SNC·LAVALIN

Detailed engineering of water management and geotechnical infrastructures at Amaruq

Design report of South Whale Tail Diversion Channel

Agnico Eagle Mines Limited

Mining & Metallurgy

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Subject: Detailed engineering of water management and geotechnical infrastructures at Amaruq
Design report of South Whale Tail Diversion Channel
Our file: 651298-2900-40ER-0001-00

Mr. Lavallée,

Mr. Bolduc,

We are pleased to submit the final version of the report mentioned in the above subject.

Do not hesitate to communicate with the undersigned should you have further questions regarding the content of this report.

Truly yours,

SNC LAVALIN INC.

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Project Manager
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YJ/bsp

List of Revisions

Revision				Revised pages	Remarks
#	Prep.	App.	Date		
PA	AA/HT/TA		06/06/2019		For internal comments
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Table of Content

Page

List of Tables

List of Figures

List of Appendices

1.0 INTRODUCTION

1.1 Context

Agnico Eagle Mines Limited, Meadowbank Division ("Agnico Eagle") is developing the Whale Tail Pit, a satellite gold deposit on the Whale Tail property, as a continuation of current mine operations and milling at the Meadowbank Mine. The Amaruq property is a 408 km² site located on Inuit Owned Land, approximately 150 km north of the Hamlet of Baker Lake and approximately 50 km northwest of the Meadowbank Mine in the Kivalliq region of Nunavut. The property, whose location is shown on Figure 1-1 was acquired by Agnico Eagle in April 2013.

Figure 1-1: Meadowbank and Whale Tail site locations

1.2 Project description

A scoping study of the Whale Tail Pit Project was initiated in January 2015 by AEM. SNC-Lavalin Inc. (SNC-Lavalin) was retained for the engineering of the geotechnical and water management infrastructure of the project (SNC-Lavalin, 2015a). The site layout was jointly developed by the SNC-Lavalin and AEM teams. A permitting engineering report followed the scoping study and was completed in early 2016 to develop the water management infrastructures (SNC-Lavalin, 2016a).

As part of these infrastructures, there is a dewatering dike that is required to enable mining of the open pit located in the north part of Whale Tail Lake. This dike, named Whale Tail Dike (WTD), is located on a shallow

plateau of the lake floor with an approximate 2 m depth of water. Once in operation, the downstream side of the dike will be dewatered and the upstream side of the dike will allow a 3.5 m raise of the water level prior to being discharged by gravity towards Mammoth Lake via a new blasted channel located west of the property: the South Whale Tail Diversion Channel (SWTDC). Hence, SWTDC will be the outlet of Whale Tail Lake once the Whale Tail dike (WTD) is constructed. It will be located in the south-western part of the Whale Tail Lake watershed and it will channel flow from Whale Tail Lake (Lake A20) to Mammoth Lake. Figure 1-2 shows the general location of the channel and its corresponding flooding area. This channel will be built between existing A20, A45 and Mammoth lakes and will reroute approximately 2,400 ha of watershed.

In 2017, AEM mandated SNC-Lavalin to perform the detailed engineering of WTD and the SWTDC. Since the geotechnical campaign was postponed for winter 2019, the channel was designed at a feasibility engineering level and was presented in a technical memorandum (SNC-Lavalin, 2018a). Due to few data available for the calibration of the hydrologic and hydraulic model, a safety factor of 1.5 was used for the design of SWTDC, resulting in a conservative design with a 25 m base width channel.

In 2018, SNC-Lavalin conducted a peer review of the hydraulic assessment carried out for the SWTDC (SNC-Lavalin, 2018b). This review concluded that a channel section with a base width of 5.0 m, would have sufficient capacity to convey the IDF (Inflow design flood). The IDF was determined by SNC-Lavalin (2017), following the recommendations in CDA (2013 & 2014), given a dike hazard classification of High, and consisting in 1/3 between the 1,000-Yr Flood and the PMF. Nevertheless, it was recommended by SNC-Lavalin to use a significant safety factor, to account mainly for the models and computations uncertainties due to the very limited data available on site, and also for potential blockages of ice during the spring freshet.

In 2019, AEM retained SNC-Lavalin to perform the detailed engineering of SWTDC following the results of the 2019 geotechnical campaign. The following sections present the detailed engineering for the SWTDC which includes the hydraulic and geotechnical aspects developed for this phase of the project.

Figure 1-2 shows a general layout of the site, the dike, the channel and the lakes.

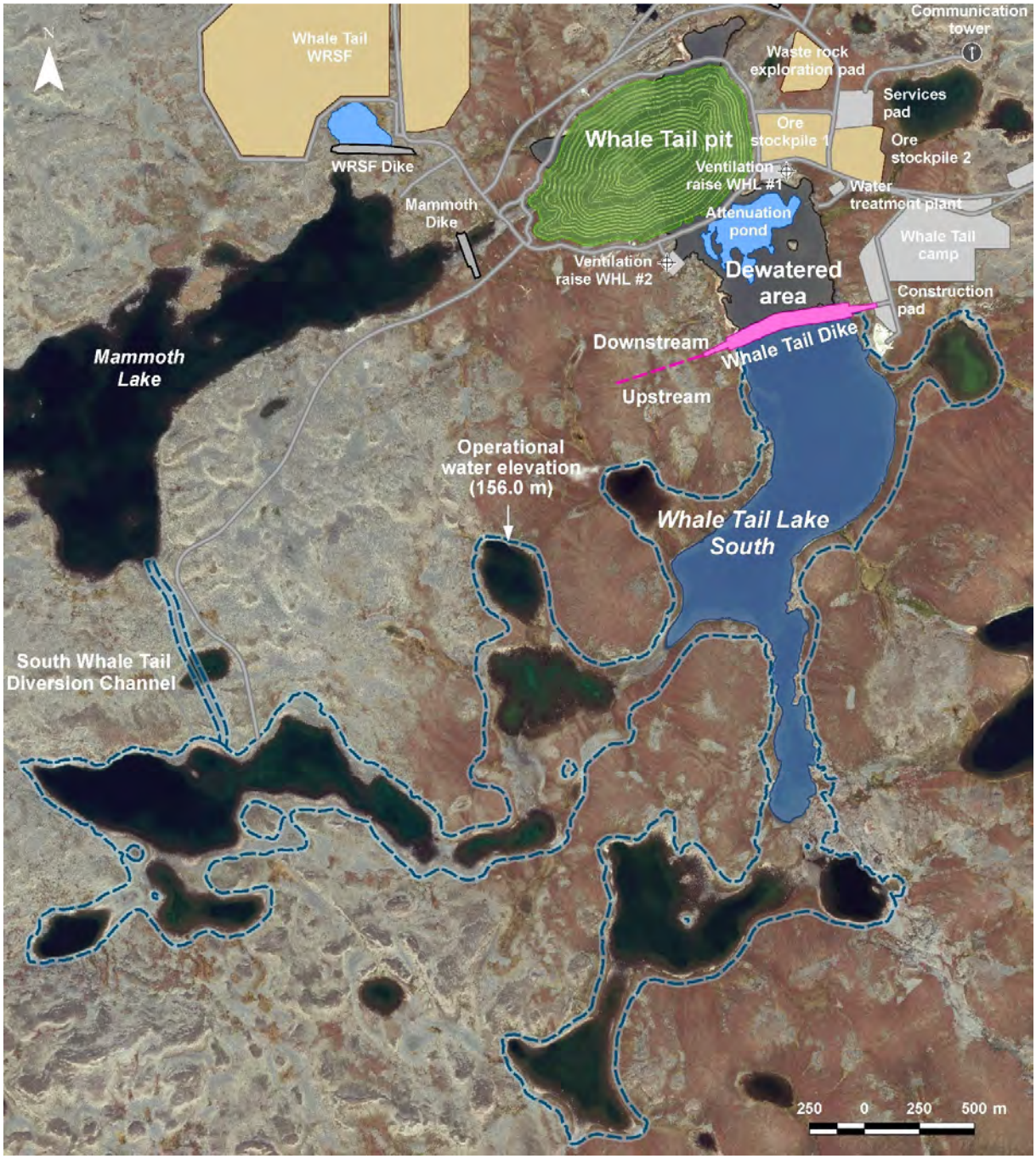


Figure 1-2: Amaruq project mine layout

2.0 REGULATION, CODES, GUIDELINES AND STANDARDS

The design of the SWTDC was conducted in adherence with the recommendations provided in the latest Dam Safety Guidelines produced by the Canadian Dam Association (CDA, 2013 & 2014).

The geotechnical component of the work will follow the recommendations provided in the American Society for Testing and Materials (ASTM) for the geotechnical components of the work. Channel protection was based on the methodology recommended by various leading agencies, including USACE (1994).

The standards and codes that shall be followed during the construction of WTD are presented in Appendix B: Technical specifications.

3.0 DESIGN BASIS, CRITERIA, AND INVESTIGATIONS

3.1 Design basis and criteria

The design of the SWTDC is carried out in adherence with recommendations provided in the latest Dam Safety Guidelines produced by the Canadian Dam Association (CDA, 2013 & 2014). The design criteria and design basis for SWTDC have been developed by SNC and are described in detail in the document Design Criteria for South Whale Tail Diversion Channel (Appendix D). A summary of the design criteria and design basis is presented below.

The design criteria and basis adopted for SWTDC are the following:

- The system, Whale Tail Dike (WTD) and South Whale Tail Diversion Channel (SWTDC), is classified as “High” according to classification by the Canadian Dam Association (CDA, 2013, 2014). Hence, an inflow design flood (IDF) of 1/3rd Flood between the 1,000-Yr Flood and the PMF is adopted for the design of SWTDC (SNC-Lavalin, 2018b).
- The current expected life span of the SWTDC is about 20 years.
- The SWTDC will drain a watershed of 2429 ha. This area includes all the runoff flowing naturally from the South Whale Tail Lake’s surroundings, and the watershed from Lake A53.
- The volume of the South Whale Tail Lake (SWTL) that will be taken into consideration for the final design of the channel will be those that correspond to the new configuration of Whale Tail Lake. Runoff water from the surrounding watershed will be routed through the South Whale Tail lake first prior to entering the SWTDC.
- The water operation-levels stablished previously in SNC-Lavalin (2018a) to divert the flows from SWTL to Mammoth Lake will be adopted in the design phase as follows:
  - Normal operating water level (NOWL) 156.0 m
  - Maximum water level (MWL) 157.0 m
  - Channel Inlet-invert elevation 155.8 m
  - Initial water elevation in South Whale Tail Lake at the start of the design event of 155.8 m
- The channel will have a trapezoidal shape with lateral slopes of 3H:1V.

- Rip rap protection will be sized following the methodologies recommended by leading agencies and corporation (i.e. USACE 1994).
- A transition material between the bottom of the excavation and the riprap will be planned.
- If no information is collected within the footprint of the SWTDC, the analyzed soil sample from the industrial sector will be used as representative of the soil foundation of the channel.

3.2 Geotechnical investigation

A geotechnical campaign was performed along the proposed South Whale Tail Diversion Chanel (SWTDC) for the Whale Tail Project. The objective of this field campaign was to characterize the foundation condition of the SWTC for construction purposes.

The drilling campaign was performed with a Tamrock drill using a bit of four (4) inches diameter and rods of twelve (12) feet long. Ten (10) drill holes were carried out to a depth of 10.1 m. Drawing no. 651298-2900-4GDD-0001 (Appendix A) shows the location of investigation boreholes carried out along the proposed location of SWTDC. It should be noted that no soil information was collected during this field investigation.

The geotechnical investigation report is presented in Appendix C.

4.0 HYDROLOGY

4.1 Hydrotechnical Analysis

4.1.1 Lakes & Watershed Characteristics

With the dike (WTD) in place the exiting drainage area of the lake (WTL) is reduced from approximately 2,815 ha to 2,429 ha. The latest correspond to the new watershed area of the SWTL that will be discharging into the SWTDC. With the new conditions, the SWTL, will have a total lake-area of approximately 470 ha at maximum water level (El. 157.0 m).

Figure 4-1 shows the stage storage curve obtained for the SWTL which was derived from available bathymetric and topographic data.

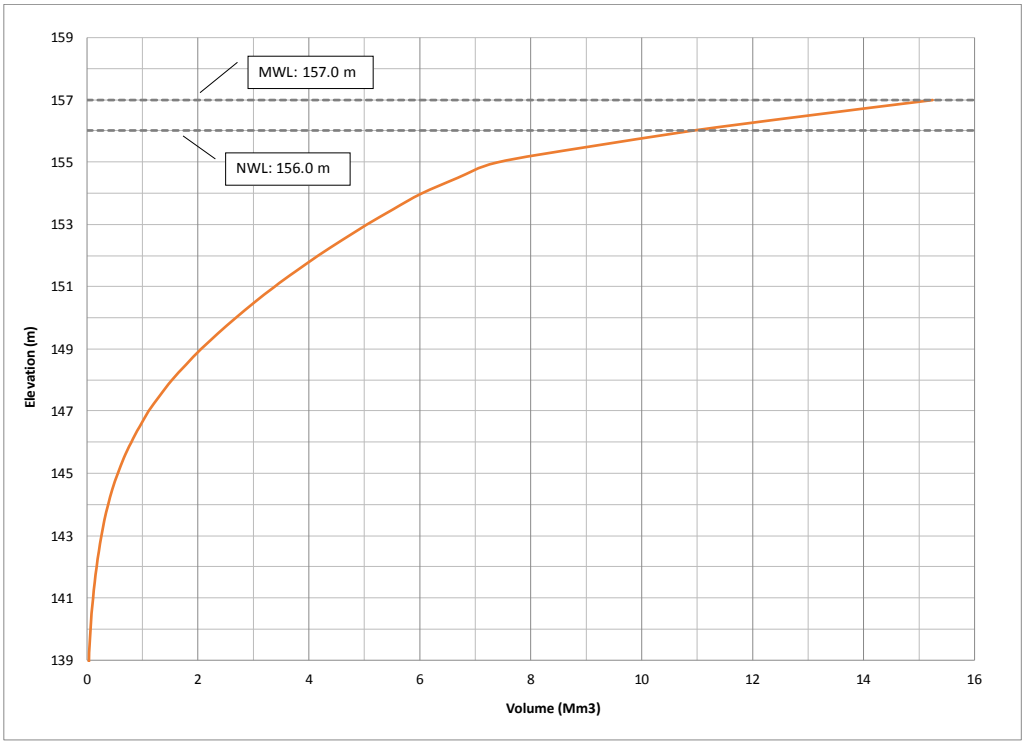


Figure 4-1: Stage- Storage Curve - SWTL

Based on Figure 4-1, the total storage capacity of the SWTL at normal water level (NWL) and at maximum water level (MWL) is approximately 10.5 Mm^3 and 14.5 Mm^3, respectively. The active volume of the lake is, therefore, approximately 4.0 Mm^3.

Other stage storage curve used in the analysis correspond to Mammoth Lake which was derived from existing topographic and bathymetric data. This curve is included in Appendix E.

4.1.2 Flow and Flow Routing

Based on SNC-Lavalin (2018a), the IDF peak was defined at the inlet of the SWTDC to be approximately 10.6 m^3/s. Following this analysis, SNC-Lavalin (2018b) conducted a prefeasibility study for the design of the channel using the information in SNC-Lavalin (2018a). After that, a peer review was conducted by SNC-Lavalin (2018b) where the findings indicated that the flood routing effects of the new WTL were more important than for the existing WTL, and that needed to be considered in more detail. Therefore, an assessment was conducted through a re-routing exercise to evaluate these effects and to estimate the peak inflow to the new WTL. These results were updated in the present mandate by following the steps below:

1. First, the IDF hydrograph at the outlet of the existing lake (WTL) is computed. SNC-Lavalin (2018a) estimated an IDF peak flow value of 10.6 m^3/s at the inlet of SWTDC. To obtain the corresponding peak flow value at the outlet of the existing lake (WTL), this value was multiplied by the ratio of the

existing lake drainage area (2,815 ha) and the new (SWTL) lake drainage area (2,429 ha): 10.6 x 1.16 = 12.3 m^3/s. The same approach was used to obtain the whole hydrograph.

2. Then, the inflow hydrograph into the existing lake (WTL) was determined. The outflow hydrograph obtained at the previous step was used as input for re-routing computation through WTL. WTL storage-elevation curve, the discharge capacity curve developed by Golder (2016) for WTL outlet, and the re-routing results are presented in Appendix E. The obtained WTL inflow hydrograph has a peak flood value of 21.2 m^3/s.
3. Finally, the new lake (SWTL) inflow hydrograph was determined by multiplying the inflow hydrograph for the existing lake (WTL) by the ratio of their drainage areas (2,429 ha/2,815 ha = 0.86). The resulted IDF peak-inflow value is 18.3 m^3/s. This peak-inflow value, and its corresponding hydrograph, were adopted and used for the design of the SWTDC.

Table 4-1 summarizes the results obtained from the above steps, and Figure 4-1 shows the obtained SWTDC design inflow hydrograph with a peak inflow value of 18.3 m^3/s. This hydrograph was used as input for the HEC-RAS model, described in Section 4.3.

Table 4-1: Re-Routing Results

Location	SNC-Lavalin			
	2018*	2019**		
	SWTDC inlet	WTL outlet	WTL inlet	SWTL outlet
IDF peak flow (m^3/s)	10.6	12.3	21.2	18.3

*Result obtained from SNC-Lavalin (2018a)
**Results obtained in the present analysis

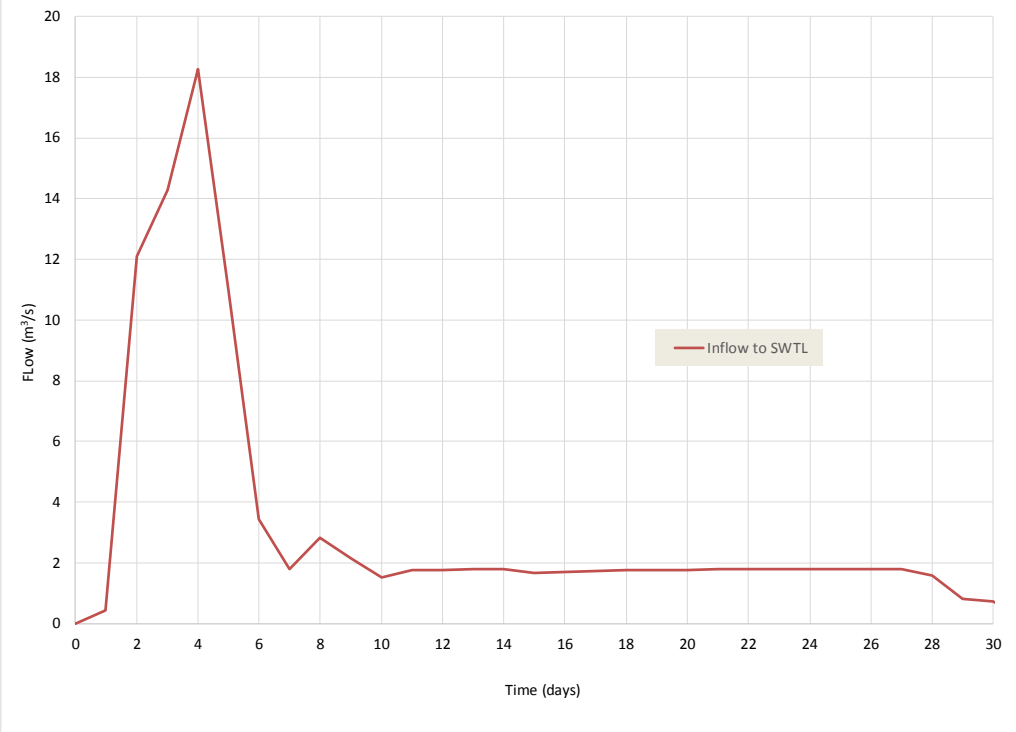


Figure 4-2: SWTL - Inflow Hydrograph

4.1.3 Hydrodynamic Model

A hydrodynamic model was prepared, using HEC-RAS Version 5.07, to simulate the new hydraulic conditions of the SWTL and to properly size the SWTDC. The model includes SWTL and Mammoth Lake as storage areas, as well as the SWTDC represented by cross sections. The cross sections were obtained from the existing topographic and bathymetric data by using the RasMapper Tool which is a HEC-RAS tool that allows cutting series of sections from existing terrain. It must be noted that since Lake A45 is part of the SWTDC, this lake is also represented by the cross sections.

Boundary conditions in the model were set as inflow hydrographs to SWTL, at the upstream boundary conditions, and normal depth at the outlet channel of Mammoth Lake, as downstream boundary conditions. The outlet of Mammoth Lake was also represented by cross sections, in the model, which location is considered sufficiently far, so the water level in the channel will not be noticeably affected by the downstream boundary conditions. Inflow hydrographs that represent the IDF at Mammoth Lake were also set in the model. The HEC-RAS model extent is shown in Figure 4-3.

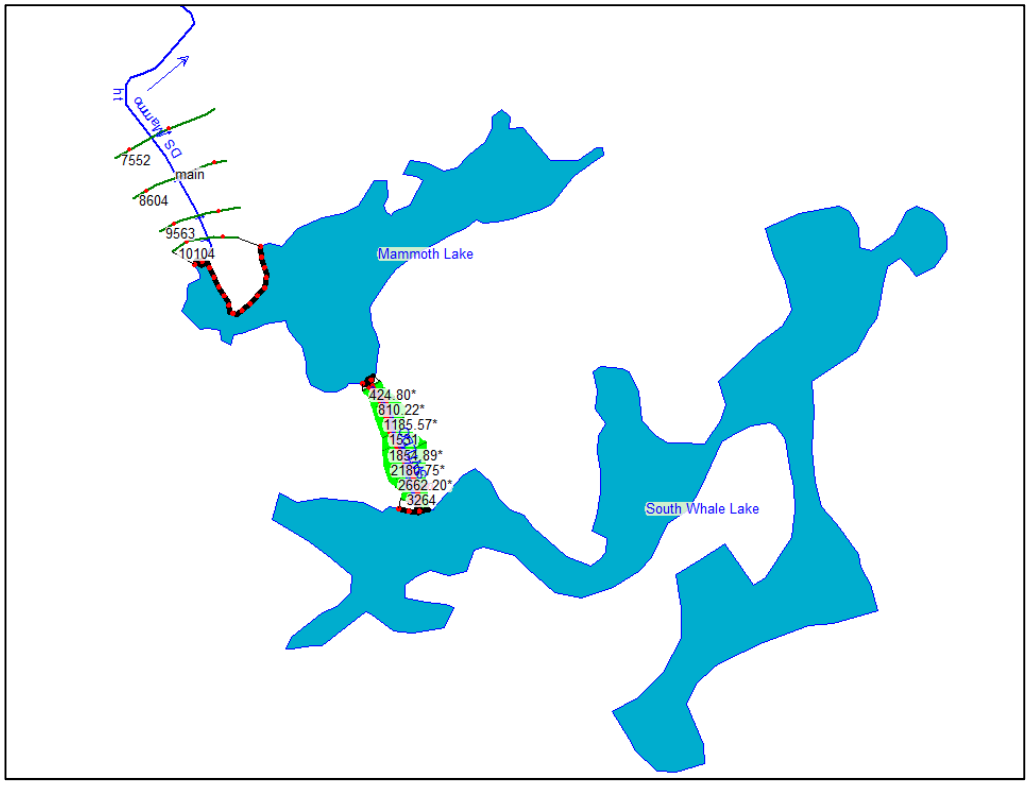


Figure 4-3: HEC-RAS Model Extend

To set the trapezoidal-channel section in the model for the SWTDC (with the characteristics provided in Section 3.1), the HEC-RAS tool "Channel Design Modification" was used. This tool allows to perform series of trapezoidal cuts from existing terrain models by selecting a required channel slope. A general 3D view of the obtained trapezoidal section of the SWTDC is shown in Figure 4-4.

It must be noted that the channel was divide in two sections, the section upstream of Lake A45 (upstream section) and the section downstream of Lake A45 (downstream section). For the selected channel-slope of 0.3% at starting invert-elevation of El. 155.8 m, the upstream section will be intersecting Lake A45 at approximate elevation of El. 154.8 m. From Lake A45, the downstream section will have the same elevation at the inlet, El. 154.8 m. This would allow a depth of approximately 1.8 m at Lake A45 during operations.

The total length of two sections of the channel is approximately 700 m. The downstream section includes a channel portion that corresponds to the existing natural channel, approximately 150 m that connects with Mammoth Lake. Manning "n" numbers for the SWTDC were set to 0.038 for the canal which correspond to "n" numbers for rock protection, and 0.06 for the overbanks.

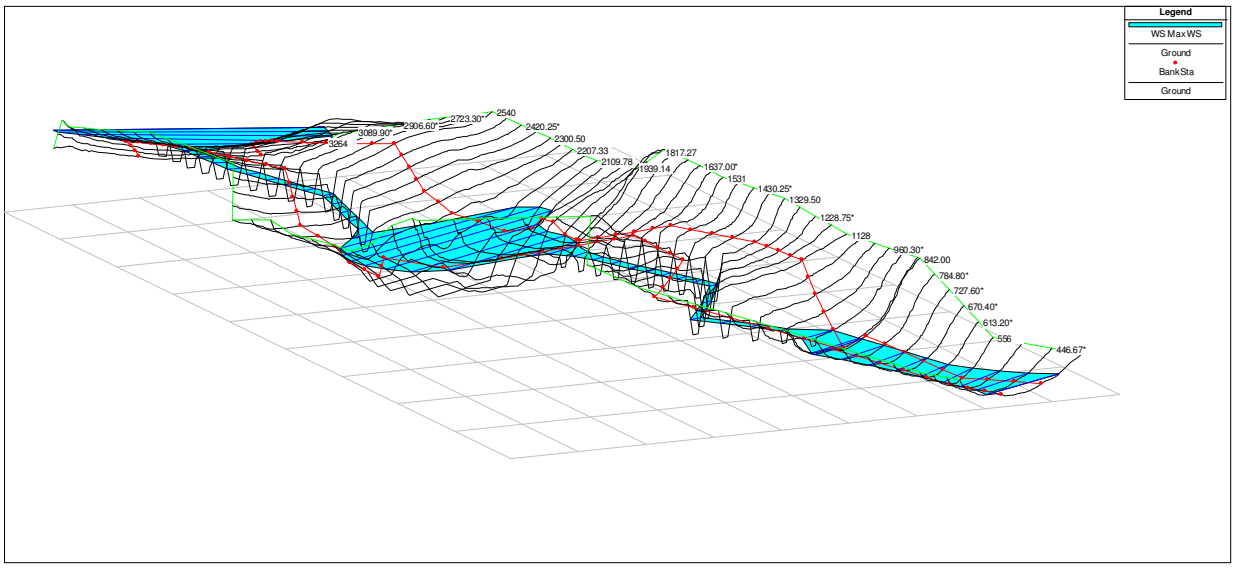


Figure 4-4: 3D view of the SWTDC section

The initial water levels in the lakes were defined as follows:

- SWTL El.: 155.8 m (Assuming that the lake will have a similar water level as the invert-elevation of the channel at the beginning of the spring freshet.
- Mammoth Lake El.: 153.0 m (The normal water level at this lake is approximately at El. 152.5 m, but the El. 153.0 was used as conservative assumption)

The channel size was estimated with the model by running several simulations (by trial and error) and changing the base width of the channel until the water levels in SWTL matches the elevation of 156.7 m which corresponds to SWTL's MWL (El. 157.0 m) minus 0.3 m of freeboard for the channel.

4.1.4 Model Results

The HEC-RAS results indicate that a 5.0 m channel-width with lateral slopes of 3H:1V and bed-slope of 0.3% would be able to convey the IDF (1/3 between the 1:1,000-Yr Flood and the PMF) with adequate freeboard. Figure 4-5 shows the flood routing results from the HEC-RAS model at SWTL. It indicates that the peak inflow is attenuated when routed through the SWTL, and the resulted water level in the lake is approximately 156.7 m. The peak inflow is reduced from 18.3 m^3/s to 7.5 m^3/s. This attenuation resulted due to the increased SWTL storage capacity of about 4.0 Mm^3 (for comparison, the volume of the IDF inflow hydrograph is approximately 8.7 Mm^3).

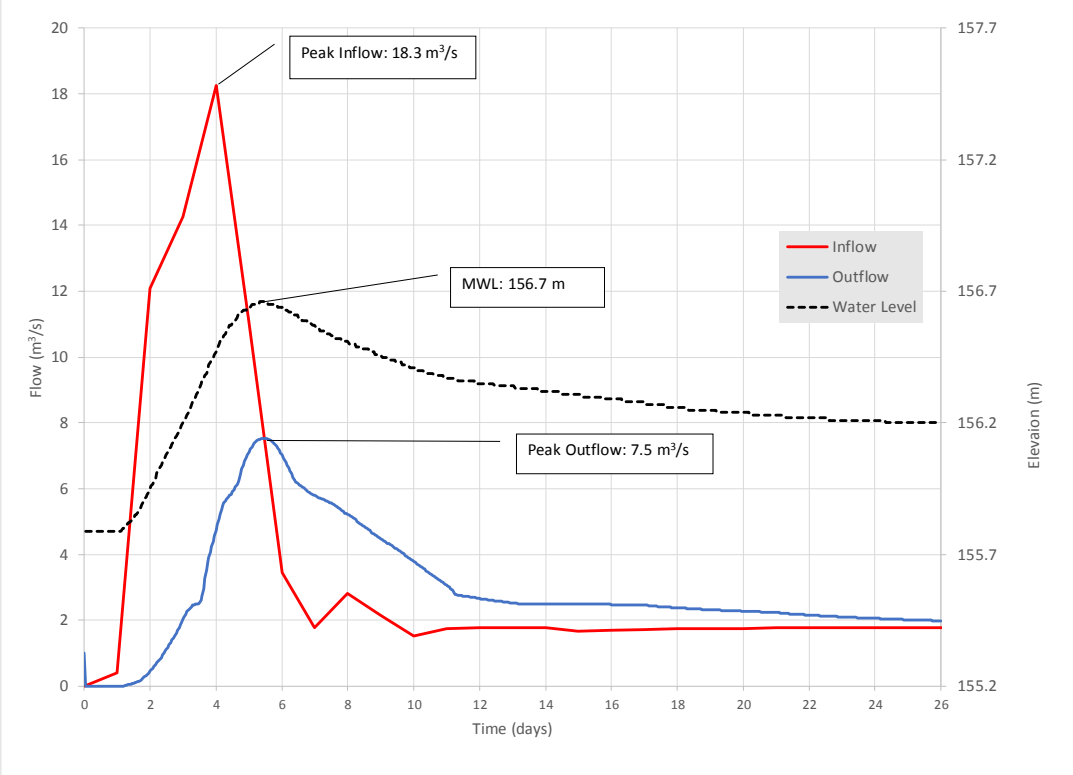


Figure 4-5: Flood Routing IDF – Channel 5.0 m Width

Other results from the model indicate that the Froud Numbers along the SWTDC were less than 1 which indicates that the flow is sub-critical. The maximum flow velocity in the channel was found to be approximately 1.5 m/s, and the maximum flow depth was 1.0 m. Figure 4-6 shows the channel profile that includes the design-bed-slope and the bottom of Lake A45, the water profile, and the exiting terrain elevation for both, left and right overbanks.

The computed minimum velocities in the channel were tested for a range of flows from 1.0 to 3.3 m/s (this 3.3 m/s corresponds to the maximum peak measured by Golder (2016) at the mouth of WTL) and the obtained minimum velocity was found to be approximately 0.6 m/s. This value is within the typical-permissible range of flow velocities (0.6-0.9 m/s) to prevent sedimentation in the channel.

