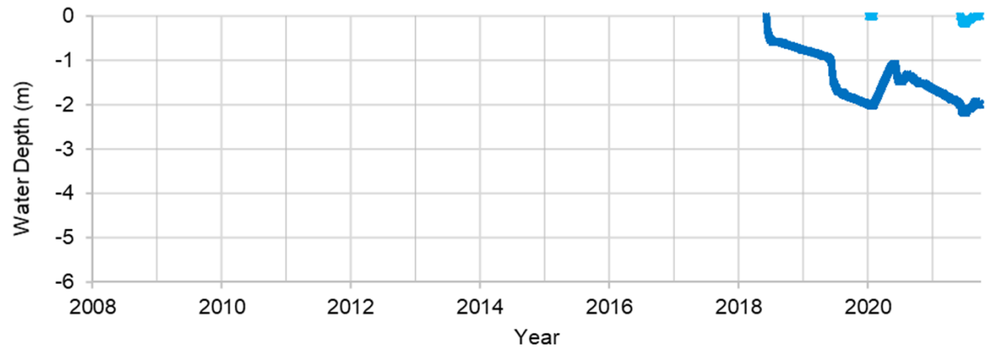
Notes:
1. Water level elevation within TIA measured at station TIA-2
2. Annual change in water level based due to TIA operation and annual inflow from rainfall and snowmelt
3. North Dam commissioned as water retention structure in 2012

srk consulting	AGNICO EAGLE	North Dam and South Dam – Thermal Performance Review 2021
		North Dam – Water Level Along Upstream Dam Face
Job No: 1CT022.077 Filename: North_South Dam Thermal Review2021	DORIS TIA	Date: Oct. 2021 / Approved: CWS / Figure: **7**









Notes:

1. Water depth for each monitoring section based on water elevation (Station TIA-2) and as-built surface elevation at the upstream toe (dark blue line and arrow) and position immediately above upstream foundation GTC (light blue line and arrow)
2. Water depth considered to be approximate to support understanding spatial-temporal changes in water at each monitoring section.

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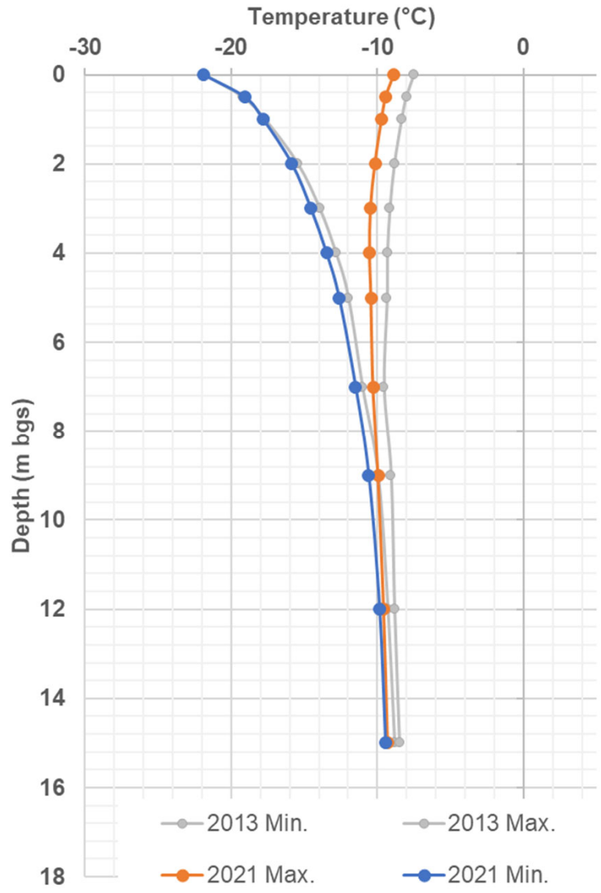
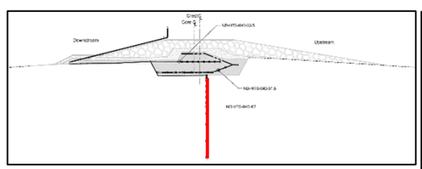
North Dam and South Dam – Thermal Performance Review 2021

North Dam – Approximate Water Depth at Upstream Positions

Date: Oct. 2021 | Approved: CWS | Figure: **8**

ND-VTS-040-KT





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Filename: North_South Dam Thermal Review2021

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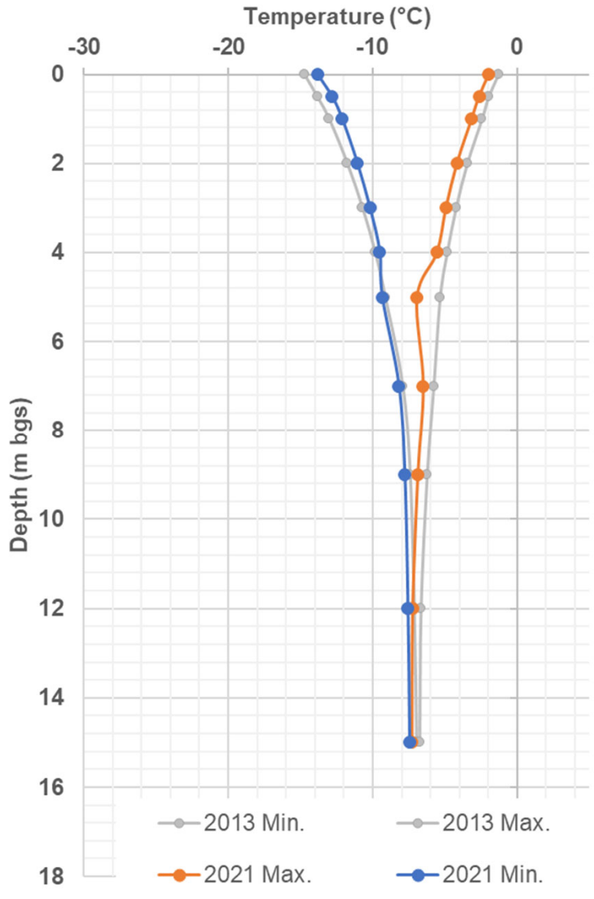
North Dam and South Dam – Thermal Performance Review 2021

North Dam Foundation Ground Temperature – Section 0+40

Date:	Approved:	Figure:
Oct. 2021	CWS	**9**

ND-VTS-060-DS



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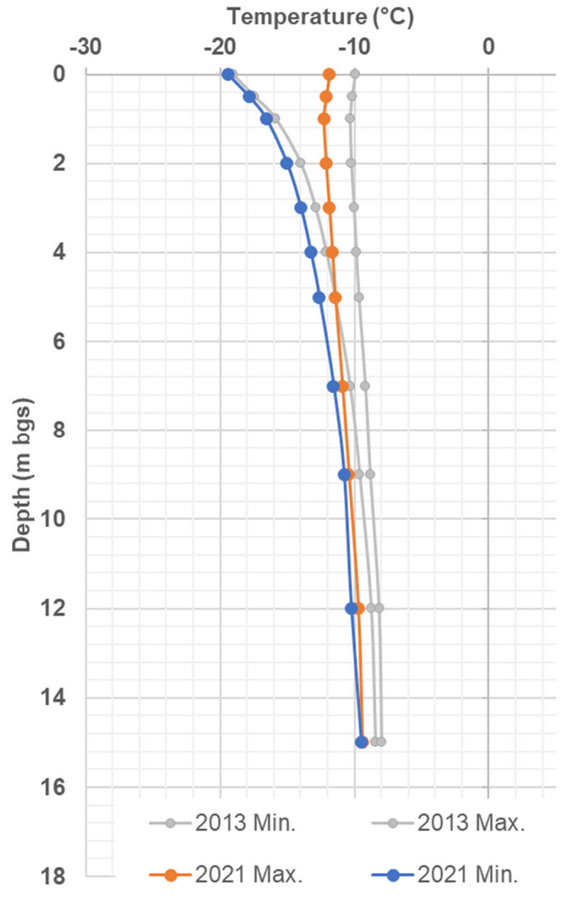
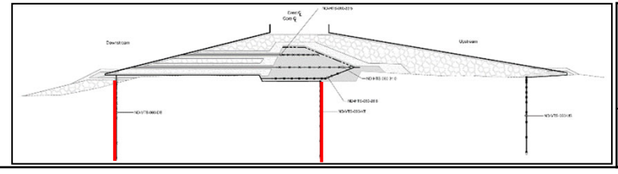


ND-VTS-060-US

Ground Temperature Cable Damaged



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Job No: 1CT022.077

Filename: North_South Dam Thermal Review2021

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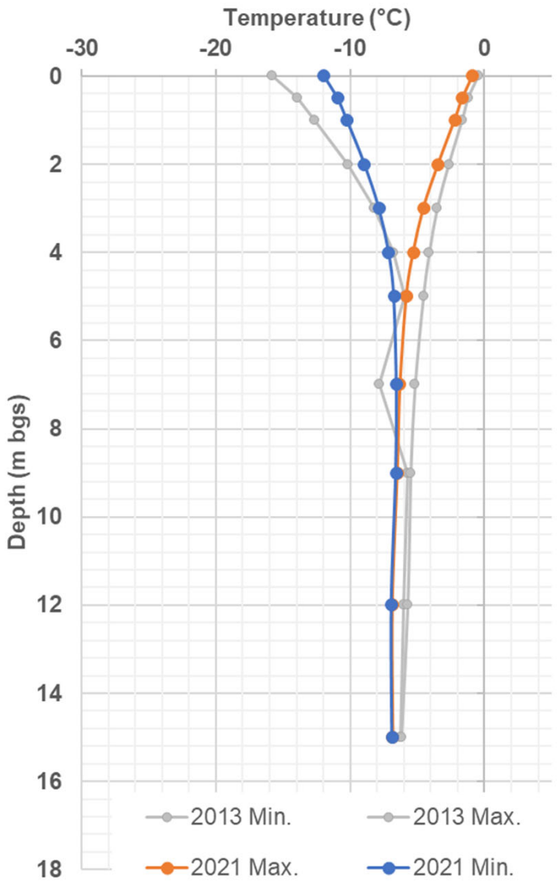
DORIS TIA

North Dam and South Dam – Thermal Performance Review 2021

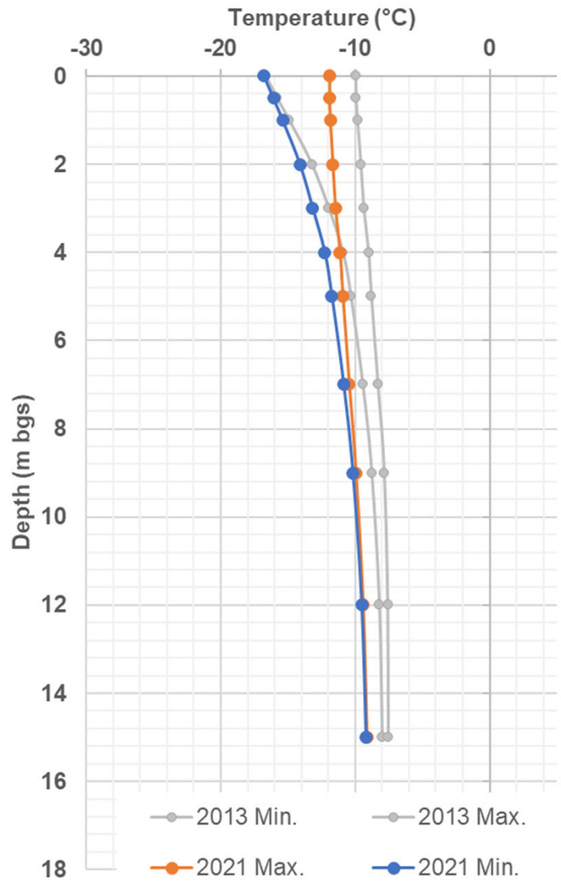
North Dam Foundation Ground Temperature – Section 0+60