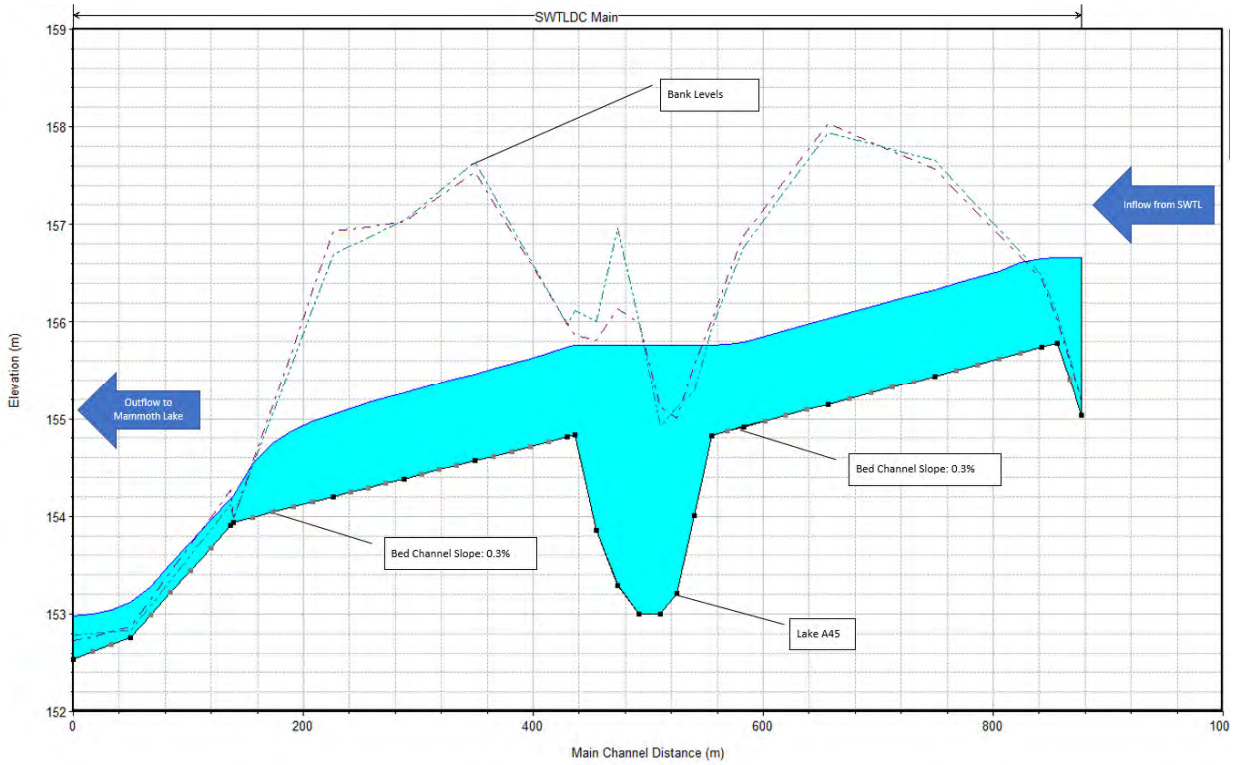


Figure 4-6: SWTDC Profile

4.2 Riprap design

Riprap was designed to provide protection against the erosive forces of the flow to the channel bed and slopes. Three methodologies were compared to estimate riprap mean diameter (D_{50}), NEH (2007), USACE (1994) and MTQ (2014).

Table 4-2 shows the results obtained for riprap based on the maximum velocity in the channel of 1.5 m/s.

Table 4-2: Summary results of riprap for SWTDC according to hydraulic calculations

Lateral slope (Z)	(m)	3.00
Manning (n)	()	0.038
Freeboard	(m)	0.3
Channel Bed Slope	(%)	0.30%
Velocity	m/s	1.5
D_{50} USACE	(mm)	73
D_{50} ISBASH Turbulent	(mm)	85
D_{50} MTQ 2014	(mm)	98
Minimum recommended Riprap D_{50}	(mm)	100
Minimum recommended Riprap Layer Thickness	(mm)	300

5.0 INITIAL CONDITIONS OF THE SITE

5.1 Water quality monitoring and management plan

AEM will follow the water quality monitoring program as detailed in Section 4.2 and 4.3 of the Water Quality Monitoring and Management Plan for Dike Construction and Dewatering (AEM, 2017). The routine monitoring in the Mammoth Lake receiving environment will be done as per section 4.2.1. AEM is committed to provide a proactive and effective response to any potential TSS problem; the monitoring program detailed in Section 4.2 has been designed to provide quick feedback. Based on experience at the Meadowbank Mine, the TSS-turbidity relationship will be used.

As detailed in the Water Quality Monitoring and Management Plan for Dike Construction and Dewatering, during the dike construction AEM will abide by limits established by the Nunavut Water Board (NWB) in the Water License 2AM-WTP1826. The following Maximum Monthly Mean (MMM) and Short Term Maximum (STM) TSS concentrations will be met:

Table 5-1: MMM and STM TSS concentrations to be met

Parameter	MMM (mg/L)	STM (mg/L)
TSS in areas where there is spawning habitat and at times when eggs or larvae are expected to be present	6	25
TSS in all other areas and at times when eggs/larvae are not present	15	50
TSS in impounded areas (e.g. North basin of Whale Tail Lake) at all times in all areas	15	50

Trigger values have been developed with corresponding management action plans; should TSS concentrations in the water body exceed the trigger values during either dike construction, an adaptive management action plan consisting of a series of steps to be undertaken will be initiated. The trigger value for the STM concentration is a single sample that exceeds the STM concentration. The trigger value for the MMM is a 7-day moving average concentration that exceeds the MMM.

The strategy used by AEM to manage risk related to erosion during construction and operation of the structure are detailed in the Whale Tail Pit Water Management Plan (Section 3.1.4.5). As discussed, Best Management Practice (BMPs) might be implemented if required.

Temporary BMPs may include:

- Silt fences and fabric installations;
- Turbidity curtains;
- Sediment control basin to detain sediment-laden water;
- Diversion of flows away from construction area.

5.2 Foundation condition

Based on the geotechnical investigation carried out in 2019 (Appendix C), the general site condition consists of boulders overlying overburden soils which are in turn underlain by bedrock. Boulders were encountered in most on the drill holes to a depth of 2.7 m.

The overburden consists of glacial till composed of sand and gravel. The thickness of the overburden ranges from 0.8 m to about 8.8. An ice layer was found in the drill hole SWTC-19-03 between 7.4 and 7.6 meters deep. Moreover, frozen soil was found between 1.2 and 3.7 meters in the drill hole SWTC-19-04, between 1.3 and 3.7 meters in the drill hole SWTC-19-05 and between 1.1 and 3.6 meters in the drill hole SWTC-19-10.

Good bedrock was reached at depth ranging between 4.4 and 8.8 meters and poor bedrock was reached at depth ranging from 2.6 and 7.6 meters. However, bedrock was not reached in the drill holes SWTC-19-05 and SWTC-19-10.

No soil information was collected during this field investigation. Therefore, it is assumed that the soil samples from the industrial site (GT-002-003 and GT-002-003) are representative of the foundation condition of the channel. The grain size distribution curves for the soil samples from the industrial site are as shown in Figure 6-1. Nevertheless, no testing was carried out on the fine portion of the soils. Hence, the D_{15} of the soil samples was determined to be 0.05 mm by extrapolation as shown in Figure 6.1.

6.0 SOUTH WHALE TAIL DIVERSION CHANNEL DESIGN

6.1 General

The South Whale Tail Diversion Channel (SWTDC) will be the outlet of Whale Tail Lake once the Whale Tail dike (WTD) is constructed. It will be located in the south-western part of the Whale Tail Lake watershed and it will channel flow from Whale Tail Lake (Lake A20) to Mammoth Lake. This channel will be built between existing A20, A45 and Mammoth lakes and will reroute approximately 2,400 ha of watershed.

SWTDC will have a trapezoidal shape with lateral slopes of 3H:1V and a base width of 5.0 m. The channel will consist of two portions upstream and downstream of Lake A45; from 0+073 to 0+390 and 0+490 to 0+839. During construction, the water level of Lake A45 will have to be decreased from el. 156.5 to 153.7 m. At the end of construction, the operational water level at Lake A45 will be at 154.8 m (refer to section 7.2 on dewatering strategy).

As mentioned in section 4.0, the SWTDC will be constructed using a protective riprap layer to avoid erosion and limit TSS in the water. This riprap protection placed on the bottom and the sides of the channel will serve to avoid erosion problems due to flow velocity. The riprap will have a thickness of 0.5 m and will consist of blasted rock with a diameter of 100 – 300 mm. Two transition materials with a 0.3 m thickness each will be needed between the overburden and the riprap for particle retention between the foundation soil and the riprap. For sections of the channel where the excavation is too deep, it is proposed to place rockfill material on the upper part of the slope above the maximum water level. A minimum layer of 500 mm shall be sufficient to protect the till to degrade.

During construction, it is highly recommended to observe the type of material that is present at the bottom of lake A45. In the case where the material at the bottom of the lake is too fine and muddy, a protection layer will be required in order to avoid any erosion instability to the channel. The type of protection layers can be adapted on site.

6.2 Source of material

The SWTDC will be composed of several materials (source and type): most of these materials will be produced or processed on site. According to the CDA Guidelines (CDA, 2013), the gradation of these materials should be selected to have adequate particle retention between the materials. Grain size distributions proposed for the materials are presented in Section 6.3.

The transition layers, identified as fine and coarse filters, will be placed between the overburden and the riprap. These materials will also be produced by crushing rock. Grain size distributions for material proposed for these filters are also presented in Section 6.3.

The rockfill, coarse filter and fine filter material will be Non-Acid Generating (NAG) and Non-Metal leaching (NML) rockfill from Whale Tail Pit (including Quarry 1 and Starter Pit). AEM will follow the Whale Tail Pit Waste Rock Management Plan to ensure that the rockfill used for the channel's construction is NAG and NML.

6.3 Material gradation

As mentioned in Section 3, the riprap will not be placed directly over the overburden (till). Transition layers are necessary between the bottom of the excavation and the riprap protection layer to avoid the loss of fine overburden material through the riprap. The transition layers will also serve partly as a levelling material following the excavation of the channel. However, most part of the leveling could be done with the excavated material if work is done in summer and the backfill material contains no ice rich till.

The transition materials are selected to be filter-compatible with the riprap and the underlying overburden. Requirements from the US Bureau of Reclamation (USBR, 2014) and the CDA granular filter design criteria were used to verify the maximum allowable D_{15} for particle retention requirements ($D_{15,C}/D_{85,F} < 5$; $D_{15,C}/D_{15,F} < 40$).

This verification confirmed that two layers of transition material, coarse filter and fine filter (with the same specification as the ones used for Whale Tail Dike), are required. This is due to the pronounced gap between the gradation of the overburden soil (assumed D_{15} is very fine) and the proposed rip rap (D_{15}=100 mm). Grain size distributions of crushed aggregates produced at Meadowbank for fine and coarse filters are presented in Figure 6-1. The same production procedures are proposed for all of the fine and coarse filter materials for the channel. Nevertheless, a min D_{15} of 7.5 mm shall be obtained for the coarse filter for particle retention purposes.

Figure 6-1 shows the gradation of the proposed materials. The typical sections and profile of the SWTDC are presented on Drawing no. 651298-2900-4GDD-0001.

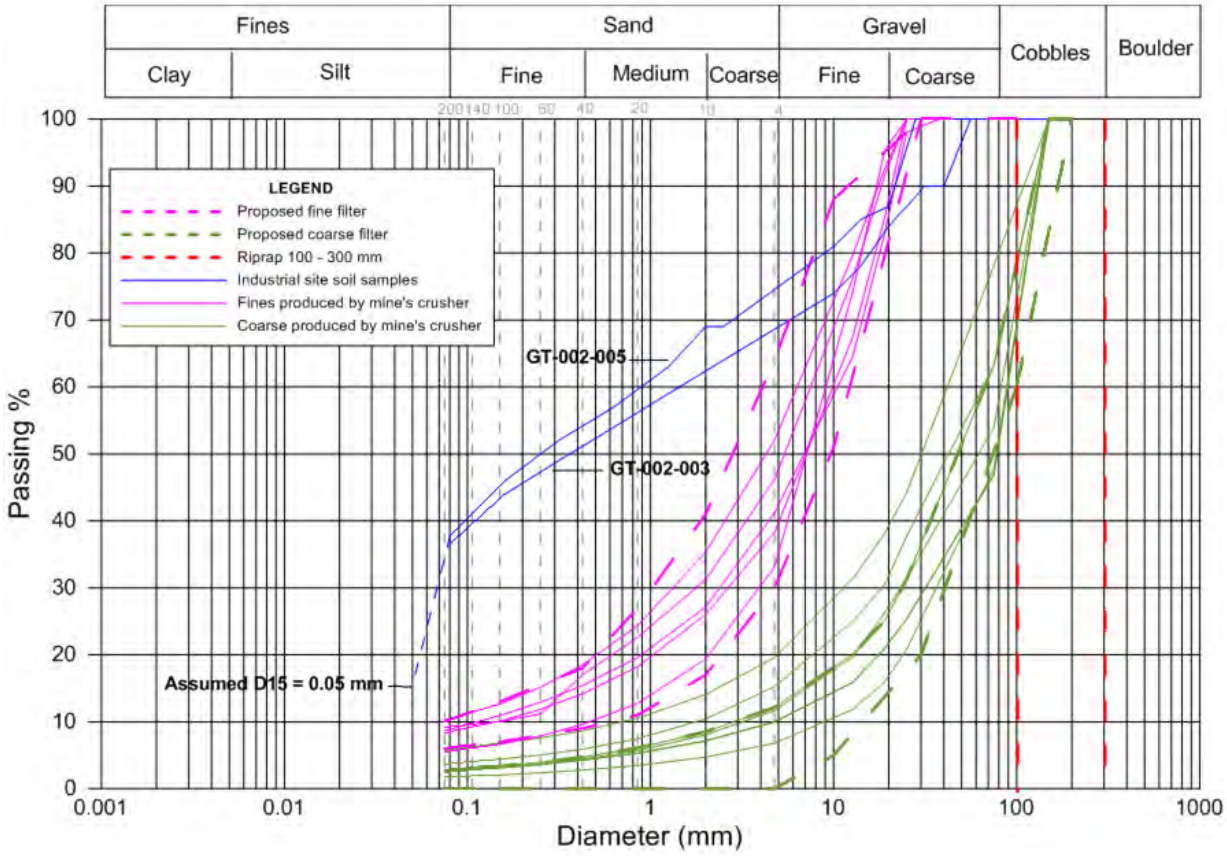


Figure 6-1 : Proposed Gradation

If soil samples are obtained at the SWTDC location, and that sieve analysis is performed, the filters can be modified and may be replaced by only one transition material.

7.0 CONSTRUCTION

7.1 Timing for construction

The South Whale Tail Channel is planned to be constructed in Q4 2019 starting in September. This construction timeline will allow working in the dry and to complete the channel before the water level of the Whale Tail South Basin reaches the invert level of the channel.

7.2 Construction methodology

As the channel is located in a boulder field, special construction methodology will have to be established for the construction.

For any construction season, the channel may have to be blasted because the overburden will be frozen. Even if the construction occurs in summer, boulders will probably have to be blasted due to their size. Blasting near water will follow the DFO's "Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters". It should be noted that the DFO's approval must be obtained prior to blasting.

In order to be able to circulate with machinery for the channel construction, a working platform will have to be built in the footprint of the channel. The working platform will be required for winter or summer construction period. It will provide a surface for excavation by drilling and blasting operation.

The following figure shows a schematic of the working platform.

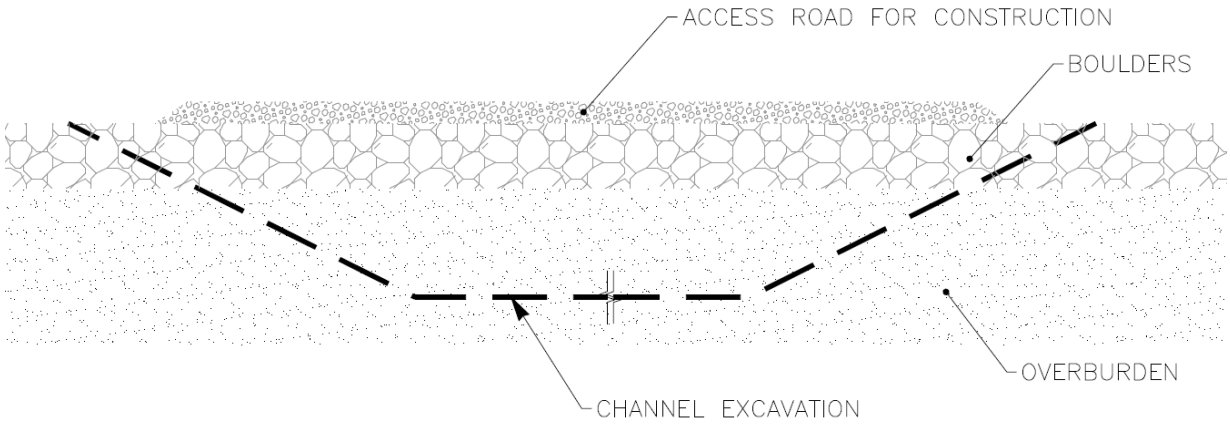


Figure 7-1: Working Platform for SWTDC Construction

7.3 Water management during construction

During the construction of the South Whale Tail Channel the water level of Lake A45 will be lowered to allow excavation of the sub-base of the channel at the inlet and outlet of Lake A45. The water will be pumped out into the boulder field between Lake A45 and Mammoth Lake and then report to gravity to Mammoth Lake. Construction access will be built within the drawdown portion of Lake A45 to advance the pump intake as required.

Construction of the channel will progress from downstream to upstream to allow water reporting to the construction area to flow by gravity to the boulder field going to Mammoth Lake. Local accumulation of water in the construction area will be pumped to sumps within the construction area and then to the boulder field between Lake A45 and Mammoth Lake.

Pumping the water in the boulder field between Lake A45 and Mammoth Lake will limit potential for erosion and TSS reaching Mammoth Lake. Regular inspection will be conducted for erosion issue and mitigation measure such as silt fence and turbidity barriers will be deployed as required.

8.0 QUANTITIES

The quantities of materials required for the construction of SWTDC are presented in Table 7-1. These quantities are extracted from the 3D model developed as part of the design.

A contingency of 20% on fill and excavation materials except fine filter, provided by Agnico Eagle, was added to the calculated quantities to cover for loss of materials. A contingency of 40% was added on fine filter as this material will also be used as levelling material following blasting or excavation of the channel.

Table 8-1: Quantity Estimation for the Construction of SWTDC

Item	Unit	Estimated Quantity	Contingency	Quantity Including Contingency
Excavation - blasting	m^3	34,500	20%	41,400
Fine filter	m^3	3,000	40%	4,200
Coarse filter	m^3	2,900	20%	3,500
Rip Rap	m^3	4,300	20%	5,200
Rockfill	m^3	3,000	20%	3,600

9.0 CLOSURE

At the end of Whale Tail Pit project, all channel and ditches will be backfilled to promote natural drainage. The SWTDC life span is estimated of 20 years prior to be backfilled. The restoration will be done in compliance with the closure plan.

10.0 CONCLUSIONS AND RECOMMENDATIONS

- The design of the SWTDC indicated that two layers of transition filter materials, coarse filter and fine filter (which are similar to the ones used for WTD) are required between the riprap and the overburden soil.
- The current expected life span of the SWTDC is about 20 years. It is recommended that during this period AEM monitor this structure and make appropriate maintenance of it when required.
- The SWTDC plays a critical role in the protection of the Whale Tail Dike to ensure that the water level does not overtop the dike. Thus, it is assumed and recommended that appropriate maintenance and surveillance procedures will be put in place by AEM. Access roads and ramps on both sides of the channel and adequate equipment with trained staff will be considered for maintenance purposes.

11.0 PERSONNEL

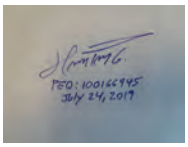
This report has been prepared by Angie Arbaiza, Holman Tellez and Tezera Azmatch, and revised by Patrick Scholz and Yohan Jalbert.

We trust that this report is to your satisfaction. Should you have any question, please do not hesitate on contacting me.

SNC LAVALIN INC.

Prepared by:

Angie Arbaiza, Eng., M.Sc.A.
Geotechnical Engineer
Mining & Metallurgy



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Hydrologist
Mining & Metallurgy

Tezera Azmatch, Eng., M.Sc.A.
Geotechnical Engineer
Mining & Metallurgy

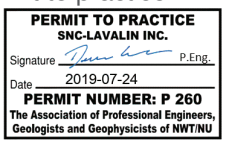
Verified by:

Yohan Jalbert, Eng.
Project Manager
Mining & Metallurgy

2019.07.24 14:15:44 -04'00'

Patrick Scholz, Eng., M.Eng.
Hydrologist
Mining & Metallurgy

Permit to practice:



Denise Leahy, P. Eng., Dr. Ing.
Senior Geotechnical Engineer
Mining & Metallurgy

12.0 REFERENCES

AEM, 2018, South Whale Tail Diversion Channel Design – AEM Review, Technical Memorandum, September 2018.

GOLDER, 2016 – Hydrology Baseline

MTQ, 2014 – Ministère des Transports de Québec Manuel de conception des ponceaux, Ouvrages routiers, Guides et manuels, Novembre 2014.

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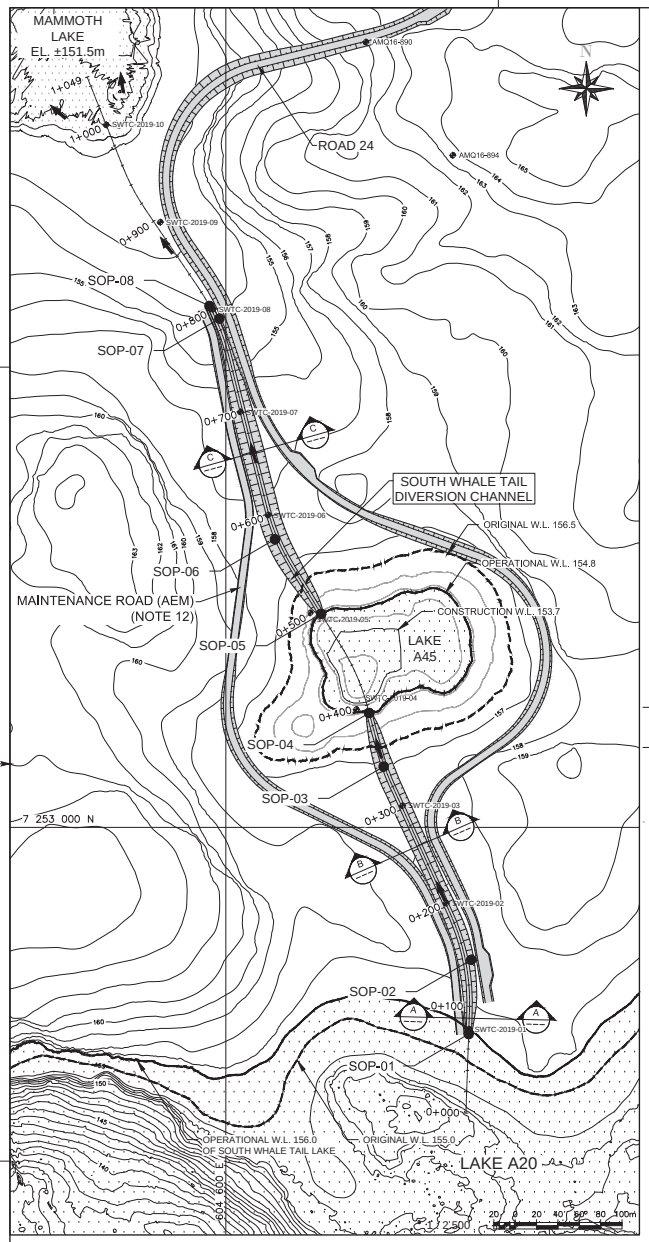
USBR, 1983 – U.S. Boreau of Reclamation – Hydraulic Design for Stilling Basing for Pipe or Channels outlet, EM 25

USACE, 1994, US Army Corps of Engineers, Hydraulic Design of Flood Control Channels - Engineer Manual 1110-2-1601.

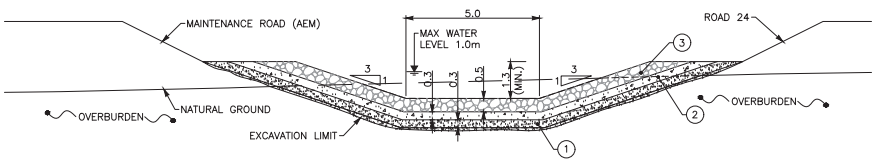
Appendix A

Construction drawings



SOUTH WHALE TAIL DIVERSION CHANNEL - PLAN VIEW

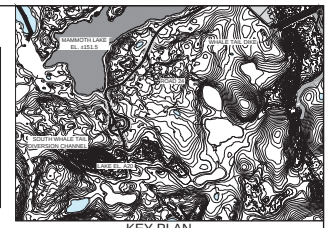
SCALE 1: 2500



SECTION A-A - SOUTH WHALE TAIL DIVERSION CHANNEL - TYPICAL SECTION IN OVERBURDEN

SCALE 1: 100

SETTING OUT POINTS				
NAME	STA.	EASTING	NORTHING	RADIUS
SOP-01	0+074	604 827.4	7 252 806.6	---
SOP-02	0+142	604 829.8	7 252 876.1	200
SOP-03	0+340	604 747.8	7 253 057.0	200
SOP-04	0+392	604 734.2	7 253 107.2	---
SOP-05	0+496	604 689.3	7 253 199.9	---
SOP-06	0+577	604 646.0	7 253 269.8	200
SOP-07	0+790	604 594.0	7 253 476.2	200
SOP-08	0+804	604 584.7	7 253 488.2	---



KEY PLAN

SCALE 1: 40000

LEGEND

OPERATIONAL WATER LEVEL

AMQ15-441 EXPLORATION BOREHOLE

SWTC-2019-01 AIR TRACK DRILL HOLE (DESTRUCTIVE) (AEM, 2019)

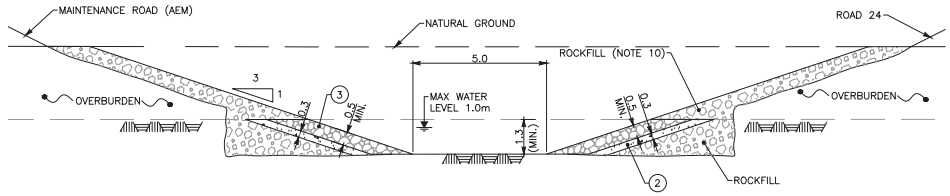
SOP-01 SETTING OUT POINTS

LEGEND FOR FILL MATERIAL

FINE FILTER

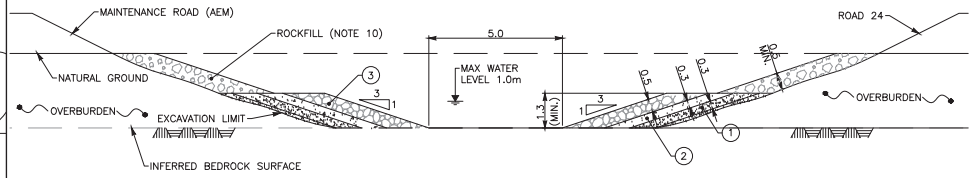
COARSE FILTER

RIP RAP (100-300 mm)



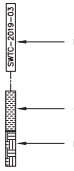
SECTION B-B - SOUTH WHALE TAIL DIVERSION CHANNEL - TYPICAL SECTION IN OVERBLASTED BEDROCK

SCALE 1: 100



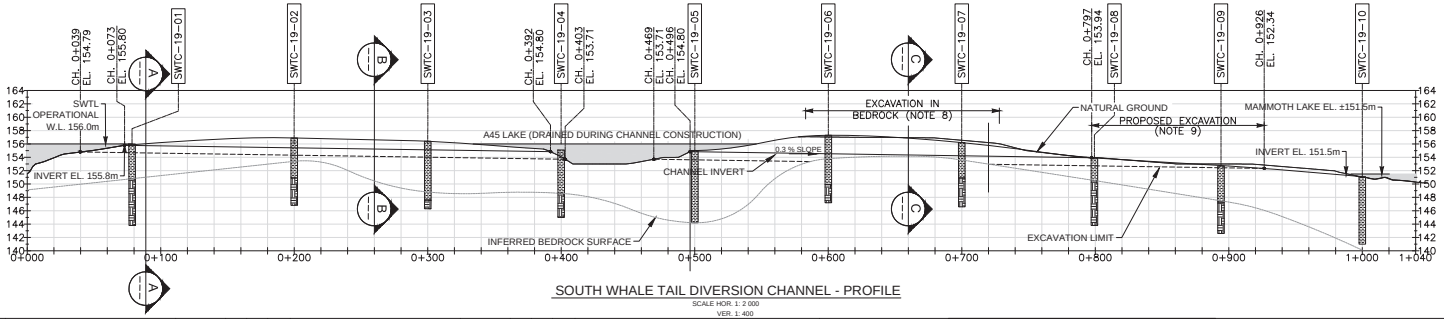
SECTION C-C - SOUTH WHALE TAIL DIVERSION CHANNEL - TYPICAL SECTION FOR EXCAVATION IN BEDROCK

SCALE 1: 100



NOTES:

1. WORKS SHOWN ON THIS DRAWING SHALL BE EXECUTED IN ACCORDANCE WITH THE APPLICABLE TECHNICAL SPECIFICATIONS.
2. ALL ELEVATIONS ARE IN METERS.
3. MATERIAL 1 WILL BE USED AS LEVELING FILL FOLLOWING EXCAVATION OF THE CHANNEL. HOWEVER, IF THE WORK IS DONE IN SUMMER, LEVELING CAN BE DONE WITH EXCAVATED MATERIAL IF IT MEETS THE SPECIFICATIONS.
4. THE BEDROCK SURFACE WAS ESTIMATED USING THE FIELD INVESTIGATIONS FROM 2019 (AEM, 2019).
5. IF THE EXCAVATED SURFACE IN THE OVERBURDEN EXPOSES LARGE ICE LENSES, OR ICE RICH AND THAW SOFTENING LAYER(S), THE CONTRACTOR SHALL PROPOSE A METHOD THAT WILL MINIMIZE THAW INDUCED DITCH SLOPE INSTABILITY OR EXCESSIVE LATERAL DEFORMATION TO AEM'S REPRESENTATIVE BEFORE CONTINUING WITH THE WORK.
6. THE LAYOUT OF THE ROAD IS APPROXIMATE. THE DETAILED ENGINEERING OF THIS STRUCTURE IS PRESENTED IN THE ROAD'S DESIGN REPORT (SNC LAVALIN, 2019).
7. DETAILS RELATED TO THE REFERENCES ARE GIVEN IN THE LIST OF REFERENCES IN THE SWTDC DESIGN REPORT.
8. TRANSITION OF FILL MATERIALS CAN BE ADJUSTED DURING THE CONSTRUCTION FOR THIS PORTION OF THE CHANNEL THAT WILL BE IN BEDROCK.
9. THE LAYOUT OF THE INLET AND THE OUTLET OF THE CHANNEL AND SECTOR OF LAKE A45 WILL NEED TO BE ADAPTED DURING THE CONSTRUCTION TO MINIMIZE IMPACT ON THE SHORE AND ON THE LAKE. TURBIDITY BARRIER OR SILT CURTAIN MAY BE REQUIRED.
10. THICKNESS OF ROCKFILL IS VARIABLE AND CAN BE ADAPTED DURING THE CONSTRUCTION OF THE CHANNEL IN BEDROCK. A MINIMUM THICKNESS OF 0.5 m IS REQUIRED.
11. ACCESS ROAD FROM ROAD 24 TOWARDS THE CHANNEL SHALL BE CONSTRUCTED FOR MAINTENANCE AND CLEANING PURPOSES WITH A MAXIMUM SLOPE OF 10%. LIMITS SHALL BE DEFINED ON SITE BASED ON EQUIPMENT.
12. THE MAINTENANCE ROAD MAY BE CONSTRUCTED BY AEM FOR CLEANING AND MAINTENANCE PURPOSES. TO BE EVALUATED FOLLOWING THE FIRST SEASON OF OPERATION.



SOUTH WHALE TAIL DIVERSION CHANNEL - PROFILE

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VER. 1: 400

ISSUE No	REV.	DATE (Y/M/D)	PURPOSE OF ISSUE
04	00	2019-07-22	ISSUED FOR CONSTRUCTION
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03	TOPO_SWTC.DWG (BAHTY LAKE A45)
02	AMQ BATHY CL1M MD
01	644819-SITE AMARUQ - 2019-02-07_REV2

REFERENCE DRAWINGS

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PERMIT NUMBER: P 260
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DRAWN D. LAN	PROJECT ENGINEERING MANAGER Y. JALBERT, P. ENG.
CHECKED Y. JALBERT, P. ENG.	CLIENT
DATE 2019-06-21	
SCALE AS SHOWN	

CLIENT: AGNICO EAGLE

PROJECT: AGNICO EAGLE – MEADOWBANK DIVISION WHALE TAIL PIT

TITLE: SOUTH WHALE TAIL DIVERSION CHANNEL PLAN VIEW, PROFILE AND TYPICAL SECTIONS

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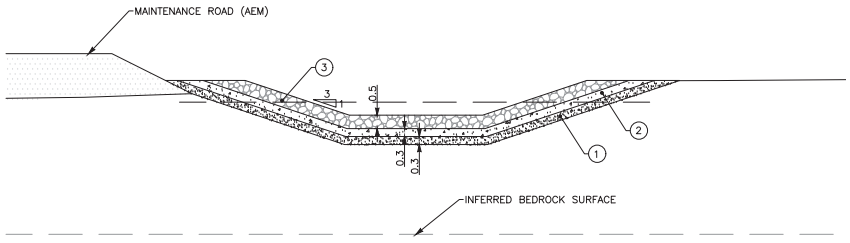

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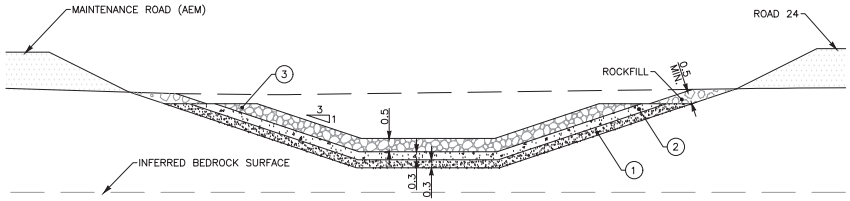

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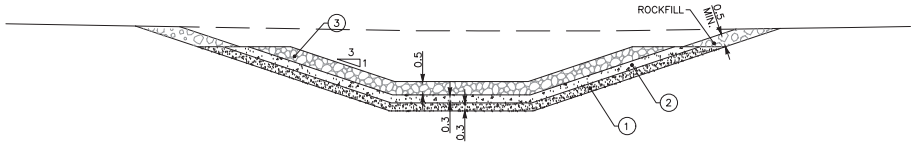

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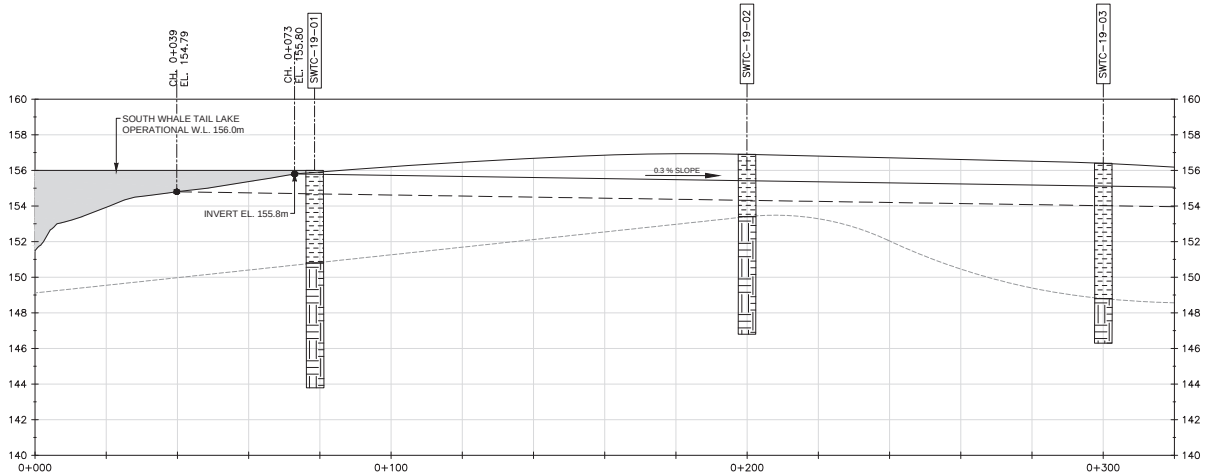

SOUTH WHALE TAIL DIVERSION CHANNEL - PROFILE
SCALE HOR. 1: 750
VER. 1: 150

LEGEND FOR FILL MATERIAL

- FINE FILTER
- COARSE FILTER
- RIP RAP (100-300 mm)

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DATE 2019-06-07	
SCALE AS SHOWN	

CLIENT
AGNICO EAGLE

PROJECT
AGNICO EAGLE - MEADOWBANK DIVISION
WHALE TAIL PIT

TITLE
SOUTH WHALE TAIL DIVERSION CHANNEL
PROFILE AND SECTIONS 0+000 TO 0+400

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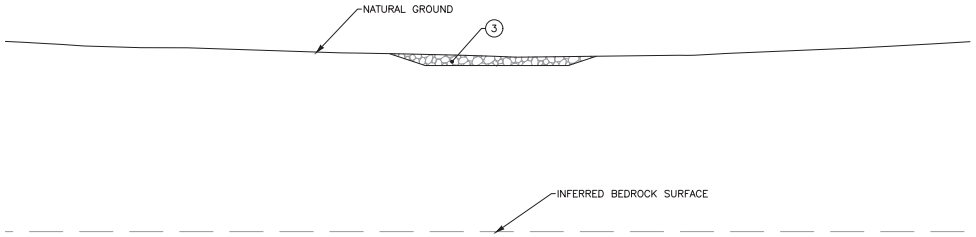

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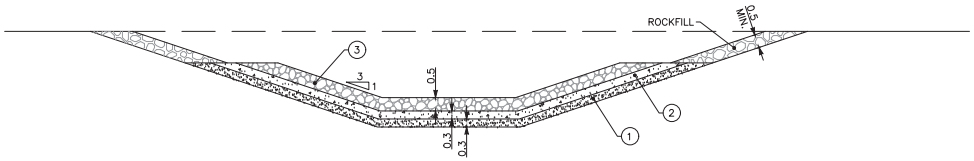

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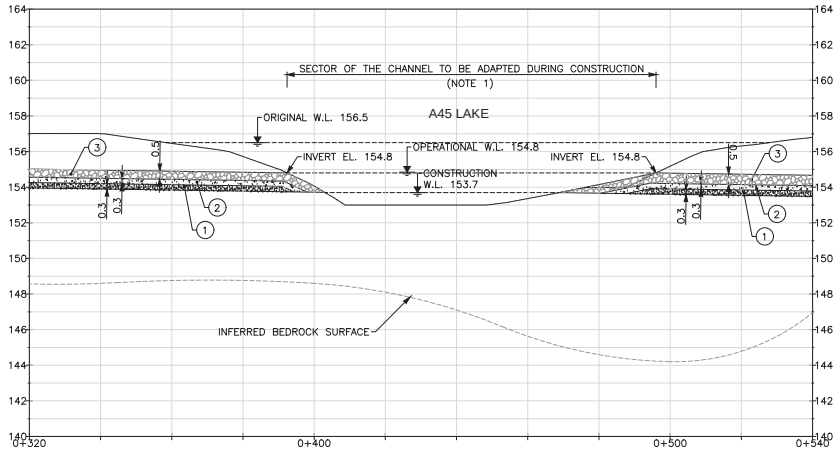

SOUTH WHALE TAIL DIVERSION CHANNEL - PROFILE (LAKE A45)
SCALE HOR. 1: 750
VER. 1: 150

LEGEND FOR FILL MATERIAL

- FINE FILTER
- COARSE FILTER
- RIP RAP (100-300 mm)

NOTE:

1. A PROTECTION LAYER MAY BE REQUIRED TO AVOID ANY EROSION INSTABILITY TO THE CHANNEL DEPENDING ON THE TYPE OF MATERIAL THAT IS PRESENT AT THE BOTTOM OF LAKE A45.

ISSUE No	REV.	DATE (Y/M/D)	PURPOSE OF ISSUE
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03	PC	2019-07-09	ISSUED FOR AEM COMMENTS
02	PB	2019-06-07	ISSUED FOR AEM COMMENTS
01	PA	2019-06-05	ISSUED FOR INTERNAL REVIEW

ISSUE REGISTER

ISSUE No	REV.	DATE (Y/M/D)	PURPOSE OF ISSUE

ISSUE REGISTER

No	REVISION DESCRIPTION	DATE (Y/M/D)	*	**

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REVISION REGISTER

No	REVISION DESCRIPTION	DATE (Y/M/D)	*	**

INITIALS: * DESIGNED ** APPROVED

REVISION REGISTER

No	
03	TOPO_SWTC.DWG (BAHTY LAKE A45)
02	AMQ BATHY CL1M MD
01	644819-SITE AMARUQ – 2019-02-07_REV2

REFERENCE DRAWINGS

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SNC-LAVALIN INC.
Signature
Date 2019-07-23
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CHECKED Y. JALBERT, P. ENG.	CLIENT
DATE 2019-06-07	
SCALE AS SHOWN	

CLIENT: AGNICO EAGLE

PROJECT: AGNICO EAGLE – MEADOWBANK DIVISION
WHALE TAIL PIT

TITLE: SOUTH WHALE TAIL DIVERSION CHANNEL
PROFILE AND SECTIONS 0+500 TO 0+800

PROJECT No	SUBDIVISION	SUBJECT	SERIAL	REV.
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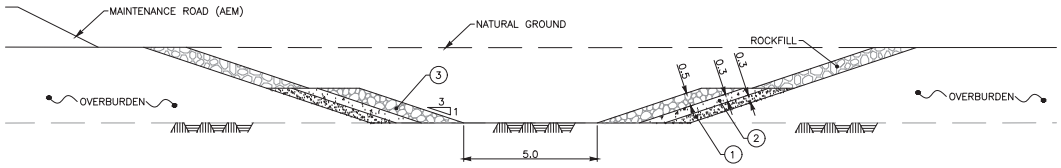

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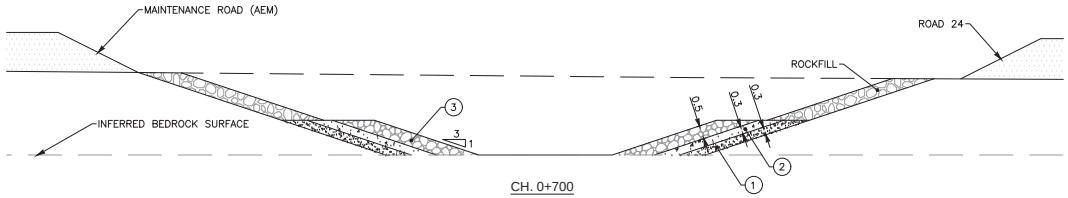

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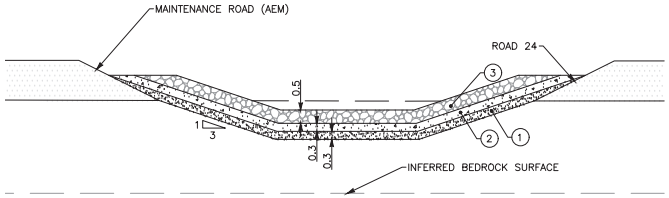

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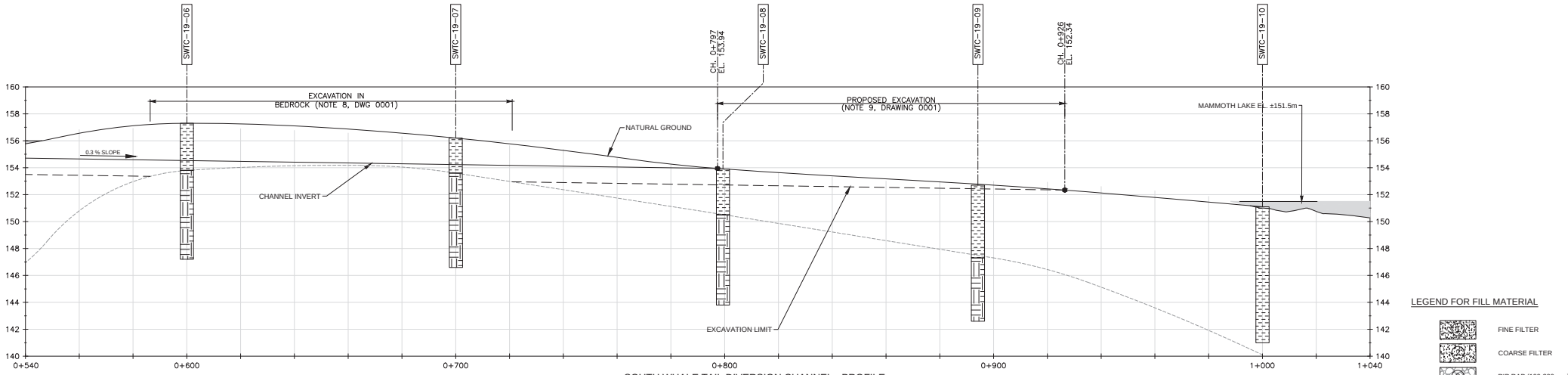

SOUTH WHALE TAIL DIVERSION CHANNEL - PROFILE
SCALE HOR. 1: 750
VER. 1: 150

LEGEND FOR FILL MATERIAL

1 FINE FILTER

2 COARSE FILTER

3 RIP RAP (100-300 mm)

ISSUE No	REV.	DATE (Y/M/D)	PURPOSE OF ISSUE
04	00	2019-07-22	ISSUED FOR CONSTRUCTION
03	PC	2019-07-09	ISSUED FOR AEM COMMENTS
02	PB	2019-06-07	ISSUED FOR AEM COMMENTS
01	PA	2019-06-05	ISSUED FOR INTERNAL REVIEW

ISSUE REGISTER

ISSUE REGISTER

No	REVISION DESCRIPTION	DATE (Y/M/D)	*	**

INITIALS: * DESIGNED ** APPROVED

REVISION REGISTER

No	REVISION DESCRIPTION	DATE (Y/M/D)	*	**

INITIALS: * DESIGNED ** APPROVED

REVISION REGISTER

No	
02	AMQ BATHY CL1M MD
01	644819-SITE AMARUQ – 2019-02-07_REV2

REFERENCE DRAWINGS

PROFESSIONAL SEAL

PERMIT TO PRACTICE
SNC-LAVALIN INC.
Signature
Date 2019-07-22
PERMIT NUMBER: P 260
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

SNC-LAVALIN
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PREPARATION	APPROVAL
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DRAWN: D. LAN	PROJECT ENGINEERING MANAGER: Y. JALBERT, P. ENG.
CHECKED: Y. JALBERT, P. ENG.	CLIENT
DATE: 2019-06-07	
SCALE: AS SHOWN	

CLIENT: AGNICO EAGLE

PROJECT: AGNICO EAGLE – MEADOWBANK DIVISION
WHALE TAIL PIT

TITLE: SOUTH WHALE TAIL DIVERSION CHANNEL
SECTIONS

PROJECT No	SUBDIVISION	SUBJECT	SERIAL	REV.
651298	2900	4G DD	0004	00

A1-HOR-FRAME-EN (SI)

LAST SAVE: 2019/07/22 – 2:53pm
PATH: T:\proj\651298 Detailed Eng WM-Geotech Amaruq\40_DD_DESSINS\DETAILED DESIGN OF SWTDC\651298-2900-4020-0004-00.dwg

Appendix B

Technical specifications

TITRE: **TECHNICAL SPECIFICATIONS FOR THE CONSTRUCTION OF SOUTH WHALE TAIL DIVERSION CHANNEL**

CLIENT: **AGNICO-EAGLE MEADOWBANK DIVISION**

PROJECT: **DETAILED ENGINEERING OF WATER MANAGEMENT AND GEOTECHNICAL INFRASTRUCTURE AT AMARUQ MINE**

PREPARED BY : Tezera Azmatch, P. Eng., Ph.D.

REVIEWED BY : Angie Arbaiza, P. Eng., M. Sc.

APPROVED BY : Yohan Jalbert, P. Eng.

Index of revisions

Revision				Revised pages	Remark
No.	Prep.	App.	Date		
PA	TFA	AA	11/06/2019	All	Issued for internal review
PB	TFA	AA	13/06/2019	All	Issued for AEM comments
PC	AA	YJ	10/07/2019	All	Issued for AEM comments
00	AA	YJ	22/07/2019	All	Issued for construction

INSTRUCTION TO PRINT CONTROL: (Indicate X where applicable)

☐ Entire Criteria revised. Reissue all pages

☐ Reissue revised pages only

STAMP THE CRITERIA AS FOLLOWS:

☐ Released for internal revision

☐ Issued for comments and approval

☐ Released for bid

☒ Released for construction (installation specifications only)

TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

1.0 WORK DESCRIPTION

1.1 Description of the project

Agnico Eagle Mines Limited, Meadowbank Division (''AEM'') is developing the Whale Tail Pit, a satellite gold deposit on the Whale Tail property, as a continuation of current mine operations and milling at the Meadowbank Mine. The Whale Tail property is a 408 km² site located on Inuit Owned Land, approximately 150 km north of the Hamlet of Baker Lake and approximately 50 km northwest of the Meadowbank Mine on the Kivalliq region of Nunavut. The property was acquired by Agnico Eagle in April 2013 and is subject to a mineral exploration agreement with Nunavut Tunngavik Incorporated.

To enable mining of the open pit located in the north part of Whale Tail Lake, a dewatering dike named Whale Tail Dike (WTD) was constructed in 2018 on a shallow plateau of the lake floor with an approximate 2 m depth of water. Once in operation, the downstream side of the dike will be dewatered and the upstream side of the dike will allow a 3.5 m raise of the water level prior to being discharged by gravity towards Mammoth Lake via a new blasted channel located west of the property: the South Whale Tail Diversion Channel (SWTDC). This channel will be built between existing A20, A45 and Mammoth lakes and will reroute approximately 2,400 ha of watershed.

1.2 Work included

The work shall include mobilization of all necessary equipment and materials as well as providing supervision, technical personnel (including surveyors) and skilled labour for the construction of SWTDC.

The Contractor shall prepare a detailed work plan outlining its proposed method of execution with particular focus on the channel excavation and foundation preparation, placement of the fill and protection of materials. The work plan shall be approved by the Owner and the Design Engineer.

The Work includes but is not limited by the following items:

1. The preparation of all documentation that the Contractor is required to provide prior to the beginning of the Work.
2. Site preparation including snow, ice and boulder removal and proper disposal.
3. Blasting, stripping, excavation and grading.
4. Granular fill loading, hauling, placement and compaction.
5. Controls including sampling and testing.

If judged necessary by the QA inspectors and/or the QC representatives, or the applicable representatives, additional tests shall be performed by an external laboratory.

1.3 List of drawings

The list of drawings is presented in Table 1-1 and the drawing is included in Appendix 1.

Table 1-1: List of Drawings

DRAWING NO	TITLE	REVISION
651298-2900-4GDD-0001	SWTDC Plan view, profile and typical sections	00
651298-2900-4GDD-0002	SWTDC profile and sections 0+000 to 0+320	00
651298-2900-4GDD-0003	SWTDC profile and sections 0+320 to 0+540	00
651298-2900-4GDD-0004	SWTDC profile and sections 0+540 to 1+000	00

2.0 GENERALITIES

2.1 Unit system

Unless indicated otherwise, Amaruq's coordinate system is used and all elevations are tied to the UTM Zone 14, NAD83 (CSR), and the metric unit system (SI) is used.

2.2 Codes and Standards

Whenever mention is made of a standard or regulation, it is understood that the reference is the most recent issue of the said standard or regulation unless specifically mentioned.

The Contractor may suggest the application of alternative standards provided that the resulting final product is at least equal in quality to that specified.

The standards presented in the following table shall be respected during the execution of the works.

Table 2-1: Standards and Codes

Activity / Tests	Standard
Particle Size Analysis	ASTM D422 - 63(2007), Standard Test Method for Particle-Size Analysis of Soils

2.3 Definition of terms and stakeholders

Below is a list of the stakeholders engaged in the SWTDC construction process:

1. The **Owner** is represented by the AEM Geotechnical Engineer.
2. Quality Assurance (**QA**) is represented by AEM or a subcontractor.
3. The **Designer** is represented by SNC-Lavalin.
4. The **Contractor** is represented by Kivaliq Contractors Group (KCG) and includes the surveyors and all subcontractors (if any).
5. Quality Control (**QC**) is represented by the contractor or a subcontractor of AEM, and is responsible of QC for the entire work.

2.4 Scope of responsibilities

The responsibilities of each stakeholder are defined as follows:

2.4.1 Owner's Representative (AEM)

- Review working plan and documents from the Contractor to confirm that it is in accordance with the design.
- Report deviation to the AEM Geotechnical Coordinator.
- Identify changes to be made in the design or drawings, collect information and share it with the Designer.
- Oversee the execution and coordination of the entire work.
- Review work and monitoring of construction.
- Share data with QA inspectors and QC representatives including but not limited to layout, scope limit control and data collection for as-built drawings and report.
- Review quantities.
- Coordination, daily interaction with QA and QC personnel.
- Follow-up the construction schedule.
- Confirm the waste disposal area.
- Plan or approve platforms to stockpile materials.
- Responsible of the health and safety and environmental issues and procedures on site.
- Supply fine filter, coarse filter and riprap material.

2.4.2 Quality Control Representative (contractor or a subcontractor of AEM)

- Inspection and documentation of work procedures to ensure the works meet the drawings (lines and grades) and the specifications.
- QC testing as required by the specifications (Appendix 2).
- Prepare daily reports.
- Prepare approval forms.
- Work under the supervision of the Owner's Representative as applicable.
- Request additional testing when required.

2.4.3 Quality Assurance Inspector (AEM or a subcontractor)

- Observe all work, have an active role in the construction and liaise with the designer.
- Inspection, documentation and review QC and Contractor work to ensure that the control meets the specifications and the Design.
- QA personnel may perform occasional independent checks. The Contractor shall co-operate in a timely manner during sampling and testing. Loading and disposal of sampling materials, when no longer required by AEM or its subcontractor, shall be carried out by the Contractor.
- Request additional testing when required and review QC testing and procedures.
- Collect signed forms (approval and non-conformity forms) and give copy to Owner's Representative.
- Prepare QA report to be included in as-built report.
- Perform tasks as defined in Appendix 2.
- Report design deviations to the Owner representative, Contractor and Designer.
- Prepare as-built report, including testing results, drawings and reports.

2.4.4 Contractor (KCG)

- Construction of the SWTDC in compliance with the requirements of the drawings and the specifications.
- Carry out all survey and stake out and provide all material volumes to the Owner's Representative, QA Inspectors and/or QC Representatives.
- Supervise all its sub-contractors.
- Share all collected data with Owner's Representative, QA Inspectors and/or QC Representatives.

- Prepare construction drawings, collect information and share it with the Owner's Representative.

2.4.5 AEM Geotechnical Coordinator

- Communicate with the Designer for any technical questions or issues.
- Report design deviations to the Designer.

2.4.6 Designer (SNC-Lavalin)

- Review documentation requested from the Contractor prior to the beginning of the Work.
- Be informed of the construction schedule and the advancement of the Work.
- Send a sealed technical memorandum to the AEM Geotechnical Coordinator within appropriate timeframe to confirm the design change(s).

2.5 Work method and equipment

The Contractor shall submit to the Owner's Representative its working methods with the specific equipment and procedures he plans to use at least 30 days prior to the start of the work. The complete list of documentation to be provided prior the beginning of the Work is presented in Section 2.12.

2.6 Subsurface conditions

Drawing no. 651298-2900-4GDD-0001 (Appendix 1) shows the location of investigation boreholes carried out along the proposed location of SWTDC in 2019. Based on the information from this investigation (Appendix 4), the general site condition consists of boulders overlying overburden soils which are in turn underlain by bedrock. Boulders were encountered in most on the drill holes to a depth of 2.7 m.

The overburden consists of glacial till composed of silt, sand and gravel. The thickness of the overburden ranges from 0.8 m to about 8.8. An ice layer was found in the drill hole SWTC-19-03 between 7.4 and 7.6 meters deep. Moreover, frozen soil was found between 1.2 and 3.7 meters in the drill hole SWTC-19-04, between 1.3 and 3.7 meters in the drill hole SWTC-19-05 and between 1.1 and 3.6 meters in the drill hole SWTC-19-10.

Sound bedrock was reached at depth ranging between 4.4 and 8.8 meters and weathered bedrock was reached at depth ranging from 2.6 and 7.6 meters. However, bedrock was not reached in the drill holes SWTC-19-05 and SWTC-19-10.

The Contractor shall make its own interpretations of the subsurface conditions based on the available information.

2.7 Lines, grades and tolerances

- Lines and grades shall be obtained from the drawings presented in Appendix 1.
- Bench marks for the layout of the channel will be provided by the Contractor's surveyor.
- The Contractor's surveyor shall be responsible for all staking and other survey requirements such as lines and grades specified or shown on the drawings.
- Lines and grades are subject to modifications by the Designer and/or the Owner's Representative (when justified) and additional lines and grades may be required as the work progresses. Tolerance on lines and grades is of ± 0.1 m of the theoretical lines.
- The Contractor shall use the applicable control points to complete the layout of all the works. Any additional control point required to execute the work adequately shall be provided by AEM.
- If the Contractor or any of its subcontractors or any of their representatives or employees move, destroy or render inaccurate any survey control point, such control point shall be replaced at the Contractor's expense.

2.8 Additional drawings

The Designer may provide additional drawing(s) if considered necessary. These drawings shall form part of the contractual document and will be the result of a design deviation.

2.9 Land, lake, environment and infrastructure protection

- The Contractor shall limit traffic to the area inside the boundary established by the Owner's Representative.
- The Contractor shall respect the Environmental procedures of AEM.
- The Contractor shall present an environmental mitigation control plan for the Work. This shall include, but not limited to, a water management plan during construction and appropriate controls on site he plans to implement before and during the Work. The Contractor is responsible of the performance of these mitigation controls.
- Fires are not allowed on site.
- The Contractor shall make sure that all personnel under his responsibility will do everything possible to protect the environment.
- Unless approved by the Owner's Representative, once construction is completed, no fill material shall be left at the construction site.
- All frozen excavated materials must be disposed of as directed by the Owner's Representative.

- Unless approved by the Owner's Representative, all excavated snow shall be disposed of as per AEM's Snow Management Plan.
- In order to mitigate suspended sediment transport which may occur after the flooding of the lake and the channel, turbidity barriers or permanent sediment settlement areas may be planned at the channel outlet in Mammoth Lake.

2.10 Site cleanup

The Contractor is responsible for the cleanup and removal of garbage and other foreign materials from the construction site to the satisfaction of the Owner's Representative.

2.11 Health and safety

- All construction work shall be conducted in accordance with Agnico Eagle's sustainable development and Health and Safety standards and regulations.
- All personal protection equipment appropriate for the work shall be used by all workers.
- Detailed work procedures for every construction task shall be provided by the Contractor and approved by the Owner's Representative.
- A daily coordination meeting shall be held between the Contractor, QA and QC Inspectors and AEM representatives to discuss planning and safety.

2.12 Documentation to be provided to AEM by the Contractor

At least 30 days prior to the beginning of the Work, the Contractor shall submit the following documents:

- The location of the stockpile area(s) he plans to use as well as the location of borrow sources and access roads.
- The proposed construction schedule, construction method and a list of specific tools and equipment which will be used during the Work.
- The proposed method of excavation in frozen ground and/or bedrock, including slope, channel bottom alignment and grade controls.
- Procedure and technique of fill placement for embankments, fine filter, coarse filter and riprap protection layer.
- The proposed method that will minimize thaw induced ditch slope instability or excessive lateral deformation if the blasted surface in the overburden exposes large ice lenses or ice rich and thaw softening layer(s).
- A detailed written procedure for water management and an environmental mitigation control plan for the Work.

3.0 CONSTRUCTION MATERIALS

3.1 General

- Only sound and suitable materials meeting the requirements of this document and approved by the QC and/or QA personnel shall be used.
- Great care shall be taken to limit particle segregation during stockpiling, loading and placement of fill materials. Occasionally, the QC representatives and/or the QA inspectors may ask the Contractor to modify its construction procedures to meet this requirement.
- Fill materials shall be free from all organic matter or other deleterious, unapproved, unstable or unsuitable materials such as ice/snow, frozen fill or peat.
- Unless approved by the Owner's Representative as well as supported by random inspections by the QC and/or QA personnel, all fill materials shall only be obtained from stockpiles or sources identified at the beginning of the construction works.
- All materials shall be manufactured from good quality non-potentially acid generating (NPAG) and non-leaching sources.

3.2 Definitions

- ''Sound'' or ''Suitable'' fill materials are defined as being free from deleterious matter, having a gradation which permits compaction or placement to a stable state, and having the characteristics specified for the particular materials after handling, re-handling, processing and reprocessing have taken place.
- ''Unstable'' or ''Unsuitable'' fill materials are defined as being too wet, containing oversized or segregated particles, organic or other deleterious matter, such as ice or snow, or having poor characteristics which may result in undesirable settlement or other movement of the fill or within the fill, or otherwise not meeting the requirements of the specifications. However, this definition permits drying, dewatering, watering, screening, raking and any other processing or reprocessing to make the material stable and suitable prior to incorporating it into the fill.

3.3 Materials

3.3.1 Fine Filter

The fine filter material to be used as a transition layer (together with the coarse filter material specified below) between the bottom of the excavation and the riprap protection layer shall be produced by crushing and screening rockfill and shall meet the gradation limits specified below in Table 3-1. The fine filter will be placed between the excavation and the coarse filter.

Table 3-1: Fine filter gradation

Sieve (mm)	Passing (%)
30	100
10	51-88
4.75	30-64
2	17-41
0.850	11-27
0.425	9-18
0.150	7-13
0.075	6-10

3.3.2 Coarse Filter

The coarse filter material to be used as a transition layer between the bottom of the excavation and the riprap protection layer shall be produced by crushing and screening rockfill and shall meet the gradation limits specified below in Table 3-2. The coarse filter will be placed between the fine filter and the riprap.

Table 3-1: Coarse filter gradation limits

Particle size (mm)	Finer than (%)
200	100
100	60-80
30	20-37
10	5-19
4.75	0-24
2	0-11
0.850	0-7
0.425	0-5
0.150	0-3
0.075	0-2

3.3.3 Riprap 100-300 mm

The material to be used as riprap in the channel to avoid erosion shall be a clean 100-300 mm blasted rock from a quarry, pre-production or production zone (runoff mine). After placement, it shall meet the gradation limits specified below in Table 3-3.

Table 3-2: 100-300 mm riprap gradation limits

Particle size (mm)	
Maximum	300
Minimum	100

3.4 Non-conforming materials

Where and when directed by the QC Representative or the QA Inspector, the Contractor shall excavate and/or remove all unsuitable materials to the designated spoil or dump.

4.0 EXECUTION OF WORKS

The Contractor's attention is drawn to the fact that the work might be executed during arctic winter and that the work will be carried out in a protected area (in an environmental context). Special care shall be taken to ensure the safety of all employees, to avoid damage to the land and breaking ice outside the designated working area.

4.1 Work method and sequence

- The method of construction and the sequence of execution shall be adapted to conditions that may change often, in order to minimize fill cross contamination and foundation disturbance. In the work method, the Contractor shall demonstrate that all the stage of construction is planed to be done safely.
- Heavy equipment traffic shall be adapted to the site conditions that may change often so to minimize surface disturbance and the formation of ruts in the work area. The Contractor shall restore disturbed areas as close as possible to the original condition to the satisfaction of the Owner's Representative.

4.2 Site preparation

4.2.1 General

- The Contractor shall remove snow, ice and boulders within SWTDC footprint prior to any fill placement and shall keep the work area dry.

- The QC Representative may occasionally request that additional soil stripping and removal of snow and ice be carried out from areas in the channel's footprint shown on the drawing.
- The removed material shall be stockpiled separately in areas approved by Owner's Representative.
- The prepared foundation shall be approved by the QC/QA personnel prior to fill placement.
- All survey shall be done by the Contractor.
- The approval and visual inspection forms shall be prepared by QC/QA personnel.