Date:	Approved:	Figure:
Oct. 2021	CWS	**10**

ND-VTS-085-DS



ND-VTS-085-KT



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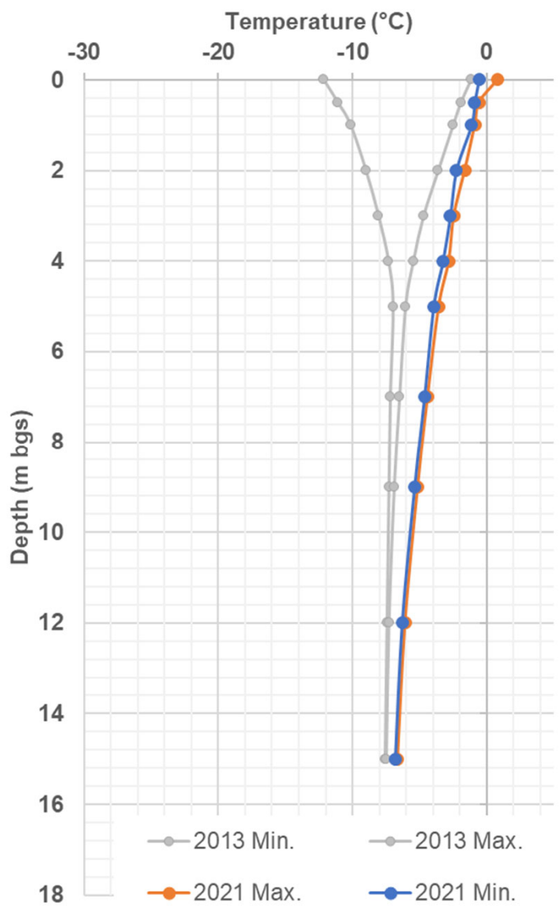
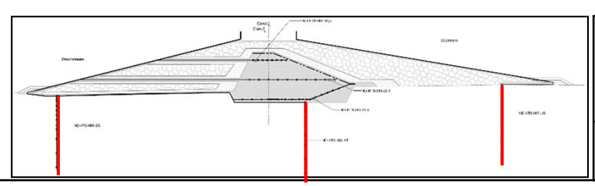




srk consulting

Job No: 1CT022.077

Filename: North_South Dam Thermal Review2021

AGNICO EAGLE

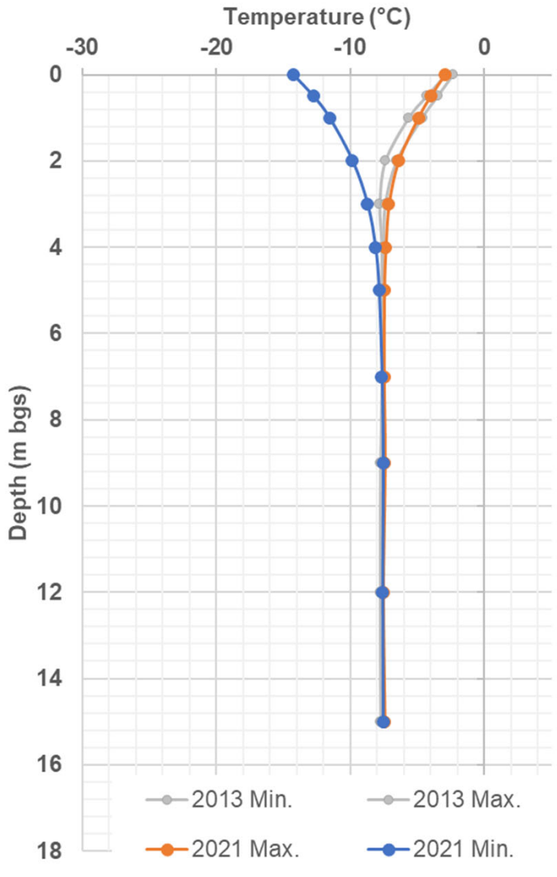
DORIS TIA

North Dam and South Dam – Thermal Performance Review 2021

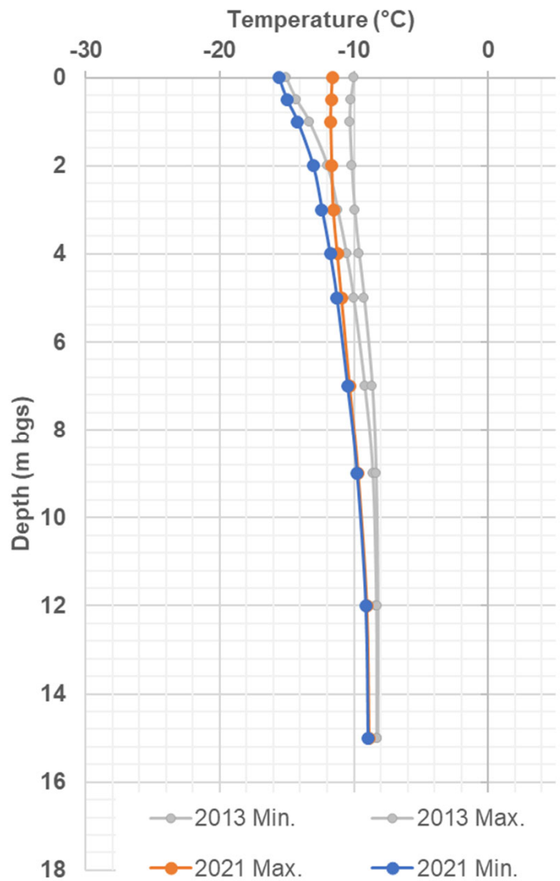
North Dam Foundation Ground Temperature – Section 0+85

Date:	Approved:	Figure:
Oct. 2021	CWS	**11**

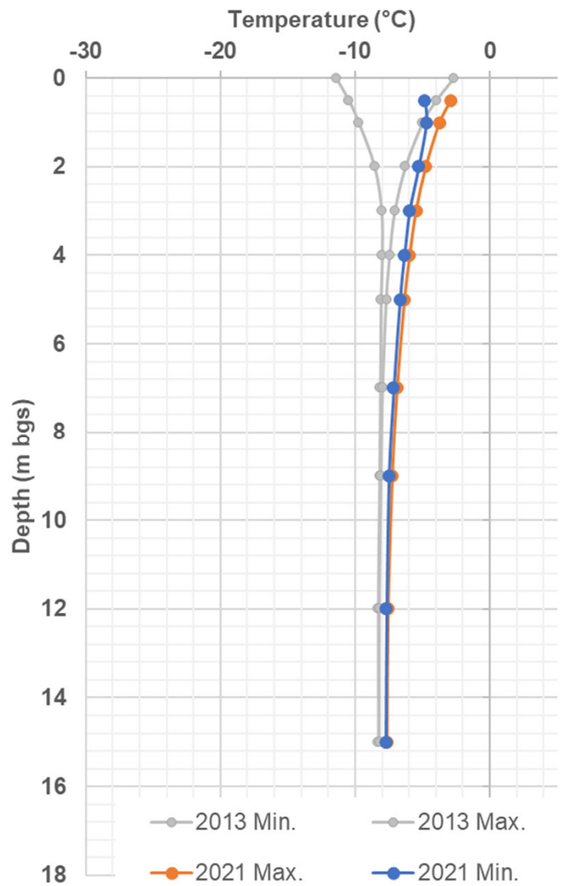
ND-VTS-130-DS

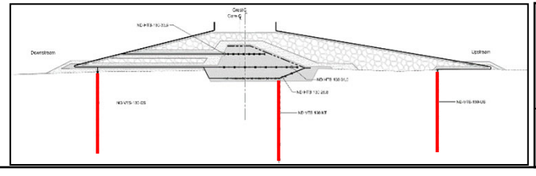


ND-VTS-130-KT



ND-VTS-130-US





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Job No: 1CT022.077

Filename: North_South Dam Thermal Review2021

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North Dam and South Dam – Thermal Performance Review 2021

North Dam Foundation Ground Temperature – Section 1+30

Date:	Approved:	Figure:
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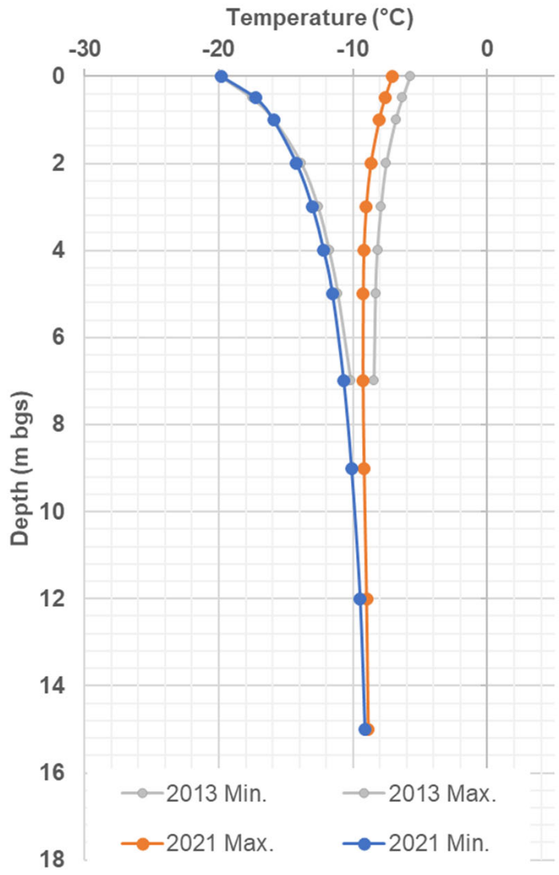
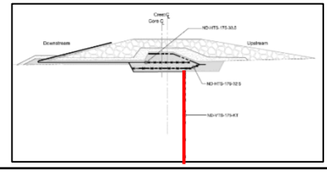
ND-VTS-175-DS **ND-VTS-175-KT** **ND-VTS-175-US**





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Job No: 1CT022.077

Filename: North_South Dam Thermal Review2021

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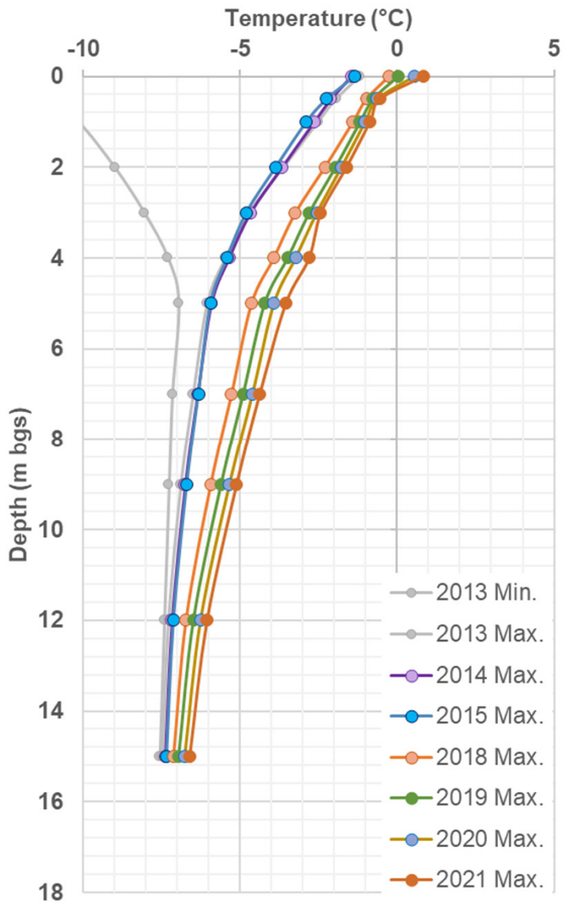
North Dam and South Dam – Thermal Performance Review 2021

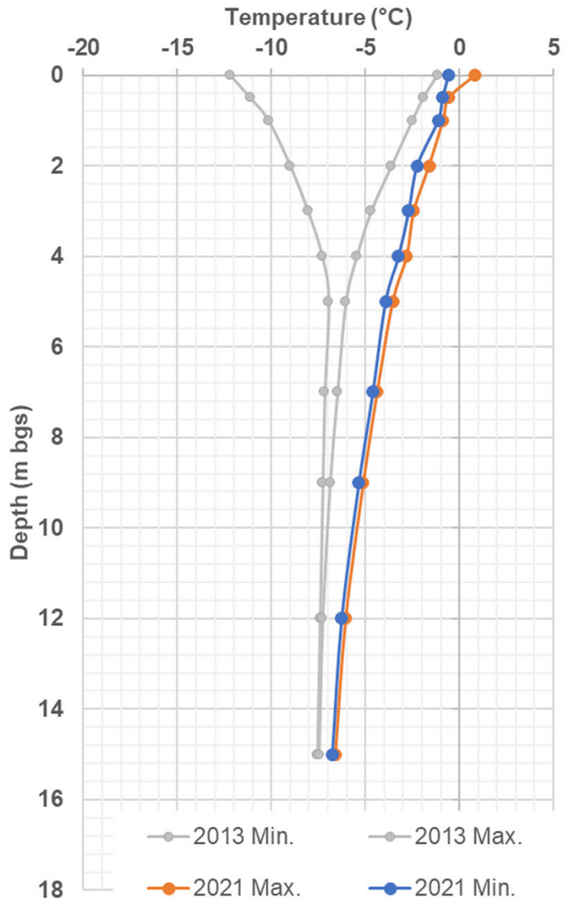
North Dam Foundation Ground Temperature – Section 1+75

Date:	Approved:	Figure:
Oct. 2021	CWS	**13**

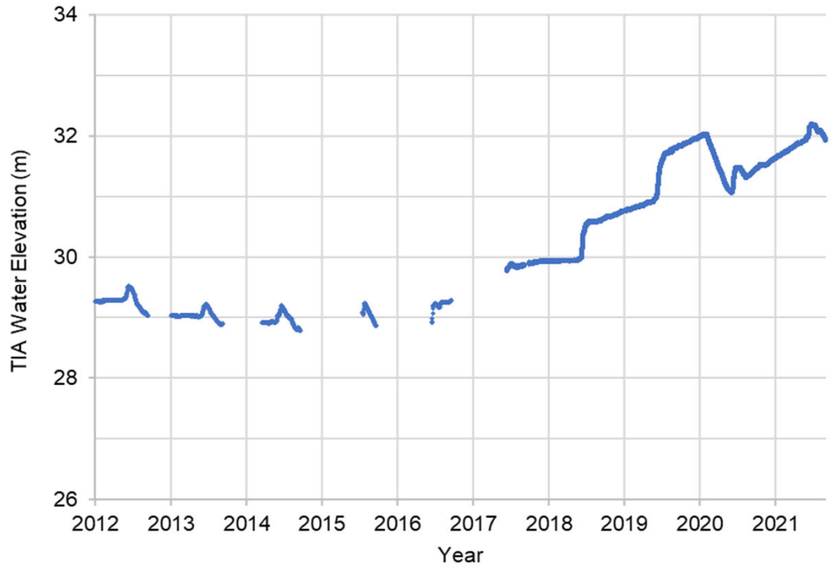
ND-VTS-085-US
Maximum Annual Ground Temperature



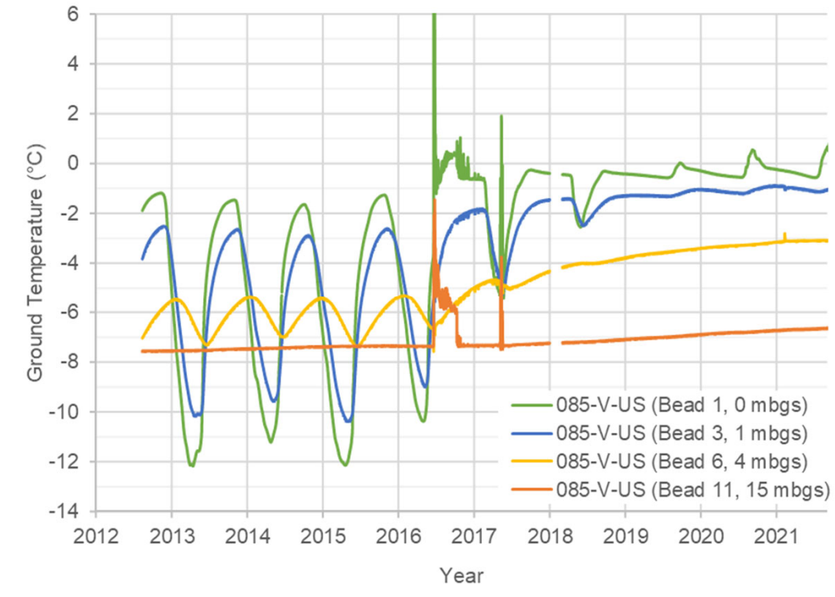
ND-VTS-085-US
Maximum and Minimum Annual
Ground Temperature (2013 and 2021)



TIA Water Elevation



ND-VTS-085-US, Ground Temperature Time Series



Notes:
1. Water level elevation within TIA measured at station TIA-2

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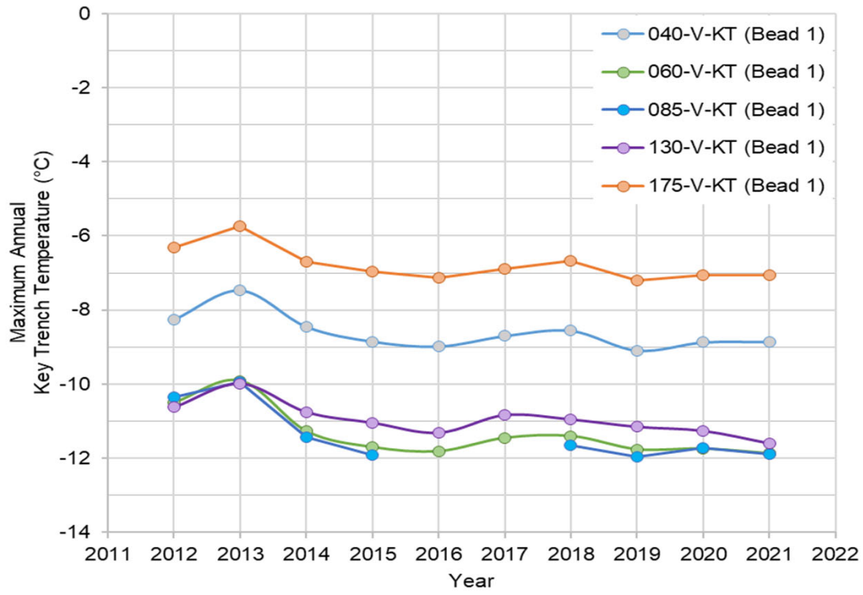
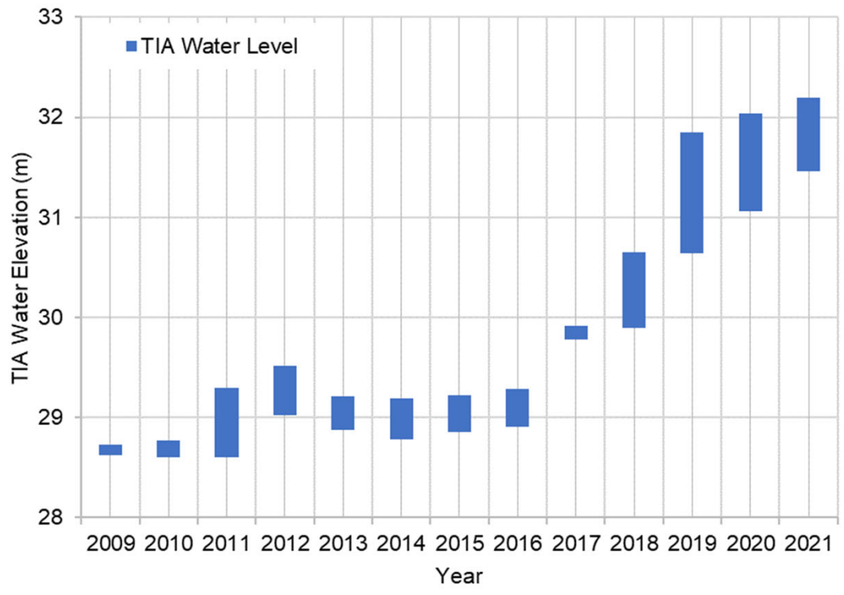
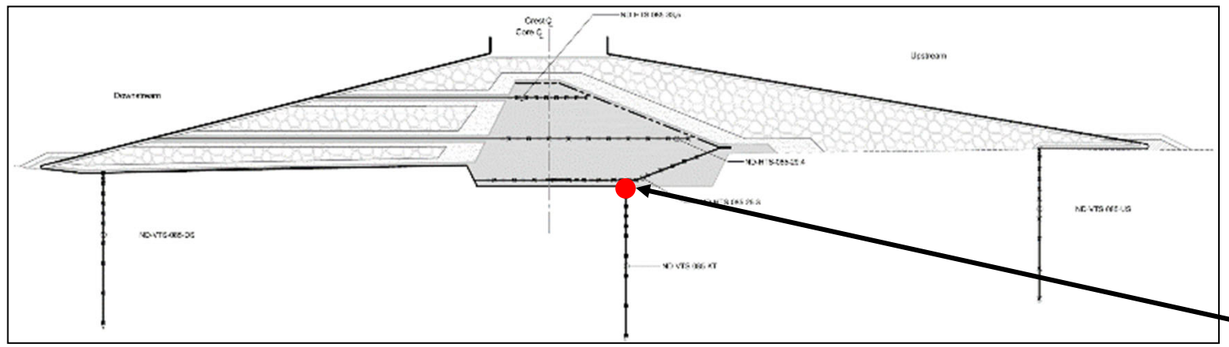
		North Dam – Upstream Toe Foundation
Job No: 1CT022.077 Filename: North_South Dam Thermal Review2021	DORIS TIA	Date: Oct. 2021 | Approved: CWS | Figure: **14**

Key Trench
Maximum Annual Ground Temperature



TIA Water Elevation

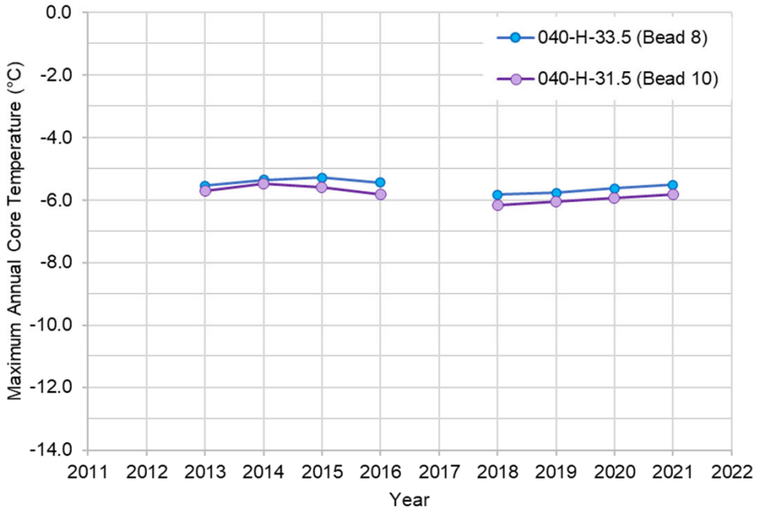


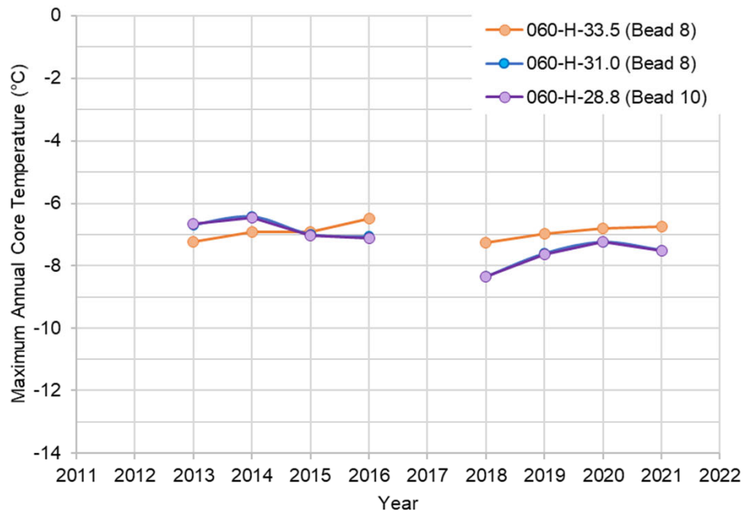


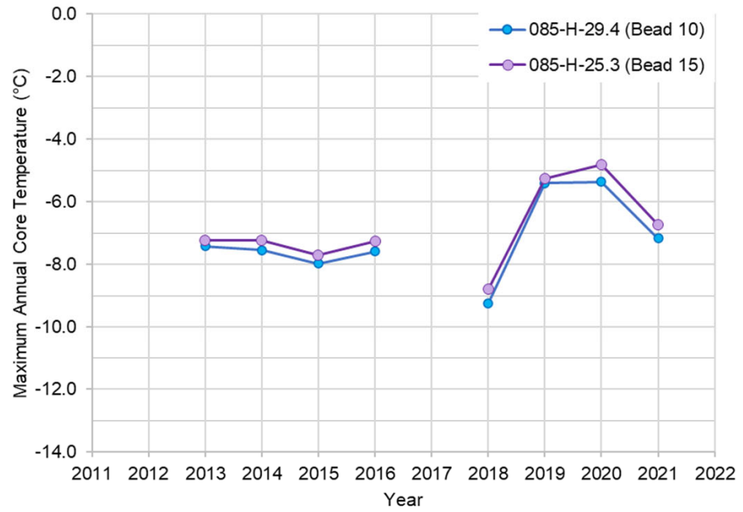
Location for reported key trench temperature