4.2.2 Access Roads

- The Contractor shall use in a proper manner the access roads that lead to the construction site.
- If required, the Contractor shall submit to the Owner's Representative full details of all temporary construction roads, ramps and access planned for the construction of the channel. Details related to these temporary works shall include location, alignment, required safety berm or traffic signs, period of use, materials used and plan for their removal.
- The Contractor shall maintain in good condition all existing or new access roads used for the execution of the work such as the access roads connecting the work area to stockpiles and waste dump areas to the satisfaction of the Owner's Representative.
- All the temporary access roads shall be constructed on top of the existing ground. No stripping or excavation shall be undertaken unless approved by the Owner's Representative.
- The Contractor shall supply and install all required traffic signs and safety equipment to ensure worker safety on the construction site for the complete duration of the work.
- Access road maintenance shall be planned and executed in such a way that worker safety is not compromised. Access roads shall be kept clean of snow and if required, sprinkled with abrasive materials such as gravel to the satisfaction of the Owner's Representative.
- Once the construction work is completed, all temporary access roads shall be removed and the material disposed of as directed by the Owner's Representative.

4.3 Water management during construction

The Contractor shall be responsible for the construction of temporary swales, ditches and sumps and be equipped with all the necessary pumps, hoses, and other equipment needed to

maintain excavations dry for the complete duration of the work and to the satisfaction of the QC and the QA personnel. The pumped water shall be discharged to the AEM approved location. However, a detailed written procedure of water management during construction shall be submitted to the Owner's Representative for approval prior to the beginning of the Work (Section 2.12).

For the dewatering of the Lake A45, the Contractor shall lowered the water level to allow excavation of the sub-base of the channel at the inlet and outlet of Lake A45. The water will be pumped out into the boulder field between Lake A45 and Mammoth Lake and then report to gravity to Mammoth Lake. The Contractor may have to implement mitigation measure such as silt fence and turbidity barriers. The need of it will be shared during the construction by the Owner Representative.

4.4 Foundation preparation

4.4.1 General

Foundation preparation involves making sure that the footprint of SWTDC is free of snow, ice, boulders and any other deleterious materials or soft pocket at all times during the first layer of fill placement regardless of the type or fill zone.

4.4.2 Channel Excavation

- Based on the available information described in Section 2.7, the channel excavation is expected to be entirely in frozen overburden. However, if the overburden is thinner than expected, the channel invert could be partly on bedrock.
- To avoid the channel invert to be sitting on ice-rich material or any thaw softening layer, the channel invert shall be sitting on the ice-poor glacial till surface or on the bedrock surface.
- The channel excavation may be carried out in permafrost, thus requiring drilling and blasting; if the blasted surface in the overburden exposes massive ice, ice-rich material or thaw softening layer(s), the Contractor shall propose a method that will minimize thaw induced ditch slope instability or excessive lateral deformation to the Owner's Representative before continuing with the excavation work or any fill placement.
- The Owner's Representative shall be responsible for the blast hole depth, spacing and pattern prior to blasting the frozen overburden. The Owner's Representative shall use a drilling pattern with blast hole depths that will produce the channel configuration as shown on the drawings. The Owner's attention is drawn to the requirement that blasting of frozen overburden shall be carried out with care to minimize cracking of frozen ground below excavation level.

- The final channel invert depth as well as longitudinal and lateral dimensions shall meet those shown on the drawings and shall be approved by the Owner's Representative and the QC/QA personnel prior any fill placement.
- The blasted material shall be removed completely to ease the inspection of the foundation.
- Excavated materials shall be set aside separately or stockpiled in areas approved by the Owner's Representative.
- The QC/QA personnel may, from time to time, request that additional soil stripping and removal of snow and ice be carried out in the channel's footprint.
- The channel shall be dewatered (when applicable) and all thawed soil removed prior to any backfilling. Snow and/or ice have to be completely removed from the channel invert before any fill placement to the satisfaction of the QC/QA personnel.
- Snow and/or ice, soil and rock shall be placed into the Waste Rock Storage Facility (WRSF) area where the water may be collected and treated, or any other area approved by the Owner's representative.

4.5 Stockpile and disposal areas

- Unless authorized otherwise, all stripped materials including snow, ice and soil shall be disposed in the WRSF, or any other area approved by the Owner's representative. During the construction, any other waste disposal area requires written authorization by the Owner's Representative.
- The Contractor shall develop its stockpiles to facilitate drainage and minimize fill segregation.

4.6 Material placement and compaction

4.6.1 General

The Contractor shall prepare the surface to be filled, load, unload and handle the fill in such a way that segregation and loss of fines are limited and shall meet the requirements of Section 3.0 after placement.

Blasted material can be used as fill material for the sector where overblast is done if this material meets the requirements of Section 3.0.

4.6.2 Fine Filter

- The fine filter is used as a transition layer between the bottom of the excavation and the coarse filter, and as leveling material following the excavation or blasting of the channel.

- The Contractor shall avoid excessive handling of the fine filter to prevent particle segregation.
- Haul trucks shall dump their load on horizontal surface and not in the slope to limit fill segregation.
- Any snow and ice accumulated on the previous lift shall be removed before placement of the new lift.
- Each lift shall be placed with an excavator bucket in maximum lift thickness of 0.5 m. Great care must be taken to limit particle segregation during placement. Occasionally the QC and QA personnel may ask the Contractor to modify his construction procedure to meet this requirement.
- Each lift shall be compacted dynamically with an excavator bucket until it reaches a dense and stable surface.
- Placement and compaction of the fill must be performed to the satisfaction of the QC and QA personnel.

4.6.3 Coarse Filter

- The coarse filter is used as a transition layer between the fine filter and the riprap protection layer.
- The Contractor shall avoid excessive handling of the coarse filter to prevent particle segregation.
- Haul trucks shall dump their load on horizontal surface and not in the slope to limit fill segregation.
- Any snow and ice accumulated on the previous lift shall be removed before placement of the new lift.
- Each lift shall be placed with an excavator bucket in maximum lift thickness of 0.5 m. Great care must be taken to limit particle segregation during placement. Occasionally the QC and QA personnel may ask the Contractor to modify his construction procedure to meet this requirement.
- Each lift shall be compacted with an excavator bucket.
- Placement and compaction of the fill must be performed to the satisfaction of the QC and QA personnel.

4.6.4 Riprap

- The Contractor shall avoid excessive handling of the riprap to prevent particle segregation.

- Haul trucks shall dump their load on horizontal surface and not in the slope to limit fill segregation.
- Riprap shall be placed with an excavator bucket in a single lift. Great care must be taken to limit segregation during placement. Occasionally the QC and QA personnel may ask the Contractor to modify their construction procedure to meet this requirement.
- Placement of the fill must be performed to the satisfaction of the QC and QA personnel.

4.7 Adverse conditions

The Contractor shall not carry out any excavation, placement or compaction of fill materials when conditions are such that in the opinion of the QC Representative and the QA Inspector, the quality of the work or adjacent works would be adversely affected. After any operation has been stopped owing the adverse conditions, operations shall not be re-started without the approval of the Representatives and/or the QA Inspectors and the Owner's Representative.

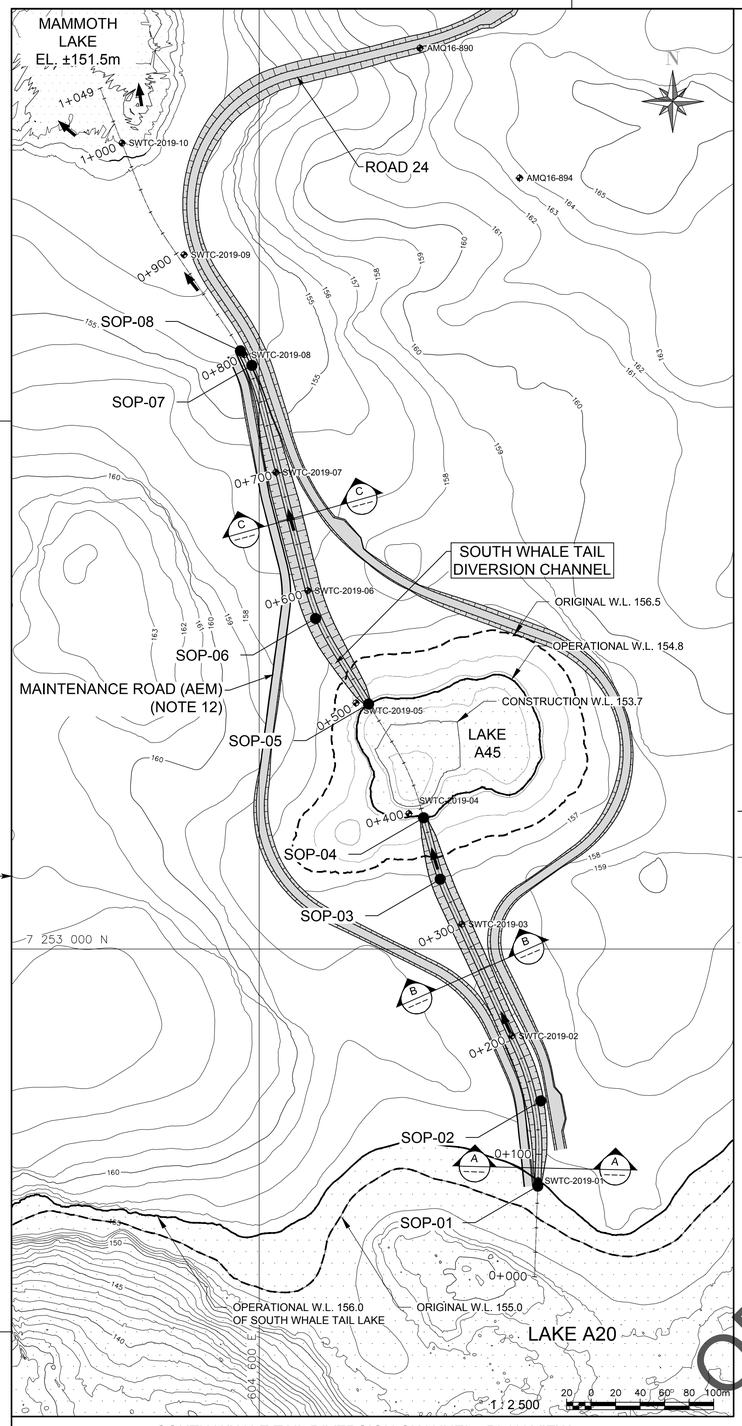
4.8 Acceptance

The Contractor shall submit works or sections of works completed in accordance to the lines and grades shown on the drawings for Owner's Representative approval.

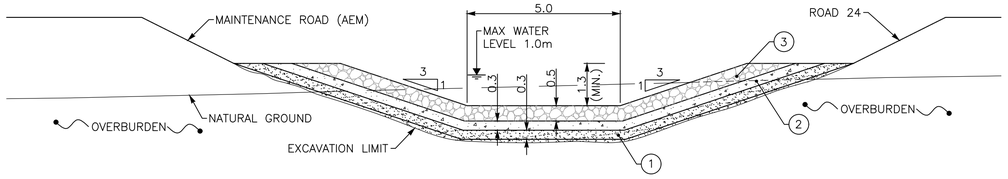
5.0 QUALITY CONTROL AND QUALITY ASSURANCE PROGRAM

- The QC/QA approval form is included in Appendix 3 and the tasks for QC/QA are presented in Appendix 2.
- The Contractor shall be entitled to be represented during all field tests carried out by the QC Representative in order to determine whether fill materials meet the requirements of the Specifications.
- The QC Representative will notify the Contractor prior to the start of such tests but the QC Representative shall not be required to wait for the arrival of the Contractor.
- The Contractor shall provide assistance when required for collecting and handling the samples.
- Sampling or testing required by the QC Representative shall be executed by the Contractor without delay. All samples and tests shall be taken or performed in accordance with the appropriate standard, approved by the QC Representative, and shall meet the requirements of the present document.
- Visual inspections of excavation and sources of imported fills will be carried out by the QC Representative on a regular basis to ensure that the excavation work and fill materials meet the requirement of the present document.
- The QC Representative shall provide QA inspector and Owner's Representative calibration sheets for each standardized equipment used for testing of the materials prior to the commencement of the Work (e.g. sieves, tensiometer).

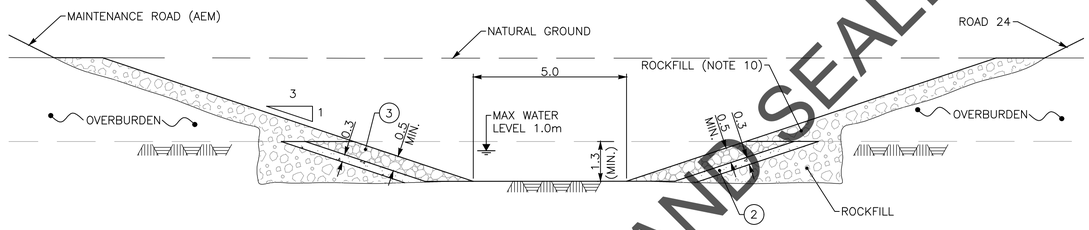
APPENDIX 1
Drawings



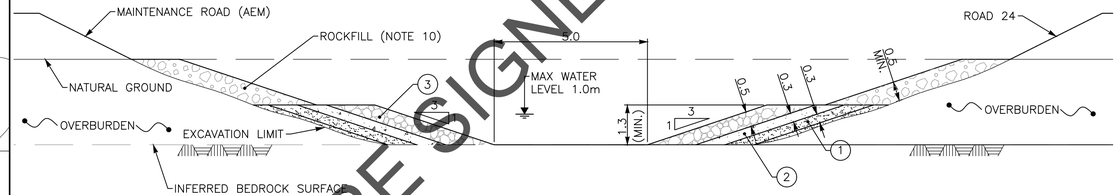
SOUTH WHALE TAIL DIVERSION CHANNEL - PLAN VIEW
SCALE 1: 2500



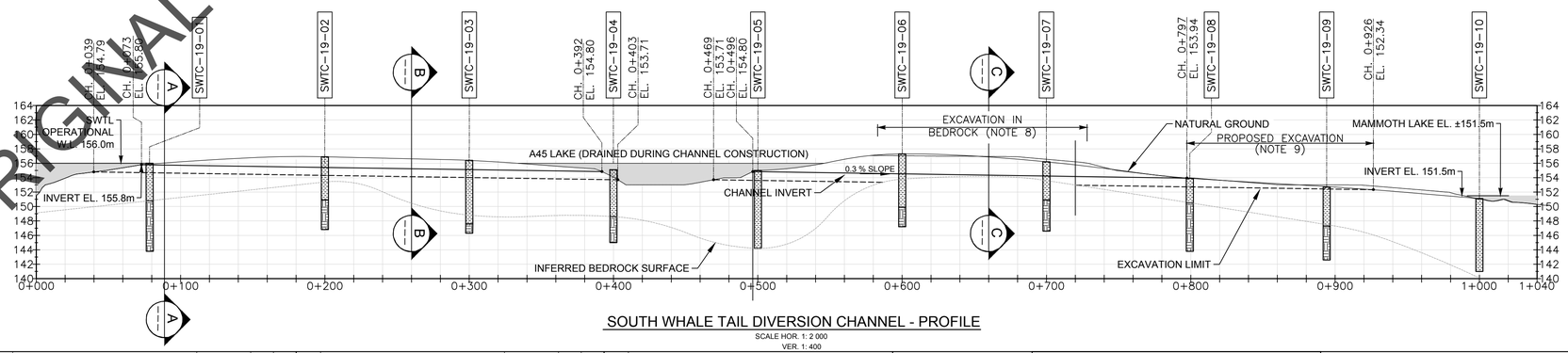
SECTION A-A - SOUTH WHALE TAIL DIVERSION CHANNEL - TYPICAL SECTION IN OVERBURDEN
SCALE 1: 100



SECTION B-B - SOUTH WHALE TAIL DIVERSION CHANNEL - TYPICAL SECTION IN OVERBLASTED BEDROCK
SCALE 1: 100

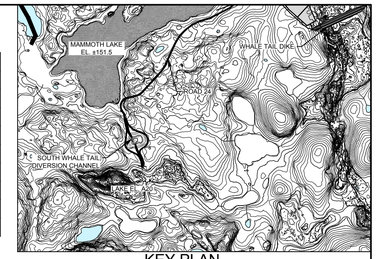


SECTION C-C - SOUTH WHALE TAIL DIVERSION CHANNEL - TYPICAL SECTION FOR EXCAVATION IN BEDROCK
SCALE 1: 100



SOUTH WHALE TAIL DIVERSION CHANNEL - PROFILE
SCALE HOR. 1: 2 000
VER. 1: 400

SETTING OUT POINTS				
NAME	STA.	EASTING	NORTHING	RADIUS
SOP-01	0+074	604 827.4	7 252 806.6	---
SOP-02	0+142	604 829.8	7 252 876.1	200
SOP-03	0+340	604 747.8	7 253 057.0	200
SOP-04	0+392	604 734.2	7 253 107.2	---
SOP-05	0+496	604 689.3	7 253 199.9	---
SOP-06	0+577	604 646.0	7 253 269.8	200
SOP-07	0+790	604 594.0	7 253 476.2	200
SOP-08	0+804	604 584.7	7 253 488.2	---



KEY PLAN
SCALE 1: 40000

LEGEND

- OPERATIONAL WATER LEVEL
- AMQ15-441 — EXPLORATION BOREHOLE
- SWTC-2019-01 — AIR TRACK DRILL HOLE (DESTRUCTIVE) (AEM, 2019)
- SOP-01 — SETTING OUT POINTS

LEGEND FOR FILL MATERIAL

- 1 — FINE FILTER
- 2 — COARSE FILTER
- 3 — RIP RAP (100-300 mm)

SWTC-2019-03 — NAME
OVERBURDEN
BEDROCK

NOTES:

1. WORKS SHOWN ON THIS DRAWING SHALL BE EXECUTED IN ACCORDANCE WITH THE APPLICABLE TECHNICAL SPECIFICATIONS.
2. ALL ELEVATIONS ARE IN METERS.
3. MATERIAL 1 WILL BE USED AS LEVELING FILL FOLLOWING EXCAVATION OF THE CHANNEL. HOWEVER, IF THE WORK IS DONE IN SUMMER, LEVELING CAN BE DONE WITH EXCAVATED MATERIAL IF IT MEETS THE SPECIFICATIONS.
4. THE BEDROCK SURFACE WAS ESTIMATED USING THE FIELD INVESTIGATIONS FROM 2019 (AEM, 2019).
5. IF THE EXCAVATED SURFACE IN THE OVERBURDEN EXPOSES LARGE ICE LENSES, OR ICE RICH AND THAW SOFTENING LAYER(S), THE CONTRACTOR SHALL PROPOSE A METHOD THAT WILL MINIMIZE THAW INDUCED DITCH SLOPE INSTABILITY OR EXCESSIVE LATERAL DEFORMATION TO AEM'S REPRESENTATIVE BEFORE CONTINUING WITH THE WORK.
6. THE LAYOUT OF THE ROAD IS APPROXIMATE. THE DETAILED ENGINEERING OF THIS STRUCTURE IS PRESENTED IN THE ROAD'S DESIGN REPORT (SNC LAVALIN, 2019).
7. DETAILS RELATED TO THE REFERENCES ARE GIVEN IN THE LIST OF REFERENCES IN THE SWTDC DESIGN REPORT.
8. TRANSITION OF FILL MATERIALS CAN BE ADJUSTED DURING THE CONSTRUCTION FOR THIS PORTION OF THE CHANNEL THAT WILL BE IN BEDROCK.
9. THE LAYOUT OF THE INLET AND THE OUTLET OF THE CHANNEL AND SECTOR OF LAKE A45 WILL NEED TO BE ADAPTED DURING THE CONSTRUCTION TO MINIMIZE IMPACT ON THE SHORE AND ON THE LAKE. TURBIDITY BARRIER OR SILT CURTAIN MAY BE REQUIRED.
10. THICKNESS OF ROCKFILL IS VARIABLE AND CAN BE ADAPTED DURING THE CONSTRUCTION OF THE CHANNEL IN BEDROCK. A MINIMUM THICKNESS OF 0.5 m IS REQUIRED.
11. ACCESS ROAD FROM ROAD 24 TOWARDS THE CHANNEL SHALL BE CONSTRUCTED FOR MAINTENANCE AND CLEANING PURPOSES WITH A MAXIMUM SLOPE OF 10%. LIMITS SHALL BE DEFINED ON SITE BASED ON EQUIPMENT.
12. THE MAINTENANCE ROAD MAY BE CONSTRUCTED BY AEM FOR CLEANING AND MAINTENANCE PURPOSES. TO BE EVALUATED FOLLOWING THE FIRST SEASON OF OPERATION.

ISSUE No	REV.	DATE (Y/M/D)	PURPOSE OF ISSUE
04	00	2019-07-22	ISSUED FOR CONSTRUCTION
03	PC	2019-07-09	ISSUED FOR AEM COMMENTS
02	PB	2019-06-07	ISSUED FOR AEM COMMENTS
01	PA	2019-06-05	ISSUED FOR INTERNAL REVIEW

ISSUE REGISTER

ISSUE REGISTER

REVISION REGISTER (No | REVISION DESCRIPTION | DATE (Y/M/D) | * | **)

REVISION REGISTER (No | REVISION DESCRIPTION | DATE (Y/M/D) | * | **)

INITIALS: * DESIGNED ** APPROVED

No	REFERENCE DRAWINGS
04	ROAD 24 FROM SNC
03	TOPO_SWTC.DWG (BAHTY LAKE A45)
02	AMQ BATHY CL1M MD
01	644819-SITE AMARUQ - 2019-02-07_REV2

PROFESSIONAL SEAL

SNC·LAVALIN
Mining & Metallurgy
5500, des Galeries Blvd., bur. 200, Quebec (Quebec), Canada G2K 2E2
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DRAWN: D. LAN	PROJECT ENGINEERING MANAGER: Y. JALBERT, P. ENG.
CHECKED: Y. JALBERT, P. ENG.	CLIENT
DATE: 2019-06-21	
SCALE: AS SHOWN	

CLIENT: AGNICO EAGLE

PROJECT: AGNICO EAGLE – MEADOWBANK DIVISION WHALE TAIL PIT

TITLE: SOUTH WHALE TAIL DIVERSION CHANNEL PLAN VIEW, PROFILE AND TYPICAL SECTIONS

PROJECT No	SUBDIVISION	SUBJECT	SERIAL	REV.
651298	2900	4G | DD	0001	00

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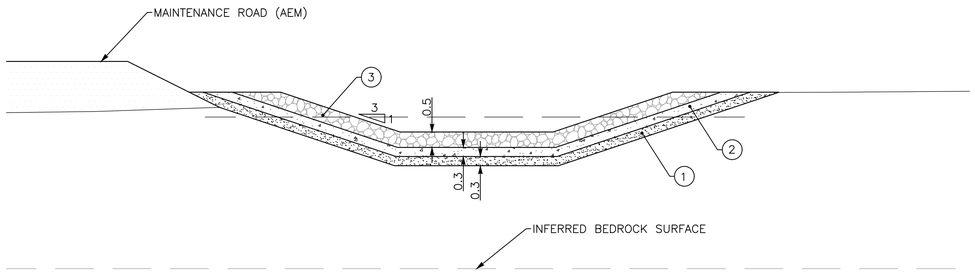

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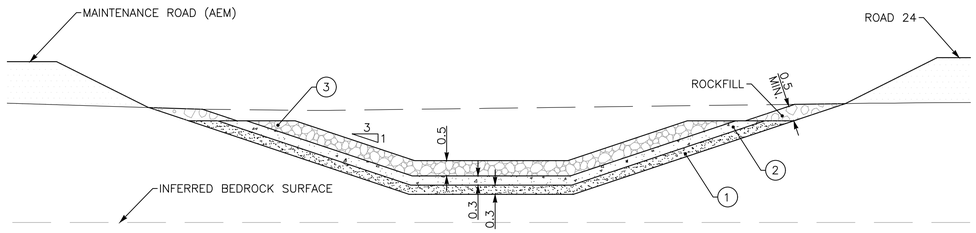

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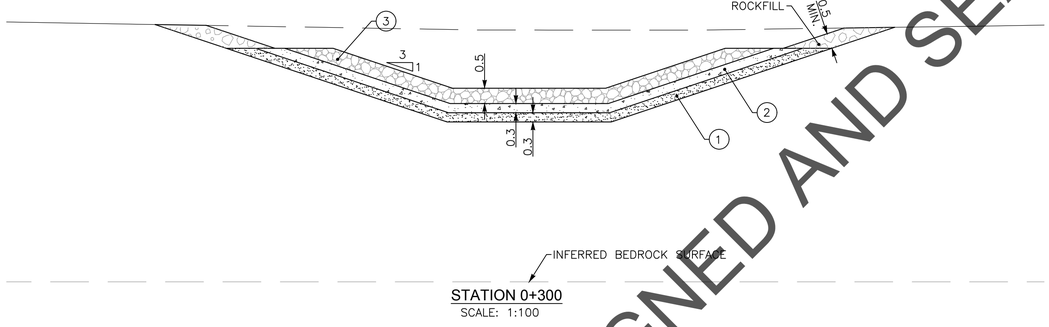

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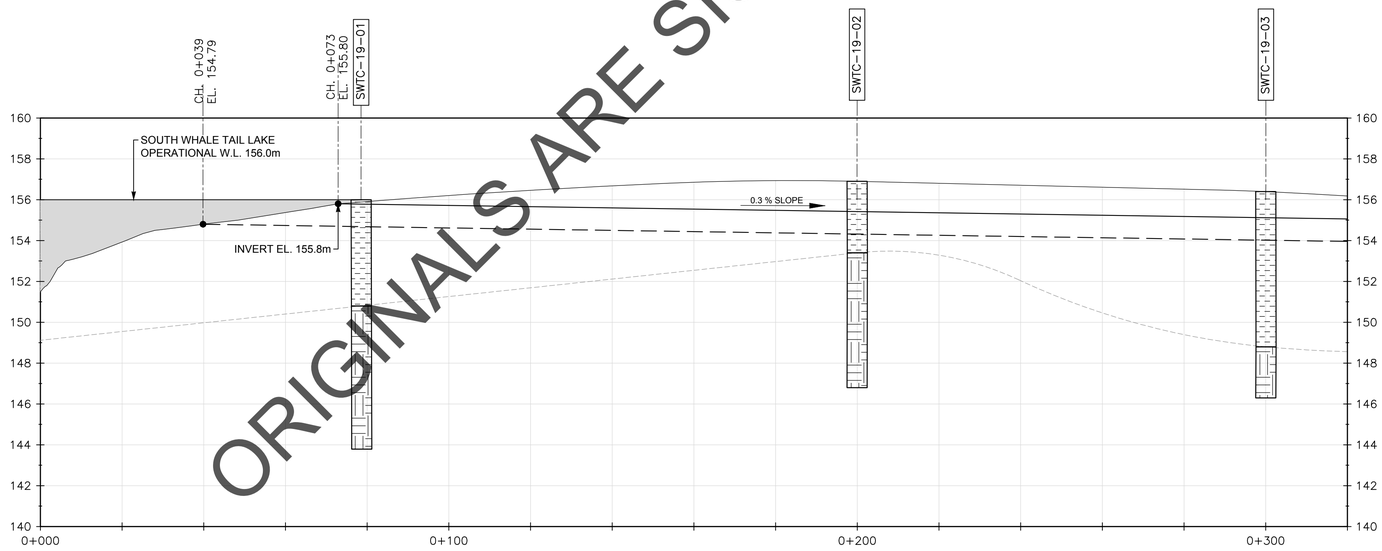

SOUTH WHALE TAIL DIVERSION CHANNEL - PROFILE
SCALE HOR. 1: 750
VER. 1: 150

LEGEND FOR FILL MATERIAL

1 FINE FILTER

2 COARSE FILTER

3 RIP RAP (100-300 mm)

ISSUE No	REV.	DATE (Y/M/D)	PURPOSE OF ISSUE
04	00	2019-07-22	ISSUED FOR CONSTRUCTION
03	PC	2019-07-09	ISSUED FOR AEM COMMENTS
02	PB	2019-06-07	ISSUED FOR AEM COMMENTS
01	PA	2019-06-05	ISSUED FOR INTERNAL REVIEW

ISSUE REGISTER

ISSUE REGISTER

No	REVISION DESCRIPTION	DATE (Y/M/D)	*	**

INITIALS: * DESIGNED ** APPROVED

REVISION REGISTER

No	REVISION DESCRIPTION	DATE (Y/M/D)	*	**

INITIALS: * DESIGNED ** APPROVED

REVISION REGISTER

No	
02	AMQ BATHY CL1M MD
01	644819-SITE AMARUQ - 2019-02-07_REV2

REFERENCE DRAWINGS

PROFESSIONAL SEAL

SNC·LAVALIN
Mining & Metallurgy
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DRAWN D. LAN	PROJECT ENGINEERING MANAGER Y. JALBERT, P. ENG.
CHECKED Y. JALBERT, P. ENG.	CLIENT
DATE 2019-06-07	
SCALE AS SHOWN	

CLIENT
AGNICO EAGLE

PROJECT
AGNICO EAGLE - MEADOWBANK DIVISION
WHALE TAIL PIT

TITLE
SOUTH WHALE TAIL DIVERSION CHANNEL
PROFILE AND SECTIONS 0+000 TO 0+400

PROJECT No	SUBDIVISION	SUBJECT	SERIAL	REV.
651298	2900	4G DD	0002	00

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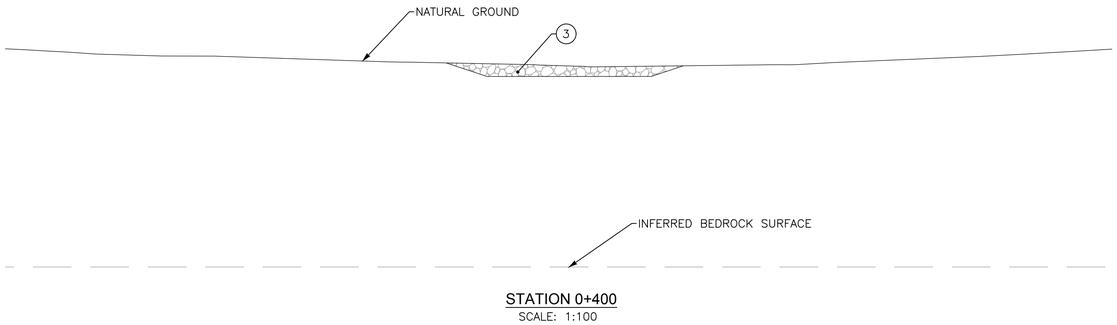

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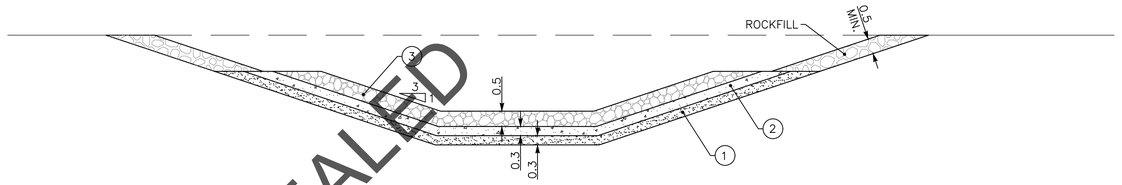

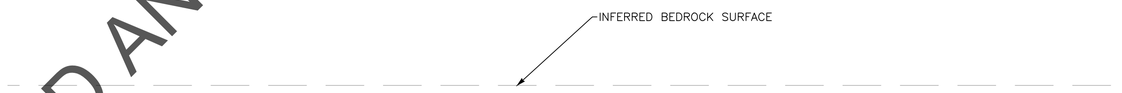

CH. 0+500
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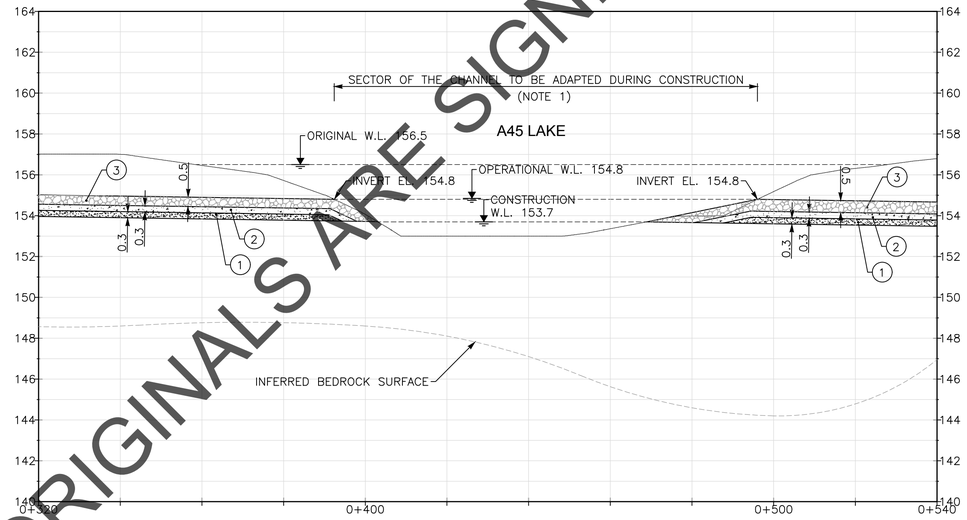

SOUTH WHALE TAIL DIVERSION CHANNEL - PROFILE (LAKE A45)
SCALE HOR. 1: 750
VER. 1: 150

LEGEND FOR FILL MATERIAL

1	FINE FILTER
2	COARSE FILTER
3	RIP RAP (100-300 mm)

NOTE:

1. A PROTECTION LAYER MAY BE REQUIRED TO AVOID ANY EROSION INSTABILITY TO THE CHANNEL DEPENDING ON THE TYPE OF MATERIAL THAT IS PRESENT AT THE BOTTOM OF LAKE A45.