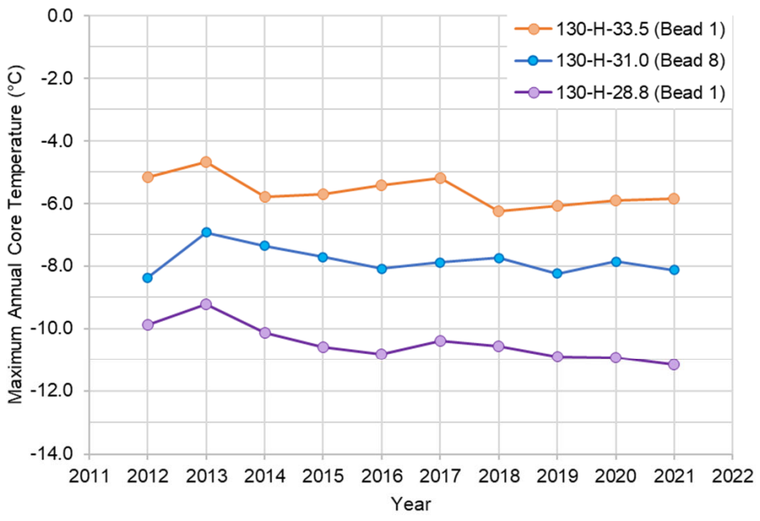
Notes:
1. Maximum key trench temperature report for Bead 1 of vertical foundation ground temperature cable located immediately beneath key trench.
2. Water level elevation within TIA measured at station TIA-2

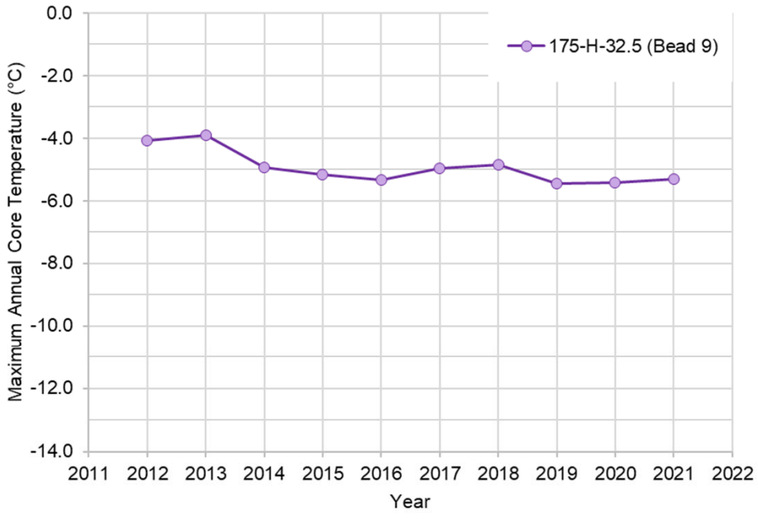
srk consulting	AGNICO EAGLE	North Dam and South Dam – Thermal Performance Review 2021
Job No: 1CT022.077 Filename: North_South Dam Thermal Review2021	DORIS TIA	**North Dam – Maximum Annual Key Trench Temperature**
		Date: Oct. 2021 / Approved: CWS / Figure: **15**

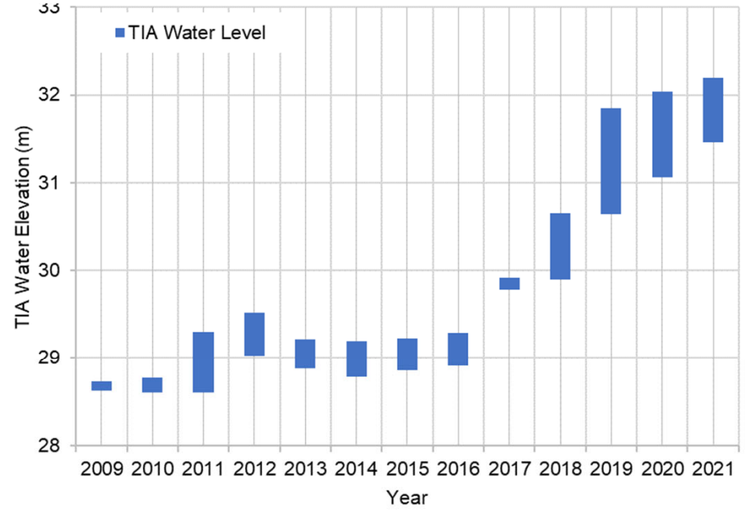












Notes:
1. Maximum annual core temperature report for warmest sensor installed within the core at each instrumented elevation of the frozen core
2. Water level elevation within TIA measured at station TIA-2

srk consulting	AGNICO EAGLE	North Dam and South Dam – Thermal Performance Review 2021
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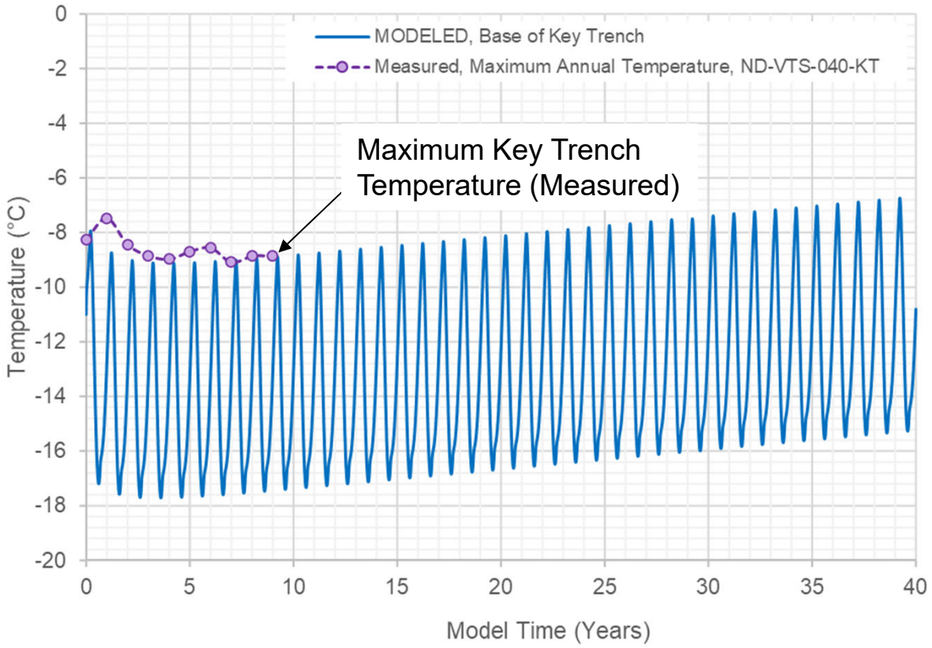
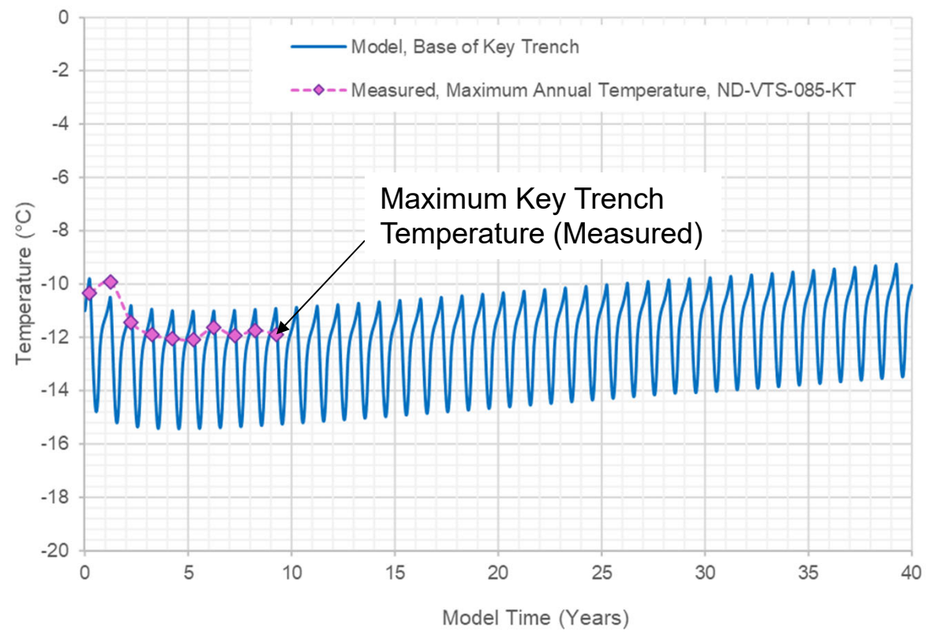
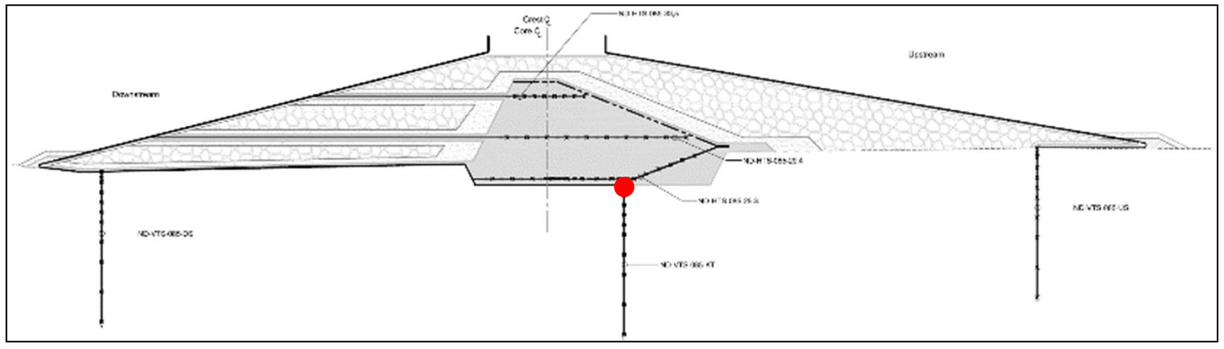
		Date: Oct. 2021 / Approved: CWS / Figure: **16**

North Dam Section 0+40



North Dam Section 0+85

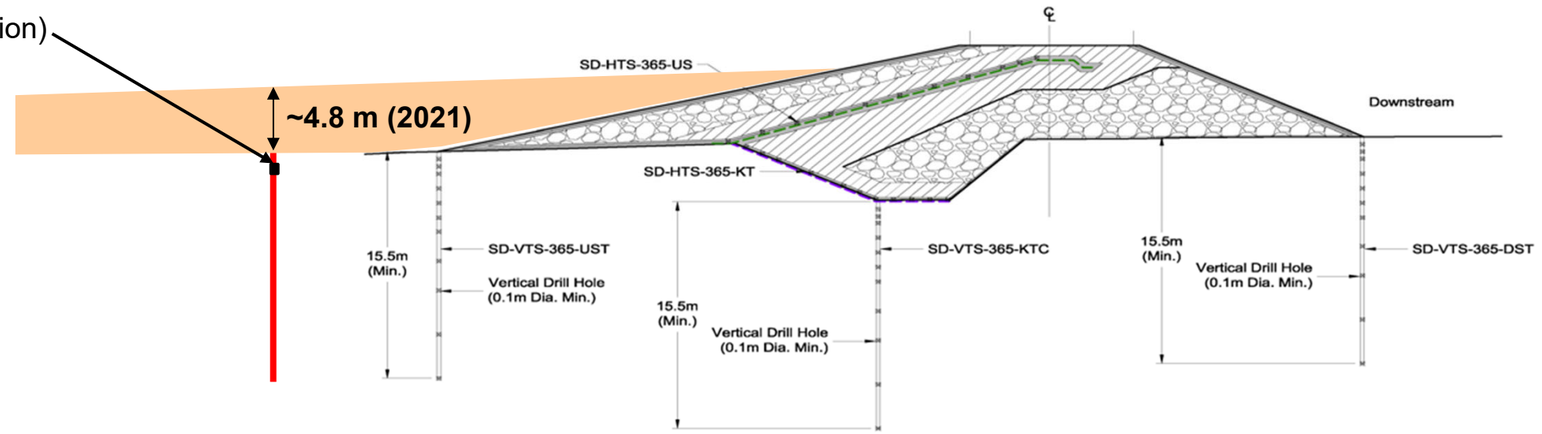




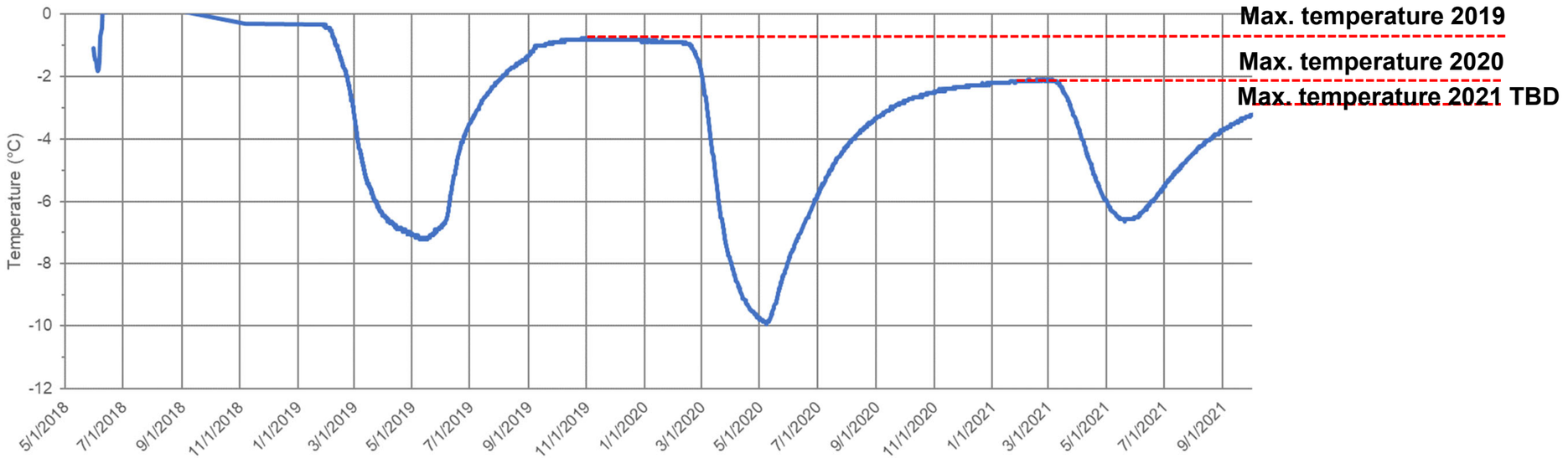
Notes:
1. Modeled key trench temperature from SRK (2016)
2. Measured daily and maximum annual key trench temperature shown for ND-VTS-085-KT