ISSUE No	REV.	DATE (Y/M/D)	PURPOSE OF ISSUE
04	00	2019-07-22	ISSUED FOR CONSTRUCTION
03	PC	2019-07-09	ISSUED FOR AEM COMMENTS
02	PB	2019-06-07	ISSUED FOR AEM COMMENTS
01	PA	2019-06-05	ISSUED FOR INTERNAL REVIEW

ISSUE REGISTER

ISSUE No	REV.	DATE (Y/M/D)	PURPOSE OF ISSUE

ISSUE REGISTER

No	REVISION DESCRIPTION	DATE (Y/M/D)	*	**

INITIALS: * DESIGNED ** APPROVED
REVISION REGISTER

No	REVISION DESCRIPTION	DATE (Y/M/D)	*	**

INITIALS: * DESIGNED ** APPROVED
REVISION REGISTER

No	
03	TOPO_SWTC.DWG (BAHTY LAKE A45)
02	AMQ BATHY CL1M MD
01	644819-SITE AMARUQ - 2019-02-07_REV2

REFERENCE DRAWINGS

PROFESSIONAL SEAL

SNC·LAVALIN
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CHECKED: Y. JALBERT, P. ENG.	CLIENT
DATE: 2019-06-07	
SCALE: AS SHOWN	

CLIENT: AGNICO EAGLE

PROJECT: AGNICO EAGLE – MEADOWBANK DIVISION
WHALE TAIL PIT

TITLE: SOUTH WHALE TAIL DIVERSION CHANNEL
PROFILE AND SECTIONS 0+500 TO 0+800

PROJECT No	SUBDIVISION	SUBJECT	SERIAL	REV.
651298	2900	4G | DD	0003	00

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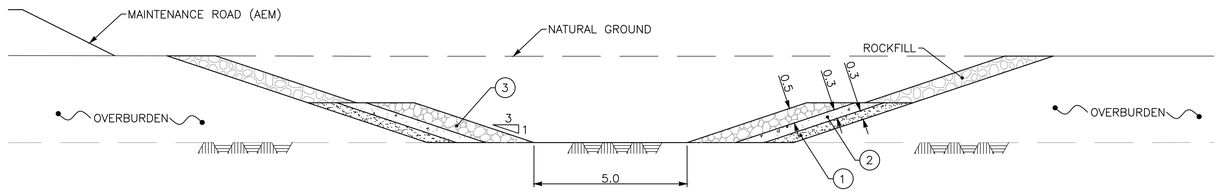

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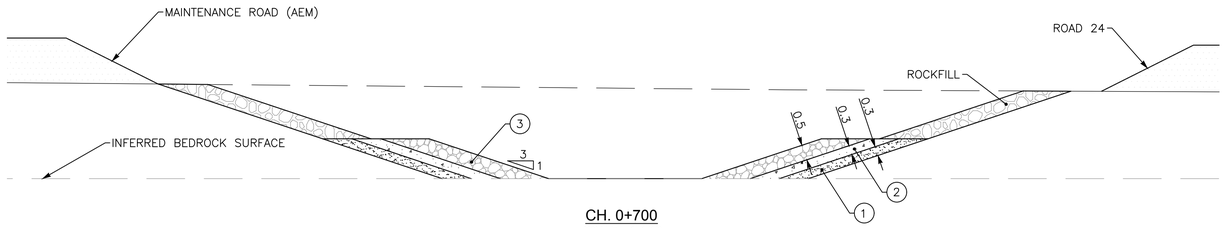

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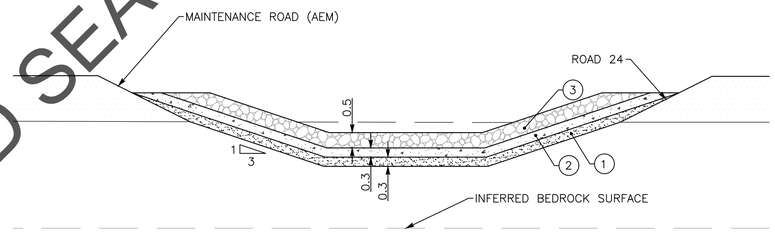

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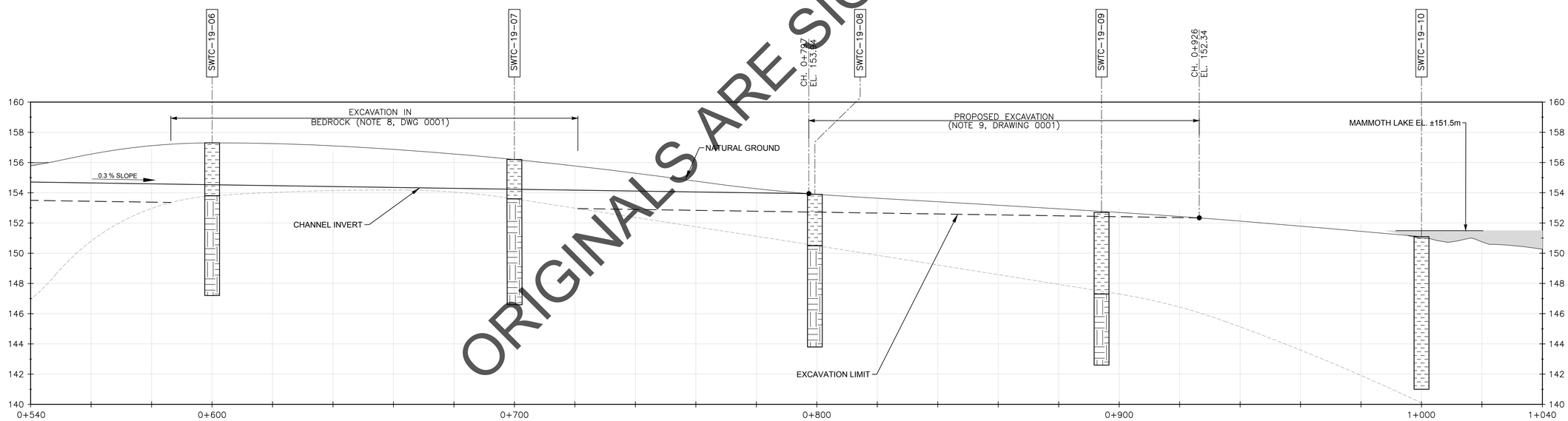

SOUTH WHALE TAIL DIVERSION CHANNEL - PROFILE
SCALE HOR. 1: 750
VER. 1: 150

LEGEND FOR FILL MATERIAL

1 FINE FILTER
2 COARSE FILTER
3 RIP RAP (100-300 mm)

ISSUE No	REV.	DATE (Y/M/D)	PURPOSE OF ISSUE
04	00	2019-07-22	ISSUED FOR CONSTRUCTION
03	PC	2019-07-09	ISSUED FOR AEM COMMENTS
02	PB	2019-06-07	ISSUED FOR AEM COMMENTS
01	PA	2019-06-05	ISSUED FOR INTERNAL REVIEW

ISSUE REGISTER

ISSUE No	REV.	DATE (Y/M/D)	PURPOSE OF ISSUE

ISSUE REGISTER

No	REVISION DESCRIPTION	DATE (Y/M/D)	*	**

INITIALS: * DESIGNED ** APPROVED

REVISION REGISTER

No	REVISION DESCRIPTION	DATE (Y/M/D)	*	**

INITIALS: * DESIGNED ** APPROVED

REVISION REGISTER

No	
02	AMQ BATHY CL1M MD
01	644819-SITE AMARUQ - 2019-02-07_REV2

REFERENCE DRAWINGS

PROFESSIONAL SEAL

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PREPARATION	APPROVAL
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DRAWN: D. LAN	PROJECT ENGINEERING MANAGER: Y. JALBERT, P. ENG.
CHECKED: Y. JALBERT, P. ENG.	CLIENT
DATE: 2019-06-07	
SCALE: AS SHOWN	

CLIENT: AGNICO EAGLE

PROJECT: AGNICO EAGLE – MEADOWBANK DIVISION
WHALE TAIL PIT

TITLE: SOUTH WHALE TAIL DIVERSION CHANNEL SECTIONS

PROJECT No	SUBDIVISION	SUBJECT	SERIAL	REV.
651298	2900	4G|DD	0004	00

A1-HOR-FRAME-EN (SI)

LAST SAVE: 2019/07/22 - 2:53pm
PATH: T:\proj\651298 Detailed Eng WM-Geotech Amaruq\40_DD_DESSINS\DETAILED DESIGN OF SWTDC\651298-2900-4GDD-0004-00.dwg

APPENDIX 2
SWTDC – QA/QC Program

Item	Material	QA Inspector			QC Representatives			Owner's representative – Geotechnical Engineer
		Task	Frequency	Form to be filled	Task	Frequency	Form to be filled	
Survey	All placed materials	Visual assessment for grade limits	Periodically	Daily report	Ensure that the surveyors use the latest information, bench marks and other data and have a good understanding of the Project and meet requirements	Continuously	Daily report	Coordinate and compile information
Gradation limit	Fine Filter	Visual assessment Review QC data and procedure	Periodically or as requested	Daily report	Visual inspection and testing - Sampling - Grain Size distribution	5 / 100m	Daily report	Modify the source or the method of crushing and/or processing. Collect and assess the QC results.
	Coarse Filter	Visual assessment Review QC data and procedure	Periodically or as requested	Daily report	Visual inspection and testing - Sampling - Grain Size distribution	1 / 200m	Daily report	Modify the source or the method of crushing and/or processing. Collect and assess the QC results.
	Riprap	Visual assessment Review QC data and procedure	Periodically	Daily report	Visual inspection	Continuously	Daily report	Modify the source or the method of crushing and/or processing. Adapt the screening if required.
Foundation approval	Free of snow / Ice / Boulder	Visual inspection for foundation approval (on bedrock or ice poor till) and verify the excavation limit with the surveyor	Periodically prior to filling of footprint	Daily report / QA/QC approval form	Visual inspection to detect any unsuitable material and coordination with Contractor to ensure specifications are met. Coordination with the Contractor to remove the above undesirable materials. Verify the excavation limits with the surveyor.	Continuously	Daily report / QA/QC approval form	Collect, review and compile completed QC/QA forms.
Placement and compaction of materials	All materials	Visual inspection – procedures meet the specification Material placement approval	Periodically	Daily report / QA / QC approval form	Visual inspection of each lift – ensure specifications are met / Manage the procedures with the Contractor, counting the number of passes for compaction	Periodically	Daily report / QA / QC approval form	Collect, review and compile completed QC/QA original forms

APPENDIX 3
Approval Form and Daily Report Form

SNC·LAVALIN

SITE REPORT
(Detailed)

Document number

Visit date	Time (Start/End)	Project No.	Prepared by

Project	Client
	Agnico Eagle

Consultant	Contractor
SNC-Lavalin	

Weather : ☐Sunny ☐Cloudy ☐Rain ☐Storm ☐Snow ☐Glaze

Wind : ☐None ☐Light ☐Moderate ☐Strong, gusts

Temperature : _____ °C

Comments : _____

Appendix : ☐Yes ☐No Pictures ☐Yes ☐No Inspection report or other : _____

ACTIVITIES PERFORMED BY SNC-LAVALIN (indicate if test forms were used)

SITE GUIDELINES (guidelines, memos, modification proposals, etc.)

No	Subject	Given to

SPECIFIC ELEMENTS VERIFIED

Elements	Location	Scope and comments

SAFE AND SAFETY REMARKS

Issued by :

Signature | Date

Verified by :

Signature | Date

SKETCH

SNC·LAVALIN

Sustaining capital
Mining & Metallurgy
1140 Maisonneuve boul. West
Montreal (Québec)
Canada H3A 1M8

Telephone: (514) 393-8000
Fax: (514) 390-2765
www.snclavalin.com

APPROVAL FORM

PROJECT : _____

PROJECT #: _____ **DATE:** _____

DOCUMENT #: _____ **TIME:** _____

(YYYYMMDD-DS/NS-01) DS/NS = Day/Night shift (24 hour clock)

APPROVAL FOR :

- ❒ Foundation approval (footprint)
- ❒ Foundation approval (key trench)
- ❒ Fill placement: _____
- ❒ CB cutoff wall approval
- ❒ Other: _____

LOCATION		**PREVIOUS APPROVALS**	
Station		**Station:**	
Inclination:		**Details:**	
ELEVATION :	❒ varies _____ m		

COMPLIANCE WITH TECHNICAL SPECIFICATIONS:

(Add additional items if needed)

	VERIFICATIONS DONE BY:				
	QA		**QC**		**N/A**
	Y	**N**	**Y**	**N**	
1. Lines and grades					
2. Free of ice/snow/water					
3. Cleaning of trench and/or pile bottom					
4. Gradation (visual)					
5. Placement (lift thickness, segregation, etc.)					
6. Compaction					
7. Foundation on bedrock					
8. Key-in depth into bedrock					
9. Water quality					
10. CB slurry viscosity and density					
11. Elevation of CB Piles					
12. Primary piles strength (Minimum of 50 kPa UCS)					
13. Keying between primary and secondary					
14. Cracks on top of cutoff wall					

	QA		QC		N/A
	Y	N	Y	N	
15. CB mix/slurry tested (UCS, permeability, and pinhole tests)					
16. As built survey completed					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					

DETAILS (Refer to list above for item #)		**APPROVED BY:** QA		QC	
ITEM		**Y**	**N**	**Y**	**N**

APPROVED BY:	**NAME**	**SIGNATURE**	**DATE**
QA REPRESENTATIVE			
QC REPRESENTATIVE			
OWNER'S REPRESENTATIVE			

APPENDIX 4
2019 Field Investigation

AGNICO EAGLE

MEADOWBANK GOLD MINE

WHALE TAIL PROJECT

2019 SOUTH WAIL TAIL CHANEL

GEOTECHNICAL INVESTIGATION REPORT

MAY 2019

VERSION 0

TABLE OF CONTENTS

1. SUMMARY

Work Period: 2017-09-24 – Field recognition

2019-03-31 – Stake out

2019-04-04 – Drilling campaign

Field work performed by: Jerome Collard, AEM Project Technician

Drill: Tamrock #9932

4 inches bit with 12 feet rods

2. DESCRIPTION OF THE GEOTECHNICAL CAMPAIGN

A geotechnical campaign was performed along the proposed South Whale Tail Chanel (SWTC) for the Whale Tail Project. The objective of this field campaign was to characterize the foundation of the SWTC for building purposes. The SWTC will allow the water of the South Basin of Whale Tail Lake to flow into Mammoth Lake.

The drilling campaign was performed with a Tamrock drill using a bit of four (4) inches diameter and rods of twelve (12) feet long. The work was supervised by an Agnico Eagle Mines technician who noted the visual observations and took pictures, which are presented in Appendix 5.

The drill holes stake out was made on the 31th of March 2019. The ten (10) drill holes originally planned (SWTC-19-1 to SWTC-19-10) were all completed during the drilling campaign from 11:25 AM to 15:10 PM on the 4th of April 2019. The drill holes location is detailed in Appendix 1.

Prior to the geotechnical campaign, field recognition was done on the 24th of September 2017 to assess the conditions of the ground in place. Pictures of that event are presented in Appendix 2.

The depth of the ten (10) drill holes was 10.1 meters. For most of them, the good bedrock was reached at depth ranging between 4.4 and 8.8 meters and the poor bedrock was reached at depth ranging from 2.6 and 7.6 meters. However, the bedrock was not reached in the drill holes SWTC-19-05 and SWTC-19-10.

Regarding the water conditions, the drill holes SWTC-19-04, SWTC-19-05 and SWTC-19-10, contained a layer of ice at the surface, respectively of 1.2, 1.3 and 1.1 meters of thickness. In these same drill holes, unfrozen water was observed from a depth between 3.7 and 3.8 meters. An ice layer was also found in the drill hole SWTC-19-03 between 7.4 and 7.6 meters deep. Moreover, frozen soil was found between 1.2 and 3.7 meters in the drill hole SWTC-19-04, between 1.3 and 3.7 meters in the drill hole SWTC-19-05 and between 1.1 and 3.6 meters in the drill hole SWTC-19-10.

The stratigraphy was similar in each drill hole. Boulders were mostly found at the surface with a layer thickness of approximately 1.3 meters. In the drill holes SWTC-19-01 to SWTC-19-04, brown sand and gravel was found at different depth and with a thickness ranging between 2.8 and 7.3 meters. In the drill holes SWTC-19-05 to SWTC-19-10 (at the exception of SWTC-19-07), a fine grey silty sand was found at

an average depth of 2.5 meters with a thickness ranging between 2.3 and 7.5 meters. The Appendix 3 presents the more detailed drill holes logs.

A visual summary of the results obtained from this geotechnical campaign is present in Appendix 4.

APPENDIX 1 – DRILL HOLES LOCATION

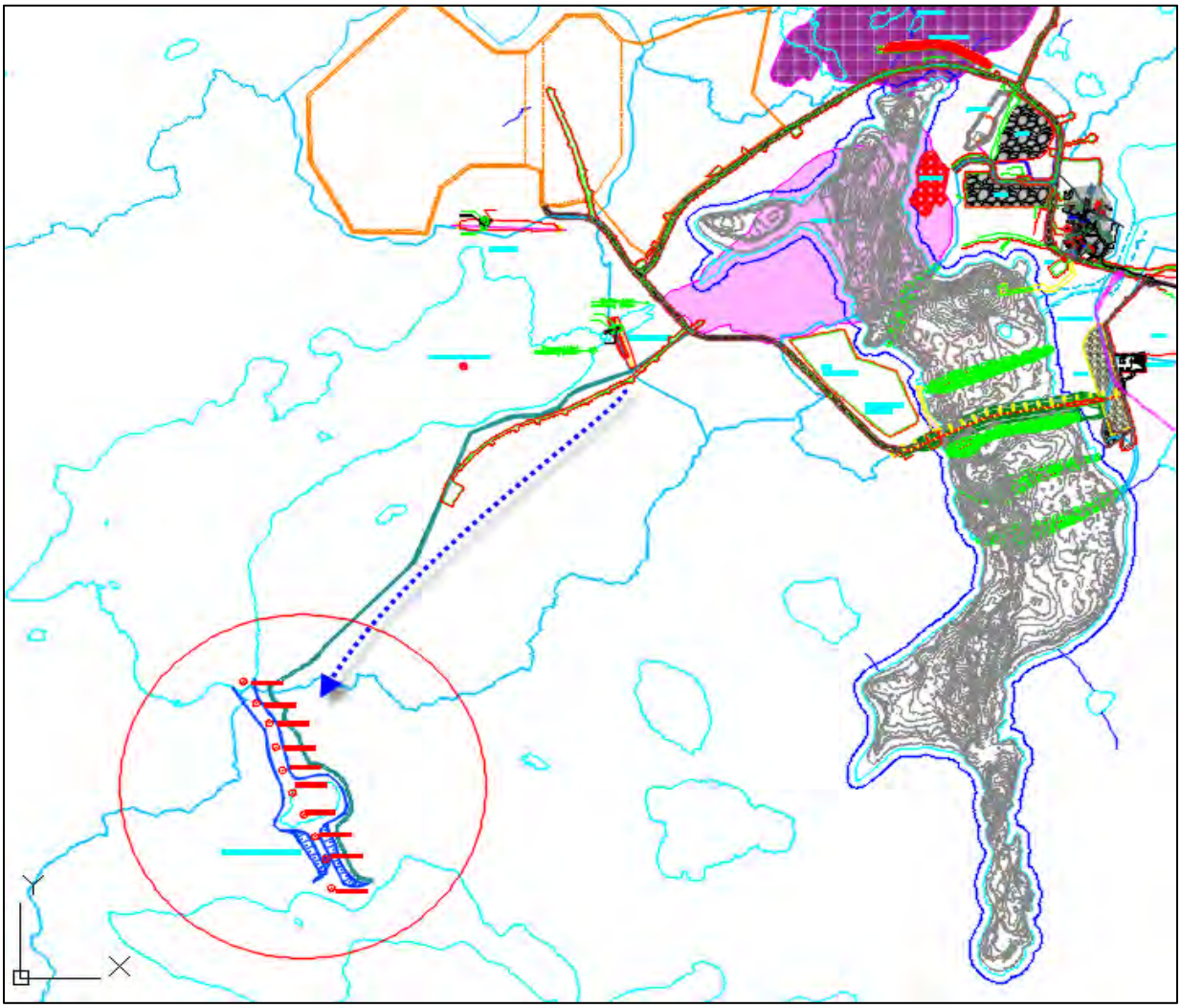

Figure 1: South Whale Tail Channel Location

Table 1: Drill Hole coordinates

Drill Hole ID	Easting	Northing	Elevation
SWTC-19-01	604828	7252811	156.0
SWTC-19-02	604806	7252929	156.9
SWTC-19-03	604765	7253020	156.4
SWTC-19-04	604722	7253111	156.3
SWTC-19-05	604679	7253201	156.3
SWTC-19-06	604640	7253293	157.3
SWTC-19-07	604614	7253389	156.2
SWTC-19-08	604588	7253485	153.9
SWTC-19-09	604539	7253567	152.7
SWTC-19-10	604488	7253658	152.2

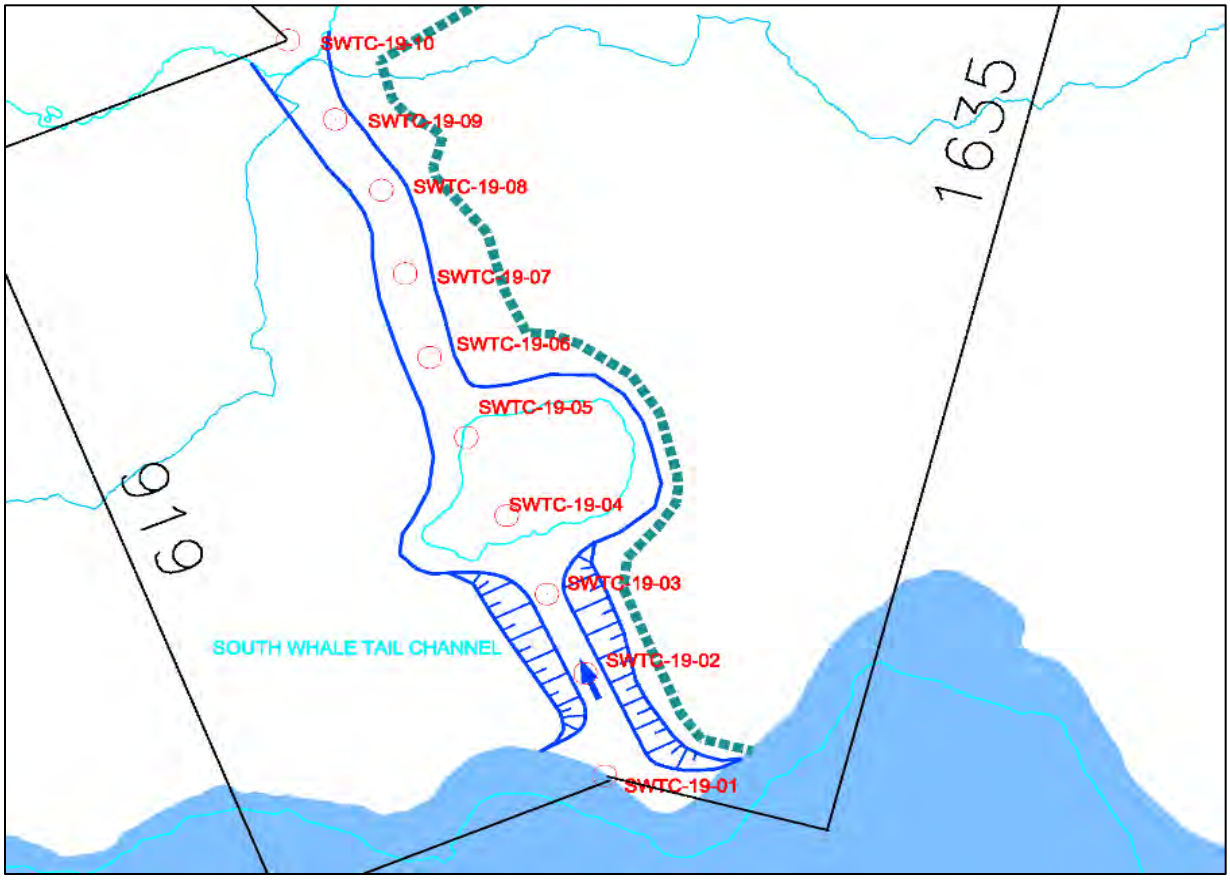

Figure 2: Location of the drill holes SWTC-19-01 to SWTC-19-10

APPENDIX 2 – FIELD RECOGNITION PICTURES

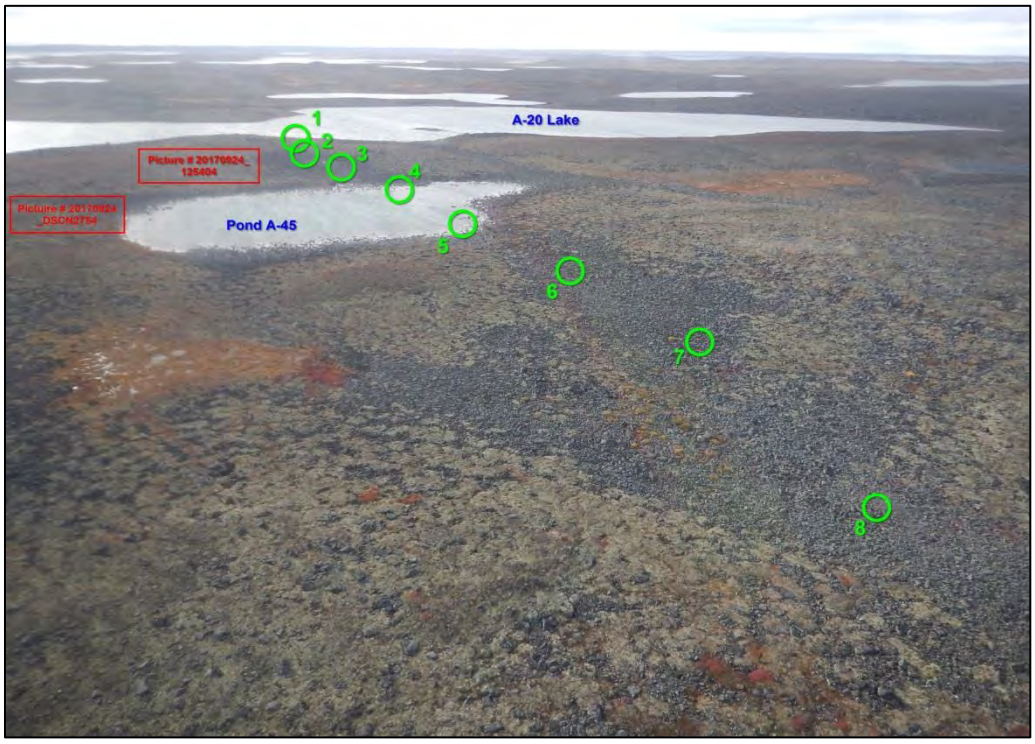

Figure 3: 2017 Aerial Overview, looking South

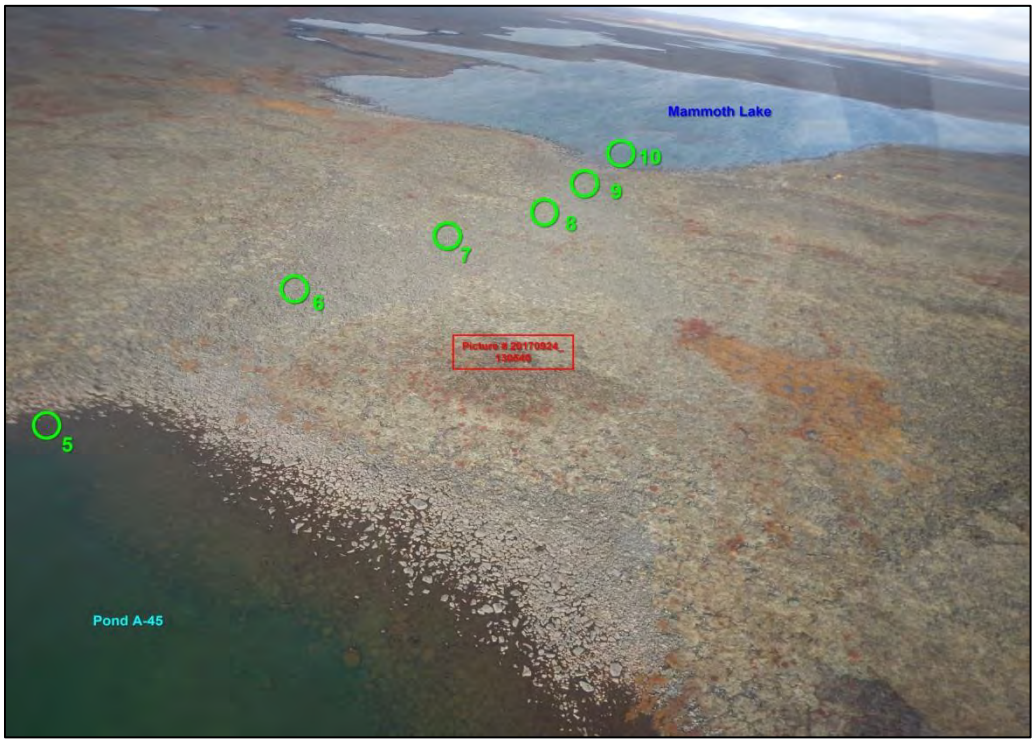

Figure 4: 2017 Aerial Overview, looking North

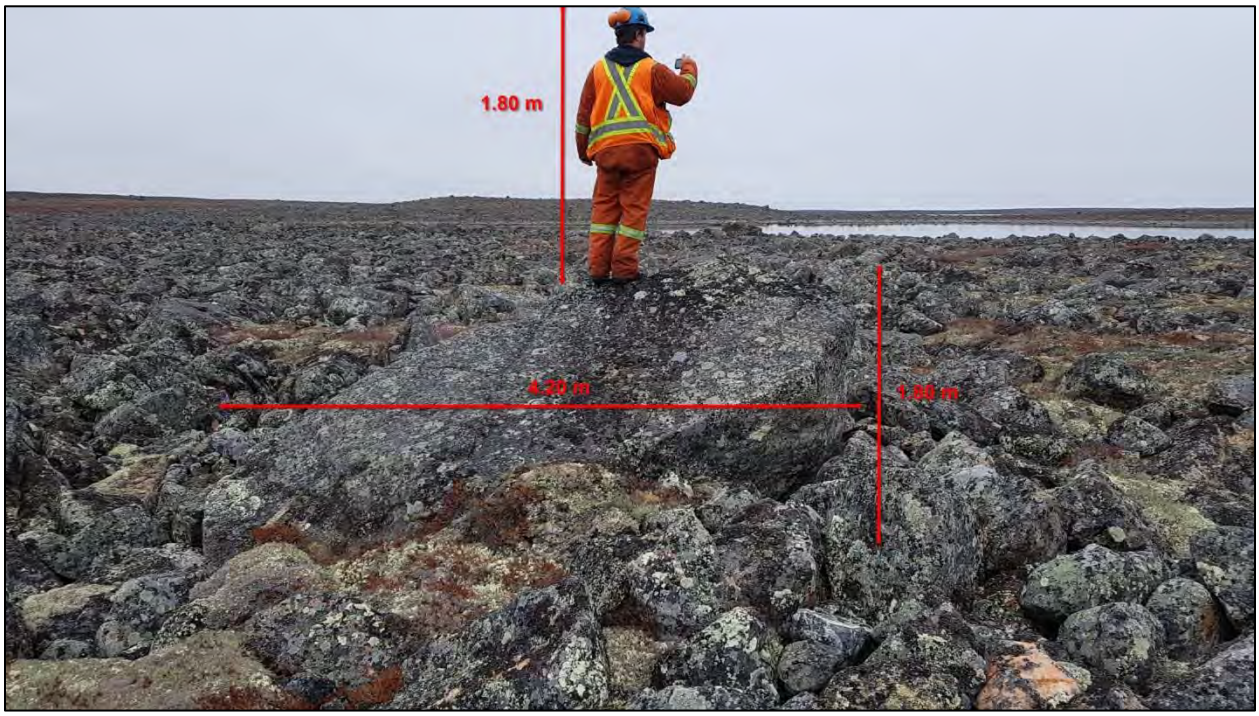

Figure 5: Ground condition with approximate boulder dimension

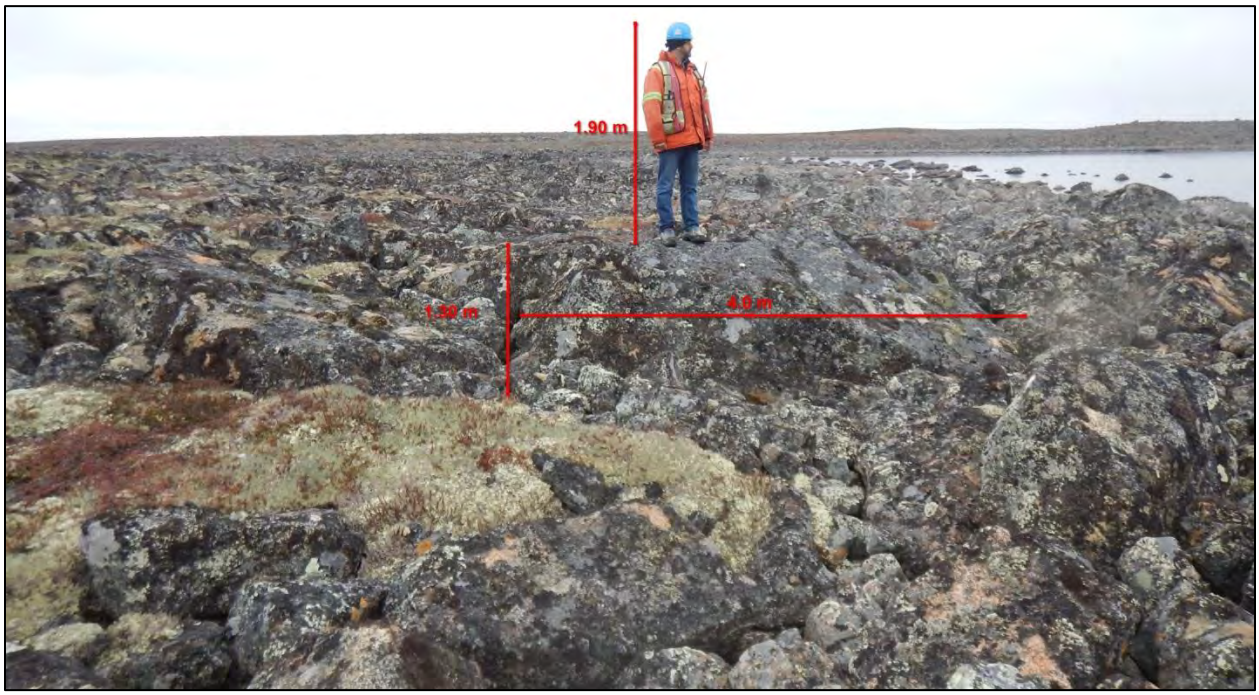

Figure 6: Ground condition with approximate boulder dimension

APPENDIX 2 – DRILL HOLES LOGS

Table 2: SWTC-19-01 Description

Drill Hole ID		Easting	Northing	Elevation	Starting time	Ending time
SWTC-19-01		604828	7252811	156.0	3:10 PM	3:25 PM
Depth range (m)		**Thickness (m)**	**Description**			
0.0	1.1	1.1	Boulders			
1.1	5.2	4.1	Brown sand and gravel			
5.2	10.1	4.9	Good (hard) bedrock			
Final Depth	10.1	-	End of drilling at desired depth, bedrock reached			
Water level	-					