srk consulting	AGNICO EAGLE	North Dam and South Dam – Thermal Performance Review 2021
Job No: 1CT022.077 Filename: North_South Dam Thermal Review2021	DORIS TIA	**North Dam Section 0+85 – Measured vs. Modeled Temperature**
		Date: Oct. 2021 / Approved: CWS / Figure: **17**

SD-VTS-US2
Uppermost Sensor (Bead 1)
Base of tailings (Approx. Location)



SD-VTS-US2



Notes:
1. SD-VTS-US2 located upstream of dam toe near monitoring Section 0+365
2. Uppermost sensor (Bead 1 shown) located immediately below the base of tailings beach
3. Tailings beach approximately 3.8 m and 4.7 m thick in 2019 and 2020, respectively

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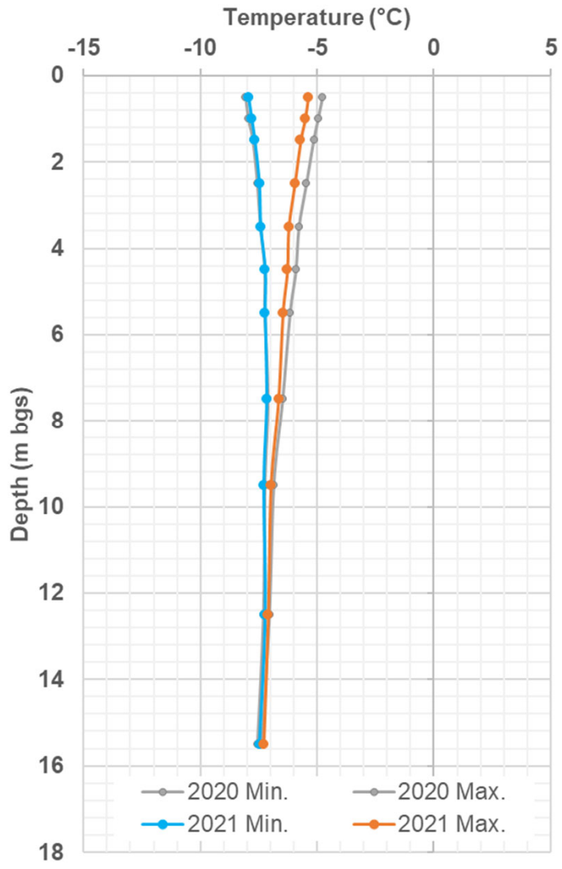
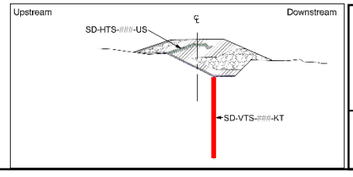
		South Dam Base Tailings Temperature – SD-VTS-US2
Job No: 1CT022.077 Filename: North_South Dam Thermal Review2021	DORIS TIA	Date: Oct. 2021 / Approved: CWS / Figure: **18**

SD-VTS-065-KT



Notes:
1. Ground temperature cables not installed beneath upstream and downstream toe at Section 0+65



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North Dam and South Dam – Thermal Performance Review 2021

South Dam Foundation Ground Temperature – Section 0+65

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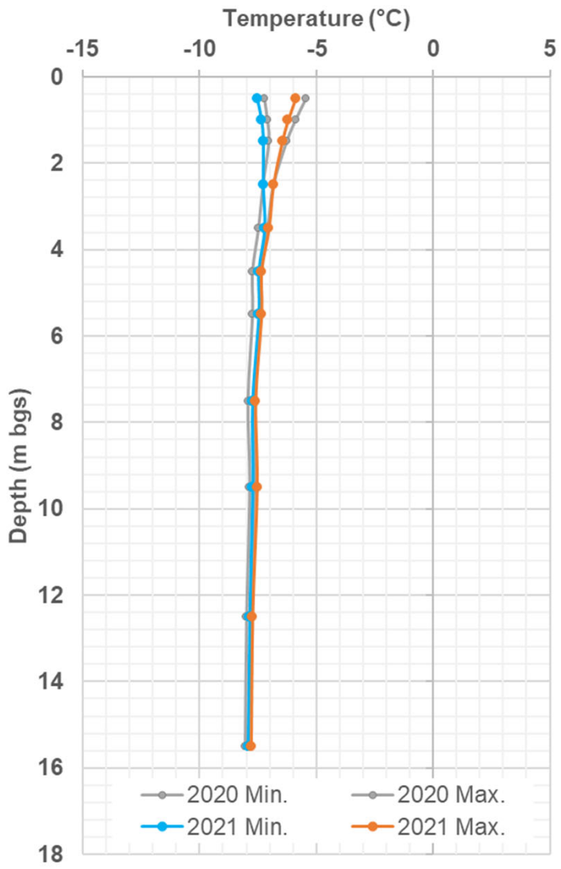
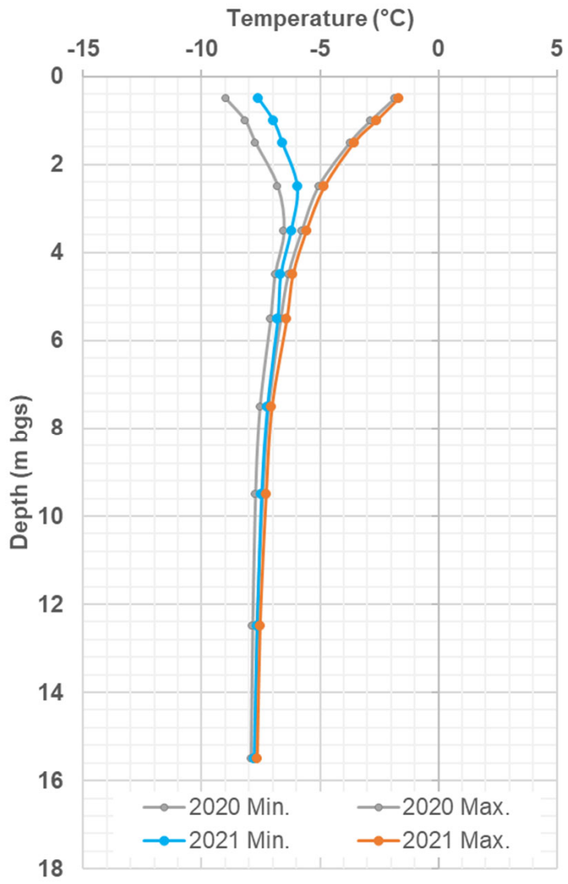
SD-VTS-155-US

Ground Temperature Data
Not Received

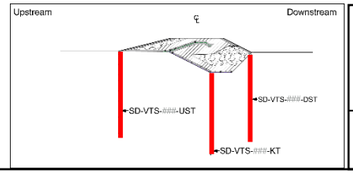
SD-VTS-155-KT



SD-VTS-155-DS



Notes:
1. Ground temperature data not received due to instrument failure at SD-VTS-155-US



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North Dam and South Dam – Thermal Performance Review 2021

South Dam Foundation Ground Temperature – Section 1+55

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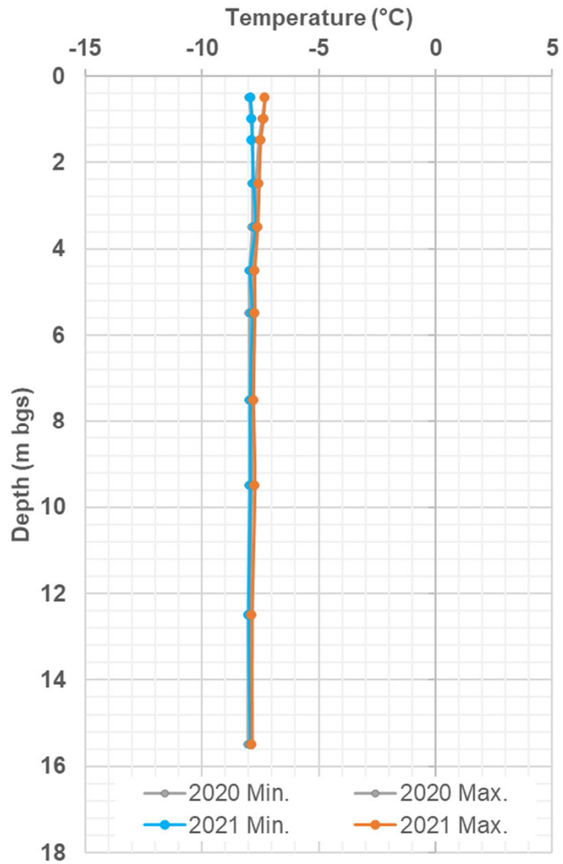
SD-VTS-240-US

Ground Temperature Data Not Received

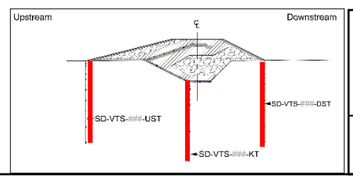
SD-VTS-240-KT



SD-VTS-240-DS

Ground Temperature Data Not Received

Notes:
1. Ground temperature data not received due to instrument failure at SD-VTS-240-US and SD-VTS-240-DS in 2020



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Job No: 1CT022.077
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North Dam and South Dam – Thermal Performance Review 2021

South Dam Foundation Ground Temperature – Section 2+40

Date:	Approved:	Figure:
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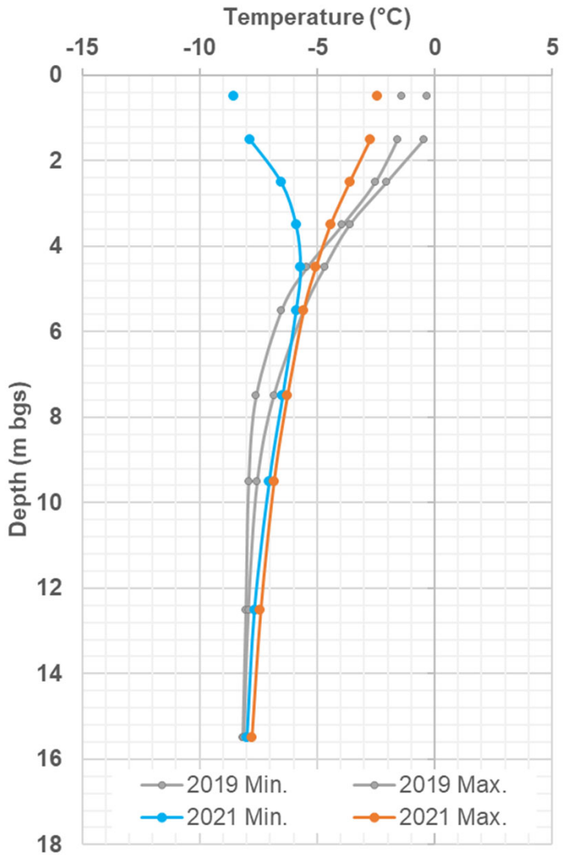
SD-VTS-365-US



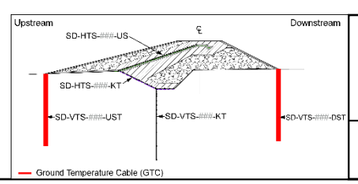
SD-VTS-365-KT

Ground Temperature Data Not Received

SD-VTS-365-DS

Ground Temperature Data Not Received

Notes:
1. Ground temperature data not received from GTC SD-VTS-365
2. Ground temperature for SD-VTS-365-DS up to August 3, 2020. GTC inactive beyond stated date.



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Filename: North_South Dam Thermal Review2021

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North Dam and South Dam – Thermal Performance Review 2021

South Dam Foundation Ground Temperature – Section 3+65

Date:	Approved:	Figure:
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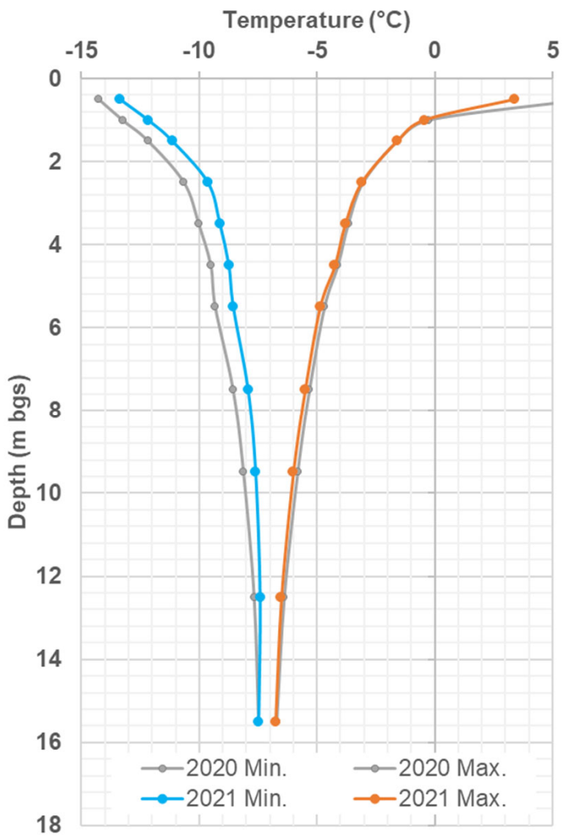
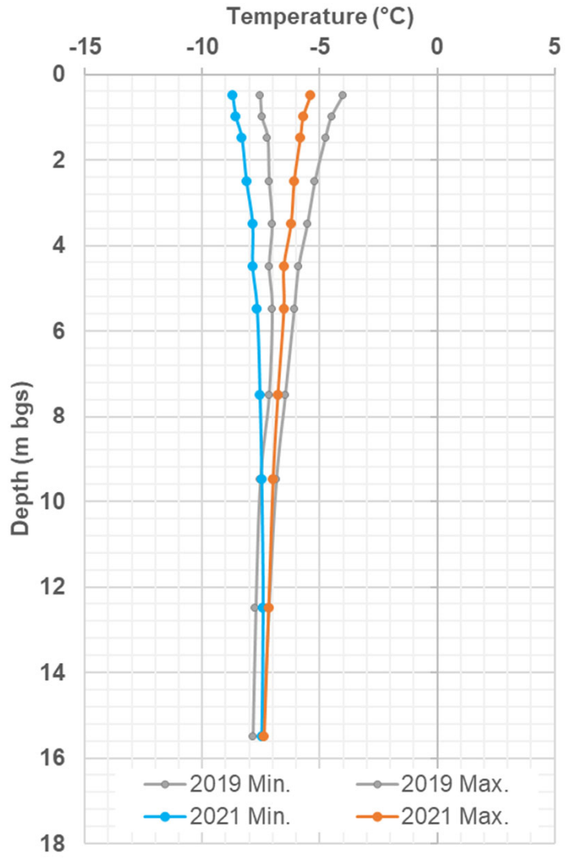
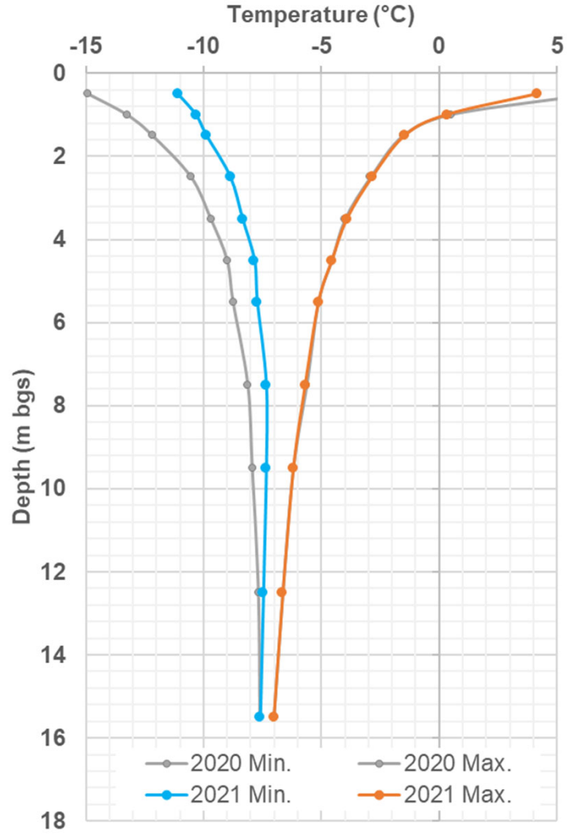
SD-VTS-460-US

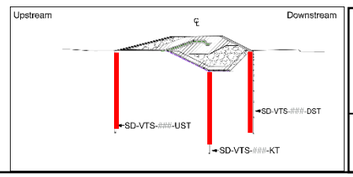


SD-VTS-460-KT



SD-VTS-460-DS





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Job No: 1CT022.077

Filename: North_South Dam Thermal Review2021

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North Dam and South Dam – Thermal Performance Review 2021

South Dam Foundation Ground Temperature – Section 4+60

Date:	Approved:	Figure:
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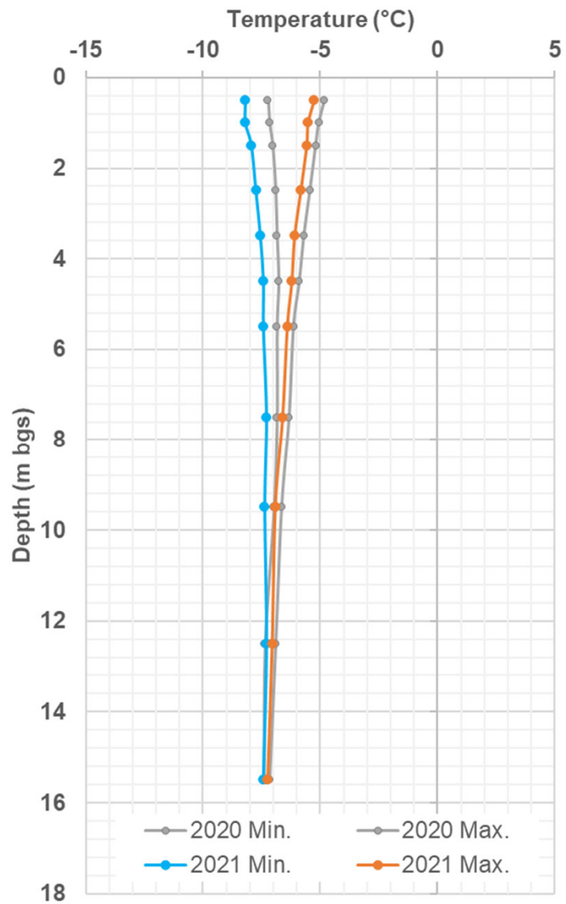
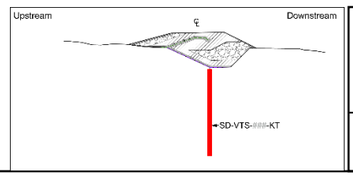
SD-VTS-510-KT



Notes:
1. Ground temperature cables not installed beneath upstream and downstream toe at Section 5+10



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Filename: North_South Dam Thermal Review2021

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North Dam and South Dam – Thermal Performance Review 2021

South Dam Foundation Ground Temperature –Section 5+10

Date:	Approved:	Figure:
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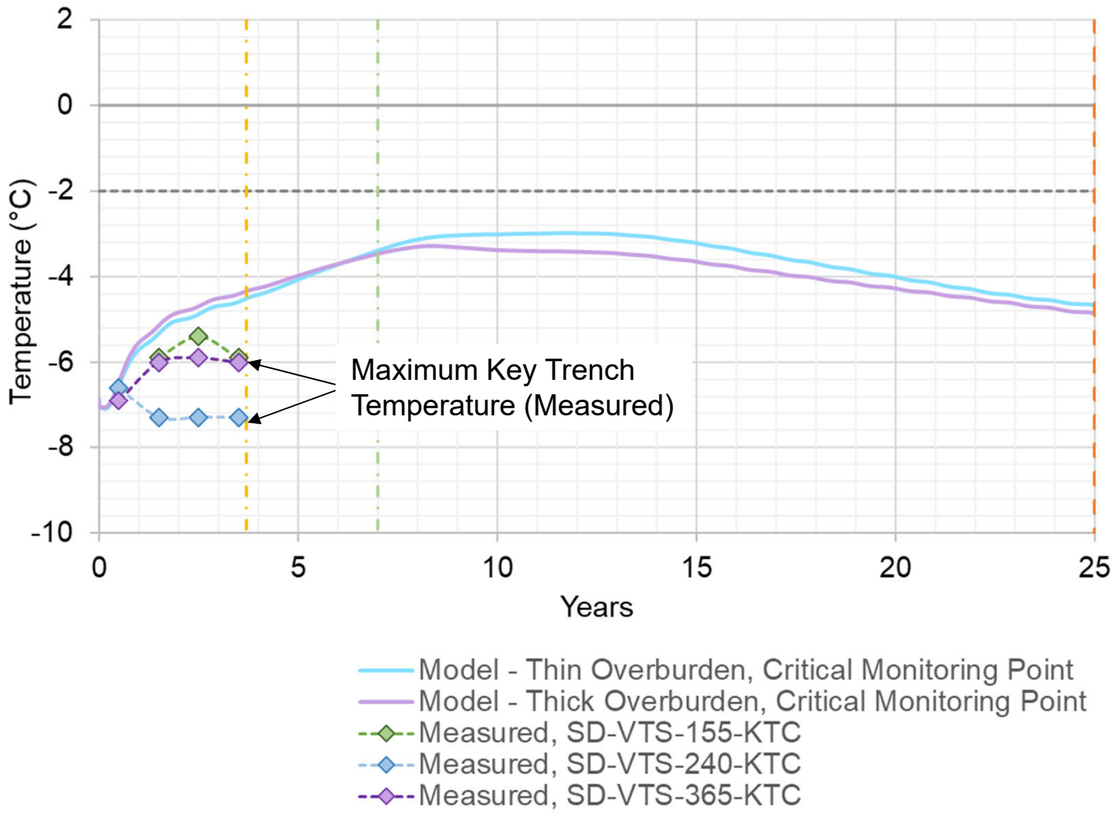
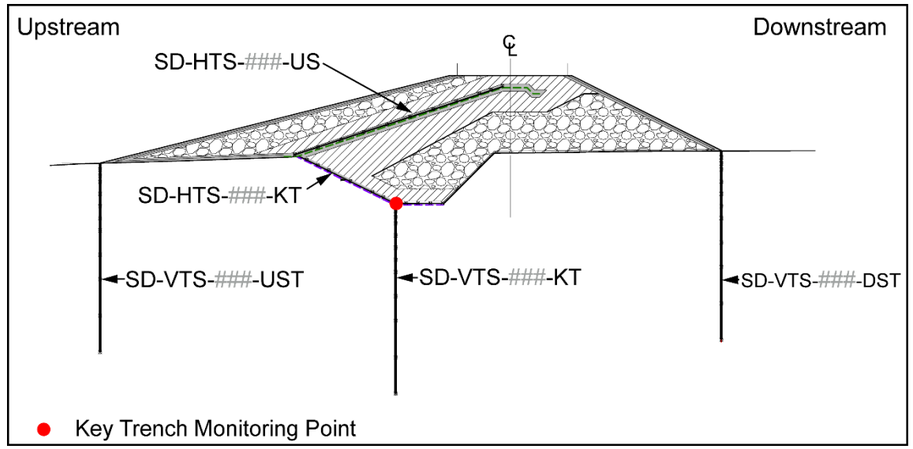
Maximum Section of Dam – Key Trench Monitoring Point