Table 3: SWTC-19-02 Description

Drill Hole ID		Easting	Northing	Elevation	Starting time	Ending time
SWTC-19-02		604806	7252929	156.9	2:45 PM	3:10 PM
Depth range (m)		**Thickness (m)**	**Description**			
0.0	0.7	0.7	Boulders			
0.7	3.5	2.8	Brown sand and gravel			
3.5	5.8	2.3	Poor bedrock or boulders (fine cutting, no chips)			
5.8	6.0	0.2	Brown sand			
6.0	10.1	4.1	Good (hard) bedrock			
Final Depth	10.1	-	End of drilling at desired depth, bedrock reached			
Water level	-					

Table 4: SWTC-19-03 Description

Drill Hole ID		Easting	Northing	Elevation	Starting time	Ending time
SWTC-19-03		604765	7253020	156.4	2:20 PM	2:45 PM
Depth range (m)		**Thickness (m)**	**Description**			
0.0	1.0	1.0	Boulders			
1.0	7.4	6.4	Brown sand and gravel			
7.4	7.6	0.2	Ice layer			
7.6	8.8	1.2	Poor bedrock or cobbles			
8.8	10.1	1.3	Good (hard) bedrock			
Final Depth	10.1	-	End of drilling at desired depth, bedrock reached			
Water level	-					

Table 5: SWTC-19-04 Description

Drill Hole ID		Easting	Northing	Elevation	Starting time	Ending time
SWTC-19-04		604722	7253111	156.3	2:00 PM	2:20 PM
Depth range (m)		**Thickness (m)**	**Description**			
0.0	1.2	1.2	Ice			
1.2	3.7	2.5	Frozen fine grey sand (lake mud)			
3.7	7.7	4.0	Brown sand and gravel			
7.7	10.1	2.4	Good (hard) bedrock			
Final Depth	10.1	-	End of drilling at desired depth, bedrock reached			
Water level	3.7					
Comments	A-45 Lake shore					

Table 6: SWTC-19-05 Description

Drill Hole ID		Easting	Northing	Elevation	Starting time	Ending time
SWTC-19-05		604679	7253201	156.3	1:35 PM	2:00 PM
Depth range (m)		**Thickness (m)**	**Description**			
0.0	1.3	1.3	Ice			
1.3	3.7	2.4	Frozen fine grey material			
3.7	10.1	6.4	Fine grey silty sand (muddy cutting)			
Final Depth	10.1	-	End of drilling at desired depth, no bedrock reached			
Water level	3.7					
Comments	A-45 Lake shore					

Table 7: SWTC-19-06 Description

Drill Hole ID		Easting	Northing	Elevation	Starting time	Ending time
SWTC-19-06		604640	7253293	157.3	1:05 PM	1:35 PM
Depth range (m)		**Thickness (m)**	**Description**			
0.0	2.7	2.7	Boulders			
2.7	3.5	0.8	Fine grey sand (till)			
3.5	7.4	3.9	Poor bedrock			
7.4	10.1	2.7	Good (hard) bedrock			
Final Depth	10.1	-	End of drilling at desired depth, bedrock reached			
Water level	-					

Table 8: SWTC-19-07 Description

Drill Hole ID		Easting	Northing	Elevation	Starting time	Ending time
SWTC-19-07		604614	7253389	156.2	12:45 PM	1:05 PM
Depth range (m)		**Thickness (m)**	**Description**			
0.0	2.6	2.6	Boulders and brown sand			
2.6	5.3	2.7	Poor bedrock			
5.3	10.1	4.8	Good (hard) bedrock			
Final Depth	10.1	-	End of drilling at desired depth, bedrock reached			
Water level	-					

Table 9: SWTC-19-08 Description

Drill Hole ID		Easting	Northing	Elevation	Starting time	Ending time
SWTC-19-08		604588	7253485	153.9	12:20 PM	12:45 PM
Depth range (m)		**Thickness (m)**	**Description**			
0.0	1.2	1.2	Boulders			
1.2	3.4	2.2	Fine Grey sand (till)			
3.4	4.4	1.0	Poor bedrock			
4.4	10.1	5.7	Good (hard) bedrock			
Final Depth	10.1	-	End of drilling at desired depth, bedrock reached			
Water level	-					

Table 10: SWTC-19-09 Description

Drill Hole ID		Easting	Northing	Elevation	Starting time	Ending time
SWTC-19-09		604539	7253567	152.7	12:00 PM	12:20 PM
Depth range (m)		**Thickness (m)**	**Description**			
0.0	1.3	1.3	Boulders			
1.3	2.3	1.0	Fine grey sand (till)			
2.3	5.4	3.1	Brown corse sand			
5.4	6.8	1.4	Poor bedrock			
6.8	10.1	3.3	Good (hard) bedrock			
Final Depth	10.1	-	End of drilling at desired depth, bedrock reached			
Water level	-					

Table 11: SWTC-19-10 Description

Drill Hole ID		Easting	Northing	Elevation	Starting time	Ending time
SWTC-19-10		604488	7253658	152.2	11:25 AM	12:00 PM
Depth range (m)		**Thickness (m)**	**Description**			
0.0	1.1	1.1	Ice			
1.1	3.6	2.5	Frozen grey mud			
3.6	3.8	0.2	Boulders			
3.8	7.5	3.7	Fine grey silty sand (muddy cutting)			
7.5	9.8	2.3	Brown sand and gravel			
9.8	10.1	0.3	Harder material (maybe cobbles or poor bedrock)			
Final Depth	10.1	-	End of drilling at desired depth, no bedrock reached			
Water level	3.8					
Comments	Mammoth Lake shore					

APPENDIX 4 – STRATIGRAPHY SUMMARY

Table 12: Summary of the stratigraphy of drill hole SWTC-19-01 to SWTC-19-10

Description	SWTC-19 Drill Hole numbers									
	01	02	03	04	05	06	07	08	09	10
Ice	-	-	7.4 – 7.6	0.0 – 1.2	0.0 – 1.3	-	-	-	-	0.0 – 1.1
Frozen grey material	-	-	-	1.2 – 3.7	1.3 – 3.7	-	-	-	-	1.1 – 3.6
Boulders	0.0 – 1.1	0.0 – 0.7	0.0 – 1.0	-	-	0.0 – 2.7	0.0 – 2.6	0.0 – 1.2	0.0 – 1.3	3.6 – 3.8
Fine grey silty sand	-	-	-	-	3.7 – 10.1	2.7 – 3.5	-	1.2 – 3.4	1.3 – 2.3	3.8 – 7.5
Brown sand and gravel	1.1 – 5.2	0.7 – 3.5 5.8 – 6.0	1.0 – 7.4	3.7 – 7.7	-	-	-	-	2.3 – 5.4	7.5 – 9.8
Poor bedrock	-	3.5 – 5.8	7.6 – 8.8	-	-	3.5 – 7.4	2.6 – 5.3	3.4 – 4.4	5.4 – 6.8	9.8 – 10.1
Good bedrock	5.2 – 10.1	6.0 – 10.1	8.8 – 10.1	7.7 – 10.1	-	7.4 – 10.1	5.3 – 10.1	4.4 – 10.1	6.8 – 10.1	-
End of drill hole	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1

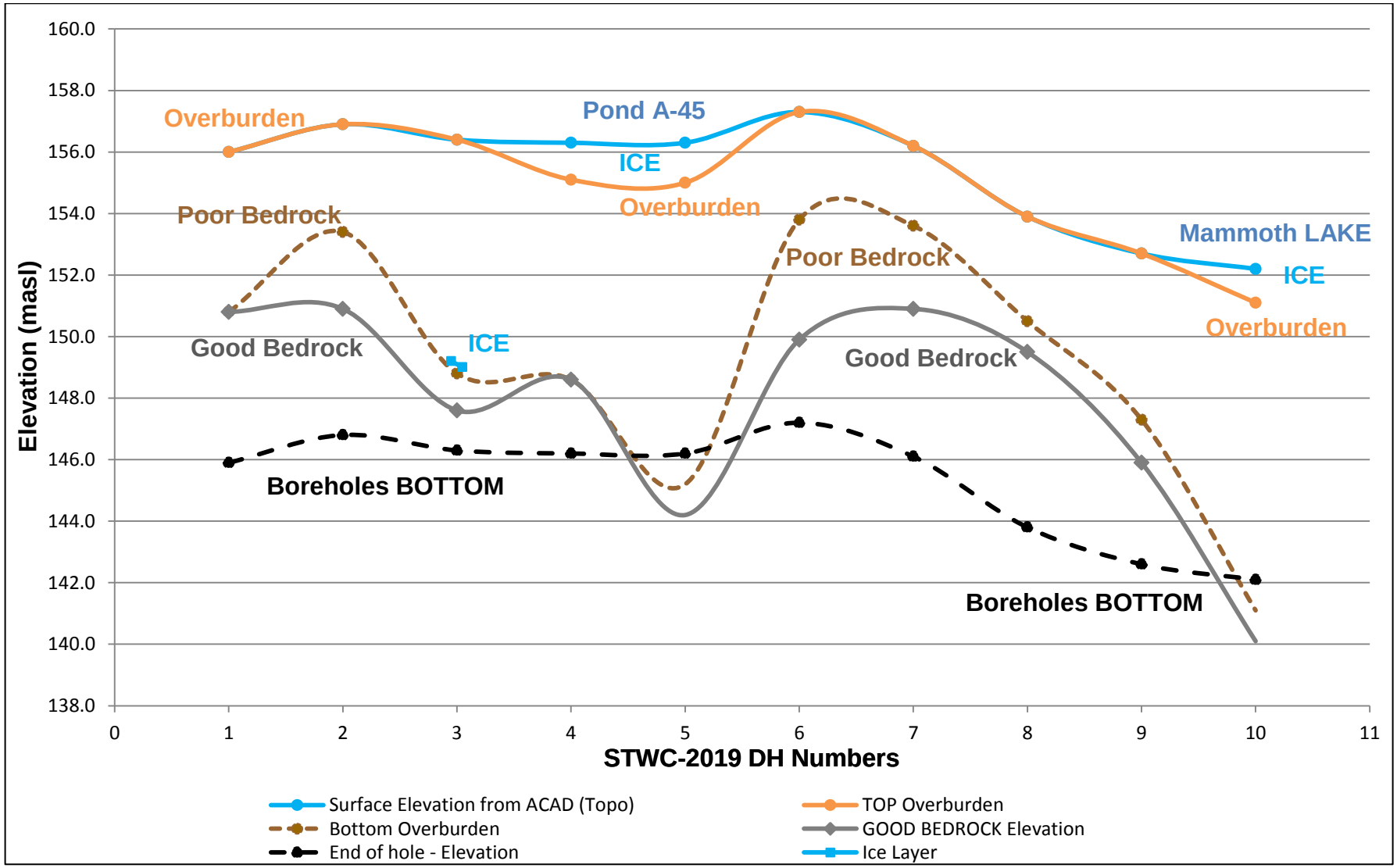

Figure 7: Visual representation of the stratigraphy of drill holes SWTC-19-01 to SWTC-10

APPENDIX 5 – PHOTOGRAPHIC REPORT

Figure 8: Overview of the site, looking North-East

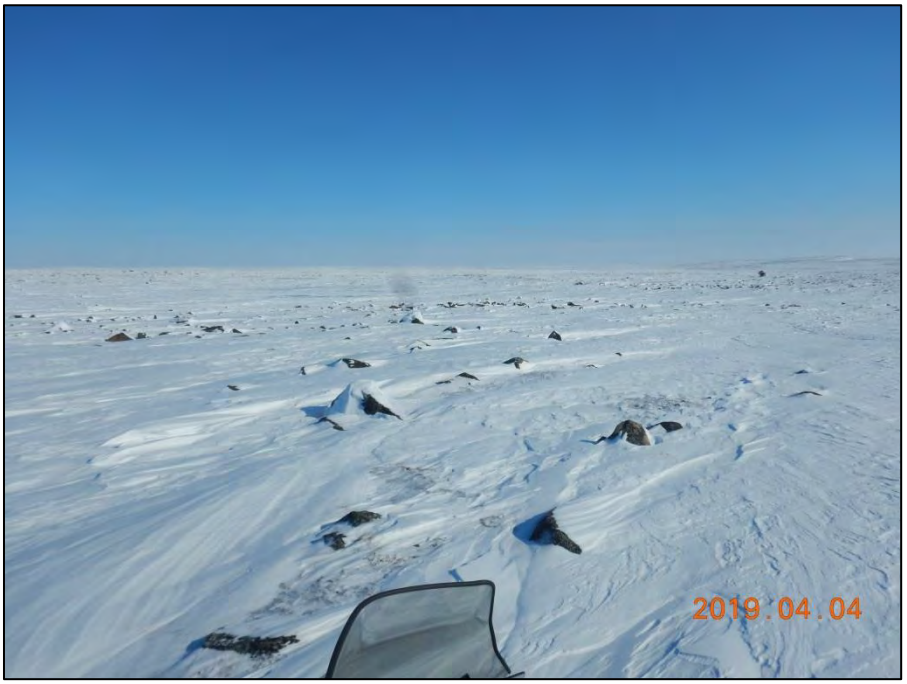

Figure 9: Overview of the site, looking South-East

Figure 10: Location of SWTC-19-01

Figure 11: Overburden drilling in SWTC-19-01

Figure 12: Location of SWTC-19-02

Figure 13: Overburden drilling in SWTC-19-02

Figure 14: Location of SWTC-19-03

Figure 15: Bedrock drilling in SWTC-19-03

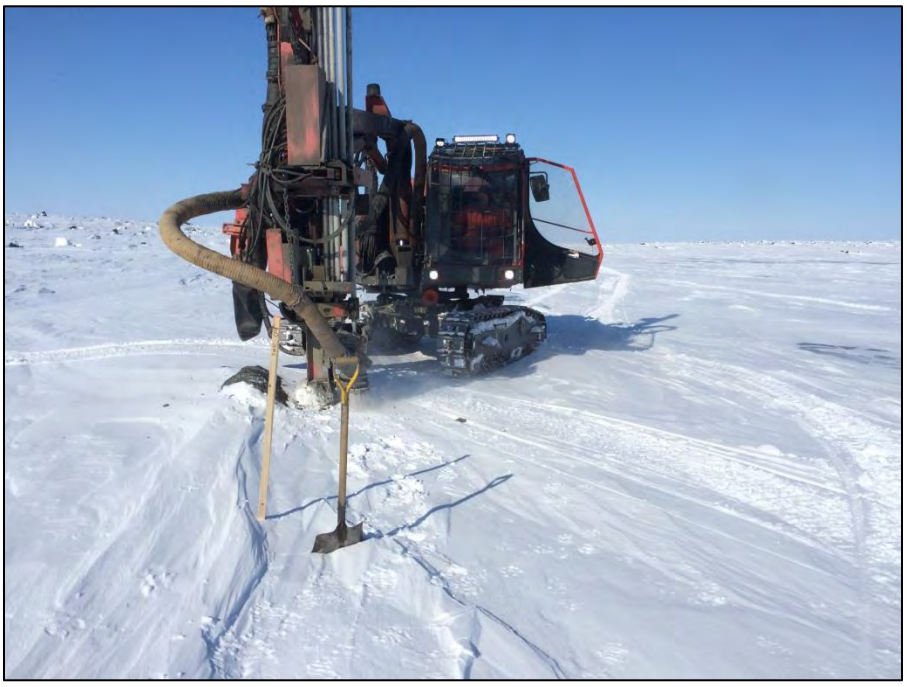

Figure 16: Location of SWTC-19-04

Figure 17: Presence of water in SWTC-19-04

Figure 18: Location of SWTC-19-05

Figure 19: Presence of water in SWTC-19-05

Figure 20: Location of SWTC-19-06

Figure 21: Poor bedrock drilling in SWTC-19-06

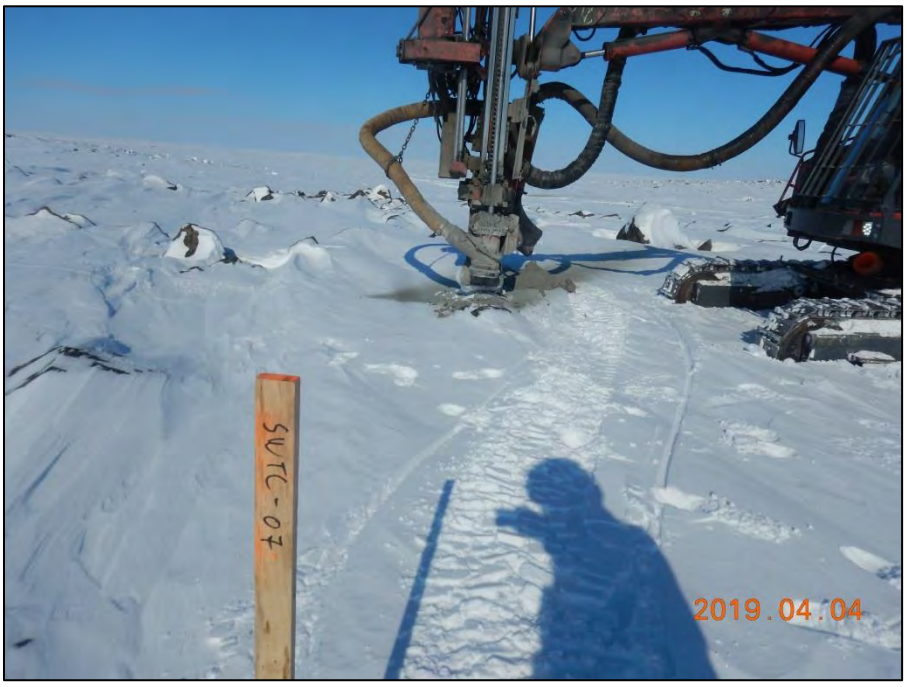

Figure 22: Location of SWTC-19-07

Figure 23: Bedrock drilling in SWTC-19-07

Figure 24: Location of SWTC-19-08

Figure 25: Overburden drilling in SWTC-19-08

Figure 26: Location of SWTC-19-09

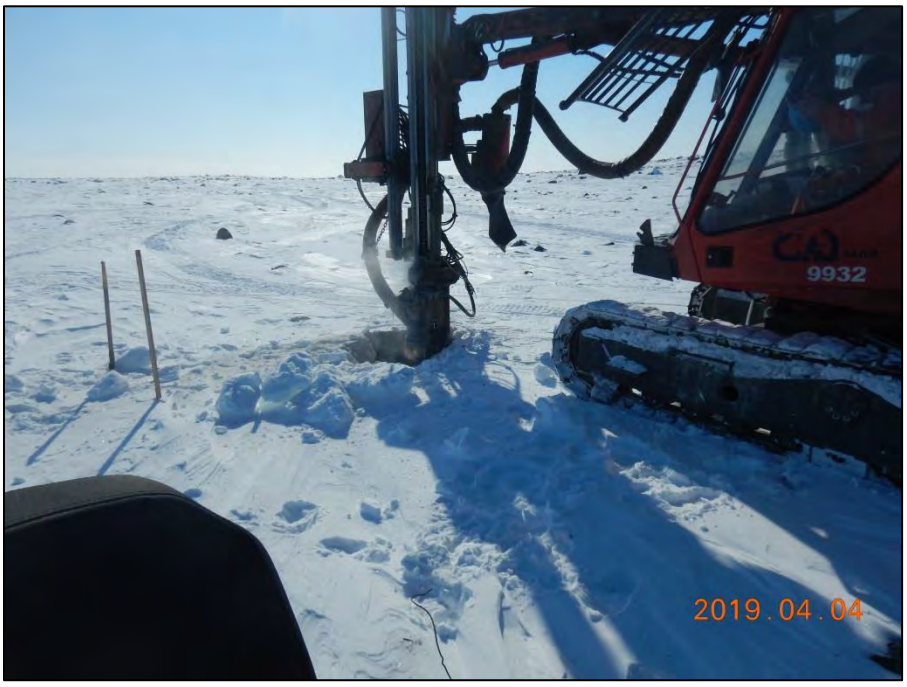

Figure 27: Location of SWTC-19-10

Figure 28: Overburden drilling in SWTC-19-10

Figure 29: Presence of water in SWTC-19-10

Appendix C

2019 Field Investigation

AGNICO EAGLE

MEADOWBANK GOLD MINE

WHALE TAIL PROJECT

2018 SOUTH WAIL TAIL CHANEL

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The depth of the ten (10) drill holes was 10.1 meters. For most of them, the good bedrock was reached at depth ranging between 4.4 and 8.8 meters and the poor bedrock was reached at depth ranging from 2.6 and 7.6 meters. However, the bedrock was not reached in the drill holes SWTC-19-05 and SWTC-19-10.

Regarding the water conditions, the drill holes SWTC-19-04, SWTC-19-05 and SWTC-19-10, contained a layer of ice at the surface, respectively of 1.2, 1.3 and 1.1 meters of thickness. In these same drill holes, unfrozen water was observed from a depth between 3.7 and 3.8 meters. An ice layer was also found in the drill hole SWTC-19-03 between 7.4 and 7.6 meters deep. Moreover, frozen soil was found between 1.2 and 3.7 meters in the drill hole SWTC-19-04, between 1.3 and 3.7 meters in the drill hole SWTC-19-05 and between 1.1 and 3.6 meters in the drill hole SWTC-19-10.

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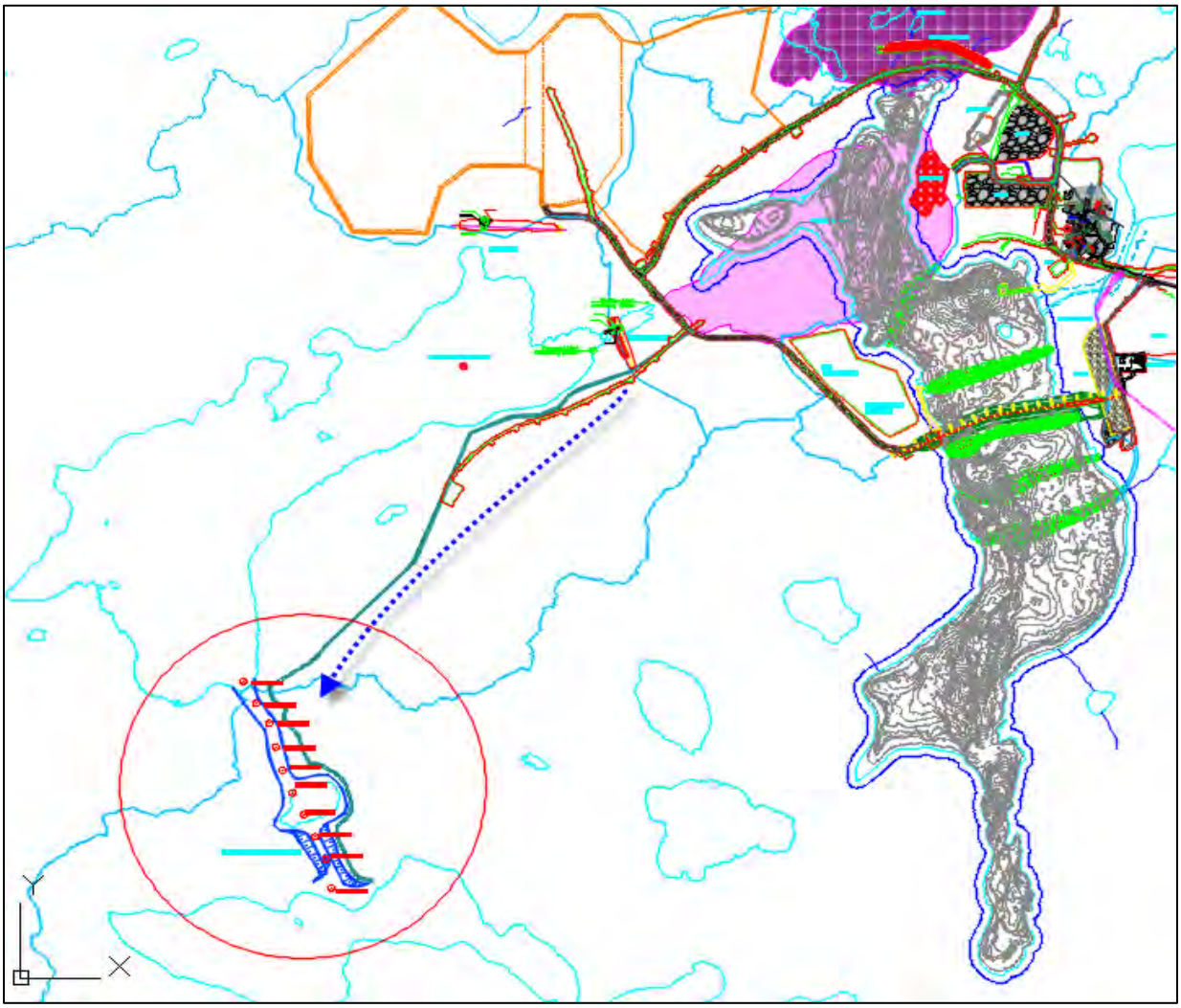

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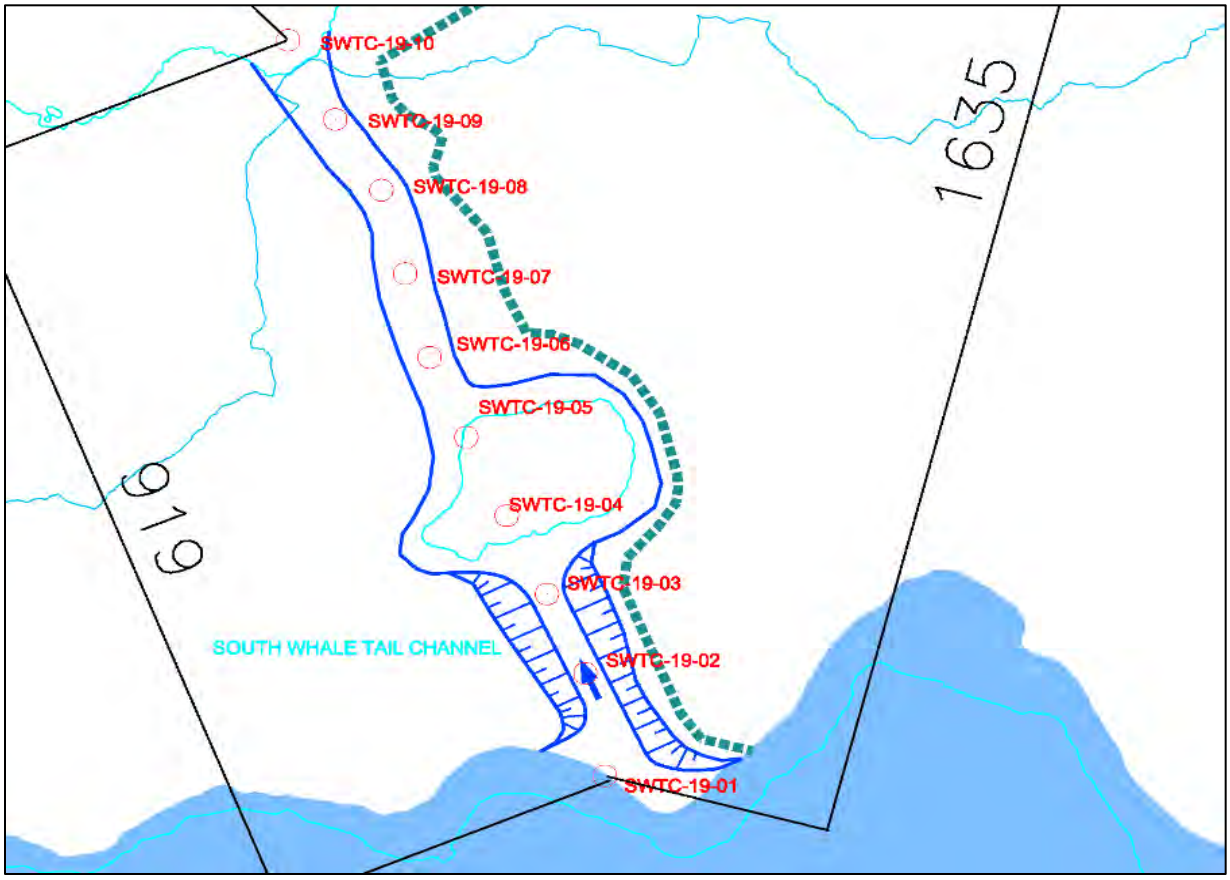