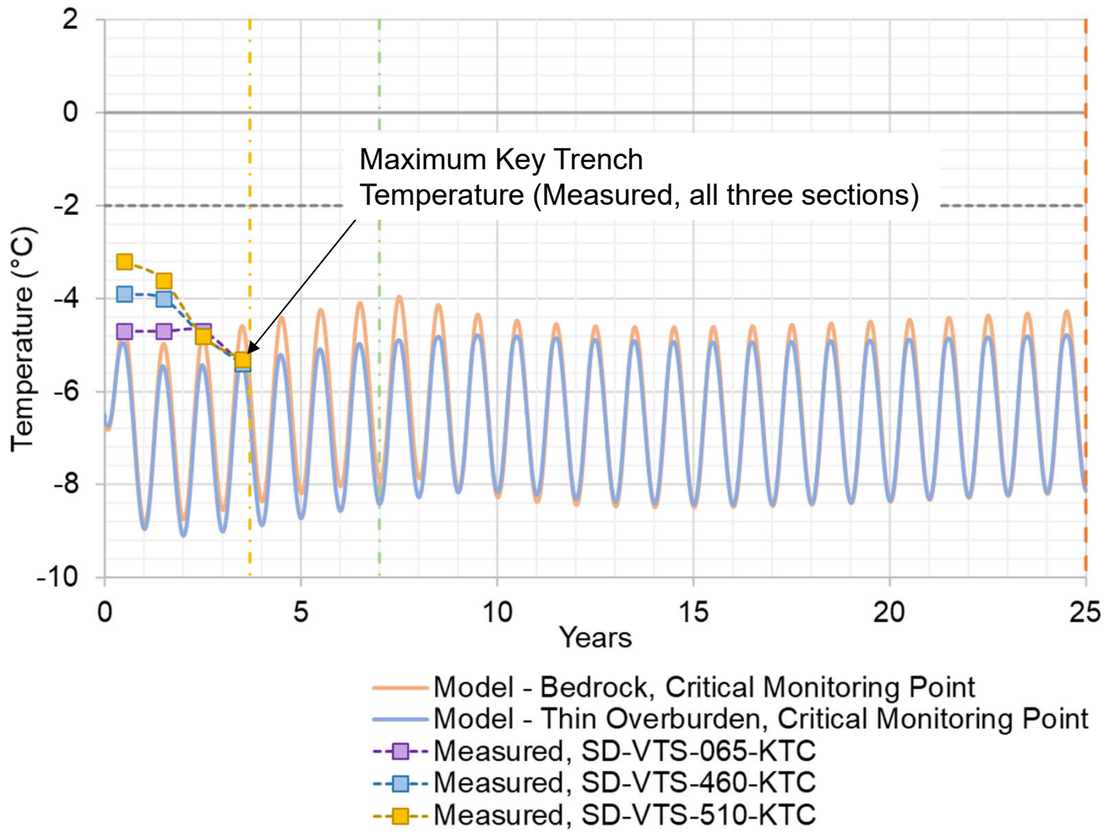


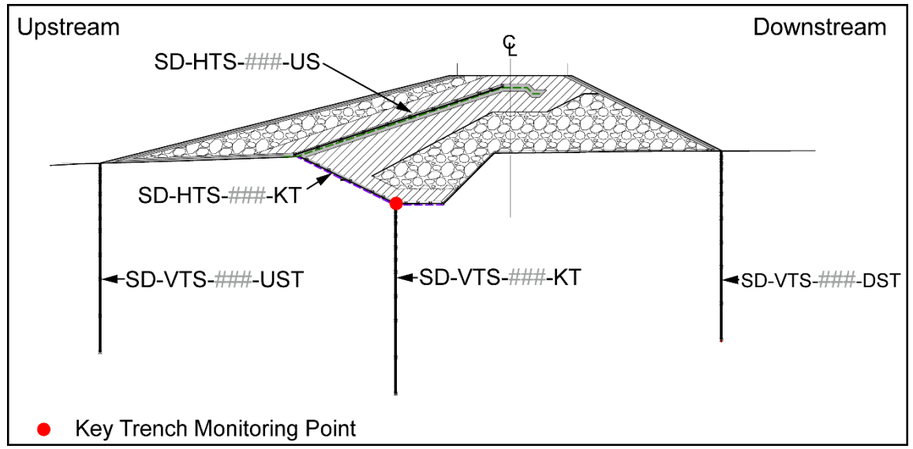


Notes:
1. Maximum modeled ground temperature for critical key trench monitoring point from SRK (2019c)
2. Maximum temperature measured at the base of key trench shown for SD-VTS-155-KT, -240-KT, -365-KT

srk consulting	AGNICO EAGLE	North Dam and South Dam – Thermal Performance Review 2021
		South Dam Maximum Section – Measured vs. Modeled Temperature
Job No: 1CT022.077 Filename: North_South Dam Thermal Review2021	DORIS TIA	Date: Oct. 2021 / Approved: CWS / Figure: **25**

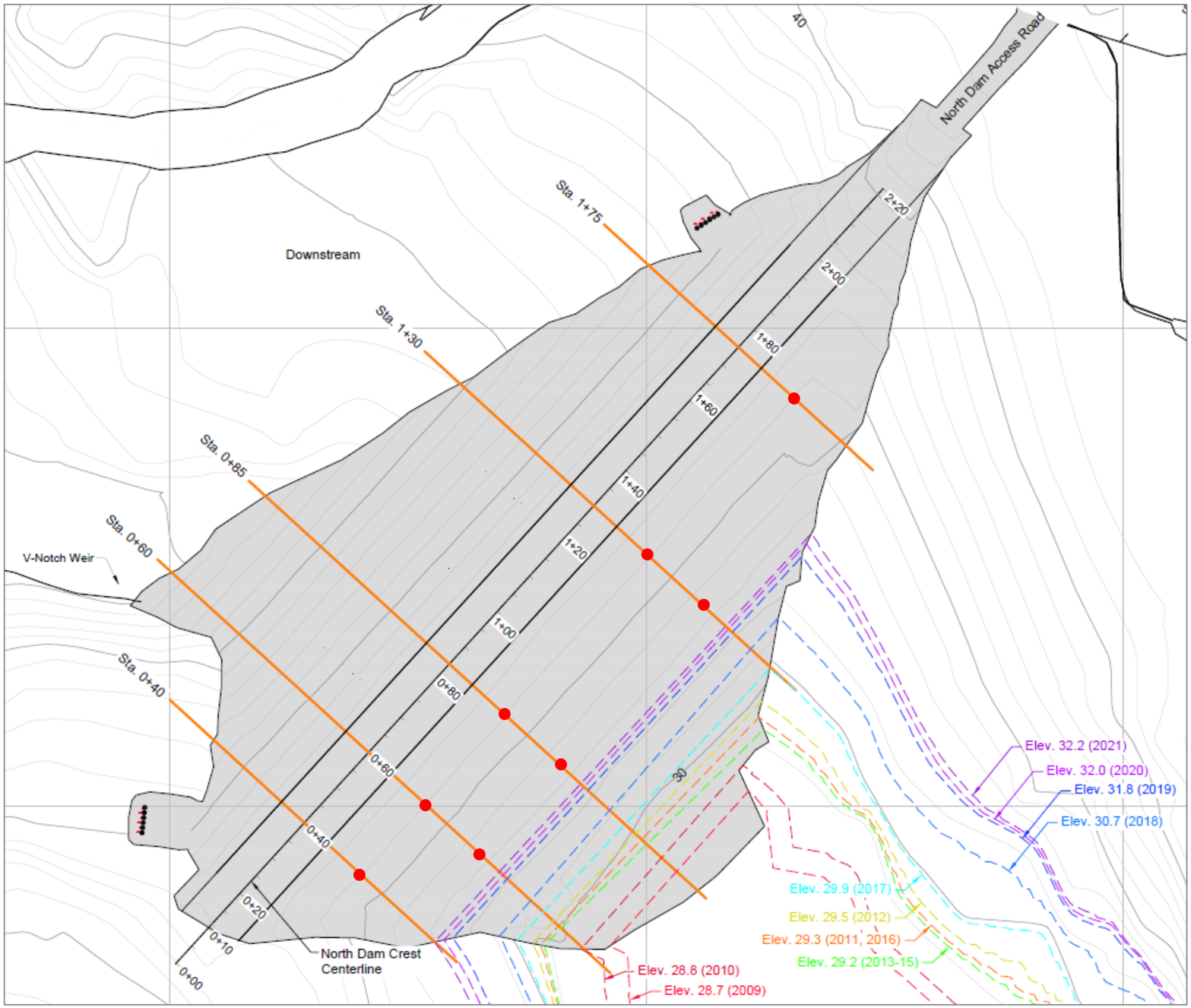
Minimum Section of Dam – Key Trench Monitoring Point





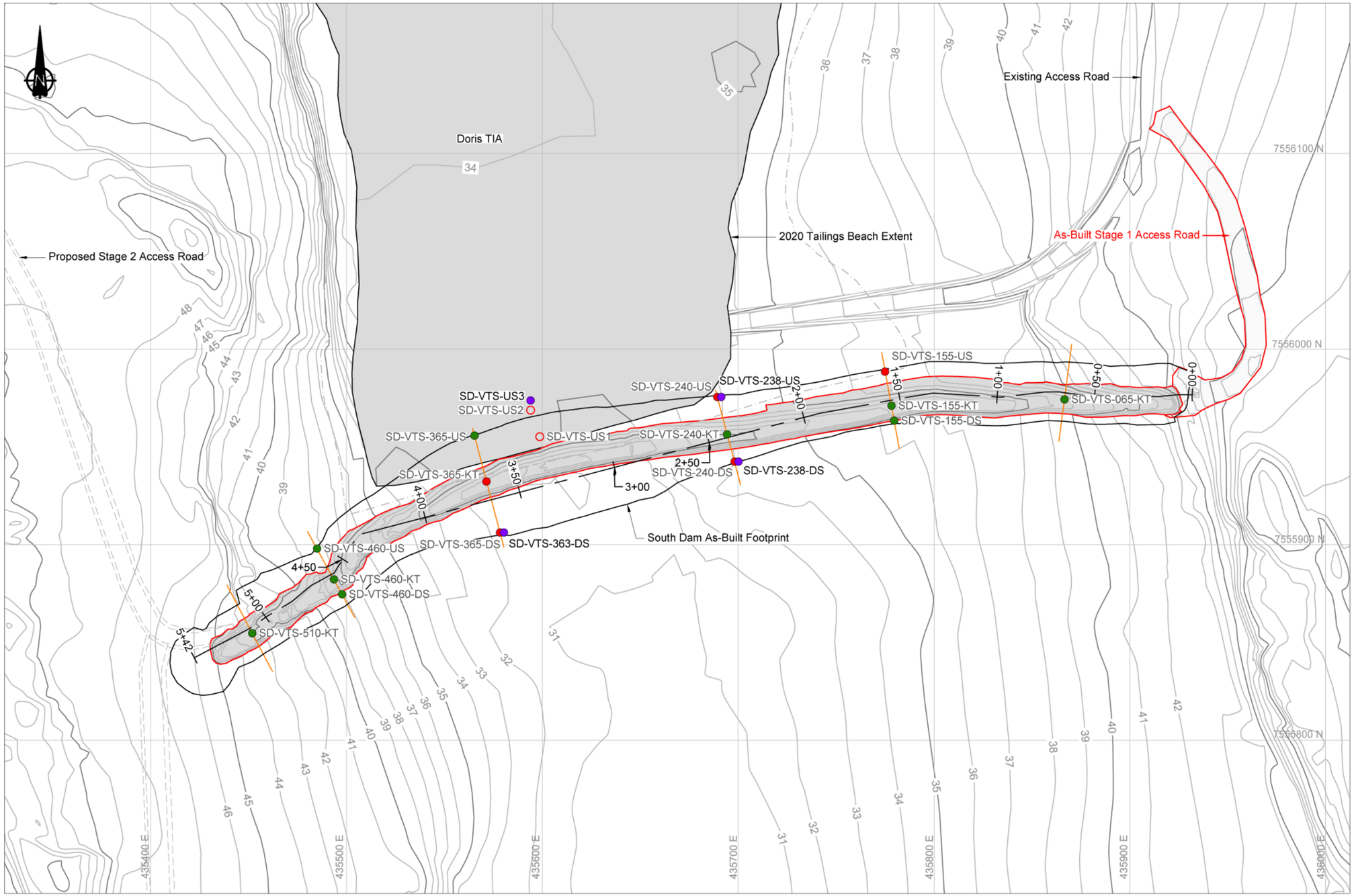
Notes:
1. Maximum modeled ground temperature for critical key trench monitoring point from SRK (2019c)
2. Maximum temperature measured at the base of key trench shown for SD-VTS-155-KT, -240-KT, -365-KT

srk consulting	AGNICO EAGLE	North Dam and South Dam – Thermal Performance Review 2021
Job No: 1CT022.077 Filename: North_South Dam Thermal Review2021	DORIS TIA	**South Dam Minimum Section – Measured vs. Modeled Temperature**
		Date: Oct. 2021 / Approved: CWS / Figure: **26**



- Recommended Installation of Upstream Surface Monuments (approximate location)

srk consulting	AGNICO EAGLE	North Dam and South Dam – Thermal Performance Review 2021
		North Dam Recommended Location for Upstream Surface Monuments
Job No: 1CT022.077 Filename: North_South Dam Thermal Review2021	DORIS TIA	Date: Oct. 2021 / Approved: CWS / Figure: **27**



LEGEND

- Active GTC
- Inactive GTC
- Partial Function GTC
- Recommended Replacement GTC
- Monitoring Section
- Proposed Road / Dam Infrastructure
- As-Built Key Trench Excavation
- Phase 1 Tailings Footprint
- Dam Footprint
- Tailings Extent (2020)

NOTES

1. Contours shown at 1.0m interval. Topographic contour data from the terrain model was provided by the Client (TMAC).
2. All units shown are in meters unless otherwise stated.
3. Status of vertically installed ground temperature cables (GTCs) as of March 2021.

REFERENCES

NAD83 UTM Zone 13.

REPLACEMENT GTC (Recommended)

I.D.	Northing	Easting
SD-VTS-US3	7555974	435594
SD-VTS-238-US	7555976	435691
SD-VTS-238-DS	7555942	435700
SD-VTS-363-DS	7555906	435580

0m 20 40 60 80

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AGNICO EAGLE

DORIS TIA

North Dam and South Dam – Thermal Performance Review 2021

South Dam Recommended Location for Replacement GTCs

Date: Oct. 2021 | Approved: CWS | Figure: **28**

Attachment 2
Recommendations and Agnico Responses – TIA

Table 1 2021 Tailings Impoundment Area Annual Geotechnical Inspection Report Recommendations and Agnico Response

Please note: Formal recommendations are provided in black text, EOR suggestions are captured in blue text, and where appropriate, an EOR update status of certain recommendations or important context is provided in *red* text.

Inspection Item	2021 Recommendations	Agnico Response
Tailings Operating, Maintenance and Surveillance (OMS) Manual and Emergency Response Plan (ERP)	▪ Overall, the OMS manual, TARPS and Dam Emergency plan must be reviewed by Agnico Eagle and updated to reflect the many recent changes, including, but not limited to the Dam Emergency Plan, the updated TARPs and change in key personnel listed in the OMS manual. Minor updates to the North and South dam monitoring SOPs are also recommended. ▪ All components should be reviewed against Agnico Eagle's corporate tailings management system and updated tailings standards through a gap analysis to identify required updates. ▪ The suite of OMS, TARPs, ERP and Dam Emergency Plan must be reviewed with all site operations annually and updated as necessary. ▪ Agnico Eagle should ensure all staff are properly informed and trained on the contents of the OMS Manual.	SRK and Agnico are currently collaborating on updates to these plans. The OMS manual, including the TARPS, is updated once per year in accordance with the AEM governance policy for Critical Infrastructure. The update takes place during the second quarter of the year. An update of the ERP manual will be made at the same time. Agnico is currently in the process of updating the Dam Emergency Plan. Agnico conducts regular review of the OMS manual with key staff including emergency response scenarios. Components of the OMS manual are included with new hire orientations.
Compliance with Monitoring Frequency Requirements	▪ Recommended monitoring frequencies have been met in all categories except for visual inspections and survey monitoring. Agnico Eagle should aim to improve the frequency of these monitoring events in 2022. ▪ *It is understood that COVID-19 and site staffing limitations during this monitoring year impacted the ability to collect this data. Plans in place now from Agnico to further increase visual inspections in 2022.*	Agnico will carryout monitoring activities as per the Monitoring SOP. Any deviations from protocol will be communicated to the Engineer of Record (EOR).
Thermosyphons	▪ The joints on the thermosyphons are showing signs of weathering and rusting. The thermosyphon weld joints should be cleaned (wire-wheel) and repainted to slow additional corrosion.	AEM will ensure that appropriate maintenance is given to the thermosyphons including the joints.
CR1000 Datalogger Battery Voltage	▪ The external CR1000 datalogger batteries should continue to be monitored and recharged annually or replaced as needed.	Battery charge data is reviewed monthly, and batteries are maintained accordingly.
Visual Inspection (Walk Over)	▪ Increase the completion of weekly visual inspections at the North Dam in accordance with the specified frequency. ▪ *The number of visual inspections (formerly walk overs surveys) has improved in 2021, however additional inspections are required to be in compliance with the specified frequency.*	Agnico will carryout monitoring activities as per the Monitoring SOP. Any deviations from protocol will be communicated to the Engineer of Record (EOR).
Monitoring of Flowing Water at the Toe of the North Dam	▪ Modify the water quality monitoring SOP based on the absence of data to suggest the presence of TIA Reclaim Pond water in the flowing water at the toe of the North Dam. Recommended changes to the monitoring SOP are below, final changes to the frequency will be documented in an updated SOP. ▪ Reduce the water quality and flow monitoring frequency for field measurements, from once per week to once per month in the periods while flowing water is observed (if observed). ▪ Reduce the laboratory water quality monitoring frequency to once per year, during August, when flowing water is observed at the downstream toe, ensuring that this sample	Agnico will reduce the water flow and quality monitoring frequency as recommended.

	is collected and analyzed per the SOP, including all field parameters. This change in frequency also applies to the other LAS samples described in the monitoring SOP.	
Ground Temperature Cables (GTCs) and D405 Dataloggers	▪ GTCs provide thermal monitoring of the dam to ensure conditions remain within the intended design for safe operation and tailings containment. GTC replacement is recommended in some areas of the South Dam where recent instrument failure has occurred. Four replacement GTCs are suggested to be installed at this time (two upstream and two downstream). The Agnico Eagle should work forward to install these replacement GTCs as soon as practical. Priority should be given to the two upstream GTC replacements. Four replacement GTC strings are on site (at the Doris North Camp) ▪ Complete a detailed visual inspection of the South Dam after spring melt, especially looking for any exposed or damaged ground temperature cables. This will allow for preventative maintenance and placement of protective material to be done if exposed cables are observed, which will help to limit the potential for damage from wildlife. ▪ Complete a manual download of data from each datalogger once in 2022, following the instructions in the monitoring SOP. ▪ *Beadedstream telemetry subscription requires annual renewal. Agnico Eagle has taken over the subscription with Beadedstream and will be responsible for maintenance of the GTC telemetry system operations are maintained.*	Agnico will look to install the GTC as soon as practical, and conduct spring survey of all GTC cables., Maintenance and repairs will be conducted as required. Manually downloads will be collected annually.
Visual Inspection (Walkover)	▪ Increase the completion of weekly visual inspections at the South Dam in accordance with the required weekly frequency.	Weekly walkover surveys will continue as per the South Dam SOP.
Annual Physical Inspection of the South Dam	▪ There are two zones on the 2H:1V downstream slope of the South Dam, specifically where the downstream GTCs were brought up the downstream slope, that some minor sloughing and tension cracking of the dam shell ROQ has occurred. These areas should be closely monitored and additional fill (toe berm) along these portions of the slope could provide some mitigation in these areas (See later bullet). ▪ Phase 1 South Dam construction disturbance, where snow access roads were constructed appears to have initiated some permafrost degradation (thaw depressions and ponding) and should continue to be closely monitored. ▪ *All ponding, tension cracking, sloughing and permafrost disturbance is within the Phase 2 South Dam footprint. Delayed construction of the Phase 2 raise may lead to further degradation of the permafrost in these areas. To proactively mitigate the risk of foundation thaw prior to construction of the South Dam Phase 2 raise, a thermal toe berm should be implemented. The toe berm would include at least 1.5 m of ROQ fill placed over this area (about 5 m in width). The toe berm fill would be integrated into the Phase 2 dam shell volume. Initial volumetric modeling of a 2 m thick, top crest width 5m with 2H:1V side slopes indicates that neat-line volumes for this additional fill material would be in the range of 4,000 m^3.* ▪ *Agnico Eagle has already sourced dust suppression agents for the TIA and should determine when the dust suppression measures should be implemented based on monitoring*	A mitigation plan has been developed in collaboration between SRK and AEM to add additional rockfill in the area mentioned. It is to be noted that these areas are located outside of the current section of the dam retaining tailings and the movement are shallow and limited to the slope. AEM will continue to closely monitor the area as part of the monitoring and surveillance program.

	observations and the planned restart of production and tailings deposition.	
Tailings Deposition System	▪ The tailings discharge system must be operated in accordance with the tailings deposition plan (SRK 2021). Primary spigot moves should be expected during, or shortly after, spring melt and again prior to winter freeze up. The next winter discharge should be located at the northeastern extent of the subaerial beach (north of the current spigot H location) to limit ice entrainment due to winter sub-aerial deposition. Following spring melt, deposition from the South Dam (Spigot A, B and C) should resume. In the subsequent fall/winter, a move to the new northeastern extent of the subaerial beach should be anticipated. ▪ A bathymetric survey was conducted in 2021. With this newly available data, Agnico Eagle should work with SRK to complete tailings volume reconciliation and updated deposition planning prior to resuming production. ▪ Plans for the Phase 2 raise of the South Dam should be made in parallel with updates to the mine plan to ensure construction can occur in the appropriate season (winter); The raise is required to be in place once the tailings beach against the existing dam reaches the full supply level for tailings (36.5 masl or approximately 2.64Mt of total tailings tonnage). The required timing is dependent on the resumption of production and future milling rates. ▪ *Production activities and tailings discharge have been suspended in 2022. No immediate recommendations during periods when tailings discharge is not active.*	N/A The tailings deposition plan is followed as much as feasible in the field. The simple geometry of the Hope TIA does not require a complex sequencing of change in the deposition area over the year. The main operational criteria is to ensure that the South Dam has a minimal tailings beach length of 100 meters. This component of the design criteria of the South Dam has been followed at all time in 2021. Note that no AEM tailings deposition is planned in 2022 and 2023.
Emergency Dump Catch Basins	▪ The Western Emergency Dump Catch Basin still requires repairs and should be closely monitored. Additional liner slippage since 2020 was noted at the top of the liner crest. This pond still maintains the minimum required capacity but further liner slippage may result in a reduction of the capacity of this emergency catch basin.	The tailings emergency catchment basin will be repaired at the earliest opportunity.
Pipelines (Reclaim, Tailings Deposition and TIA Discharge)	▪ Agnico Eagle should carefully inspect all pipelines placed directly on the tundra for signs of vegetation dieback and associated flow path channeling. Where this is occurring, the pipeline must be relocated to follow existing all-weather road shoulders, and appropriate remediation needs to be put in place where damage has occurred. ▪ The smaller diameter TIA pipelines going from the North Dam to Doris Creek, that were used during the care and maintenance period and before tailings were placed in the TIA around 2017, are no longer connected or functional. Agnico Eagle should consider removing these nonfunctional pipelines from the tundra.	Agnico will continue to monitor all pipelines placed directly on the tundra for signs of tundra damage. To date, Agnico has not observed any issues with insulated lines on the tundra. If damage is observed, Agnico will take the appropriate action to prevent further damage to tundra and remediate where required.
TIA Reclaim Pond Jetty (710 Pumphouse) Pad	▪ Continue settlement monitoring at the TIA Reclaim Jetty (710 Pumphouse) following the recommended survey frequency of twice monthly, May through November. ▪ Once the survey monitoring of the Reclaim Jetty resumes, and the surface is snow-free, conduct an audit of the existing survey monitoring points and establish survey monitoring points where proposed locations are missing or damaged. ▪ Agnico Eagle should develop a plan to raise the Reclaim Jetty pad from its current minimum elevation of roughly 32.1 masl to above the Full Supply Level of the TIA (33.7 masl	Agnico Eagle is in the process of reviewing options for modification of the TIA Reclaim Jetty to improve long term operation at this area. Agnico has been continuously monitoring settlement of the reclaim jetty.

	would raise the pad 0.2 meters above the TIA FSL), or some interim raise which the water level can be maintained with adequate freeboard below the pad. ▪ Once any significant construction or remediation is complete, ensure the recommended TIA Reclaim Jetty survey monitoring points are reestablished.	
TIA Operational Water Balance and Level Targets	▪ Water level targets must be adhered to whenever practical. Short-term or risk-based exceedances may be acceptable. ▪ Currently the main area of immediate impact from raised water levels is the TIA Reclaim Jetty. See recommendations in the section above. ▪ The RBDS resumed in June 2021 and has since been stopped as of December 1, 2021 due to changes in the discharge water quality requirements (specifically changes in the toxicity testing requirements). From a TIA water management perspective, it is important that the RBDS be re-commissioned or alternative water management strategies be developed as the water level approaches the FSL of the TIA (33.5 masl). ▪	Agnico Eagle and SRK are actively in the process of reviewing options for future water management in the TIA. Changes to the water balance and level targets will be reported on in future reports.