Figure 2: Location of the drill holes SWTC-19-01 to SWTC-19-10

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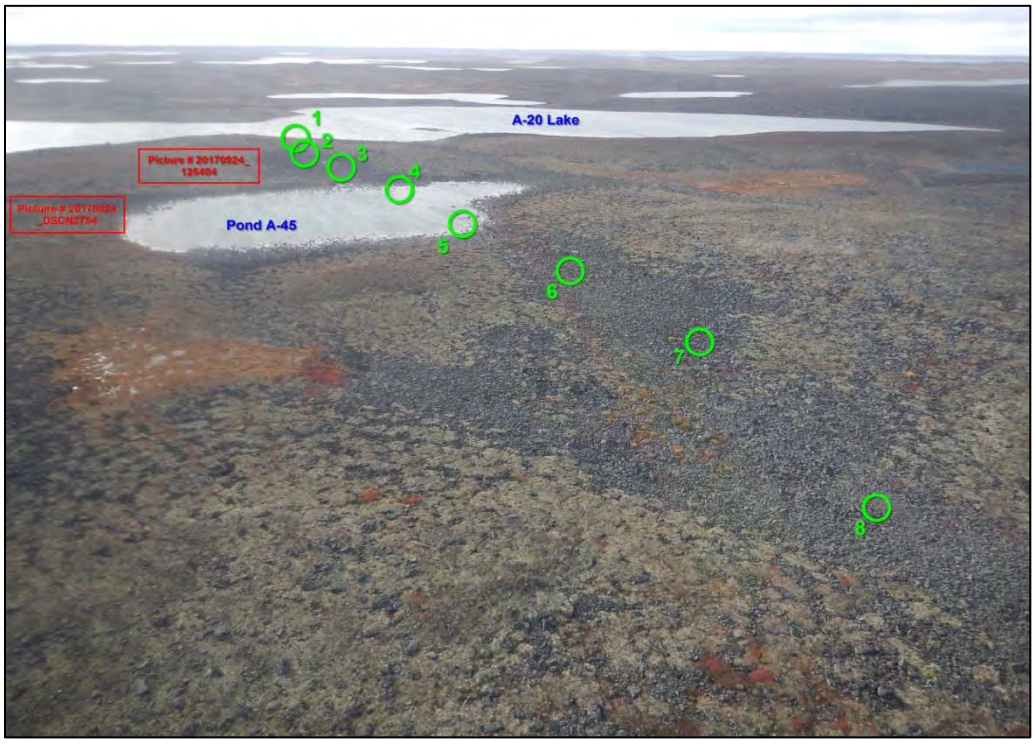

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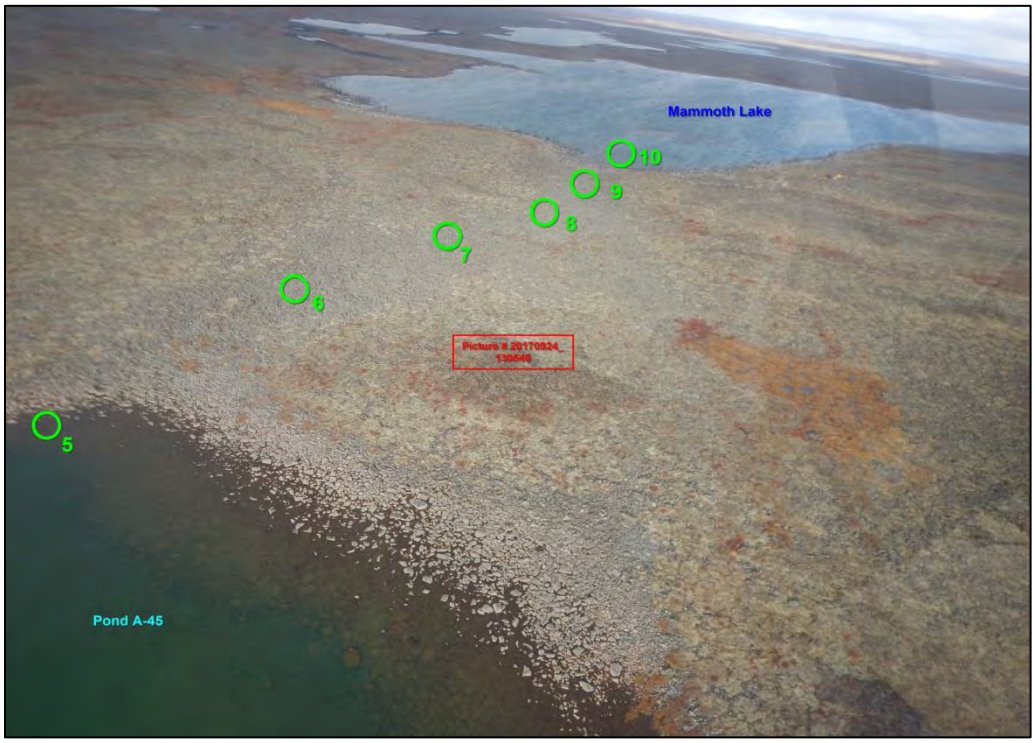
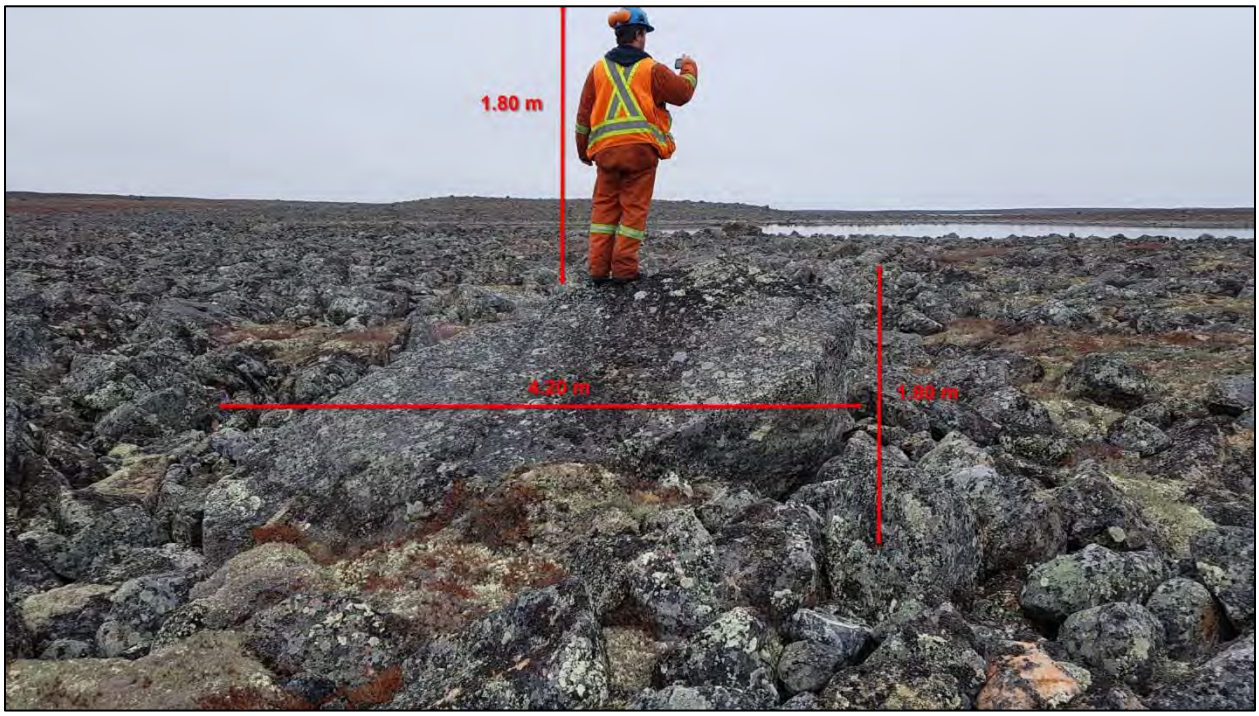


Figure 4: 2017 Aerial Overview, looking North



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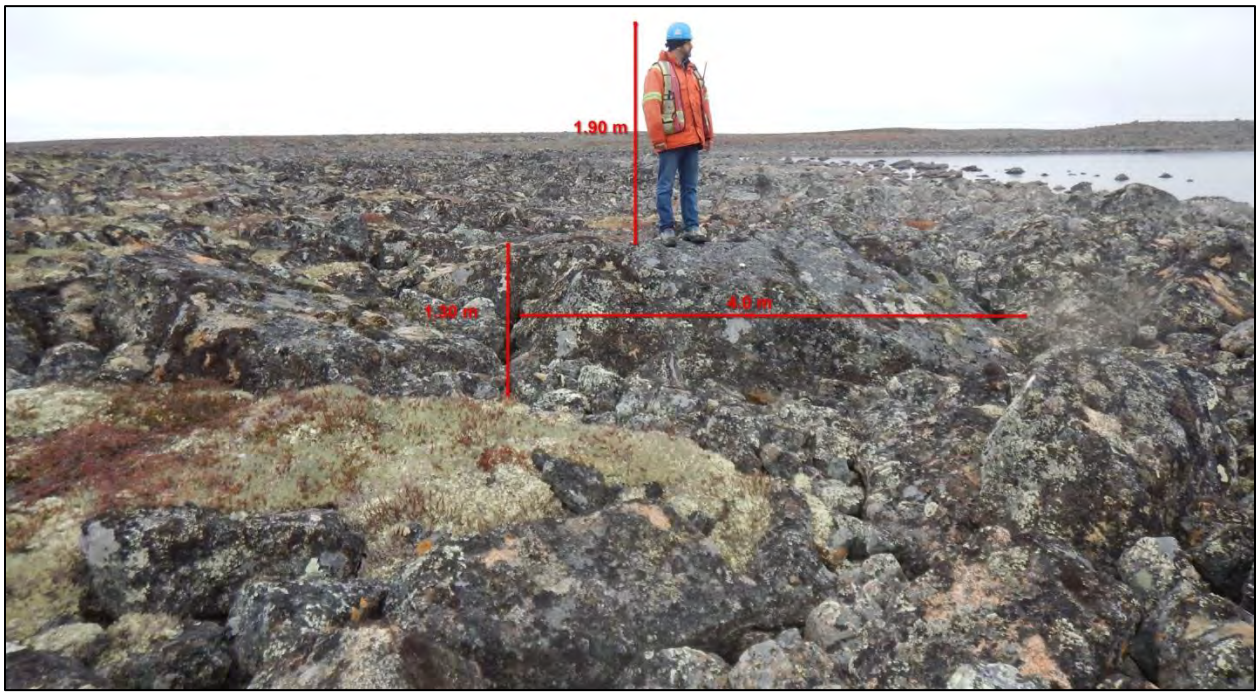

Figure 6: Ground condition with approximate boulder dimension

APPENDIX 2 – DRILL HOLES LOGS

Table 2: SWTC-19-01 Description

Drill Hole ID		Easting	Northing	Elevation	Starting time	Ending time
SWTC-19-01		604828	7252811	156.0	3:10 PM	3:25 PM
Depth range (m)		**Thickness (m)**	**Description**			
0.0	1.1	1.1	Boulders			
1.1	5.2	4.1	Brown sand and gravel			
5.2	10.1	4.9	Good (hard) bedrock			
Final Depth	10.1	-	End of drilling at desired depth, bedrock reached			
Water level	-					

Table 3: SWTC-19-02 Description

Drill Hole ID		Easting	Northing	Elevation	Starting time	Ending time
SWTC-19-02		604806	7252929	156.9	2:45 PM	3:10 PM
Depth range (m)		**Thickness (m)**	**Description**			
0.0	0.7	0.7	Boulders			
0.7	3.5	2.8	Brown sand and gravel			
3.5	5.8	2.3	Poor bedrock or boulders (fine cutting, no chips)			
5.8	6.0	0.2	Brown sand			
6.0	10.1	4.1	Good (hard) bedrock			
Final Depth	10.1	-	End of drilling at desired depth, bedrock reached			
Water level	-					

Table 4: SWTC-19-03 Description

Drill Hole ID		Easting	Northing	Elevation	Starting time	Ending time
SWTC-19-03		604765	7253020	156.4	2:20 PM	2:45 PM
Depth range (m)		**Thickness (m)**	**Description**			
0.0	1.0	1.0	Boulders			
1.0	7.4	6.4	Brown sand and gravel			
7.4	7.6	0.2	Ice layer			
7.6	8.8	1.2	Poor bedrock or cobbles			
8.8	10.1	1.3	Good (hard) bedrock			
Final Depth	10.1	-	End of drilling at desired depth, bedrock reached			
Water level	-					

Table 5: SWTC-19-04 Description

Drill Hole ID		Easting	Northing	Elevation	Starting time	Ending time
SWTC-19-04		604722	7253111	156.3	2:00 PM	2:20 PM
Depth range (m)		**Thickness (m)**	**Description**			
0.0	1.2	1.2	Ice			
1.2	3.7	2.5	Frozen fine grey sand (lake mud)			
3.7	7.7	4.0	Brown sand and gravel			
7.7	10.1	2.4	Good (hard) bedrock			
Final Depth	10.1	-	End of drilling at desired depth, bedrock reached			
Water level	3.7					
Comments	A-45 Lake shore					

Table 6: SWTC-19-05 Description

Drill Hole ID		Easting	Northing	Elevation	Starting time	Ending time
SWTC-19-05		604679	7253201	156.3	1:35 PM	2:00 PM
Depth range (m)		**Thickness (m)**	**Description**			
0.0	1.3	1.3	Ice			
1.3	3.7	2.4	Frozen fine grey material			
3.7	10.1	6.4	Fine grey silty sand (muddy cutting)			
Final Depth	10.1	-	End of drilling at desired depth, no bedrock reached			
Water level	3.7					
Comments	A-45 Lake shore					

Table 7: SWTC-19-06 Description

Drill Hole ID		Easting	Northing	Elevation	Starting time	Ending time
SWTC-19-06		604640	7253293	157.3	1:05 PM	1:35 PM
Depth range (m)		**Thickness (m)**	**Description**			
0.0	2.7	2.7	Boulders			
2.7	3.5	0.8	Fine grey sand (till)			
3.5	7.4	3.9	Poor bedrock			
7.4	10.1	2.7	Good (hard) bedrock			
Final Depth	10.1	-	End of drilling at desired depth, bedrock reached			
Water level	-					

Table 8: SWTC-19-07 Description

Drill Hole ID		Easting	Northing	Elevation	Starting time	Ending time
SWTC-19-07		604614	7253389	156.2	12:45 PM	1:05 PM
Depth range (m)		**Thickness (m)**	**Description**			
0.0	2.6	2.6	Boulders and brown sand			
2.6	5.3	2.7	Poor bedrock			
5.3	10.1	4.8	Good (hard) bedrock			
Final Depth	10.1	-	End of drilling at desired depth, bedrock reached			
Water level	-					

Table 9: SWTC-19-08 Description

Drill Hole ID		Easting	Northing	Elevation	Starting time	Ending time
SWTC-19-08		604588	7253485	153.9	12:20 PM	12:45 PM
Depth range (m)		**Thickness (m)**	**Description**			
0.0	1.2	1.2	Boulders			
1.2	3.4	2.2	Fine Grey sand (till)			
3.4	4.4	1.0	Poor bedrock			
4.4	10.1	5.7	Good (hard) bedrock			
Final Depth	10.1	-	End of drilling at desired depth, bedrock reached			
Water level	-					

Table 10: SWTC-19-09 Description

Drill Hole ID		Easting	Northing	Elevation	Starting time	Ending time
SWTC-19-09		604539	7253567	152.7	12:00 PM	12:20 PM
Depth range (m)		**Thickness (m)**	**Description**			
0.0	1.3	1.3	Boulders			
1.3	2.3	1.0	Fine grey sand (till)			
2.3	5.4	3.1	Brown corse sand			
5.4	6.8	1.4	Poor bedrock			
6.8	10.1	3.3	Good (hard) bedrock			
Final Depth	10.1	-	End of drilling at desired depth, bedrock reached			
Water level	-					

Table 11: SWTC-19-10 Description

Drill Hole ID		Easting	Northing	Elevation	Starting time	Ending time
SWTC-19-10		604488	7253658	152.2	11:25 AM	12:00 PM
Depth range (m)		**Thickness (m)**	**Description**			
0.0	1.1	1.1	Ice			
1.1	3.6	2.5	Frozen grey mud			
3.6	3.8	0.2	Boulders			
3.8	7.5	3.7	Fine grey silty sand (muddy cutting)			
7.5	9.8	2.3	Brown sand and gravel			
9.8	10.1	0.3	Harder material (maybe cobbles or poor bedrock)			
Final Depth	10.1	-	End of drilling at desired depth, no bedrock reached			
Water level	3.8					
Comments	Mammoth Lake shore					

APPENDIX 4 – STRATIGRAPHY SUMMARY

Table 12: Summary of the stratigraphy of drill hole SWTC-19-01 to SWTC-19-10

Description	SWTC-19 Drill Hole numbers									
	01	02	03	04	05	06	07	08	09	10
Ice	-	-	7.4 – 7.6	0.0 – 1.2	0.0 – 1.3	-	-	-	-	0.0 – 1.1
Frozen grey material	-	-	-	1.2 – 3.7	1.3 – 3.7	-	-	-	-	1.1 – 3.6
Boulders	0.0 – 1.1	0.0 – 0.7	0.0 – 1.0	-	-	0.0 – 2.7	0.0 – 2.6	0.0 – 1.2	0.0 – 1.3	3.6 – 3.8
Fine grey silty sand	-	-	-	-	3.7 – 10.1	2.7 – 3.5	-	1.2 – 3.4	1.3 – 2.3	3.8 – 7.5
Brown sand and gravel	1.1 – 5.2	0.7 – 3.5 5.8 – 6.0	1.0 – 7.4	3.7 – 7.7	-	-	-	-	2.3 – 5.4	7.5 – 9.8
Poor bedrock	-	3.5 – 5.8	7.6 – 8.8	-	-	3.5 – 7.4	2.6 – 5.3	3.4 – 4.4	5.4 – 6.8	9.8 – 10.1
Good bedrock	5.2 – 10.1	6.0 – 10.1	8.8 – 10.1	7.7 – 10.1	-	7.4 – 10.1	5.3 – 10.1	4.4 – 10.1	6.8 – 10.1	-
End of drill hole	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1

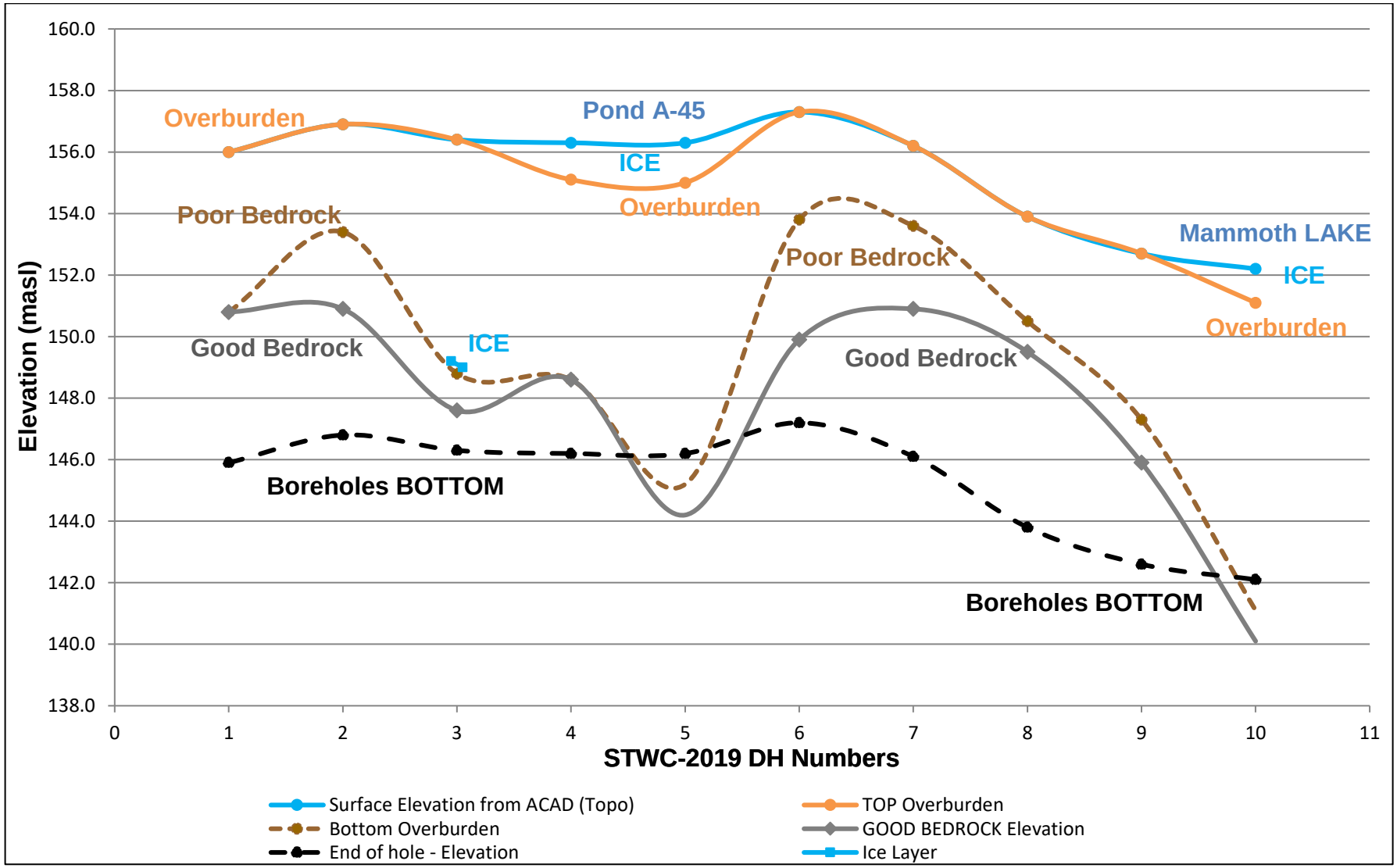

Figure 7: Visual representation of the stratigraphy of drill holes SWTC-19-01 to SWTC-10

APPENDIX 5 – PHOTOGRAPHIC REPORT

Figure 8: Overview of the site, looking North-East

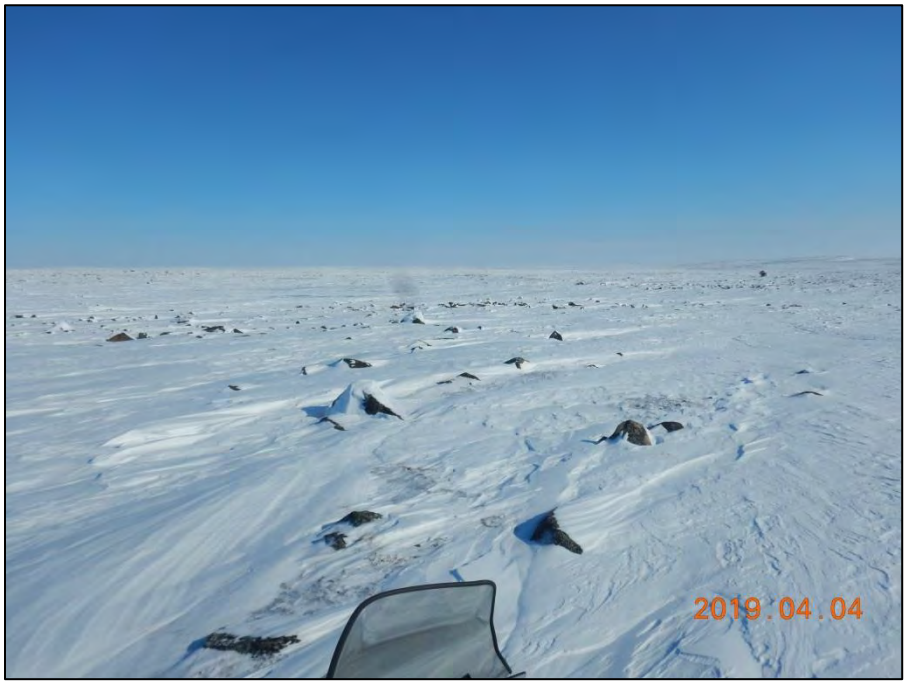

Figure 9: Overview of the site, looking South-East

Figure 10: Location of SWTC-19-01

Figure 11: Overburden drilling in SWTC-19-01

Figure 12: Location of SWTC-19-02

Figure 13: Overburden drilling in SWTC-19-02

Figure 14: Location of SWTC-19-03

Figure 15: Bedrock drilling in SWTC-19-03

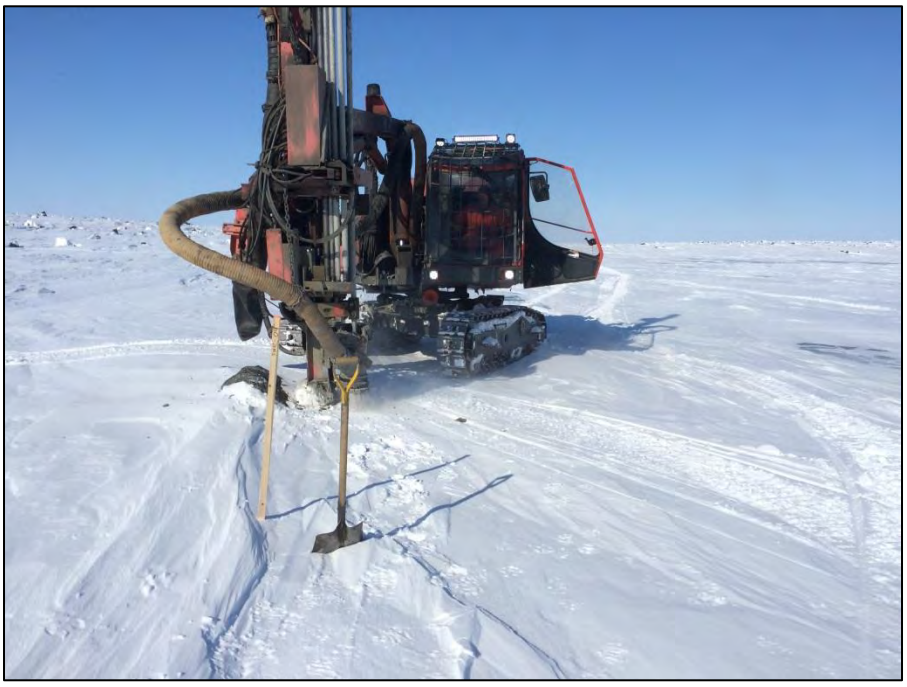

Figure 16: Location of SWTC-19-04

Figure 17: Presence of water in SWTC-19-04

Figure 18: Location of SWTC-19-05

Figure 19: Presence of water in SWTC-19-05

Figure 20: Location of SWTC-19-06

Figure 21: Poor bedrock drilling in SWTC-19-06

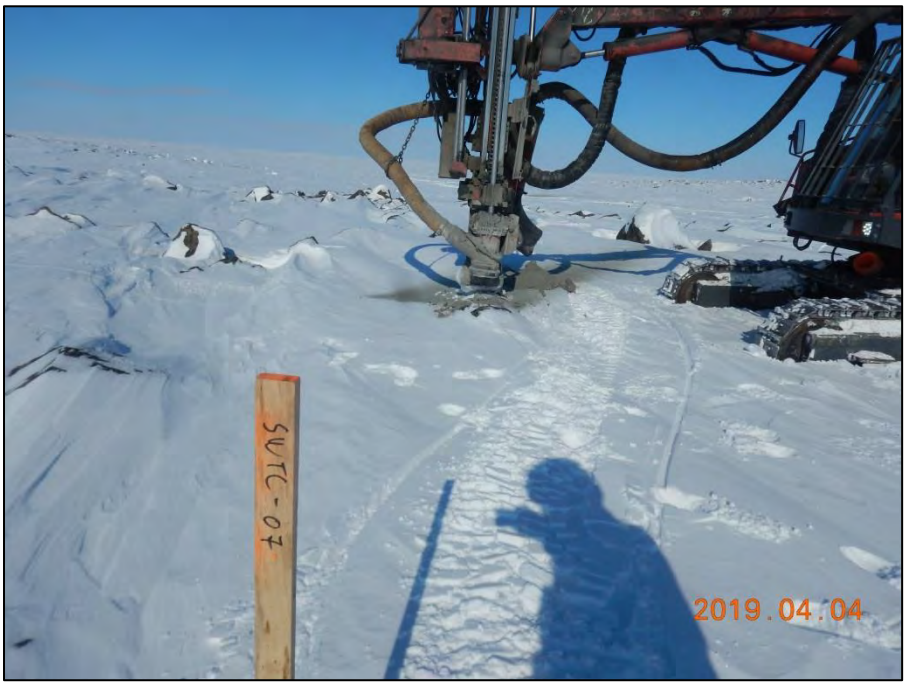

Figure 22: Location of SWTC-19-07

Figure 23: Bedrock drilling in SWTC-19-07

Figure 24: Location of SWTC-19-08

Figure 25: Overburden drilling in SWTC-19-08

Figure 26: Location of SWTC-19-09

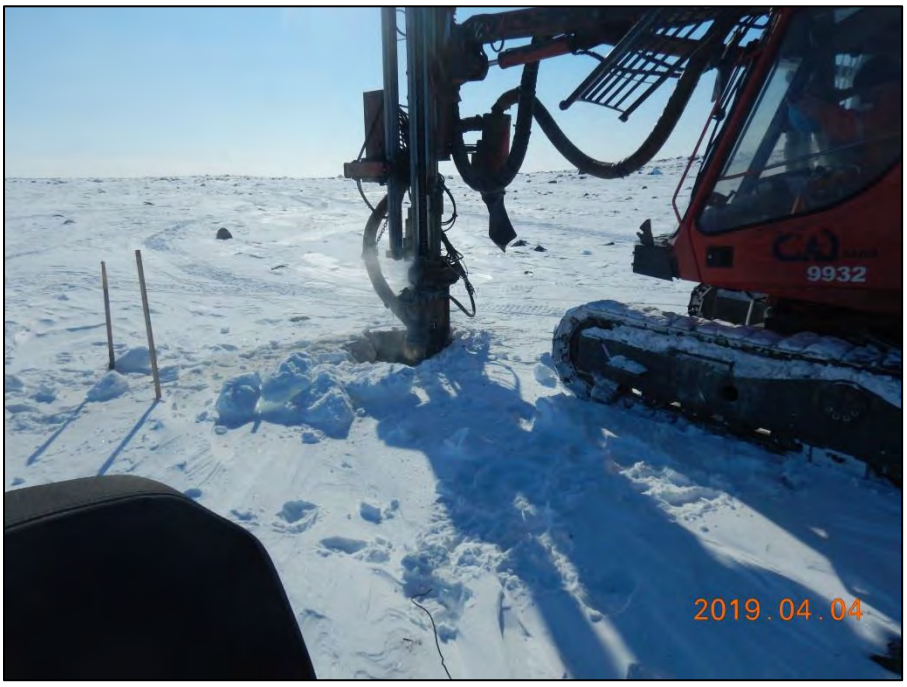

Figure 27: Location of SWTC-19-10

Figure 28: Overburden drilling in SWTC-19-10

Figure 29: Presence of water in SWTC-19-10

Appendix D

Design criteria for South Whale Tail Diversion Channel

Title of document: **DESIGN CRITERIA FOR SOUTH WHALE TAIL DIVERSION CHANNEL**

Client: **AGNICO EAGLE LIMITED**

Project: **AMARUQ PROJECT – DETAILED ENGINEERING OF SOUTH WHALE TAIL DIVERSION CHANNEL**

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REVISION INDEX

Revision #	Prep.	Rev.	Date	Pages Revised	Remarks
PA	HT/AA		28/03/2019		Issued for internal revision
PB	HT/AA	PS/YJ	29/03/2019	All	Issued for AEM comments
PC	HT/AA	ALN/YJ	16/05/2019	All	Issued for AEM comments
00	HT/AA	ALN/YJ	24/05/2019	All	Final emission

NOTICE TO READER

This document contains the expression of the professional opinion of SNC-Lavalin Inc. ("SNC-Lavalin") as to the matters set out herein, using its professional judgment and reasonable care. It is to be read in the context of the agreement dated October 4th 2017 (the "Agreement") between SNC-Lavalin and Agnico Eagle Limited (the "Client") and the methodology, procedures and techniques used, SNC-Lavalin's assumptions, and the circumstances and constraints under which its mandate was performed. This document is written solely for the purpose stated in the Agreement, and for the sole and exclusive benefit of the Client, whose remedies are limited to those set out in the Agreement. This document is meant to be read as a whole, and sections or parts thereof should thus not be read or relied upon out of context.

SNC-Lavalin has, in preparing estimates, as the case may be, followed accepted methodology and procedures, and exercised due care consistent with the intended level of accuracy, using its professional judgment and reasonable care, and is thus of the opinion that there is a high probability that actual values will be consistent with the estimate(s). Unless expressly stated otherwise, assumptions, data and information supplied by, or gathered from other sources (including the Client, other consultants, testing laboratories and equipment suppliers, etc.) upon which SNC-Lavalin's opinion as set out herein are based have not been verified by SNC-Lavalin; SNC-Lavalin makes no representation as to its accuracy and disclaims all liability with respect thereto.

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TABLE OF CONTENTS

List of figures

List of tables

1.0 INTRODUCTION

1.1 Context

Agnico Eagle Mines Limited, Meadowbank Division ("Agnico Eagle") is developing the Whale Tail Pit, a satellite gold deposit on the Whale Tail property, as a continuation of current mine operations and milling at the Meadowbank Mine. The Amaruq property is a 408 square kilometre (km^2) site located on Inuit Owned Land approximately 150 kilometres (km) north of the hamlet of Baker Lake and approximately 50 km northwest of Meadowbank Mine in the Kivalliq Region of Nunavut. The property was acquired by Agnico Eagle in April 2013.

1.2 Project description

A scoping study of the Whale Tail Pit Project was initiated in January 2015 by AEM. SNC-Lavalin Inc. (SNC-Lavalin) was retained for the engineering of the geotechnical and water management infrastructure of the project (SNC-Lavalin, 2015a). The site layout was jointly developed by the SNC-Lavalin and AEM teams. A permitting engineering report followed the scoping study and was completed in early 2016 to develop the water management infrastructures (SNC-Lavalin, 2016a).

As part of these infrastructures, there is a dewatering dike that is required to enable mining of the open pit located in the north part of Whale Tail Lake. This dike, named Whale Tail Dike (WTD), is located on a shallow plateau of the lake floor with an approximate 2 m depth of water. Once in operation, the downstream side of the dike will be dewatered and the upstream side of the dike will allow a 3.5 m raise of the water level prior to being discharged by gravity towards Mammoth Lake via a new blasted channel located west of the property: the South Whale Tail Diversion Channel (SWTDC). This channel will be built between existing A20, A45 and Mammoth lakes and will reroute approximately 2,400 ha of watershed.

In 2017, AEM mandated SNC-Lavalin to perform the detailed engineering of WTD and the SWTDC. Since the geotechnical campaign was postponed for winter 2019, the channel was designed at a feasibility engineering level and was presented in a technical memorandum (SNC-Lavalin, 2018a). Due to few data available for the calibration of the hydrologic and hydraulic model, a safety factor of 1.5 was used for the design of SWTDC, resulting in a conservative design with a 25 m base width channel.

In 2018, AEM performed a review of the Baseline Hydrology and the SWTDC design report produced by SNC-Lavalin, detailing AEM's technical opinion regarding the design of this channel (AEM, 2018). Following this review, AEM mandated SNC-Lavalin to conduct a third party review of the previous hydraulic assessment that was carried out for the SWTDC (SNC-Lavalin, 2018b). This review concluded that a channel section with a base width of 5.0 m, would have sufficient capacity to convey the IDF with no safety factor and with adequate freeboard when taking into account the storage capacity available in the South Whale Tail Lake. Nevertheless, it was recommended to use a safety factor to account for potential blockage of ice and sediment in the channel during operation.

In 2019, AEM mandated SNC-Lavalin to perform the detailed engineering of SWTDC following the results of the 2019 geotechnical campaign. The following sections present the design criteria for the SWTDC which includes the geotechnical aspects and water management parameters established for this phase of the project. Figure 1-1 shows the general location of the channel and its corresponding watershed areas.

602 000 604 000 606 000 608 000 610 000

7 256 000 7 254 000 7 252 000 7 250 000

Nemo Lake
Mammoth Lake
Whale Tail Lake (North basin)
Whale Tail Lake (South basin)
Lake A53 146.5 ha
South Basin 2,303.6 ha
North East dike
Whale Tail waste rock storage facility
WRSF dike
Open pit
Ore stockpile
Waste rock exploration pad
Whale Tail camp
Whale Tail attenuation pond
Whale Tail dike
Mammoth dike
South Whale Tail channel

N

PROJECT COMPONENTS (PHASE I)

- Dike or cofferdam
- Modified waterbody
- Collection ditch
- Diversion ditch
- Open pit
- Storage facility
- Industrial area
- Road

HYDROGRAPHY

- Watercourse
- Lake
- Whale Tail Lake modified watershed (2,450.1 ha)

AGNICO EAGLE

SNC·LAVALIN

AMARUQ GOLD MINING PROJECT
Detailed Engineering of Water Management and Geotechnical Infrastructure

Whale Tail Lake Watershed After the Construction of Whale Tail Dike

Sources:
Topography, PhotoSat, 2015
CanVec, NRCan, 2016
Project components : March 2018

Project: 651298
File: snc651298_001_f2_WTLWshdMod_190524.mxd

0 350 700 m

1:35 000

UTM projection, Zone 14, NAD83 (CSRS)

May 24, 2019 | **Figure 2**

S:\INTC\MineAmaruq\651298 Detailed Eng WM-Geotech\produit\001-CriteresConception\snc651298_001_f2_WTLWshdMod_190524.mxd

2.0 CODES, LAWS AND REGULATIONS

The design of the SWTDC must be in adherence with recommendations provided in the latest Dam Safety Guidelines produced by the Canadian Dam Association (CDA, 2013 & 2014).

The geotechnical component of the work will follow the recommendations provided in the American Society for Testing and Materials (ASTM) for the geotechnical components of the work. Riprap protection will be sized following the methodology recommended by various leading agencies and corporations (i.e. USACE 1994).

3.0 DESIGN CRITERIA – GENERAL

The criteria adopted for Phase I of the Amaruq Project were based on previous design definitions established in previous SNC-Lavalin's documents (i.e. SNC-Lavalin 2018a & 2018b). The following sections describe the criteria adopted for the design of the channel. The system, dike and channel, was previously given the classification of "High" and the selected IDF was the 1/3rd Flood between the 1,000-Yr Flood and the PMF (SNC-Lavalin, 2018b).

3.1 Sub-Drainage Areas

All-natural drainage areas reporting to existing WTL (before the WTD was constructed) were delineated and defined previously in SNC-Lavalin 2018c, including the new watershed areas that were defined once the WTD and the SWTDC enter in operation. These watershed areas were estimated to be:

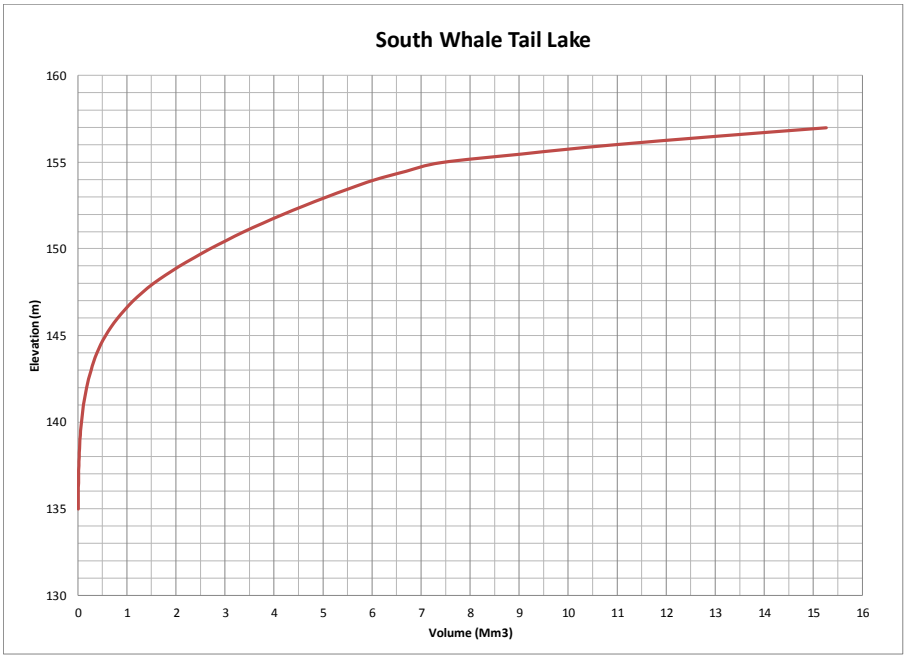
- Total watershed area, natural conditions of the system: 2,815 ha
- Total watershed area, with the system in place (dike and channel): 2,429 ha

The SWTDC will drain a watershed of 2429 ha. This area includes all the runoff flowing naturally from the South Whale Tail Lake's surroundings, and the watershed from Lake A53. The watershed areas to manage during operation are shown in Figure 1-1. Only this area (2,429 ha) will be taken into consideration for the design of the SWTDC.

3.2 Lake Volume

The volume of the South Whale Tail Lake (SWTL) that will be taken into consideration for the final design of the channel will be those that correspond to the new configuration of Whale Tail Lake. The state-storage relationship for these conditions is shown in Figure 3-1. Runoff water from the surrounding watershed will be routed through the South Whale Tail lake first prior to entering the SWTDC.

Figure 3-1 – Stage Storage Curve SWTL



3.3 Flood flows

Table 3-1 summarises the results previously obtained in the hydrological study (SNC-Lavalin, 2018c) for spring and summer-fall rainfall-depths, in 72 hours, for different return periods. Table 3-2 summarises the maximum annual snowpack-depths, for different return periods.

Table 3-1 : Precipitation Events (1950-2016)

Return Period [year]	72- hour Spring Rainfall [mm]	72- hour Summer - Fall Rainfall [mm]
2	12.9	30.8
5	20.5	43.0
10	25.5	51.2
25	30.5	59.0
50	37.0	69.2
100	41.9	76.8
1000	58.7	103.0
PMP(1)	133.9	225.0

(1) PMP is not associated with any return period.

Table 3-2 : Maximum Annual Statistical Snowpack

Return Period [year]	Maximum Annual Snowpack [mm water-eq]
2	93
5	130
10	153
25	173
50	197
100	214
1000	275
PMS(1)	440

(1) Probable Maximum Snow (PMS) is not associated with any return period.

Based on this hydrological analysis (SNC-Lavalin, 2018c), the most extreme PMF (Probable Maximum Flood) resulted from the combination of the spring PMP (Probable Maximum Precipitation) in 72 hours and the 1:100-Yr snowmelt in 13 days.

The WTD was given a classification of “High” (CDA, 2013 & 2014), and the corresponding inflow design flood (IDF) was the 1/3rd Flood of the 1,000-Yr Flood and the PMF. This flood will be adopted for the detailed engineering of the SWTDC. Inflow hydrographs, also defined in SNC-Lavalin (2018c), will be used in the final design for the channel.

Other information that will be used for reference in the design engineering phase is the Annual Intensity-duration-frequency (I-D-F) curves, available at Baker Lake A - meteorological station which is operated by Environment Canada (EC). Table 3-3 shows the rainfall depths in (mm) for return periods ranging from 1:2 years to 1:100 years.

Table 3-3 : I-D-F Baker Lake A Station

Duration	Return Period [year]						
	2 years	5 years	10 years	20 years	25 years	50 years	100 years
	Annual Rainfall Depth [mm]						
5 min	2	3	3	4	4	5	5
10 min	2	3	4	5	5	5	6
15 min	3	4	4	5	5	6	6
30 min	4	6	6	7	8	9	9
1 h	6	9	10	12	12	14	15
2 h	9	13	16	19	20	22	25
6 h	17	23	27	31	32	36	39
12 h	22	32	39	45	48	54	60
24 h	27	40	48	57	59	67	75

3.4 Water Levels

The water operation-levels stablished previously in SNC-Lavalin (2018a) to divert the flows from SWTL to Mammoth Lake will be adopted in the design phase as follows:

- Normal operating water level (NOWL) 156.0 m
- Maximum water level (MWL) 157.0 m
- Channel Inlet-invert elevation 155.8 m
- Initial water elevation in South Whale Tail Lake at the start of the design event of 155.8 m
- A minimum channel depth will be determined based on the depth of the water at the minimum slope plus 0.3 m of freeboard.

3.5 General design basis and assumptions

- The channel will have a trapezoidal shape with lateral slopes of minimum 3H:1V.
- The alignment of the SWTDC will be chosen to minimize its length and excavation. The length will be approximately 1,000 m with a 4.0 m drop between SWTL and Mammoth Lake. The total length of the channel will be confirmed during the design based on the variations of the terrain and geotechnical considerations for the alignment of the channel. The bed-slope will be based on existing topography to involve minimum excavation. Opportunities will be sought during the design phase to convey the flows downstream of Lake 45 through the existing natural channel, without construction of a channel at this location.
- A hydrodynamic model will be prepared based on the new configuration of the SWTL to properly size the SWTDC. The model will include SWTL, Lake 45 and Mammoth Lake as storage areas to represent the new conditions of the system, including the SWTLDC. Boundary conditions will be the inflow hydrographs to SWTL as upstream boundary and water levels at Mammoth Lake as downstream boundary conditions.
- A base width of the channel will be obtained by trial and error based on the flood flow (IDF) and slopes of the channel.

- Rip-rap protection will be sized following the methodologies recommended by leading agencies and corporations (i.e. USACE 1994). The rip-rap will provide protection to resist the erosive forces of the flow to the channel bed and slopes. The protective layer will be sized according to the interrelation of the stone shape, size, weight, and durability in addition to riprap gradation and layer thickness. The rip-rap size (D50), layer thickness and proper gradation will be provided to protect the channel.
- A transition material between the bottom of the excavation and the rip-rap will be planned.
- The current expected life span of the SWTDC is about 20 years. During this period, AEM will be present to monitor this structure and make appropriate maintenance of it when required.
- It is assumed that Whale Tail Dike is sealed up to elevation 157.0 m.
- If no information is collected within the footprint of the SWTDC, the analyzed soil sample from the industrial sector (Samples 16-SG-09156 to 16-SG-09160) will be used as representative of the soil foundation of the channel.
- The SWTDC plays a critical role in the protection of the Whale Tail Dike to ensure that the water level does not overtop the dike. Thus, it is assumed that the appropriate maintenance and surveillance procedures will be put in place by AEM to prevent and reduce the risk of ice and snow blockage in the SWTDC. Access roads and ramps on both sides of the channel and adequate equipment and trained staff will be considered for maintenance purposes. These best management practices will be described in the OMS manual by AEM and SNC-Lavalin to ensure that these procedures are satisfactory for the safe operation of the channel.
- The inlet of the channel will be faced relatively at the deepest part of the lake to minimize chances of ice blockage during the spring freshet.

4.0 REFERENCES

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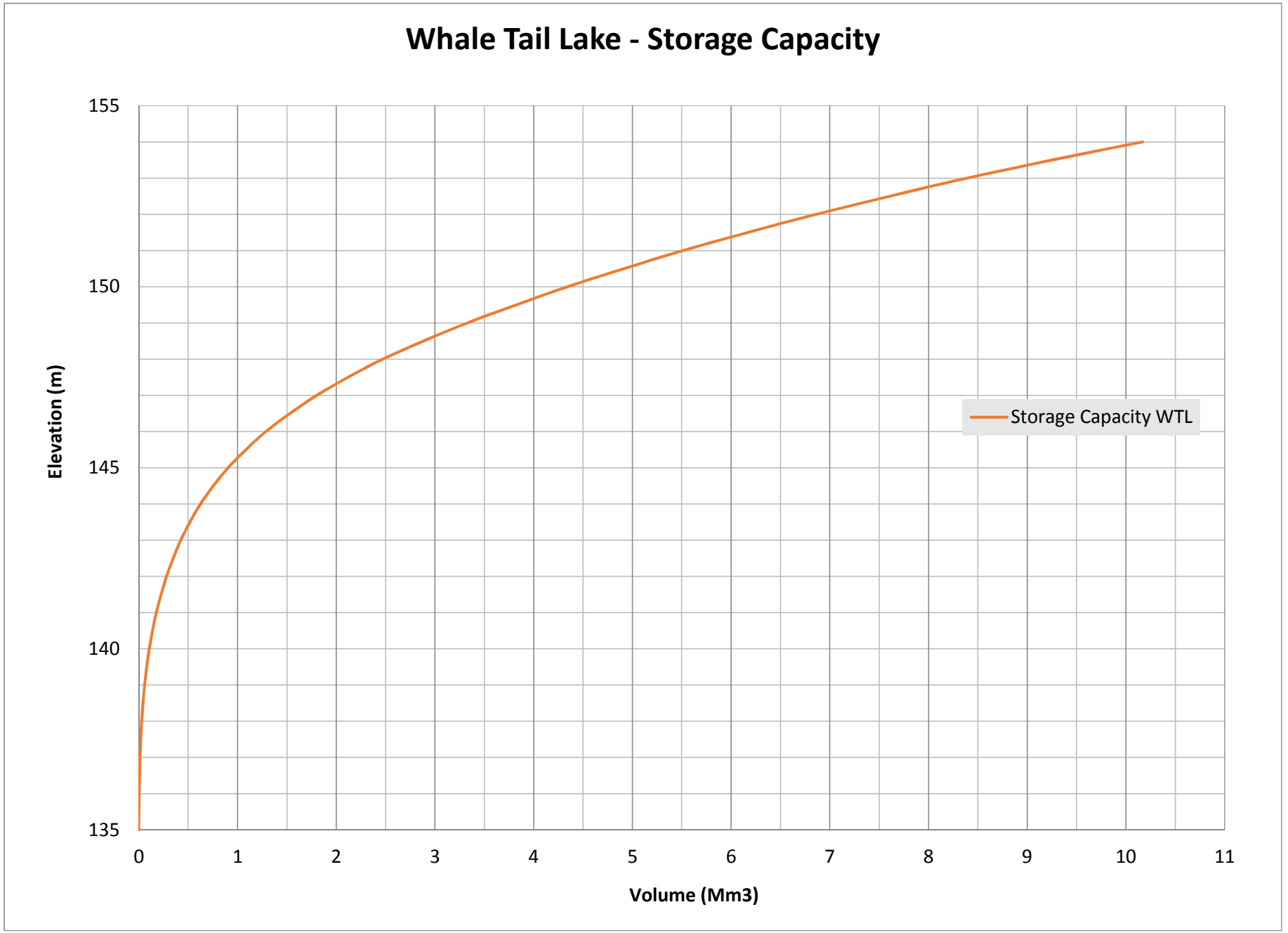
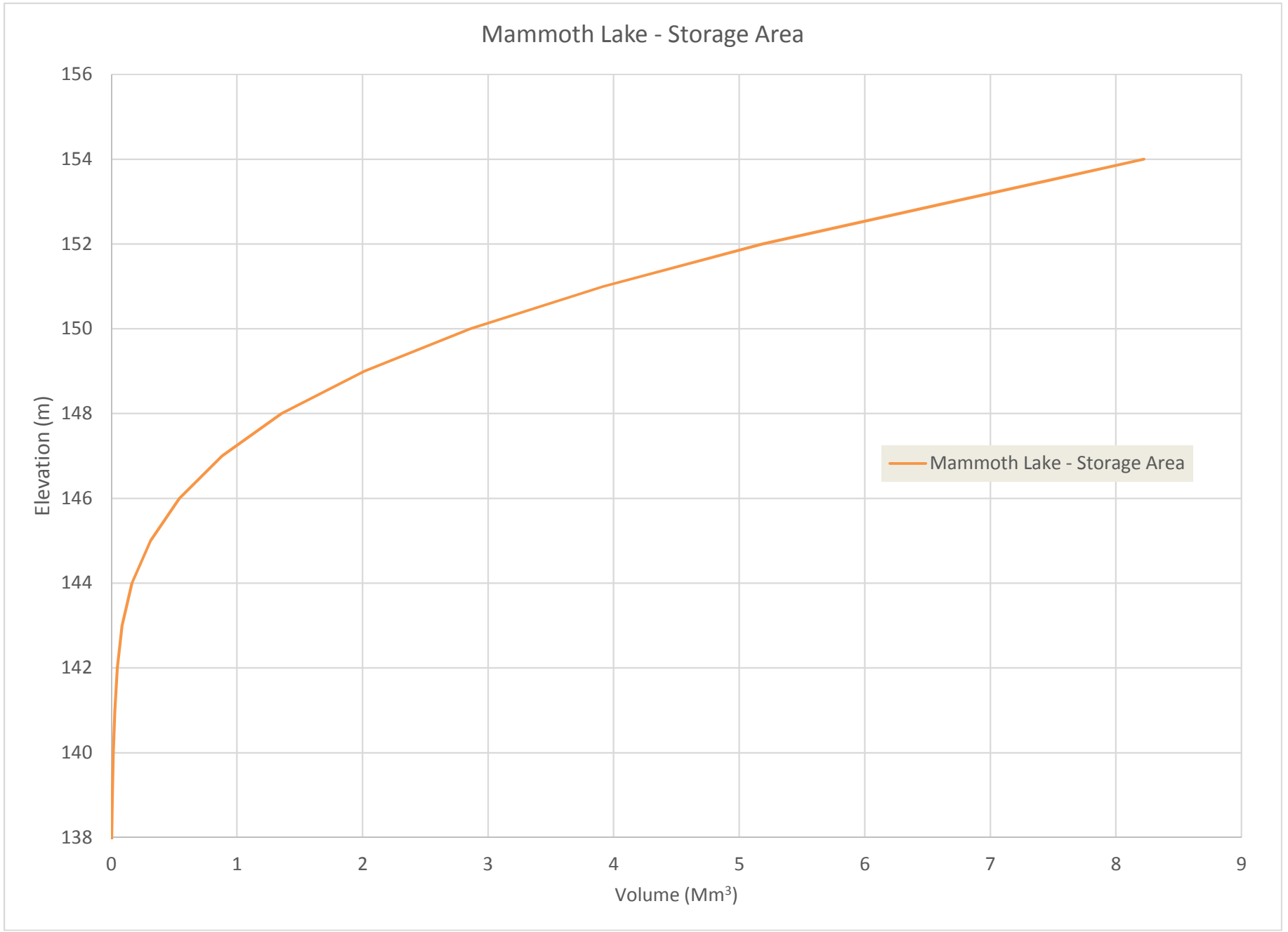
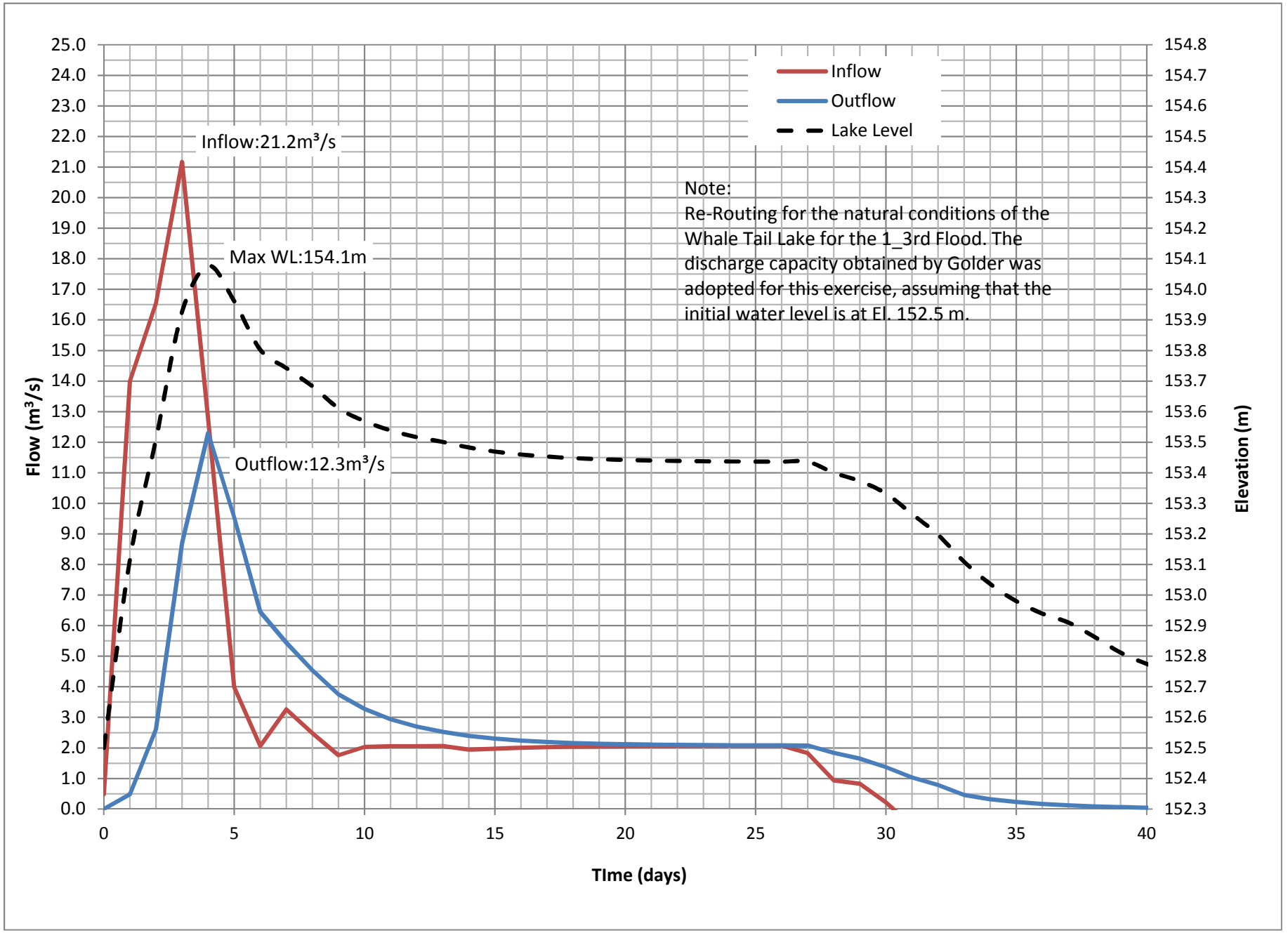
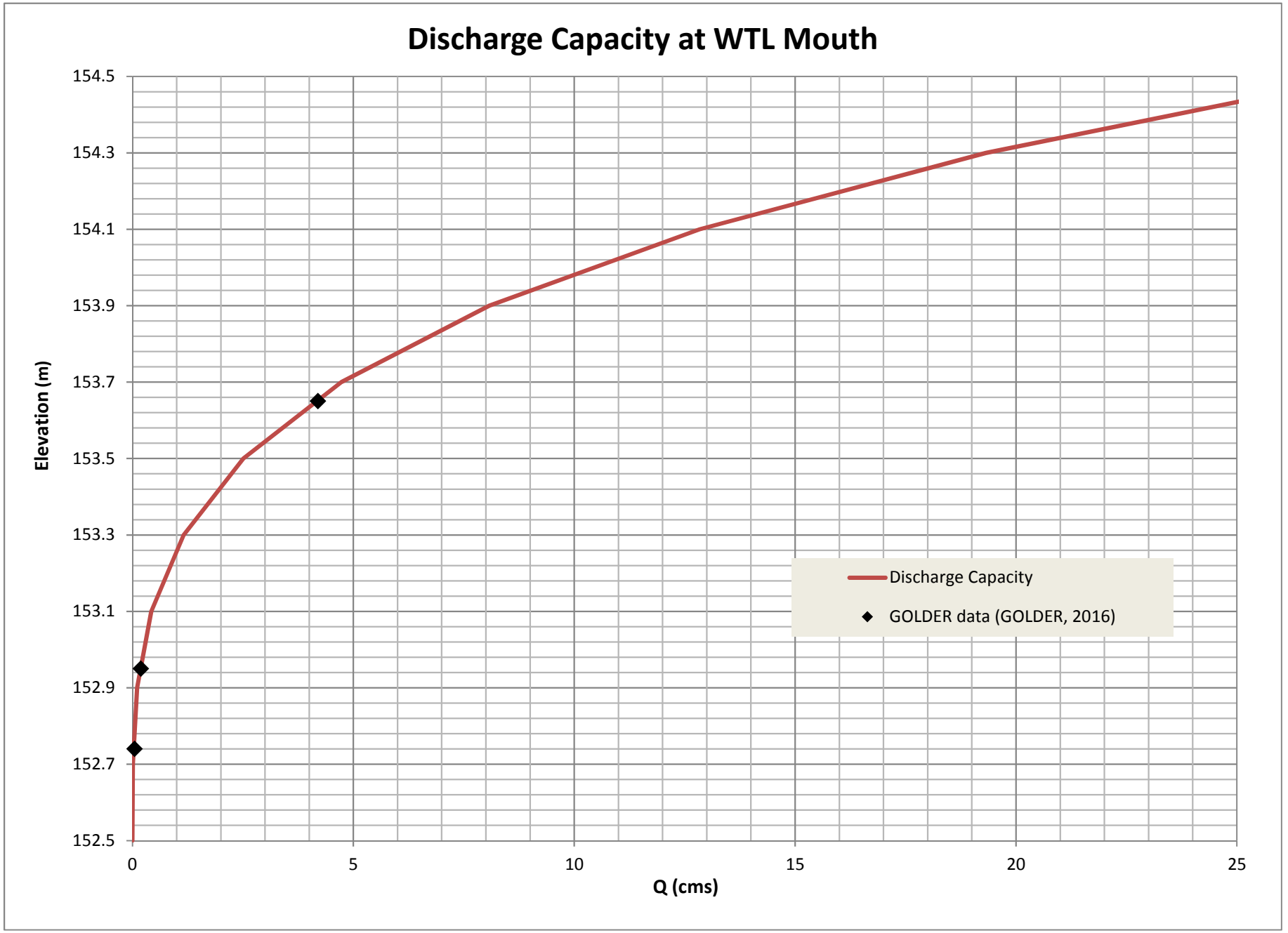
Appendix E

Hydraulic calculations


Whale Tail Lake - Storage Capacity
155
150
145
140
135
Elevation (m)
0
1
2
3
4
5
6
7
8
9
10
11
Volume (Mm3)
Storage Capacity WTL


Mammoth Lake - Storage Area
156
154
152
150
148
146
144
142
140
138
Elevation (m)
0
1
2
3
4
5
6
7
8
9
Volume (Mm3)
Mammoth Lake - Storage Area


Inflow
Outflow
Lake Level
Inflow:21.2m³/s
Max WL:154.1m
Outflow:12.3m³/s
Note:
Re-Routing for the natural conditions of the Whale Tail Lake for the 1_3rd Flood. The discharge capacity obtained by Golder was adopted for this exercise, assuming that the initial water level is at El. 152.5 m.
Flow (m³/s)
Elevation (m)
TIme (days)
25.0
24.0
23.0
22.0
21.0
20.0
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
154.8
154.7
154.6
154.5
154.4
154.3
154.2
154.1
154.0
153.9
153.8
153.7
153.6
153.5
153.4
153.3
153.2
153.1
153.0
152.9
152.8
152.7
152.6
152.5
152.4
152.3
0
5
10
15
20
25
30
35
40


Discharge Capacity at WTL Mouth
154.5
154.3
154.1
153.9
153.7
153.5
153.3
153.1
152.9
152.7
152.5
Elevation (m)
0
5
10
15
20
25
Q (cms)
Discharge Capacity
GOLDER data (GOLDER, 2016)

Appendix F

Road 24 detailed engineering report